Robben Island Museum

Integrated Conservation Management Plan
2013-2018

DRAFT

Natural Environment Management Plan
RIM Vision Statement

Robben Island World Heritage Site (RIWHS) as a living museum aims to memorialise and promote its unique universal symbolism of the triumph of the human spirit over adversity and injustice, using both its tangible and intangible resources.

RIWHS will engage its local, national and international stakeholders to develop world class conservation and use programmes, and employ strategies that will:

- Reflect its documented memories of the political imprisonment landscape and other historical layers;
- Encourage critical debate and lifelong learning;
- Promote democratic principles and human rights;
- Promote self-reflection and spiritual engagement of the site through a world class visitor experience.

Therefore RIWHS shall manage its richly layered resources and associated activities in a manner that promotes economic sustainability and development for itself and local communities.

RIM Mission Statement

In implementing its vision, RIWHS will focus on the following core purposes:

- Implementation of an integrated management approach and tools for the site;
- Enhancement of universal access;
- Improved visitor experience through effective visitor management;
- Improved interpretation and public programming;
- Review and implementation of policies for the management of the site;
- Ensuring the significance of the site through sound conservation management strategies;
- Providing an opportunity for sustainable economic empowerment.
# Table of Contents

RIM Vision Statement ...................................................................................................................... ii  
RIM Mission Statement ..................................................................................................................... ii  
Acronymns ........................................................................................................................................ v  
Executive Summary ........................................................................................................................... vi  
Part I: Background ............................................................................................................................. 1  
1. Introduction ................................................................................................................................... 1  
2. Approach and Guiding Principles .................................................................................................. 2  
   2.1 A framework NEMP .................................................................................................................. 2  
   2.2 The ‘cultural landscape’ ........................................................................................................... 2  
   2.3 Spatial planning ........................................................................................................................ 2  
   2.4 Co-operative governance ......................................................................................................... 3  
3. Goals for Environmental Management ....................................................................................... 3  
4. Implementation of the NEMP ........................................................................................................ 4  
   4.1 Legal framework ...................................................................................................................... 4  
   4.2 Alignment with other plans and policies .................................................................................. 4  
   4.3 Organisational Structure and Responsibilities ...................................................................... 6  
      4.3.1 Within RIM ....................................................................................................................... 6  
      4.3.2 External to RIM ............................................................................................................... 6  
   4.4 Schedule and budget ................................................................................................................ 7  
   4.5 Reporting and monitoring ....................................................................................................... 8  
   4.6 Record keeping and data management .................................................................................... 8  
   4.7 Review of the NEMP .............................................................................................................. 9  
5. Management Specifications .......................................................................................................... 10  
Part II: Management Specifications ................................................................................................. 11  
1. Co-operative governance ............................................................................................................ 12  
2. RIM communications and reporting ......................................................................................... 14  
3. Spatial planning ........................................................................................................................... 16  
4. Vegetation management .............................................................................................................. 18  
5. Large herbivores .......................................................................................................................... 23  
6. Game fowl ..................................................................................................................................... 25  
7. Problem terrestrial vertebrates – cats, rabbits, rats, pets .......................................................... 27  
8. Small indigenous animal species ............................................................................................... 29  
9. Bee colony .................................................................................................................................... 30
10. Arthropods ............................................................................................................. 31
11. Marine and coastal management........................................................................... 32
12. Management of marine mammals, seabirds and shorebirds ............................... 35
13. Mainstreaming sustainability .................................................................................. 40
14. Environmental education and awareness ............................................................. 45
15. Summary .................................................................................................................. 47

Part III: References and Appendices........................................................................... 49

References ...................................................................................................................... 49

Appendix 1: Legal Framework ....................................................................................... 52
Appendix 2: Review of Relevant Plans and Policies ...................................................... 53
Appendix 3: Environmental Method Statement ............................................................. 54
### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>ADU</td>
<td>UCT Animal Demography Unit</td>
</tr>
<tr>
<td>CN</td>
<td>Cape Nature</td>
</tr>
<tr>
<td>CSIR</td>
<td>Council for Scientific and Industrial Research</td>
</tr>
<tr>
<td>DAC</td>
<td>National Department of Arts and Culture</td>
</tr>
<tr>
<td>DAFF</td>
<td>National Department of Agriculture, Forestry and Fisheries</td>
</tr>
<tr>
<td>DEA</td>
<td>National Department of Environmental Affairs</td>
</tr>
<tr>
<td>DEA O&amp;C</td>
<td>National Department of Environmental Affairs: Directorate of Oceans and Coasts</td>
</tr>
<tr>
<td>DEA&amp;DP</td>
<td>Department of Environmental Affairs &amp; Development Planning of the Western Cape</td>
</tr>
<tr>
<td>DPW</td>
<td>Department of Public Works</td>
</tr>
<tr>
<td>DWA</td>
<td>Department of Water Affairs</td>
</tr>
<tr>
<td>EEP</td>
<td>Emergency and Evacuation Plan</td>
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<tr>
<td>EPPs</td>
<td>Ex-Political Prisoners</td>
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<tr>
<td>EMP</td>
<td>Environmental Management Programme</td>
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<tr>
<td>FM</td>
<td>Facilities Maintenance</td>
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<tr>
<td>GIS</td>
<td>Global Information System</td>
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<tr>
<td>ICMP</td>
<td>Integrated Conservation Management Plan</td>
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<tr>
<td>MCS</td>
<td>DAFF Monitoring, Control and Surveillance Group</td>
</tr>
<tr>
<td>MLRA</td>
<td>Marine Living Resources Act 18 of 1998</td>
</tr>
<tr>
<td>MoU</td>
<td>Memorandum of Understanding</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Environmental Management Act 107 of 1998</td>
</tr>
<tr>
<td>NEM:AQA</td>
<td>National Environmental Management: Air Quality Act 39 of 2004</td>
</tr>
<tr>
<td>NEM:BA</td>
<td>National Environmental Management: Biodiversity Act 10 of 2004</td>
</tr>
<tr>
<td>NEMP</td>
<td>Natural Environment Management Plan</td>
</tr>
<tr>
<td>NEM:PAA</td>
<td>National Environmental Management: Protected Areas Act 57 of 2003</td>
</tr>
<tr>
<td>NHRA</td>
<td>National Heritage Resources Act 25 of 1999 (NHRA).</td>
</tr>
<tr>
<td>NMG</td>
<td>Nelson Mandela Gateway</td>
</tr>
<tr>
<td>NWA</td>
<td>National Water Act 36 of 1998</td>
</tr>
<tr>
<td>RIM</td>
<td>Robben Island Museum</td>
</tr>
<tr>
<td>SAHRA</td>
<td>South Africa Heritage Resource Agency</td>
</tr>
<tr>
<td>SANBI</td>
<td>South African National Biodiversity Institute</td>
</tr>
<tr>
<td>SANCCOB</td>
<td>Southern African Foundation for the Conservation of Coastal Birds</td>
</tr>
<tr>
<td>SAP</td>
<td>South African Police</td>
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<tr>
<td>SAEON</td>
<td>South African Environmental Observation Network</td>
</tr>
<tr>
<td>SPCA</td>
<td>Society for the Prevention of Cruelty to Animals</td>
</tr>
<tr>
<td>SU</td>
<td>Stellenbosch University</td>
</tr>
<tr>
<td>UCT</td>
<td>University of Cape Town</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Education, Scientific and Cultural Organisation</td>
</tr>
<tr>
<td>UW</td>
<td>University of Witwatersrand</td>
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<tr>
<td>WHS</td>
<td>World Heritage Site</td>
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</table>
Executive Summary

Robben Island was inscribed as a World Heritage Site by UNESCO in 1999 on the basis of its cultural significance and subsequently declared as a World Heritage Site (WHS) in 2007. The unique geographical context for the WHS has meant that various human interventions have transformed the natural environment, namely through the introduction of alien plant and animal species and the development of facilities and infrastructure. The activities of residents, staff and visitors continue to impact natural resources and this remains an ongoing challenge for management. Management of the site therefore requires the protection and enhancement of both the cultural and natural environments.

In order to maintain the multi-layered historical landscape depicting the various historical and cultural periods, the landscape must be managed in accordance with national and provincial priorities for conservation of natural and built environments. Management decisions and actions should be aimed at minimising the cost of maintaining the natural environment in the medium to long term. The overarching aim for environmental management is therefore to ensure the Island’s natural ecosystems are restored to a condition in which they will become self-sustaining and can be kept in that condition with minimal management input – thus meeting a basic criterion of sustainability. However internal and external factors such as the increasingly important role of the Island for the conservation of Threatened indigenous species, especially seabirds, has meant that the management objectives for Robben Island’s natural environment must be expanded to include a number of different dimensions. There are as follows:

- To restore and then maintain the health of terrestrial ecosystems;
- To restore and then maintain the health of coastal and marine ecosystems;
- To promote the conservation of Threatened indigenous species, especially those that are endemic to southern Africa;
- To foster relations with other relevant governmental bodies and organs of state that will result in collaborative management of the natural environment;
- To foster relations with relevant research and educational institutions;
- To foster internal communication within RIM;
- To employ spatial planning tools to assist and inform management of the natural environment; and
- To mainstream sustainability into operations and improve resource use efficiency.

The conservation priorities for the natural environment of Robben Island are as follows:

- To minimise the risk of wildfires to wildlife and habitat as well as to people and the built environment;
- To manage the stocking of large herbivores on the Island so as not to exceed the carrying capacity;
- To manage the conservation of seabirds and other indigenous birds;
- To manage the conservation of other indigenous vertebrates and invertebrates; and
- To rehabilitate the vegetation to a condition where it will become self-sustaining and can be kept in that condition with minimal management input.
A Natural Environmental Management Plan (NEMP) is necessary to provide the framework for achieving the stated environmental objectives and priorities and provides the foundation for management actions. The NEMP was produced through a revision of the 2002 EMP compiled by the CSIR. Part I provides the legal, institutional and procedural context for the more detailed ‘Management Specifications’ that are set out in Part II. Each Management Specification relates to a specific area of intervention required to meet the provisions of the law as well as the overarching objectives for environmental management. The Management Specifications are as follows:

1. Co-operative governance;
2. RIM communications and reporting;
3. Spatial planning;
4. Vegetation Management;
5. Large herbivores;
6. Game fowl;
7. Problem terrestrial vertebrates;
8. Small indigenous animal species;
9. Bee colony;
10. Arthropods;
11. Marine and coastal management;
12. Management of marine mammals, seabirds and shorebirds
13. Mainstreaming sustainability; and

Extracted from these Management Specifications are the particular actions requiring immediate implementation and these are identified as follows:

1. Establishment of a Robben Island Environmental Advisory Committee;
2. Investigate the legal framework within which the African penguins and other seabirds at the Island would receive adequate protection;
3. Firebreak design and maintenance;
4. Cat, rabbit, rat eradication/control;
5. Identify target for Fallow Deer eradication/control;
6. Designation of, and procurement and institution of signage for, no-go areas;
7. Installation of speed bumps;
8. Alien vegetation removal near sensitive cultural sites;
9. Formalisation of agreements with stakeholders for monitoring of poaching (DAFF and SAPS); and
10. GIS and fire training for environmental staff.

The document is considered to be a Framework NEMP which sets out the various actions for implementation and prioritises these over a five year period. This document should therefore be considered a live document which should be built upon as more detailed environmental action plans are devised. The immediate priorities outlined above provide the starting point for implementation of the NEMP.
**Part I: Background**

1. **Introduction**

Robben Island was inscribed as a World Heritage Site by UNESCO in 1999 on the basis of its cultural significance; it was subsequently declared as a World Heritage Site (WHS) in 2007 under the World Heritage Convention Act (49 of 1999). The Act requires an Integrated Conservation Management Plan (ICMP) to provide the framework and the necessary strategies to ensure that Robben Island maintains its integrity as a WHS. A Natural Environmental Management Plan (NEMP) is necessary to provide the framework for the management of the natural environment and is one of the supporting documents under the framework of the 2nd ICMP (2013-2018). This NEMP provides the foundation for management actions in respect of the natural environment, through a revision of the 2002 EMP compiled by CSIR.

Robben Island is recognised as a site of outstanding universal value on the basis of its political symbolism as a place of selfless struggle and as a place that signifies the triumph of the human spirit over great adversity. The human history of the site is however, rich and layered and is said to have begun in 1498 with the arrival of Vasco De Gama. Various periods of occupation and habitation symbolise layers of human history and include maritime, colonial, military, religious, disease, common law and political imprisonment heritage. Over the various periods, the Island has experienced a significant degree of transformation from its original natural state through built infrastructure; the over-exploitation of living marine and terrestrial resources as well as other resources such as groundwater; the introduction of livestock, game and alien animal species; and the intentional planting of alien plant species. The natural environment is an integral part of the rich cultural landscape and requires effective management to promote a more sustainable backdrop for the promotion of Robben Island as a World Heritage Site.

Robben Island Museum (RIM) is the management authority for Robben Island and the 1 nautical mile marine buffer that surrounds the Island. The Island itself is a national asset and falls under the jurisdiction of the Department of Arts and Culture (DAC) who provide funding on the basis that Robben Island is a cultural institution. The Department of Public Works (DPW) are custodians of the immoveable assets and are responsible for the maintenance of state assets and capital works projects relating to the built environment with funding received from DAC.

