



South African
NATIONAL PARKS

Bontebok National Park

PARK MANAGEMENT PLAN

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AUTHORISATION

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

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EXECUTIVE SUMMARY

The Bontebok National Park (BNP) is the smallest national park managed by SANParks, and also one of the oldest. The purpose of the establishment of the original BNP in 1931 was to ensure the survival of the bontebok, a task which can no longer be regarded as the top priority because the species has successfully been established in many protected areas within its historical range. Widespread habitat destruction in the region, mainly through crop cultivation, has elevated the importance of conserving the last remaining patches of natural lowland vegetation. This management plan identifies the conservation of the biodiversity of the renosterveld and lowland fynbos as the priority biodiversity conservation objective. However, the bontebok remains the popular icon of the BNP and the maintenance of a viable population in the park is retained as a high priority. Other large herbivores of importance in the park are Cape mountain zebra, grey rhebok and also Cape grysbok, a small antelope endemic to the Cape Floristic Region. Because the BNP is one of the last remaining islands of natural lowland habitat in the area, the conservation of numerous rare species of plants and animals is an increasing priority, and the BNP is thought to be the last stronghold of a number of rare plant species. Sound management of the processes of fire and herbivory are considered particularly important for achieving the vegetation conservation objective of the park.

An important objective for SANParks is to promote all possible opportunities for visitors to appreciate and value national parks. Each park should become a nature-based tourism destination of choice, thereby constituting an economically and culturally valuable asset to the regions in which it occurs. The BNP, favourably situated near the highway linking the Cape Peninsula with the Garden Route, has considerable potential in this regard. However, much remains to be done to realize this potential. Visitor facilities are old, and need to be expanded and upgraded. This is particularly true of facilities for day visitors, which are in urgent demand but are currently inadequate. The road network needs to be upgraded and rationalized, and the variety of activities on offer to visitors needs to be increased. Particularly in that it is situated in a biome that is extremely vulnerable to loss of biodiversity, the BNP should give priority attention to environmental education. The BNP also offers valuable opportunities for appreciation of the rich cultural heritage of the region. The management plan therefore puts forward operational plans for expansion of its education capacity, covering both environmental and cultural heritage.

The budget of the BNP is sufficient only to maintain the park in its current state, but will not realize its desired state either for biodiversity conservation, tourism or education potential. Programs and budgets are put forward to make good the shortfall.

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1 INTRODUCTION: BACKGROUND INFORMATION

1.1 Location

Bontebok National Park (BNP) (34°02' S, 20°25' E) is situated 240 km from Cape Town and 8 km from Swellendam. It lies on the coastal plateau between the Langeberg Mountain range (5 km away) and the Indian Ocean (50 km away).

The first Bontebok National Park was established in 1931 near Bredasdorp specifically to save the few remaining bontebok from extinction (Barnard & Van der Walt 1961). At the time, a mere 17 bontebok *Damaliscus pygargus* spp. *pygargus* remained from a known population of 20 animals in the area. Initially the bontebok thrived under this protection, but later inadequate grazing (Novellie 1986), parasite infestations, trace element deficiencies (Barnard & Van der Walt 1961) and the wet marshy conditions in the area again threatened the survival of this species. The animals were subsequently transferred to the park at its current location in the Swellendam District in 1960, and the new park was formally proclaimed on 24 March 1961 (Barnard & Van der Walt 1961; Van Rensburg 1975). The remaining animals at the old park in Bredasdorp were translocated to the then Provincial wildlife farm, De Hoop (now a Provincial Nature Reserve).

1.2 Extent

Communal land from the Swellendam municipality and a few privately owned farms were obtained for the new park (1462 ha) at Swellendam, and proclaimed on 24 March 1961 (Van der Merwe 1968). In December 1965, two additional pieces of land were acquired by the State and proclaimed, bringing the park to a total of 2775 ha (Van der Merwe 1968). During 2000 an additional piece of land of 700 ha, known as 'Die Stroom', was acquired, BNP hence totalling 3475 ha. The park as it was prior to acquiring Die Stroom will hereafter be referred to as the 'old park'.

