Camdeboo-Mountain Zebra National Park Corridor: Opportunities for Conservation and Socio-Economic Development

Matthew Norval

Abstract—The Wilderness Foundation, in partnership with South African National Parks has initiated a two year project in the Karoo; The Mountain Zebra-Camdeboo Corridor Project. Through either voluntary Contractual National Park or Protected Environment agreements, the project aims to work with, rather than displace, current conservation-compatible land-use practices such as eco-tourism, livestock grazing and other sustainable resource use. Less formal conservation options, such as biodiversity agreements, will also be offered to landowners. These agreements provide benefits to landowners in terms of protecting the environment as well as contributing towards the conservation of threatened wildlife species. Protection contributes to safeguarding the recently-identified Sneeuberg Centre of Endemism, part of the Amathole-Sneeuberg Montane Belt. The project will stimulate conservation-friendly economic development in the region while protecting it from inappropriate development. It is envisaged that the outcome of the project will be a mosaic of properties, including both SANParks-managed and privately-owned land.

Introduction

The idea of a corridor between the Camdeboo and Mountain Zebra National Parks was first officially proposed in 2003 and more recently South African National Parks (SANParks) identified an opportunity to consolidate and expand the protected area estate in an area stretching from Mountain Zebra National Park (MZNP) to Camdeboo National Park by means of voluntary contractual agreements with private landowners. The project footprint includes one of the top three identified priorities for large formal protected areas within the grassland biome.

Matthew Norval, Director Conservation Programme, Wilderness Foundation South Africa; Email: matthew@sa.wild.org

In: Watson, Alan; Carver, Stephen; Krenova, Zdenka; McBride, Brooke, comps. 2015. Science and stewardship to protect and sustain wilderness values: Tenth World Wilderness Congress symposium; 2013, 4-10 October; Salamanca, Spain. Proceedings RMRS-P-74. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 208 p.

The Mountain Zebra National Park Complex is an identified Critical Ecosystem Partnership Fund (CEPF) priority with the prioritization based on the presence of a range of Red Listed Species (especially the larger charismatic threatened mammals), the potential importance as a climate change adaptation corridor, and to a lesser extent for the delivery of ecosystem goods and services. The area forms a large part of a corridor known as the Amathole-Sneeuberg Montane Belt, and now also contains the recently identified Sneeuberg Centre of Endemism.

The project aims to capitalise on the opportunities created through the emergence of a significant private conservation land holding in the area with land use compatible for formal inclusion as contractual national parks. If this opportunity is not pursued immediately there is a danger that the consolidation of this complex will not be possible in the future due to fragmentation of land parcels and irreversible impacts from incompatible land use.

The first phase of the project is being implemented through a partnership between Wilderness Foundation, a Non-Government Conservation Organisation, and South African National Parks and is being implemented over a two-year period that commenced in March 2012 and concludes in February 2014.

The aim of the project is to create a conservation corridor through either Contractual National Park or Protected Environment agreements with private landowners, and through doing so stimulate conservation-friendly economic development in the region and protect it from inappropriate development. Both these are categories of formal protected area which represent significant benefits in terms of protection by national legislation and provide long term security of conservation tenure (e.g. National Park status completely protects areas from prospecting and mining, while Protected Environment status provides significant protection). The Contractual National Park category is most suitable for larger conservation and ecotourism operations, while the Protected Environment category is focused on ensuring the effective management of landscapes (especially rangeland and sustainable resource use areas). In addition, the project will offer less formal conservation options to landowners (e.g. biodiversity agreements). The project will not be looking at purchasing land but rather aims to voluntarily include privately owned and managed land as part of the corridor.

The project will work with, rather than displace, current conservation-compatible land-use practices such as appropriately managed rangeland, eco-tourism and sustainable resource use areas (such as hunting). The expected outcome of the project is an enlarged and consolidated corridor of for-

mally protected areas made up of a matrix of both privately and SANParks managed land that addresses various conservation objectives, e.g., reducing the threat from natural gas prospecting; encouraging conservation compatible range management; improving the protection of endangered species; and stimulating a sustainable agriculture, eco-tourism and conservation driven economy.

The objective of the corridor is: To maintain the current landscape in terms of its scenic, biodiversity and landscape values through collective action by the private landowners and to protect the area from detrimental developments.