In 2000, the City of Cape Town was established as a municipality in terms of the Local Government: Municipal Structures Act (117 of 1998). Under the earlier Municipal Demarcation Act (27 of 1998) the new municipality included Robben Island within its boundaries.

The geographical location of Robben Island and unique institutional arrangements provide a challenging context for decision-making. However it is the aim of this NEMP to foster collaboration between stakeholders and provide a clear path for managing the natural environment for the following 5 years and indefinitely into the future.

The NEMP is set out in three parts, Part I is the Background and focuses on the legal and policy context, the approach to developing and implementing the NEMP, the goals for environmental management and the implementation of the NEMP. Part II refers to the detailed ‘Management Specifications’ and outlines the specific objectives and tasks required to achieve these under the
themes of Co-operative governance; RIM communications and reporting; Spatial planning; Vegetation management; Large herbivores; Game fowl; Problem terrestrial vertebrates; Small indigenous animal species; Bee colony; Arthropods; Marine and coastal management; Management of marine mammals, seabirds and shorebirds; Mainstreaming sustainability; and Environmental education and awareness. Under each of these themes the legislative framework, background, objectives, programmes/actions, responsibilities, implementation and related documents are listed. Part III includes the list of references as a source of further information as well as the appendices.

2. **Approach and Guiding Principles**

A number of guiding principles have shaped the approach to developing and implementing an effective NEMP for Robben Island based on the unique context and these are outlined below.

2.1 **A framework NEMP**

This NEMP has as its point of departure, the 2002 EMP developed by the CSIR. This revised NEMP aims to ensure that RIM complies with the current regulatory framework, and to establish which of the original objectives remain relevant. In doing so, a Framework NEMP has been provided which sets out the various actions for implementation and prioritises these over a five-year period. This document should therefore, be considered a live document which should be built upon as more detailed environmental action plans are devised.

2.2 **The ‘cultural landscape’**

The 2nd Integrated Conservation Management Plan (ICMP) 2013 – 2018 as the overarching management plan for Robben Island has adopted a management approach based on an appreciation of the Island’s cultural landscape. In short, a cultural landscape is defined as a tapestry of the layers of heritage, of which the natural environment forms one layer. The approach is therefore based on spatial relationships between the various landscape components and signifies a more holistic management approach, extending beyond the prison era and the built environment, to the natural environment and setting in which the Island has evolved. This mindshift has elevated the importance of managing the natural environment as a key component of this landscape, calling for more integration within RIM itself, as well as in the way the Island is managed.

2.3 **Spatial planning**

In support of the concept of a cultural landscape, a spatial planning approach is advocated, whereby the spatial relationships between the various layers and components can be depicted graphically. The 2nd ICMP recommends Geographical Information Systems (GIS) mapping as the main platform from which information relating to the Island’s cultural and natural environment should be documented and analysed. Geographic variations, which should include sensitive natural environments, can be taken into account when planning for activities on the Island. Zonation, which is an accepted spatial planning management measure used for other types of protected areas, can be used to control where certain land uses or activities should be allowed in the terrestrial and marine environments within the extent of 1 nautical mile. Spatial planning tools such as this are imperative for more streamlined data management, as well as a more informed decision-making.
2.4 Co-operative governance

Co-operative governance is recommended as an overarching approach to environmental management on the Island. This approach is necessary since several government bodies have both a legal and advisory mandate over Robben Island and an expressed willingness to provide support and expertise to RIM. An Environmental Advisory Committee is recommended as the cooperative governance mechanism as is detailed further in Part II.

3. Goals for Environmental Management

The overarching vision and strategic objectives for Robben Island as a World Heritage Site are outlined in the 2nd ICMP. Whilst the aim is to enhance the heritage resource of the site with an emphasis on the prison landscape, there is also the acknowledgement that the natural environment plays a key role in the cultural landscape, as well as conservation of Threatened species, notably seabirds, and needs to be managed accordingly. In 2001 various management scenarios were proposed to guide the conceptualisation of the ‘desired state’ of the natural environment (Le Maitre et al., 2011):

1. Pre-settlement landscape: this involves restoring and rehabilitating the landscape of Robben Island to its pre-settlement natural condition (pre 16th century);
2. Zoo landscape: this involves retaining all plant and animal species introduced during the recent historical period and actively managing the natural environment to support viable populations of ungulate species through, for example, active enhancement of the forage quality to increase the carrying capacity; and
3. Multi-layered historical landscape: this involves maintaining the human-altered landscape changes and the multi-layered artefacts of different historical and cultural periods. The landscape is managed in accordance with national and provincial priorities for conservation of natural and built environments. Management decisions and actions should be aimed at minimising the cost of maintaining the natural environment in the medium to long term. Species which are alien to the Island have little conservation value; require active management intervention to sustain their survival; or which result in adverse impacts, should be removed.

The 2002 EMP was based on the assumption that the multi-layered historical landscape scenario was favoured by RIM Management. The overarching goals for environmental management to achieve this ‘desired state’ are ‘aimed at ensuring the Island’s natural ecosystems are restored to a condition in which they will become self-sustaining and can be kept in that condition with minimal management input – thus meeting a basic criterion of sustainability’ (Chapman et al., 2000).

However, since 2002, internal and external factors have influenced the management priorities on Robben Island. The most significant has been the increasingly important role of the Island for the conservation of Threatened indigenous species, especially seabirds. Whilst the concept of a self-sustaining ecosystem is still applicable, extensive consultation with RIM and other stakeholders has identified a new broader set of environmental objectives as follows:
To restore and maintain the health of terrestrial ecosystems;
To restore and maintain the health of coastal and marine ecosystems;
To promote the conservation of Threatened indigenous species, especially those that are endemic to southern Africa;
To foster relations with other relevant governmental bodies and organs of state that will result in collaborative management of the natural environment;
To foster relations with relevant research and educational institutions;
To foster internal communication within RIM;
To employ spatial planning tools to assist and inform management of the natural environment; and
To mainstream sustainability into operations and improve resource use efficiency.

The conservation priorities for the natural environment of Robben Island are as follows:

To minimise the risk of wildfires to wildlife and habitat as well as to people and the built environment;
To manage the stocking of large herbivores on the Island so as not to exceed the carrying capacity;
To manage the conservation of seabirds and other indigenous birds;
To manage the conservation of other indigenous vertebrates and invertebrates; and
To rehabilitate the vegetation to a condition where it will become self-sustaining and can be kept in that condition with minimal management input.

4. Implementation of the NEMP

In developing the detailed ‘Management Specifications’ outlined in Part II, considerations internal and external to RIM have been taken into account. These include the current legal context that provides the overarching framework, within which the NEMP should be implemented, as well as the internal policy framework and institutional arrangements. The manner in which the NEMP is to be implemented is also outlined and includes a brief description of responsibilities, the scheduling of activities, reporting, record keeping and the review requirements for the NEMP. These are detailed in the sub-sections below and provide a broader context within which the management specifications in Part II should therefore be viewed.

4.1 Legal framework

The NEMP is rooted in the current legal framework of the Republic of South Africa and aims to ensure that RIM complies with the provisions of the law. Appendix 1 sets out the relevant legislation promulgated by each sphere of government and the responsibilities of RIM, DPW and/or any person that may undertake an activity on Robben Island.

4.2 Alignment with other plans and policies

It is the intention of this NEMP to align with both the requirements of the law, and with other relevant strategic plans and policies within the institutional context. The NEMP is one of the supporting documents within the framework of the 2nd Integrated Conservation Management Plan (ICMP) (2013-2018) that was drafted in a parallel but integrated process. Other supporting
documents include a Visitor Management Plan and an Interpretation Plan, whilst it has been recommended that a Built Environment Management Plan is also required. A Draft Strategic Plan (2013-2018) had already been drafted by RIM and will be revised to align with the 2nd ICMP.

A review of the relevant existing plans and policies has been appended as Appendix 2 and includes the following:

1. RIM Strategic Plan 2013-2018
2. RIM natural environment policies
3. Other RIM policies
4. RIM Emergency and Evacuation Plan
5. DPW Maintenance Plan
6. UNESCO Operational Guidelines
7. Mission Reports
8. State Party Report

It is noted that some of the provisions within the relevant plans and policies may be outdated and this has been taken into account when drafting this NEMP. The NEMP also fits into a suite of plans within the 2nd ICMP, as illustrated in Figure 1.

Figure 1: The RIM Management Planning Framework of the RIWHS
4.3 Organisational Structure and Responsibilities

4.3.1 Within RIM

The Environmental Management Unit falls within the Heritage Department. The Environmental Unit Manager therefore, reports to the Heritage Manager. There are two other environmental positions within the unit, a nature conservator and environmental officer. It is proposed that the Environmental Management Unit be incorporated within the Estates Department for improved strategic alignment and stronger management.

Regular communication between the RIM Environmental Management Unit and the other RIM units is a necessity. The specific actions and responsibilities are detailed in Section B, Management Specification 2: RIM Communications and reporting. Figure 1 illustrates the simplified structure of the organisation, with the locations of the various Units within each Department.

4.3.2 External to RIM

A number of key stakeholders have direct or indirect responsibility for the natural environment on Robben Island. DPW is a key partner in the management of Robben Island and communication with DPW is critical for effective management. The Environmental Unit Manager should take responsibility for communications with the equivalent member of staff within DPW and discussions are required to establish the appropriate procedures that can be implemented. This is something that should be considered when the proposed new Facilities Management contract is implemented.

The statutory stakeholders are listed below in Table 1, with details of their areas of responsibility, followed by other advisory or research partners. Co-operative governance is detailed in Part II, Management Specification 1: Co-operative governance.

Table 1: Robben Island Environmental Stakeholders

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Areas of Responsibility</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAHRA</td>
<td>Heritage authority for Robben Island including the protection of the cultural resources within the 1 nautical mile zone.</td>
<td>Regulator</td>
</tr>
</tbody>
</table>
| Department of Public Works (DPW) | Horticulture (DPW, 2012):
1. Clear road perimeter (1.5 to 3 meter from road-side);
2. Tree felling (dead, dangerous and alien trees);
3. Mowing and gutting of both formal and informal grass areas;
4. Maintenance of sport fields;
5. Maintenance of 3 graveyards;
6. Disposal and management of garden waste;
7. Maintenance of air strip and helicopter pad;
8. Coastal road clean ups;
9. Landscape planning and implementation; and
10. Firebreak maintenance.
Workshops (DPW, 2012) and Built Care (2010):
1. Roads and stormwater;
2. Reservoirs and water supply;
3. Sewer network;
4. Electricity generation and distribution;
5. Fuel lines, tanks and pumps;
6. Harbour infrastructure;
7. Quarries;
8. Dune management; and
9. Fire fighting services; Standby & After Hour Emergency Services. | Partner |
### Stakeholder Areas of Responsibility

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Areas of Responsibility</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Agriculture, Forestry and Fisheries (DAFF)</td>
<td>Fisheries Management: Monitoring, Control and Surveillance Directorate – regulates poaching of marine resources; and Fisheries Management: Research into the health of the Benguela Ecosystem and Island Closures Project.</td>
<td>Regulator Research</td>
</tr>
<tr>
<td>South African National Biodiversity Institute (SANBI)</td>
<td>Leads and coordinates research and monitors and reports on the state of biodiversity in South Africa.</td>
<td>Advisory</td>
</tr>
<tr>
<td>CapeNature</td>
<td>Scientific Services regulates and provides advice in terms of nature conservation.</td>
<td>Regulator Advisory</td>
</tr>
<tr>
<td>Western Cape Provincial Government – DEA&amp;DP</td>
<td>Mandates in terms of Integrated Coastal Management and Seashore Act provisions; Waste Management authorisations; Land Use Planning; and Disaster Management Framework.</td>
<td>Regulator Advisory</td>
</tr>
<tr>
<td>City of Cape Town</td>
<td>Regulator of various environmental components including environmental health, animals, water, storm water, fire safety, waste management, air quality, and disaster management; Mandates in terms of integrated coastal management; and Leads biodiversity planning and implementation for the Cape Town Metropolitan Area.</td>
<td>Regulator</td>
</tr>
<tr>
<td>University of Stellenbosch (SU), Department of Conservation Ecology and Entomology</td>
<td>Vegetation and entomology monitoring and research.</td>
<td>Research Advisory</td>
</tr>
<tr>
<td>University of Cape Town (UCT), Animal Demography Unit (ADU) and Percy FitzPatrick Institute</td>
<td>Seabird and shorebird research; and Earthwatch Project for penguins (in partnership with SANCCOB, DEA, Birdworld).</td>
<td>Research Advisory</td>
</tr>
<tr>
<td>University of Witwatersrand (UW)</td>
<td>Plant and marine invertebrate inventories towards the Barcode of Life Database as a once off project. Previous involvement in undertaking a census of the rabbit populations.</td>
<td>Research</td>
</tr>
<tr>
<td>University of the Western Cape (UWC), Department of Biodiversity and Conservation Biology</td>
<td>Previous involvement in biodiversity surveys.</td>
<td>Research</td>
</tr>
<tr>
<td>Southern African Foundation for the Conservation of Coastal Birds (SANCCOB)</td>
<td>Seabird rehabilitation; and Chick Bolstering Project (with CN, UCT ADU, DEA O&amp;C).</td>
<td>Advisory Research</td>
</tr>
<tr>
<td>The Cape of Good Hope Society for the Prevention of Cruelty to Animals (SPCA) Wildlife Unit</td>
<td>Provide advice regarding animal care, including animal culling projects.</td>
<td>Advisory</td>
</tr>
</tbody>
</table>

#### 4.4 Schedule and budget

Management Specifications are outlined in Part II which lists priorities for immediate action within the first year of the plan, followed by other ongoing operation or maintenance actions.