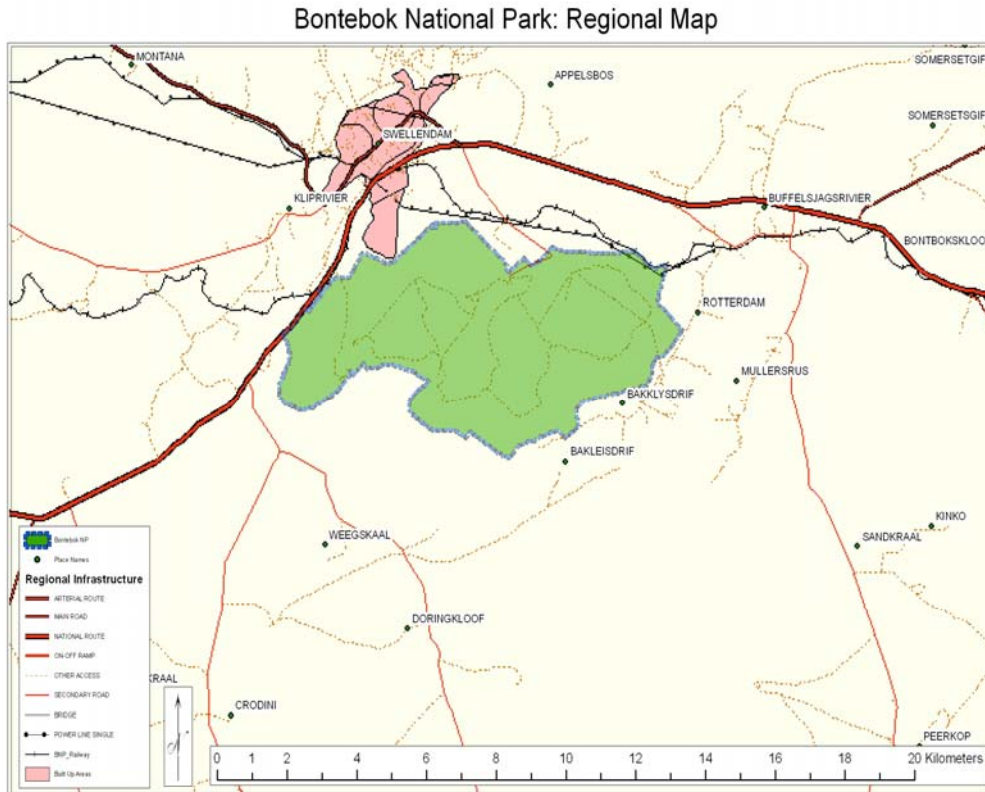


Figure 1: The extent and location of Bontebok National Park.

1.3 History

As noted above, the Bontebok National Park, originally located south of Bredasdorp, was re-proclaimed at its present location near Swellendam in 1961. It is not certain who the earliest inhabitants of this area were, although many Stone Age tools of ancient civilizations are found between Riversdale and the Buffeljags River. Much evidence exists of the presence of nomadic San and Khoe-khoen people (Van Rensburg 1975).

Of special importance to the Swellendam/Caledon area were the Hessekwas herders, who kept numerous sheep and cattle on the coastal lowlands, which they used for trading with the Cape settlers since 1660 (Van Rensburg 1975). Lang Elsie was a remarkable woman chieftain who lived between 1734 and 1800, with remains of her kraal - today visible in the park as an open yard-like expanse of ground - occurring next to the Breede River (now called "Lang Elsiekraal") (Tomlinson 1943). Graves of Nougá Saree, a neighbouring chieftain, and a few of his followers are believed to be in the vicinity of the "Ou Tuin" along the Breede River in the park, although the exact locality of these graves is currently not known. His fat-tailed sheep and long-horned cattle grazed on what became the old racecourse, whereas Lang Elsie's grazing land are believed to have constituted the remainder of the flats extending to the Buffeljags River. Since the early eighteenth century the white civilization started to encroach on the area. A combination of factors, including the smallpox epidemic of 1713, devastated the Khoe-Khoen tribes and only scattered remnants could be found on farms in the district by the end of the eighteenth century.

Wheat cultivation also commenced in the early eighteenth century, which marked the start of the eradication of the area's natural vegetation (Van Rensburg 1975). According to Skead (1980), giving account of the Dutch farmers of the late 1700's, deterioration in veld condition and overgrazing had already been noticed by then. There are also records of farmers burning the veld and trying to get rid of the renosterbos (*Elytropappus rhinocerotis*). Between 1848 and 1904 a portion of the current park was used as a racecourse for horses, and between 1952 and 1960 part of it was used as a shooting range. Being part of the town commonage of Swellendam, it was also heavily grazed by domestic livestock prior to 1960. The area was thus subject to intensive human use before the park was proclaimed.