Conservation Corridors Defined

Biodiversity conservation corridors are strategically located regions that link key habitats for plants and animals, including protected areas. Typically they can be broad landscapes that cover a range of land uses, including agriculture, human settlements, and in certain cases even industrial activities (Lane 2008).

Broadly speaking, corridors connect fragmented habitats and protected areas and play a number of roles that can include: conserving threatened species; protecting territory needed by wide ranging species; sustaining natural processes, like water cycles and pollination; and developing solutions that protect nature while supporting human well-being (Lane, 2008).

The corridor concept has a number of advantages. Most threats to critical habitats actually originate far from the sites and well outside of the control of park managers and conservationists, like decisions made by national and provincial governments or the pressures of changing market demands. Conservation corridors, however, can help foster and encourage collaboration among stakeholders at all scales. Planning a corridor is essentially creating a sustainable landscape that's optimized for both human and nonhuman inhabitants over the long term (Lane 2008).

Challenges and the Project Approach

Successful corridor planning must involve a thorough understanding of local and regional communities and their economic needs. This then needs to be followed by a strategy for addressing those needs while achieving the biodiversity goals set for the corridor.

Conservation strategies at the landscape scale inevitably revolve around the question of development versus conservation and this is very much the case in the Karoo. Challenges include generating information on tradeoffs and costs, and also finding the synergies that exist between the economic tools and options including more productive agricultural practices and ecotourism—to support development while lowering the costs of conservation to the government and local people

Figure 1—Map indicating the Corridor planning domain in relation to the two anchor national parks.

Figure 2—The Mountain Zebra Camdeboo Corridor is characterised by typical Arid Karoo landscapes. Photo credit: Chris Marais / Wilderness Foundation.

The project will focus on a planning domain (project footprint) of 530,000 ha. Existing privately owned, but not formally protected conservation areas cover 97,000 ha within the corridor, and includes well established privately owned nature reserves.

The Camdeboo-Mountain Zebra Corridor has significant biodiversity value and meets the criteria of the National Environmental Management: Protected Areas Act (No.57 of 2003) for the declaration as a Protected Environment (to be known as the Mountain Zebra Camdeboo Protected Environment: MZCPE).

The purpose of the MZCPE is captured in the motivation for its proclamation.

- Enable owners of land to take collective action to conserve biodiversity on their land and to seek legal recognition therefore
- Protect the area if the area is sensitive to development due to its – biological diversity; natural characteristics; scientific, cultural, historical, archaeological or geological value; scenic and landscape value; or provision of environmental goods and services
- To maintain the current landscape of the area which has, through the current management, maintained its biodiversity value

The medium term objective was to contract 30,000 ha into the corridor as Contractual National Park or Protected Environments both of which are categories of formal protected area which represent significant benefits in terms of protection by national legislation and long-term security of conservation tenure. The 30,000 ha already represents 10% of the Maputaland-Pondoland-Albany Hotspot conservation areas expansion target, and in planning the potential was identified to consolidate up to 100,000 ha or a third of the overall target for the hotspot. A number of private landowners have already expressed interest in contractual consolidation. The medium to long-term outcome would be an enlarged protected area made up of a matrix of both privately and SANParks managed land that addresses the conservation challenges of the region.

Some risks do exist mostly related to landowner willingness but the project team believes that this can be overcome as a result of clear planning and implementation. This view is based on some successful initial work already undertaken in the area.

A dedicated project manager has been appointed and is based in Camdeboo National Park and in Graaff-Reinet and they are responsible for the day to day management of the project and coordinating the implementation of the work plan. Strategic support, work plan development and oversight are carried out by experienced staff from both SANParks and the Wilderness Foundation. This is achieved by setting up a joint steering structure as well as by providing on the ground support as required. The Project Manager will be able to operate independently as well as in close cooperation with the park managers of both national parks involved.

Initially the project collated existing planning documents and data as well as specific information on private landowners and land uses in the area. This project was used by the broader management team to develop an operational plan that includes entering into negotiations with these landowners in order to secure long term contractual national park partnerships and/or the establishment of protected environments.