However, because this NEMP is a framework document, detailed timeframes and budgets can only be identified as and when each intervention is investigated and when specific management plans are produced. The document is a live document and should be updated and revised to reflect this progress.
Table 2 outlines the most immediate priorities for management of the natural environment that are selected from Part II and represent the starting point for action and budget allocation. Sea birds are a priority for conservation in terms of their international importance; although there are existing projects and programmes that address various aspects of their conservation, there is an urgent need to coordinate their management at Robben Island.

Table 2: Priority actions for RIM and DPW

<table>
<thead>
<tr>
<th>Priority</th>
<th>Management Specification</th>
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<tbody>
<tr>
<td>1</td>
<td>Establishment of a Robben Island Environmental Advisory Committee</td>
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<tr>
<td>2</td>
<td>Investigate the legal framework within which the African penguins and other seabirds at the Island would receive adequate protection</td>
</tr>
<tr>
<td>3</td>
<td>Firebreak design and maintenance</td>
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<td>4</td>
<td>Cat, rabbit, rat eradication/control</td>
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<td>5</td>
<td>Identify target for Fallow Deer eradication/control</td>
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<td>6</td>
<td>Designation of, and procurement and institution of signage for no-go areas</td>
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<td>7</td>
<td>Installation of speed bumps</td>
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<td>8</td>
<td>Alien vegetation removal near sensitive cultural sites</td>
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<tr>
<td>9</td>
<td>Formalisation of agreements with stakeholders for monitoring of poaching (DAFF and SAPS)</td>
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<td>10</td>
<td>GIS and fire training for environmental staff</td>
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4.5 Reporting and monitoring

This NEMP is a framework guidance document. While quantitative targets for measurement can not be identified at this level, each action plan or intervention should set specific targets against which it can be measured.

Reporting to the Environmental Advisory Committee on the progress towards the actions in this NEMP is however, a requirement and will allow implemented actions to be monitored. Reference to this is outlined in Management Specification 1: Co-operative governance.

Environmental impacts of work undertaken on the Island can also be measured using Environmental Method Statements and will allow identification of issues and options to address them. Refer to Management Specification 2: RIM communications and reporting.

4.6 Record keeping and data management

The RIM Environmental Team are all responsible for record keeping in relation to the following activities:

- Any changes to the NEMP;
- Programmes, work/action plans, schedules, budgets and costs that are a requirement under Part II of the NEMP;
• Copies of all MoUs signed with environmental stakeholders (and DPW);
• Minutes of meetings with key stakeholders and RIM staff to record decisions made, in particular those set out within Management Specification 2: RIM Communications and reporting;
• Records of all management interventions taken; e.g. cats culled, orphaned penguin chicks or oiled penguins rescued; rehabilitated birds released at or near to the Island;
• Any mission reports or other reports that make reference to environmental management, or include a review of the NEMP;
• Training needs and achievements of staff within the RIM Environmental Team; and
• GIS data should be held as part of the central GIS database to be developed by RIM (refer to 2nd ICMP and Management Specification 3: Spatial planning).

These records must be documented in a form that is accessible for review on request. Any changes to the NEMP must be circulated to the relevant RIM and DPW staff.

The NEMP must be stored on a shared network drive so that it is accessible to all RIM employees as the responsibility to implement the ‘Management Specifications’ is not limited to the RIM Environmental Management Unit only.

### 4.7 Review of the NEMP

The NEMP is considered a live document and should be continually updated as action plans are implemented. A comprehensive external review of the NEMP by mandated stakeholders, perhaps aided by a consultant, is recommended after 5 years at the same time that the ICMP is revised. This review would include the following:

• Changes in relevant legal and policy framework (refer to Appendix 1);
• Changes in the institutional arrangements;
• Addition of new programmes or work plans and/or completion of existing programmes/work plans;
• Recommendations of the Environmental Advisory Committee (refer to Management Specification 1: Co-operative governance);
• Training needs of environmental staff; and
• A review of the success of this NEMP in achieving the objectives outlined within.
5. Management Specifications

Part I has provided the context for the more detailed ‘Management Specifications’ that are set out in Part II. Each Management Specification relates to a specific area of intervention required to meet the provisions of the law as well as the overarching goals for environmental management set out in Section 4. The Management Specifications are as follows:

1. Co-operative governance;
2. RIM communications and reporting;
3. Spatial planning;
4. Vegetation management;
5. Large herbivores;
6. Game fowl;
7. Problem terrestrial vertebrates;
8. Small indigenous animal species;
9. Bee colony;
10. Arthropods;
11. Marine and coastal management;
12. Management of marine mammals, seabirds and shorebirds;
13. Mainstreaming sustainability; and
Part II: Management Specifications
1. Co-operative governance

Legislative Framework:

Background:
- Robben Island World Heritage Site is unique due to its status as a national asset under the jurisdiction of a number of national departments and government authorities, while it is geographically located within the City of Cape Town, in the Western Cape Province.
- In addition to the terrestrial extent of the site as an Island, the site includes a 1 nautical mile buffer and marine ecosystem.
- The Department of Public Works (DPW) is responsible for the maintenance of the built environment as well as bulk infrastructure and other natural environment components such as firebreaks.
- Table 1 in Section A lists the jurisdictions of the various environmental stakeholders. Willingness to collaborate through advisory or support functions has already been expressed by many stakeholders including DEA Oceans and Coasts, CapeNature, the City of Cape Town, the University of Cape Town, Stellenbosch University, Department of Agriculture, Fisheries and Forestry (DAFF) and the South Africa Police (SAP).
- The unique natural environment on Robben Island offers many research and educational opportunities and a number of organisations have been involved on this basis.

Objectives:
- Foster relations with other relevant governmental bodies or organs of state to provide assistance and support to one another, as well as to share information and collaborate on matters of common interest.
- Foster relations with research and educational institutions to provide a platform for scientific research and to inform management measures and decision-making.

Programmes/Actions:
- RIM should establish an Environmental Advisory Committee. RIM will plan and facilitate bi-annual meetings with environmental stakeholders to seek advice and guidance on implementing the NEMP and to share information.
- The Environmental Advisory Committee will advise on the content of the NEMP.
- It will also provide a monitoring function to ensure that progress towards implementation of the NEMP has been made.
- Stakeholders with statutory responsibility should be permanent and other environmental stakeholders should be contacted on an ad hoc basis depending on the relevance of issues on the agenda.
- Relevant stakeholders should include, inter alia:
  - DPW;
  - DEA O&C;
  - DAFF;
  - CapeNature;
  - City of Cape Town;
  - Research partners in the form of universities and other institutions such as Stellenbosch University and University of Cape Town; and
- Ad hoc: SANCCOB; Cape of Good Hope SPCA, Birdlife SA, SANParks, SANBI, DWA (Working for Water) and veterinarians.

- Once RIM has made initial contact and gauged commitment from the stakeholders, an initial meeting involving all stakeholders (permanent and ad hoc) should establish the procedures, terms of reference, and a standard agenda for future Environmental Advisory Committee meetings. The frequency and content of these meetings should be collectively reviewed by the Environmental Advisory Committee on an annual basis.

- The presence of an advisory committee was a condition of the previous sewer outfall permit. In the absence of a new permit, these issues could be addressed within the proposed Environmental Advisory Committee if acceptable to the other stakeholders (refer to Management Specification 13: Mainstreaming sustainability).

- All research partnerships should comply with the RIM Environmental Research Policy and should be formalised through an MoU.

**Responsibilities:**

- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team where relevant.

- Once established, the Environmental Advisory Committee is responsible for guiding and supporting RIM in their areas of expertise; and should assist RIM to progress towards finalisation of and implementation of the NEMP.

- The CEO is responsible for the signing of MoUs.

**Implementation:**

- Immediate priority:
  - Establishment and operationalisation of the Environmental Advisory Committee;

- Ongoing:
  - Renew existing MoUs when necessary; and
  - Review the frequency and content of the Environmental Advisory Committee meetings.

**Related Documents:**

- RIM Environmental Research Policy; and
- Existing MoUs (DPW, SU, UCT).
2. RIM communications and reporting

**Legislative Framework:**

**Background:**
- RIM as an institution was originally established as a Museum in terms of the Cultural Institutions Act. As a result, the institutional arrangements pertaining to the management of the natural environment require strengthening.
- More effective communication within RIM would enhance the functioning of the Environmental Management Unit.

**Objectives:**
- Foster communication amongst the relevant RIM Departments and Units to improve efficiency and to share information on matters of common interest.

**Programmes/Actions:**
- Any RIM Unit/Department Manager must seek input and/or approval from the Environmental Manager should they engage in any of the following activities:
  - Planning and implementation of any special event;
  - Planning and implementation of a new tour, or change in an existing tour;
  - Planning and implementation of any educational or interpretation programme which includes material on the natural environment;
  - Planning and implementation of any restoration or capital works project (including environmental authorisations thereof);
  - Appointment of a contractor or service provider (by RIM/DPW). In addition the contractor should complete an Environmental Method Statement that would include, inter alia, what work is being undertaken and where, schedule, and method. The Method Statement is authorised by the Environmental Manager as being environmentally acceptable upon completion. Refer to Appendix 3 for a recommended template. Contractors must also adhere to the relevant RIM policies for contractors, namely the Code of conduct for staff, DPW, staff visitors and contractors; and the General Guidelines for Contractors Working on Robben Island;
  - Day to day maintenance activities in any of the areas identified as sensitive. As an interim measure, temporary signage will demarcate these areas until a zonation plan is developed. Refer to Management Specification 3: Spatial planning;
  - Planning and implementation of any activity or programme within the 1 nautical mile buffer; and
  - Production of any marketing materials that include content on the natural environment.
- The Environmental Manager should be proactive in approaching the relevant departments if he/she wishes to undertake any activities that are likely to impact their operations or relate to their areas of jurisdiction.
- The RIM Environmental Manager should establish procedures for regular communication with all other Departments and DPW to share information on current activities relating to the natural environment. This is detailed further in Management Specification 14 as part of the Environmental Education and Awareness Programme and could also include news of any scientific publications, new partnerships, plans or programmes under implementation (e.g. alien clearing), new no-go areas or road closures etc. This aim of this provision is to maintain
awareness and also to inform staff of sensitive areas or activities to avoid, given the continually changing conditions.

- The RIM Environmental Team should actively engage with the Tourism Department to establish the potential for an ecotourism tour. This could include, inter alia, a walking or cycling tour to view the seabirds, game fowl, large herbivores, coastal environments, current vegetation management projects, environmental management initiatives (such as desalination or waste sites) and so forth. Once implemented, the measures recommended under Management Specification 13: Mainstreaming sustainability, could also be included in a tour.

- One of the actions listed in the Visitor Management Plan is to conduct an Environmental Impact Assessment (EIA) to assess the impacts of tourists on the Island. This should not be limited to impacts on an average day, but should include impacts during peak times such as events. Based on this, the relevant RIM Units should develop a Policy that stipulates specific conditions that must apply during future events to minimise impacts to the cultural and natural environment.

- All relevant RIM policies should be revised where necessary in accordance with the requirements in this NEMP. The policies, along with the NEMP and the 2nd ICMP, should be made accessible to all RIM employees via a shared network drive.

**Responsibilities:**

- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team where relevant.

- The RIM Departmental/Unit managers are all responsible for their activities that may impact the environment as specified above, and for collaborating with the RIM Environmental Team to improve protection and awareness of the natural environment.

- RIM Environment and Tourism Department should collaborate to determine the viability of ecotourism opportunities.

**Implementation:**

- **Priority:**
  - Finalise communications procedures amongst RIM staff and distribute to relevant staff.

- **Ongoing:**
  - Implement the communication procedures and initiatives;
  - Review communication procedures annually; and
  - Document communications in a log.

**Related Documents:**

- All RIM policies including those for contractors.
3. Spatial planning

**Legislative Framework:**

**Background:**
- No consolidated spatial representation exists of environmental constraints, opportunities, or sensitivities, to inform management.
- Various terrestrial zonations were previously applied to the Island to facilitate management of the terrestrial ecosystems. Refer to Chapman *et al* (2000), for the description of the ecological zonations: urban fringe, *Eucalyptus* plantation, open range (degraded Strandveld and littoral communities), and transitional (invaded areas and pioneer dune grass).

**Objectives:**
- To employ spatial planning tools to assist and inform management of the natural environment.

**Programmes/Actions:**
- An environmental constraints and opportunities mapping exercise should be undertaken in parallel with the cultural landscape mapping identified in the 2nd ICMP. This will ensure that activities on the Island avoid sensitive areas while identifying areas which are degraded and require improvement. An Action Plan should be developed for the mapping exercise to identity actions, responsibilities, schedule and budget.
- GIS mapping is the appropriate tool and mapping could include the following layers of data:
  - Base data could include – built environment, roads, infrastructure, firebreaks, contours, geology, hydrology, coastal erosion etc.;
  - Fauna and Avifauna – critical habitat for sea birds, heronries, shorebirds, habitat for indigenous mammals, reptiles, amphibians, insect colonies (bees) and other coastal and marine organisms;
  - Flora – broad ecological zones, alien stands, locations of rare and indigenous species, alien plants requiring conservation;
  - Research sites – e.g. vegetation transects or seabird nests;
  - Management sites, e.g. proposed fire breaks and no-go areas; and
  - Existing and proposed visitor facilities or routes e.g. walking tours.
- Options to archive or integrate this information with SAEON, CapeNature or SANBI databases should be investigated.
- Members of the Environmental Team should receive the appropriate technical equipment and training to undertake GIS mapping for the natural environment.
- Once the database is sufficiently comprehensive, a Zonation Plan should be developed for terrestrial and marine environments. The typologies, for each zone can be identified, specifying restrictions and/or proactive management actions required within each zone. The application of the plan should remain flexible to allow for incorporation of the findings from ongoing research and management actions.