1.4 Climate

The annual rainfall is 511 mm of which most (59 %) falls during the winter months (April to October). According to Novellie (1986), two main peak rainfall periods are evident, one in April-May and the other in August, while the driest months are normally December and January. Temperature ranges between a summer maximum of c. 40 °C and a winter minimum of c. 0 °C, whereas the annual average temperatures are between 6 °C and 32 °C. Snow occurs on the Langeberg Mountains. Prevailing winds are southeasterly in summer and northwesterly (dry warm bergwinds) or southwesterly (associated with cyclonic systems) in winter (Grobler & Marais 1967). Although the park does not hold a weather station/Stevenson screen, rainfall records have been kept since 1961 and min/max temperatures since 1991. In addition, estimates of cloud cover and wind speed and direction are recorded daily.

1.5 Geology and soils

More than 90 percent of the park encompasses alluvium and gravel terraces, with outcrops of consolidated rock (belonging to the Witteberg series) occurring only along the Breede River. Gravel terraces of three ages can be recognized comprising roll-stones of quartz-like sandstone, and sandy gravel. The north and central parts of the park consist of high-level silcrete and ferricrete, while the southwestern flats comprise an alluvial belt of loam and sandy loam (probably an old meander of the river which was gradually filled by sand). The most recently acquired area in the west (Die Stroom) is characterized by shales and siltstone with occasional sandstone beds along the Breede River. Soils are immature brown earth and

podzols, shallow lithosols and deep alluvial sand. Glenrosa and/or Mispah forms, with lime rare or absent in upland soils but generally present in low-lying soils, occur in the southern part of Die Stroom. Prisma-cutanic and/or pedocutanic diagnostic horizons dominate the soils of the remainder of the park.

1.6 Topography

Bontebok National Park lies between 60 and 197 masl on the coastal plateau between the Langeberg mountain range and the Indian Ocean. The topography comprises a series of gently undulating gravel terraces descending from a rocky plateau in the northeast through sand and boulders to an alluvial plain. The flats in the southeast are surrounded by low hills and the perennial Breede River (Grobler & Marais 1967; Theron 1967).

1.7 Hydrology

The Breede River in BNP runs in a series of long (>1 km), broad (50 m – 150 m) channels with deep (>2 m) pools, separated by narrow rapids and stony runs (Russell 2001). The substratum in channels and pools consists predominantly of sand and silt, with some small stony patches. In rapids and runs, the substratum consists predominantly of cobble and sand, with the bedrock exposed in some places (Russell 2001).

1.8 Flora

Beds of *Phragmites australis* and *Typha capensis* line both banks of the Breede River, while there is limited growth of other aquatic species (Russell 2001). The south bank comprises scrub-covered hills with occasional rock outcrops and the north bank consists of gently sloping sandy soils, supporting mature woody vegetation in a well-established riparian strip. The protection of riparian and aquatic vegetation to provide suitable habitat for indigenous fish species is one of the few measures that can be taken to ensure their survival (Russell 2001).

The only work on non-vascular flora was that cited in O’Keeffe (1986) on algal growth potential at several sites in the Breede River for use as an indicator of river health status.

Apart from the aquatic and riparian vegetation, BNP protects two vegetation types or Broad Habitat Units (BHUs) as defined by Cowling and Heijnis (2001), i.e. Suurbraak Grassy Fynbos and Overberg Coast Renosterveld. The new vegetation map for South Africa (Mucina *et al.* 2005) indicates three vegetation types for BNP, i.e. Cape Lowlands Alluvial Vegetation, Eastern Ruens Shale Renosterveld, and Swellendam Silcrete Fynbos, the boundaries of which do not correspond with those of the mentioned two BHUs. Nevertheless, all these lowland vegetation types are globally considered to be of high conservation priority (Cowling *et al.* 1999; Driver *et al.* 2005). Coastal Renosterveld is the most altered vegetation type of the fynbos, 85 % being lost mainly to agriculture (Moll & Bossi 1984). Due to the virtual destruction and extremely fragmented nature of South Coast Renosterveld (especially towards the west (Kemper *et al.* 2000)), this vegetation type is regarded as critically endangered (Cowling *et al.* 1986; Von Hase *et al.* 2003). The high conservation status of South Coast Renosterveld thus raises the conservation importance of BNP.