The expected outcome of the project is an enlarged, consolidated corridor of formally protected areas made up of a matrix of both privately and SANParks managed land that addresses the conservation challenges detailed earlier. In addition to protecting the recently identified Sneeuberg Centre of Plant Endemism, the area has the potential to play a key role in permanently safeguarding the threatened Cape Mountain Zebra and Black Wildebeest, as well as playing a significant role in Black Rhino and Cheetah conservation.

Figure 3—Extensive livestock farming with sheep and cattle is the predominant agricultural practice within the planning domain. Photo credit: Chris Marais / Wilderness Foundation.

This project is also complimentary to and supportive of the outcomes of another project being implemented by the Wilderness Foundation that is working with national, provincial and private protected area managers to promote management effectiveness within reserves in this region.

The Planning Domain: Landscape, Natural Features and Biological Environment

The planning domain stretches from Cradock in the east to Graaff-Reinet in the west. The area is bounded in the north by the main Graaff-Reinet/Cradock Road (R61) and then runs along the N9 for 20km before following secondary roads westwards for approximately 25km and then due south to the N9. The planning domain is then generally bounded on the south and southwest by the N9 and R75, except around Graaff-Reinet, where the town is excluded from the planning domain. The domain boundary then runs north of the R63, before following the R337 to Cradock. The total area encompassed by this planning domain covers some 523,000 ha.

Climate

The climate 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 and 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 and 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.

Topography and Terrain Morphology

The mountainous terrain of the MZNP 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 planning area is dominated by the Sneeuberge (running north-south in the central portion of the area) and the Tandjiesberge (running east-west through the centre of the planning domain). Low altitude plains of the Great Karoo (at approximately 850m asl.) are found in the southeast, while the higher altitude (approximately 1,200m asl.) plains of the North Karoo extend into the planning domain in the northwest.

Hydrology and Aquatic Systems

The Sundays River (and its ephemeral tributary, the Voël River) drain the southern and western slopes, while the headwaters of the Great Fish River drain the eastern and northern slopes). The proposed planning domain for the MZNP would be an important area for the conservation of the water catchments for the Great Fish River which drains the basins to the north of the Tandjiesberg (Holness et al 2003)

Vegetation

The protected environment is located in a transitional area between four biomes: Grassland, Nama Karoo, Thicket and Savanna. According Low and Rebelo (1996) six major vegetation types are present in the area:

- South Eastern Mountain Grassland covers 36% of the planning domain, predominantly within the central mountainous region. These areas are sweet to mixed grasslands with *Merxmuellera disticha*, *Melica decumbens*, *Karoochloa purpurea* grasses and shrubs such as

Figure 4—The conservation of the plant diversity of the Karoo is an important motivation for the establishment of the corridor. (*Aloe ferox* pictured here). Photo credit: Chris Marais / Wilderness Foundation

Euryops annuus, *Sutera macrosiphon* and *Elytropappus rhinocerotis*. In places, owing to overgrazing, Karoid elements appear to have moved into the plant community.

- Eastern Mixed Nama Karoo covers the northern plains (32% of the domain). The Eastern Mixed Nama Karoo is a mix of grass and shrub dominated vegetation types that are subject to dynamic changes in species composition depending upon rainfall and probably fire. It remains the only Karoo vegetation type shaped by fire. Shrubs such as *Pentzia incana*, Eriocephalus ericoides and *E. spinescens* dominate, while grasses such as *Aristida* spp. *Eragrostis* spp. and Themeda triandra are common. The river valleys generally have dense stands of Acacia karroo.
- Valley Thicket (16% of the planning domain) occurs on the southern slopes of the Tandjiesberge. Olea europea subsp africana, *Ziziphus mucronata*, *Scutia myrtina* and *Rhus pallens* are common. Succulents are rare.
- The southern plains are covered by Central Lower Karoo (13% of the planning domain). Typical shrubs, succulents and grasses include *Euclea undulata*, *Tylecodon paniculatus*, *Rhus undulata* and *Eriocephalus ericoides*.
- Spekboom Succulent Thicket (3% of the planning domain) occurs at the transition between Valley Thicket and Central Lower Karoo vegetation types. The Spekboom *Portulacaria* afra dominates, with other shrubs such as *Carissa haematocarpa*, *Maytenus polycantha* and *Grewia robusta* being present.
- Small areas (1% of the domain) of Sub-Arid Bushveld savanna biome elements are found along the Southwest border of the domain.