**Responsibilities:**
- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team where relevant.
- The Mapping and Zonation Plan should be produced with guidance from the Environmental Advisory Committee who represent a range of stakeholders that can provide advice on different aspects of data collection, management and analysis as well as practical application of management measures within the zones. CapeNature, DEA O&C and SANBI in particular, should be consulted.
- Development of the Zonation Plan should be undertaken in collaboration with other relevant
RIM Departments/Units to ensure alignment with other RIM policies and projects.

**Implementation:**
- **Priority:**
  - Establish a Mapping Action Plan; and
  - Establish a Zonation Plan.
- **Ongoing:**
  - Revise the Mapping and Zonation Plan in response to management actions, research findings and environmental changes.

**Related Documents:**
- All RIM Environmental Policies;
- Chapman et al 2000;
- Le Maitre et al 2001;
- Underhill and Crawford 2001;
- Fortuin 2002;
- Cole and Cewana 2002; and
- Sherley et al in prep.
### 4. Vegetation management

#### Legislative Framework:
- Conservation of Agricultural Resources Act 43 of 1983.
- Disaster Management Act 57 of 2002.
- Air Quality Management By-law 6772 of 2010.
- Water By-law 6847 of 2011.

#### Background:
- According to SANBI, the original vegetation type on Robben Island was Cape Flats Dune Strandveld. It is classified as Endangered in recognition of the fact that the ecosystem has ‘undergone degradation of ecological structure, function or composition as a result of human intervention’ and is ascribed protection from NEM:BA (SANBI, 2011).
- Transformation of the natural vegetation has occurred over the past 350 years. The large woody shrub component of the original Strandveld vegetation was completely removed and the diversity of the herbaceous component was reduced and altered.
- The introduction of livestock, non-indigenous herbivores such as Fallow Deer and European Rabbits and subsequently a variety of game species, have all contributed to transformation of the vegetation.
- Alien species such as Rooikrans (*Acacia cyclops*), Manatoka (*Myoporum serratum*) and *Eucalyptus* such as the Spider Gum (*E. lehmannii*) were intentionally introduced from the 1980s. Invasions of these species were largely controlled by the pressure from herbivores, thus parts of the Island remain free from aliens.
- Alien species, namely Rooikrans and Manatoka, provide important breeding habitat for Threatened avifauna including seabird and colonial bird species.
- Non-indigenous herbivores, namely Fallow Deer and European Rabbits, are having a detrimental impact on the existing natural vegetation but the former are thought to improve access to preferred breeding habitat of African penguins.
- Stellenbosch University’s Department of Conservation Ecology and Entomology has entered into a MoU with RIM for monitoring, research and training collaboration, focusing on the recovery and rehabilitation of the natural vegetation following management interventions.
- Early findings from research undertaken by Stellenbosch University indicate that rabbit control measures have improved vegetation cover and grazing capacity.
- The existing vegetation is not sufficient to maintain current fauna populations and supplementary feed is required on an annual basis to sustain these populations.
- A number of alien plantations have historical value and must be maintained as part of the cultural landscape, for example Lovers Lane.
- Alien vegetation has invaded certain heritage resources such as the Leper Graveyard and the quarries.
- Dense alien thickets as well as the accumulation of dead plant material pose a significant fire risk to humans, fauna and the built environment. DPW are responsible for maintaining firebreaks on the Island.
- Currently biocontrol is used to manage Rooikrans.
- Vegetation cleared during firebreak maintenance is deposited in a vegetation dump which is currently utilised illegally for domestic waste disposal.
During alien clearing operations, plant material is normally taken off the Island by ferry. Since the alien clearing project in 2006, removal by ferry has ceased and the woodlots remain as a fire hazard.

**Objectives:**
- To rehabilitate the vegetation to a condition where it will become self-sustaining and can be kept in that condition with minimal management input.
- To manage vegetation so as to minimise the risk of wildfires to people, wildlife and habitat as well as to the built environment.

**Sub-objectives:**
- Systematically remove invasive alien plant species while minimising the impact of these removals on the habitats of key bird species and indigenous fauna.
- Minimise the risk of the introduction of additional alien plant species.
- Maintain alien plant species that have historical or cultural or breeding habitat value.
- Rehabilitate and restore the natural vegetation of the Island especially in areas that have been cleared of plantations.
- Close and rehabilitate roads, tracks and pathways that are not required for management, including wildlife monitoring, or used for public cycling or walking.
- Protect and maintain populations of rare plant species.
- Minimise the potential impacts of plant pathogens on the vegetation or particular plant species.

**Programmes/Actions:**
- Management of fire risk:
  - RIM staff must adhere to the Emergency and Evacuation Plan (EEP) in terms of the preventative measures for veld fires;
  - RIM should identify and establish new firebreaks and DPW must maintain existing firebreaks to limit the spread of fire. A key priority must be to protect the penguin colony however, where firebreaks are required within the seabird breeding areas, DEA must be consulted and artificial nests may need to be provided (refer to Management Specification 12);
  - As outlined in the EEP, staff must undergo fire-fighting training and fire awareness training to ensure that there is always capacity on the Island in case of an incident. The members of the Environmental Team should attend such training;
  - RIM should develop a fire Contingency Plan to deal with the direct and indirect impacts of the fire on the fauna and avifauna and their habitat. This includes responses to loss of habitat, forage and even evacuation of certain species such as penguins if possible; and
  - Implementation of the Alien Plant Control Programme (mentioned below) to reduce the risk of fire in the long term.
- RIM should seek the advice of the Environmental Advisory Committee to establish the best approach to control the alien plant species on the Island and rehabilitate vegetation using indigenous species. An Alien Plant Control Programme and a Rehabilitation Programme can be undertaken in parallel using some principles recommended below. The Programmes must take into account the status of the ‘large herbivore’ and ‘game fowl’ populations and the respective action plans outlined in Management Specifications 5 and 6.
- Initially the status quo should be established through a botanical survey. Many sources of information exist which should be ground-truthed. The outcomes should be incorporated into the Management Specification 3: Spatial Planning as a mapping and zonation exercise. This is summarised as follows:
  - List and map the locations of any Red List Threatened plant species;
  - Identify areas/zones which are a priority to retain in terms of biodiversity or habitat, especially seabird breeding areas;
  - List and map the locations of all alien invasive plant species on Robben Island showing the
distribution, age and density of all dominant species;
- Identify all alien invasive species that have a cultural value and need to be retained. This should be undertaken as part of the cultural landscape analysis which will also identify the way in which such plantations should be managed;
- Identify alien invasive plants that should be retained to provide shade near cultural sites; and
- Divide the Island into zones demarcated for different alien invasive plant clearing strategies e.g. control only in culturally important alien plant stands; eradicate in non-seabird areas; control and replace with indigenous vegetation in seabird breeding areas.

- Establish an Alien Plant Control Programme with a number of objectives and key principles as recommended in the reports by SANParks (Cole and Cewana, 2002) and Chapman et al (2000), including:
  - Adopt a phased approach and set annual targets;
  - Prioritise removal of alien vegetation in the following order:
    - Invasive species;
    - Vegetation near urban areas and the built environment to reduce fire hazards, and vegetation from around buildings as this has encouraged penguins to enter buildings and nest close to buildings;
    - Vegetation that is impacting heritage resources e.g. The Leper Graveyard, quarries;
    - Vegetation in the wetland which potentially has ecological value; and
    - Vegetation in areas accessible to visitors.
  - Establish an early detection system for:
    - Emergent weeds;
    - Threatened habitats;
    - Vulnerable habitats; and
    - High risk areas.
  - The following measures are recommended for clearing alien invasive plants in penguin breeding areas (refer to Management Specification 12: Management of marine mammals, seabirds and shorebirds for additional recommendations):
    - Priority actions in the breeding areas are to clear the dead material, which poses a fire risk, introduce artificial breeding units and ultimately rehabilitate with natural vegetation;
    - Only clear alien invasive plants within the penguin breeding areas outside the breeding seasons of species using the existing habitats;
    - No Rooikrans thickets should be removed until suitable native plant species are established to provide alternative breeding habitat;
    - Provide alternative artificial habitat such as nest boxes for penguins to nest in since it has been established that nest boxes improve breeding success over vegetation nests (Sherley et al, 2012). Monitor the uptake rate of boxes in areas cleared for e.g. fire breaks. Since the boxes are most effective when under vegetation, investigate the opportunity to replace Rooikrans with Tetragonia fruticosa; and
    - Planting indigenous trees at the edge of the penguin breeding areas to allow expansion of penguins into more open areas. These trees must initially be protected from browsers.
  - Removal of Eucalyptus plantations is of low priority as it provides cover for penguins, nesting sites for other birds, habitat for tortoise populations and forage for bees;
  - The establishment of young Eucalyptus plants should be monitored and prevented;
  - Removal of Manatokas are of low priority but should be monitored until they can be addressed;
  - Other minor alien species are of low priority but should be monitored until they can be addressed;
Follow up control operations will be required; and
Research partners such as Stellenbosch University can provide advice and monitor the outcomes of the programme especially in relation to the linkages with other Management Specifications (5 and 7) such as those relating to the control of large herbivores and rabbits.

- The Rehabilitation Programme for the re-introduction of indigenous vegetation species should be based on the following principles:
  - Successful establishment is only possible once the herbivore populations have been eradicated or brought under control;
  - Select species based on those that were likely to have occurred on the Island, namely Cape Flats Dune Strandveld. The spring floral display elements of the Strandveld can be introduced by seeding, small nodes of Strandveld shrubland that are established should be allowed to spread over time;
  - Rehabilitation should be phased and fences can be used to protect areas from herbivores;
  - Species should provide alternative breeding and roosting habitat for all types of birds;
  - Species should provide forage for bees;
  - Species should provide alternative browse for browsing animals such as Steenbok;
  - The wetland should be a priority for rehabilitation;
  - Remediation of soils in felled *Eucalyptus* plantations could be a requirement in the long term if the plantations are cleared;
  - Unused roads, tracks or pathways should be closed and rehabilitated, except where they form part of the firebelt system; and
  - Research partners such as Stellenbosch University can provide advice and monitor the outcomes of the programme.

- Establishment of a Vegetation Disposal Programme, for organic material generated from alien removals and firebreaks:
  - In the short-term, the DPW Facilities Management contract will provide for removal of wood from the Island. However, an air burner would address this problem and could also be used for the burning of dead birds to prevent disease (as set out in Management Specification 12); and
  - In the medium term, a solution must be sought for addressing vegetative waste on the Island. Vegetative waste should be recovered as far as possible and re-used where appropriate, opportunities for permaculture, vermicomposting or incineration should be explored, whilst only indigenous plants can be used as mulch. The feasibility of using wood that is harvested from alien clearing projects for biomass should be investigated. It could be stockpiled and utilised to heat water for the propagation system in the hydroponics building.

- Management of the introduction of alien species or disease:
  - It must be included as part of the terms of reference for contractors that high risk goods including sand, construction and earth moving machinery should be free of alien species before being transported to the Island.
  - Critical habitats and species of heritage value should be inspected on an annual basis for any indication of unusual deaths or die-backs. Researchers working in key habitats should also report any such findings. RIM should investigate unusual deaths or die-backs and consult the Agricultural Research Council - Plant Protection Institute if advice is required.

**Responsibilities:**

- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team where relevant in collaboration with the DPW Horticulture Department.
- DPW are a key partner in maintaining the estate and communication with the RIM
Environmental Manager is necessary for any actions in relation to the management of vegetation.

- Once established, the Environmental Advisory Committee has a responsibility to offer RIM guidance and support in their areas of expertise and where possible, and to assist RIM in achieving progress towards implementing the NEMP.
- Stellenbosch University is currently responsible for monitoring the vegetation on the Island and will report back to the Environmental Manager as per the MoU.
- Advice can be sought from CapeNature, SANParks and SANBI.
- Partnerships such as Working for Water, and Working on Fire should be investigated.
- The City of Cape Town is a regulator in terms of fire safety and may be able to provide advice on alien removal as there is currently a scheme in the City. It is also responsible for providing the framework for disaster management in the City.
- The Agricultural Research Council - Plant Protection Institute is an advisory for biocontrol and diseases affecting plants.

**Implementation:**

- **Priority:**
  - Consult with stakeholders; and
  - Develop an Alien Plant Control Programme, Rehabilitation Programme and Vegetation Disposal Programme.
- **Ongoing:**
  - Implement the programmes and other measures.

**Related Documents:**

- RIM Terrestrial Ecosystems Policy.
- RIM Emergency and Evacuation Plan.
- DPW Maintenance Plan.
- MoUs with DPW, SU.
- Fortuin 2002.
- Cole and Cewana 2002.
- Stellenbosch University 2011.
- SANBI 2011.
- Sherley *et al* 2012.
5. Large herbivores

Legislative Framework:
- Animals Protection Act 71 of 1962.
- City of Cape Town Animal By-law 6896 of 2011.