Only a sketchy description (and associated map) of the terrestrial vegetation communities of the western half of the old park exists (Grobler & Marais 1967). This study has been done prior to initiation of the short-cycle fire regime, and has identified 12 vegetation communities belonging to three main groups, i.e. riparian/tree-group, sweet veld/ renosterbos-group (Acocks Type 46), and mixed grass veld/*Leucadendron*-group (Acocks Type 70). Despite the rudimentary vegetation description, a comprehensive (though unpublished) plant species list has been kept in concurrence with building up the park’s herbarium collection. The plant species list (with > 600 species) has been regularly updated and expanded by various

internal/external botanists (e.g. Rebelo undated) but needs verification. A phytosociological study of Die Stroom is currently in progress. Various popular articles extol the flora of the park (e.g. Von Kaschke 1994; Strydom 1995; Rodrigues 1996; Van der Walt 2003).

1.9 Fauna

1.9.1 Invertebrates

No comprehensive list of aquatic invertebrates exists for the park. The only work done on aquatic invertebrates was that of Coetzer (1986) surveying the benthic invertebrates of the Breede River for use as an indicator of river health status. Twenty-eight taxa were collected during two sampling efforts (March 1975 & 1976; Appendix 7.2) at a site that borders onto the park, i.e. at the national road bridge across the Breede River at Swellendam. The habitat type sampled was described as “stones in a shallow slow-flowing river stretch” (Coetzer 1986). In terms of relative abundance of invertebrate functional feeding groups at this site, collector-filterers were most abundant, followed by comparable numbers of collector-gatherers and scrapers, with very few shredders and predators/piercers (Coetzer 1986). The high proportion of collector-filterers in the lower reaches of the Breede River was attributed to large amounts of return-flow of irrigation water because erosion-zone features occurred at sampling localities in this section (Coetzer 1986).

Coates (1970) compiled a checklist of the Collembola of South African parks, listing three *Seira* species (*S. mathewsi*, *S. grisea*, and *S. marephila*) for BNP and the plants on which they occur. No other inventories of the park’s terrestrial invertebrates exist.

1.9.2 Fishes

A total of 380 fish from 12 species was recorded during sampling of six sites in the Breede River in BNP during 1999 and 2000 (Russell 2001). Fish species collected included one indigenous freshwater species, two indigenous catadromous species, three indigenous estuarine species, two species translocated from other South African rivers, and four alien species. Among these were the red-data listed *Barbus andrewi* (Vulnerable) and the previously red-data listed *Myxus capensis* (Rare), although the domination of alien and translocated species is of conservation concern. Braack’s (1981) records of surveys done between 1961 and 1977 add one indigenous and two alien fish species to Russell’s (2001) list. At the regional scale, Barnard (1943) has done a revision of the indigenous freshwater fish of the southwestern Cape region.

1.9.3 Amphibians

Routine investigations have resulted in the discovery of ten frog species inhabiting BNP (Braack 1981). The eleventh species, *Breviceps* sp., can only be regarded as a likely inhabitant at this stage.

1.9.4 Reptiles

Surveys have confirmed the presence of 18 snake, six lizard, three tortoise and one terrapin species in BNP (Braack 1981). No additional tortoise or terrapin species are expected to be found, whereas the list of snakes and lizards is most likely incomplete. In addition to inventories, preliminary work has been done on resource partitioning and sympatry in land tortoises in the park (Rowlands 1988).