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 with a wide diversity of habitats ranging from mountaintops to valley bottoms have the potential to 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 potential corridor are currently very poorly conserved elsewhere in South Africa and the corridor will play a critical role in the long-term preservation of biodiversity.

Figure 5—Mountain Zebra in their stronghold in the Mountain Zebra National Park, in the east of the corridor. Photo credit: Chris Marais / Wilderness Foundation.

Fauna

Mountain Zebra National Park was initially proclaimed in 1937 to preserve the rapidly declining Cape mountain zebra population that had been reduced to about 100 animals (Novellie, Lloyd and Joubert 1992). From 11 animals in 1950, the mountain zebra population in MZNP grew to 200 in 1981, after which the population has been maintained at this level through removals until recent expansion allowed the population to increase. The population now stands at over 300 animals and is an important source of genetically uncontaminated zebra from which to stock other conservation areas within the historical range of the species.

However, the habitats and vegetation communities within the park support a variety of other fauna and the conservation of biodiversity is also a priority. There are 7 mammal species in the proposed corridor that are currently or have previously been listed as red list species. These are:

- White-tailed mouse (*Mystromys albicaudatis*);
- Sclater's golden mole (*Chlorotalpa sclateri*);
- Black-footed cat (*Felis nigripes*);
- Aardwolf (*Proteles cristata*);
- Honey badger (*Mellivora capensis*);
- African wild cat (*Felis silvestris*); and
- Aardvark (*Orycteropus afer*).

The existing MZNP currently supports 15 species of large mammal of which black rhino, eland, red hartebeest, black wildebeest, blesbok, springbok, and Cape buffalo have been successfully reintroduced.

The consolidation of the corridor has the potential to hold some of largest populations of grassland herbivores, namely blesbok and black wildebeest, and in this regard would be an important national park. Furthermore, if and when appropriate, the introduction of large predators, such as lion, cheetah, and wild dog could be considered and would be a considerable draw card.

The corridor will also become an important refuge for resident large raptor species such as the *Martial Polemaetus bellicosus*, and Black Eagle *Aquila verreauxii*, as well as the Red Data Book Cape Vulture *Gyps coprotheres*. Following IUCN criteria the Camdeboo National Park is of global ornithological importance (Barnes, 1998). The globally threatened Lesser Kestrel is seasonally present in numbers from 500-3000. 20-50 breeding pairs of the globally threatened Blue Crane are also present. Nationally threatened bird species include the Tawny Eagle, Martial Eagle, Kori Bustard, Ludwig's Bustard and Stanley's Bustard; all of which are thought to breed in the reserve. Other near threatened species includes the Blue Korhaan, Secretary Bird and Ground Woodpecker. In addition to these species, a number of restricted range and biome restricted species are present, including the Karoo Korhaan, Sicklewinged Chat, Karoo Chat, Layard's Titbabbler, Namaqua Warbler and Blackheaded Canary.

Of the bird species that have been confirmed to occur in the corridor seven are listed as vulnerable and eight are listed as near threatened. The vulnerable species are:

- Tawny eagle (*Aquila rapax)*;
- Martial eagle (*Polemaetus bellicosus*);
- African marsh harrier (*Circus ranivorus*);
- Lesser kestrel (*Falco naumanni*);
- Blue crane (*Anthropoides paradiseus*);
- Kori bustard (*Ardeotis kori*); and
- Ludwig's bustard (*Neotis luwigii*).

The Near Threatened species are:

- Black stork (*Ciconia nigra*);
- Greater flamingo (*Phoenicopterus ruber*);
- Lesser flamingo (*Phoeniconaias minor*);
- Secretary bird (*Sagittarius serpantanus*);
- Black harrier (*Circus maurus*);
- Peregrine falcon (*Falco perigrinus*);
- Lanner falcon (*Falco biarmicus*); and
- Blackbellied korhaan (*Eupodotis caerulescens*).

Figure 6—Agriculture, conservation and tourism are important drivers of the Karoo economy. Photo credit: Chris Marais / Wilderness Foundation.

There is good herpetofaunal representation with 45 recorded reptiles, with the potential to encounter an additional 12 species, while the amphibians are relatively well represented with 12 species. The reptiles include 13 regional endemics and one extremely local endemic.