Background:
- Overstocking of Robben Island over the past 350 years with livestock; non-indigenous herbivores such as Fallow Deer and European Rabbits; and a variety of game species including Springbok, Ostrich, Eland and Bontebok has contributed to transformation of the vegetation of the Island according to the earliest recorded descriptions.
- European Fallow Deer were introduced in 1963 for sport hunting by prison staff and important guests and are considered by some as part of the cultural landscape. Springbok were introduced prior to 1955. Steenbok were originally introduced to Robben Island in 1658 and again in 1973.
- Robben Island is currently overstocked with large herbivores and numbers are escalating necessitating a management cycle of culling and removals, which is inhumane and unsustainable, or sterilisation that will cap population growth. Subsidised feeding, translocation and culling operations have been undertaken over the years. Feeding is not a long term solution as import of feed introduces unwanted plants and invertebrates.
- Steenbok browse and graze, often feeding on the shoots of alien vegetation and assisting with the control thereof to some degree.
- Restoration and rehabilitation of natural vegetation will not be effective if the large herbivores remain at their current levels.
- The heritage and biodiversity legislation are in conflict as the former values the alien species (Fallow Deer) as a heritage resource, whilst the latter advocates for the removal of aliens but accepts their presence if benefiting conservation of threatened indigenous species.
- Indecision and external influence have hindered plans to control large herbivores in the past and RIM must take a strong position to facilitate more sustainable management measures.

Objectives:
- Finalise and implement a policy on the most appropriate option/s for achieving and maintaining sustainable stocking rates of large herbivores.

Programmes/Actions:
- The RIM Environmental Manager must plan and facilitate a meeting with all relevant Departments and Units within RIM, the Council and EPPs, to reach internal consensus in principle as to whether the large herbivores (Fallow Deer, Springbok and Steenbok) are considered to fulfil the objectives of the ‘Multi-layered historical landscape’.
- Depending on the decision, either a Herbivore Eradication Plan and/or a Herbivore Management Plan must be developed with the input from the Environmental Advisory Committee, in particular DEA O&C and CapeNature. The plan/s should, inter alia, establish the feasibility of culling versus relocation and, if the animals are retained, determine the suitable carrying capacity, sterilisation requirements, monitoring requirements and options for maintaining genetic integrity of the remaining population. The plan/s should also take into account the game fowl populations and respective action plans outlined in Management Specification 6 as this has a direct bearing on the carrying capacity of the Island as a whole.
- It is recommended that all large herbivores are eradicated if vegetation rehabilitation is to be successful, however a scientifically grounded programme of sterilisation merits consideration.

### Responsibilities:
- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team where relevant.
- CapeNature is a key partner in terms of permitting (see Appendix 1) and advisory functions and should be consulted on all matters relating to large herbivores.
- Stellenbosch University is currently responsible for monitoring the vegetation on the Island and can advise on carrying capacity and monitoring changes to vegetation as a result of the Plans.
- The Cape of Good Hope SPCA Wildlife Unit provides an advisory function on matters of animal welfare on Robben Island and is responsible for monitoring related activities.
- The City of Cape Town has jurisdiction over keeping animals through their Environmental Health By-law (2003) and the manner in which feed and manure are stored and the way in which animal carcasses are disposed through their Animal By-law (2011).

### Implementation:
- **Priority:**
  - Make a decision on management of large herbivores;
  - Establish a Herbivore Eradication Plan/Herbivore Management Plan; and
  - Commence implementation.
- **Ongoing:**
  - Monitor the number of remaining animals; and
  - Retain genetic diversity amongst remaining populations.

### Related Documents:
- RIM Policy on Terrestrial Ecosystems.
- Fortuin 2002.
- Crawford and Dyer 2000.
6. Game fowl

Legislative Framework:
- As above in Management Specification 5.

Background:
- Game fowl were mostly introduced to Robben Island in the 1950s and 1960s and include Cape Francolin (*Francolinus capensis*); Helmeted Guineafowl (*Numida meleagris*); Chukar Partridge (*Alectoris chukar*); Indian Peafowl (*Pavo cristatus*) and the Cape Francolin (*Pternistis capensis*).
- Although numbers have increased in recent years, the feral cats have previously provided some degree of control of the populations of these birds.
- Guineafowl in particular is becoming a problem on the Island.
- The Chukar Partridge and Indian Peafowl have ecotourism potential as they are not found elsewhere in South Africa and, although they are not indigenous species, many bird watchers have expressed interest in visiting the Island for this purpose.

Objectives:
- To manage the game fowl populations within ecologically sustainable limits.
- To explore ecotourism opportunities relating to game fowl.

Programmes/Actions:
- RIM must seek advice from the Environmental Advisory Committee regarding the monitoring requirements for game fowl and approach partner tertiary institutions already linked to the Island if capacity is required.
- On this basis, RIM must establish a Game Fowl Management Plan to monitor and manage the populations over time, bringing populations under control if capacity is exceeded. In particular when the feral cats are eradicated their numbers can be expected to increase (refer to Management Specification 7 below).
- The plan should also take into account the large herbivore populations and respective action plans outlined in Management Specification 5 as this has a direct bearing on the carrying capacity of the Island as a whole.
- Game fowl should be considered as a highlight on any future ecotourism tours (refer to Management Specification 2: RIM Communications and reporting).

Responsibilities:
- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team where relevant.
- CapeNature should provide advice and should be consulted on all matters relating to game fowl.
- The Cape of Good Hope SPCA Wildlife Unit provides an advisory function on matters of animal welfare on Robben Island and is responsible for monitoring activities such as culling.
- SANParks can also be approached for advice.
- Stellenbosch University and University of Cape Town are currently involved in research projects on the Island and opportunities for partnership should be explored.

Implementation:
- Priority:
  - Seek advice from the Environmental Advisory Committee;
  - Approach tertiary institutions already linked to the Island; and
  - Establish a Game Fowl Management Plan.
- Ongoing:
  - Implement the Game Fowl Management Plan.

Related Documents:
- RIM Policy on Terrestrial Ecosystems.
- Fortuin 2002.
- Crawford and Dyer 2000.
7. **Problem terrestrial vertebrates – cats, rabbits, rats, pets**

**Legislative Framework:**
- As above in Management Specification 5.

**Background:**
- Cats (*Felis catus*) were introduced earlier than 1881. While there are an estimated 5 cats remaining, numbers have fluctuated over the years as a result of population growth to reach over 100 individuals. This was brought under control through eradication initiatives.
- Cats are opportunistic predators that prey on endemics including breeding birds (marine and terrestial birds and their chicks), reptiles (lizards, snakes, chameleons), amphibians, spiders and insects. They also prey on introduced species including game fowl, rats and rabbits.
- European Rabbits (*Oryctolagus cuniculus*) were introduced in 1654 as a source of meat for ships. Numbers have also fluctuated, reaching almost 25,000 at one point, but at present are estimated at around 2,000. Rabbits have a high reproductive rate and have detrimental impacts on the natural and built environments.
- The direct effects of rabbits include competition with burrowing birds for existing burrows; bird colony desertion due to disturbance or even egg destruction; destruction of urban horticulture; and sustenance for predator populations. Indirectly they reduce plant cover for terrestrial nesting birds, deplete food for granivorous birds and indirectly deplete food for insectivorous birds, and increase soil erosion. Rabbits also cause damage to the built environment from burrowing.
- A rabbit and cat culling and monitoring project has been in place since 2009. While this has kept populations low, it has not achieved total eradication. It is critical to address this issue to remove the risk to seabirds and to facilitate vegetation rehabilitation efforts (along with European Fallow Deer, see Management Specification 5).
- Black Rats (*Rattus rattus frugivorus*) arrived on the Island on boats and were abundant in 1614 and 1620 but have been kept under control by the feral cat population. In addition to being a pest they may impact seabird chicks and other indigenous species of fauna.
- Various pets that were purposefully brought onto the Island by residents; cats, dogs and poultry, pose a great risk to sea bird populations and also impact other fauna.

**Objectives:**
- Eradicate the feral cat and rabbit populations;
- Monitor and control the rat populations; and
- Prohibit pets or livestock on Robben Island.

**Programmes/Actions:**
- RIM must establish and implement a Feral Animal Eradication Programme which simultaneously addresses cats, rabbits and rats.
- Cats and rabbits must be eradicated as soon as possible to reduce the number of animals that need to be culled. Until the populations are totally eradicated, an annual survey is required.
- Cats should be removed as a priority in terms of focussing resources and also because if rabbits numbers begin to decline initially, the cats would turn to other indigenous fauna as a source of food.
- The Programme must establish the medium/long term specifications for monitoring and controlling the remaining populations of rats as these are unlikely to be completely removed.
- Measures must address the risk of reintroductions of rats by boat and this can include communications with the V&A Waterfront to establish controls on the mainland.
- Rat control should be done in a manner that minimises implications for other wildlife.
- Additional measures for rabbits and rats are set out in the RIM Terrestrial Ecosystem Policy and include:
  - Establish if the existing rabbit burrows start to become utilised by penguins and if not, initiate a programme to collapse them;
  - Trap and fumigate rats in abandoned buildings that are not also being used by penguins or other scarce fauna;
  - Address sources of food-waste collection;
  - Address littering on the Island;
  - Use rat-proof bins;
  - Collect all rat carcasses daily to limit odour and hygiene risks from decaying rats;
  - Construct rat guards on all ships/ferries docking at Robben Island; and
  - Provide a Clearing Room where building material can be checked for rats.
- CapeNature and DEA O&C (which runs control programmes for South Africa’s sub-Antarctic islands) must be consulted for advice.
- In compliance with the requirements of NEM:PAA, prohibit introduction of any new pets onto the Island and enforce the removal of existing pets owned by staff. This includes any mammal, bird (including poultry), amphibian, reptile or other non-indigenous species.

### Responsibilities:
- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team where relevant.
- DPW and other RIM Departments (in particular, Cargo and Ferrys and Estates), must take responsibility for implementing certain provisions in the Programme.
- CapeNature and the Cape of Good Hope SPCA Wildlife Unit can provide advice on feral animal eradication and the SPCA is also responsible for monitoring related activities.
- The V&A Waterfront can assist with preventative rat control measures on the mainland.

### Implementation:
- **Priority:**
  - Establish a Feral Animal Eradication Programme.
- **Ongoing:**
  - Implement the Feral Animal Eradication Programme; and
  - Monitor and control remaining rat populations.

### Related Documents:
- RIM Policy on Terrestrial Ecosystems.
- Fortuin 2002.
- Crawford and Dyer 2000.
- Wilke 2011.
- de Villiers et al 2010.
8. Small indigenous animal species

**Legislative Framework:**

- As above in Management Specification 5.

**Background:**

- Small indigenous species include mammals such as the Cape Golden Mole and the Pygmy Mouse; reptiles such as Cape Legless Skink, Angulate Tortoise, Cape Dwarf Chameleon, Mole Snake; and amphibians such as Sand Rain Frog and Clicking Stream Frog.
- Many of these species are thought to have been separated from the mainland some time ago.
- Whilst informal observations of small indigenous animals have been recorded over time, the only species formally monitored is the Angulate Tortoise under the monitoring programme of Stellenbosch University. Early findings show a preference for the *Eucalyptus* as habitat.
- These animals are all under threat or in competition with the alien species such as the feral cat and European Rabbit as described in Management Specification 7 above. They are also compromised by alien vegetation invasion described in Management Specification 4 above.

**Objectives:**

- Monitor small indigenous animal populations.
- Enhance habitat for the existing small indigenous animal populations.

**Programmes/Actions:**

- RIM must establish a Monitoring Programme for populations of small indigenous animals.
- Existing research partnerships with Stellenbosch University/University of Cape Town could be extended to include other species and should be explored.
- The Environmental Advisory Committee, in particular CapeNature, can be consulted for advice.
- Critical habitat on the Island should be mapped as part of the Spatial Planning Management Specification 3 above and enhancement of the available habitat can be undertaken as part of the Vegetation Management Specification 4 above.

**Responsibilities:**

- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team where relevant.
- CapeNature and SANBI should provide an advisory functions in relation to indigenous fauna.
- Stellenbosch University and University of Cape Town are currently involved in research projects on the Island and opportunities for partnership should be explored.

**Implementation:**

- Priority:
  - Establish a Small Indigenous Animals Monitoring Programme in partnership with other stakeholders.
- Ongoing:
  - Implement the monitoring programme.

**Related Documents:**

- RIM Policy on Terrestrial Ecosystems.
- Crawford and Dyer 2000.
- Fortuin 2002.
- Stellenbosch University 2011.
9. Bee colony

**Legislative Framework:**

**Background:**
- Honey bees (*Apis mellifera*) were introduced to Robben Island in about 1970 and used commercially, for research and later for honey by prison warders. Approximately 10 bee colonies are present on Robben Island which are said to occur in hives, tree hollows and some of the unused buildings.
- Since the colonies are free of the destructive alien *Varroa* mite, the Agricultural Pests Act has declared Robben Island as a sanctuary. Movement of additional bees to the Island is prohibited.
- The bee colonies are valuable for research into combating pests and diseases that affect the industry in South Africa.
- *Eucalyptus* plantations are the main source of forage for the bees.