1.9.5 Birds

The first bird list for BNP was a preliminary one (Winterbottom 1962) comprising 103 species. This list underwent numerous additions (Winterbottom 1965, 1967a; Penzhorn 1977; Marais 1990) and revisions (Winterbottom 1967b; Martin *et al.* 1987), the most recent one (Baron 1981) listing 186 bird species of which 71 species were classified as residents, 10 as migrants and 95 as visitors. Whittington (2001) and Staegmann (2003) subsequently added three more species to the list. Endangered birds that occasionally appear in the park

are the Black stork and Cape vulture (Greyling & Huntley 1984). The park's birds have also been publicised in the popular literature (e.g. Winterbottom 1961; Jackson 2001). A strip-count survey of bird densities in the renosterveld of BNP (Winterbottom 1968) gave an average density of 151 birds per 40 ha – the Grey-backed Cisticola (*Cisticola subruficapilla*) being the most numerous species, accounting for 23 % of all birds counted. Bird population size and diversity of the coastal renosterveld were compared to those of coastal fynbos (Winterbottom 1968). The fynbos was found to support 2 - 4 times the population, greater diversity and a smaller proportion of insectivorous birds compared to the renosterveld.

1.9.6 Mammals

Various accounts of historical mammal occurrence in the Swellendam area exist (Tomlinson 1943; Bateman 1961; Van der Merwe 1968; Van Rensburg 1975; Skead 1980; Boshoff & Kerley 2001), listing predators such as lion, leopard, hyaena, jackal, wild dog, and wild cat(s). Ungulates within historical range include bontebok, grey duiker, Cape grysbok, red hartebeest, grey rhebok, steenbok, and Cape mountain zebra (currently present in BNP), and buffalo, bushpig, eland, elephant, hippopotamus, black rhinoceros, and klipspringer (currently absent from BNP) (Boshoff & Kerley 2001). Extralimital species that were previously introduced but later removed are common reedbuck and springbok (Novellie & Knight 1994). A checklist of mammals is given by Stuart and Braack (1978) and Robinson *et al.* (1981). Rodents are listed by De Graaff (1974).

Among the specialized studies done on mammals in BNP, much emphasis was on the bontebok and grey rhebok. Aspects particularly well-studied were bontebok life history, demography, population dynamics (De Graaff *et al.* 1976a; Novellie 1986), genetic purity (Fabricius *et al.* 1989; Essop *et al.* 1991), feeding ecology (Beukes *et al.* 1989), fecundity, reproduction (Skinner *et al.* 1980; Novellie 1981), territorial-, mating- and drinking behaviour (David 1970, 1971, 1973a&b, 1975a&b; Van Zyl 1978); grey rhebok feeding- and general ecology (Beukes 1984, 1987, 1988); and life histories (De Graaff *et al.* 1976b; Van der Walt *et al.* 1976a&b), parasitology and glandular secretions/pheromones (Le Roux 1980; Nell 1992) of various ungulates.

Bontebok is a preferred grazer of short- to medium grasses such as *Cynodon dactylon*, *Themeda triandra*, *Digitaria eriantha* and *Eragrostis* species (Beukes *et al.* 1989). Of the grass species in the park, 11 can be considered palatable, 18 acceptable and 23 unpalatable to bontebok, whereas only 5 % of shrubs are utilized (De Graaff *et al.* 1976a). Beukes (1984) showed that the quality of the bontebok's diet is higher during winter than during summer. Presumed poor reproduction in bontebok between 1960 and 1973 spurred several studies on the matter. Skinner *et al.* (1980) found males to be in fair breeding condition and concluded that a post-lambing seasonal lambing percentage of 54 % must be considered the norm for bontebok in BNP, permitting a satisfactory population growth. An unknown factor was the extent and causes of lamb mortality. Novellie (1986) showed that lambing percentage is correlated with rainfall of the 12 months preceding the mating season. Bothma (1986) recommended a sex ratio of 1 male to 2 females for natural bontebok populations, and for the maintenance of a healthy age structure, populations should consist of 30 – 40 % subadults. Watson *et al.* (1991) described a method of age determination from skull growth in blesbok, which may also be applied to bontebok.

Beukes (1988) showed that grey rhebok are predominantly browsers, contrary to the common belief that they are grazers. Dicotyledonous shrubs and forbs (many of the genera *Disparago*, *Metalasia*, and *Aspalathus*) comprised 97 %, and graminoids 3 % of their diet, which has implications for the management of rare plant species in the park. Life history descriptions of the red hartebeest- (Van der Walt *et al.* 1976a), eland- (De Graaff *et al.* 1976b), and Cape buffalo- (Van der Walt *et al.* 1976b) account for the removal of buffalo from BNP in 1974 due to great difficulty (and expenses) with keeping the animals in the park, and the removal of eland and red hartebeest in 1975 as a result of poor performance and low

fecundity (mainly related to nutritional deficiencies and parasites). Selected studies were done in BNP on the genetics of animals other than bontebok/blesbok, i.e. geographic mitochondrial DNA variation in the rock hyrax (Prinsloo & Robinson 1992), and the role of cytogenetics in genetic conservation of mammals (Robinson & Elder 1993).