Potential Land Use and the State of Transformation

Soil characteristics and topography within the planning domain play a fundamental role in determining potential land use, with much of the area being covered by soils unsuitable for arable agriculture or grazing. Forty nine percent of the planning domain is unsuitable for use other than conservation, water catchments or recreation. A further 29% is unsuitable for arable agriculture, but may be used for grazing when conditions permit. This suggests that much of the planning area could be converted to conservation use, without a significant opportunity cost in terms of either arable agricultural land or good grazing being lost. Further, the poor agricultural potential of the land suggests that the cost of acquiring land will be relatively low, or alternatively that the attractiveness for landowners of incorporation under a contractual basis within the extended park will be high (Holness et al 2003).

The planning domain is relatively untransformed at present. Holness et al (2003) suggest that only 5.1% (26733ha) of the planning domain has been transformed by ploughing, urbanization, erosion, or long turn degradation by overgrazing. Further, almost all the land transformation has occurred along the periphery of the planning domain. Important areas of land degradation are the southern Great Karoo Plains, the area around Graaff-Reinet, and the farms (especially De Rust and Doornhoek) that were recently incorporated into the MZNP. Within the core area of the planning domain only 1.2% of the land has been degraded. This may be an underestimate of the actual levels of transformation within the study area, as overgrazing of grassland areas is suggested to have allowed the invasion of karroid shrubs.

Creating Development Options: Partnerships and the Long-Term View

The two national parks are important components of the corridor as they provide the institutional support, experience and long term commitment that will give the corridor the sustainability required. Both park managers are involved in the implementation of the corridor project and this was done deliberately to demonstrate commitment and to encourage the building of relationships between landowners and SANParks staff.

While the Mountain Zebra National Park was initially proclaimed in 1937 for the sole purpose of protecting a remnant population of the Cape Mountain zebra *Equus zebra zebra*. The importance of the park has now grown beyond a "species park" focus on the mountain zebra, to an important site for the vegetation type typical of this north-eastern area of the Karoo (Novellie, Lloyd and Joubert 1992). The park has expanded over the years and is now 28,000 ha and with the increased value being placed in tourism, the park is now seen to form an important nucleus for tourism to this part of the Karoo.

Similarly the Camdeboo National Park was established in 1979 (as the Karoo Nature Reserve) and it protects a variety of Karoo fauna and flora. It includes the scenic Valley of Desolation and Spandaukop. The park is currently 19,102 ha in size and surrounds the historic town of Graaff-Reinet and includes the Vanryneveldspas Dam.

Figure 7—Establishment of the corridor aims to conserve biodiversity as well as important heritage and cultural features of the Karoo. Photo credit: Chris Marais / Wilderness Foundation.

Given the stated tourist needs and the costs of transport and infrastructure, it is desirable that SANParks makes its greatest investments in tourism into those parks that have the capacity to maintain a high diversity of large mammals and are situated relatively close to areas of high human population density (for the domestic tourist) or close to international centres or attractions (for overseas tourists). A varied and attractive landscape, capable of supporting a high diversity or high density of animals, including rare or threatened species, in a malaria-free zone is also necessary. In this regard the MZNP (as a key feature of the corridor) has the potential to fulfil the criteria in being able to provide a unique South African experience in the form of the Karoo, with good game viewing in a topographically diverse landscape, free of malaria, close to the N10 national road about three hours drive from Port Elizabeth on the main road to Bloemfontein, and on the N9 National Road between Gauteng and the Garden Route.

Apart from the range of attractions found on private land and those yet to be developed the consolidated conservation corridor would be able to offer a number of unique attractions:

- ◊ Some the best Karoo scenery available, including the Valley of Desolation and Spandaukop.
- ◊ A Globally Important Bird location, offering a good opportunity of seeing a variety of Karoo endemics and raptors, as a draw card for birders.
- ◊ A base for cultural tourists, located around historic Graaff-Reinet and near to the internationally known "Owl House" of Nieu Bethesda.
- ◊ The largest concentrations of grassland herbivores in South Africa.

Further, the expansion proposed motivated for here will hopefully stimulate conservation-friendly economic activity in this otherwise depressed part of South Africa, in a way similar to that experienced around the Greater Addo Elephant National Park project and other conservation and development initiatives. While the corridor may contribute to increasing the potential for the further development of nature based tourism it also aims to not only maintain the current landscape, but in time promote better management of the land in the future.

A fundamental principal of the protected environment (as a key component of establishing the corridor) is that it integrates conservation with livestock production, arable agriculture, hunting and ecotourism.

The focus on biodiversity conservation efforts will be to:

- ◊ Protect the landscape and its scenic characteristics
- ◊ Secure key biodiversity features and ecological functioning within the corridor
- ◊ Promote conservation minded farming

As one of the outcomes of the project is to promote appropriate development, a regional conservation and ecotourism forum is being established which will play a role in establishing opportunities linked to the corridor. Importantly, it is envisaged to remain in place after the project to continue to pursue conservation related development options. The purpose of the forum is primarily to identify and develop opportunities for ecotourism and conservation within the corridor. In addition it will act as a forum for role-players to discuss areas of common interest related to conservation, agricultural and tourism issues. In time, it is hoped that it will also act as a conduit for encouraging the sharing of scientific information and on-the-ground expertise to promote effective co-operation between those involved in conservation management, agriculture and tourism in the area. It will also promote the awareness, understanding, appreciation and active conservation of the special qualities, status and natural processes of the area

The Forum's sphere of activity includes a wide range of environmental issues including wildlife and habitats; landscape; heritage and archaeology; natural resources including air, water and soils; agriculture and land management; public access and recreation; and environmental awareness and education.

Conclusion

The Camdeboo-Mountain Zebra Corridor Project is taking a holistic approach to the conservation and development challenges of the Karoo. The corridor provides opportunities for private landowners and SANParks to cooperate to create the envisioned matrix of land uses that promotes conservation, facilitates economic opportunities and focuses on development options that will not limit those of future generations.

The Camdeboo-Mountain Zebra Corridor Is deserving of formal protection status for many reason, any one of which would be sufficient for such status:

- ◊ The MZCPE falls within the Sneeuberg centre of endemism
- ◊ The protected environment houses a diverse assemblage of plants and animals
- ◊ The area is a transitional area between four biomes and includes six major vegetation types poorly conserved elsewhere in South Africa
- ◊ Includes a Globally Important Bird Area
- ◊ It is an important area for conservation of the water catchments for the Great Fish River which drains the basins to the north of the Tandjiesberge
- ◊ It is an area with unique and valuable scenic and landscape characteristics

In years to come it is unlikely that our children's children will wish that we had hydrofracked more in the Karoo but it is very likely that they will wish that we had set aside more land for conservation and created more corridors. We look forward to doing just that in partnership with conservation agencies, landowners and local communities.

References

Barnes, K.N 1998. The Important Bird Areas of Southern Africa, Birdlife South Africa, Johannesburg.

Brown, L.R. and Bezuidenhout 2000. The phytosociology of the De Rust section of the Mountain Zebra National Park, Eastern cape. Koedoe 43(1): 1-18.

Holness, S., Castley, J.G. and Knight, M.H 2003: The Greater Mountain Zebra National Park Development Plan: Linking Graaff-Reinet to Cradock, Internal report, Scientific services, South African National Parks .

Pond, U Beesley, B.B., Brown, L.R., and Bezuidenhout, H 2002. Floristic analysis of the Mountain Zebra National Park, Eastern Cape. Koedoe, 45(1): 35-57.

Lane, C 2008. Conservation corridors.www.conservation.org

Low, A.B. and A. Rebelo 1996. Vegetation of South Africa, Lesotho and Swaziland. Department of Environmental Affairs, Pretoria.

Novellie, P.A 1988. Factors affecting the seasonal movements of Cape mountain zebras in the Mountain Zebra National Park. South African Journal of Zoology 23:13-19.

Novellie PA, P Lloyd and E Joubert 1992. Mountain zebras. In: Zebras, Asses, and Horses: An action plan for the conservation of wild equids, P Duncan (Ed.), IUCN Species Survival Commission, Gland.

Van der Walt, P.T. 1980. A phytosociological reconnaissance of the Mountain Zebra National Park. Koedoe 21: 1-32.

Werger, M.J.A. 1978. Biogeographical divisions of southern Africa. Biogeography and Ecology of southern Africa. (Ed.) M.J.A. Werger, Junk, The Hague 145-170.