**Objectives:**
- Maintain the bee sanctuary.

**Programmes/Actions:**
- RIM must ensure the quarantine conditions for the bee sanctuary are adhered to and ensure no bees are brought onto the Island.
- When undertaking environmental mapping as specified under Management Specification 3: Spatial planning, the locations of the bee colonies and their forage must be mapped.
- Annual inspections should be undertaken to establish whether the colonies are active.
- When considering rehabilitation under Management Specification 4: Vegetation management, include for an alternative, sustainable forage source to replace the *Eucalyptus*.
- Consult the Agricultural Research Council for advice and to establish if any research opportunities exist.

**Responsibilities:**
- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team where relevant.
- The Agricultural Research Council should provide an advisory function.

**Implementation:**
- Priority:
  - Map and undertake an initial inspection of colonies to determine activity.
- Ongoing:
  - Implement quarantine requirements;
  - Inspect colonies for activity on an annual basis; and
  - Reassess the quality of the *Eucalyptus* as forage annually.

**Related Documents:**
- RIM Policy on Terrestrial Ecosystems.
- Fortuin 2002.
## 10. Arthropods

### Legislative Framework:

### Background:
- Stellenbosch University has investigated the rehabilitation value of Robben Island based on arthropod natural capital.
- It was found that remaining natural areas are still diverse in arthropods, despite the transformation of the original natural vegetation on Robben Island by anthropogenic activities, including alien plant and animal introductions (Roese and Pryke, 2011).
- Many of the arthropods are likely to be genetically distinct from arthropods from the mainland and introductions should be avoided.
- Early findings also indicate that arthropod diversity is negatively affected by overgrazing by alien mammals as well as the presence of *Eucalyptus* plantations.

### Objectives:
- Enhance arthropod biodiversity.

### Programmes/Actions:
- Monitoring of arthropods should continue in partnership with Stellenbosch University to evaluate the effectiveness of management strategies.
- The eradication of alien grazing mammals, especially rabbits, is supported as a priority, as set out in the Management Specifications above (5 and 7).
- The rehabilitation of *Eucalyptus* plantations back to natural vegetation is supported as set out in the Management Specification 4-Vegetation Management above.

### Responsibilities:
- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team where relevant.
- Stellenbosch University is a key partner in arthropod research and monitoring.

### Implementation:
- **Priority:**
  - Implement other Management Specifications (4, 5 and 7).
- **Ongoing:**
  - Monitor arthropod diversity.

### Related Documents:
- RIM Policy on Terrestrial Ecosystems.
- Fortuin 2002.
- Stellenbosch University 2011.
- Roets and Pryke 2012.
11. Marine and coastal management

Legislative Framework:
- Disaster Management Act 57 of 2002.
- National Heritage Resources Act 25 of 1999 (NHRA).
- Wreck and Salvage Act 94 of 1996.
- Sea Shore Act 21 of 1935.
- Storm Water Management By-law 6300 of 2005.

Background:
- Robben Island is a small part of the large and dynamic Table Bay environment and is exposed to many forces, natural and manmade, that affect the bay.
- The Island is in close proximity to large tankers anchoring off the coast while waiting to enter Cape Town Harbour. The Island is prone to collecting material disposed of through the emptying of ships’ bilges, and material from Cape Town and fishing boats (especially fishing line) washing up on the shores. As a result there is an ongoing problem with the accumulation of marine litter or ‘flotsam and jetsam’.
- The Island is also vulnerable to oil spills from passing or nearby wrecked vessels.
- Robben Island’s coastline is dominated by rocky shores but includes a sandy beach south of Murray’s Harbour. Manmade or cultural features include Murray’s Bay Harbour, a number of marine outfalls, a jetty, the Bath of Bethesda Tidal Pool, the Bluestone Quarry near the shore and 68 shipwrecks offshore.
- There are issues regarding accumulation of sand against the Murray’s Bay Harbour wall and erosion of the historical tidal defence in the Bluestone Quarry for which a solution is being sought.
- Human activities in the marine and coastal environment include fishing by residents from the rocky shore as well as by the public from boats within the 1 nautical mile buffer, illegal poaching of marine resources such as lobster and abalone and recreational activities such as walking along the coast by staff and wreck diving. Permits for wreck diving are issued by SAHRA. Occasional events are held involving water sports and permits are required from DEA.
- Poaching directly (through disturbance) and indirectly (through depletion of food resources) impacts seabirds and shorebirds that nest along the shoreline.
- A major threat to the health of the marine ecosystem is the discharge from the marine sewer and desalination outfall. While the outfall is monitored, the impacts on the marine ecology have not been investigated.
- The NEM:ICMA is the new legislation governing marine pollution and RIM await guidance on suitable levels of effluent. Alternative systems for treatment and disposal of sewage systems are under investigation. In the absence of this, the conditions set out in the existing DWA permit should be adhered to and a monitoring system should be instituted to monitor the impact of the sewer outfall on the marine environment.

Objectives:
- Maintain the health of coastal and marine ecosystems and species.

Programmes/Actions:
- Together with DPW, establish an Island-wide Anti-Litter Campaign (refer to Management
Specifying 13: Mainstreaming sustainability), to include marine litter. The Campaign should create awareness and also provide for routine cleanups, reactive cleanups after high seas and storm events, and annual cleanups as part of other initiatives such as CoastCare. It must take into account the timing of operations to avoid disturbance to seabird breeding and moulting and should be implemented only under the supervision of a member of the RIM Environmental Team or authorised seabird expert.

- Finalise the MoU between RIM and DAFF’s Monitoring, Control and Surveillance (MCS) group to improve collaboration and address illegal removal of marine living resources within Robben Island’s coastal waters.
- Explore the possibility of formalising the protection of marine living resources within the 1-nautical mile zone as currently only the cultural resources are protected.
- Refer to Management Specification 13: Mainstreaming sustainability for treatment of sewage as well as measures to limit the waste entering the sea through stormwater or filtration.
- Refer to the Emergency and Evacuation Plan (EEP) for measures to address monitoring and mitigation of oil spills on the shores as well as Management Specification 12: Management of marine mammals, seabirds and shorebirds for other measures.
- DEA O&C must be approached to clarify the mandate of RIM under the NEM:ICMA in terms of coastal management programmes. Once underway the programme must consider existing and future climate variability and change impacts such as sea level rise as well as impacts from natural processes such as coastal erosion.
- Take decisions to address the accumulation of sand against the Murray’s Bay Harbour Wall and the erosion of the Bluestone Quarry, while considering the long term environmental and financial sustainability of efforts.
- Refer to Management Specification 14: Environmental education and awareness for the inclusion of raising awareness amongst staff and the public on marine and coastal issues.
- RIM should communicate with Eskom regarding the marine monitoring undertaken at Koeberg Nuclear Power Station to establish whether opportunities to collaborate exist.

Responsibilities:
- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team where relevant.
- DPW is a partner in terms of cleanups of marine and coastal litter and oil spill response measures.
- DEA O&C is a key partner, regulator and advisor.
- DAFF Fisheries Division is responsible for issuing permits under the MLRA.
- DAFF MCS Directorate is a key partner in enforcing the MLRA in terms of poaching.
- SAHRA has jurisdiction over the cultural resources in the 1 nautical mile buffer zone.
- South African Maritime Authority and SAHRA are regulators in terms of ship wrecks.
- Eskom’s Koeberg Nuclear Power Station has an existing marine monitoring programme and there may be opportunities for collaboration.

Implementation:
- Priority:
  - Formalise partnerships to address illegal marine living resource exploitation (DAFF, SAPS);
  - Resolve ICM mandates with DEA;
  - Take decisions on Murray’s Bay Harbour and the Bluestone Quarry; and
  - Implement other Management Specifications (3, 12, 13, 14).
- Ongoing:
- Implement management actions.

**Related Documents:**
- RIM Marine Ecosystems Policy.
- RIM Maritime Archaeology Policy.
- Maneveldt *et al* Undated.
- Fortuin 2002.
- DEA 2010.
12. Management of marine mammals, seabirds and shorebirds

**Legislative Framework:**
- Disaster Management Act 57 of 2002.
- City of Cape Town Animal By-law 6896 of 2011.

**Background:**
- Marine living resources, including seabirds, provided sustenance to pre-colonial coastal inhabitants and to sailors from the 1500s. Cape fur seals (*Arctocephalus pusillus pusillus*), after which the Island was named, were heavily exploited for their food, fur and oil and the colony abandoned Robben Island in approximately 1660. In around the 1800s African Penguins (*Spheniscus demersus*) were also extinct on the Island.
- There are some 41 species of whales and dolphins inhabiting or migrating through South African waters. Most of these species are pelagic occurring off the continental shelf. Only eight species occur inshore, these include southern right, humpback and bryde whales; with dolphin species such as bottlenose, common, humpback, dusky and heaviside.
- Robben Island is identified as an Important Bird Area (IBA) under the Birdlife International programme, as a nationally and globally important location for the conservation of seabirds.
- Five species and two subspecies are endemic to southern Africa and currently the African Penguin and Bank Cormorant are both classified as Endangered.
- Robben Island has South Africa’s largest Bank Cormorant and Swift Tern colonies, its largest and most important Hartlaub’s Gull colony and in 2011 its fourth largest African Penguin colony. It has supported its largest colony of Crowned Cormorant.
- Seabirds at Robben Island form part of metapopulations, with immigration to and emigration from Robben Island particularly for first-time breeders of site faithful breeding species such as African Penguin but also of adults in nomadic species such as Swift Terns. Hence, management needs to be at a metapopulation level.
- The Island hosts migrant birds from the Eurasian Arctic, such as Terns.
- Threats to seabirds include insufficient food, fire, insufficient breeding habitat likely to be exacerbated by loss of alien vegetation as habitat (shade and nests) and the old jetty, predation from cats, seals, kelp gulls and possibly rats, injury from flotsam and jetsam especially fishing line.
Seabird conservation is in direct conflict with human activity and the conservation of heritage resources. For example, penguins are nesting in the Ou Tronk and Leper Graveyard resulting in a conflict between the NHRA and NEM:BA. Similarly, gulls are roosting on buildings, causing damage to the heritage resource and creating a nuisance to residents.

Future environmental change impacts may include increasing temperatures, which impact penguins specifically, as well as increased risk for birds breeding near the shoreline, such as Bank Cormorants, during big swells and storm events.

A number of research programmes are currently underway. These include DEA Island Closures Project; SANCCOB and CapeNature Chick Bolstering Project; Earthwatch Project with DEA, UCT ADU SANCCOB and other bird organisations involving monitoring of seabirds and shorebirds; DEA and UCT ADU research programme also involving monitoring.

The state of seabird populations provides a suite of indicators for environmental change. The pivotal location of Robben Island lends significant opportunity to further research in this field given the populations are managed appropriately.

Cape fur seals are protected under the Policy for Seals, Seabirds and Shorebirds in South Africa (DEA, 2007). At Robben Island seals have initiated a haulout in Murray’s Bay Harbour close to the Bank Cormorant colony. Seals pose a threat to seabirds as they compete with certain species for food and breeding space and prey on seabirds. As an example, the seals sighted near Robben Island have been seen killing African Penguins and will probably soon displace the Bank Cormorants from their nesting site in the Harbour if no action is taken.

Objectives:

- Manage the conservation of seabirds, shorebirds and marine mammals.

Sub-objectives:

- Maintain and increase breeding productivity and survival rates of seabirds.
- Minimise mortality by predators and competition for breeding space.
- Minimise mortality of seabirds through fire, oil, road accidents and disease.
- Protect safe nesting/roosting places for seabirds.
- Assist with strandings by facilitating the rapid reporting, recueing and release of live stranded animals.
- To ensure that correct procedures are provided for the humane treatment of stranded, sick or injured marine mammals.
- To use the stranding of dead marine mammals to increase knowledge of the biological and behavioural characteristics and increase community awareness of local marine conservation issues.
- Promote sustainable tourism.
- Promote the role of Robben Island for conservation.
- Contribute towards research of the health of the southern Benguela ecosystem.

Programmes/Actions:

- Investigate the legal framework within which an Integrated Conservation Management Plan for Robben Island can be developed, which would ensure adequate protection of African penguins and other seabirds at the Island.
- Refer to Management Specification 3: Spatial planning for mapping and zonation exercise which should include seabird habitat and will identify zones of human conflict where special management requirements apply. As an interim measure to avoid human disturbance, no-go areas should be established immediately and communicated using mobile signage which can be moved as and when birds change location. This should include the protection of heronries and gulleries for migratory birds, herons etc. The signage will become law under the Penguin Biodiversity Management Plan.

- The zonation exercise should consider the retention of alien vegetation as safe nesting and resting sites for seabirds, particularly under the circumstances that increasing temperatures increase the importance of shade to seabirds. Specific provisions for clearing aliens are set out in Management Specification 4: Vegetation management. Whilst the removal of alien vegetation is favourable, alternative nests need to be considered during planning.

- Discourage the use of the airstrip for any tourism initiatives, and use it only during emergency situations, such as disaster evacuation or for fire-fighting helicopters and transport of VIPs. Seabirds are very sensitive to aircraft flying overhead and do not breed well with regular air traffic in their air space. While air restrictions over penguin breeding colonies is under investigation by DEA, the South African National Air Force should be instructed not to fly low within the airspace of Robben Island and to comply with the provisions of NEM:PAA. The RIM Access and Control Policy should be updated accordingly.

- Refer to Management Specification 7 on the total removal of feral cats which are an immediate threat and cause of mortality to seabirds and their chicks. Rats may also have a direct impact on seabird chicks and must be controlled. This should however, be done in a manner that minimises implications for other wildlife.

- Refer to Management Specification 11 for marine litter cleanup requirements to reduce seabird mortality by entanglement in fishing gear which should be under the supervision of a member of the RIM Environmental Team or seabird expert.

- Reduce road mortality using simple measures such as:
  - Place temporary speed-reduction humps or barriers in key locations where penguins are observed to cross roads;
  - Redirect traffic to avoid no-go areas during breeding seasons;
  - Keep traffic on Cornelia Road to a minimum; and
  - Keep manholes covered at all times.

- Reduce mortality through fire, oiling and disease by developing Contingency Plans for such events. This can be done in collaboration with SANCCOB:
  - Refer to Management Specification 4: Vegetation management for management of firebreaks as fires pose a significant threat to seabirds and their habitat;
  - Reduce disease through burning of dead birds that have been affected by disease and restrict live poultry or any pet bird (refer to Management Specification 4, 7 and 13); and
  - Refer to the EEP for measures to address monitoring and mitigation of oil spills on the shoreline.

- If any other form of mortality is identified, remedial actions should be taken in this regard.

- When Bank Cormorants are not breeding, in collaboration with O&C DEA, take measures to prevent seal encroachment into the Bank Cormorant colony in the harbour. Additionally monitor the rest of the Island to ensure seals do not encroach on other bird breeding areas. Remedial actions such as displacement or construction of artificial barriers should be implemented in consultation with DEA O&C. Seals can only be culled under certain circumstances outlined in the Policy (DEA, 2007) and with a permit. Seals do not breed on Robben Island, however, if any other threat from the visiting seals is identified by RIM they should report this to DEA O&C and seek management advice.

- Refer to Management Specification 2: RIM Communications and reporting above. Consult the RIM Environmental Manager as well as a seabird expert, to assist with planning and supervision.
of capital work developments or restoration projects that are planned within seabird breeding areas. This includes restoration of the Ou Tronk or Leper Graveyard and where other maintenance activities are required such as the dune management near the harbour wall. Other stakeholders such as DEA O&C and UCT ADU must be consulted for advice on how best to address the potential disruption to seabirds.

- Similarly with reference to Management Specification 2: RIM Communications and reporting, the following actions apply:
  - Explore opportunities for raising environmental awareness amongst staff and the public on matters of seabird conservation. The Environmental Education and Awareness Programme set out in Management Specification 14 lists a number of ways that staff and visitors can be educated and made more aware of sustainability and environmental issues in general. The breeding sites of Swift Terns, Hartlaub’s Gulls, Grey-headed Gulls and birds (including Crowned Cormorant) that use the heronry are not always fixed on the Island and regular communication is advised for this reason;
  - Any special event requires input from the RIM Environmental Team to avoid impacts on seabirds amongst other possible environmental impacts (refer to Management Specification 2: RIM Communications and reporting);
  - Select and plan tour routes to avoid seabird breeding areas, for example the route near the Bluestone Quarry; and
  - Contractors are required to adhere to RIM policies and complete an Environmental Method Statement and this will ensure that seabirds are not negatively impacted (refer to Management Specification 2: RIM Communications and reporting).

- RIM Management and DPW should consider measures to contain or address diesel discharge and spills at the harbour where the Bank Cormorants breed (refer to Management Specification 13: Mainstreaming sustainability).

- Viewing of seabirds is an ecotourism opportunity that should be explored on the following bases (refer to Management Specification 2: RIM Communications and reporting):
  - Only small groups are led by experienced guides on foot;
  - Sensitive areas and seasons must be avoided;
  - Disturbance could be minimised through appropriate infrastructure such as viewing platforms and the existing boardwalk could be maintained for this purpose; and
  - A benefit would be that public awareness is raised, the tourism product is diversified and an appreciation for seabirds is fostered amongst staff.

- RIM should continue to collaborate with DEA O&C and UCT ADU on monitoring and understanding the biology of seabird populations on the Island, to develop and institute effective management programmes for their conservation. Particularly important are considerations of environmental change and mitigation of any direct impacts on the Island.

- Report stranded cetaceans or incidents of haulouts by species of pinnipeds other than endemic Cape fur seals. Assist with reporting and recording of entrapped, entangled and ship struck cetaceans. This should include animals sighted in transit by crew of ferries in transit to and from Robben Island.

- RIM should continue to collaborate with DEA O&C, DAFF and UCT ADU to contribute information to an annual index of health of the Southern Benguela ecosystem and investigate the potential for using the seabird populations on RI as indicators for environmental change.

### Responsibilities:

- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team where relevant.
- DPW is a partner in terms of cleanups of marine litter, maintenance of firebreaks and response to oil spills.
- DEA O&C should provide support and advice, and continue to collaborate with RIM on existing
research programmes. DEA should consult and involve the RIM Environmental Team on relevant initiatives, for example on the African Penguin Management Plan.

- DEA O&C provides support on marine pollution issues such as oil spills and stranded or hauled out marine mammals.
- DAFF Fisheries Directorate is a research partner as seabirds are an indicator of marine ecosystem health.
- UCT ADU should provide support and advice and continue to work closely with RIM on existing research programmes.
- CapeNature is a research partner and advisory body and issues permits for various activities above.
- SANCCOB is an advisory body on seabird rescue and rehabilitation and is a partner on the Chick Bolstering Project and assist with rescuing abandoned chicks.

**Implementation:**

- **Priority:**
  - Investigate the legal framework within which the African penguins and other seabirds at the Island would receive adequate protection;
  - Eradicate feral cats and remove of all pets on the Island (Management Specification 7);
  - Institute mobile signage for no-go areas; and
  - Institute speed humps and redirect traffic during breeding season
- **Ongoing:**
  - Implement the other actions.

**Related Documents:**

- RIM Policy on Marine Ecosystems.
- RIM Emergency and Evacuation Plan.
- RIM Visitor Management Plan.
- RIM policies for contractors (Code of Conduct for Staff, DPW, Staff Visitors and Contractors Policy; General Guidelines for Contractors Working on Robben Island).
- Fortuin 2002.
- RIM Visitor Management Plan.
- SANCCOB 2006.
- DEA 2010.
- Sherley *et al* 2011.
### 13. Mainstreaming sustainability

#### Legislative Framework:
- Limit or Restrict the Use of Water By-law 5994 of 2003.
- Storm Water Management By-law 6300 of 2005.
- Air Quality Management By-law 6772 of 2010.
- Water By-law 6847 of 2011.

#### Background:
- Water Resources:
  - The groundwater resources of Robben Island have been over exploited in the past and poor abstraction management resulted in the intrusion of seawater.
  - Since 1998, a reverse osmosis desalination plant meets the needs of RIM. The desalination plant produces up to 500,000 litres of potable water per day. Water from the desalination plant is stored for drinking and fire fighting purposes in two main reservoirs with a capacity of 2.5 million litres.
  - The desalination process is energy intensive and therefore reliant on the operation of the diesel generator. If the operations of the desalination plant are interrupted, there is a three-day supply of water in the reservoirs.
  - DPW manages a maintenance contract that covers the desalination plant, reservoirs, boreholes and the sewers. The desalination plant and piped water network were recently upgraded. The borehole water is regularly tested for quality and quantity by the contractor.
  - One of the reservoirs holds water pumped from different boreholes and this is currently used to irrigate various gardens and open landscapes.
  - Groundwater from boreholes Numbers 5, 6, 10 and the one near the hydroponic nursery could potentially be used for irrigation in the hydroponic nursery and the future use of the nursery to propagate indigenous plants for the Island. Testing of quality and quantity of groundwater is necessary to establish whether the supply is adequate.
  - Rainwater tanks at residential houses and buildings do not contribute towards water supply in any meaningful way.
  - A waterborne sewer network services all the buildings on the Island. Waterborne sewage is captured in an interceptor sewer line and transferred to a single point where the effluent is macerated before being discharged into the ocean untreated. This marine outfall requires authorisation from DEA under the ICMA. RIM is awaiting guidance on acceptable thresholds.
  - Investigations are underway to identify an alternative sewage treatment to reduce marine impacts and produce treated wastewater for irrigation purposes and sludge for compost to be used on the estate.
  - Camdekon Engineers are the engineering management consultants currently contracted by DPW to maintain water and sewerage infrastructure on the Island.
- Energy:
  - Electricity on the Island is generated by two 1,000 kVA diesel engine generators; five 300 kVA diesel engine generators in the power house; and one 400 kVA stand-by diesel
A network with various substations with switchgear services the Island.

- Approximately 40,000 litres of diesel is stored in two storage tanks in the harbour with a fuel line to the powerhouse and a storage tank in the powerhouse. Infrastructure is outdated and vehicles filling their tanks at the harbour disrupts breeding seabirds.
- RIM and DPW have a number of vehicles that run on diesel, including buses, cars and service vehicles.
- An existing service contract for the generation of electricity is managed by DPW.
- The accumulation of deadwood on the Island offers potential for a biomass facility that could generate energy.

**Waste Management:**

- Solid waste is collected by the DPW and deposited at an officially designated waste site on the Island. From here an appointed contractor, currently Wasteman, sorts the waste, keeping organic material, paper and cardboard separate from other waste. Waste is then transported by ferry to the mainland and deposited at a registered site.
- Hazardous waste (asbestos, contaminated diesel etc.) is also transported off the Island and disposed of at an appropriate licensed facility.
- A draft ‘Waste Disposal Plan’ is under discussion between RIM and DPW and aims to address the waste that has accumulated on the Island over the years. This includes waste inherited from the previous regimes, such as the Prison Period, and waste from the more recent capital projects that has not been removed. Both RIM and DPW will contribute towards the project and a contractor will be tasked with disposal of the waste.
- Solutions for the disposal or recycling of vegetative waste require investigation as transport to mainland is costly. The aim is to use all vegetative waste on the Island and various opportunities are being investigated.
- The receptacles currently used for transporting waste are unsuitable as they do not contain the waste efficiently causing pollution during transportation.
- Marine litter along the shoreline is an ongoing problem and requires regular cleanups. This is the responsibility of RIM, DPW and DEA.
- Litter by staff and tourists is also an ongoing problem and illegal dumping is occurring which has impacts such as attracting rats and cats, as well as pollution to the groundwater system.
- Disposal of rubble in the waste disposal site by contractors should be prevented.

**Objectives:**

- Mainstream sustainability into operations and improve resource use efficiency.
- Re-establish a sustainable groundwater resource for potential future use.
- Manage potable water resources sustainably.
- Introduce a more sustainable approach to energy use through improved energy efficiency and the introduction of renewable energy as an alternative to fossil fuels.
- Develop a waste management plan to ensure adherence to the waste management hierarchy.

**Programmes/Actions:**

- RIM as a government institution should lead by example in mainstreaming sustainability in all operations.
- RIM must acquire all the relevant permitting documents as well as data collected by the contractors that manage the bulk services on behalf of DPW, namely waste, sewage and energy facilities. This information includes data on borehole water quality and quantity; desalination outputs; water consumption; water storage; diesel consumption; electricity consumption; electricity consumption used by the desalination plant specifically; sewage generated; and volumes and types of waste collected. Roles and responsibilities for RIM and DPW must be established to monitor compliance of these operations. The 2005 City of Cape Town Services Report sets out monitoring requirements and suggested potential indicators.
• This data will provide the basis for monitoring resource use efficiency and a consultant should be appointed to assist with the production of a Sustainability Strategy to address, inter alia:
  – Integrated water resource management;
  – Improved energy efficiency and a reduced reliance on fossil fuels, including transport; and
  – Integrated waste management.
• Retrofitting existing premises with more resource efficient devices needs to consider any restrictions in terms of the heritage legislation and consultation and approval from SAHRA would be necessary.
• In the absence of a Strategy at present, a number of immediate priorities are recommended:
  – Aquifer remediation:
    o Continue to monitor the quantity and quality of borehole water resources with the aim of replenishing the aquifer;
    o An independent hydrogeologist must undertake regular external audits of the aquifer remediation programme;
    o DPW and RIM must establish the potential groundwater resources available for irrigation in the hydroponic nursery as set out in Management Specification 4: Vegetation Management as a long term objective.
  – Water use efficiency:
    o Conduct a water audit to monitor consumption of the various facilities on the Island, including staff accommodation, and to establish whether any leakage is occurring. Thereafter RIM Estates Department should regularly audit the facilities and report any leaks to DPW to address until the FM contract is finalised;
    o Water consumption and wear and tear on fittings can be reduced if water pressure reducing valves are installed if water pressure is considered high by normal domestic standards;
    o Include water saving devices in all new installations or facilities. This could include, inter alia, installing showers instead of baths; water efficient tap fittings and shower heads; water efficient or dual flush toilets; waterless urinal valves; greywater recycling systems; and rainwater harvesting tanks to store water;
    o Reduce water used on the estate. Use of hosepipes to clean hard surfaces should not be allowed and hose pipes should not be used for cleaning vehicles;
    o Consider treatment of the desalinated water to reduce corrosivity to the reticulation network and metallic appliances;
    o Establish the feasibility of using a combination of groundwater and seawater inputs to the desalination plant which could have the potential to reduce the energy requirements to treat the water to potable standards; and
    o Establish the feasibility of using treated wastewater for irrigation purposes should an alternative sewage treatment system be implemented.
  – Energy use efficiency:
    o Include energy saving devices in all new installations or facilities. This could include, inter alia, insulation of geysers, ceilings, hot water pipes and urns; installation of timers adjusting thermostats on geysers and air conditioning units; installation of lighting controls (motion sensors, timers, daylight sensors) to selected spaces to activate lighting; installation of energy efficient showerheads and energy saving bulbs;
    o Procurement of new vehicles, appliances and equipment should consider energy efficiency as a criteria;
    o Investigate ways to reduce the dependency on transported diesel which includes diesel used to power the desalination plant as detailed above; and
    o Establish the feasibility of introducing renewable energy installations such as solar, through wind, tidal energy, biomass or biogas. The installation of any renewable energy facilities will need to be assessed in terms of their impact on the heritage.
resources and the cultural landscape in general.

- As a component of the Sustainability Strategy, RIM/DPW must employ a consultant to develop a Waste Management Plan for the Island with the aim of becoming an accredited waste generator under the City of Cape Town’s Integrated Waste Management By-law. The following actions should be addressed:
  - All reasonable measures must be taken to avoid generation of waste, and to reduce, reuse, recycle and to dispose of waste in an environmental sound manner;
  - Ensure that where waste activities trigger the thresholds as per NEMWA, the required waste license applications are applied for – i.e. waste minimisation and or storage waste activities;
  - No hazardous, chemical or medical waste is to enter the general waste stream. Hazardous waste should be disposed of at a licensed hazardous landfill facility (Vissershok landfill site). Management and handling of the said waste should be in strict adherence to legislative requirements. A method statement should be compiled for the handling, transportation and disposal of such waste streams.
  - Any new developments requiring planning permission must contain suitable accommodation for the storage and disposal of waste to a licensed landfill site;
  - Finalise the draft Waste Disposal Plan and implement in order to undertake a comprehensive clean-up of derelict and hazardous objects such as petrol drums, discarded vehicles, disused machinery, building materials and rubble that has accumulated on the Island;
  - Enforce penalties for illegal dumping by residents or contractors, alternative approaches should be explored for these types of wastes through sorting and re-use of materials;
  - Provide appropriate signage and recycling bins as part of an Island wide Anti-Litter Campaign. Awareness can be communicated through measures set out in Management Specification 14;
  - Include marine litter in the campaign and provide for monitoring of litter in the various areas, routine cleanups, reactive cleanups after high seas and storms or special events, as well as annual cleanups as part of broader initiatives such as CoastCare;
  - Reduce the use of plastic water bottles by introducing alternatives such as water dispensers, or installation of water filters on taps. This could be accompanied by the sale of branded water bottles which tourists will keep and take off the Island at the end of their tour;
  - Separate all waste at source. The appropriate infrastructure (bins) and systems (collections) must be implemented by RIM/DPW and thereafter this policy should be enforced;
  - Prohibit residents and staff from burning litter/scrap or any other rubbish;
  - Implement measures to ensure that food waste is contained and removed frequently to avoid attracting rats;
  - All receptacles used for transporting waste to the mainland should be weatherproof, such as plastic bins, and this would reduce the risk of leakage and windblown waste;
  - When buying supplies for the Island, preference should be given for recyclable and easily reusable or compostable goods, similarly goods that have already been recycled;
  - Obtain a list of cleaning products used by cleaning contractors and investigate greener products or strategies such as microfiber cloths, low-foaming solutions, chlorine-free products, phosphate-free products, reduced/recycling of packaging, reduced VOC emissions, and biodegradability of chemicals;
  - Address waste entering the sea through stormwater or filtration using measures such
as litter traps on stormwater drains, bunding of workshop and fuel storage areas, and removal of all rubbish tips formal and informal. The diesel storage facilities are close to the open ocean and at present, discharge and spills enter the harbour and impact seabirds;

- Investigate the short and long-term solutions to address vegetative waste. Vegetative waste should be recovered as far as possible and re-used where appropriate, opportunities for permaculture, vermicomposting or incineration should be explored, whilst only indigenous plants can be used as mulch;
- Any new installations or facilities for staff or visitors should consider the impact on the existing sewage treatment and disposal system;
- RIM and DPW must continue to collaborate to investigate alternative treatment and disposal systems for sewage in the medium to long-term. This includes the possibility of installing a methane digester which would also generate energy, as well as a composter to provide compost from sludge which can be used on the estate; and
- In the absence of any decision, continue monitoring the amount and quality of effluent and comply with the provisions of the previous DWA sewer outfall permit. This includes the requirements for an advisory committee. In addition, a monitoring programme should be instituted to assess the impact on the marine environment of the sewer outfall.

- A key component of the Sustainability Strategy should be to implement an Environmental Education and Awareness Programme which would consider all aspects of resource use efficiency, this is addressed in Management Specification 14.
- The Sustainability Strategy should monitor resource usage during peak times and over special events and this could assist with devising acceptable thresholds for numbers required to maintain sustainable resource use. This can inform the Visitor Management Plan in the future.
- The Strategy should also consider means of reducing environmental impact during tours such as promoting smaller walking and cycling tours as an alternative to driving.

**Responsibilities:**
- RIM Environment, RIM Estates and DPW should engage on most of the actions listed above.
- DPW is responsible for providing the information on borehole water quality and quantity; desalination outputs; water consumption; water storage; diesel consumption; electricity consumption; sewage generated; and volumes and types of waste collected. DPW is also responsible for providing RIM with copies of the existing permits for bulk services.
- City of Cape Town is a key partner with regards to environmental resource management, including service provision, and on this basis RIM should establish an MoU with the City.

**Implementation:**
- Priority:
  - Commence monitoring of resource use and produce a Sustainability Strategy.
- Ongoing:
  - Install new devices as and when new facilities are developed; and
  - Investigate sustainability or ecotourism opportunities as and when they arise.

**Related Documents:**
- RIM Freshwater Resources Policy.
- RIM Waste Policy.
- RIM Energy Policy.
- RIM Conservation Policy for Movable Resources and Collections.
- RIM policies for contractors (Code of Conduct for Staff, DPW, Staff Visitors and Contractors Policy; General Guidelines for Contractors Working on Robben Island).
- DPW Maintenance Plan.
**14. Environmental education and awareness**

**Legislative Framework:**

**Background:**
- Robben Island is a high profile World Heritage Site and has great potential to inspire and influence the lives of South Africans as well as the international community.
- Various incidents and behaviour that occurs on the Island indicate a lack of awareness of environmental and sustainability issues amongst RIM and DPW staff as well as the public, this includes littering, dumping, speeding, resource wastage etc.
- Environmental awareness and education is a fundamental requirement to the success of other initiatives proposed to mainstream sustainability into the everyday operations of RIM and DPW.
- The unique and diverse environment of Robben Island provides numerous opportunities for staff and the public to engage on environmental issues.

**Objectives:**
- Foster an appreciation for the environment amongst staff and visitors and enhance awareness through education.

**Programmes/Actions:**
- An Environmental Education and Awareness Programme should be implemented to foster a culture of sustainability within RIM as well as to improve awareness to visitors which will also have the benefit of improving the RIM brand. Measures could include:
  - Conduct basic Environmental Awareness Training as part of the induction for all new staff and any contractors working on the Island, to include, inter alia, no-go areas, fire hazards, water and energy wise use, waste control, animals, road rules etc.;
  - Sign a Code of Conduct for new staff and residents to create awareness and instil pride in their workplace;
  - Encourage staff awareness and behavioural change through workshops, regular newsletters or briefings emailed including updates regarding progress and achievements, as well as though distributing educational resources;
  - Environmental issues that should be communicated to staff as part of this programme could include, inter alia:
    - Vegetation management: progress and practices on alien vegetation clearing and rehabilitation; quarantine awareness; and fire awareness;
    - Indigenous and feral fauna: findings of surveys; progress on eradication programmes; and rat prevention awareness;
    - Bee colony: quarantine awareness;
    - Marine and coastal management: findings of surveys; and poaching awareness;
    - Seabird management: findings of surveys; progress of programmes; climate change awareness; communication of breeding seasons, no-go areas, road closures and oil response measures;
    - Resource use efficiency: water wise practices; energy wise practices; litter awareness; and waste hierarchy awareness; and
    - Participation: circulation of surveys to staff where natural environment projects or programmes impact directly on their workplace or accommodation.
  - Organise competitions to generate interest and incentivise staff, for example prizes for the staff member who submits the best solution to an environmental problem;
  - Improve visitor awareness by providing information in the form of resources in the NMG building such as displays or exhibitions; production and sale of leaflets or booklets (refer to...
‘Wildlife of Robben Island’ by Crawford and Dyer, 2000 which could be revised); audiovisual or audio information provided during the ferry trip; signage on the Island; verbal information from tour leaders and guides; web-based or other social media; and improve the visibility and accessibility of facilities such as recycling bins which symbolise RIM’s commitment to sustainability. Similar categories can be communicated to visitors as listed for the staff above; and
- Encourage annual events with volunteers, scholars or students in line with other RIM HR and Education policies.

**Responsibilities:**
- The RIM Environmental Manager is responsible for all of the above actions, with support from the RIM Environmental Team, where relevant and the Education, Human Resources and Marketing Departments.
- DPW is a partner and their staff should be included in the initiatives.
- City of Cape Town Environmental Resource Management Department could be consulted for environmental education resources.

**Implementation:**
- **Priority:**
  - Design an Environmental Education and Awareness Campaign.
- **Ongoing:**
  - Implement the Environmental Education and Awareness Campaign.

**Related Documents:**
- RIM Freshwater Resources Policy.
- RIM Waste Policy.
- RIM Energy Policy.
- RIM HR Policies.
- RIM Education Policies.
- DPW Maintenance Plan.
- City of Cape Town Smart Living Handbook.
- City of Cape Town Smart Building Handbook.
- City of Cape Town Environmental Awareness, Education and Training Strategy.
15. Summary

The overarching aim for environmental management on Robben Island is to ensure the Island’s natural ecosystems are restored to a condition in which they will become self-sustaining and can be kept in that condition with minimal management input – thus meeting a basic criterion of sustainability. The overarching objectives for management of Robben Island are identified as follows:

- To restore and then maintain the health of terrestrial ecosystems;
- To restore and then maintain the health of coastal and marine ecosystems;
- To promote the conservation of Threatened indigenous species, especially those that are endemic to southern Africa.
- To foster relations with other relevant governmental bodies and organs of state that will result in collaborative management of the natural environment;
- To foster relations with relevant research and educational institutions;
- To foster internal communication within RIM;
- To employ spatial planning tools to assist and inform management of the natural environment; and
- To mainstream sustainability into operations and improve resource use efficiency.

The more specific conservation priorities for the natural environment of Robben Island are as follows:

- To minimise the risk of wildfires to wildlife and habitat as well as to people and the built environment;
- To manage the stocking of large herbivores on the Island so as not to exceed the carrying capacity;
- To manage the conservation of seabirds and other indigenous birds;
- To manage the conservation of other indigenous vertebrates and invertebrates; and
- To rehabilitate the vegetation to a condition where it will become self-sustaining and can be kept in that condition with minimal management input.

Each Management Specification has provided the actions required for each area of intervention required to meet the provisions of the law as well as the overarching objectives for environmental management. The immediate priorities have been identified as follows:

1. Establishment of a Robben Island Environmental Advisory Committee;
2. Investigate the legal framework within which the African penguins and other seabirds at the Island would receive adequate protection;
3. Firebreak design and maintenance;
4. Cat, rabbit, rat eradication/control;
5. Identify target for Fallow Deer eradication/control;
6. Designation of, and procurement and institution of signage for, no-go areas;
7. Installation of speed bumps;
8. Alien vegetation removal near sensitive cultural sites;
9. Formalisation of agreements with stakeholders for monitoring of poaching (DAFF and SAPS); and
10. GIS and fire training for environmental staff.

RIM and DPW as managers and custodians of the Island should address these priorities as a starting point for implementation of the NEMP, with the view to protecting and enhancing the natural environment of Robben Island as a WHS and source of national pride.
Part III: References and Appendices

References

Field Visits

4 September 2012
13-14 September 2012

Personal Communications

Estelle Esterhuizen, Nature Conservator, RIM (13 Sept)
Rivaaj Mahaveer, Estates, RIM (14 Sept)
Sabelo Madlala, Environmental Unit Manager, RIM (19 Sept; 2 Oct; 9 Oct, 1 Nov)
Rob Crawford, DEA Oceans and Coasts (26 Sept)
Bruce Dyer, DEA Oceans and Coasts (26 Sept)
Mario Leshoro, Environmental Officer, RIM (2 Oct)
Newi Makhado, DEA Oceans and Coasts (2 Oct)
Richard Sherley, Animal Demography Unit, UCT (2 Oct)
Karen Esler, Department of Conservation Ecology and Entomology, University of Stellenbosch (9 Oct)
Guy Palmer, CapeNature (15 Oct)
Razeena Omar, DEA Oceans and Coasts (17 Oct)
Mike Slayen, Table Mountain National Park, SANParks (22 Oct) [phone]
Keith Wiseman, City of Cape Town (7 Nov) [phone]
Madikana Thenga, City of Cape Town (7 Nov) [phone]
Brett Glasby, Wildlife Unit, Cape of Good Hope SPCA (11 Nov) [phone]

Resources


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Stellenbosch University 2011. Short term vegetation changes following the control of European rabbits on Robben Island, Research Highlights Brief for Resource Managers, November 2011.


Appendix 1: Legal Framework
Appendix 2: Review of Relevant Plans and Policies
Appendix 3: Environmental Method Statement