1.10 Regional Socio Economic Contribution

As a destination for visitors (over 16 000 visitors during the 2005/06 financial year) the BNP complements numerous other local destinations in making tourism a significant factor in the regional economy. The Park contributes to skills development and capacity building by involving communities in relevant Expanded Public Works Programmes (EPWP), thereby offering them job opportunities. Through the EPWP, the Park has created over five SMMEs ranging from labour consultants to small building contractors. The Park through call-backs, supports these SMMEs whenever there are business opportunities available within the park. So far, through the EPWP alone, over R1, 300, 000 has been spent on SMMEs, moreover, about fifth of which was spent on small contractors. The Park currently has no concessionaires, but anticipates hosting a few after the completion of the envisaged new developments of coffee shop, kiosk managed by SMMEs. National and Local Service Providers are utilised by the Park to facilitate all its requirements. The Park supports local businesses whenever services are required. The nearest town, Swellendam, is very small, and faces rapidly increasing informal settlement, unemployment and lack of skills. HIV/AIDS is also seen as one of the major challenges.

2 OBJECTIVES SETTING: THE PROTECTED AREAS MANAGEMENT PLANNING FRAMEWORK AND THE BALANCED SCORECARD

The rationale underlying the development of management plans by SANParks follows the Management Plan Framework of the Department of Environmental Affairs and Tourism (Cowan 2006) and the SANParks Biodiversity Custodianship Framework (Rogers 2003) in that:

- A vision statement leads to the formulation of a desired state for the park.
- The vital attributes of the system are identified, together with the determinants, threats and constraints that influence the vital attributes.
- A hierarchy of objectives is identified with a view to ensuring the achievement of the desired state by maintaining the determinants of the vital attributes while mitigating the threats and constraints.
- Operational plans are put in place to achieve the objectives.
- Achievement of objectives is monitored.
- Adaptive management principles are applied to 'learn by doing' enabling an iterative process of revision and improvement of the management plan.

In addition to objectives designed to achieve the desired state, there are important corporate strategic objectives which must be reflected in the park management plans. These strategic objectives have been derived through the Balanced Scorecard, which has been instituted as the performance measurement system of SANParks. The SANParks Balanced Scorecard is described in more detail in the Policy Framework Governing Management Plans (SANParks 2006). The Balanced Scorecard strategic objectives of relevance to the BNP management plan include:

- Achieve leadership in biodiversity conservation.
- Become the custodian of choice for protected area management.
- Become the nature-based tourism destination of choice.
- Contribute to local educational and socio-economic development.
- Transform the domestic guest profile, through growth, to be representative of South African society.
- Ensure best practices in managing HIV and AIDS
- Advance strategic human resource management.
- Improve income to cost ratio.
- Achieve good corporate governance.

2.1 The Desired States and Objectives Hierarchies

Desired states and objective hierarchies are set below for each of the following categories: biodiversity conservation, socio-economic development, cultural heritage, and tourism.

2.1.1 Desired State and Objectives for Biodiversity

For the BNP there is a need to adapt the biodiversity desired state so that it reflects the fact that conservation priorities in the region have changed. The original reason for proclamation of the park was to protect the bontebok from the threat of extinction. In this objective the BNP has been very successful; over many years numerous bontebok from the park have been translocated to publicly-owned protected areas and to private land within the historical range of the species. Although the conservation status of bontebok is vulnerable it is currently reasonably secure. However, extensive destruction of the natural habitat has heightened the conservation value of the renosterveld and lowland fynbos vegetation. The last remaining patches of natural vegetation have been fragmented into islands surrounded by transformed

land. Fragmentation of this kind is known to be an important factor accelerating the loss of biodiversity because fragmentation restricts natural dispersal and recolonization of organisms. In the absence of recolonization there is a high risk that local populations will, in time, go extinct. The way to mitigate the negative effects of fragmentation is to create ecological corridors to allow a measure of natural dispersal.

