Chapter 21: Helderberg Marine Protected Area Management Plan

SECTION A: BACKGROUND INFORMATION

1. Introduction

The Helderberg MPA is situated on the north-eastern side of False Bay in the Western Cape, and falls within the jurisdiction of the City of Cape Town (CCT). It falls within the warm temperate Agulhas bioregion, and is a productive, biologically diverse area. Sandy beaches with mobile dune systems dominate the coastline in the area, while offshore habitats comprise rocky reefs, kelp beds, sandy soft-sediment, and pelagic environments. The health of the ecosystems within the Helderberg MPA varies greatly, with those in the poorest state being associated with estuaries where water abstraction, pollution and encroachment by development are extensive.

1.1 Purpose and Scope of the Management Plan

The purpose of this document is to describe the Helderberg MPA, its goals and objectives, methods for achieving these, and methods for measuring the success of the MPA. It aims to protect and conserve the values of the MPA whilst simultaneously allowing for reasonable access to and utilisation of the MPA by various user groups. It is a living, public document and as such is subject to periodic review.

1.2 Development of the Management Plan

The Management Plan for the Helderberg MPA has been compiled by the City of Cape Town (CCT). It draws on international experience of MPA management, as well as the relevant guideline published by the International Union for the Conservation of Nature (IUCN), and national legal and institutional requirements. An annual review of the management plan will be undertaken for the first three years, after which it should be reviewed every five years.

1.3 Management Framework

The management of marine living resources in South Africa is a national responsibility. In terms of the Marine Living Resources Act, the delegated authority to manage MPAs is the Minister of Environmental Affairs, through the Marine and Coastal Management branch. The Helderberg MPA abuts two erven (erf 789 and 790) which fall under the custodianship of Cape Nature. These erven are leased to Cape Nature by Heartland Properties and RDM Denel and which form part of the Cities biodiversity network.

1.4 Structure of the Plan

This management plan outlines the framework for the management of the Helderberg MPA to assist its stakeholders in achieving the site's conservation and user-principle objectives. The plan is broken down into distinct sections with an introduction followed by a section on the background of the MPA. Subsequent sections provide guidance on site management and can be described

as the “living” part of the document. The term “living” illustrates the expectation that this part of the management plan will evolve and change over time to suit the needs of the MPA and its stakeholders. This part includes the specific objectives set for the Helderberg MPA by MCM and CCT. It also provides guidance on governance, as well as management actions such as monitoring, compliance, education and awareness-raising, all of which will be critical to the success of the MPA.

1.5 Goals and Objectives of the Helderberg MPA

Marine Living Resources Act - Main Objectives

1. For the protection of fauna and flora or a particular species of fauna or flora and the physical features on which they depend;
2. To facilitate fishery management by protecting spawning stock, allowing stock recovery, enhancing stock abundance in adjacent areas, and providing pristine communities for research or;
3. To diminish any conflict that may arise from competing uses in that area.

The management agency, CCT, have developed a set of goals specifically related to the Helderberg MPA, which are based on the three main objectives of the MLRA. These include:

Biophysical Goals

1. To protect the marine and estuarine ecosystems that are representative of the Agulhas bioregion and to maintain biodiversity and ecological functioning in these ecosystems;
2. To protect depleted, endangered and endemic species and populations and to protect habitats which are important for the survival and revival of these species and populations;
3. To contribute towards the long-term viability of marine fisheries

Socioeconomic Goals

a) To promote non-consumptive, ecotourism opportunities;
b) To provide opportunities for marine ecological research and monitoring of environmental effects of human activities on marine ecosystems;
c) To facilitate the interpretation of marine ecosystems for the promotion of conservation among scholars and tourists;

Governance Goals

1. To reduce conflicts between competing users in the MPA and surrounding areas;
2. To ensure that appropriate and effective legal structures are developed for protecting the biodiversity of the MPA and the activities that benefit from it;
3. To fulfil South Africa’s international commitment to marine protection in terms of international protocols and conventions;

The development of related management actions further supports the MLRA objectives by identifying the activities which will be undertaken by CCT to reach the biophysical, socioeconomic and governance goals and ensures the effectiveness of the MPA. These management actions are discussed in Section B onwards.

2 Description of the Area

2.1 Site Location

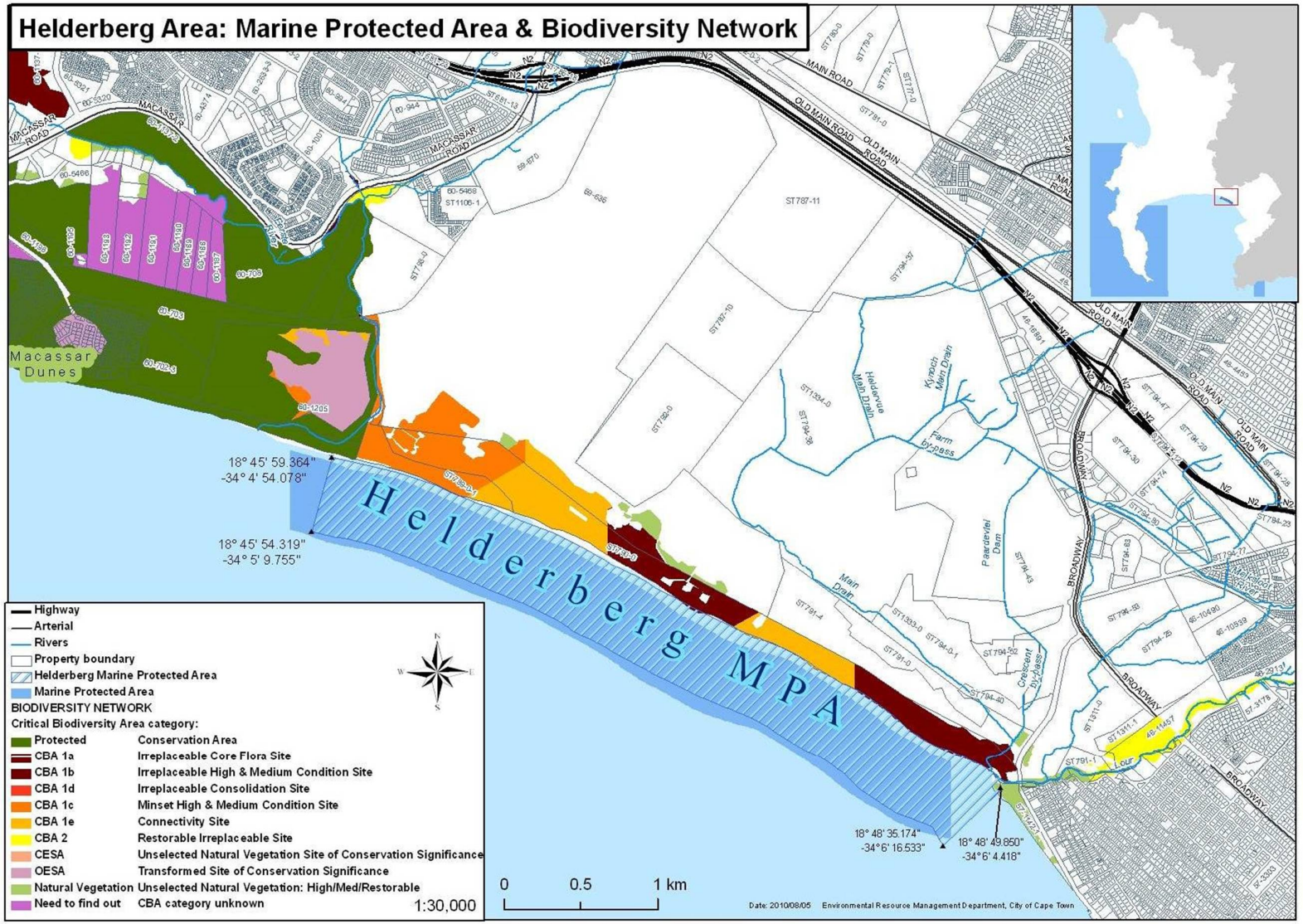

Figure 1: Helderberg MPA

2.2 Geography and Habitat

The east side of False Bay has extensive areas of fine quartzite sand bottom, and there are also occasional deposits of very fine, low-density silt which is easily disturbed and returned to suspension. This silt generally deposits over the sand and depressions in the reef during relatively long periods of calm seas. There are small areas of shell, gravel and mud near Gordon's Bay between the rocky shoreline reef and the sand bottom. The late-Precambrian age Malmesbury group is the oldest rock formation in the area, consisting of alternating layers of dark grey fine-grained greywacke, sandstone and slate, seen along the rocky Sea Point and Bloubergstrand shorelines, and from the Strand to Gordon's Bay. These sediments were originally deposited on an ancient continental slope by sub-marine slumping and turbidity currents. The sequence was subsequently metamorphosed by heat and pressure, and folded tightly in a NW direction so that the rock layers are now almost vertical. These rocks were, in most places, scoured by wave action during past periods of higher sea level. During winter, prevailing north-west and south-west winds bring rain associated with sub-Antarctic cold fronts. Although microclimates significantly affect local rainfall, in general the lower slopes receive approximately 800 mm p.a. The region suffers from summer drought. Temperatures are moderate and range from -5°C minimum in winter and 35°C maximum in summer. The annual average minimum and maximum temperatures are 11°C and 24°C respectively.

The shore of the MPA comprises 4km of sandy beach, as well as some low profile sandstone reefs which fall within the boundary (500m seaward of the high water mark) of the MPA. The beach within the Helderberg MPA is the least disturbed part of the northern shore of False Bay and harbours the last relic population of the giant isopod *Tylos granulatus* south of Yzerfontein.

The main habitats that can be found in the Helderberg MPA are:

a) Sandy beaches

Helderberg's ecosystems include the three zones typical of sandy beaches: the surf zone, the beach, including the intertidal and backshore zones, and the sand dunes. Sandy beaches are characteristically dynamic habitats, wave action being the predominant driver of change, which makes these habitats a unique home to a number of hardy and well adapted species.

The dunes in the area are considered a part of a mobile dune system in which sand is transported both in the littoral zone and long-shore, where it is trapped by coastal vegetation, resulting in the development of fore-dunes. Development within this mobile system has resulted in huge long-term costs, as developments have been inundated with windblown sand.

Threats to the sandy beach at Helderberg:

- Development in the active littoral zone, resulting in the inundation of buildings by sand.
- Artificial dune stabilisation and removal of fore-dunes for development, which deplete the available supply of sand needed for beach functioning.
- Although the Helderberg beach is kept clean, pollution in the form of plastic and oil spills remains a permanent threat if left unchecked.

- No specific research regarding invertebrates has been completed for the Helderberg MPA, which makes clear recommendations and the identifying of specific threats difficult.

b) River mouths

Historically, the Eerste River estuary was a small, temporarily open system with the mouth state predominantly determined by river flows. Under these conditions sea water intrusions created estuarine conditions in the water body that extended 0.9-2.5km in the summer months when the mouth was closed. During this period the estuary was a prime angling spot with up to 23 species of fish recorded. Estuary conditions began to deteriorate from as early as the 1940s due to water abstraction, effluent discharges from wineries and increased turbidity due to poor land use. Chemical pollution from a defence factory also entered the estuary around the time of the Second World War. Conditions in the estuary have not improved in recent years: flow has increased dramatically, with treated effluent entering the estuary or its source rivers from six waste water treatment plants. This increased flow has resulted in the mouth being permanently open (were it to close, breaching would be necessary to prevent flooding of the Macassar wastewater treatment works which are situated on the estuary floodplain). The flow changes largely preclude saltwater penetration which, combined with high pollutant levels, have lead to the loss of most estuarine biota. The estuarine sediments have become anoxic and industrial effluent (particularly heavy metals) entering the sea via the estuary is detrimental to the near-shore marine environment.

The Lourens River estuary enters False Bay on the western outskirts of Strand. It is a small, temporarily open system that forms a saline lagoon during the summer months. Over the period 1948-1978, pollution from the Strand sewage works, AECI, Somchem and Triomph chemical factories and the Gants food factory as well as buildings and excavations impacted negatively on the estuary. The Lourens River has also been altered by channelization and flood-control engineering works, water extraction and alien vegetation encroachment. The closure of the wastewater treatment works (1978) and the AECI chemical factory (1990) in addition to improved management of the Lourens River has improved the ecological condition of the Lourens estuary in recent years, and in 1997 the entire river was declared a Protected Natural Environment. Due to many years of limited public access to the estuary, it functions as a protected roosting site for many seabirds, such as gulls, terns and cormorants, and also constitutes an important estuarine nursery area for marine fish species.

c) Sub-tidal Reefs

There are sub-tidal reefs present offshore of the 5 kilometre stretch of beach known as The Strand. These reefs are known to be home to fish species such as Roman (*Chrysoblephus laticeps)*, Red Stumpnose (*Chrysoblephus gibbiceps)*, Galjoen (*Dichistius capensis)* and Red Steenbras (*Petrus rupestris)*.

2.3 Key Marine fauna found in the Helderberg MPA

The Helderberg MPA is subjected to frequent summer upwelling events, during which water temperatures may drop to 11° C in summer. Although this area is considered part of the warm temperate Agulhas bioregion, it forms a transition between the warm and cool temperate regions. The habitat includes predominantly sandy beaches and low profile sandstone reefs.

Meiofauna are by far the most abundant of the fauna found on sandy beaches, as their small size allows them to live between sand grains. Typical meiofauna include nematodes, copepods and ostracods. Meiofauna play an important role in breaking down organic matter that is then colonised by bacteria. They are also commonly used to monitor pollution on sandy beaches owing to their sensitivity to pollution and other forms of disturbance.

Life in the intertidal zone includes sand mussels, Mole and Ghost crabs, Plough snails, sandhoppers and the presence of Kelp gulls, African Black Oystercatchers, White-fronted Plovers and Sanderlings. Offshore, zooplankton including small shrimps and prawns, as well as a variety of fish, are found.

Before the proclamation of the area as an MPA, linefishing from boats targeted geelbek (*Atractoscion aequidens)*, carpenter (*Argyrozona argyrozona)*, roman (*Chrysoblephus laticeps)*, dageraad (*Chrysoblephus gibbiceps)*, seventy four (*Polysteganus undulosus)*, snoek (*Thysites atun)*, hottentot (*Pachymetopon blochii)*, silver kob (*Argyrosomus inodorus*), yellowtail (*Seriola lalandii)*, and chub mackerel (*Scomber japonicus)* between 1897 and 1906. The catch rates of these- except hottentot, snoek and yellowtail- decreased substantially (between 70 and 100% declines) by 1987, indicating a massive loss of predators on the reef and in the pelagic zone. Those species that increased were either small and less valuable (hottentot), or nomadic (snoek and yellowtail). The decline in chub mackerel may represent an environmental shift. The present (2009) state of fish stocks in the MPA is uncertain owing to the lack of a monitoring programme. Catches in the region, however, are depressed.

Overfishing was not limited to offshore species. There is considerable evidence of a decline in surfzone fish, including galjoen (*Dichistius capensis)*, silver kob, blacktail (*Diplodus sargus),* and white steenbras (*Lithognathus lithognathus)*. In the case of the latter, environmental degradation of the relevant nursing grounds (estuaries) is likely to have contributed significantly to the decline. The catch rates recorded in the present period are a mere fraction of earlier records, a situation that is mirrored throughout the region. Coastal fish have not been protected in the present MPA, which has prevented a recovery. Other MPAs which have stopped shore angling have seen recoveries in coastal fish.

Present-day fishing still targets these species, but shore angling has expanded to include a number of elasmobranch species which are targeted by sport anglers. These include the spotted sevengill shark (*Notorynchus cepedianus)*, smoothhound shark (*Mustelus mustelus)* and the spotted gulley shark (*Triakis megalopterus)*. Sharks caught by anglers are generally returned to the water, but one can expect some mortality with these catch-and-release fisheries.

The African Black Oystercatcher (*Haematopus moquini)* was listed as near threatened in 2006. It feeds predominantly on inter-tidal mollusks and nests on the ground in the coastal zone, where disturbance by humans and domesticated animals has threatened this species. The area is also an important nesting ground for migrating common and sandwich terns, which spend four months of each year within the Helderberg MPA.

2.4 Human Settlements

The suburb of Strand, with a population of 116 000, is situated on the shores of False Bay at the foot of the Hottentots Holland Mountains, approximately 40 minutes' drive from Cape Town. It consists of two bays, Melkbaai and Mostertsbaai, and forms part of the Helderberg Basin, along with Somerset West and Gordon's Bay. Its main attraction is "the strand" - 5 kilometres of white sandy beach. Beach Road runs along the Strand coastline for several kilometres, allowing easy access to the coastline at a number of places. The inland side of the road is lined with restaurants, shops and residential complexes.

2.5 History and Archaeological sites

Strand was founded in 1714, at which time it served purely as a fishing area to coloured and Malay fishers who settled in the area. In the 1830s, its popularity as a holiday destination began to increase, and the small village was named Van Ryneveldsdorp after a man who built his holiday home there. As its popularity grew, the name was changed to Somerset West Strand, becoming known over time as 'Strand'. The area now known as the Helderberg MPA first belonged to De Beers Consolidated Mines, owned at the time by Cecil John Rhodes. It was granted to the company in 1900 for the purpose of building a factory to supply De Beers mines with dynamite.

The land known as Vergelegen is regarded a historical landmark, and has been excavated for evidence of slave-life in the Cape during the eighteenth century. The property was acquired illegally at the end of the seventeenth century by Governor Willem Adriaan van der Stel, who used slaves of the Dutch East India Company to build his estate. When this abuse of power came to the attention of the Dutch East India Company in the Netherlands, van der Stel lost his position as governor, and the Company ordered the destruction of Vergelegen as a warning to future governors. Archaeologists believe that this destruction was never completed, and that the original Vergelegen foundations still remain beneath the current building.

Hendon Park, Gordon's Bay, contains one of the last remnants of shell middens along the False Bay Coast. Gordon's Bay midden is situated on the remnant of what was the highest of a series of dunes which until the 1920s was covered in dense vegetation. The remains of a possible fish trap is visible at low tide. The shell midden was formed as a result of two occupation episodes, which are separated from eachother by a sterile layer of windblown sand. The shellfish remains and fish bones contained within the midden provide a good indication of species of marine animals which were present in the past. These can be used, not only to recreate the diet of the indigenous people who lived here, but also to recreate the environmental conditions and health of the marine environment at the time of the accumulation of the midden.

Boundaries and zoning

The entire Helderberg MPA is classified as a “no-take” zone. The boundaries of the Helderberg MPA are indicated in figure 1 above:

4. Regulations

Section 43, subsection 2, of the MLRA states that-

“(2) No person shall in any marine protected area, without permission in terms of subsection (3):

a) fish or attempt to fish;
b) take or destroy any fauna and flora other than fish;
c) dredge, extract sand or gravel, discharge or deposit waste or any other polluting matter, or in any way disturb, alter or destroy the natural environment;
d) construct or erect any building or other structure on or over any land or water within such a marine protected area; or
e) carry on any activity which may adversely impact on the ecosystems of that area.”

SECTION B: MANAGEMENT OF THE MPA, ITS USER GROUPS AND KEY SPECIES FOUND THEREIN

1. Strategic Plan

The CCT Strategic Plan should be read in conjunction with this Management Plan. The Strategic Plan sets out key actions, roles and responsibilities of the CCT and MCM. The key performance areas described in this Management Plan are considered critical for management interventions in order to ensure that the Helderberg MPA meets its objectives. It should be noted that the Helderberg MPA as it currently exists is not proclaimed in such a manner that can ensure its objectives. A key performance area will therefore be to support a new set of regulations and a new zoning plan for the MPA.

2. Key Performance Areas

2.1 Overview

Many living marine resources have been depleted over the last century, including many line-fish species and abalone. Steps need to be taken to allow such populations to recover sufficiently to enable them to provide rich yields into the future. The Helderberg MPA must seek to address this as far as possible. Furthermore, whilst all South Africans can expect access to marine resources, such access must be controlled in a fair manner to ensure that no person or group compromises the opportunities of any other, whether present or future generation. The termination of illegal harvesting (poaching) in this respect is a priority.

The Helderberg MPA must be managed in such a manner as to maximise opportunities for tourism, whilst minimising the impact thereof on marine and coastal resources.

Furthermore, it must be recognised that the future of our natural coastal assets rests with the South African people. It is therefore essential to educate people about the wealth of resources in the coastal area, and raise their awareness about the human activities that threaten them. From an early age, people need to be taught to respect the environment upon which they depend.

2.2 Management of Key species within the Helderberg MPA

Species of interest	Reason	Conservation action
African Black Oyster catcher	Near threatened, red data listed	No MPA specific regulation. Nesting sites may require protection from dogs, pedestrians.
Bank cormorant	Red data listing	Nesting site at Stony Point protected from visitors and mammalian predators. Purse-seining not allowed in MPA

Cape Cormorant	Endangered	Nesting sites at Stony Point protected from visitors and mammalian predators. Purse seine not allowed in the MPA
Reef fish: roman, red stumpnose, galjoen, red steenbras	Heavily depleted	MPA excludes fishing
White steenbras	Heavily depleted (Threatened, according to IUCN listing)	MPA excludes fishing
Silver kob	Heavily depleted	MPA excludes fishing
Belman	Heavily depleted	MPA excludes fishing
Abalone	Heavily depleted, CITES listed	Fishery has been closed, diving banned in MPA, regular monitoring
Rock lobster	Keystone predator	Protected in MPA
Sea urchin (Parechinus)	Shelters juvenile abalone	No action required – not harvested

2.3 Demarcation of Boundaries and Signage of the Helderberg MPA

- The Naval Hydrographic Office located in Simon's Town must be notified of the boundaries and zones pertaining to the Helderberg MPA to include the required information in the updated SAN Charts.
- The boundaries will be demarcated using beacons with sector lights attached to them. These will be placed on the shore boundaries so that they are clearly visible both from the land and- within reason- the sea. As far as possible an additional beacon should be placed on the shore immediately above the high water mark at each boundary in such a manner that when they are directly behind one another, the line formed will coincide with the boundary in question.
- As far as possible, all landward access points to the MPA will be signposted in English Afrikaans and Xhosa and will clearly indicate the MPA's boundaries, its coastal and offshore extent, activities permitted/not permitted in the area, a map, and a contact telephone number for reporting of incidents.
- All signage will comply with both DEAT and CCT policy guidelines as far as possible.

2.4 Management of Fishing Activities

There are various types of MPA which offer varying degrees of protection to marine living resources, and which therefore determine how fishing activities taking place within them should be managed. The Helderberg MPA is a no-take zone, which means that no fishing whatsoever (commercial, recreational or small-scale) is permitted. Marine living resources may only be extracted from the area for scientific purposes, and only with a permit.

a) Commercial

- All commercial fishing is prohibited within the Helderberg MPA
- All fishing gear on vessels that are in, or enter the MPA for the purposes of passage, must be stowed

b) Recreational Fishing

- All recreational fishing from a boat is prohibited in the MPA
- All fishing gear on vessels that are in, or enter the MPA for the purposes of passage, must be stowed
- Collection of bait or any invertebrate species is prohibited throughout the MPA
- Additional zoning may be implemented to mange different user groups in order to avoid conflict and to protect environmental integrity.
- No fishing is allowed between the mouth of the Eerste River and the mouth of the Lourens River in False Bay, extending 500m seawards from the high-water mark.
- Compliance with regulations will be encouraged through education and awareness programmes

c) Spearfishing

- All spearfishing is prohibited within the Helderberg MPA
- All spearfishing gear on vessels that are in, or enter the MPA for the purposes of passage, must be stowed

d) Invertebrate and Bait Collection

- All invertebrate and bait collection is prohibited within the Helderberg MPA

e) Aquarium Collection

- Collection of any marine species for the purposes of aquarium usage may only take place under the authority of a valid permit issued under section 13 of the MLRA
- Where such collection does take place, a valid permit must be presented to the Fisheries Control, or other Authorised Officer, at his/her request
- The permit should specify the species as well as the amounts permitted for extraction

f) Fishing Charter Programmes

- No Fishing Charter boats are allowed within the MPA

g) Extractive use in the MPA

- The only exception for the extraction of marine living resources in the MPA would be granted for the purpose of scientific research, in terms of section 81 of the MLRA, which states that:

    1) If in the opinion of the Minister there are sound reasons for doing so, he or she may, subject to the conditions that he or she may determine, in writing exempt any person or group of persons or organs of state from a provision of this act.

- These applications are subject to stringent assessment and permits are only issued when appropriate

2.5 Boat Launch Site Management

Currently, there is no boat launching site within the Helderberg MPA. In case of future provision of launching sites or jetties, two sets of legislation are applicable:

- The Regulations for the Control of Vehicles in the Coastal Zone (Government Notice 1399 of 2001 amended in GN No.1426 of 2004) in terms of the National Environmental Management Act 1998
- Regulate all activities within the 100m Coastal Protection Zone in accordance with the Integrated Coastal Management Act 24 of 2008 (Chapter 2, Part 2).
- Regulate activities within 100m of high water mark in accordance with NEMA EIA Regulations, 2013

The following should also be taken into account in the event a boat launch site is considered for the MPA:

- Compliance with all relevant legislation
- Preference should be given to a beach launch site as op[posed to the installation of hard infrastructure i.e. a physical slipway
- Consideration of necessary studies
- Sites must be clearly signposted
- Sites are to be controlled and managed by the CCT

2.6 Anchoring within the Helderberg MPA

At present, all users may anchor within the MPA. This activity should be monitored to ascertain the potential impacts thereof and, if impacts are noted, appropriate management actions must be considered for implementation.

2.7 User and Vessel Safety Requirements

- The category of vessels applicable to the Helderberg MPA and discussed herein include categories B to E (category A is not valid within the scope of this Management Plan)
- Category B refers to vessels operating more than 15 but not more than 40 nautical miles from shore (this category will only be applicable from the Helderberg Harbour and will be managed by MCM. Catch records and launch site registers will however be recorded and monitored for the Helderberg MPA purposes
- Category C refers to vessels operating more than 5 but not more than 15 nautical miles from shore

- Category D refers to vessels operating more than 1 but not more than 5 nautical miles from shore
- Category E refers to vessels operating not more than 1 nautical mile from shore
- Most of the requirements are clearly discussed in documentation compiled by the South African Maritime Safety Authority (SAMSA) and the following documentation is attached as appendices under Appendix 7:
  - Merchant Shipping (National Small Vessel Safety) Regulations, 2007, as amended
  - Marine Notice No. 22 of 2008
  - Small vessel safety pamphlets
  - Safety requirements for Categories B, C, D, and E vessels for preparation of safety surveys

- Any queries relating to user and vessel safety should be sent to the SAMSA e-mail address: info@samsa.org.za
- SAMSA requirements must be managed within the context of the Helderberg MPA and Control Officers will need to regularly monitor vessels to ensure these requirements are met. This activity should be built into weekly patrols
- Safety equipment required for small boats includes:
  - Sufficient fuel for the intended voyage (+25% extra)
  - A life jacket for each person
  - Distress flares (stored in a waterproof container)
  - For signaling: a mirror, a waterproof torch, spare batteries, a spare bulb and a sound device
  - Compass
  - Bailing device
  - Paddles or oars
  - Grab-line
  - Anchors and ropes
  - Knife
  - Survival blanket for each person
  - Identification sheet of highly visible material – for identification from the air
  - First aid kit (including bandages, plaster, antiseptic ointment, seasickness pills, sunburn lotion)
  - Fresh water
  - Tool kit suitable for the boat
  - Air-bellows for inflatable boats
  - Radio (in larger boats)
- CCT staff managing the Helderberg MPA should undergo St. Johns first aid course

2.8 Other Tourist Activities

a) Existing Tourist Activities

At present the MPA is open to all types of tourist activities, which may occur without a permit. The following tourist activities are known to occur in the MPA:

- Various land based tourist activities that involve the MPA, including watching marine mammals and birds that frequent the MPA
- Surfing and Kite-surfing

- Swimming and bathing
- Traditional and cultural uses (for baptism and sea-water extraction/drinking)
- Day hikers on the coastal zone
- Activities associated with vessels such as speed and power boating

The management of tourist activities will include determining and mitigating the potential impacts on the values of the MPA as well as avoiding user conflict. Management actions include:

- Monitoring the different user groups to determine when and where conflicts arise
- Determine the reason for the conflict
- Intervene immediately where appropriate or submit the conflict for discussion at the next Helderberg Marine Working Group meeting for resolution
- Identify well-elevated points above high-use and environmentally sensitive areas for the purpose of fixed point photography. Time intervals between photographs should be determined (recommended interval is no more than six months) during and post high season. Records of these photographs are to be kept and problematic changes such as erosion must be discussed, and solutions sought, at Helderberg Marine Working Group meetings.
- Monitoring of the MPA will be integrated with the City's Coastal Monitoring Programme

Other activities

- In accordance with Municipal by-laws, no dogs are permitted within the coastal zone of the Helderberg MPA due to the potential impact on birds. Appropriate signage informing the public of this must be available at landward coastal zone entry points. Actions 5.3.2 (a) and 5.3.2 (b).
- The lighting of fires in the MPA may only take place at designated places where the appropriate facilities occur.

b) Potential Tourism Activities

There is potential within the Helderberg MPA for several other tourist activities. Opportunities to encourage and support such activities, for the socio-economic benefit of the community and to increase the financial sustainability of the Helderberg MPA, should be considered. Potential activities include:

- Scenic tours
- Marine animal watching
- Non-motorised water sports

Where tourist activities are visibly impacting on the integrity of the Helderberg MPA, the carrying capacity of the MPA for such activities must be determined and, if necessary, the number of operators, times, days and locations of activities must be limited. If necessary, zones will be created for resource protection or to separate user groups. This strategy is essential to ensure that natural resources are protected, user conflicts are reduced, and safety for all user groups is ensured.

c) Public Events

- Public events taking place within the Helderberg MPA which could potentially have a negative impact on the environment should be discussed by the Helderberg Marine Working Group to determine the conditions under which the event must occur.

- Monitoring of the proposed site for the event should include the taking of a photograph of the site from an elevated point prior to the event, during setting up of the event (where appropriate) or during the event itself (to determine visitor numbers and distribution within the site under discussion), as well as after the event to determine changes in the environment.
- Where negative impacts are determined, appropriate action must be either immediately taken, or discussed at the following Helderberg Marine Working Group meeting and the solution implemented where appropriate.
- In the case of annual events, the Helderberg Marine Working Group must take into account any negative impacts which an event had before deciding if it should proceed the following year.

2.9 Emergency Events

- The occurrence of floods is often associated with flotsam, which poses a danger to users within the Helderberg MPA.
- The Management Authority, where possible with the assistance of volunteers, must traverse the Helderberg MPA as soon as possible after the flooding has occurred to identify any dangerous flotsam or environmental degradation.
- Dangerous flotsam identified should be removed if possible. Alternatively, warnings should be posted informing users of the Helderberg MPA of the nature and location of the danger.
- A portion of the Helderberg MPA budget should be allocated to the costs associated with such communication of warnings.

2.10 Appropriate Boating and Sailing Organisations and Clubs

- Interaction with such associations and organisations may be required to ensure improved awareness and/or compliance of certain members into the future.
- Partnerships with these organisations/associations is encouraged
- The Association names and headquarters details are available for such interaction below:
  - South African Sailing: P.O. Box 519, Paarden Eiland, 7420. Tel: 021-5110929 Fax: 021-511 0965. E-mail: mail@sailing.org.za
  - South African Jetsport Boating Association: Tel: 011-425 3499
  - South African Inflatable Boat Association: Tel: 012-914 7737. E-mail: hanliflack@worldonline.co.za
  - South African Power Boat Association: Tel: 011-425 3499. E-mail: powerboat@mweb.co.za
  - South African Water Ski Federation: P.O. Box 7896, Centurion, 0046. Tel: 011-634 0430. Fax: 011-634 0500

SECTION C: MANAGEMENT OF INFRASTRUCTURE AND EQUIPMENT

1. Equipment required for the management of the Helderberg MPA

CURRENT EQUIPMENT			
Item	Unit	Priority	Partnership/funder
Honda XR 250 Tornado Motorcycle	1	High	City of Cape Town
Binoculars	1	High	City of Cape Town
Trunking Radio	1	High	City of Cape Town
Laptop	1	High	City of Cape Town

REQUIRED EQUIPMENT			
Item	Unit	Priority	Partnership/funder
4x4 pickup	1	High	City of Cape Town
Nets	1 x 50m	High	City of Cape Town
Measuring equipment (rulers, measuring tape/ measure board)		High	City of Cape Town
Underwater Temperature Recorder (UTR)	1	High	City of Cape Town
Weather station	1	High	City of Cape Town
Fish tag kit from Ori		High	City of Cape Town
Small 3.2m Semi-rigid boat and small 15hp motor. (This is for monitoring purposes.)	1	High	City of Cape Town
Fishing equipment (rods, reels, line, hooks, sinkers and bait)		High	City of Cape Town
Jet ski (Law enforcement)	1	Medium	City of Cape Town
Scuba diving equipment		Medium	City of Cape Town
Cell Phone	1	High	City of Cape Town

2. Machinery safety and marking requirements in terms of SAMSA

- Fire extinguishers must be serviced annually by an approved fire appliance servicing agent
- All equipment belonging to a vessel must be permanently marked with the vessel's name or approved marking
- The trailer bearing a vessel must be marked in a conspicuous position with the vessel's name or approved marking, and with the management authority's name and telephone number

3. Use of Equipment

a) Capacity Requirements

- All staff to be handling management equipment must obtain the correct training and experience necessary
- A skipper's licence must be obtained by the Helderberg MPA Manager
- Boat crew should undertake the necessary health and safety training for launching and marine vessel use. All staff must undergo a first aid course, including CPR, and must be proficient in the use of the first aid kit

b) Equipment register

- A register must be available for each piece of equipment so that when required for use, the staff member utilising the equipment can sign it out and back in.
- The register should include a table with the item in question, a column for the name of the staff member utilising the equipment, date and time it was taken for use, date and time it was returned and a column for comments where the staff member must state the condition of the piece of equipment upon its return. This should preferably be done in the presence of another staff member such as a supervisor to ensure that the comments are correct.
- In the case of motorised transport (the vehicle or boat), the register must include kilometres travelled, estimated fuel used and odometer reading (in the case of the vehicle). The supervisor should check the motorised transport register frequently to determine service requirements of the equipment as per the manufacturer's servicing requirements (e.g. new diesel vehicle requires a service between every 10 000-20 000kms).
- Fine books should be ordered in advance so that there is always stock available.

c) Equipment Maintenance and Insurance

- All equipment must be maintained in accordance with its manufacturer's servicing requirements
- Tyres of motorised and trailer transport should be checked for legal standards at each service or annually (at minimum for new tyres and at least quarterly for older tyres)
- A budget must be made available for costs associated with maintenance of equipment (amount determined by costs of servicing etc)
- An insurance budget should be provided and all equipment insured
- Maintenance to the outboard engine must take place before it is used if it has been standing for some time:
    - Put in a fresh water tank. Do not use the flushing device as the engine will not reach running temperature and the thermostat will not open.
    - Remove the air filters; run the engine until it warms up. Check the water is flowing strongly. Remove the fuel line without switching off.
    - Spray 'storage seal' into the carburettors until the engine runs out of the fuel in the carburettors and stops. Ensure each one received a good quantity. Switch off the ignition.
    - Make sure the carburettors have no fuel left. Undo the drain screws to allow drainage.
    - Replace air filters and fuel line etc and tighten.
    - Spray the engine with a mixture of paraffin and light machine oil. Assemble the spray cover. Wash the outer surface of the engine with fresh water.
    - Grease all linkages with marine grease, including the steering linkages.
    - Remove the propeller, check and clean, and grease the splines.
- After use of the vessel and engine:

- Rinse the vessel, trailer and engine with fresh water. Take care to not pollute the surrounding environment.
- Let freshwater circulate inside the engine until the engine is well flushed.

4. Maintenance of Infrastructure

- Signage should be checked on each patrol for wear and tear, as well as for graffiti or other damage
- A budget line must be created to restore, replace or upgrade signage as and when required

SECTION D: COMPLIANCE

1. Background

Poaching in the MPA happens mostly in the areas around the Eerste and Lourens Estuaries. It takes place in the form of illegal bait collection, cast netting, illegal fishing and gill netting. The main targeted species are Sand prawn (*Callianassa kraussi*), Blood worm (*Arenicola loveni*), Kob (*Argyrosomus spp*.), White Steenbras (*Lithognathus lithognathus*), Garric (Lichia amia) and Southern Mullet (*Liza richardsonii*).

2. Objectives

The compliance objective for the Helderberg Marine Protected Area is to achieve resource protection through compliance with the declaration as an MPA and the related Regulations, and other applicable laws. The Compliance Plan is intended to contribute towards resource protection, facilitate fishery management, and reduce user conflict arising from competing uses in the MPA. It is intended to complement other elements of the Management Plan and lead to an increased level of success. High-profile, visible enforcement will require proper funding, supervision, staffing, and equipment.

3. Compliance Methodologies

Compliance can be achieved through a range of methods and is best achieved through the use of many tools and methods, including:

- Through community involvement and education
- Traditional enforcement operations, including patrols, apprehension of offenders, confiscation of equipment and convictions for offences
- Signage used to advise the community of the MPA and which activities may or may not occur in the area
- Field rangers encountering members of the public to advise the public of the regulations pertaining to the MPA before an offence is committed
- Distribution of materials such as the DEAT brochure “Recreational Fishing Information Brochure December 2008” (and later editions)
- Planned poaching syndicates and commercial enterprises knowingly commit offences for financial gain. When these culprits are apprehended (if at all possible and with good evidence), admission of guilt fines should not be accepted and rather charges laid

4. Community Involvement

- CCT to encourage user groups and all members of the public to report offences of MPA regulations through an incident reporting system.
- CCT to encourage honourary ranger involvement.

5. Voluntary Compliance Through Education

The Awareness Plan (Section F) includes elements designed to help the public understand the conservation significance of marine protected areas and why it is important to comply with the MPA regulations. This promotes voluntary compliance by the public through education and awareness programmes. This section should therefore be read in conjunction with Section F.

6. Enforcement Operations

a) Patrol Schedules

- At present there is only 1 MPA manager and one part-time field ranger. This could impact directly on the capacity to enforce regulations
- Co-ordination of volunteers and enforcement officers is necessary to maximise the efficiency of each support group
- Enforcement/compliance priorities must be determined for each week
- Compliance requires vessel patrols, diver patrols, inspections at the launch site and shore patrols as far as possible; however, within the current constraints, vessel and vehicle patrols will predominantly be required
- Patrols must be conducted with logbooks daily with night patrols taking place as needed
- Random patrols should be implemented
- Mountain stake-outs should be conducted if and when necessary
- Patrols conducted on foot must include the beaches
- Vehicle patrols must be conducted on town and management roads to cover larger areas quickly (motorcycle or quad bike and 4x4 vehicle)
- Regular vessel patrols must be conducted. The MCM vessels, “Victoria Mxenge”, “Ruth First” and “Lilian Ngoyi” conduct roving patrols along the coastline and these can be accessed for compliance in certain situations.
- Establish working relationships with the police and MCM Inspectorate
- Weekends, public and school holidays are heavy utilisation periods and extra patrols should be conducted
- All aspects of the MLRA and Helderberg MPA regulations are to be enforced during patrols
- A short report (which will provide necessary information for the compiling of the Quarterly reports) should be completed after patrols which must include information such as:
  - Number of persons encountered and interacted with, and in what manner
  - Number of persons contravening the law and actions taken
  - Distance, duration and route travelled
  - Any changes or impacts relative to environmental degradation noted and at what location (preferably GPS reading to be taken at site of degradation)
  - Whether any materials/brochures were distributed, if so which ones, how many, and to what type of visitor (i.e. tourist, fisher, etc)
- Arrange prosecutor’s day (once every two years) to inform the public of procedures, laws, consequences.
- Establish a reliable procedure to establish position at sea, from a boat (GPS) and from the shore (triangulation with sighting compass and GPS).
- Disseminate regulatory information on site and in shops
- General approach: high profile, preventative enforcement

b) Other Enforcement Operations:

- On occasion, it may be necessary to carry out “high impact operations” to ensure high law enforcement visibility and presence
- Additional staff from the nearest CCT office and local police should be utilised during such operations

c) Database of Offenses and Offenders:

- In order to maintain efficient compliance it will be a necessity to develop and maintain a photographic database of the commercial and recreational fishing boats so as to try and assist with identification of vessels fishing illegally within the MPA.
- A database of all illegal activities and suspicious vessels/vehicles/persons must be kept up to date at all times and reviewed on a quarterly basis.
- An electronic database must be maintained by CCT to ensure easy access to compliance information (e.g. repeat offenders) and for easy forwarding to the necessary partners.
- A photo-ID of suspects and offenders must be kept.
- For successful enforcement to take place it is imperative to liaise and work with other law enforcement agencies and the judicial system. Prosecutors should also be informed about the MPA.
- Regular training exercises and meetings should be held with all parties.

d) Compliance and Legal Proceedings

- In serious cases, confiscation of equipment and poached marine organisms, and possibly arrest, will take place. In most cases, confiscated organisms should be returned to the intertidal zone after being photographed or registered and counted at the relevant South African Police Services station.
- All admission of guilt fines and court appearance cases must be registered at the Strand Police station
- Legal proceedings as per the MLRA must be adhered to, in order to ensure positive convictions and fines
- GPS positioning and photographs of the site, offender and exploited resource
- Accurate reports/dockets must be compiled with all evidence well marked, recorded and stored as appropriate
- Dockets must be submitted to the court with evidence
- Court proceedings follow
- If positive conviction: ensure that the fine relates to the MLRA and that such income returns to the Marine Living Resources Fund as stipulated in the Act

SECTION E: CAPACITY

1. Staff

In June 2009, the City and DEA entered into a management agreement for the Helderberg MPA. This agreement provides for the following:

- Annual financial payment from DEA to the City to cover the costs associated with managing the Helderberg MPA
- The development of an agreed annual operating budget for the MPA
- The development of an agreed MPA Management Plan
- The appointment by the City of an MPA Manager

This agreement remains in place and is renewable annually by agreement by both parties. On completion of the agreement the City appointed Mr Jaco Uys, a member of the Helderberg District Biodiversity Branch as the MPA Manager as part of his broader function within the Helderberg District biodiversity and conservation objectives. The City has successfully managed the Helderberg MPA within the framework of the agreement since 29th June 2009 and continues in that management role.

2. Skill Requirements

- An MPA Manager must have at least a degree in Nature Conservation or Oceanography and additional qualifications in MPA management would be advisable. A certificate in MPA Management should be achieved within the first year in order to manage the MPA and staff effectively.
- Additional staff required to patrol/manage the MPA and conduct monitoring programmes are Field Rangers who have passed a recognised Field Ranger course (THETA-approved National Certificate in Natural Resource Guardianship). Field Rangers must also undertake environmental education and capacity building skills as they would run environmental education programmes during quiet periods. MPA Field Rangers must have at least a Grade 12 pass with a Code 08 vehicle licence or a Code 02 motorbike licence.
- Peace Officers Certification, Fisheries Inspectorate and first aid are vital for all staff members.
- It is highly advised that all Staff must be qualified in further specialist courses such as Personnel Management Courses (pending budget allocations and prioritisation through management), but also including:
    - Marine & MPA Legislation
    - Skippers license and boat maintenance
    - Visitor control and compliance
    - Marine Education
    - Investigating Crime Scenes and Docket Handling
    - Court Procedures
    - Commercial Diving Ticket
- Staff must attend various workshops and short courses as required for the station.

- Staff, both permanent and voluntary, must be suitably trained to execute their functions in terms of awareness-raising and education. They would require a complete knowledge of the Helderberg MPA environment and management issues.
- Records should be kept of all courses attended.
- Personnel should be given opportunities to practice new skills attained.
- Personnel should be monitored in terms of improved efficiency following the course.
- A budget line must be made available for capacity building in order to achieve the requirements listed above.

3. Equipment Requirements

- This is discussed in detail under Section C.

SECTION F: AWARENESS

1. Background

The City of Cape Town and DEAT Marine and Coastal Management recognise that their proficiency as managers of South Africa's marine resources depends on their ability to inspire public support and participation through awareness. The focus of this awareness plan is to promote an understanding of the importance of healthy ocean ecosystems, the importance of MPAs and the role that the community can play in their care.

Marine protected area management is emerging as a national priority due to undesirable impacts on marine ecosystems. An important management tool to protect marine resources will be to implement an awareness programme that improves understanding of the Helderberg MPA within its surrounding communities and amongst visitors.

2. Objectives

- Protection of the marine biodiversity of the Helderberg MPA and the surrounding areas through achieving market and public awareness of the Helderberg MPA and the values, services and products it provides.
- Provide information on the benefits/importance of the Helderberg MPA to all user groups and visitors through a range of communication strategies.

3. Awareness Methodologies

- Appropriate signage at key predetermined sites that are highly visible and relevant to the user group in question
- Compilation and distribution of information and compliance pamphlets
- Implementation of school programmes
- Radio broadcasting, newspaper and local magazine articles, presentation at events when requested
- Positive interaction with the surrounding boat clubs
- Participation in and driving of local and national events such as Marine Week activities, beach clean ups, diving events to promote the area, fish watch activities etc
- Interpretation and dissemination of Helderberg MPA research outputs for use by the non-research community
- Compilation of appropriate "Codes of Conduct" for the different user groups as required

4. Programme Activities

All staff will be utilised for formal awareness programmes with local children and adults throughout the year, with the exception of the December-January school holidays. Ongoing environmental awareness must be conducted in conjunction with patrols.

a) School Programmes:

To be carried out on the coast or at schools and include:

- Poster competitions; “touch pools”; beach clean-ups and competitions; poster designing; informative video footage
- Children 10 years and older: snorkelling in tidal pools (include safety module)
- Adopt-a-beach programme can be implemented

b) General Visitors addressing all user groups:

- Interpretive boards for tourists (e.g. whale information boards, pamphlets, booklets, flyers
- Promote marine conservation through local, national and international media (internet, newspapers, magazines, TV)
- Interpret and disseminate Helderberg MPA research for information and use by the non-research community
- Promote alternative non-consumptive activities within the Helderberg MPA with different user groups

c) Specific User Groups “Codes of Conduct”

- Guidelines and Codes of Conduct should be developed in consultation with each specific user group, allowing for use in a manner that does not harm the environment
- Periodic evaluations should be undertaken to monitor the effectiveness of these Codes of Conduct
- Changes should be recommended when necessary.

d) Volunteers

- Develop/enhance the Helderberg MPA volunteer training programme
- Prioritise working with previously disadvantaged communities to encourage and support volunteer opportunities
- Develop formal and informal education-based volunteer programmes
- Introduce community-based volunteer research and monitoring programmes such as Fish in Reserves and Oceanographic Research Institute’s (ORI) catch-cards
- Develop recognition and benefits for volunteers (letter of reference, community recognition through media, clothing)

5. Addressing conflict between user groups within the MPA.

Appropriate signage and information on resources must be developed in partnership with the different user groups, in order to reduce user conflicts and ensure protection of the marine environment (e.g. demarcate areas for certain activities).

SECTION G: SCIENTIFIC RESEARCH AND MONITORING

1. Background And Overview

Monitoring the environment and human activities in and around MPAs should be pursued for two reasons. The first is to provide reliable data for the assessment of the effectiveness of the MPA. Monitoring activities undertaken for this purpose will be designed around the specific objectives of the MPA. Typically, indicators are selected to represent key processes or resources. Successful indicators are easily measured.

The second reason is to provide baseline information against which other potentially impacted areas can be assessed, and which can be used to measure long-term changes in the environment. In South Africa, where there are a number of MPAs spread along the coast, the duplication of such monitoring activities can serve as an excellent network to detect shifts that may be associated with climate change and range changes of critical species.

MPA monitoring should be part of the process of adaptive management. Monitoring in isolation is somewhat pointless. It needs to be included in negative feedback process. The results of monitoring need to be evaluated against pre-determined criteria or thresholds. Thresholds are designed to represent boundaries of acceptable variation. When indicators attain or cross threshold values, a set of actions aimed at addressing impacts, or mitigating unavoidable changes, should be triggered. Importantly, the thresholds and the actions need to be established *a priori*, along with the monitoring programme.

Whereas this structure should pertain also to environmental monitoring, the purpose of such monitoring transcends the MPA. In general the results of environmental monitoring are fed into national structures (e.g. working groups convened by SANBI or MCM), and the selection of appropriate thresholds and actions are beyond the scope of this plan. Environmental monitoring in MPAs should adopt indicators that are used at these higher levels. This management plan lists such indicators.

There are some general principles of monitoring in MPAs that should be considered. Experience in South Africa suggests that monitoring in MPAs is seldom maintained for long enough to be useful, and generally monitoring programmes do not out-live the tenure of the official or researcher who instigated the programme. This is a common failing. One of the purposes of listing monitoring programmes in this plan is to ensure their continuity and consistency with respect to methods. It should also be noted that some monitoring programmes are by their nature unsustainable. This relates mostly to costs. It is clear now, for example, that marine science was heavily funded in the 1980's and 1990's, and that research undertaken in the field was not sustained in the early 2000's. The situation may be rectifying itself, and the danger exists that over-investment in monitoring might mean that some programmes cannot be sustained when funding declines again. The termination of monitoring programmes is wasteful. The purpose of this section should be to develop sustainable and useful monitoring. Other factors that influence sustainability include changing ethics (not all methods used now may be acceptable in future), changing technology (new technology may force changes in methods), shifting priorities (what is deemed an important indicator now, may be deemed irrelevant in future), and changes in legislation (for example, changes in diving regulations make it difficult to repeat work done two decades ago).

Another crucial challenge for monitoring programmes is the capture and storage of data. Many monitoring programmes in the past were effectively wasted because of a failure to ensure that the data was recorded or published in a form that was available for evaluation and comparison by later researchers. The advances in information technology is partly the reason for this failure, as the media of recording has changed several times in the last three decades and is likely to continue to change. Fortunately the South African Environmental Observation Network (SAEON) has been established to address this problem, and it is likely that this agency will be the repository or co-repository for much of the data generated by monitoring in the MPA.

Each monitoring project is described in this section (subsections 4 and 5). Those marked with an asterisk would be needed for an expanded MPA but are probably not warranted by the existing designation which covers a relatively small area. The various MPA monitoring projects are described under six sub-headings, the purposes of which are described here.

Indicator: The variable that has been chosen for monitoring is described and explained. Its usefulness as an indicator needs to be understood by MPA staff, but it also needs to be endorsed by those agencies that intend to use the indicator in revising management strategies. The way in which this indicator is to be used will be described where appropriate.

Method: The method used to measure the indicator is described and referenced. Statistical rigour and continuity with other similar projects, past projects and internationally accepted procedures are key considerations, but cost is often the most important determinant.
Frequency: The frequency of monitoring is usually a trade-off between manpower costs and statistical power. Infrequent measurements of ecological and social indicators generally provide data sets in which signals are swamped by noise. This description also includes considerations related to randomness and stratification of sampling- details which could easily limit the power of the data sets.

Responsibility: The lead agent relates to factors such as whether the monitoring is required for the evaluation of the MPA or for broader objectives, whether the MPA staff are trained or equipped to undertake the work, and whether there may be a conflict of duties. Responsibility also carries implications for funding sources, access to data and ownership of data.

Threshold values: Where appropriate and possible threshold values are listed. In most cases, these values will be determined in advance by consensus.

Possible actions: This section lists the possible actions that could be taken should thresholds be reached. Actions should be refined once agreement has been reached among managers and within co-management structures and representatives of affected parties, as appropriate.

Data storage: Describes who will store the data, where it will be stored, who will have rights of access to it and the form in which it will be stored.

2. Objectives

- To provide information for management decisions and strategies

- To maintain current understanding of the state of the values of the MPA, and to identify threats at an early stage
- To facilitate scientific research and understanding of the physical, biological and socio-economic systems of the Helderberg MPA

3. Scientific Research

- Researchers wishing to conduct scientific research in the Helderberg MPA are issued exemptions under Section 81 of the MLRA which are issued by MCM.
- CapeNature also requires a research agreement (MoU) with the researcher and a Register of Research Projects
- All applications to undertake scientific research are assessed according to a set of criteria
- CapeNature maintains a database on research programs
- Researchers' credibility should be discussed under the guidance of MCM

The following must be considered when research applications are assessed:

- The permit-holder must submit a report after each field visit
- The permit-holder must submit annual reports and final reports to CapeNature and MCM at the completion of their scientific research programs
- The permit-holder must ensure that all equipment deployed in the MPA is marked with the permit holder's name and their permit number
- The permit-holder must ensure that all equipment is removed at the end of the study and prior to the expiry of the Scientific Research Permit
- The permit-holder must inform the General Manager of their arrival date one month in advance
- The permit-holder must not use rotenone, poisons, or chemicals to catch fish in the MPA
- The permit-holder must ensure that where footage/photographs are collected, CCT has free access to these
- The permit-holder must note that any footage/photographs collected may only be used for financial gain with written permission from MCM/CCT

4. Physical environment

a) Sea Temperature

- **Indicator**: Sea temperature. Temperature of coastal waters is one of the variables most likely to respond to climate change, either through direct heat transfer or from changes in frequency and intensity of upwelling. Temperature in turn sets the physiological limits of many species. Limits are usually set not by average temperature but by minima or maxima, which implies that continuous recording (by implication remote, unmanned) is preferred to manual discrete measurement.
- **Method:** A continuous Underwater Temperature Recorder (UTR) will be installed on the outer wall of the harbour. The calibration of the instrument will be checked every six months, at the end of a series and at the start of a new one.

- **Frequency:** Recovery and downloading should be planned for every six months. A second UTR may need to be held in reserve for replacement, which will reduce the effort required for changing instruments.
- **Responsibility**: The MPA manager will need to coordinate instrument retrieval, change and download. If necessary, divers may need to be contracted to assist.
- **Threshold values:** The indicator will be summarised as an average with maxima and minima. Long-term trends in temperature will also be useful. Data will be analysed by oceanographers.
- **Possible actions:** MPA staff will be unlikely to be able to address the causes of temperature changes, but it will certainly be useful when examining changes in biotic communities.
- **Data storage:** SAEON coastal node, Grahamstown and MCM-EUC. Data will be stored in electronic format. Temperature will be indexed hourly. Data will be available upon request to SAEON.

b) Weather*

- **Indicators**: Air temperature, wind speed and direction. Basic weather patterns influence local coastal conditions, such as sea temperature and stratification. Measurements need to be continuous, and consistent with elsewhere.
- **Method**: An automatic, dial-up weather station will be installed (exact location still to be determined).
- **Frequency:** Continuous recording. Monthly data downloading.
- **Responsibility:** MPA manager / MCM.
- **Threshold values:** The indicators will be summarised as an average with maxima and minima. Long-term temperature trends and the duration of upwelling-inducing winds will be useful statistics. Data will be analysed by oceanographers (MCM).
- **Possible actions:** MPA staff will not be able to address the causes of changes in weather. The information will need to be disseminated to researchers, as well as coastal managers at municipal, provincial and national levels.
- **Data storage:** SAEON coastal node and Grahamstown. Data will be stored in electronic format. Temperature will be indexed hourly. Data will be available upon request to SAEON and MCM.

5. Biophysical Environment

a) Inter-tidal communities

- **Indicators**: Species community structure, keystone species abundance and alien species abundance. Changes in inter-tidal communities may reflect climate change, exploitation, a catastrophic pollution event or the effects of an alien invader. Multi-variant analysis can be used to determine the present community structure, which can serve as a standard. Specific target species include giant periwinkle, red-bait and siffie. Indicators of community change include space-occupies such as barnacles, mussels and limpets. Abundances of these should be monitored.
- **Method**: A 0.5 m^2 quadrant should be used to quantify species abundance at alternate 0.5 m spacing along a randomly selected transect on the rocky shore at selected sites (e.g. Stony Point, Die Been), from the low shore to the high shore. Sessile species (mussels, algae) can be evaluated as percentage cover. Mobile species (e.g. limpets) will need to be counted. All organisms larger than 5 mm will need to be included in counts. The percentage of sand on the shore should be included as % cover.

- **Frequency**: Every full-moon, spring-low tide.
- **Responsibility**: MPA manager.
- **Threshold**: Species abundance thresholds can be obtained from prior records, and published findings. Mostly, community data will serve as benchmarks, which could be useful in identifying the effects of catastrophic pollution such as oil-spills.
- **Possible actions:** Identify causes of significant impacts. If harvesting is the cause, investigate further possible restriction, or evaluate effectiveness of compliance.
- **Data storage:** The MPA manager should store this information. Copies may be lodged with SAEON.

b) Surf-zone fish community*

- **Indicator:** Catch per unit effort and size structure of selected species. The catch per unit effort is an indication of fish abundance. The size structure is an indication of mortality rate. Targeted species that should be monitored include, galjoen, silver kob, white steenbras, belman, blacktail, spotted gulley shark and spotted sevengill shark.
- **Method**: Fishery-independent survey. Anglers will be used to catch and release fish from the shore, using standardised methods. Volunteer anglers can be sourced through the Western Province Shore Angling Association. All fish will be measured and recorded. Fishing will take place under the leadership of an MPA official and under permit from MCM. Fishing will take place inside and outside the restricted areas.
- **Frequency:** Surveys should be done on one day of each month.
- **Responsibility**: MPA manager. The job could also involve university or technikon students.
- **Threshold values:** The restricted area will enjoy the maximum possible protection from harvesting, and the results of a survey here will serve as a benchmark for other areas. Threshold values will need to be determined at a national level (Linefish Working Group), as problems with resident species in restricted areas can only point to general recruitment failures. Data analyses should be facilitated through the Linefish Working Group.
- **Possible actions:** Further restrictions on fishing effort (by way of bag limitation, seasonal closure, area closure, permit reduction).
- **Data storage:** National Marine Linefish System and SAEON.

c) Subtidal reef fish

- **Indicator:** Linefish density per species. The density of linefish species (threatened, keystone and top predator) will provide an indication of the health of the temperate reefs in the offshore restricted area. Key species will include roman, silver kob, dageraad, and hottentot. Migratory and nomadic species such as geelbek, yellowtail and snoek will be less useful indicators.
- **Methods**: Baited traps will be deployed from a small boat. This method has undergone preliminary tests by MCM, but requires further testing. It promises to give a reliable and repeatable indication of fish density, eliminating problems associated with fishing skill (controlled angling), poor visibility and diver influence (underwater visual census).
- **Frequency:** Unknown**.** The programme should begin with a minimum of ten deployments per season.
- **Responsibility**: MPA manager and SAEON

- **Threshold values**: Unknown, due to the exploratory nature of the method. Threshold values will probably be cast in terms of relative trends.
- **Possible actions:** Further restrictions on fishing effort (by way of bag limitation, seasonal closure, permit reduction). The restricted area already enjoys the maximum degree of protection.
- **Data storage**: SAEON

d) Abalone

- **Indicator**: Abalone density and size structure.
- **Methods**: Divers swim along fixed transects and count and measure all abalone. This is known at MCM as the Fishery Independent Abalone Survey (FIAS).
- **Frequency**: Annual survey done along several fixed transects.
- **Responsibility**: MCM and the Abalone Working Group.
- **Threshold values**: Data is analysed by size-structured production models. Trends are used to set regulations. Currently the entire fishery is closed. The data will mostly be used in the first period to detect a possible recovery, the strength of recruitment pulses, and the possibility of further poaching.
- **Possible actions**: The maximum restriction is already implemented. Further action will involve better enforcement. A recovery might indicate possible opening of the resource outside of MPAs.

e) West Coast Rock Lobster

- **Indicator:** West Coast Rock Lobster density and size structure.
- **Methods:** Trap surveys are used as a standardised capture method. The number of lobster per trap is used to compute a relative catch per unit effort index. Each lobster is measured and returned. Surveys will conform to MCM standards.
- **Frequency:** Annual surveys done on pre-selected reefs.
- **Responsibility:** MCM or Reserve Manager.
- **Threshold values:** Long term trends in size structure and density will be compared to previous years and adjacent areas. The stock is managed nationally in a series of zones. The values obtained at the Betty's Bay MPA will influence the management east of Cape Hangklip. The threshold values are interpreted in terms of an age-structure model used by MCM.
- **Possible actions:** The maximum restriction is already implemented. Deliberate culling of rock lobster, if deemed to be an impediment for abalone recruitment, is not advised.

f) Seabirds

- **Indicators:** Number of breeding pairs
- **Method:** Counting.
- **Frequency:** Bi-annual.
- **Responsibility:** MCM.
- **Threshold value:** Three years of successive decline.
- **Possible action:** Conduct research into causes. Additional predator control if necessary.

- **Data storage:** MCM (Dr R. Crawford)

h) Cetaceans

- **Indicators**: Number of individual sightings, and mother-calf pairs (Southern Right whale).
- **Methods**: Aerial counts.
- **Frequency**: Unknown.
- **Responsibility:** South African Museum, University of Pretoria.
- **Threshold values:** Rates of change will be used for management action, which will most likely involve regulation of boating activity and boat-based whale-watching.
- **Possible action:** Regulation of boating activity and boat-based whale-watching.
- **Data storage:** South African Museum, University of Pretoria.

6. The process of review

The process of review needs to be made clear, with threshold values established in advance if possible. In this draft document thresholds are not always available, as they need to be discussed and accepted by managers and other parties. Generally, people's acceptance of thresholds is determined more by the intended actions than by the ecological considerations.

It is advised that MPA managers establish working groups, or use existing working groups, to review the results of monitoring projects. The composition of such groups and frequency of meetings need to be established for each monitoring project.

The following Guidebooks offer managers a process and methodology to evaluate the effectiveness of their MPA for the purposes of adaptive management:

a) Pomeroy, Robert S., Parks, John E. and Watson, Lani M. (2004) How is your MPA doing? A Guidebook of Natural and Social Indicators for Evaluating MPA Management Effectiveness, IUCN, Gland, Switzerland & Cambridge, U.K.

b) Wells, Sue and Mangubhai, Sangeeta. (2004) Assessing Management Effectiveness of Marine Protected Areas: A Workbook for the Western Indian Ocean. IUCN Eastern African Regional Programme, Nairobi, Kenya

SECTION H: FUNDING, RESPONBILITIES, AUDITING AND CONCLUSION

1. Funding and Responsibility

The CCT is the delegated authority to ensure the effective management of the Helderberg MPA. CCT has entered into an agreement with MCM to implement the management activities described herein.

The Management Agency, through the MPA Manager, must ensure that the activities prescribed in the Sections dealing with management of the MPA (sections B-G) are carried out and that competent individuals and/or organisations are contracted to undertake the tasks where appropriate or that the staff component is adequately increased and capacitated. The annual Management Plan and Environmental Audit (described in the next section) will determine if the management activities are being carried out adequately, and if adjustments to the Management Plan need to be made.

The delegated authority, contracted management agency, and where possible or appropriate other relevant parties, should allocate funding for activities as necessary.

A budget to fund the implementation of the Helderberg MPA Management Plan must be compiled and approved before the start of each financial year, in collaboration with the delegated authority and the contracted management agency, which in this case is the MPA Manager and his/her staff.

The contractual agreement between MCM and the Management Authority, CCT, requires that the MPA Manager compile and submit a quarterly report to MCM. The contractual agreement with clear deliverables and the annual work plan must be read in conjunction with this management plan.

In addition, the MPA Manager and CCT are encouraged to raise additional funding, but should keep MCM informed in order to avoid allegations of "double dipping" where the same item is requested/funded from different sources.

2. AUDITING OF MANAGEMENT ACTIVITIES AND EFFECTIVENESS

a) Objectives:

Auditing of the Management Plan should not be confused with monitoring of the MPA in accordance with Section G. The purpose of implementing an audit is to ascertain the relevance and effectiveness of the activities recommended within the framework of this Management Plan, in order to ensure that the environment is being maintained in a satisfactory condition. This is done by:

- ensuring that the accepted Management Plan is adhered to
- ensuring that utilization of resources is within acceptable and determined limits and that conflict resolutions are facilitated
- determining if the condition of the environment is deteriorating or improving under current management regimes by measuring certain parameters and monitoring the changes over time

b) Implementation:

- A programme for annual environmental auditing must be designed and agreed upon with MCM, led by CCT.
- There are a number of current MPA audit tools designed to determine the health and effectiveness of MPAs and develop management strategies accordingly. However, the effectiveness and/or relevance of this document to meeting the principles and objectives of the Helderberg MPA need to be audited and amended as required.
- It is recommended that audit sheets be drawn up to accurately evaluate the effectiveness of this document.
- It is recommended that an independent organisation/agency/individual carry out the audit. The CAPE utilizes simple systems such as the METT system which is supported.
- The audit must be undertaken in intervals as agreed upon between the delegated authority and the contracted management agency, but the recommended interval is every year for the first 3 years and every 5 years thereafter.
- Amendments to improve the document should be made and incorporated where necessary.
- Some guideline/example parameters to consider in the audit include:

    - **Marine and terrestrial vegetation**
        i) Changes in species diversity, composition and abundance
        ii) Degree and rates of change in invasion of alien plant species
        iii) Unnecessary destruction of vegetation
        iv) Rate of success of rehabilitation of areas previously disturbed

    - **Marine resources**
        i) Size and abundance of key species
        ii) Fecundity of large predatory fish as an indicator of a healthy functioning ecosystem

    - **Lourens and Eerste river water quality**
        i) Changes in flow rate
        ii) Changes in chemical composition
        iii) Pollution and pollutants

    - **General**
        i) Condition of vehicles, equipment and signage
        ii) User group awareness of the Helderberg MPA and conduct relative to signage
        iii) Number of fines issued and whether or not these are lessening over time
        iv) Number and rate of successful convictions
        v) Rate and reduction of conflicts between users

3. CONCLUSION: AMENDMENTS AND UPDATING OF THE HELDERBERG MPA MANAGEMENT PLAN

The Helderberg MPA Management Plan must be seen as a dynamic working document and should be revised every 5 years. It is, however, important that changes to the Management Plan and the reasons therefore be documented in order to reflect the history and development of the plan.