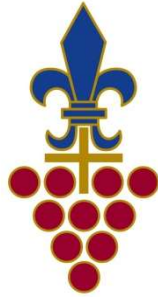


CONSULTATIVE DRAFT



MONT ROCHELLE NATURE RESERVE

ENVIRONMENTAL MANAGEMENT PLAN

February 2021

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PREAMBLE

Mont Rochelle Nature Reserve was proclaimed a *Local Nature Reserve* in 1982 in terms of Provincial Notice 671/1982. It is now governed under the National Environment Management: Protected Areas Act, 57 of 2003, which contains the following set of requirements for management plans.

Section 41 of the above Act states that:

- (1) The object of a management plan is to ensure the protection, conservation and management of the protected area concerned in a manner which is consistent with the objectives of this Act and for the purpose it was declared.
- (2) A management plan must contain at least —
 - (a) the terms and conditions of any applicable biodiversity management plan;
 - (b) a coordinated policy framework;
 - (c) such planning measures, controls and performance criteria as may be prescribed;
 - (d) a programme for the implementation of the plan and its costing;
 - (e) procedures for public participation;
 - (f) where appropriate, the implementation of community-based natural resource management; and
 - (g) a zoning of the area indicating what activities may take place in different sections of the area, and the conservation objectives of those sections.
- (3) A management plan may contain —
 - (a) development of economic opportunities within and adjacent to the protected area in terms of the integrated development plan framework;
 - (b) development of local management capacity and knowledge exchange;
 - (c) financial and other support to ensure effective administration and implementation of the co-management agreement; and
 - (d) any other relevant matters.
- (4) Management plans may include subsidiary plans, and the Minister or MEC may approve the management plan or any subsidiary plan in whole or in part.

Through this Environmental Management Plan the vision, goals and objectives of Stellenbosch Municipality for Mont Rochelle Nature Reserve are given effect in context of the relevant legislation and associated regulations. Accordingly, the primary aims of this Environmental Management Plan include the following:

1. Facilitating the restoration and long-term conservation of Mont Rochelle Nature Reserve in a manner which is consistent with the objectives of the National Environment Management: Protected Areas Act, 57 of 2003.
2. Restoration and long-term protection of the nature reserve as a valuable natural heritage site.
3. Promotion of a conservation ethos in the minds of the people of the area and the general public with the objective to create a shared responsibility to maintain the health, diversity and productivity of Mont Rochelle Nature Reserve in a spirit of stewardship and caring.
4. Implementation of management practices that will benefit current and future generations and will honour applicable obligations and undertakings at all levels of society.

5. Provision of sustainable outdoor recreational opportunities that does not compromise the biodiversity value of Mont Rochelle Nature Reserve.
6. Implementing management practices that benefit current and future generations, and honor Stellenbosch Municipality's obligations and undertakings from local to global levels.
7. Celebrating the diversity, beauty and richness of Mont Rochelle Nature Reserve and seeking an equitable balance of opportunities and benefits in its utilisation.
8. Striving for recognition by all the people of Franschhoek that Mont Rochelle Nature Reserve is 'their' property to enjoy in a spirit of community.

This Environmental Management Plan assigns responsibility for management intervention within Mont Rochelle Nature Reserve, schedules such intervention and quantifies the cost associated with such intervention. In so doing, this document aims to be a mechanism whereby management intervention can be monitored and audited on a yearly basis.

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1. INTRODUCTION

The Mont Rochelle Nature Reserve (hereafter referred to as either the reserve or MRNR) is a declared local authority nature reserve. It forms part of the Cape Winelands Biosphere Reserve (CWBR) which was approved by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and included in the World Network of Biosphere Reserve on 18 September 2007. It is situated within the Cape Floral Kingdom containing remnants of near extinct Renosterveld types.

Stellenbosch Municipality (further referred to as the Municipality) is in the process of making all its declared nature reserves National Environmental Management: Protected Areas Act, 57 of 2003 (NEM:PAA), compliant. In terms of Section 39 of the NEM:PAA a dedicated *Management Authority* is to be established for a protected nature area. The Municipality is to act in this capacity. The NEM:PAA furthermore requires that a *management plan* be prepared and be submitted to the relevant Minister for consideration. The purpose of this plan is to meet the latter requirement.

Through this Environmental Management Plan (EMP), the vision, goals and objectives of the Municipality and all other stakeholders for MRNR are given effect in context of the relevant legislation and associated regulations. Accordingly, the primary aims of the EMP include the following:

- a) Facilitating the restoration and long-term conservation of MRNR in a manner which is consistent with the objectives of the NEM:PAA.
- b) Restoration and long-term protection of the nature reserve as a valuable natural heritage site.
- c) Promotion of a conservation ethos in the minds of the people of the area and the general public with the objective to create a shared responsibility to maintain the health, diversity and productivity of the reserve in a spirit of stewardship and caring.
- d) Implementation of management practices that will benefit current and future generations and will honour applicable obligations and undertakings at all levels of society.
- e) Provision of sustainable outdoor recreational opportunities that does not compromise the biodiversity value of the nature reserve.
- f) Implementing management practices that benefit current and future generations, and honour our obligations and undertakings from local, to global levels.
- g) Celebrating the diversity, beauty and richness of MRNR and seeking an equitable balance of opportunities and benefits in its utilisation.
- h) Striving for recognition by all the people of Franschhoek that MRNR is 'their' property to enjoy in a spirit of community.

2. PURPOSE, GOAL AND VISION

2.1 PURPOSE OF THE PROTECTED AREA

The purpose of a protected area, as described in Section 17 of the NEM:PAA, is to:

- (a) protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes in a system of protected areas;
- (b) preserve the ecological integrity of those areas;
- (c) conserve biodiversity in those areas;
- (d) protect areas representative of all ecosystems, habitats and species naturally occurring in South Africa
- (e) protect South Africa's threatened or rare species;
- (f) protect an area which is vulnerable or ecologically sensitive;
- (g) assist in ensuring the sustained supply of environmental goods and services;
- (h) provide for the sustainable use of natural and biological resources;
- (i) create or augment destinations for nature-based tourism;
- (j) manage the interrelationship between natural environmental biodiversity, occurring in South Africa;
- (k) generally, to contribute to human, social, cultural, spiritual and economic development; or
- (l) rehabilitate and restore degraded ecosystems and promote the recovery of development; or endangered and vulnerable species.

MRNR is located in the Cape Floral Kingdom, an area of global biodiversity significance. The reserve conserves a unique combination of habitats, ecosystems and species. In conserving this unique biodiversity, secondary objectives will include the conservation of the only examples of Swartland Alluvium Fynbos left within the boundaries of Stellenbosch. MRNR also acts as a research, recreational and educational facility for the people of Stellenbosch Municipality.

2.2 OVERARCHING GOAL

The over-arching goal of the MRNR is to contribute towards environmental sustainability and the conservation of biodiversity as a prerequisite for the latter. This EMP builds on the recognition that for biodiversity conservation to succeed, the maintenance of environmental integrity (as defined by ecological, economic and social criteria) must be one of the primary determinants of land-use planning and management.

Sustainability, under present circumstances, cannot be achieved without any form of management intervention and such intervention has to be financed to a significant extent. Accordingly, sustainable development projects or use within the area should ideally contribute towards the required financing of management activities in a spirit of partnership. The CSIR (2002) states that sustainable development should *improve the state of any given situation*. Sustainable development requires a long-term, integrated, systems approach pertaining to economic, environmental and social issues. Fostering a strong sense of community and building partnerships and consensus among key stakeholders are important elements of sustainable development (CSIR, 2002). The International Union for the Conservation of Nature (IUCN) defined sustainable development as '*development that meets the needs of the present generations without compromising the ability of future generations to meet their own needs*'.

The International Institute for Sustainable Development (IISD) (1995) states that sustainable development occurs at the intersection of three global imperatives, namely *human well-being*, *environmental integrity* and *economic efficiency*. The interactive model of sustainability illustrates that sustainable development occurs where the three imperatives interact within an 'interactive zone' (Figure 1). Development outside this 'interactive zone' will not be sustainable. Mebratu (1998).¹ The EMP builds on the following understanding of the three global imperatives:

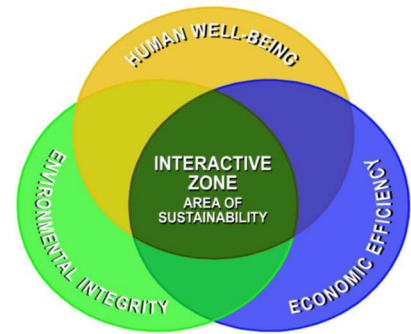


Figure 1: The interactive model of sustainability.

2.2.1 Human Well-Being

Human well-being refers to both *material* and *spiritual* well-being. Material well-being refers to the absence of poverty. Spiritual well-being *inter alia* refers to the absence of inequality and being in a position to obtain new powers, emotionally, intellectually and physically and to be able to play a meaningful role in promoting and achieving sustainable development. It is recognised that MRNR has a significant impact on the well-being of the people of Stellenbosch and surroundings in terms of a number of important aspects.

2.2.2 Environmental Integrity

Environmental integrity refers to the relative '*wholeness*' of the environment. 'Environment' is defined as the aggregate of all external conditions and influences affecting the life of an organism. Environmental integrity is determined by the *value* of the environment or place (natural or human-made), with specific reference to its intrinsic, systemic, and/or instrumental value. The EMP builds on the recognition that the human-made environment is located within and 'contained' by the natural environment. The manner in which human settlements are developed, therefore, has an immense impact on the quality and integrity of the environment as a totality. It is therefore imperative that the human-made environment be planned, designed and developed in a manner that will ensure the maintenance of the values referred to above (i.e. intrinsic, systemic, and/or instrumental value). From a natural environmental perspective, ecological integrity is a key factor in the sustainable development equation. Ecological integrity *inter alia* requires that biodiversity is protected and essential ecological processes and services (e.g. water yield and quality, soil conservation, decomposition, etc.) are maintained. *Environmental health* is the key to sustainable development. The primary threat to environmental health is fragmentation of community-supporting ecosystems. Fragmentation generally leads to a cycle of environmental degradation, which subsequently influences the well-being of the dependent communities.

2.2.3 Economic Efficiency

Economic efficiency is understood as *the optimisation of benefit at the lowest cost*. It includes the innovative and efficient use of available resources. MRNR is an important public resource that has to be managed for the benefit of all concerned and in terms of best-practice management strategies in order to ensure efficiency.

¹ Mebratu, D. 1998: Sustainability and sustainable development: Historical and conceptual overview. *Environmental Impact Assessment and Review*, 18:493-520.

2.3 GUIDING PRINCIPLES

It is important that the following principles guide management of MRNR:

- i. Precautionary principle: The precautionary principle refers to actions on issues considered to be uncertain. The principle is used by policy makers to justify discretionary decisions in situations where there is the possibility of harm from making a certain decision when extensive scientific knowledge on the matter is lacking. Precaution may be defined as *caution in advance* or *caution practised in the context of uncertainty*. The precautionary principle is an expression of a need by decision-makers to anticipate harm before it occurs.
- ii. Causal principle: This principle indicates that default responsibility for rectification or mitigation of any particular impact rests with the entity which directly caused such impact. While the more well-known polluter pays principle is a subcategory of this, the causal principle applies not just to pollution but more generally to all impacts.
- iii. Integration principle: The Integration principle refers not only to the cooperation between different social bodies, but also to the integration of different physical, biological and social realities and issues pertaining to a particular geographic area.
- iv. Cooperation principle: Government as well as the private sector, non-governmental organisations and science all need to be involved to ensure sustainability. Successful long-term environmental management requires that all role players to act cooperatively to achieve a common goal.

2.4 MANAGEMENT OBJECTIVES

Further to achieving the above listed goals, the management objections for MRNR are the following:

- (a) Water conservation through the conservation of the catchment area with the aim of providing the optimal sustainable stream-flow of high quality water to lower lying areas and the town of Franschhoek.
- (b) Nature conservation by managing the reserve in accordance with ecologically acceptable principles.
- (c) Outdoor recreation by creating opportunities for dedicated environmental interpretation and low intensity outdoor recreation.
- (d) Providing opportunities for research that would benefit nature conservation in general.

2.5 VISION

The overriding mission of the International Union for Conservation of Nature was adopted as a fundamental guideline in the formulation of the vision, goals and objectives for the nature reserve, namely:

- a) 'The maintenance of essential ecological processes, the preservation of genetic diversity and the insurance of the sustainable utilisation of species and ecosystems that can only be achieved by the conservation of essential habitats and not individual species'.

- b) 'The management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations' (IUCN, 1980).

The following vision is set for the nature reserve:

To manage and protect Mont Rochelle Nature Reserve as a sustainable and safe area which is recognised and valued for its environmental significance, environmental integrity and community-supporting functions.

3. LOCATION AND EXTENT

3.1 LOCATION

MRNR is situated within Stellenbosch Municipality at the top of the Franschhoek Pass, 3 km east from the town of Franschhoek on the R45, a busy regional route linking Franschhoek, Paarl and Stellenbosch with Villiersdorp and Caledon. The elevation reaches approximately 300 m above sea level in the eastern slopes of Franschhoek, up to 600 m in the Franschhoek Pass and approximately 1 000 – 1 400 m above sea level in the mountain peaks.

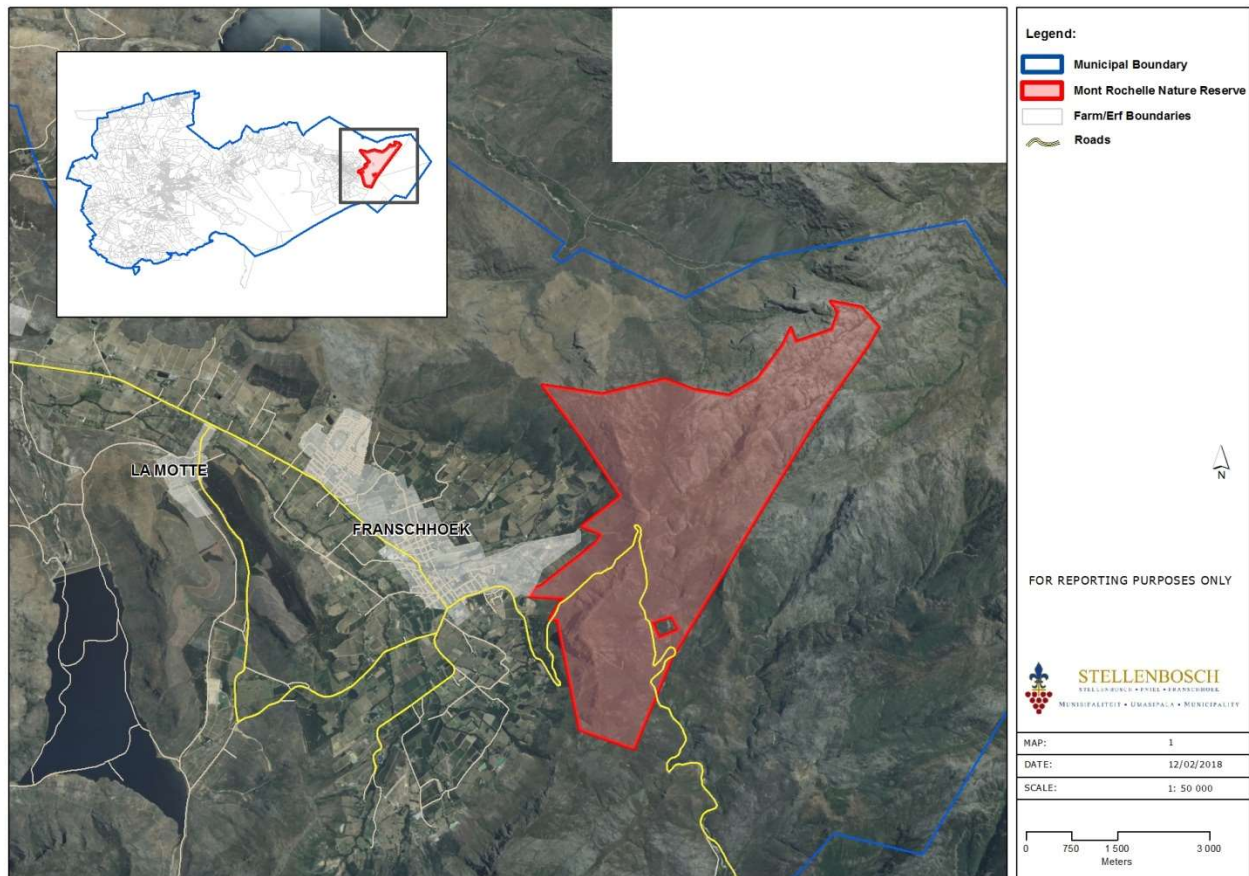


Figure 2: Mont Rochelle Nature Reserve in context of Franschhoek town.

MRNR covers an area of $\pm 1\,760$ ha, is bordered by the Hottentots Holland Provincial NR (42 000 ha), the Limietberg Provincial NR (117 000 ha) and the Theewaterskloof Conservancy (21 000 ha). It is situated within the Hawequas and Hottentots-Holland Mountain Catchment Area which is administered by the Western Cape Nature Conservation Board (WCNCB). MRNR was proclaimed a *Local Nature Reserve* in 1982 in terms of Provincial Notice 671/1982.

3.2 PROPERTY INFORMATION

As mentioned above, MRNR consists of an area of approximately 1 760 ha which mainly comprises of Farm No. 23.

Farm 759 is located in the south-eastern area of the reserve and does not form part of the MRNR (Figure 3). In 1977, this portion of the reserve (former commonage) was donated to the ACSV by

the former Franschhoek Municipality. This 10 ha site, approximately 300 m south of the entrance to the reserve, has been managed under the name, Karmel, for the past 30 years. No formal zoning exist for this portion inside MRNR but the site has been registered as a camp site.

The latter site is hired out to schools or other interested groups and extends across the Du Toits River with footpaths leading down to several rock pools. The Catspad hiking trail, which starts on private property on the Franschhoek side of the mountain, extends over a portion of the site. On-site amenities include two sleeping quarters, a hall, toilets as well as braai facilities. The site is capable of housing 104 at a time people and bookings have to be made well in advance.

In the centre of the reserve a portion of land has been subdivided into various erven explained briefly in the section below.

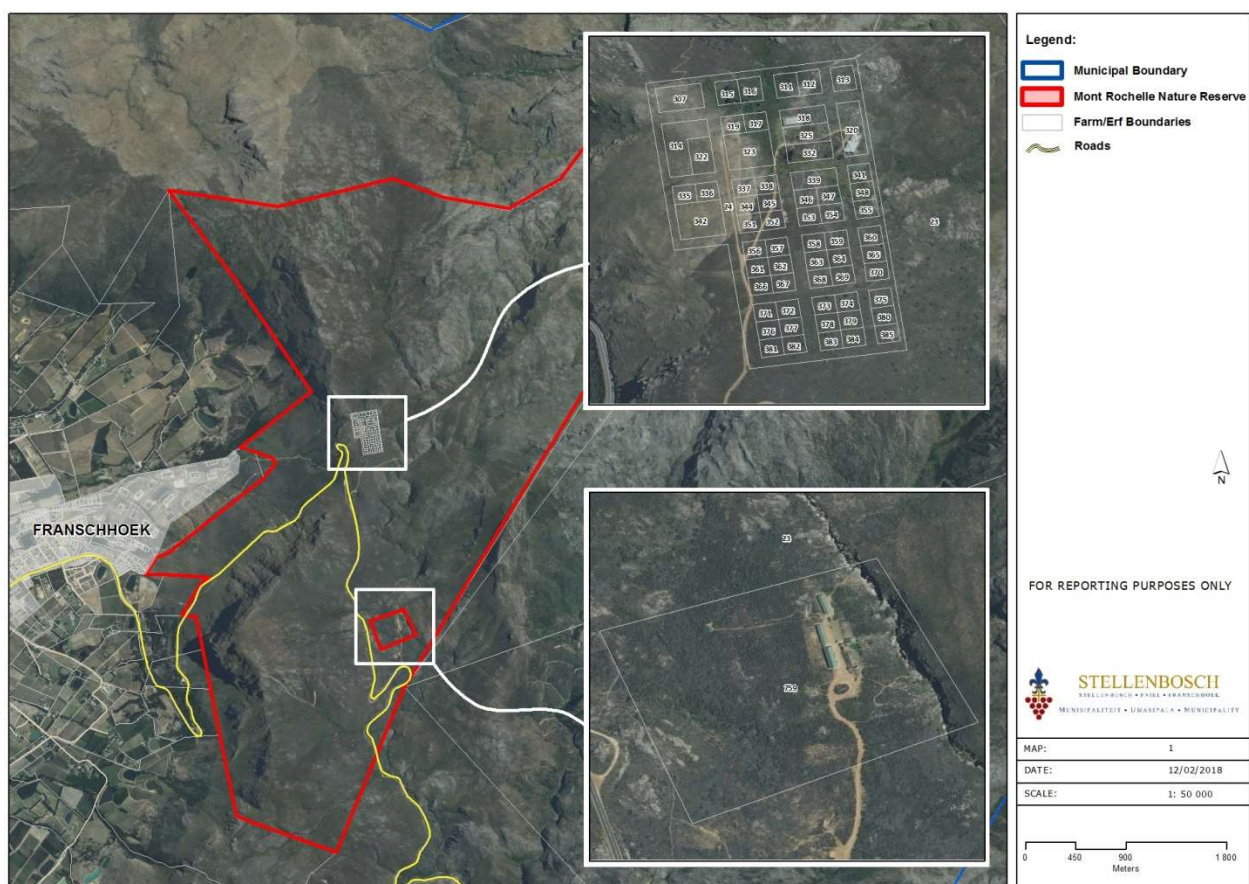


Figure 3: Property description.

4. LAND USES

4.1 HOMESTEADS AND PRIVATE ERVEN

In terms of a Council resolution (28 November 1911, Minutes Book 2:288) a total of 62 erven were proclaimed in MRNR in 1910, 14 of which have been sold on an auction to private individuals. The purpose of the auction was to generate funds for improving the Franschhoek sports facilities and the water provision to the town. The last erf was sold in 1995 after which the Council decided that no more erven would be sold.

Between 1912 and 1913 homesteads were erected on two of these erven, one of which was destroyed by a wildfire in 1998/99. Basic access roads to the erven were constructed by the Municipality. Some of the owners use their erven for camping during certain times of the year.

There are no limiting conditions that exempt the Council from providing services and prevents the owners from constructing any buildings. No formal zonation exists for these erven. The Municipality plans to deproclaim unsold erven (excluding the road) and consolidate them into the reserve to be managed in accordance with the MRNR EMP.

4.2 OUTDOOR RECREATION

MRNR is visited by an undetermined number of tourists for the purposes of picnicing, trail-running, mountain-biking and studying ecological manifestations. Wing-gliding and sight-seeing are also undertaken from specific sites within the reserve.

Hiking is the activity that attracts most of the recreationists to MRNR. Hikers have several options of trails to choose from. Entrance to the hiking trails is situated at the reserve entrance on top of the pass. The Catspad Hiking Trail which follows the original toll road between Franschhoek and Villiersdorp is a popular trail which starts on private land and leads through the Limietberg and MRNR. A permit is required for the use of these trails.

The second trail to Perdekop (inside Limietberg Nature Reserve) is about 7,5 km and takes between 3 and 4 hours there, and 2.5 hours back. It leads from the the parking area at MRNR, climbing steeply to a contour and then high above the Du Toits River. On route hikers have a view over the Theewaterskloof dam and the Villiersdorp valley. Once at Observation Point (1 056m) one has a view over the Wemmershoek dam and valley. Before reaching Observation Point a cairn indicates a neck where the path climbs steeply up to Perdekop. Once the plateau has been reached the path to Perdekop is relatively easy. Additional routes include the Du Toitskloof trail, Winelands trail, Aalwynkop trail, Breakfast Rock trail, Manganese trail and the Middagkransberg trail.

As per Section 8.3 below two categories in use have been identified in the utilisation / development zone on top of the pass. The first zone include the area where private homes are located whilst the other include the zone utilised by visitors. The latter is the area between the entrance gate and the mountain pass where recreation facilities such as picnic facilities, ablutions, a parking area, information centre, and a vantage area will be located.

The Catspad Monument, on the top of the Franschhoek pass, was erected in 1952. This monument was erected by the original post wagon on the exact site where it went over the Franschhoek mountains.

5. PHYSICAL DESCRIPTION

5.1 CLIMATE

Mont Rochelle is located within the Mediterranean climatic zone of the Western Cape, which is typified by cool, wet winters and hot, dry summers. The rainfall in MRNR ranges between 900 mm and 1 300 mm per annum with occasional snowfall in winter months, sometimes even as late as October and November. The high precipitation is partly due to the occurrence of orographic rainfall during most of the year. Strong south-easterly winds are common during summer months and accompanying clouds, which often covers the reserve, bring lots of moisture with it.

5.2 TOPOGRAPHY, GEOLOGY AND SOIL

The landscape in the region of MRNR dates back to the break-up of the super continent called Gondwana, approximately 140 million years ago. On that stage Southern Africa was a hilly plateau landscape. The new rivers that originated with the birth of the Indian and Atlantic Oceans of that time, gradually extended their valleys until the current Berg River and Riviersonderend's high waters met each other at MRNR, at the crescent of the mountain pass. The whole landscape that can be seen around MRNR is the effect of erosion from these two rivers during the past 140 million years.

The largest part of MRNR is covered by the Table Mountain Formation, a sandstone deposit which covers an area from Nieuwoudtville in the northwest to Port Elizabeth in the east. The cliffs and hilltops in the surrounding landscapes are dominated by this formation and is the sandy type of soil typical of the Fynbos biome. The age of the Table Mountain sandstone is known to be Ordovician to Silurian, this entails that it was deposited approximately 495 million to 417 million years ago, and consist one of the largest quartz sandstone formations in the world. This sandstone formation formed the Cederberg Mountain landscapes and the impressive Cape Folds Mountain range along the southern regions of the continent.

MRNR is situated in the syntax of the Fold range, in the region where the two main mountain landscapes intersect. This causes that the geological structures in the Mont Rochelle region are characterised by a complex mixture of Fold mountains and Block mountains, which determines the quality and shape of the landscape. The geological structure of Du Toit's Head is, for example, a large anticline, or kind of fold. A large amount of faulting or cracks in the earth crust occur. The top of the Franschhoek Pass is determined by one of these faultings and a large part of this pass, in the direction of Purgatory Uitspan, follow the same faulting because it created a natural route for road builders.

The main formation of MRNR is the Peninsula sandstone, a reasonable pure quartz sandstone, which was originally deposited on a coastal plain more or less similar to that of the Cape Flats, now forms the prominent cliffs throughout the range from the Franschhoek peaks to the escarpments in the Banhoek area.

Interesting rock formations which occur in the MRNR region, in the southern direction towards Purgatory Uitspan, is the Pakhuis tillite and the Cederberg shale formation. They represent a very important ice age approximately 443 million years ago. The Pakhuis Formation, a narrow band of tillite, was formed by material deposited by glacial action 400 million years ago. The ice plates,

which moved from the north and west, ploughed the coastal plain sand of the Peninsula into the shape of large folds. Soft shales of the Cederberg Formation overlay the tillite. These shales are susceptible to weathering and allow exposure of the underlying layers in a landscape that is relatively resistant to erosion (Cummings, 1997).

The western reaches of MRNR, beneath the Franschhoek Pass, are characterised by granite and older formations. These formations are poorly visible but the source of clay soils which is derived from granites and shales occurring on the lower slopes of the reserve.

5.3 HYDROLOGY

The Table Mountain sandstone formation is one of the most important underground water carriers in South Africa, this also applies to MRNR. Its fountains are in general perennial in times of drought and the water quality is excellent. Franschhoek's domestic water source has for more than a decade been the mountain stream and fountains of the Perde gorge, all of which is directly derived from the MRNR.

As stated above, MRNR forms part of the quarternary catchment of both the Breede and the Berg River, with a tributary of the latter, namely the Du Toits River originating on the reserve. Mont Rochelle, subsequently, forms part of the Hawequas and Hottentots-Holland Mountain Catchment Areas proclaimed in terms of the Mountain Catchment Areas Act, 1970 (Act 63 of 1970). Due to the shallow soils and topography of the area, the mean annual runoff is high (> 500 mm) (Midgley *et al*, 1994).

It is important to note that MRNR falls in an area that is defined as a Strategic Water Source Areas (SWSA)². SWSAs are those areas that supply a disproportionate amount of mean annual runoff to a geographical region of interest. These areas are important because they have the potential to contribute significantly to overall water quality and supply, supporting growth and development needs that are often a far distance away. SWSA areas make up 8% of the land area across South Africa, Lesotho and Swaziland but provide 50% of the water in these countries. At a national level, Strategic Water Source Areas form the foundational ecological infrastructure on which a great deal of built infrastructure for water services depends. Investing in Strategic Water Source Areas is also an important mechanism for long-term adaptation to the effects on climate change on water provision growth and development. The importance of managing this small fraction of land that contributes so vitally to our water security should be acknowledged at the highest level across all sectors.

² <http://bgis.sanbi.org/nfepa/SWSAmap.asp>

6. BIOPHYSICAL DESCRIPTION

6.1 FLORA

The vegetation of MRNR is described by Acocks (1975) as Veld Type 69: Fynbos. Low and Rebelo (1998) described its vegetation as Mountain Fynbos and identified MRNR as part of the *Franschhoek center of endemism*. Several of the plant species which occur in this centre are very restricted in their distribution. According to Low and Rebelo (1998) Mountain Fynbos is well conserved within the latter *center of endemism*, with some 98% being under statutory protection.

Due to the topography of MRNR a variety of habitats and associated plant communities occur. The vegetation of MRNR is generally lower than 1m, with taller plants such as *Protea repens*, *P. laurifolia*, *Leucadendron rubrum*, and other *Proteaceae* occurring in places. Some tree species, including *Cunonia capensis*, *Ilex mitis*, and *Bradejum stellatifolium* occur mainly along streams and in kloofs. A number of species that are endemic to the region are known to occur in MRNR, including *Serruria florida* and *Serruria zeyheri*, both of which have a narrow distribution (Greyling & Huntley, 1984).

On 6 June 1985, an exciting discovery were made when two honorary forest officers stumbled upon a new natural *Disa* hybrid. The flower, which colour was a mixture between red/purple and a very pale pink to white, was found in a colony of about 50 plants. What makes this find even more interesting is the fact that this *Disa*, which only flowers in late December, was found in mid-winter. Dr. Louis Vogelpoel (A new natural intergeneric hybrid from Table Mountain. *S.A. Orchid Journal*, 1985), diagnosed the flower to be a natural hybrid and a cross between *Disa uniflora* and *Disa caulescens*.

A number of invasive alien plant occur in the area, most of them are concentrated around riparian areas. In the rivers and streams, the spread of Black Wattle (*Acacia mearnsii*) kills all shaded indigenous understorey vegetation exposing the river banks to erosion by flooding water (Versveld, 1995). Other invasive plant include Pine trees, (*Pinus pinaster* & *P. radiata*) Hakea (*Hakea gibbosa*), and Blue gum (*Eucalyptus globulus*).

MRNR falls within the Cape Floral Kingdom, which is inter-nationally recognised as one of the six Floral Kingdoms of the world. The unique Cape Floral Kingdom is the smallest, covering a mere 0,06% of the earth's surface, and is the only Floral Kingdom contained in its entirety within a single country (refer to Figure 4).

The Cape Floral Kingdom is of immense scientific importance. It covers only 4% of South Africa, but contains 45% of all plant species occurring in the country. About three-quarters of all plants in the South African Red Data Book occur in the Cape Floral Kingdom. The Cape Floral Kingdom is characterised by an exceptional richness in plant species and high endemism. More than 8 700 species are known to occur, with more than 68% being endemic. It, thus, compares with some of the richest floras worldwide, surpassing many tropical forest regions in floral diversity. The Cape Floral Kingdom comprises various biomes, namely Fynbos, Forest, Nama Karoo, Succulent Karoo, and Thicket. However, Low and Rebelo (1996)³ state that the contribution of Fynbos in terms of

³ Low, A.B. & Rebelo, A.G. (eds). 1996. *Vegetation of South Africa, Lesotho and Swaziland*. Dept. Environmental Affairs and Tourism, Pretoria.

species richness, endemism, and fame, is so overwhelming, that the Cape Floral Kingdom is considered to be 'essentially Fynbos'.

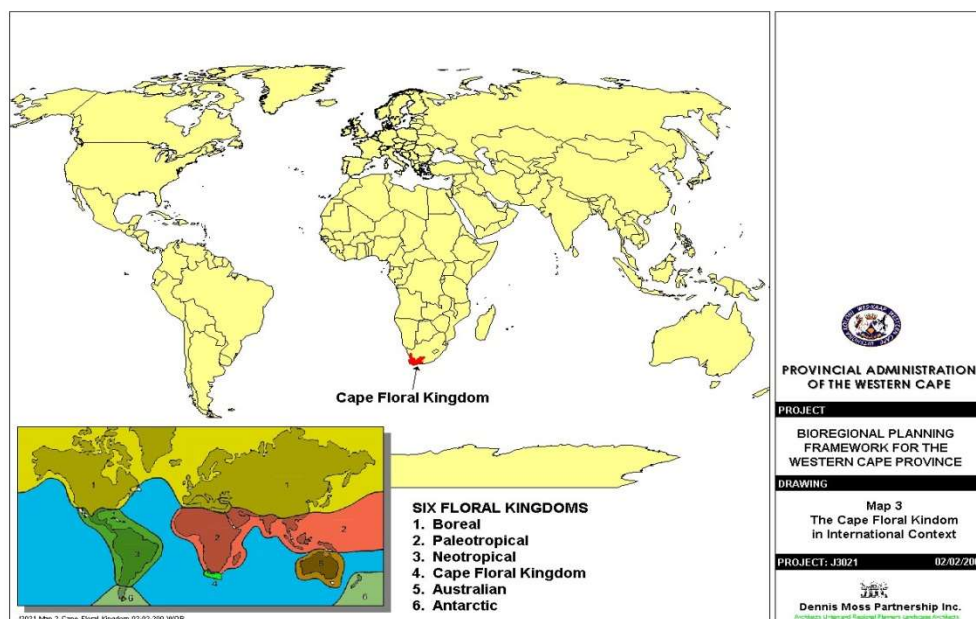


Figure 4: The Cape Floral Kingdom in International Context.

Fynbos is the noun describing the unique flora that occurs exclusively in the South-Western Cape in a narrow band following the Cape Fold Mountains from north of Nieuwoudtville to near Port Elizabeth. Many Fynbos species are extremely localised in their distribution, with sets of such localised species organised into 'centres of endemism' (Low and Rebelo, 1996).

The uniqueness and value of Fynbos puts South Africans under the obligation to explore this unique natural heritage, to display it to the rest of the world, and to preserve it for future generations. To accomplish this, an understanding of the uniqueness of Fynbos and its complicated processes and ecological cycles, and the interdependence of its various components, is necessary. Research is the key to this understanding. The Fynbos Biome provides opportunities for specialised research to scientists and students from all over the world.

The information provided by the South African National Biodiversity Institute (SANBI) and the Cape Action for People and the Environment (C.A.P.E.) with regard to the irreplaceability³ of habitats indicates that almost the whole of the reserve is indicated to be either vulnerable or critical with the higher lighting areas of MRNR being of immense conservation importance (Figure 5). This is mainly due to the fact that the area is the habitat of the Kogelberg Sandstone Fynbos. In terms of the Western Cape Biodiversity Spatial Plan (2017) the reserve is assigned the highest order conservation status due to its status as formally protected area (Figure 6). The various categories (CBA's [Critical Biodiversity Areas]) are defined in Table 1 below.

³ The potential contribution of a site to a preservation or representation goal. It is a fundamental way of measuring the conservation value of any site. An irreplaceable site will appear in every analysis of alternative combinations of sites. In other words, it is one which must be included in a conservation area because significant options for preservation are lost if the site is excluded.

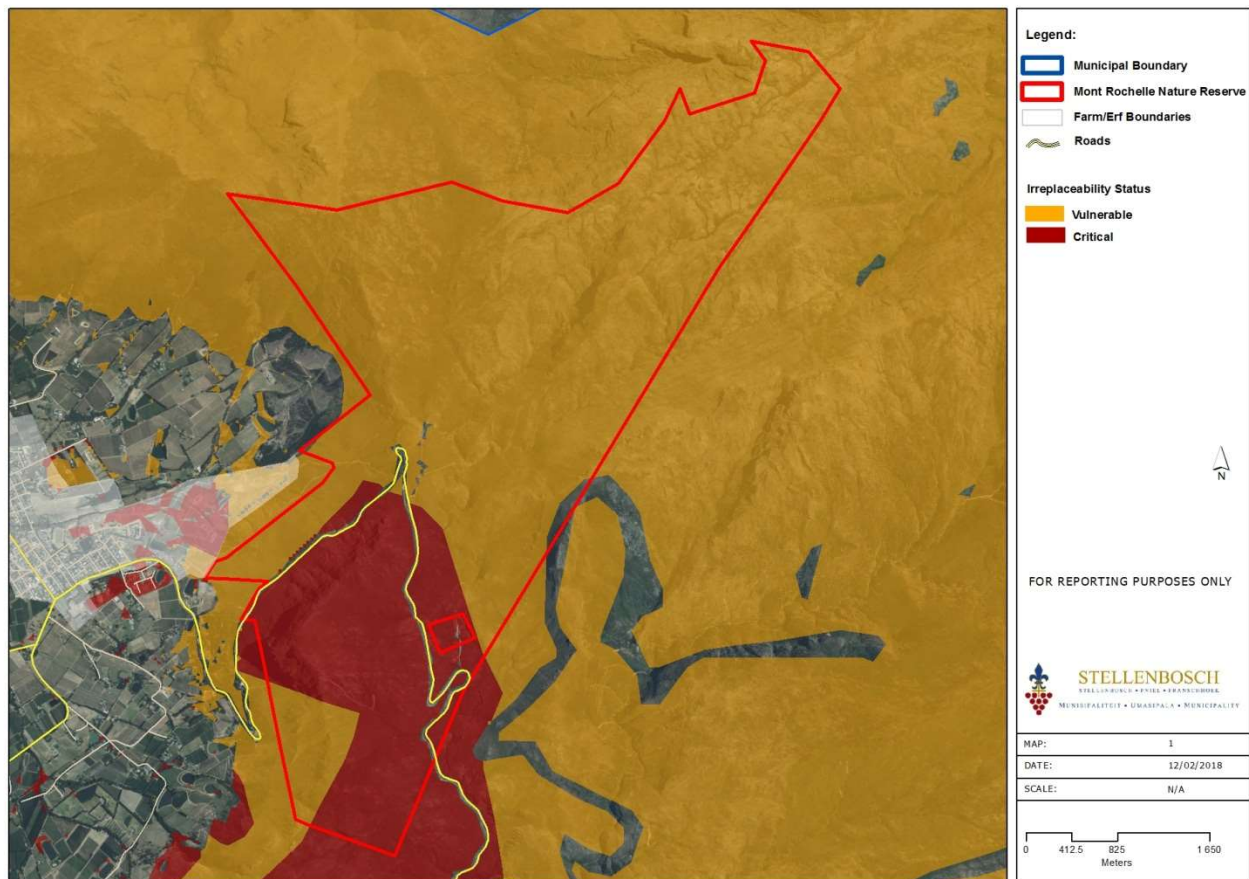


Figure 5: Irreplaceability of habitats in MRNR (Source: CAPE).

Table 1: Western Cape Biodiversity Spatial Plan map categories

MAP CATEGORY		DEFINITION
	Protected Area	Areas that are proclaimed as protected areas under national or provincial legislation.
	CBA 1	Areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.
	CBA 2	Areas in a degraded or secondary condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.
	ESA 1 ⁴	Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services.
	ESA 2	Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services.

⁴ Ecological Support Area

	Other Natural Area	Areas that have not been identified as a priority in the current systematic biodiversity plan, but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for biodiversity, they are still an important part of the natural ecosystem.
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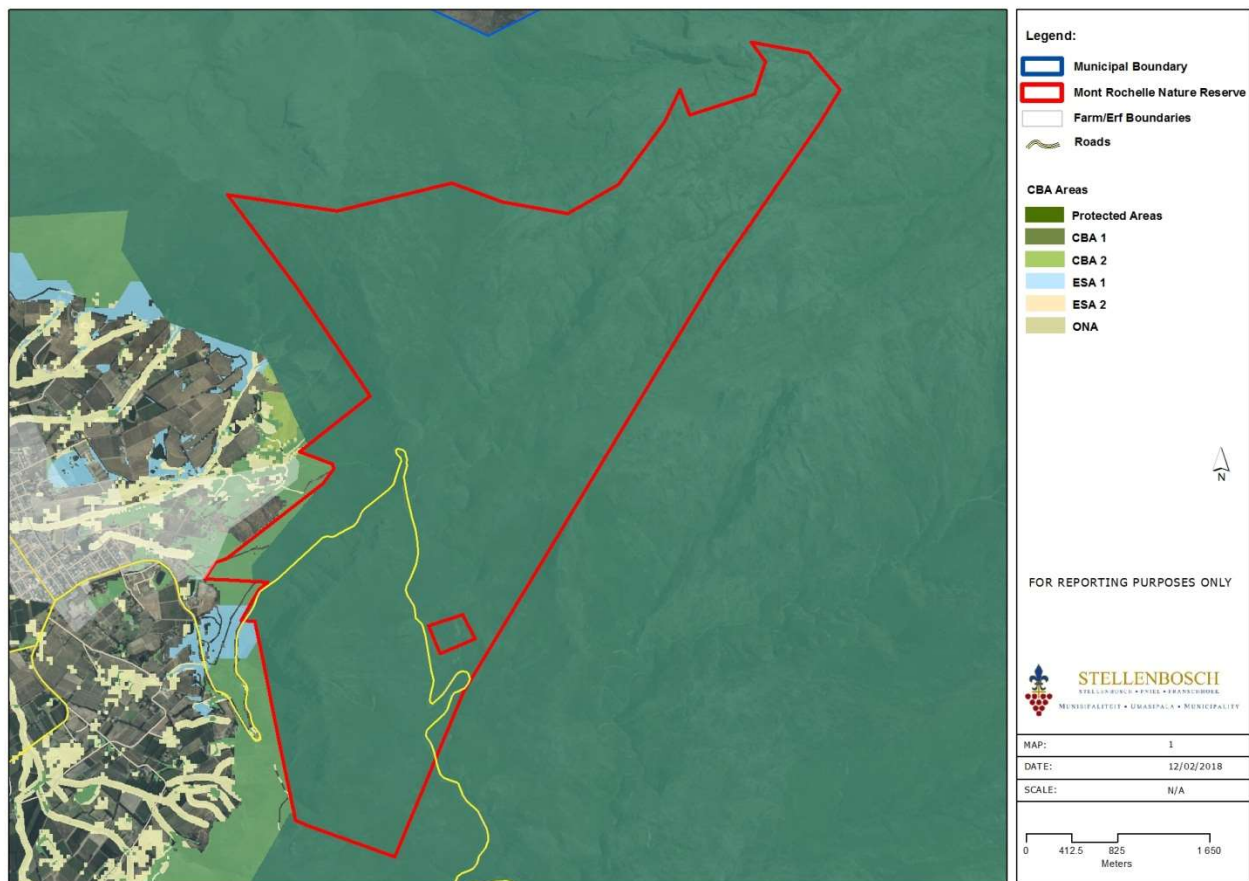


Figure 6: Critical Biodiversity Areas (Source: SANBI)

6.2 FAUNA

As with most Fynbos areas, MRNR generally has a low vertebrate animal biomass. However, the species richness of birds, mammals, frogs, reptiles, and insects is reasonably high. Species such as Leopard (*Panthera pardus*), Caracal (*Felis caracal*), Grey Rhebok (*Pelea capreolus*), Cape Grysbok (*Raphicerus melanotis*), Klipspringer (*Oreotragus oreotragus*), Baboon (*Papio ursinus*), Badger (*Mellivora capensis*), Dassie (*Hystrix africaeaustralis*), Grey Mongoose (*Galerella pulverulenta*), Striped Polecat (*Ictonyx straitus*), Porcupine (*Hystrix africaeaustralis*), and Water Mongoose (*Atilax paludinosus*) are known to occur in the area.

More than 200 bird species having been noted in the area, including the Hamerkop (*Scopus umbretta*), Barn Owl (*Typo alba*), Cape Eagle Owl (*Bubo capensis*), Cape Sugarbird (*Promerops cafer*), and the Malachite Sunbird (*Nectarinia famosa*). A number of birds of prey occur in the area, the most notable of which is the Black Eagle (*Aquila verreauxii*).

On 3 December 1995 a butterfly study was conducted by AK Brinkman and Alan Heath in MRNR. Results from this study identified a number of butterfly species, three of which were classified as

endangered in the SA Red Data Book for Butterflies. These endangered species included *Poecilmitis endymion*, *Poecilmitis nigricans nigricans*, and *Tsitana dicksoni*.

Both *Poecilmitis endymion* and *Tsitana dicksoni* are classified as rare⁴ species, while *Poecilmitis nigricans nigricans* is classified as intermediate⁵. These rare species are endemic to the region above Du Toit's Kloof and Franschhoek Mountain pass. While *Poecilmitis endymion* inhabits the highest peaks of the mountains, with its colonies usually just off the summits along small rocky ridges, *Tsitana dicksoni* are found on partly grassy slopes, skipping around the bushy shrubs that grow in its habitat.

Some of the larger endangered species include the Hawequa Flat Gecko (*Afreodura hawequensis*). This reptile is listed in the South African Red Data Book as restricted. The species is restricted to an area centred around the Hawequa Mountains, extending to Bainskloof in the north and the mountains at Franschhoek to the south (Branch, 1988).

⁴ Taxa with small populations that are not at present endangered or vulnerable but, are at risk. They are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range.

⁵ Taxa which may be worthy of inclusion but for which insufficient information is currently available on which to judge their status.

7. MANAGEMENT POLICY FRAMEWORK

Chapter 41 of the NEM:PAA requires that management plans be compiled within the context of a policy framework. The EMP, in common with all protected areas, is to be developed and managed within the framework of guiding statutes and policy frameworks. The EMP is based upon and gives effect to a dedicated environmental management policy which is defined as ‘*a statement by the organisation (i.e. the Management Authority) of its intentions and principles in relation to its overall environmental performance, which provides a framework for action and for the setting of objectives and targets*’ (SABS ISO 14004:1996{E})⁵. In this regard, the primary policy statements are as follows:

- a) Cape Winelands Biosphere Reserve inter-governmental agreements: The nature reserve, as part of the Cape Winelands Biosphere Reserve, will be managed in compliance with the applicable inter-governmental agreements upon which the Cape Winelands Biosphere Reserve is based. The reserve forms part of the CWBR core area.
- b) Planning and management context: Management of the reserve will be undertaken in context of all applicable levels of planning.
- c) Biodiversity conservation: Biodiversity is an imperative for environmental sustainability. A key objective in the management of the reserve is to ensure that biodiversity in the study area is protected and enhanced.
- d) MRNR is an important part of a system of protected areas: The reserve is to be managed as part of a system of protected areas.
- e) MRNR is a public resource: The reserve is a public resource and should be available for the sustainable use of the entire community.

7.1 PLANNING AND MANAGEMENT CONTEXT

The Municipality has directed that the bioregional planning approach advocated by the Provincial Government of the Western Cape through its Bioregional Planning Policy and comprehensively described in the *Manual for application of Bioregional Planning in the Western Cape* (PGWC, 2003) be adopted in municipal planning projects.

The Municipality recognises that one of the critical determinants of the success of an EMP planned in term of the bioregional planning approach is the extent to which all spheres of government co-operate and co-ordinate their activities as it relates to the subject area (in this case, MRNR). This EMP therefore gives effect to the requirement that the planning and management of land units such as the nature reserve should be undertaken within the context of distinct levels, namely the *international level, national level, provincial level, regional level* and the *local level*. Effective integrated planning at these levels requires innovative forms of institutional integration and social co-operation. Dialogue amongst all stakeholders, participatory planning and institutional flexibility are, therefore, essential to plan and manage effectively.

The reserve responds to the international protocols and conventions of which South Africa and, consequently, all lower spheres government are a signatory to, and the relevant legislation, policy and regulations, the most important of which are summarised below.

⁵ SABS ISO 14004:1996(E)

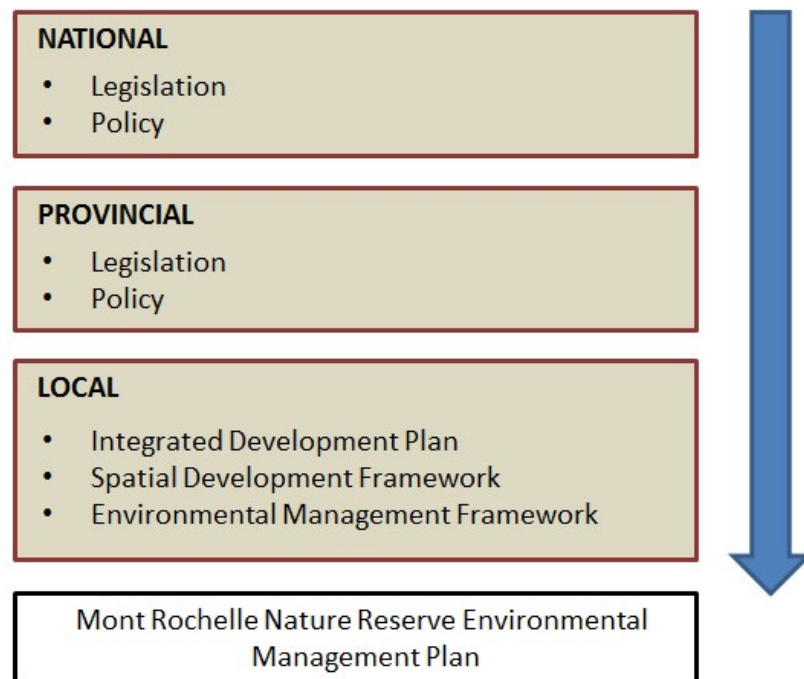


Figure 7: Planning levels applicable to the MRNR EMP.

7.1.1 International Level

7.1.1.1 UNESCO'S MAB Program and Cape Winelands Biosphere Reserve Inter-Governmental Agreements

Stellenbosch Municipality has played a leading role in the establishment of the Cape Winelands Biosphere Reserve (CWBR), which aims to give practical effect to UNESCO's MAB (Man and the Biosphere) Program. This program was launched in 1971 by UNESCO, as a global initiative of international scientific co-operation dealing with people-environment interactions over the entire realm of bioclimatic and geographic situations of the biosphere. The MAB Program was designed to solve practical problems of resource management, and aims to fill gaps in the understanding of the structure and function of ecosystems, and of the impact of different types of human interaction. Key ingredients in the program are the involvement of decision-makers and local people in research projects, training and demonstration at the field level, and the bringing together of disciplines from the social, biological and physical sciences in addressing complex environmental problems. The application approved by UNESCO represents the overarching terms of agreement upon which the CWBR are premised. These refer to the:

- Fulfilment of the three functions of the biosphere reserve as stipulated in the *Statutory Framework of the World Network of Biosphere Reserves* (1995).
- Planning and management of the biosphere reserve in accordance with the bioregional planning approach of the PGWC as described in the *Bioregional Planning Manual*.

The Municipality is a signature to the inter-governmental agreement upon which the biosphere reserve is based and is consequently under the obligation to comply with and give effect to the terms of agreement.

7.1.1.2 Agenda 21

The Agenda 21⁶ agreements reflect global consensus and political commitment on developmental and environmental co-operation. Underlying the above agreements is the realisation that the international world cannot continue with present policies, which increase poverty, hunger, sickness and illiteracy and cause continuing deterioration of ecosystems on which life on earth depends. Agenda 21 provides a broad overview of issues pertaining to sustainable development, including statements on the basis for action, objectives, recommended activities and the means of implementation. Of particular relevance for the EMP are the following principles of Agenda 21:

- a) Integrated approach to the planning and management of land resources.
- b) Promoting sustainable human settlement development.
- c) Integrating environment and development in decision-making.
- d) Establishing systems for integrated environmental management and auditing.

7.1.2 National Level

7.1.2.1 South African Constitution

The South African Constitution, Act 108 of 1996, places an obligation on all to ensure that sustainable development is promoted and that the integrity of the environment is respected. In Section 24(b)(iii) of the Bill of Rights chapter of the Constitution, it is stated that ‘everyone has the right to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that secure ecologically sustainable development and use of natural resources, whilst promoting justifiable economic and social development’.

7.1.2.2 National Environmental Management Act

Section 28 of the National Environmental Management Act, 107 of 1998 (NEMA), creates a general duty of care on every person to *take reasonable measures to prevent significant pollution or degradation of the environment from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment*. The Act provides for the preparation of environmental management plans by the relevant national departments involved in the management of the environment. The purpose of such plans is to co-ordinate and harmonise the environmental policies, plans, programs and decisions of the various national departments that exercise functions that may affect the environment or are entrusted with powers and duties aimed at the achievement, promotion, and protection of a sustainable environment, and of provincial and local spheres of government.

The NEMA Environmental Impact Assessment (EIA) Regulations in turn regulate activities which may impact on the environment as well as those that require environmental authorization. In this regard it must be noted that the competent authority for any activities occurring within Mon

⁶ Agenda 21 is an international program, adopted by some 178 governments, to put sustainable development into practice around the world. It emerged from the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992.

Rochelle Nature Reserve is the National Department of Environmental Affairs as the nature reserve is located within the core area of the CWBR.

7.1.2.3 National Environmental Management: Protected Areas Act

As stated previously, Act 57 of 2003 provides the legislative premise for the declaration and management of a Section 23 Nature Reserve. It makes provision for the *protection and conservation of ecologically viable areas representative of South Africa's biodiversity and its natural landscapes*. It makes provision for the *establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards and for intergovernmental co-operation and public consultation in matters concerning protected areas*. The purposes (Section 17 of the above Act) of the declaration of areas as protected areas are to:

- (a) *protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes in a system of protected areas;*
- (b) *preserve the ecological integrity of those areas;*
- (c) *conserve biodiversity in those areas;*
- (d) *protect areas representative of all ecosystems, habitats and species naturally occurring in South Africa;*
- (e) *protect South Africa's threatened or rare species;*
- (f) *protect an area which is vulnerable or ecologically sensitive;*
- (g) *assist in ensuring the sustained supply of environmental goods and services;*
- (h) *provide for the sustainable use of natural and biological resources;*
- (i) *create or augment destinations for nature-based tourism;*
- (j) *manage the interrelationship between natural environmental biodiversity, human settlement and economic development;*
- (k) *contribute to human, social, cultural, spiritual and economic development; or*
- (l) *rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species.*

7.1.2.4 National Environmental Management: Biodiversity Act

The Protected Areas Act, 57 of 2003 must, in relation to a protected area, be read, interpreted and applied in conjunction with the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) which has the following objectives:

- a) To provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998 (Act 107 of 1998).
- b) To provide for the protection of species and ecosystems that warrant national protection.
- c) To provide for the sustainable use of indigenous biological resources.
- d) To provide for the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources.
- e) To provide for the establishment and functions of a South African National Biodiversity Institute.

Alien vegetation is also regulated through the NEM:BA.

7.1.2.5 National Water Act

The purpose of the National Water Act, 36 of 1998, is to ensure that South Africa's water resources are protected, used, developed, conserved and controlled in a manner that takes into account, amongst others, basic human needs, equitable access thereto, the promotion of efficient, sustainable and beneficial use of water, facilitation of social and economic development, and protection of aquatic and associated ecosystems.

7.1.2.6 National Veld and Forest Fire Act

Veld fires in South Africa are dealt with under the National Veld and Forest Fire Act, 101 of 1998. The purpose of the National Veld and Forest Fire Act is *to prevent and combat veld, forest and mountain fires throughout the Republic*. The Act places the duty on land owners to make provision for the management of veld fires on their own land. Failure to do so may result in penalties being enforced (refer to Section 24 and 25 of the above Act) and claims lodged against a landowner if the above Act's requirements were not met.

7.1.2.7 National Heritage Resources Act

South Africa's heritage are dealt with under the National Heritage Resources Act, 25 of 1999 which aims to *promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations*.

7.1.2.8 Conservation of Agricultural Resources Act

The purpose of the Conservation of Agricultural Resources Act, 43 of 1980 (CARA), is to provide control over the utilization of the natural agricultural resources in order to promote the conservation of soil, water sources and the vegetation and the combating of weeds and invader plants.

7.1.2.9 Spatial Planning and Land Use Management Act

The Spatial Planning and Land Use Management Act, 16 of 2013 (SPLUMA), includes the following stipulations:

Land use planning principles and objectives

Section 59 (4): To promote environmental integration in land use planning, a competent authority must—

- a) strive towards ecologically, socially and economically sustainable development, taking into account —*
 - (i) the economic potential of the relevant area or region;*
 - (ii) biodiversity;*
 - (iii) social needs;*
 - (iv) cultural heritage resources;*
 - (v) agricultural resources*
- b) ensure that development heeds the natural processes that control the relevant area;*

- c) *strive to achieve development that is harmonised with the ecological characteristics of the environment;*
- d) *promote the conservation and management of biodiversity;*
- e) *discourage development in unsuitable environments such as —*
 - (i) *areas with a high water table;*
 - (ii) *swamps;*
 - (iii) *flood plains;*
 - (iv) *steep slopes;*
 - (v) *areas sensitive to drift-sands and sea-level rise;*
 - (vi) *areas with high biodiversity importance;*
 - (vii) *areas with important cultural and scenic landscapes —*
- f) *minimise the fragmentation of natural habitat in ecological corridors and areas with high biodiversity importance;*
- g) *facilitate soil conservation and the control of pollution;*
- h) *address the land use implications of —*
 - (i) *the provision and conservation of energy;*
 - (ii) *the management of the demand for energy;*
 - (iii) *climate change mitigation and climate change adaptation strategies;*
- i) *protect the cultural heritage and tourism resources of the Municipality.*

7.1.3 Provincial Level

7.1.3.1 Constitution of the Western Cape Province

The EMP supports and gives effect to the Constitution of the Western Cape (Act 1 of 1998). In terms of Chapter 10 of the Constitution, this province has to adopt and implement strategies to actively promote and maintain the welfare of the people and the environment of the Western Cape, including policies aimed at achieving inter alia the following:

- a) Safety and security.
- b) The protection or advancement of persons, or categories of persons, disadvantaged by unfair discrimination.
- c) The promotion of a market-orientated economy.
- d) The development of rural communities and the promotion of the welfare of rural workers.
- e) The protection of the environment of the Western Cape, including its unique fauna and flora, for the benefit of present and future generations.
- f) The protection and conservation of the natural historical, cultural historical, archaeological and architectural heritage of the Western Cape for the benefit of present and future generations.

7.1.3.2 Western Cape Provincial Spatial Development Framework

The Western Cape Provincial Spatial Development Framework (generally referred to as the PSDF) is aligned with the National Spatial Development Perspective (NSDP) and other national policy frameworks, and endorses the vision of the Western Cape Provincial Government to create 'A Home for All'. The PSDF is purported to support the development growth path paved by the iKapa Elihlumayo Strategy and the other lead strategies.

7.1.3.3 Land Use Planning Act

The SPLUMA and the Western Cape Land Use Planning Act, 3 of 2014 (LUPA), require that spatial planning and development be guided by normative principles and that policy and plans should explicitly indicate how they would meet the requirements of such principles. These principles are:

- a) Justice: Fair allocation of public resources to ensure that the needs of the poor are addressed.
- b) Sustainability: Sustainable patterns of consumption and production should be supported, and ways of living promoted that do not damage the natural environment.
- c) Resilience: Vulnerability to environmental degradation, resource scarcity and climatic shocks must be reduced. Ecological systems should be protected and replenished. The resilience of all other forms of capital, including social, monetary and infrastructural capital should be enhanced to the extent possible.
- d) Efficiency
- e) Good governance: Good governance is the key to long-term sustainability.

7.1.3.4 Provincial Bioregional Planning Policy

As stated above, the PGWC is advocating a bioregional planning approach as described in the *Manual for application of Bioregional Planning in the Western Cape* (PGWC, 2003). The Stellenbosch Municipality has adopted the said approach for the planning, development and management of its area of jurisdiction.

7.1.4 District Level

7.1.4.1 Cape Winelands District Municipality Integrated Development Plan

The Cape Winelands District Municipality set itself the broader goal of ensuring sustainable development through strategic management objectives. This will be achieved by adhering to the vision of the Municipality, namely to have *'a safe, prosperous and united Cape Winelands where all its people enjoy high standards of living'*. The Municipal IDP states that there is a dis-equilibrium between development initiatives and environmental sustainability. In order to address this problem the Municipality identified several strategies. One such strategy is *'to have data-driven sustainable livelihoods, premised on bioregional planning and in line with Agenda 21 that seeks to build and preserve the five forms of community capital (social, physical, natural, financial and institutional)'*.

7.1.4.2 Cape Winelands District Municipality Spatial Development Framework

The Cape Winelands District Municipality Spatial Development Framework conforms, to *inter alia*, the provincially-endorsed bioregional planning principles, but adds the principles of consistency and vertical equity. The latter assumes that the disadvantaged should be favoured above more advantaged people and refers to the distribution of impacts (who receives benefits or bears costs). The SDF classifies the Cape Winelands Biosphere Reserve as *a scale-informed value-adding management entity, operational within a sustainable paradigm, to support existing roles and responsibilities through structured participation and (scientific and local) knowledgeable input that responds to local conditions, needs and perceptions*. The SDF states that *on the regional and local*

level, the biosphere reserve is to facilitate coherent planning and land-use management in terms of the principles of sustainable development.

7.1.4.3 Cape Winelands Biosphere Reserve Spatial Development Framework Plan

The Cape Winelands Biosphere Reserve Spatial Development Framework Plan includes plans, guidelines and strategies that give effect to the three functions of the Cape Winelands Biosphere Reserve namely, *development, conservation and logistical support*. As such this Spatial Development Framework Plan indicates which type of land-use should be undertaken in the Cape Winelands Biosphere Reserve, where it should take place, and how such land-use should be undertaken in order to be sustainable.

7.1.5 Local Level

7.1.5.1 Stellenbosch Integrated Development Plan

The Stellenbosch IDP includes a needs-analysis, which puts forward a number of needs for the area within which MRNR is located.

7.1.5.2 Stellenbosch Spatial Development Framework

The primary goal of the Stellenbosch SDF is to give practical effect to the mission statement of the people of the local municipal area, as expressed in the SDF of the Stellenbosch Municipality, namely: *'The spatial development framework of the Stellenbosch Municipality should be measured by the 'triple bottom line' of economic efficiency, environmental sustainability and social justice with an emphasis on the issues facing the rural and urban poor.'*

7.1.5.3 Stellenbosch Environmental Management Framework

The Stellenbosch Environmental Management Framework (SEMF), adopted by the Council of Stellenbosch Municipality (June 2019) describes the international, national, provincial and local context of environmental planning and management within the Municipality. It also:

- Describes the planning and management approach adopted in the Municipality
- Serve as a basis for the preparation of detailed management plans for specific areas or aspects, e.g. river management, fire management, pollution control, etc.
- Promote sustainable development throughout the Municipality in a manner that supports the intentions of NEPAD, Agenda 21 and Local Agenda 21.
- Promote the conservation of biodiversity both within and outside conservation areas.
- Provide a spatial framework and serve as a basis for the evaluation of development proposals in terms of site-specific criteria.
- Providing guidance to developers with regard to the planning and design of projects and the establishment of contractual agreements and appropriate partnerships with the municipality and the affected communities, the purpose of which is to ensure that each development brings sustainable benefit for all parties as well as the receiving environment.

In terms of the Spatial Planning Categories contained in the SEMF Mont Rochelle is a designated A.a Area defined as a statutory protected area. In terms of the SEMF such areas are designated in terms of legislation for biodiversity conservation, outdoor recreation and non-consumptive resource use. *Conservation purposes are purposes normally or reasonably associated with the use of land for the protection of the natural and/or built environment, including the protection of the physical, ecological, cultural and historical characteristics of land against undesirable change.*

7.1.5.4 Stellenbosch Municipality: By-Law Relating Plantations, Parks, Gardens, Recreational Facilities and Nature Reserves (P.N. 373/1988)

According to the above by-law *no person shall in or on premises, buildings, land, plantations, a commonage, enclosures, nature reserves, parks, gardens, open erven and spaces, picnic areas, nurseries, trees, sport and recreation facilities which are vested in or under control of the Council –*

- (a) *disfigure or deface any post, railing, fence, seat, barrier, gate, notice board, plate, house, building, shed, urinal, closet, flag, mark or other article or thing by pasting thereon or affixing thereto in any way any bills, papers, placards or notices or by cutting, writing, stamping, painting, drawing or marking thereon in any way whatsoever,*
- (b) *remove, destroy, damage or deface any notice or sign*
- (c) *make a fire or commit any acts whereby a fire may be caused, except in places where fireplaces are provided;*
- (d) *saw, cut, gather, remove dig up, burn, pick or break any timber, tree, shrub, brushwood, fencing, pole, lawn, plants, fruits, flower or equipment, or climb therein or thereon or damage it in any way;*
- (e) *remove or disturb any soil or water at a place other than that specially provided by Council;*
- (f) *erect or cause to be erected any post, rail, fencing, tent, screen, stand, swing, building or construction of whatever nature without the written permission of the Council;*
- (g) *park, drive, ride pull or propel any type of vehicle except a manually operated wheelchair or perambulator when used for the conveyance of an invalid or a child;*
- (h) *leave any refuse, building waste, rubbish, paper, materials or any object except in containers provided for that purpose;*
- (i) *injure, kill, hunt, capture, or disturb any animal or bird, or damage or destroy the nest or eggs of any bird or interfere with the animal life in any other way;*
- (j) *break, damage, hurt, destroy, disfigure or remove any flora, fauna or nest of fauna or objects of historical or scientific interest or any property in the nature reserve;*
- (k) *introduce any flora, fauna, weapon, trap, net, explosive or poison into the nature reserve, or be in possession thereof in the nature reserve;*
- (l) *fire a fire-arm or an air-gun, discharge any firework, catapult or sling or throw a stone or other missile;*
- (m) *in any other way cause a nuisance, obstruction, disturbance or annoyance to the public, to brawl, fight, swear or use obscene, indecent or improper language, gamble, beg, behave in an indecent or offensive manner or drink intoxicating liquor;*
- (n) *sell or offer for sale or hire, or hawk or exhibit any article or distribute any pamphlet, book, handbill, or other matter; present any public entertainment; play a musical instrument, and deliver or say any speech, public address or prayer of whatever nature or sing any song or hold or participate in any public meeting or function unless he has previously obtained the written permission of the Council to do so;*

- (o) *enter upon any ablution or sanitary conveniences indicated as having been provided for persons of the opposite sex;*
- (p) *enter or leave other than by an entrance or exist provided for that purpose, or refuse to leave when requested to do so by an authorised officer of the Council or a member of the South African Police;*
- (q) *wash any article or animal under a tap, in a pond, fountain or in an ornamental pond or otherwise pollute water, or swim in a dam or wash any clothes or other things or pollute the water therein in any other manner, and*
- (r) *perform any act whatsoever which may injure persons, damage or destroy any property.*

7.1.6 Human Resources/Administration Legislation

Furthermore, human resources and administration legislation include the following:

- Occupational Health and Safety Act, 1993
- Basic Conditions of Employment Act 3 of 1997
- Labour Relations Amendment Act, 66 of 1995
- Local Government Municipal Systems Act 32 of 2000
- Promotion of Equality/Prevention of Unfair Discrimination Act 4 of 2000
- Criminals Procedures Act
- Fire-Arm Act
- Fencing Act 31 of 1963
- Hazardous Substances Act 15 of 1973
- Land Survey Act 8 of 1997
- Promotion of Access to Information Act 2 of 2000
- Promotion of Administrative Justice Act 3 of 2000
- Regional Services Council Act 109 of 1985
- Skills Development Act 97 of 1998
- State Land Disposal Act 48 of 1961
- Subdivision of Agricultural Land Act 70 of 1970
- Tourism Act 72 of 1993
- Municipal Ordinance 20 of 1974

7.2 BIODIVERSITY CONSERVATION

The MRNR EMP recognises that biodiversity is an imperative for environmental sustainability. Ecological functions of the natural systems are directly related to biodiversity. Biodiversity is the primary element in the maintenance of the resilience of ecological systems to external shocks and, thus, the ability of these systems to sustain the dependent communities. Accordingly, the key objective in the management of the nature reserve is to ensure that biodiversity is protected and enhanced.

7.3 MONT ROCHELLE NATURE RESERVE AS PART OF A SYSTEM OF PROTECTED NATURE AREAS

The EMP recognises that the functions of protected nature areas go far beyond the usual perception of the term 'protection'. Such areas are immensely valuable, beyond their boundaries, in providing for the rehabilitation of environments, as nutrient sinks, for landscape stability, and for the replenishment of species, populations and communities. The primary objective of any system of protected nature areas would be as much to restore and manage ecosystems and their functions as to protect them. This emphasises that sustainability requires planning and management for biodiversity conservation across human dominated landscapes. *To achieve this, protected areas should no longer be considered as islands of conservation within a sea of development but as an integral part of each region as a whole in terms of biodiversity conservation* (Institute of Bioregional Resource Management).

As mentioned above, MRNR forms part of a system of *de jure* and *de facto* protected nature areas that collectively form the core and buffer areas of the CWBR. This system is based upon the principle that a system of protected areas is a key element of any strategy to maintain biodiversity and ecosystem functions on a larger regional scale. It is imperative that such a system be designed and managed to represent and protect the diversity of ecological processes, communities, species and gene pools (Global Biodiversity Strategy, 1992).

7.4 MONT ROCHELLE NATURE RESERVE AS A PUBLIC RESOURCE

MRNR forms part of the public open space system of Stellenbosch. As such, it is a public resource that is of value to the entire Stellenbosch community. Accordingly the nature reserve should be available and accessible to the entire community to exercise their legitimate right to utilise such public resource in a sustainable manner. In this regard it is important that *government* (including the Municipality), *the community, corporate and other private interests, etc. share responsibility for co-ordinating land-use planning, for both public and private land and for defining and implementing development options that would ensure that human needs are met in a sustainable way* (WRI, 1992).

7.5 ADMINISTRATIVE FRAMEWORK

As stated previously the Municipality is acting in the capacity as Management Authority for MRNR. The current and future arrangement pertaining to the Management Authority is based upon Sections 38, 42 and 44 of the NEM:PAA.

Stellenbosch Municipality's function, as it pertains to the management of MRNR are:

- To manage the reserve in accordance with the approved management plan (EMP).
- To manage the reserve for the purpose for which it was declared and in accordance with applicable legislation and municipal by-laws.
- Audit / monitor management actions and associated environmental impact.
- Reports to Council on the implementation of the EMP.
- Source funding.

The Municipality in turn relies on the Friends of the MRNR group for specific management activities as required. The management of the nature reserve is an ongoing inclusive process that gives meaningful consideration to the changing and dynamic interests, needs and values of the people of Stellenbosch Municipality and those that have an interest in ensuring a prosperous future for the area. In this regard, it is important that the following be achieved:

- a) Continued participation, representation and involvement of all stakeholders promoting broad-based policy learning and capacity development.
- b) Creating adequate and appropriate opportunities for community participation in decisions that may affect the area.
- c) Developing and utilising the skills and capacities of the people living in the area in the management of the nature reserve.
- d) Encouraging on-going involvement of local people in the programs identified for the management of the nature reserve.

The Municipality and representatives of the Friends of the MRNR in turn serve on the Stellenbosch Protected Areas Forum, attended by the Department of Environment and Development Planning, Cape Nature, Stellenbosch University and representatives from other protected areas throughout the municipal area. The Stellenbosch Protected Areas Forum is technical / scientific in nature and meets on matters concerning the management and conservation of protected areas in Stellenbosch Municipality.

7.6 PROCEDURES FOR PUBLIC PARTICIPATION

News regarding MRNR will be communicated to the public by way of Municipal newsletters, publications and in the local newspapers.

7.7 PRIMARY ENVIRONMENTAL THREATS

The primary threats to the ecology, aesthetic quality and catchment functions of MRNR include the following:

Inappropriate Fire Regime: The Fynbos vegetation in MRNR requires a fire regime that provides for high intensity fires at intervals that range from 8 to 20 years, occurring in late-summer (i.e. February-March). As stated above, MRNR is managed as part of the Hottentots Holland Mountain Catchment Area, the fire management of which is undertaken in accordance with a '*minimum interference*' policy. The latter policy essentially implies that controlled burning, as a management practice, is largely excluded and that the emphasis falls on controlling 'unnatural' wildfires.

Due to the topography, climatic conditions, and factors such as land-uses on adjoining properties that are conducive to the starting of wildfires, and financial constraints that inhibit fire control activities, MRNR is particularly prone to wildfires that do not conform with its natural fire regime requirements. The latter could, in the long-term, have an adverse effect on the structure of the local plant communities, biodiversity in general, and the natural functioning of the reserve as a catchment area. In addition, an inappropriate fire regime could have immensely negative cost-implications in that it generally upsets management programs such as alien plant eradication.

Over-utilisation by visitors: MRNR is a particularly attractive natural area and provides for a broad spectrum of recreation opportunities. It is, subsequently, a popular attraction for eco-tourists and sports persons practicing specific nature-related activities. The main potential problems in this regard include pollution, trampling of plants, disturbing of animals, soil compaction leading to unnatural erosion, and degradation of the social environment. It is imperative that the carrying capacity (both social and ecological) of the reserve is not exceeded by visitors.

Alien Plant Infestation: The infestation of Fynbos areas by alien plants is known to be a primary threat to biodiversity in general (mainly due to habitat fragmentation), and catchment dynamics. In the latter regard, it is important to note that Fynbos has unique intrinsic water conservation capabilities and subsequently plays a critical role in the maintenance of the natural *water cycle*. In order to sustain the fundamentally important catchment function of MRNR it is, therefore, imperative to implement integrated eradication programs for alien plants.

Security and vandalism: MRNR is relatively secluded. Infrastructure, especially those located at the entrance complex is damaged and vandalised regularly.

8. MANAGEMENT DIRECTIVES

This section comprises the management strategies and guidelines in terms of which MRNR is to be managed in order to achieve the objectives (water conservation, nature conservation, outdoor recreation and research) documented above. The management strategies and guidelines are addressed under the following themes:

- Administration
- Environmental Protection
- Land Use Management
- Environmental Auditing

Stellenbosch Municipality is the responsible party for all conservation and management actions to be implemented unless stated otherwise. Although a MRNR does not have an approved budget at this stage a costing plan is included under Section 9.

8.1 ADMINISTRATION

The long-term sustainability of the area largely depends on its effective administration. Of key importance in this regard is that the principle of economic efficiency be given effect through the general administration of the area and that its positive role and functions in respect of the promotion of environmental integrity and human well-being be understood and supported at all levels. Institutional commitment to achieving effective administration of MRNR through, *inter alia*, the allocation of adequate budgets is of paramount importance.

Stellenbosch Municipality, through the Department: Community Services and its Nature Conservation section, is responsible for the management of MRNR. In terms of the principle of *inclusivity* the management of MRNR is an ongoing inclusive process that gives meaningful consideration to the changing and dynamic interests, needs and values of the people of Stellenbosch and those that have an interest in ensuring a sustainable future for the area. In this regard, it is important that the following be achieved:

- a) Continued participation, representation and involvement of all stakeholders promoting broad-based policy learning and capacity development.
- c) Developing and utilising the skills and capacities of the people living in the area in the management of MRNR.
- d) Encouraging on-going involvement of local people in the programs identified for the management of MRNR.

Accordingly, the Municipality is to facilitate the establishment of a Friends of MRNR group that complies with and has the capacity to give effect to the above requirements. Whilst Stellenbosch Municipality is responsible for the general maintenance of the area and the implementation of this EMP it will rely on the Friends of MRNR for specific management activities as required or where the Municipality is limited through capacity constraints. The Municipality and representatives of the Friends of MRNR in turn will serve on the Stellenbosch Protected Areas Forum, attended by the Department of Environment and Development Planning, Cape Nature, Stellenbosch University and representatives from other protected areas throughout the municipal area. The Stellenbosch Protected Areas Forum is technical / scientific in nature and meets on matters concerning the management and conservation of protected areas in the Municipality.

Table 2: Guidelines for inception phase management

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
1	Compile an annual budget for MRNR.	Annual, when required before the start of the new financial year.
2	Facilitate the establishment of a Friends of MRNR group.	On the approval of the EMP.
3	Solicit funds from potential donors.	Ongoing
4	Maximise financial income by determining and imposing appropriate tariffs for outdoor recreation and other uses.	On the approval of the EMP.
5	Plan and manage outdoor recreation by: <ul style="list-style-type: none"> • Identifying the most appropriate sites for various uses. • Formulating appropriate safety rules and emergency measures. • Formulating appropriate rules and regulations for controlling human behaviour. • Determining appropriate social and ecological carrying capacity. • Ensuring sustainable visitor management in accordance with an effective permit system. 	During the first year after the approval of the EMP.
6	Institute and maintain effective law enforcement by appointing and training competent field rangers.	During the first year after the approval of the EMP.

8.2 ENVIRONMENTAL PROTECTION

Natural resources are defined as *any materials, services and conditions that are necessary for the survival of living organisms, and have the potential to enhance quality of life. They are, in a sense, inherited by people, and are therefore part of the earth's (the natural) and people's (the cultural) heritage. Living resource conservation is specifically concerned with plants, animals and micro-organisms, and with those non-living elements of the environment on which they depend. Living resources have two important properties, the combination of which distinguishes them from non-living resources - they are renewable if conserved, and they are destructible if not* (Perry, 1954).

The intention and focus of environmental protection in MRNR is to facilitate the removal or mitigation of threats to the ecology of the reserve, to restore the biodiversity and ecological integrity of the area to the extent that it can function as a self-sustaining system.

8.2.1 Alien Clearing

Invasive alien plants are plant species that have been introduced, either intentionally or unintentionally, to South Africa. They can reproduce rapidly in their new environments and, as mentioned above, tend to out-compete indigenous plants. The result usually includes a variety of negative ecological, social, and economic impacts. Invasive alien species pose the biggest threat to biodiversity after direct habitat destruction.

All efforts must be made to control or, if possible, eradicate all invasive plants. Invasive species that occur in the public road reserve must also be controlled. The following invasive species occur in the reserve:

- *Acacia mearnsii*

- *longifolia*
- *A. melanoxydon*
- *Hakea sericea*
- *H. suaveolens*
- *Pinus pinaster*
- *P. radiata*
- *Eucalyptus* spp.

The Municipality has prepared and adopted the Stellenbosch Municipality Invasive Alien Management Plan (April 2017). In terms of this plan initial clearing methods must be followed-up and monitored to ensure successful clearing of invasive alien plants. Accordingly:

- Clearing efforts should initiate at the top of the infested areas, in terms of slope, and continue downwards. This will reduce erosion effect as well as minimize the re-establishment process of invasive alien plants within the cleared areas from overhead populations.
- Strategic placement of large tree trunks should reduce soil erosion on slopes after invasive alien clearing.
- Removal strategies for clearing invasive alien species in the area should be a combination of mechanical and chemical methods. All species should be removed mechanically by uprooting young plants and tree felling of larger trees (via axe or chainsaw), followed by the application of chemical herbicides to the cut surface to prevent resprouting. Each species has its own corresponding herbicide requirements to prevent resprouting activities and should be applied soon after tree felling. The use of herbicides may have negative effects on the health of soil composition and the natural ecosystem and should thus be used with caution and in reasonable / prescribed amounts.
- Continuous follow-up and removal of new seedlings after the initial clearing efforts are essential in order to clear the property of invasive alien plants. Follow ups and monitoring should occur annually and remaining or re-established invasive species should be removed when located.

Table 3: Guidelines for alien clearing

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
7	Conduct an assessment of the reserve to determine the degree of alien plant infestation.	Within a year of the approval of the EMP.
8	Map the areas that have been infested by alien plants as well as the degree of the infestation.	On the approval of the EMP. After an assessment has been conducted.
9	Map the areas that have been cleared of alien plants, indicating the date of operations, species removed and the current status of the portion of the site.	Annual as clearing is undertaken.
10	Implement the Stellenbosch Alien Invasive Plan (IAP) Management Plan (2017).	Annual between the months of September and May

8.2.2 Flora

'Natural vegetation is the visual expression of the environment, it is a product of the action of environmental factors over time and hence can be a valuable indicator of potential productivity of ecosystems' (Bayer, 1970).

The introduction of non-endemic species in MRNR is forbidden.

As stated above, the mountain catchment areas that feed the Berg River fall within the Fynbos Biome. Fynbos has unique intrinsic water conservation capabilities and, subsequently, plays a critical role in the maintenance of the natural *water cycle*. The overriding objective of water conservation is the management of catchment areas so as to maintain an optimal sustainable yield of high quality water. Maintenance of water yield entails ensuring the capacity of the catchment area to yield water at historical flow rates. In the case of MRNR, the latter objective essentially implies that the Fynbos vegetation in the reserve must be kept in a healthy state.

Table 4: Guidelines for flora conservation

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
11	Institute research to identify sensitive habitats in the reserve and immediate surroundings.	Once the vegetation has recovered to the extent that a reliable information can be gathered and conclusions can be drawn.
12	Institute scheduled research and monitoring to determine the recurrence of species.	Annually
13	Prevent the non-sustainable harvesting of plants used as traditional medicines by dedicated training and education of local people, law enforcement and monitoring.	Annually. Efficiency of strategies to be audited.
14	Simulate natural disturbance regimes to maintain historical vegetation composition.	Annually

8.2.3 Fauna

Biodiversity conservation essentially means conserving all the elements ('parts') of the natural environment. The mix of species in an ecosystem enables that system both to *provide* a flow of ecosystem services under given environmental conditions, and to *maintain* that flow if environmental conditions change.

The loss of biodiversity, therefore, limits the resilience of the affected ecosystem, which in turn, may have direct negative economic implications. Therefore, in order to promote biodiversity conservation in the reserve it is imperative that the conservation of the faunal component receives appropriate attention.

Table 5: Guidelines for fauna conservation

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
15	Monitor and record occurrence of wildlife.	Continually
16	Prevent all forms of unnatural predation through on-going education and law enforcement.	On-going
17	Consolidate the natural habitats of endangered animal species. Promote the functions of the Theewaterskloof Conservancy as an extended home range for specific animal species.	On-going
18	Promote artificial distribution of endemic species. Consider the stocking of rivers endemic fish species and the re-introduction of animal species.	On-going
19	Control all alien animal species.	On-going

8.2.4 Soil

Appropriate measures must be taken to protect areas susceptible to erosion by installing all the necessary temporary and permanent drainage works as soon as possible. Steep slopes and other areas prone to erosion must be maintained or restored according to the following guidelines:

- a) Warning signage displaying NO ENTRY, must be installed on all roads, trails or walkways that are permanently or temporarily closed. Physical barriers, using local natural material, may be constructed where NO ENTRY signs are not respected to prevent users from accessing such roads, trails or walkways.
- b) Existing erosion areas must be back-filled (using on-site material), compacted and restored to a proper condition.
- c) Roads, trails or walkways, permanently closed for use, must be:
 - i) ploughed,
 - ii) the top soil scarified (to make sure that no downhill trenches or drainage lines are created),
 - iii) water diversion walls created by hand at a distance of 10 metres apart (depending on the slope) leading 5 metres into the natural vegetation,
 - iv) and revegetated by either soughing or transplanting appropriate material.
- d) Areas, where the above measures are not sufficient, must be logged, parallel to the contour in order to prevent further soil erosion. Logs must be laid in lines 15 metres apart, depending on the slope (the steeper the slope the closer the barriers must be laid to each other). Logs must be secured by means of steel pegs hammered through a drilled hole on each end of the log (logs longer than 2 metre must be secured by an additional steel peg through the middle of the log). Where logs are laid across a road, the log must be laid up to a minimum of 1 meter past the edge of the road.
- e) Roads (to stay in use) must be graded to have a slight gradient to the inside (up-hill) (refer to Figure 8). A drainage ditch must be created on the inside of the road. Gravel humps must be created at an angle across roads to drain water from the road surface into the drainage ditch. At selected locations (depending on the slope) furrows must be created across the roads surface to discharge the water collected in the drainage ditch. The guiding principle behind the creation of a drainage ditch and discharge furrows is to not allow water to reach a speed at which it will create erosion. After a rain event all roads must be inspected to determine if any maintenance is required.
- f) Erosion sites on bicycle tracks and walking trails must be logged following the contours and spaced vertically 0.8-1.2 meter apart, depending on the steepness of the slope.

- g) Logs must be untreated pine (or gum) poles of not less than 150 mm with a taper of not more than 75 mm over its length.
- h) Cut and fill slopes will be shaped and trimmed to approximate the natural condition and contours as closely as possible and be undulating. Levels, incongruous to the surrounding landscape, will be reshaped using a grader and other earthmoving equipment.

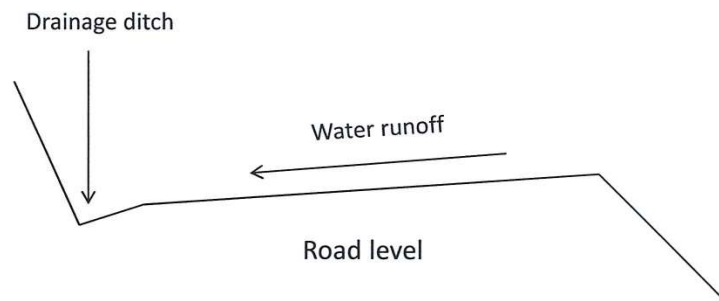


Figure 8: Road surface slope with a drainage ditch

Table 6: Guidelines for the conservation of soils

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
20	Restore erosion sites in accordance with the guidelines above.	On-going Quarterly photographic monitoring at fixed points. Annual auditing.
21	Inspect drainage ditches on all roads after exceptional rain event to determine whether maintenance is required.	On-going
22	Implement preventative measures on potential erosion sites. All roads and tracks, used or closed, are considered potential erosion sites.	On-going Quarterly photographic monitoring at fixed points. Annual auditing.
23	Prevent overuse of routes and sites susceptible to erosion through appropriate signage.	Monthly site inspection

8.2.5 Water

Water is a most critical natural resource in the region. All the sectors and communities in the Franschhoek area are dependent on a sustainable supply of water from the integrated Berg River catchment, together with its quarternary catchments and subterranean aquifers.

Land-use patterns largely influence the maintenance of water yield. Interference with the natural conditions in mountain catchment areas, e.g. draining, canalising or cultivating areas such as vleis, seepage areas, riparian areas and streambed alluvium, is detrimental to the proper functioning of a catchment. It is, therefore, of paramount importance for catchment areas to be managed appropriately.

Table 7: Guidelines for managing MRNR as part of the Dwars River catchment

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
24	Remove all forms of pollution.	On-going
25	Manage invasive alien plants in terms of the Stellenbosch IAP Management Plan (2017).	On-going

8.2.6 Fire

MRNR is susceptible to fire due to activities on in the reserve as well as land uses on adjoining properties. Any fire management regime must therefore provide innovative measures to combat the occurrence and spread of wild fires. The overarching fire management goals as it pertains to the MRNR are to:

- Protect people and property.
- Protect natural and cultural resources from undesirable effects of fire.
- Suppress unwanted fire.
- Allow fire to assume its natural role in the ecosystem.
- Manage fire cooperatively with neighbouring land owners and other stakeholders.

The fire management regime of MRNR is premised upon the following risk management strategies:

Table 8: Fire management strategies

Management Strategies	Guidelines
a) Avoiding the risk	Prohibiting high-risk human activities in close proximity to the reserve.
b) Reducing the hazard	Prescribed burning, preparation of firebreaks or manual clearing of fire hazards as well as regular inspections.
c) Reducing ignitions	Education and awareness programs, fire bans, reduction in activities during high-risk season or periods, efficient ignition investigation.
d) Reducing consequences	Contingency plans, community education programs for self-protection (lives and property), and building restrictions and standards for areas prone to veld fires.
e) Implementing an innovative artificial burning regime	Such regime and associated practices are to reduce the risk of wild fires spreading and causing extensive ecological and financial damage. Such artificial regime implies the creation of a mosaic of veld ages that will enhance the capacity of the area to and maintain its ecological functioning.

This EMP builds on the recognition that the threat of fires to MRNR and the relevant reasons for such threat are unique. Due to surrounding land uses and human behaviour wild fires will probably not be prevented through any measures taken. The solution lies in a combination of options (a), (b) and (c) above.

It is important to understand the basics of fire before preparation can be made for efficient control thereof. It is essential to note that three environmental components are required for a fire to occur. These are oxygen, heat and fuel (refer to Figure 9). Whilst the atmosphere contains 21% oxygen, only 16% oxygen needs to be in the air for a fire to start. Fuel is any living or dead material that will burn. If ignition occurs in the situation or environment where all three elements are present combustion will result and a fire will continue to burn until one of the three elements are removed. It is difficult to exclude oxygen from fires. Heat is considered a constant. However, a

reduction in fuel will reduce the total energy output (refer to Figure 10). Fuel or more specifically the amount of fuel is the aspect that can be influenced most. It therefore becomes the most critical factor in the prevention and control of fire.

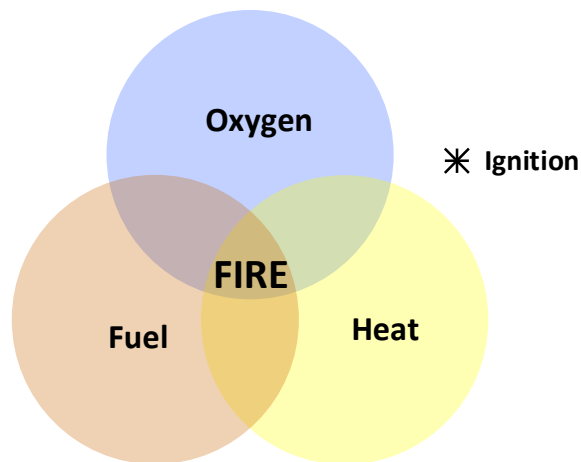


Figure 9: Basic elements of fire

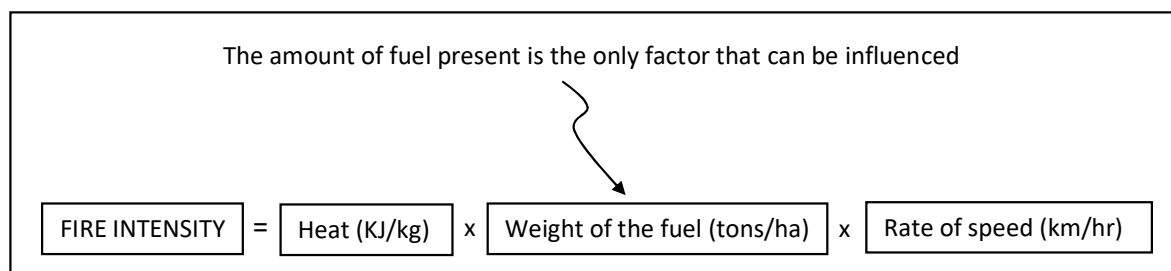


Figure 10: The factors determining the intensity of fire

Two ways of reducing the fuel load are alien vegetation clearing or control and the establishment and maintenance of firebreaks.

8.2.6.1 Alien Clearing

Invasive alien plants are characterised by being able to reproduce rapidly in their new environments, and this is usually due to a combination of factors, including:

- A lack of natural enemies in the new environment
- Resistance to local diseases and other plant pathogens
- Highly competitive growth and colonising strategies that provide them with a competitive edge, and an ability to out-grow local indigenous plants

Invasive alien plants can significantly alter the composition, structure and functionality of ecosystems and increase the fuel load for fires. They degrade the productive potential of the land, intensify the damage caused by veld fires and flooding, increase soil erosion, and impact on the health of rivers and estuaries.

8.2.6.2 Firebreaks

Fire breaks are cleared paths which will prevent the spread of fire by removing the fuel from the fire path. Section 12 of the National Veld and Forest Fire Act *stipulates that every owner on whose*

land a veldfire may start or burn or from whose land it may spread must prepare and maintain a firebreak on his or her boundary between his or her land and any adjoining land. In terms of Section 13 of the Act above a landowner is obliged to prepare and maintain a firebreak, with due regard to the weather, climate, terrain and vegetation. The firebreak must:

- *be wide enough and long enough to have a reasonable chance of preventing a veldfire from spreading to or from the neighbouring land,*
- *not cause soil erosion, and must*
- *be reasonably free of inflammable material capable of carrying a veldfire across it.*

In terms of Section 16 of the National Veld and Forest Fire Act the right or duty to prepare and maintain a firebreak prevails over any other prohibition in any other law on the cutting, disturbance, damage, destruction or removal of any plant or tree, except the owner must where possible, transplant any plant which is protected in terms of any law or where it is safe and feasible, position the firebreak so as to avoid such plant or tree.

A fire break is a means of access for personnel and equipment, to serve as a control line and to serve as a line from where a fire can be attacked from, for example by setting a backburn. The firebreaks are to be linked to access roads, thereby reducing the areas requiring preparation and increasing accessibility to the various sites. Locations where firebreaks are required vary. Individual circumstances will determine what type, width and length will be applicable. When constructing firebreaks it is important that all vegetation cover is removed and that only rocks and soil (minerals) are exposed. A fire can travel very slowly through the grass roots or decayed vegetation and great care must be taken to ensure that minimal earth is exposed throughout the length and width of the break. The following factors must be taken into account with the construction of firebreaks.

- **Access:** The placement of firebreaks on a slope must be determined by access to the break.
- **Slope:** Slope is the steepness of the land and has the greatest influence on fire behaviour. The steepness of the slope affects both the rate and direction of the fire spread. Fires usually move faster uphill than downhill and the steeper the slope, the faster the fire will move. This is because:
 - on the uphill side, the flames are closer to the fuel;
 - the fuels become drier and ignite more quickly than if on the level ground;
 - wind currents are normally uphill and this tends to push heat flames into new fuels;
 - convected heat rises along the slope causes a draft which further increases the rate of spread; and
 - burning embers and chunks of fuel may roll downhill into unburned fuels, increasing spread and starting new fires.
- **Aspect:** Aspect is the direction the land faces - north, south, east or west. The aspect of a slope influences a fire's behaviour in several ways:
 - southern aspects receive more direct heat from the sun, drying both the soil and the vegetation;
 - fuels are usually drier and less dense on southern slopes than fuels on northern slopes;
 - heating by the sun also causes earlier and stronger slope winds; and
 - on south-facing slopes, there will normally be higher temperatures, stronger winds, lower humidities, and lower fuel moistures.

- Terrain: *Terrain* or special land features may control wind flow in a relatively large area. Wind flows like water in a stream and will try to follow the path of least resistance. Ridges, trees, and rocks may alter wind flow and cause turbulence or eddies to form on the windward side of obstructions. Also, when wind flows through a restriction, such as a narrow canyon, it increases in strength. Wind movement can be critical in chutes or steep v-drainages. These terrain features create a chimney effect, causing a forced draft, as in a stove chimney. Fires in these chutes or drainages spread quickly and are dangerous.
- Elevation
- Vegetation type
- Moisture content
- Size and shape of material.
- Volume and area covered.
- Fuel content (breaks alignment should avoid heavy fuel concentrations and be situated in areas with the lightest fuels possible).
- Wind direction (internal belts should as far as possible run parallel with the prevailing winds).
- Spotting distance.
- Firebreaks should be anchored, iether to a natural barrier, road or another firebreak.
- Natural or existing barriers like roads, paths, streams, lakes, vleis, rivers, rock outcrops, or any other break in fuel should be utilise as far as possible.

There are four methods of preparing a firebreak and proper consideration should be given to each before commencing the preparation of a firebreak.

- Manual: Preparing a firebreak manually involves the utilisation of a team of workers working in a planned manner using manual tools.
- Burning: After deciding where the belt is to go, an adequate tracer is cut around the entire belt, and then the belt itself is burnt. This is the most common form of preparing a firebreak.
- Ploughing/brushcutting: Ploughing/brushcutting with a tractor is a common method of constructing breaks where the vegetation is low or has been previously removed. The positive thing with brushcutting is that the roots are not destroyed and this will assist in reducing erosion on these breaks. Bushcut material should be removed two months after cutting.
- Application of herbicide: With this method herbicide is used to kill off all the plant growth in the firebreak.

There is currently one firebreak maintained for MRNR and that is the break below the Franschoek Pass between MRNR and the urban area of Franschoek town (Figure 11).

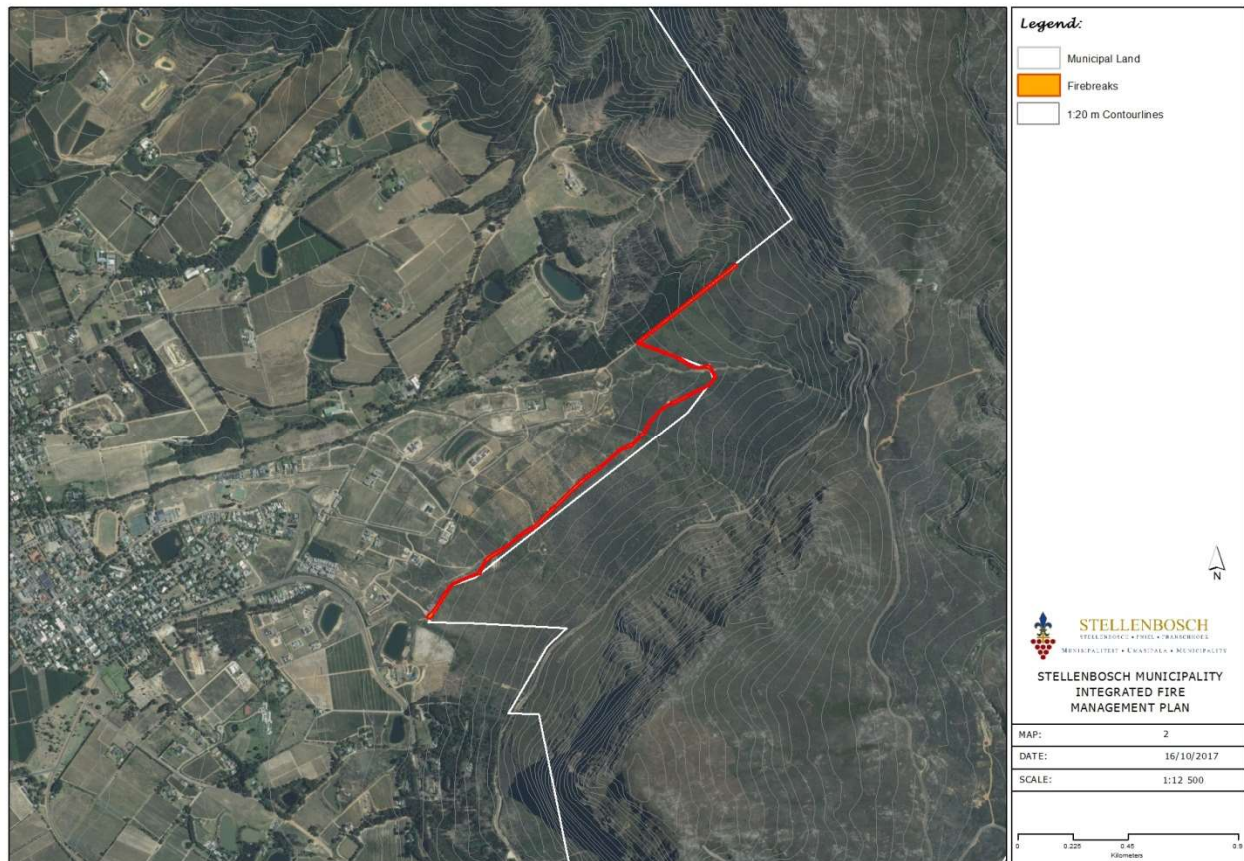


Figure 11: Firebreak below the Franschhoek Pass

Table 9: Guidelines for management of fire within MRNR

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
26	Maintain the existing firebreaks.	Annually Completed by end October
27	Conduct inspection of the area along with a representative of the local fire protection association to identify the need for additional firebreaks.	Immediately
28	Prepare firebreaks as required.	Completed by end October
29	Prepare and maintain a register of veld fires including the extent and date.	Compliance audited annually

8.2.7 Human-Made (Cultural) Environs

Development inevitably modifies the environment. In order to accommodate all of the functions of MRNR, it is important that a certain level of change or modification be accepted. However, such an acceptance requires responsible land ownership based on the following fundamental principles:

- **Owning is belonging:** In order to conceive land ownership it is necessary to realise that land parcels are inherently connected and that each parcel, and hence each owner, belongs to a larger community. A person is unlikely to use land responsibly without an awareness of the seen and unseen links, the inevitable spill-overs and externalities.

- **Embracing our ignorance:** In environmental management a prominent place is needed for human ignorance. Land ownership should include the obligation to use the land humbly, within the limits set by the land - limits that are often badly understood. The correlative rule is an acceptance of liability for land degradation and a pledge to do what is possible to restore it and of finding ways to avoid problems before they arise.
- **Sensitivity to place:** Given the complexity of nature and the paramount need to promote community well-being, land use norms must stimulate an attention to place and foster a willingness to tailor land uses to the characteristics and possibilities of each tract. Land uses must be set, not just by what is economically and physically possible in a place, but by the role of the tract of land in the surrounding ecosystem.
- **Promoting local knowledge:** Good land use is best understood as an art, tailored to the uniqueness of each place and sensitive to the possibilities and limits set by nature. Local knowledge is often tied to the terrain, soils, climate, hydrology, biodiversity, and economy of a place, arising by cautious, trial-and-error methods that environmentalists have come to call *adaptive management*.
- **Landscape-level planning:** Good ownership will include the owner's (or custodian's) participation in landscape-level planning. Land health cannot revive without plans that cover large areas, such as watersheds, ecosystems or bioregions.

Table 10: Guidelines for management the man-made environs

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
30	Ensure that development within MRNR fits with the scale, landscape and use of the area.	Ongoing
31	Record all significant archaeological manifestations. Institute research programmes to obtain reliable data of archaeological manifestations.	Annually
32	Control human impact on archaeological sites by instituting an effective permit system to control access.	Annually
33	Erect barriers and pathways/ board walks to regulate movement at sensitive sites.	Ongoing
34	Develop appropriate facilities and infrastructure.	Ongoing
35	Ensure appropriate management of the facilities and infrastructure.	Ongoing
36	Regulate the construction of roads, trails, and other facilities.	Ongoing

8.2.8 Tourism and Outdoor Recreation

It is imperative for the management of MRNR to be as professional and cost-effective as possible, and to optimise the direct financial income that can be derived from its use. MRNR has an important function in terms of providing recreational opportunities for Franschhoek and the region as a whole in that it provides for a number of nature-related opportunities that enhance regional tourism significantly. It is, therefore, important that the principle of economic efficiency be incorporated into the general management of MRNR and that its positive role and function in respect of the economic sectors (specifically tourism) be understood and promoted. Tourism is the fastest growing industry in the world. It is believed that tourism based upon protected areas could become South Africa's biggest industry in the 21st century. With imaginative marketing and appropriate pricing structures there is substantial financial income to be realised from tourism

(Turpie & Siegfried, 1996). Wesgro (1992) confirms the above statements and describes tourism as the most important growth stimulus in the economic development of the Western Cape. Tourism influences a variety of economic sub-sectors such as trade, accommodation and catering, manufacturing, agriculture, angling, hunting, personal services and transport. Tourism thus contributes substantially to regional production and job creation.

Tourism has huge potential for stimulating sustainable growth and development in the Franschhoek. The region has a wealth of unique tourism resources, the primary intrinsic attributes being the exceptional aesthetic quality and uniqueness of its landscapes, a range of natural and cultural resources, a diversity of communities with unique cultures, and unique agricultural enterprises and land use forms. In addition, tourism is a cost-effective provider of employment, with strong linkages to the local economy, and it represents a substantial multiplier effect. Ecotourism¹¹, in particular, can provide economic justification for the conservation of areas that may otherwise not receive protection, and generate revenue for the management of these areas, and the upliftment of local communities.

However, tourism also has the potential for having a huge impact on the environment. Being one of the least regulated industries, tourism has the potential to induce devastating environmental and cultural changes. It is therefore important to develop tourism in a sustainable manner. To ensure sustainable growth and profitability in the tourism industry, the following challenges need to be faced:

- a) A substantial portion of the tourism benefits must find its way into the local communities.
- b) *'Practice what we preach'* in tourism developments and operations (e.g. ensure that all new developments in the natural environment qualify as 'unobtrusive' and 'environment-friendly').
- c) Integrate the cultural and natural heritage when putting together tourism packages.
- d) Re-invest a substantial portion of tourism profits in the maintenance of the cultural and natural resources.
- e) Create a strong element of ecological and cultural awareness with tourists in order to ensure environmental sustainability.

Table 11: Guidelines for management of tourism and outdoor recreational opportunities

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
37	Involve entire community in tourism by developing and instituting educational programmes in local communities.	Annually
38	Ensure direct or indirect benefit to the total community by creating opportunities for the small business sector (e.g. sale of products, crafts, etc.). Promote the 'multiplier effect' or 'fringe benefits' of tourism (refer to additional jobs for local communities, improved local markets for products).	Ongoing

¹¹ Eco-tourism is defined as *'purposeful travel to natural areas and resources to utilise these areas and resources, to increase the understanding of the cultural and natural history of the environment, taking care not to alter the environment, producing economic benefits that make conservation of natural resources beneficial to the local people'*.

8.3 LAND USE MANAGEMENT

8.3.1 Management / Use Areas

Because the area has a spectrum of uses and comprises an area with variable degrees of degradation, ecological importance and topographical characteristics, a uniform set of management principles and rules for utilisation of the area is not feasible. The area must be retained as a public resource, used for recreational purposes on a daily basis whilst the environmental integrity of the area is protect at the same time. The management and use of the MRNR is therefore predribed by way of defining the areas within which the various activities or use is allowed within. Applying CapeNature’s zoning classification of protected areas MRNR is mainly zoned Primitive with some infrastructure and Development, associated with the erven within the reserve (see Figure 12).

The purpose of the zonation of MRNR is to control the intensity and type of use within the reserve in an effort to ensure the main goal of biodiversity conservation is met. Table 13 describes the various areas depicted by Figure 10 below.

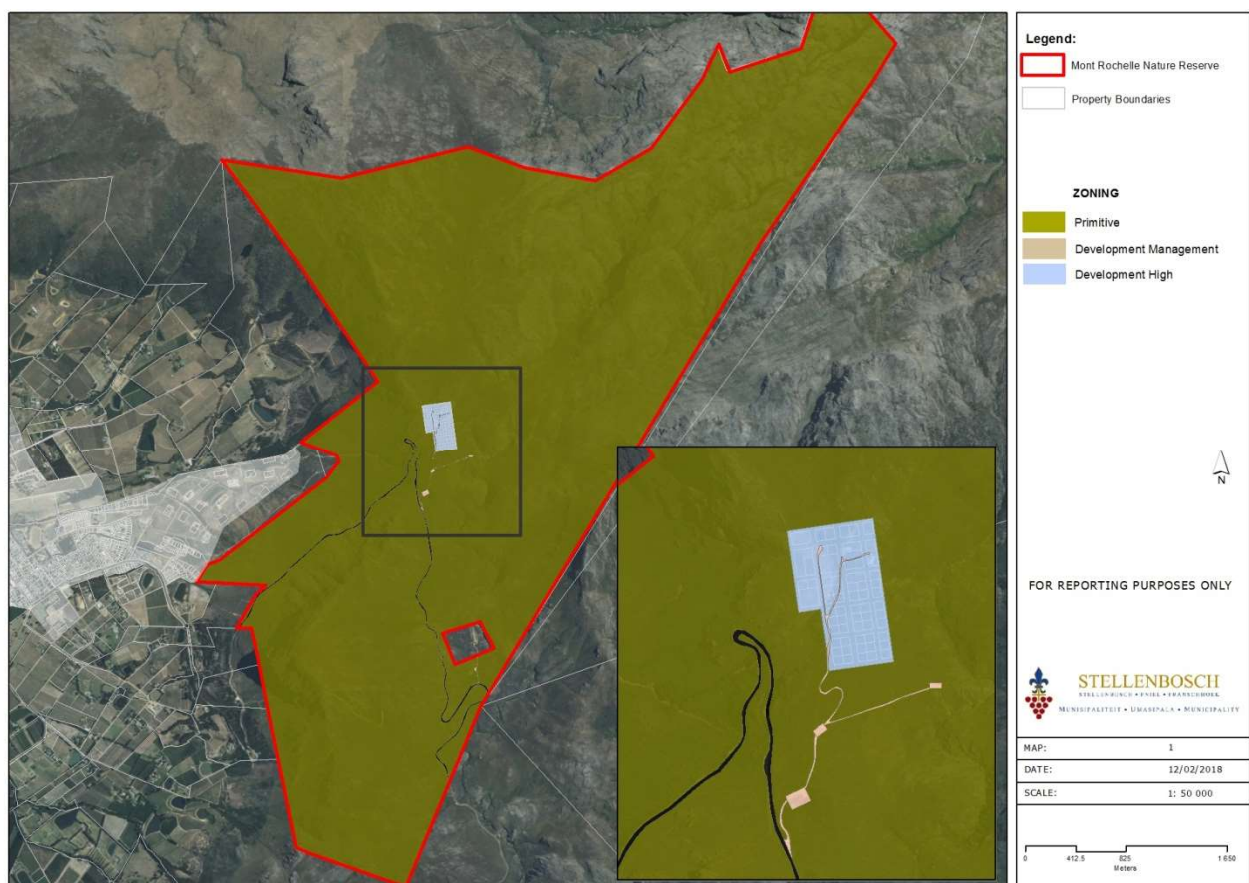


Figure 12: MRNR Zonation.

Table 13: MRNR Management / Use Areas

Area		DEFINITION AND USE
	Primitive	<ul style="list-style-type: none"> • Intrinsically wild appearance and character. • Areas where users will seldom encounter other human groups or presence. • Any visible human impact or infrastructure inside the zone is unobtrusive. • Human activities outside zone may be audible or visible in places. • Areas remote from management centres, or otherwise difficult or expensive to access for management. • Areas that might not meet the criteria for Wilderness but can serve as undeveloped visual buffers for Wilderness. • Areas that may have natural burning regimes, with no active fire management and road/firebreak infrastructure OR areas that require active fire management to stay within thresholds of concern.
	Use	<ul style="list-style-type: none"> • Research • Hiking • Trail-running • Appropriate events
	Development (Management)	<ul style="list-style-type: none"> • Existing infrastructure and utilities. • To allow for access and recreational activities. • To actively manage users and visitor impacts on adjacent sensitive areas. • To provide access to adjacent natural landscapes with no expectation of solitude. • Can provide for Environmental Education accommodation and access into surrounding landscapes.
	Development (High)	<ul style="list-style-type: none"> • Private property. • Homes constructed based on approved building plans that suite the character of the landscape.

Table 14: Guidelines for management of MRNR Management / Use Areas

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
39	Communicate the applicable use areas and associated appropriate activities through signage at the entrance and on-site.	Immediately after EMP approval.
40	Conserve and protect Primitive area.	Audited
41	Inspect recreation areas within the Primitive area to assess the impact of use and degradation.	Annually
42	Implement necessary rehabilitation works where required.	Ongoing

8.3.2 Recreational Use

A primary function of MRNR is to enhance the well-being of the people of Franschhoek, Stellenbosch Municipality and those visiting the area. Accordingly, MRNR has an important role, namely to provide the foundation for recreational and tourism opportunities which are environmentally compatible.

Rules applicable to the recreational use of the area are:

- a) Entry and use is at a person's own risk. Stellenbosch Municipality and/or its employees shall not be liable for any damage, loss, theft, injury, accident or death suffered by any person, howsoever caused.
- b) No lighting of fires.
- c) No smoking.
- d) Only approved / designated roads, trails or tracks may be used. The construction or clearing of new roads, trails or tracks are prohibited.
- e) Public vehicle / motorised access to the area is prohibited unless authorised.
- f) Visitors to comply to all signage including access signage and route markers.
- g) Any user of the area utilising the area for hiking, cycling or any other permitted activity must be equipped with the necessary safety gear and equipment.
- h) All users must utilize the area in a manner that considers the enjoyment and safety of other users.
- i) Various routes (roads, tracks or trails) may exclude particular activities such as cycling. In such cases where a route is temporarily closed for rehabilitation or maintenance, or permanently excludes a particular use, appropriate signage will be installed to communicate such information which must be adhered to as in (f) above.

Table 15: Guidelines for management of recreational use of MRNR

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
43	Audit all roads, trails and tracks and update maps accordingly. Decide on the appropriate use (or decommissioning / rehabilitation) thereof and install appropriate signage.	Immediately after EMP approval.
44	Maintain existing roads, trails and tracks to be fit for recreational use.	Ongoing
45	Inspect roads, trails and tracks to be fit for recreational use.	Monthly during summer or after heavy rain events. Weekly during summer.
46	Repair damaged roads, trails and tracks.	Ongoing
47	Close routes that require maintenance or rehabilitation and are not deemed to be safe for recreational use by installing appropriate signage and access barriers.	Ongoing
48	Inspect and maintain signage and route markers throughout the area.	Monthly

8.3.3 Access Control

Access control, or the lack thereof, is a threat to the management of the area influencing secondary threats such as the security of the area, vandalism and fire. Existing access control is inadequate and must be addressed. Access control requires that the perimeter of the area is secure and access regulated.

Table 16: Guidelines for management access control

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
49	Audit existing access-points to the reserve.	Immediately and

		ongoing
50	Audit existing access control infrastructure.	Immediately
51	Audit existing locks and ownership of keys.	Ongoing
52	Keep a register of key-holders.	Ongoing
53	Maintain fulltime manned access control at the MRNR main gate.	Immediately
54	Deploy additional staff with direct communication with law enforcement to monitor the area.	Immediately and ongoing

8.3.4 Municipal Infrastructure

MRNR houses municipal infrastructure. It is important that the Municipality are able to access, maintain and effect required improvements to these infrastructure. Although the importance of these works can not be underestimated it must be planned and executed in a manner that has the least possible impact on the area.

Table 17: Guidelines for management of municipal infrastructure

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
55	Maintain all infrastructure in good working order.	Ongoing
56	Development proposals or plans for maintenance work within MRNR to be circulated to the Department: Community Services for input.	Ongoing

8.3.5 Events

MRNR is an important resource used for spiritual, scientific, educational, recreational and tourism opportunities. Stellenbosch Municipality receives various applications for events in MRNR for consideration. It is the Municipality's responsibility to ensure that such events are compatible with the area, that such an event does not present a threat or impact to the area that cannot be avoided or mitigated and that the area ultimately benefit from such an event. In order to give effect to the potential of MRNR in this regard events must be used as a way to create a strong element of ecological and cultural awareness with event organisers and participants in order to ensure environmental sustainability. The following applies to events in MRNR:

- (i) Events are to be held in a manner that has the least possible negative environmental impact.
- (ii) Event applications must be submitted timeously for consideration, preferably 90 day prior to such an event.
- (iii) Potential impacts of an event must be considered by the municipality and an approval granted only if such impact is considered to be acceptable or is of such a nature that the likely impacts can be avoided and/or mitigated.
- (iv) The applicant applying for an event license is to provide a scope of the proposed event activities, an assessment of the likely environmental impacts of such activities, recommended mitigation measures to be implemented and the degree to which the proposed mitigation measures are expected to address the identified environmental impacts.
- (v) An application for an event in a nature area is to be circulated to the relevant municipal department tasked with the management of such an area for consideration, comment and

the provision of conditions before a decision for the granting/refusal of an event license is made.

- (vi) An applicant may be liable for an application fee, the criteria of which have been approved by the Council of Stellenbosch Municipality.
- (vii) An event license granted is only valid upon acceptance of the set conditions for the hosting of the particular event and payment made of the application fee by the event organizer.
- (viii) Unless specified otherwise, the event organizer assumes responsibility for the event's compliance to conditions imposed during the granting of an event permit.
- (ix) The event organizer is responsible for any rehabilitation to a nature area damaged or degraded during an event. The scope of such rehabilitation work will be the restoration of an area to the state prior the hosting of the relevant event.
- (x) In the event that rehabilitation work is required the municipality may direct an event organizer to investigate, evaluate and assess the impact of specific activities and report thereon and to complete rehabilitation measures before a specified reasonable date.

Table 18: Guidelines for events in MRNR

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
57	Consider all events in the area in terms of the above criteria.	Ongoing
58	Development a set of application fees for submission to Council.	Immediately after EMP approval.

8.3.6 Development

It is imperative that the integrity of MRNR be protected through appropriate planning and management intervention. Accordingly any physical development in MRNR is to be planned and implemented to have the least possible impact and to have any such impact mitigated. Development within MRNR must reflect the principles described in Section 8.2.7 above.

Table 19: Guidelines for development

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
59	Development proposals within MRNR to be circulated to the Department: Community Services for comment.	Ongoing

8.4 ENVIRONMENTAL AUDITING

This EMP builds upon the notion that uncertainty (or lack of knowledge) about the status and function of ecosystems can be addressed in an *adaptive management strategy* - an approach that relies on continual assessment and adjustment. Although repeated revision of management decisions is at the core of adaptive management, this does not threaten resource security, rather it provides for sustainability of resource use. Threats to resource security can be minimised if management objectives are set clearly. In addition, adaptive management will reduce the sort of pressure that stymies action because initial choices are not viewed as final. The dimension of continual improvement is embodied in adaptive management. Continual improvement is defined as the process of enhancing management actions to achieve improvements in overall performance (i.e. remaining dynamic). It is achieved by continually evaluating environmental performance against set environmental policies, objectives and targets with the purpose of identifying opportunities for improvement. Accordingly, the MRNR EMP is a dynamic document which is

subject to updating and amendment in accordance with the results of monitoring and auditing and the outcomes of on-going scientific research.

8.4.1 Auditing Strategies

Table 20: Auditing actions

REF -NR	ACTIONS/IMPLEMENTATION	TIME FRAME
60	Audit all documented impacts of management actions on the environment.	Annually in October.
61	Implement procedures for handling incidents of non-conformance with the EMP.	Annually in October.
62	Manage environmental records, including the results of audits and reviews.	Immediately after EMP approval.
63	Submit audit report to the Council.	Annually in October.

8.4.2 Auditing Procedures

The environment audit to be undertaken is a methodical examination of the site's environmental information to verify whether, and to what extent, the management actions have complied with set performance criteria. The review of the EMP on a five-year basis is based upon the results of the environmental audits the objective being to ensure its continuing appropriateness and effectiveness.

The environmental audit consists of three stages, namely *pre-audit*, *on-site audit* and *post-audit*. Pre-audit includes the administrative issues associated with planning the audit, selecting the institution to conduct the audit, and preparing the audit protocol. The main purpose of the pre-audit stage will be to develop an audit plan, based on the most recent information and the results of the previous year's audit. The audit plan must also address where the audit is to be conducted, what the scope and objectives of the audit are, how the audit will be conducted (keeping in mind that the results of the audit must be comparable to previous year's audit results), and when the audit is to be conducted.

The on-site audit involves the recording of required information. The audit team gathers information by observation, conducting photographic studies, taking measurements, and conducting tests as was determined during the pre-audit stage. During the on-site audit stage the strength and weaknesses of the methods of information gathering must be evaluated in order to determine whether the process of auditing is effective in achieving its goal. In keeping with the adaptive management approach, the auditing process must also be looking for continual improvement. All the information obtained is recorded and a comprehensive record of the audit and the state of affairs produced.

The audit report is completed during the post-audit stage. Such report will reflect previous results, current results, and recommended improvement goals. The audit report will also indicate failures or deficiencies and recommendations for corrective actions.

8.4.3 Environmental Indicators

Table 21: Environmental Indicators for the auditing process (*Environmental Indicators for National State of the Environment Reporting* [DEAT, 2002]).

ENVIRONMENTAL MANAGEMENT	
Environmental Management	EM01 – Multilateral environmental agreements EM02 – Budgetary allocation to natural resource management EM03 – Budgetary allocation to environmental education EM04 – Budgetary allocation to environmental research EM08 – Voluntary use of environmental accounting and reporting EM10 – Environmental reporting by the Municipality
BIODIVERSITY & NATURAL HERITAGE	
Species Diversity	BD01 – Threatened and extinct species per taxonomic group BD02 – Endemic species per taxonomic group BD03 – Alien (non-indigenous) species per taxonomic group BD04 – Population trends of selected species BD05 – Distribution and abundance of selected alien species
Habitat Change	BD06 – Extent of conserved area BD08 – Disturbance regimes: fire frequency
Resource Value	BD11 – Contribution to job creation: eradication of alien species
LAND USE	
Land Use	LU01 – Land cover LU02 – Land productivity vs potential
Land Condition	LU03 – Soil loss LU04 – Land degradation

9 VALIDITY

The MRNR EMP is based upon and aims to give effect to a long-term vision for the area which is not subject to *ad hoc* or short-term amendment. However, in terms of the principle of continual improvement the EMP is subject to revision in accordance with the results of on-going monitoring and auditing to be undertaken as described in Chapter 8.4. It will be valid, in its current form, for a period of 5 years from the date approved by Council of Stellenbosch Municipality after which revision has to be considered.

Within this period addition or amendments to the EMP can be considered as approved by the established Friends of the MRNR. These additions or amendments will be added to the document as addendums before being included in the document on revision. Examples of such addendums may include documents such as:

- a) Updated maps,
- b) Founding documentation on the proposed “Friends of the MRNR”,
- c) Updated rules on recreation, access, etc.

10 CONCLUSION

The MRNR EMP is a mechanism intended to facilitate the achievement of the vision set for the area. The EMP and its associated processes of community participation, education and performance auditing presents an opportunity for all concerned to participate in the long-term management of the area for the benefit of the current and future generations. The implementation of the EMP presents the first step in such process. This document should therefore not be seen as a final product, but rather as a step towards the implementation of integrated bioregional planning as *‘an organised process that enables people to work together, think carefully about the potential and problems of their region, set goals and objectives, define activities, implement projects, take actions agreed upon by the communities, evaluate progress and refine their approach’*.