Taking the changed conservation priorities into consideration, the vision for the BNP is:
A national park that builds and maintains a park community that works together for, and benefits equitably from, the conservation and enhancement of the unique biodiversity, ecological processes and cultural, historical and scenic resources of the park, thus making it a world class tourism destination of choice.

The attainment of the vision is recognized to be heavily dependent on the creation and maintenance of ecological corridors. The table below sets out the biodiversity components of the desired state which follow from this vision statement:

2.2 Desired state for Bontebok National Park – Biodiversity

		Priority
1	Conservation of renosterveld & lowland fynbos ecosystems recognized as the most important biodiversity objective, replacing the conservation of bontebok as the highest priority. The conservation of bontebok nevertheless remains an important objective.	High
2	Additional untransformed vegetation included in BNP.	High
3	Ecological corridors established, e.g. linkage to Marloth Nature reserve (CapeNature)	High
4	New developments/development plans in park are in line with conservation objectives	High
5	Knowledge of rare plant populations (performance & locations) improved	High
6	Buffer zones created and neighbouring land use is compatible with park objectives	High
7	Defunct instream impoundments in Breede River removed	High
8	Ungulate populations managed to minimize loss of genetic heterozygosity, especially the bontebok, grey rhebok and Cape grysbok.	High
9	Roads & infrastructure rationalised in relation to sensitivity-value analysis and tourism requirements	High
10	Alien removal programs (terrestrial & aquatic) maintained and expanded	High
11	Erosion gullies at Die Stroom rehabilitated	High
12	Old quarries, unnatural river bank erosion, and stop walls (shooting range) rehabilitated	Medium

13	Pressure on natural vegetation reduced through acquisition of adjacent farms for bontebok grazing	Medium
14	Knowledge of pollination/dispersal processes improved	Low

2.2.1 Vital Attributes, Determinants, Threats and Constraints – Biodiversity

In order to set an appropriate objective hierarchy it is helpful to identify the vital attributes of the system, as well as the factors which determine, threaten or constrain these attributes. Objectives are then set (1) to ensure the maintenance of the identified vital attributes and (2) to overcome the constraints and threats to meeting the vision (Rogers 2003). The vital attributes of biodiversity conservation, and their determinants, threats and constraints are set out in the table below.

Vital attributes	Determinants	Threats	Constraints
			GENERIC CONSTRAINTS: Limited knowledge, Lack of funds, Limited staff capacity
Representation			
a) Patterns	<u>Habitat types:</u>		
	South Coast Renosterveld	Development activities, Isolation & Fragmentation, Alien invasive species, Inappropriate fires, Overstocking, Erosion	Limited knowledge & baseline info, Outside transformation (isolation), Potential loss of species
	Suurbraak Grassy Fynbos		
	Breede River Riparian veg		
	Wetlands	Development activities, Alteration of drainage patterns, Alien invasive species, Overstocking, Fires	
	<u>Red-list / Endemic / Species of Special Concern:</u>		
	Red-listed plant species	Overstocking, Inappropriate fire regime, Lack of pollinators/dispersing agents, Climate change, Development activities, Insufficient knowledge	Trade-off between fire needs for vegetation and bontebok, Limited monitoring capacity, Limited habitat
	Red-Data animals: Bontebok (vulnerable), Cape Mountain Zebra (vulnerable). Endemic: Cape grysbok (Cape Floristic Region).	Overstocking, Inappropriate herbivore complement, Poaching, Disease (Sarcoids & 'Ooguitpeulsiekte'), Poor fences, Genetic contamination for areas outside park, Loss of genetic heterozygosity, Animal rights groups	Limited habitat, Market for selling bontebok limited to natural range, Sarcoids in Mountain zebra prevent translocation and increase management costs

Vital attributes	Determinants	Threats	Constraints
	Freshwater mullet, Berg-Breede River Whitefish, Breede River Redfin,	Alien invasive species, Physical barriers, Alteration of hydrological characteristics by impoundment, Pollution, Sedimentation	Hydrological influences are outside park, Taxonomic status
	Birds: Black Harrier (Vulnerable)	Inappropriate fires affecting food and breeding, Isolation & Fragmentation of habitat, Human disturbance	Limited habitat
	Freshwater Invertebrates?	Water quality & quantity, Habitat unavailability, Sedimentation	Hydrological influences are outside park
b) Processes	Fire	Accidental fires, Overstocking, