



South African
NATIONAL PARKS

Mountain Zebra National Park

PARK MANAGEMENT PLAN

October 2006

AUTHORISATION

This management plan is hereby internally accepted and authorised as the legal requirement for managing Mountain Zebra National Park as stated in the Protected Areas Act.

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Executive Summary

SANParks has developed a Biodiversity Custodianship Framework to plan, integrate, implement and review the biodiversity conservation, tourism and constituency building components that make up its core business, whilst ensuring continual learning and compliance with DEAT norms and standards. The Mountain Zebra National Park (Mountain Zebra NP) is situated in the Eastern Cape, on the Northern slopes of the Bankberg mountain range in the Cape Midlands. It was proclaimed in 1937 for the purpose of protecting a remnant population of the Cape Mountain zebra *Equus zebra zebra*. As such it has played a principle role in conserving this endangered species, but has now grown beyond a “species park” to focus on conserving the biodiversity of the region.

The climate of the Mountain Zebra NP is best described as cool and arid, with its mountainous terrain forming part of the south quarter of the Karoo Mountain Veld Complex of the Great Escarpment. The park is located in a transitional area between four biomes: Grassland, Nama Karoo, Thicket and Savanna. All of the major vegetation types are currently very poorly conserved elsewhere in South Africa. Being a transition area between biomes allows for an interesting mix of flora and fauna, as well as important ecological and landscape processes. Besides mountain zebra, the habitats within the park support a variety of other large mammalian species, including Cape buffalo and black rhinoceros as well as a number of plains zebras that have been selected for morphological traits that resemble the quagga (as part of a programme to ‘recreate’ this extinct subspecies of the plains zebra). The Mountain Zebra NP also supports diverse small mammal and reptile communities, as well as 216 species of birds, with a good representation of raptors. There is also a rich, largely undescribed, invertebrate fauna. These vital attributes of Mountain Zebra NP are largely determined by the steep gradients associated with the surrounding mountains, the geology and soil, climate and rainfall typical of the region, known historically as the Cape Midlands. Climate change and development of conflicting land uses present the biggest threats to Mountain Zebra NPs vital attributes.

The Vision and Mission of Mountain Zebra NP recognise the importance of conserving the characteristic elements that make up the Karoo, including both the patterns and processes associated with this landscape. The vision and mission also reflect Mountain Zebra NP’s commitment to conserve these elements for the appreciation of all its stakeholders. Mountain Zebra NP’s desired state is a fully functioning ecosystem that maintains the patterns and processes characteristic of the Karoo. While the focus is on maintaining the integrity of the biophysical component of Mountain Zebra NP, this is for the appreciation of all stakeholders. Programmes to achieve Mountain Zebra NP’s desired state fall within four categories, i.e. Biodiversity and heritage conservation, Constituency building, Sustainable tourism and Effective park management:

i) Biodiversity and heritage conservation

The purpose of Mountain Zebra NP’s park expansion programme is to link Mountain Zebra NP with Camdeboo National Park by means of state-private conservation partnerships. This expansion has the potential to offer a unique African Karoo wildlife experience, and would protect a diverse assemblage of plants and animals in an area known for its picturesque scenery. Much of the land between the two reserves is unsuitable for any land-use other than conservation, hunting or ecotourism, and significant areas are already run as private game reserves. The purpose of Mountain Zebra NP’s cultural resource programme is to manage and sustain the significance, authenticity and integrity of the tangible and intangible cultural heritage resources for which the SANParks is responsible, for the enjoyment and benefit of all South Africans and of the world. In order to fully comply with all management requirements for cultural heritage resources in the park a number of initiatives have been planned and will be implemented within the next five years. In line with SANParks’ corporate herbivore management policy, herbivore management in Mountain Zebra NP will undergo a

shift in emphasis away from paradigms designed for livestock production. The key to maintaining the full spectrum of indigenous herbivores is patch diversity rather than uniformity. There should be a range of heavily grazed to very lightly grazed areas. In relatively small parks such as Mountain Zebra NP, biodiversity is likely to be lost unless large herbivore populations are managed. Managing Mountain Zebra NP within its desired state will be achieved through strategic adaptive management. This entails setting Thresholds of Potential Concern (TPCs) to reflect the threats facing the system, monitoring the state of the system in relation to the TPCs, and taking management action when a TPC is reached. Appropriate TPCs relating to both the impact of mountain zebras on vegetation, as well as the impact of other herbivores on mountain zebra habitat, should be identified. Capacity to maintain the intensive monitoring programmes is a critical requirement to successfully implement this approach. A realistic prioritization framework has been developed to aid in decision-making regarding sensible allocation of resources for species conservation. Within this context, the Cape mountain zebra is the primary species of special concern in Mountain Zebra NP. Historical land use in Mountain Zebra NP has led to extensive transformation such that some areas require rehabilitation in order to prevent loss of ecosystem functioning. The three main areas of rehabilitation required in Mountain Zebra NP are vegetation transformation, alien plant infestation and soil erosion. Reintroductions of any animal species must conform to the SANParks policy on reintroduction. At present the only immediate plans for reintroducing carnivores into Mountain Zebra NP involve cheetah, to contribute towards the metapopulation conservation of this endangered species in South Africa. It also forms part of a long term plan to enlarge the park and to reintroduce all mammals that occurred there historically. On the basis of current evidence, it appears desirable for management to promote as far as possible the natural occurrence of fire. To achieve this it is desirable to allow lightning fires to burn to their natural extent rather than to put them out as quickly as possible. This needs to be reconciled with the issues of fire security.

ii) Sustainable tourism

Mountain Zebra NP has a park zoning plan that divides the park into areas of different use, to guide and co-ordinate conservation, tourism and visitor experience initiatives. The tourism programme, in alignment with South African tourism goals as well as SANParks corporate values and operating principles, aims to provide a true Karoo ecotourism experience by developing the infrastructure, and offering a variety of activities and quality service. Objectives to address this aim include providing adequate training for personnel, upgrading and developing the tourist infrastructure in order to increase revenue significantly, expanding tourist activities in order to enhance the ecotourism experience, expanding the size of the park, and marketing the park effectively in order to increase the number of visitors to the park. It will therefore be crucial to develop the marketing and commercial development programmes for Mountain Zebra NP during the next 5-year cycle.

iii) Building co-operation

Existing poverty relief projects under Mountain Zebra NP's Stakeholder Relationship Programme include Working for Water, Working for Wetlands and Poverty Relief Programme (upgrading of chalets and erecting of fence). The purpose of Mountain Zebra NP's local socio-economic development programme is to play a significant, targeted and effective role in contributing to local economic development, economic empowerment and social development in communities and neighbouring areas adjacent to Mountain Zebra NP by partnering with Local Government to form part of the Integrated Development Plans (IDP's), participating in Government Programmes (*WfW*, EPWP, etc.) to contribute to local skills development by supporting learnerships, implementing needs related training programmes and by creating business opportunities. The Expanded Public Works Programme (EPWP) will remain a significant focus area of the organisation to effectively contribute to the creation of temporary jobs in the short term, sustainability by investigating exit opportunities and entrepreneurial opportunities for local communities. These programmes are aimed at local poverty alleviation and therefore total funding is meant for labour costs and the contracting of

local entrepreneurs or SMME's. Preference is given to contractors from historically disadvantaged communities. Mountain Zebra NP is not involved in any organized, full scale resource use from the area. The only resource that becomes available is in the form of venison during annual harvesting operations. These operations form part of the management of large herbivores.

iv) Effective park management

Mountain Zebra NP will make use of the previously developed Strategic Management Plan (SMP; as part of its Integrated Environmental Management System) as the framework for park management action. The SMP indicates where the Park Management Team intends to focus its efforts in the next five years. Unless they are identified as having strategic importance, the SMP does not identify every maintenance, routine management operation or crisis response that integral to park operations – the SMP only prioritizes key management strategies required to achieve the long term management objectives directed by the Park Policy. Mountain Zebra NP's infrastructure development programme recognises existing infrastructure and details plans for developing new infrastructure. Such developments include upgrading of existing internal roads, tarring of the remainder of the entrance road, construction of a new entrance gate, replacement of the existing Eskom powerline to the restcamp, construction of 30-km of new tourist roads and a tented camp at Doornhoek, as well as construction of two new junior staff houses. The infrastructure development programme also details rehabilitation and decommissioning requirements such as the removal of redundant structures in particular areas of the park. The financial sustainability programme details the funding required to advance Mountain Zebra NP towards its desired state. It reveals that shortfalls include funding for infrastructure development and park expansion, and that significant sources of current funding, for example Working for Water, Working for Wetlands and other Expanded Public Works Programmes, are not guaranteed for the future. Corporate support for Mountain Zebra NP includes an increase in staff capacity (e.g. a dedicated research technician) to carry out the monitoring that is essential for the successful implementation of the biophysical programmes to achieve the desired state, and particularly to ensure the learning required by SANParks' new adaptive management approach. The purpose of the Safety and Security Plan is to put pro-active measures in place to ensure the safety and security of all people, assets, and resources in the park. The plan focuses on identifying weaknesses, strengths, threats and opportunities, identifying all roll-players. Mountain Zebra NP is not currently faced with any serious safety or security threats. Potential threats vary from poaching to robbery and natural disasters such as fires or floods. The AIDS/HIV programme for Mountain Zebra NP forms part of a broader SANParks initiative. Mountain Zebra NP will make use of the comprehensive Risk Management Framework provided on a corporate level by SANParks, incorporating corporate risk management policy, procedures and methodology. Finally, the communications programme for Mountain Zebra NP follows the Corporate Communications policy.

The essential feature of the adaptive management system employed by SANParks for its biodiversity custodianship is the iterative way in which it will enable continual improvement in the management of each park through annual and five-year review cycles. The SANParks review process employs the Balanced Scorecard system to manage the performance of its management actions. The Balanced Scorecard integrates SANParks' and park-specific objectives across all levels of its staff through explicit linkages with individual performance areas.

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List of acronyms and abbreviations used

DEAT – Department of Environmental Affairs & Tourism

EPWP – Expanded Public Works Programme

SANParks – South African National Parks

Mountain Zebra NP – Mountain Zebra National Park

SANF – South African Nature Foundation

TPC – Threshold of Potential Concern

HR – Human Resources

V-STEER – The values (social, technological, economic, ecological and political), used to understand, with stakeholders, the social, economic and ecological context of the system to be managed, and the principles/values that guide management. These are used to develop a broadly acceptable vision of the future.

Glossary of selected words

Balanced Scorecard – the performance management tool used by SANParks to ensure feedback and effective implementation of various management objectives

Objectives hierarchy – the objectives for a park, with the most important, high level objectives at the top, cascading down to objectives at finer levels of detail, and eventually to operational actions at the lowest level

Desired state- the overall conditions of the park (across the full V-STEER range) that stakeholders desire

Vision – a word “picture” of the future, or what the stakeholders see as the future for the park

Mission – an articulation of the Vision that describes why the park exists, and its overall philosophy on how to achieve its desired state

Vital attributes – unique or special characteristics of the park, the determinants of which management should strive to protect, and the threats towards which management should strive to minimise

1. BACKGROUND TO AND FORMULATION OF PARK DESIRED STATE

The proclamation of the National Environmental Management: Protected Areas Act No. 57 of 2003 (NEM: PAA) in 2005 required existing park management plans to be reformulated in compliance with this Act. In accordance with the specific requirements, SANParks has developed a Biodiversity Custodianship Framework (Rogers 2003) to plan, integrate, implement and review the biodiversity conservation, tourism and constituency building components that make up its core business, whilst ensuring continual learning and compliance with DEAT norms and standards (Cowan 2006; see Coordinated Policy Framework document). The essential feature of the system is the iterative way in which it will enable continual improvement in the management of each park through annual and five-year review cycles. The first step in developing/revising a management plan is to develop the desired state of the park, which guides park management in its daily operations. The desired state is drafted every five years with the involvement of representative stakeholders, and forms a bridge between the long term Policy and Vision for the Park, and the medium term (five year) priorities and resources available to attain that vision.

The management plan for Mountain Zebra National Park (Mountain Zebra NP) has been formulated using this Biodiversity Custodianship Framework and adaptive planning process. The adaptive planning process involves setting the fundamental decision-making environment, understanding the V-STEER system to be managed, and prioritising objectives for each park. Having been proclaimed in 1937, Mountain Zebra NP is in the maintenance phase of the protected area life cycle.

The desired state for Mountain Zebra NP comprises a Vision and Mission reflecting the high-level essence of what Mountain Zebra NP is aspiring towards, and a hierarchy of objectives translating these broad values into strategic, auditable management outcomes. This section of the plan details the setting of Mountain Zebra NP's desired state, focusing on the determinants and threats to its vital attributes, and translating the maintenance of these determinants and overcoming of these threats from broad objectives into specific and auditable management actions.

Thereafter, specific programmes to achieve the desired state for Mountain Zebra NP are detailed. These programmes are the core components of protected area management, and for SANParks comprise biodiversity conservation, sustainable tourism, building co-operation and effective park management. Finally, the plan outlines how the various Mountain Zebra NP park objectives will be prioritized, integrated and operationalised, and which feedback mechanisms will be used to ensure compliance, auditability and maximum learning, as part of the adaptive management cycle.

1.1 The fundamental decision-making environment

As with all SANParks, the objectives and management of Mountain Zebra NP must be aligned with SANParks' Vision and Mission:

Vision

National parks will be the pride and joy of all South Africans and of the world.

Mission

To develop and manage a system of national parks that represents the biodiversity, landscapes, and associated heritage assets of South Africa for the sustainable use and benefit of all.

While adhering to the SANParks vision and mission, the three pillars of the decision-making environment are the park-specific mission statement, the context of/for the managed system (at local, regional, national and international levels and at ecological, socio-economic,

political and legal levels), and thirdly, the values and operating principles. While a park's vision is a concise statement describing its core business and philosophy of management, a statement of the operating principles describes the core values of the organisation. SANParks Biodiversity and corporate values have been set but they may need to be supplemented by operating principles that meet specific needs of an individual National Park.

1.1.1. Vision and Mission for Mountain Zebra NP

The development of the Vision for Mountain Zebra NP took place during stakeholder workshops, in which the importance of conserving the characteristic elements that make up the Karoo was recognised, including both the patterns and processes associated with this landscape. The vision also reflects Mountain Zebra NP's commitment to conserve these elements for the appreciation of all its stakeholders.

The resulting Vision of Mountain Zebra NP is:

A park with characteristic northeastern Karoo assets that are enjoyed by all users.

In order to achieve this Vision, Mountain Zebra NP's Mission is:

"To conserve the plants, animals, ecological processes, landscapes and cultural assets unique to the northeastern Karoo for the appreciation of all users"

The Vision and Mission for Mountain Zebra NP ensure that while the park's management objectives and strategies (detailed further down in this management plan) conform to SANParks broad-level objectives, the specific high level objectives of the Mountain Zebra NP can ultimately be traced back to its stakeholders' values.

1.1.2. Context

Together with the corporate, park-specific and societal values and Vision, the social, technological, ecological, economic and political facts that define the circumstances relevant to Mountain Zebra NP provide the context for its decision-making environment.

Location and Boundaries

Mountain Zebra NP is situated in the Eastern Cape, on the Northern slopes of the Bankberg mountain range in the Cape Midlands (Figure 1). It is situated on the R61 road, 12km from Cradock on the road to Graaff-Reinet, and is 262km from Port Elizabeth. It is also 800km from both Johannesburg and Cape Town. Until the late 1990's, the Mountain Zebra NP remained at 6 536 ha in area. However, to make it both ecologically and financially more viable, the park has been expanded to 28 412 ha. A plan for the further expansion of the park (section) seeks to unify the current Mountain Zebra and Camdeboo National Parks into a national park of 330 000 ha, an ideal that could be achieved through a combination of land acquisition and contractual land inclusions.

History

The Mountain Zebra NP was proclaimed in 1937 for the purpose of protecting a remnant population of the Cape Mountain zebra *Equus zebra zebra*. The species was almost driven to extinction; there were as few as 100 animals in existence in 1940 (Novellie, Lloyd & Joubert 1992). By 1981 the mountain zebra population in the Mountain Zebra NP had grown to 200, after which the population has been maintained at this level through removals until recent expansion allowed the population to increase to 280 animals. The relocated animals have been used to start other successful populations in protected areas such as in the Karoo National Park, Karoo Nature Reserve (now Camdeboo National Park), de Hoop Nature Reserve and also on a number of private ranches. By 1998 the world population had grown to 1200. Thus, the Mountain Zebra NP has played a principle role in conserving this endangered species. However, the Mountain Zebra NP has now grown beyond a "species park" to focus on conserving the biodiversity of the region.

Thirty archaeological sites were located during a survey by Brooker (1977), including three small rock shelters and 27 open sites. Analysis of the artefacts from these sites suggests that there was only ephemeral occupation of the area before the Holocene, and that during the Holocene there was a relatively larger population resided there. Rock paintings - depicting antelope, a large cat (possibly a leopard or a cheetah), baboons and human figures - are present at one of the shelters.

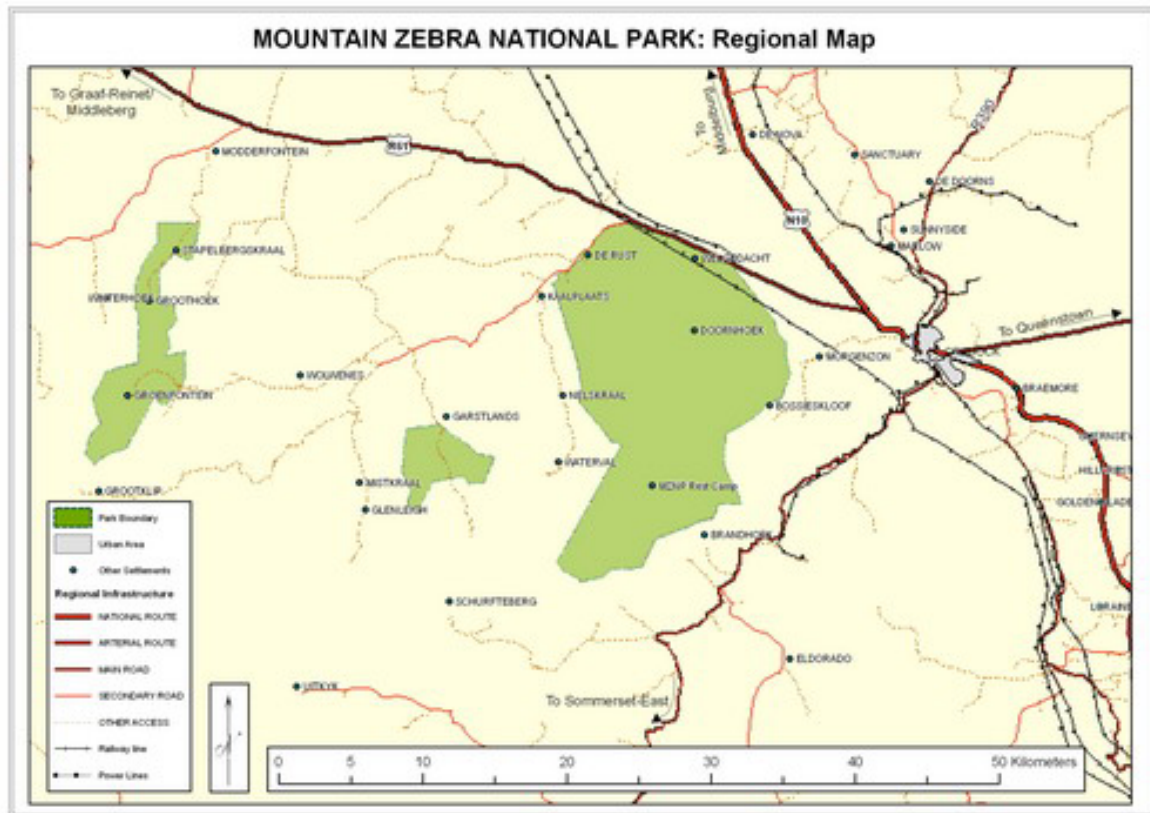


Figure 1 – The location of Mountain Zebra NP in the Cape midlands

Physical environment and land use

i) Climate

The climate of the Mountain Zebra NP is best described as cool and arid. Mean monthly minimum and maximum temperatures vary from 6-28°C in summer (September to March) and from 0-20°C in winter (April to August) (Brown & Bezuidenhout, 2000). Rainfall averages about 400 mm, with most (70%) falling in the summer months. Average annual rainfall for the period 1963 - 1996 was 382.6 mm with a distinct summer season peak between October to March (74 %). February had the highest rainfall with 56.7 mm while June had the lowest with 11.5 mm. Periodic light snow occurs during the winter months. Frost is common between May and October.

ii) Geology and Soils

The geology of the region is dominated by sedimentary rock types such as sandstones, siltstones and mudstones of the Beaufort Series of the Karoo System with post-Karoo doleritic intrusions being prevalent in some areas. The Beaufort Series contains a range of yellow-grey to dark-grey and greenish fine to medium grained sandstones which interchange with thick black to black-green and purple bands of mudstone and unstable shales (Toerien, 1972; van der Walt, 1980). The areas to the south and west of the existing Mountain Zebra

NP are covered by extensive dolerite sheets and a number of dykes. Soils are generally shallow except along sloping pediments and large parts of the park are rocky with little or no soil. A soil map of the Mountain Zebra NP is in preparation (Bezuidenhout unpublished).

iii) Topography and Hydrology

The mountainous terrain of the Mountain Zebra NP is part of the south quarter of the Karoo Mountain

Veld Complex which forms part of the Great Escarpment separating the Great Karoo and Upper Karoo (van der Walt, 1980). The southern boundary of the park follows the summit of the Bankberg, the highest point of which is 1957 m asl. To the north the Mountain Zebra NP extends across open flats to include the distinctive inselberg known as Salpeterkop. At 1000 to 1200 m the flats to the north-east form the lowest part of the park. The Wilgerboom River, running in a north-north-easterly direction through the park, only flows strongly after good rain but generally contains pools throughout the year.

Biological environment

i) Vegetation

In terms of the classification of South African vegetation by Mucina *et al.* (2005) the Mountain Zebra NP has three vegetation types, the Eastern Upper Karoo, Karoo Escarpment Grassland and Eastern Cape Escarpment Thicket making up 37%, 53% and 10%, respectively of the park (Figure 4). The park thus incorporates elements of three biomes, the Nama-Karoo, Grassland and Thicket. The Karoo Escarpment Grassland is dominated by the grass species *Merxmuellera disticha*, with shrubs such as *Euryops annuus*, and *Elytropappus rhinocerotis*. The Eastern Upper Karoo is a mix of grass and shrub dominated vegetation types that are subject to dynamic changes in species composition depending upon rainfall. Shrubs such as *Pentzia incana*, *Eriocephalus ericoides* dominate, while grasses such as *Aristida* spp. *Eragrostis* spp. and *Themeda triandra* are common. Fires are fairly common in the Karoo Escarpment Grassland and may also occur occasionally in the Eastern Upper Karoo. The vegetation types in the Mountain Zebra NP are poorly or hardly protected elsewhere in South Africa (Driver *et al.* 2005).

The combination of different vegetation types is important from the point of view of preserving biodiversity, as well as from an aesthetic viewpoint. The area is one of transition between biomes allowing for an interesting mix of flora and fauna, as well as preserving important ecological and landscape processes. The warm north-facing slopes (which characterise the park) with a wide diversity of habitats ranging from mountaintops to valley bottoms will provide suitable habitat ideal to cater for the seasonal requirements of the large herbivores (Novellie, 1988). In addition the north aspect provides for productive land capable of supporting relatively high densities of game, with greater proportions of the more productive Karoo veld types allowing the carrying of large herbivores. Herbivore densities within the rocky grassland areas are likely to be low. Importantly, all of the major vegetation types in the park are currently very poorly conserved elsewhere in South Africa: South Eastern Mountain Grassland (0.3% conserved), Eastern Mixed Nama Karoo (1.08%), Valley Thicket (2.2%) and Central Lower Karoo (0.05%). Hence, the reserve will play a critical role in the long-term preservation of biodiversity.

The interface between biomes promotes a rich flora, as well as preserving important ecological and landscape processes. An analysis of the flora (Pond *et al.* 2002) revealed 680 plant species in the park, thirteen of which are Red Data species. At 5.05 plant species per 100 ha the density of plant species in the Mountain Zebra NP is very high compared to other protected areas in the arid and semi-arid areas of South Africa, a feature which can be ascribed to the wide habitat and substrate diversity of the Mountain Zebra NP (Pond *et al.* 2002).

ii) Fauna

As noted, Mountain Zebra NP has played an important role in the conservation of the Cape mountain zebra, and today constitutes one of the major sources of genetically uncontaminated zebra from which to stock other conservation areas. Besides mountain zebra, the habitats within the park support a variety of other large mammalian species. Some of these species were present when the park was proclaimed, others were reintroduced in accordance with the objective of restoring the diversity of large herbivores that occurred in historical times (Novellie & Knight, 1994; Novellie, Randall & Knight, 1994). Species that were reintroduced recently are Cape buffalo and black rhinoceros, as well as a number of plains zebras that have been selected for morphological traits that resemble the quagga (as part of a programme to 'recreate' this extinct subspecies of the plains zebra). The Mountain Zebra NP currently supports 15 species of large mammals.

The Mountain Zebra NP also supports diverse small mammal and reptile communities (Grobler & Bronkhorst, 1981a,b; De Graaff & Nel, 1970; De Graaff, 1974). Although a distinct Karoo fauna is not recognised by zoogeographers (Werger, 1978) there are endemic species in a number of vertebrate taxa, particularly reptiles, which are confined to the region. There are some 216 species of birds in the Mountain Zebra NP with a good representation of raptors. Black eagles nest within the park and Cape vultures have been recorded more frequently in the past few years (Grobler & Bronkhorst, 1981b, Penzhorn & Bronkhorst 1976).

As a result of the ephemeral nature of the rivers there are no indigenous fish species. However, there is a rich, largely undescribed, invertebrate fauna to be found in the region and some species may have a significant impact on the vegetation, notably the Karoo caterpillar *Loxostega frustralis*, the brown locust *Locustana pardalina* and the harvester termite *Hodotermes mossambicus*.

1.1.3 Values and Operating Principles

Our values are the principles we use to propose and evaluate between alternative options and decisions. SANParks has adopted eleven corporate values, which serve as guiding principles around which all employee behaviour and actions are governed and shaped. These corporate values include:

- We shall demonstrate leadership in all we do
- We shall embrace, and be guided by environmental ethics in all we do
- We shall promote transformation within, and outside of the organisation
- We shall strive for scientific and service excellence at all times
- We shall act with professionalism at all times
- We shall adopt, and encourage initiative and innovation by all
- We shall treat all our stakeholders with equity and justice
- We shall exercise discipline at all times
- We shall show respect to all
- We shall act with honesty and integrity
- We shall strive for transparency and open communication at all times

Mountain Zebra NP takes its biodiversity values from the headline SANParks biodiversity values:

- We adopt a **complex systems view** of the world while striving to ensure the **natural functioning** and **long term persistence** of the **ecosystems** under our care.
- We aim at persistent achievement of **biodiversity representivity** and **complementarity** to promote **resilience** and ensure **ecosystem integrity**.

- We can **intervene in ecosystems responsibly and sustainably**, but we focus management on **complementing natural processes** under a "**minimum interference**" philosophy.
- We accept with humility the **mandate of custodianship** of biodiversity **for future generations** while recognising that both natural and social systems change over time.

Although SANParks corporate and biodiversity values have been set, they need to be supplemented in Mountain Zebra NP by operating principles that meet the specific needs of Mountain Zebra NP's maintenance phase and focus on upliftment of the surrounding communities. The operating principles below reflect the values of individuals in the Mountain Zebra NP stakeholder group, including SANParks and Mountain Zebra NP management:

- Minimum human impact
- Minimise external factors from influencing system
- Building co-operation with other conservation agencies, particularly with regards to endangered species
- Strive for high work ethic
- Compliant with all applicable legislation
- Striving towards financial sustainability
- Establish an ecologically sustainable and visitor friendly park that all want to visit
- Maintain current good relationships between park and local communities and government

1.2 Vital attributes underpinning the value proposition of Mountain Zebra NP

Listing the vital attributes of a park is an important step in the objective setting process as it identifies the fundamental purpose(s) of conservation management for a particular park. The following vital attributes have been identified as making Mountain Zebra NP unique, or at least very special in its class. Each attribute is accompanied by important factors determining or threatening the attribute. Using this information helps management to achieve the desired state by formulating park objectives that focus on maintaining the determinants of, and on overcoming the constraints and threats to, these vital attributes. In addition, in this way the management plan is customized in its fullest local extent, without detracting from some of its more generic SANParks functions. The vital attributes of Mountain Zebra NP, as recognised by its stakeholders, can be summarised as follows:

- Mountain Zebra NP's biodiversity assets, primarily the ecological gradients, geology, soil and climate that produce the particular drainage lines, catchments and vegetation structure typical of the Great Karoo, as well as the endemic and typically Karoo faunal and floral assemblages, e.g. Cape mountain zebra
- The typical Karoo landscapes produced by the geology and vegetation
- The underrepresented Nama Karoo vegetation protected in Mountain Zebra NP
- The catchment of the Wilgerboom river (entirely within Mountain Zebra NP)
- Good tourism infrastructure and technology
- Nightskies
- Uninterrupted views and wilderness qualities
- Good relationship with neighbours
- Accessibility (close to Cradock on established roads)
- Accommodation, conference facility, tranquility/quietness, hospitality of staff
- Venue for school outings – good interactions between schools and MZNP

- Bushman paintings
- Existing environmental awareness initiatives

The biophysical vital attributes are largely determined by the steep gradients associated with the surrounding mountains, the geology and soil, climate and rainfall typical of the Great Karoo. Climate change and development of conflicting land uses or infrastructure present the biggest threats to these vital attributes. Lack of interest from surrounding communities, lack of publicity and transport to the park, and lack of benefits to the landless through park expansion are socio-economic threats to Mountain Zebra NP's desired state identified by its stakeholders.

1.3 Setting the details of the desired state for Mountain Zebra NP

SANParks' biodiversity custodianship framework guides park management in setting up a management plan, implementation thereof, and the review of the plan (see Coordinated Policy Framework document). The essential feature of the system is the iterative way in which it will enable continual improvement in the management of each park through annual and five-year review cycles. The first step in developing/revising a management plan is to develop the desired state of the park, which guides park management in its daily operations. The desired state is drafted every five years with the involvement of representative stakeholders, and forms a bridge between the long term Policy and Vision for the Park, and the medium term (five year) priorities and resources available to attain that vision.

Mountain Zebra NP's desired state is a fully functioning ecosystem that maintains the patterns and processes characteristic of the Karoo. While the focus is on maintaining the integrity of the biophysical component of Mountain Zebra NP, this is for the appreciation of all stakeholders.

In order that the current and future extent of the Park is protected and managed effectively, the desired state is decomposed into a hierarchy of component objectives of increasing focus, rigour and achievability. The final level represents acceptable, achievable and measurable objectives.

1.3.1 An objectives hierarchy for Mountain Zebra NP

In order that the current and future extent of the Park is protected and managed effectively, the desired state is decomposed into a hierarchy of component objectives of increasing focus, rigour and achievability. The final level represents acceptable, achievable and measurable objectives, linked to a performance management tool known as the Balanced Scorecard.

In order for Mountain Zebra NP to move towards realising its jointly agreed upon Vision, four high level objectives have been identified, and are cascaded down to finer and finer levels of detail, ending with specific operational or management strategies. Figure 2 represents the highest level objectives in Mountain Zebra NP's objectives hierarchy, which form the basis for prioritisation of management issues, and are explicitly derived from the park's Mission and Vision. The full hierarchy of objectives can be obtained from park management upon request. The high level objectives focus on conserving the full range of compositional, structural and functional biodiversity assets (including the characteristic Karoo landscapes) of the northeastern Karoo, conserving the cultural assets of Mountain Zebra NP, and presenting these for the appreciation of all users through tourism opportunities and the provision of other benefits, particularly to local communities. The fourth and final objective is an enabling objective that makes the attainment of the other objectives possible through best practise management of Mountain Zebra NP's human resources.

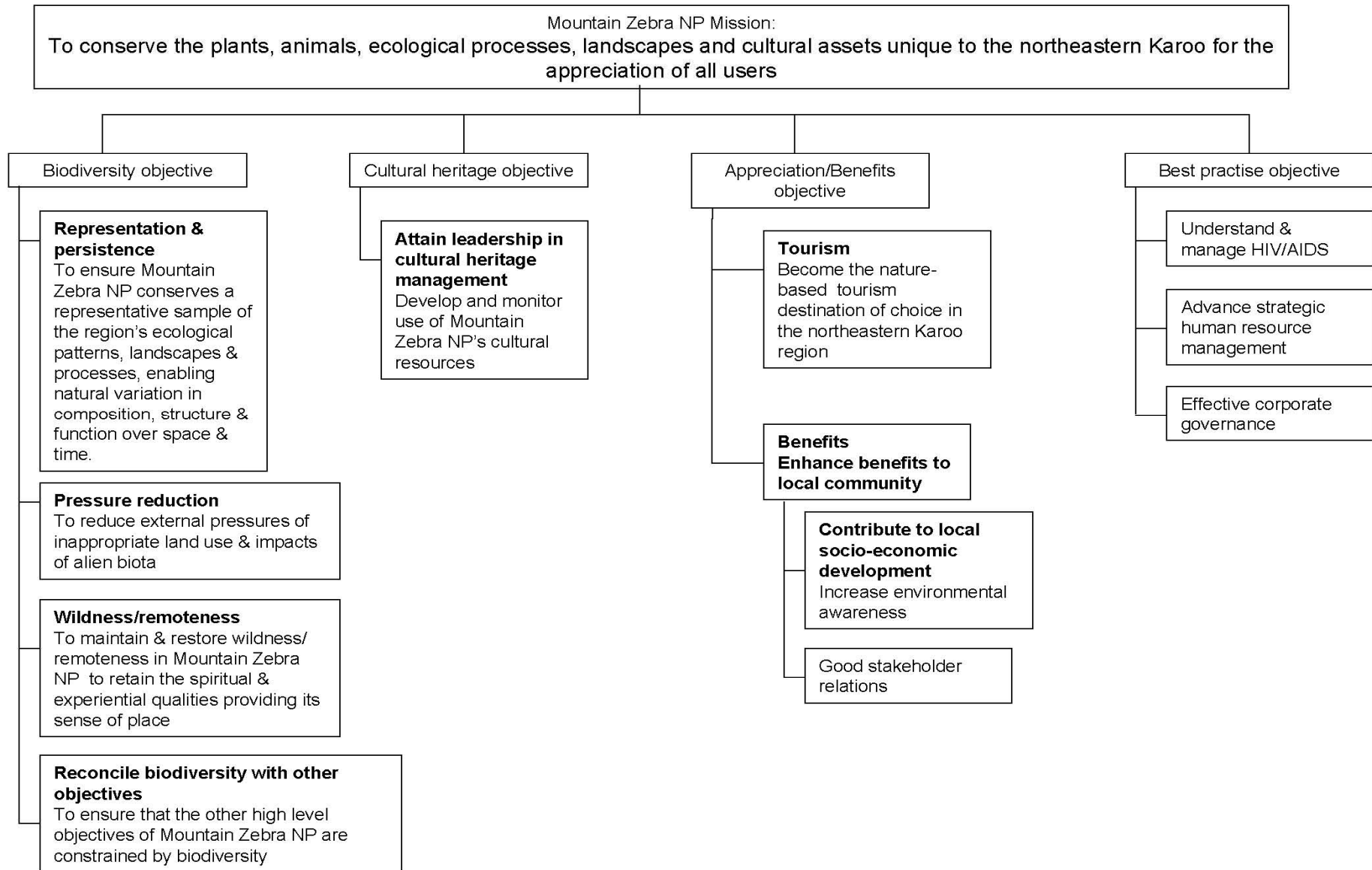


Figure 2 – High level objectives in an objectives hierarchy for Mountain Zebra NP

1.3.2. Thresholds of concern and other exact conservation targets

In the adaptive management of ongoing change in ecological systems, thresholds of concern are the upper and/or lower limits of flux allowed, explicitly specifying the boundaries of the desired state of the park. If monitoring or predictive modelling indicate exceedances beyond these limits, then mandatory management options of the adaptive cycle are prompted. Considering the biophysical objectives stated above, the following TPCs are provisionally listed for Mountain Zebra NP, but require development in consultation with scientific experts:

- Extent of change of vegetation structure typical of the northeastern Karoo (this could potentially be brought about by climate change or overutilization of vegetation by herbivores)
- Extent of change of the underrepresented Nama Karoo vegetation and bare patches
- Extent of change of habitat required by Cape mountain zebra
- Homogenization of the habitat, such as may occur through the widespread encroachment of grazing lawns into taller grass habitat.
- Signs that grazing lawns are 'unsustainable' over the long term.
- Change in population growth rate trends, particularly for species of special concern, e.g. mountain zebra, black rhino, and in relation to introduction of predators.
- Change in proportional representation of herbivore foraging guilds (bulk grazer, concentrate grazer, mixed feeder and browser)
- Change in the ratio of productivity to biomass
- Shifts in the long-term distribution patterns of herbivores across the landscape
- Shifts in prey composition of predator diets

These provisional TPCs will form part of particular programmes (below) to achieve the desired state, and will require explicit monitoring to assess the potential exceedance of each TPC. This has critical capacity and funding implications for the future budgeting and resource requirements of the park. It is therefore crucial to note at this point that the adaptive management cycle cannot be successfully implemented without the necessary capacity for monitoring. In addition, research should be solicited in conjunction with the monitoring to increase our understanding of the ecological processes in Mountain Zebra NP. Research, too, should be explicitly linked to the issues in Mountain Zebra NP's objective hierarchy. The current list of TPCs focus on the maintenance of Mountain Zebra NP's biophysical attributes. The above TPCs constitute the range believed to be necessary initially. If other issues arise (e.g. the need for certain rare biota TPCs) these can be set from generic principles. The development of TPCs for cultural heritage, tourism and effective park management are a high priority for the next 5-year management cycle.

1.3.3 Conservation Development Framework (CDF)

A full CDF will be developed for Mountain Zebra NP within the first iteration of this plan in 5 years' time. However, a practical zonation for Mountain Zebra NP (Figure 3) has been undertaken and may be used to guide development of the park.

2. PROGRAMMES TO ACHIEVE THE DESIRED STATE

This section deals with the specific, but often crosslinked, programmes that address the park objectives and lead to management actions on the ground. Together they represent the park's best attempt to achieve the desired state. Each subsection is a summary of the particular programme, invariably supported by a detailed description called a low-level plan, not included in this plan, but available for scrutiny upon request. All of these programmes are subservient to, and guided by, SANParks corporate level policies that translate SANParks values into operating principles (see SANParks Coordinated Policy Framework document).

The various programmes are detailed under the five “real-world” activity groupings as reflected in the SANParks biodiversity custodianship framework, namely Biodiversity and Heritage Conservation, Sustainable Tourism, Building Co-operation, Effective Park Management, and Corporate Support.

2.1 Biodiversity and Heritage Conservation

2.1.1 Park Expansion Programme

The purpose of Mountain Zebra NP’s park expansion programme is to link Mountain Zebra NP with Camdeboo National Park by means of state-private conservation partnerships. This expansion has the potential to offer a unique African Karoo wildlife experience, and would protect a diverse assemblage of plants and animals in an area known for its picturesque scenery. Linking these two reserves would result in a reserve over 120 km in length, with the potential to include up to 520 000 ha under different forms of conservation management. Much of the land between the two reserves is unsuitable for any land-use other than conservation, hunting or ecotourism, and significant areas are already run as private game reserves. The existence of extensive areas of land run for game offers the potential to consolidate the area with relatively limited land purchases.

The reserve is located in a transitional area between four biomes: Grassland, Nama Karoo, Thicket and Savanna. Importantly, all of the major vegetation types in the potential reserve are currently very poorly conserved elsewhere in South Africa: South Eastern Mountain Grassland (0.3% conserved), Eastern Mixed Nama Karoo (1.08%), Valley Thicket (2.2%) and Central Lower Karoo (0.05%). Hence, the reserve will play a critical role in the long-term preservation of biodiversity. The park will support a unique combination of southern grassland species such as blesbok, black wildebeest, springbok, red hartebeest and quagga. The park will further enhance the conservation of the Cape Mountain Zebra, and will have the capacity to carry a significant population of Black Rhinoceros and disease-free Cape Buffalo. The reserve will include a Globally Important Bird Area, which will include valuable populations of Lesser Kestrels, Blue Cranes and a variety of Karoo endemics.

Even if all the conservancies proved to be unsuitable for inclusion, a reserve of 286 209ha would still be possible. Importantly, many of the linkages anticipated in this consolidation plan could be made with far smaller land acquisitions than are outlined above. Conversely, in a best-case scenario, the reserve could be expanded to include most of the planning domain (523 182 ha). Although the plan is presented in stages, it does not need to take place in this order. Further, any one of the stages (except for Stage Five) could stand alone as a viable development.

2.1.2 Cultural Heritage Programme

The purpose of the cultural resource programme is to manage and sustain the significance, authenticity and integrity of the tangible and intangible cultural heritage resources for which the SANParks is responsible, for the enjoyment and benefit of all South Africans and of the world. An archaeological survey of Mountain Zebra NP was undertaken 1973 at the request of the then National Parks Board of Trustees. The aim of the survey was “to establish the potential of sites for excavation or collection of material for the possible creation of site museums” (Brooker, 1977). Thirty archaeological sites were located during the survey. These include three small rock shelters which include San rock art and 27 open sites. Most of the sites occur primarily along the river valleys where the banks are wide and flat. Scrapers indicating a Holocene age dominated the formal artefacts discovered from 22 of these sites.

Since the 1973 survey Mountain Zebra NP has expanded its borders considerably. A number of early farmer graves have recently been identified including some historical

farmsteads. One of the farmsteads (Doornhoek) was declared a national monument under the old National Monuments act of South Africa and is currently used as a tourist guesthouse. Other initiatives under this programme can be found in the associated lower level plan.

2.1.3 Herbivory Programme (including water provision)

Past programmes for monitoring of the vegetation and herbivore populations are described in Novellie (1989), Novellie and Strydom 1989; Novellie 1990a and Novellie (1994). These monitoring programmes focused on patches that were known to be favoured by the different species of large herbivores in the Mountain Zebra NP, including grazing lawns maintained by springbok, blesbok and black wildebeest, as well as longer grass habitat favoured by zebras and red hartebeest. The monitoring programmes tracked both the way in which these key habitat patches were used by herbivores and the way in which the vegetation in the patches changed in response to the combined influence of between-year rainfall changes and herbivory. The ultimate objective was to understand the long term dynamics of patch use by the large herbivores, and the way this should be managed to maintain the diversity of the system. A TPC based on these programmes has been put forward in the operational plan for the conservation of mountain zebras. The Mountain Zebra NP has expanded considerably in size since these programmes were designed and therefore they need to be revised and updated. Appropriate TPCs need to be identified.

Capacity to maintain the intensive monitoring programmes of the past, and to extend them to cover the new areas of the park, is currently seriously lacking, and this needs to be taken into consideration before this new approach to herbivore management can be successfully implemented in Mountain Zebra NP.

Water is provided for wildlife at a number of sites and the impact that this artificial provision of water has on the distribution of wildlife needs to be considered. A number of impoundments along the primary river drainage line exist in Mountain Zebra NP while there are also a number of depressions that hold water periodically after rains. These water sources should be mapped and the nature of their permanence determined to provide an indication for management as to the need to supply further sources, particularly for species such as buffalo and black rhino. In accordance with corporate policy, provision of water will be kept to a minimum and explicitly related to vegetation impacts and minimum viable population sizes of species of special concern such as mountain zebra and black rhino.

2.1.4 Rehabilitation Programme

Historical land use in Mountain Zebra NP has led to extensive transformation (of both vegetation and soil) such that some areas require attention in order to prevent loss of ecosystem functioning. Vegetation transformation in Mountain Zebra NP includes change of vegetation community in terms of composition, density and structure, as well as invasion of vegetation communities by alien plant species. Most transformations in Mountain Zebra NP are human-induced, mainly due to previous agricultural practices. The dominant soil transformation is soil erosion and change in the chemical composition of the soil (e.g. through accumulation of inappropriate nutrients due to fertilizers) in areas historically used for crop production. Rehabilitation of the degraded farmland areas should therefore be one of the priorities for Mountain Zebra NP.

There are three forms of transformation in Mountain Zebra NP, vegetation transformation, alien plant infestation, and soil erosion. The objective of rehabilitation activities should first focus on reestablishing ecosystem functioning. The initial areas of functioning that require attention are soils and vegetation recruitment.

Currently there is no active re-vegetation in the areas where degradation has occurred. Although soil transformation includes soil erosion and change in the chemical composition of the soil (e.g. through accumulation of inappropriate nutrients due to fertilizers), in Mountain Zebra NP soil erosion is the main aspect that needs attention. Soils along the foothills are highly erodible. This characteristic combined with historical overgrazing is exacerbating erosion potential in Mountain Zebra NP. There are old broken dam walls that channel water thus increasing the potential of soil erosion downstream. In the larger areas of the park, erosion is not a significant factor. The majority of areas where erosion is common are areas that have been historically unsustainably utilised for domestic herbivory. An area where this phenomenon is extensive is along drainage lines. Although there is a gabion built along one of the drainage lines, there is a need of constructing even more gabions. The rehabilitation programme is linked to the zoning programming through replanting activities in areas where vegetation has been transformed, and removing redundant structures to restore the sense of place of Mountain Zebra NP.

Both soil and vegetation rehabilitation should be linked with the government's social commitment of linking natural rehabilitation with poverty alleviation. One of the primary goals of research and monitoring will be to ensure that relevant interventions are implemented for rehabilitation. Monitoring will be necessary to ensure that the interventions implemented have been effective.

All invasive alien organisms found in the Mountain Zebra NP are removed using approved procedures. The alien biota programme will be governed by the Regulations in terms of the Biodiversity Act once these have been promulgated. With the possible exception of occasional stray domestic cats, alien animals do not pose a problem in Mountain Zebra NP. A list of alien plant species recorded in Mountain Zebra NP can be found lower level plan associated with this programme. Only the two *Opuntia* species pose a significant problem, although intensive control programmes appear largely to have brought them under control. All alien flora control should be in line with Working for Water standards and Dept Agriculture guidelines on herbicide use and application. Alien mammals are rare in Mountain Zebra NP; if any are encountered they should be eliminated in accordance with the SANParks Standard Operating Procedures for Lethal Population Management or the SANParks Standard Operating Procedures for Capture, Transportation and Maintenance in Holding Facilities of Wildlife. Recent alien mammal reports include impala, fallow deer and even waterbuck. The presence of Red river hogs on a neighbouring farm is a source of concern, as this species can inbreed with bushpig.

2.1.5 Species of Special Concern Programme

SANParks' biodiversity values stipulate that, except in crucial instances for the survival of globally critically endangered species, management for system integrity and biodiversity must take precedence over species management. However, SANParks will strive to prevent extinction, within National Parks, of species on the IUCN's global critically endangered or endangered lists, and will work with other conservation initiatives to secure and strengthen the future of such species over their historic distribution ranges. Within this context, a realistic prioritization framework has been developed to aid in decision-making regarding which species to allocate resources for sensibly. All species in Mountain Zebra NP must be put through this prioritisation process, and according to the SANParks framework, those that emerge as category 1 or 2 species must have their own TPCs and monitoring programme.

There are currently four mammal species that may require additional management considerations. One of these the Cape mountain zebra is the reason for the establishment of the park and the management objectives for this species have been highlighted previously (Novellie 1989, Novellie *et al.* 2002). The other three are the south-western ecotype of the black rhinoceros, the Cape buffalo and the morphological strain of the plains zebra that

resembles the “quagga”. The Cape Mountain zebra is the primary species of special concern in Mountain Zebra NP, since a primary aim of the park has been “To preserve a viable, genetically uncontaminated population of the Cape mountain zebras from which individuals can be drawn for reestablishment in other parts of the historical range of the subspecies, or in zoological gardens.” Mountain zebras are dependent on habitat with good cover of moderately tall, tufted grasses (Grobler 1983; Novellie and Winkler 1993). Grazing by antelope species that favour short grass (for example, springbok, blesbok, black wildebeest) may transform the habitat into a condition that is not optimal for zebras. As noted elsewhere in this management plan, it is necessary from the point of view of maintaining biodiversity to allow the natural development of a mosaic of grazing lawns together with patches of taller grasses. The diversity of patch types is the key to maintaining the full spectrum of indigenous herbivores. However, excessive impact by short grass grazers may lead to proliferation of grazing lawns which, if allowed to proceed to extremes, would be both undesirable from the point of view of patch diversity and also deleterious for the zebra. It is therefore necessary to set one or more TPC’s to reflect the condition of mountain zebra habitat. Further detail regarding the conservation of the mountain zebra population, including recommended TPCs and offtakes can be found in the associated lower level plan.

A key management objective for the buffalo centres on the threat posed by disease (see Zimmermann & Castley 2005). The park objective is likely to require that the population remains disease free and any signs of diseases should be dealt with rapidly. Random blood tests of the population would also provide a mechanism to detect disease early, allowing for planned interventions to limit the potential impacts, should these occur. The “quagga” population at Mountain Zebra NP forms one of the primary repositories for individuals displaying a high prevalence of the desired traits and an active management program is required to effectively maximise the retention of these traits within the population. Regular monitoring of the population is required and foals should be scrutinised each year to determine their contribution to the program. Repositories of unsuitable stock are maintained in the Addo Elephant NP in various areas.

2.1.6 Fire Programme

Almost all vegetation types within Mountain Zebra NP are potentially fire prone. As is characteristic of vegetation of the Grassland Biome, lightning fires tend to occur particularly in the Karoo Escarpment Grassland¹. On private farms in the Karoo and Cape Midlands this vegetation type is regularly burnt to stimulate grazing (Roux and Smart 1979). In the other vegetation units of the Mountain Zebra NP fires are much less frequent, but nevertheless can occur in years when the grass biomass is high. It is noteworthy that Low and Rebelo (1996) regarded the Eastern Mixed Nama Karoo (redefined as Eastern Upper Karoo by Driver et al. 2005) as being the only vegetation type of the Nama Karoo Biome in which fire can be important in shaping communities. Fire is thus clearly a natural feature of the Karoo Escarpment Grassland (which includes vegetation units 5 and 6 of Brown and Bezuidenhout *in prep.* b) and it probably occurred fairly regularly in historical times. For other vegetation types of the Mountain Zebra NP fire is likely to have been rare rather than regular, but could nevertheless have had a major impact on plant communities.

During much of the history of the Mountain Zebra NP the practice was to put out lightning fires as soon as they were observed. Long absence of fire from the Karoo Escarpment Grassland led firstly to abnormal accumulation of dry material that made accidental fires difficult to control and secondly to a low level of utilization of the grazing by large herbivores (Novellie 1989). Lack of knowledge makes it difficult to put forward appropriate conservation objectives

¹ The name ‘Karoo Escarpment Grassland’ is that of Mucina et al (2005). Previous names for this vegetation type were South-eastern Mountain Grassland (Low and Rebelo 1996) and Karroid *Merxmüllera* Mountain Veld (Acocks 1988).

for fire management, and a priority should be to encourage further research on the role of fire in the vegetation types of the Mountain Zebra NP. However, on the basis of current evidence, it appears desirable for management to promote as far as possible the natural occurrence of fire. To achieve this it is desirable to allow lightning fires to burn to their natural extent rather than to put them out as quickly as possible. This needs to be reconciled with the issue of fire security (detailed in the associated lower level plan).

2.1.7 Damage-Causing Animals Programme

A number of wildlife species are currently listed as 'problem animals' or 'vermin' within the provincial ordinances although the tag is broadly applied as a result of the actions of possibly only a minor number of individuals. There is often little empirical evidence to support the perceptions that many carnivores are responsible for the threats posed to livestock (Marker *et al.* 2003) although the beliefs of landowners are likely to affect their attitudes and behaviour to wildlife regardless of the actual threats posed (Hill 2000). Much of the future improvement in dealing with these conflicts will rely on the transparent relationships between SANParks and neighbouring landowners and an integrated approach to mitigating such situations. SANParks should strive to provide as much information about the ecological requirements of the species to landowners while simultaneously making recommendations for alternative management strategies to deal with reported incidents. In order to effectively monitor the impacts of these conflict situations SANParks needs to establish a reporting system that can be used by tourists, park neighbours as well a park staff. The reporting system should capture essential information about the date and time of the incident the species involved and what action was taken by the individuals responding to the incident, prior to reporting this to SANParks.

Contingency plan in the event of escape of a damage causing animal

Reports of escaped damage causing animals will be investigated immediately and relevant role-players informed eg. Park Manager, Provincial Authority, Regional Manager. The Section Ranger will take charge of the recovery/relocation of the animal/s. The SANParks's Wildlife Veterinary Officer will be called upon to dart the animal whereafter the animal will be relocated to the temporary holding camp and kept for at least two weeks before being released back into the veldt. All darting, transporting and handling of the animal will be conducted according to the guidelines of the Animal Care Committee of SANParks. According to the Draft Norms, Standards and Regulations Relating to the Management of Permits for the capture or destruction of any large predator will only be issued after the provincial authority has been satisfied that the capture or killing of such animal is warranted. In the event that the escaped animal causes damage to livestock outside of Mountain Zebra NP, SANParks' Legal department will address all civil suits/claims lodged against Mountain Zebra NP. Similarly, SANParks' Legal department will address all civil suits/claims lodged against Mountain Zebra NP in the event that the escaped animal threatens human life. In such instances the animal in question will be destroyed.

It should be noted that there are special conditions relating to damage causing large predators and the transportation of large predators according to the Draft Norms, Standards and Regulations Relating to the Management of Large Predators (2006):

- Damage caused by large predators is an inherent agricultural risk and therefore the onus is on the landowner to use non-lethal preventative measures to protect his property from large predators that might cause damage.
- Exemption from permit requirements for the transport requirements of large predators will only be allowed in case of sick or injured animals in need of urgent medical care at an animal medical facility, provided that a veterinary surgeon at such medical facility has certified that the animal is in need of urgent medical attention.

Contingency plan for disease affecting any damage causing animal/s

If it is suspected that the damage causing animal from Mountain Zebra NP had contracted any disease, the SANParks's Wildlife Veterinary Officer and provincial authority (state veterinarian) will be informed as soon as possible. If the animal has sustained a life-threatening injury the Wildlife Veterinary Officer will advise on the treatment or euthanasia of such animal. The Guidelines of the Animal care Committee will apply in case of euthanasia.

2.1.8 Reintroduction Programme

Over the years the large mammal fauna of the Mountain Zebra NP has been restored and there are few species that remain to be introduced. The majority of any future reintroductions will be restricted to larger carnivores as the herbivore guild has effectively restored historical species occurrence. The most recent introductions include the gemsbok which have been successfully introduced to the northern sections of the expanded park (it should be noted that previous introductions to the original park failed – Novellie & Knight 1994) and the introduction of plains zebra (*Equus burchelli*) exhibiting quagga-like morphological features.

The herbivore populations in the park continue to show positive growth as demonstrated by the regular (often annually) offtake of substantial numbers of larger herbivores. It is likely that the park prey populations would be able to sustain the introduction of a small number of larger carnivores. To this end it is recommended that the park consider the introduction of a number of cheetah. The success of this introduction should be monitored (to assess the response by both predator and prey) to inform the future introduction of species such as lion and wild dog. Although the prey requirements will need to be met for both of these species the area requirements of wild dog (Lindsey *et al.* 2004) may impede their successful introduction at this stage.

Any carnivore reintroductions must conform with the SANParks policy on reintroduction of carnivores. At present the only immediate plans for reintroducing carnivores into Mountain Zebra NP involve cheetah. Cheetah are amongst the most endangered of the larger predators in SA. The purpose of reintroducing cheetah into Mountain Zebra NP is to contribute towards the metapopulation conservation of this endangered species in South Africa. It also forms part of a long term plan to enlarge the park and to reintroduce all mammals that occurred there historically. Although Mountain Zebra NP is currently 28 412 ha in size, the cheetah will only be introduced into a 21 000 ha portion of the park. It is estimated that this area will be able to support a population of 10 -15 cheetah. Surplus cheetah will be handled in line with NCCF-SA meta-population management and surplus animals may later be introduced to Addo Elephant National Park and Karoo National Park. Cheetah will be sourced from De Wildt Cheetah and Wildlife Trust in Limpopo Province and were not bred in captivity. Six cheetah will be introduced, with a sex ratio of 2 male: 1 female. All cheetah will be fitted with tracking collars and be closely monitored for the first year by a dedicated researcher. Contingency plans in the event of an escaped cheetah will follow the principles outlined in the guidelines for damage causing animals (above). Leopards are expected to occur in the park (and anecdotal evidence from the region suggests that this may be the case), and the low density and solitary nature of this species suggests that it is already able to maintain itself on the resident populations of mountain reedbuck, grey rhebok, klipspringer as well as other wildlife utilising the elevated regions of the park.

2.2 Sustainable Tourism

2.2.1 Park zoning plan

The primary objective of a park zoning plan is to establish a coherent spatial framework in and around a park to guide and co-ordinate conservation, tourism and visitor experience initiatives. A zoning plan plays an important role in minimizing conflicts between different users of a park by separating potentially conflicting activities such as game viewing and day-visitor picnic areas whilst ensuring that activities which do not conflict with the park's values and objectives (especially the conservation of the protected area's natural systems and its biodiversity) can continue in appropriate areas. The zoning of Mountain Zebra NP was based on an analysis and mapping of the sensitivity and value of a park's biophysical, heritage and scenic resources; an assessment of the regional context; and an assessment of the park's current and planned infrastructure and tourist routes/products; all interpreted in the context of park objectives. The use zoning plan for Mountain Zebra NP is shown in Figure 3. Full details of the use zones, the zoning process, the Park Interface Zones (detailing park interaction with adjacent areas) and the underlying landscape analyses are included in the Mountain Zebra NP Zoning Document which is available on request.

Remote Zone: This is an area retaining an intrinsically wild appearance and character, or capable of being restored to such and which is undeveloped and roadless. There are no permanent improvements or any form of human habitation. It provides outstanding opportunities for solitude, with awe inspiring natural characteristics with sight and sound of human habitation and activities barely discernable and at far distance. In Mountain Zebra NP, Remote areas were designated in the high altitude mountain areas of the park. The zones were designated to include most landscapes with high environmental sensitivity and value.

Primitive Zone: The prime characteristic of the zone is the experience of wilderness qualities with the accent on controlled access. Access is controlled in terms of numbers, frequency and size of groups. The zone shares the wilderness qualities of the Remote zone, but with limited access roads and the potential for basic small-scale self-catering accommodation facilities such as a bushcamp. Views of human activities and development outside of the park may be visible from this zone. In Mountain Zebra NP, Primitive areas were designated to buffer Remote areas from higher use areas, as well as to protect most of the remaining sensitive areas (such as the Wilgeboom Valley and most escarpment slopes) from high levels of tourist activity. Primitive areas were also designated in valleys with low environmental sensitivity to allow access to Remote areas as well as to contain the infrastructure required for management and tourist activity in these areas (e.g. trail huts and access roads). The two satellite sections of Mountain Zebra NP were designated primitive pending their full consolidation into the park. In areas where Remote zones border on the park boundary, a 100m wide Primitive zone was designated to allow park management access to fences.

Quiet Zone: This zone is characterized by unaccompanied non-motorized access. Visitors are allowed unaccompanied (or accompanied) access, mainly on foot, for a wide range of experiences. Larger numbers of visitors are allowed than in the primitive zone and contact between visitors is frequent. In Mountain Zebra NP, Quiet areas were designated immediately adjacent to the main rest camp to allow visitors access to the short day walks.

Low Intensity Leisure Zone: The underlying characteristic of this zone is motorized self-drive access with the possibility of small basic camps without facilities such as shops and restaurants. Facilities along roads are limited to basic self catering picnic sites with toilet facilities. In Mountain Zebra NP, Low intensity leisure areas were designated in the current game viewing areas (Rooiplaat, the northern plains areas and the Wilgeboom loop), as well as additional potential plateau and plains areas where these did not conflict with the underlying landscape sensitivity and value analysis.

High Intensity Leisure Zone: The main characteristic is that of a high density tourist development node with amenities such as shops, restaurants and interpretive centres. This is the zone where more concentrated human activities are allowed, and is accessible by

motorized transport on high volume transport routes. In Mountain Zebra NP, High intensity leisure areas were restricted to the current rest camp and management areas.

The current park use zonation is based on the same biodiversity and landscape analyses undertaken for a Conservation Development Framework (CDF); however certain elements underlying the CDF such as a tourism market analysis are not be fully incorporated into the park use zonation. A full CDF will be developed for Mountain Zebra NP within the current update cycle. Remote areas will be investigated for possible formal declaration as Wilderness Area in terms of Section 22 of the PAA. Special management overlays which designate specific areas of a park that require special management interventions (e.g. areas requiring rehabilitation) will also be identified.

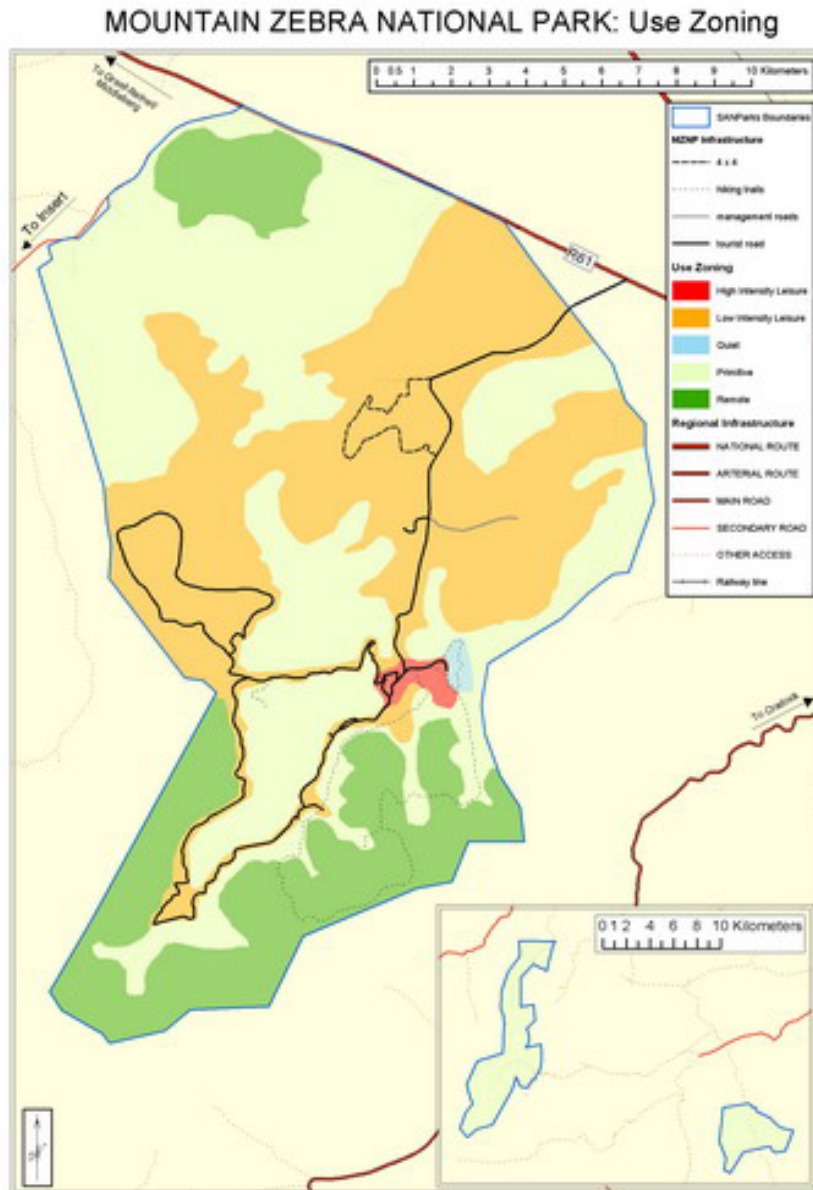


Figure 3 – Zonation plan for Mountain Zebra NP

2.2.2 Tourism Programme

The Integrated Development Plans for the local Municipality regard the Mountain Zebra National Park as one of its key tourist attractions, and suggests that all future developments should take cognisance of the important role that tourism plays in the economy of the region. The tourism vision for Mountain Zebra NP is to provide a true Karoo ecotourism experience by developing infrastructure, and offering a variety of activities and quality service. The lower level plan for the tourism programme details the objectives and measures needed to attain this vision. This includes providing adequate training for personnel, upgrading and developing tourist infrastructure, to expand the available tourist activities, to expand the park, and to market Mountain Zebra NP more effectively. Tourism developments planned for Mountain Zebra NP over the next five years include the establishment of a tented bush camp and 4x4 trail, additional chalets, revamping of the main gate and information office, upgrading of the roads, and the establishment of an interpretation facility or trail.

Mountain Zebra NP's tourist accommodation facilities currently comprise a main camp and guest house. The main camp is situated close to the Wilgerboom River with a view of the Bankberg Mountains and its dolerite outcrops. There are 19 chalets, 1 guest house, a camping facility, a restaurant, swimming pool, curio shop, a conference room and picnic sites. The guest house, a restored Victorian homestead dating back to the 1800s, can accommodate six persons and is situated further into the park, overlooking the Doornhoek dam in the Wilgerboom River. None of the accommodation facilities is fenced, which does enhance the wilderness experience. Within Mountain Zebra NP, places of interest include the Grootkloof geological rock fall, bushman cave paintings, the Doornhoek guesthouse which is a national monument, an Anglo Boer War site, and settler graveyards dating back to the 1800s. There are a number of sites of interest in the immediate surroundings of Mountain Zebra NP which further enhance Mountain Zebra NP as a tourist destination – the popular natural hot water spring (Cradock spa), gravesites of the political activists Goniwe, Calata, and Mkhonto who were brutally killed in the mid-eighties during the period of the State of Emergency, and the house and grave of popular author Olive Schreiner's are on the farm Buffelsfontein outside Cradock. Several Bed and Breakfast establishments are also present in Cradock. Excluding the camping facility, Mountain Zebra NP's average occupancy rate over the past 3 years was 64.6%. Camping occupancy in Mountain Zebra NP has generally been very low, with an average of 8.7% over the past three years. Although Mountain Zebra NP has a conference venue that can accommodate 30 people, it has not fully utilised.

2.2.3 Other programmes under Sustainable Tourism

Marketing and commercial development programmes must still be developed for Mountain Zebra NP. This will be a priority for Mountain Zebra NP during the next 5-year management cycle, and both must comply with its Conservation Development Framework (CDF).

2.3 Building co-operation

2.3.1 Stakeholder Relationship Management Programme

The purpose of Mountain Zebra NP's stakeholder relationship management programme is to establish and maintain meaningful and beneficial relationships with a wide range of stakeholders supporting Mountain Zebra NP. For a list of identified stakeholders, please refer to the lower level plan for stakeholder relationship management. Mountain Zebra NP has established a Park Forum in which various institutions around Cradock are represented. Park forum meetings take place once a quarter in the park and in the community halls. The intention over the next five years is to establish projects to ensure that meaningful and beneficiary relationships are maintained between Mountain Zebra NP and its primary

stakeholders. Existing projects include Working for Water; Working for Wetlands and Poverty Relief Programme (upgrading of chalets and erecting of fence). Research and monitoring should include external and internal evaluations using indicators to assess inputs, processes and outputs. A risk of successfully implementing this programme is an inability to resource and fund activities adequately.

2.3.2 Environmental Education and Interpretation Programme

The purpose of the education development programme in Mountain Zebra NP is to build constituencies amongst people in support of SANPark's conservation endeavours by playing a significant, targeted and effective role in promoting a variety of educational opportunities and initiatives. The People and Conservation department of Mountain Zebra NP enhances biodiversity conservation through the promotion of a conservation ethic and developing park-community relations. The primary component of the work conducted by this department is related to Environmental Interpretation & Education and focuses on the various park user groups (tourists, learners and staff) and local communities. The park's service area can roughly be estimated as reaching 45 000 people and a total of 40 schools (primary as well as secondary including farm schools). These educational programs are facilitated by the People and Conservation Officer in the park. The areas of learning covered are extensive, but tend to concentrate on the protection and management of nature, the environment (in all its forms) and environmental learning. These programmes are normally offered free of charge (to improve accessibility), principally to the disadvantaged South African. Learners are transported to the park twice a month by the Park's Taxi. The number of learners visiting the park has increased tremendously. A total of 2500 learners and 99 adults visited the park during the previous financial year (2005/6). The park also hosts numerous environmental campaigns to celebrate environmental calendar days for example. World Environment Day, World Wetland Day, Arbor Day; World Aids Day and environmental competitions for example, Morula kids competition; which is an annual competition hosted by SANParks.

Mountain Zebra NP also provides an educational and information outreach service in the form of presentation of awareness programmes, focusing on targeted local schools, youth groups, religious groups, inmates and communities staying inside and outside the park. Mountain Zebra NP also supports the Decade for Education for sustainable Development - which commenced in 2005 – whereby we use Environmental Education as a tool for achieving affective resource management and sustainable development. The People and Conservation Officer is committed to invest in the development of an environmentally friendly ethic in the youth. Projects include the establishment of a Junior Honorary Rangers corps during this financial year. To complement and support these education and awareness programs; the park develops and maintains resource materials, tools and kits; supports teacher programs; develops information resources such as booklets, books, videos, maps and pamphlets and develops and maintains interpretive displays and signage.

Mountain Zebra NP offers a variety of short trails to explore the rugged karroo ecosystems and mountains. Each trail has an associated theme to ensure a variety of experiences that cater for wide participant interest. The trails can be done with or without a guide.

It is envisaged that the self-guided options will be supported with the necessary information resources such as a special trails map with accompanying interpretive information linked to various numbered markers along the footpaths. Interpretive trails enhance environmental awareness by informing participants about various aspects of the environment - drawing on both scientific and traditional knowledge - and engaging participants in the environment through hands-on experiences. The guide also provides reference to further information with the aim of initiating further research or encouraging participants to get engaged in activities in and for the environment.

2.3.3 Local Socio-economic Development Programme

The purpose of Mountain Zebra NP's local socio-economic development programme is to play a significant, targeted and effective role in contributing to local economic development, economic empowerment and social development in communities and neighbouring areas adjacent to Mountain Zebra NP by partnering with Local Government to form part of the Integrated Development Plans (IDP's), participating in Government Programmes (*WfW*, EPWP, etc.) to contribute to local skills development by supporting learnerships, implementing needs related training programmes and by creating business opportunities. The Expanded Public Works Programme (EPWP) remains a significant focus area of the Park to effectively contribute to local socio economic development. These programmes are all focus on poverty alleviation and are therefore labour intensive projects that create temporary jobs in the short term. Expanded Public Works Programmes include Working for Water (Clearing alien invasive species in the park), Working for Wetlands (Restoring wetlands to prevent soil erosion), and a Poverty Relief Programme (Upgrading nineteen chalets and erecting 68 kilometre predator proof fence). Great importance is also afforded to the skills development component of these programmes, with specific targets set for both hard and soft skills development. Sustainability is further supported by investigating and implementing exit strategies through the development of entrepreneurial opportunities for local communities.

Nine SMME's have been created, and their employees are attending life skills and development courses such as HIV and AIDS awareness, and diversity management. Mountain Zebra NP facilitates Skills and / or Learnership programmes. Both processes involve park staff and unemployed members from the neighbouring local communities. All participants in the Working for Water and Working for Wetlands programmes are trained in Life skills (E.g. HIV / AIDS, personal finance and basic first aid, occupational health and safety). Mountain Zebra NP procures contracted services ranging from maintenance to tourism related services. Where possible, local SMME's (especially PDI's) are favoured when sourcing contractors, provided that all procurement conditions as stated in the SANParks procurement policy can be adhered to.

Co-operative governance systems are being developed and strengthened for the Park with the aim to promote inclusivity and to ensure compliance with legislation. Collaboration currently focuses on planning i.e. the integration of park plans into the Integrated Development Plans (including Local Economic Development plans and Spatial Development Frameworks). Progress towards achieving the local socio-economic programme's goal is evaluated continually, and the programme adopted accordingly in order to changing needs and circumstances. Risks against achieving a successful local socio-economic programme are an inability to resource and fund programmes and activities adequately, and reliance on external funding to drive certain projects.

2.3.4 Sustainable Resource Use Programme

Mountain Zebra NP is not involved in any organized, full scale resource use from the area. The only resource that becomes available is in the form of venison during annual harvesting operations. These operations form part of the management of large herbivores (see herbivory management programme, this document), and quotas are allocated by SANParks Wildlife Management Committee. While the majority of animals are removed by means of live capture and translocated to other National Parks or sold on auction, species with low economical/market value are harvested for venison. With the re-introduction of cheetah and the move towards managing the ecosystem for flux (including in animal numbers), it is likely that annual harvesting of large herbivores will be drastically reduced. Firewood harvesting from indigenous tree species will not be permitted in Mountain Zebra NP. However, there is currently sufficient firewood available from exotic tree species such as bluegums, pepper

tree, and pines. All *ad hoc* requests for any resource use will be dealt with in line with current policy applicable to the resources eg. PMP, NEM:PA, NEM:BA, NEMA, SANParks policies.

2.4 Effective Park Management

2.4.1 Environmental Management Programme

Having an environmental management system will assist park management with the achievement of their environmental management responsibility regarding ongoing operational environmental impacts. The EMS provides a mechanism for environmental management throughout all areas and departments at park level and focuses on covering environmental aspects at an operational level which a park can control and manage directly. The outcome of this standard must be integrated with the national park management framework to ensure an integrated approach.

The following interim environmental management standards will be adhered to at all times:
WASTE MANAGEMENT: No tips or rubbish dumps are to be developed anywhere within the Park – all waste material, of whatever nature, whether of tourist or management origin must be separated for recyclable materials and the residue must be removed to the local town dump.

POLLUTION CONTROL: All toxic waste such as chemicals and batteries must be removed from the Park and disposed of in a sensitive and responsible manner. Herbicide containers will not be cleaned and used for other purposes but returned to the suppliers. Old oil drained from machines will be stored in a drum for later recycling.

VISITOR IMPACTS: Impacts of this nature that require particular attention include littering at picnic sites and the development of undesirable pathways at the Valley of Desolation. All tourist sites should be provided with baboon-proof bins while hikers are not allowed to bury any rubbish and must remove what they carry into the Park.

BUILDING SITES: The practise of using rubble from demolished structures for erosion control or roadworks will be disallowed. An EMP will be put in place before work on any building site is initiated and this will include a final cleanup clause.

OTHER ASPECTS: Driving off the roads in the veld by visitors, contractors or staff is disallowed, other than under the supervision or instruction of the Park Manager and only where this is unavoidable or warranted by circumstances such as culling or capture.

Mountain Zebra NP does not have an environmental management system at this stage but it is envisaged that such a system would be developed and implemented in 2007. This system will focus on the following requirements:

- a. Environmental aspects: The park identifies the environmental aspects which the facility controls and over which it may be expected to have an influence, and determines which of those aspects are considered significant.
- b. Legal and other requirements: The park identifies, access and communicate legal and other requirements that are applicable to the park.
- c. Environmental Objectives and Targets: The park develops objectives and targets for each significant environmental aspect. Objectives and targets are developed considering significant environmental aspects, technological options and financial, operational and business plans, and the views of interested parties.
- d. Environmental Management Programs: The park establishes environmental management programs (EMPs) as a means for achieving objectives and targets. These programs define the principal actions to be taken, those responsible for undertaking those actions and the scheduled times for their implementation.
- e. Training, Awareness and Competence: The park identifies, plans, monitors and records training needs for personnel whose work may create a significant impact upon the environment.

- f. Operational Control: The park is responsible for identifying operations and activities associated with significant environmental aspects that require operational controls in procedures, work practices or environmental management programs.
- g. Emergency Preparedness and Response: The park identifies potential for and respond to accidents and emergency situations, and for preventing and mitigating the environmental impacts that may be associated with them.

2.4.2 Infrastructure Development Programme

Current infrastructure in Mountain Zebra NP comprises tourism infrastructure, including rest camps and day visitor sites, accommodation camps, tourism road networks and entrance gates. In addition, the park also has management and support infrastructure, comprising park administration offices, staff accommodation, management roads, fences and bulk services such as electricity supplied by Eskom. Some of the infrastructure simply requires maintenance, while others still require development. Details of these may be found in the associated lower level plan, available upon request from the park manager. For example, existing internal roads will be upgraded, and the remainder of the entrance road tarred. Planned new infrastructure includes a new entrance gate, replacement of the existing Eskom powerline to the restcamp, construction of 30-km of new tourist roads and a tented camp at Doornhoek, as well as construction of two new junior staff houses. The infrastructure development programme also details rehabilitation and decommissioning requirements such as the removal of redundant structures in particular areas of the park. A detailed budget has been drawn up for the infrastructure development programme and is available in the lower level plan.

2.4.3 Safety and Security Programme

Mountain Zebra NP is not currently faced with any serious safety or security threats. Potential threats vary from poaching to robbery and natural disasters such as fires or floods. The introduction of high value animals into Mountain Zebra NP has also increased the security risk. Since Mountain Zebra NP an income-generating business unit, with international and national visitors, the possibility of criminal activities relating to theft exists, including armed robberies, theft and house breakings. The purpose of the Safety and Security Plan is to put pro-active measures in place to ensure the safety and security of all people, assets, and resources in the park. The plan focuses on identifying weaknesses, strengths, threats and opportunities, identifying all roll-players. In addition, the programme aims to have an up-to-date operational plan with regard to contingencies to deal reactively with any related security and safety matters. (for more detail, please refer to the lower level plan on Safety and Security Plan for Mountain Zebra NP). All safety and security related costs are covered under the annual nature conservation operational budget.

2.4.4 Financial Sustainability Programme

Table 1 provides an estimation of the costs involved in striving towards the desired state for Mountain Zebra NP over the next 5-year period through all of the objectives and associated programmes detailed in this management plan. It is significant to note that there is shortfall of at least R7 million for each of the next 5 years, the biggest shortfall being in 2007 due to funding required for initial development by means of park expansion and infrastructure development. Thereafter the shortfall decreases because costs are associated mainly with maintaining the infrastructure already put in place. An important omission that requires urgent attention is an estimated costing for liability and risk. Corporate support (i.e. not included in Mountain Zebra NP's budget) will be required in the form of a technician and operating budget to undertake the monitoring necessary to evaluate TPCs and feedback as part of the adaptive management process. No cost estimates have yet been included for the adaptive management components of non-biophysical aspects of the plan. A detailed breakdown of

these figures can be found in the associated lower level plan, available from the park manager upon request.

Table 1 – Estimated costs (in Rands) of reaching the desired state for Mountain Zebra NP

Cost	2007/8	2008/9	2009/10	2010/11	2011/12
To acquire Phase 1(ha)	R 7,057,800.00	R 7,057,800.00	R 7,057,800.00	R 7,057,800.00	R 7,057,800.00
Total Development costs	R 16,101,000.00	R 10,345,000.00	R 11,560,000.38	R 3,370,000.00	R 100,000.00
Annual operational costs	R 4,067,500.00	R 4,100,130.95	R 4,349,079.33	R 4,609,483.36	R 4,887,815.51
Total costs	R 27,226,300.00	R 21,502,930.95	R 22,966,879.71	R 15,037,283.36	R 12,045,615.51
Allocated funds: IDP	R 0.00	R 7,930,000.00	R 7,050,000.00	R 0.00	R 0.00
Poverty relief - DEAT	R 5,846,000.00				
SANParks operational funds	R 3,467,000.00	R 3,675,020.00	R 3,895,521.20	R 4,129,252.47	R 4,377,007.62
Total source of funds	R 9,313,000.00	R 11,605,020.00	R 10,945,521.20	R 4,129,252.47	R 4,377,007.62
Shortfall	R 17,913,300.00	R 9,897,910.95	R 12,021,358.51	R 10,908,030.89	R 7,668,607.89

2.4.5 Other programmes under Effective Park Management

Other programmes that will be developed under Effective Park Management within the next 5-year management cycle include the Staff Capacity Building Programme

2.5 Corporate Support

2.5.1 Research Support

A crucial element of the adaptive management of Mountain Zebra NP is the requirement for research and monitoring, particularly of the biophysical component. Research is directed primarily at improving our knowledge of the system in order to fine-tune the TPCs that inform management decision-making for biodiversity conservation. Monitoring is essential to assess how close the system is to moving away from the desired state, and therefore requires management action. Without research and monitoring, it would not be possible to fulfil the adaptive management cycle. Corporate support is therefore required either in the form of additional scientific or technical capacity to carry out the research and monitoring, or in the form of funds to outsource at least these activities. Infrastructural and other support for this important component must also be incorporated in the costing at corporate level.

2.5.2 HIV/AIDS Programme

The purpose of the HIV & AIDS program is to enable SANParks maintain a healthy and productive workforce within a viable and sustainable organization. The SANParks HIV/AIDS Programme is available in the corporate policy framework. Mountain Zebra NP currently awareness days, clinic to do awareness programmes, prevalence testing done (70% undertook test).

2.5.3. Other programmes under Corporate Support

Mountain Zebra NP enjoys corporate guidance (see SANParks website for co-ordinated policy framework) for several other programmes that will develop park-specific initiatives within the next 5 year management cycle. These programmes include Risk Management and Communications.

3. ADAPTIVE AND INTEGRATIVE STRATEGIES TO SUSTAIN THE DESIRED STATE

Section 1 has dealt with the desired state for Mountain Zebra NP, and Section 2 with all the specific programmes which are believed necessary to achieve that state. However, the desired state cannot be effectively maintained without explicit attention being given to prioritization, integration, operationalisation, and above all, reflection and adaptation according to the principles in the biodiversity custodianship framework.

3.1 Key prioritization, integration and sequencing issues

High level objectives needed to achieve Mountain Zebra NP's jointly agreed upon Mission have been identified and are priorities for the next 5-year management cycle. By means of an objectives hierarchy, these high level objectives have been broken down into finer level objectives and, finally, operational initiatives to attain these objectives. In this way decision-making even at the operational level can be traced all the way back to the core values of stakeholders, upon which they have been based.

The imminent reintroduction of cheetahs into Mountain Zebra NP has implications for the prioritization and sequencing of certain management issues – it is critical that predator-proof fencing is erected as soon as possible to prevent escape and potential damage to neighbouring farmers' livestock. This will perform the added function of minimising the entrance of exotic animal species from neighbouring properties. Funding for the final 20% of this fencing exercise is imminent. In addition, the introduction of cheetah within 2006 makes the development and implementation of a monitoring programme and TPCs a high priority for Mountain Zebra NP within the next year. Mountain Zebra NP should also establish a reporting system to capture information about damage-causing animal incidents. Within Mountain Zebra NP, removal of fencing is a high priority to allow animals to move freely over the entire extent of the park. Control of the highly invasive jointed cactus requires considerable management emphasis, although it currently enjoys funding from Working for Water, this is not guaranteed over the longer term. Similarly, funding for the important rehabilitation of dryland erosion only has funding for one more year. The current water provisioning policy of Mountain Zebra NP requires attention to align with SANParks corporate policy, as well as with the minimum interference approach for herbivory management to be taken in Mountain Zebra NP from now on. Identification of the key ecological processes in Mountain Zebra NP is critical in order to inform the development of appropriate monitoring and management strategies. For mammals some of the key processes will include herbivory (particularly the maintenance of grazing lawns), predation, population health and viability (growth, demographics, condition assessment). A pro-active antipoaching initiative will also be required to protect the black rhino population in Mountain Zebra NP. Finally, the shift to an adaptive management approach requires a dedicated monitoring programme and staff to undertake the monitoring. Developing the monitoring programme and appointing dedicated staff is therefore a top priority for Mountain Zebra NP's biodiversity objective. Mountain Zebra NP's marketing and commercial development programmes must be developed in the next 5-

year cycle, along with the development of TPCs for the non-biophysical attributes of Mountain Zebra NP.

3.2 Steps to Operationalisation

The formulation an objectives hierarchy for Mountain Zebra NP assisted in prioritising management actions and goals for the park. The next step is for park management to use this guidance to draw up a detailed plan of action down to annual operational level, and wherever necessary, down to the level of tasks and duties of individual staff members. The park manager must be satisfied that the desired state for Mountain Zebra NP is adequately and appropriately served by all of this. A further cross-check is contained in the Balanced Scorecard system used by SANParks to measure its performance. Mountain Zebra NP's own Balanced Scorecard, as well as those of individual staff members, is in alignment with SANParks corporate-level Balanced Scorecard objectives, thereby supporting effective implementation of objectives across all levels of the organisation.

In addition, Mountain Zebra NP's broad costing for the next 5-year cycle outlines existing, as well as projected budgets and costs to achieve the desired state. It is important not to underestimate the required costs of implementing this management plan because of historical financial limitations, but to be realistic about the funds required to carry out the operations necessary to achieve the jointly agreed upon desired state under new paradigms, and using adaptive management that requires feedbacks not previously budgeted for. The fact that this plan's budget is higher than in previous years is a direct consequence of this planning exercise having made explicit the objectives, and associated operations, necessary to achieve this jointly agreed upon desired state.

3.3. Key ongoing adaptive management and evaluation interventions

- *Feedback that the management action as decided upon and specified, is carried out as such:-* This responsibility lies with line-function management, and will be reported on via SANParks regional reporting structures to the Executive Director: Parks. Park-specific and individual Balanced Scorecards provide an explicit mechanism to ensure that this feedback takes place. In addition, the Protected Area Management Assessment (PARMA) evaluates the effectiveness of protected area management in ranger sections.
- *Feedback whenever a TPC specifying the endpoints of any of our biodiversity objectives is violated, or is credibly predicted to be violated in the future:-* This requires that a disciplined monitoring programme be in place, that the custodian of the particular programme (post/person specified in low-level TPC plans for each theme in Mountain Zebra NP) duly report the exceedance to a competent (preferably formally constituted) joint science-management forum, which includes the Park Manager or his duly appointed delegate. This must lead to a management response. There is currently no such science-management forum in Mountain Zebra NP, and establishing one is therefore a crucial step in the park's adaptive management cycle over the next 5 years. Moreover, the suite of biophysical TPCs suggested for Mountain Zebra NP require explicit formulation and quantification. Wide experience shows it is far better to have roughly defined preliminary TPCs for these themes (and improve these later, something which then tends to happen automatically) than to wait years for perfect ones to be developed.
- *Feedback that the predicted outcome (of management resulting from the above exceedance) of an intervention is achieved, or what materialized instead in its place:-* This is usually directly measurable by checking whether the same TPC returned to within its acceptable limits after management action was taken. In Mountain Zebra NP this should be done by at least quarterly meetings of the science-management forum

to be formed. The best possible adaptive decision must then be taken in light of this evaluation. Examples of outcomes that are likely to be of particular learning value in Mountain Zebra NP are the outcomes of predator-prey relationships, including the effect of cheetah on the growth rate of the mountain zebra population, the effects of minimum intervention on herbivore populations, and the effectiveness of jointed cactus control mechanisms. Additional feedbacks that are required, but for which no formal TPCs exist, relate to the effect of fire on vegetation diversity (composition, structure) in arid grasslands, and the effects of minimising/closing down further waterholes. The results of black rhino monitoring will contribute towards assessing whether habitat in Mountain Zebra NP really is suitable for the metapopulation management of this species.

- *Feedback to SANParks Head Office of the overall performance of Mountain Zebra NP relative to its stated objectives:-* This will be done via an annual State of Biodiversity report and other incidental reporting for Mountain Zebra NP. It is likely that Mountain Zebra NP may, for several key themes, take many years to progress towards the desired state (e.g. park expansion, development of the road network, invasive alien plant control), and that several issues may remain outside thresholds for many years, or may even require fine-tuning as our knowledge of the system increases or societal values change. It is important in these cases to track progress by achievement of intermediate steps towards the desired state, or to document the reasons for any changes in the mechanisms of achieving the desired state.
- *Feedback as to whether organizational or societal acceptance of the consequence of an intervention is still, as agreed on previously, acceptable:-* This is a longer-term adaptive evaluation, and if expectations are roughly met, can be dealt with at the time of the 5-yearly public meeting held to review the management plan. If, however, significant unintended consequences materialized that have shorter-term impacts, it will be the responsibility of the science-management forum above, to sense this, reflect on it, and make an appropriate recommendation to the Park Manager. The areas in which this is likely to occur are conflicting interests regarding park expansion, the issue of damage-causing animals and whether they originate within the park, financial accessibility of the park to locals, resource use in the park, and potential large-scale mortality of animals during drought periods related to the minimum interference management policy.
- *Feedback as to whether the monitoring programme and list of TPCs is manageable/achievable and effective:-* This is the responsibility of the scientific custodians involved, but overall (the programme taken as a whole) the responsibility of the science-management forum above. It is broadly challenged each 5 yearly cycle. The explicit use of adaptive management, using TPCs to make management decisions, and evaluating the state of Mountain Zebra NP along a trajectory of change away from its desired state by means of a monitoring programme, will be a new endeavour for Mountain Zebra NP. There may thus initially be feelings that the task is overwhelming, and these should be countered by referring to the objectives hierarchy for prioritisation of the various initiatives and strategies required. Manageable, achievable and effective monitoring and feedback will require complete buy-in and co-operation of the joint science-management forum, and careful consideration of the choice of a small and realistic list of TPCs that indicate the condition of essential ecosystem processes as far as possible.
- *Feedback as to whether objectives need adjustment in the longer-term:-* This is dealt with effectively at the 5-yearly review step. However, in the case of perceived “emergencies” the Park Manager is constrained within the limits of agreement. In Mountain Zebra NP, the most likely issues that may stir debate over the longer term

are the park expansion programme, and the ecological spinoffs of the minimum interference policy with regards to game populations. However, these issues should make use of the objectives hierarchy, which flows directly from the jointly agreed upon Vision and Mission for Mountain Zebra NP, as guidance during conflict resolution.

- *Feedback as to, or at least latent preparation for, surprises*:- By definition these cannot be predicted. It will however, be an explicit obligation of the Park Manager to take responsibility to stimulate contingency and risk management assessments. From an ecosystem perspective, such surprises are best dealt with by generating scenarios. Mountain Zebra's joint science-management should aim to conduct at least one structured scenario planning session per 5-year cycle. In Mountain Zebra NP, appropriate scenarios are likely to include uncontrolled extensive lightning fires, outbreaks of disease in ecologically important or valuable animal species, or a significant reduction in the numbers of high value game species through droughts or predation.

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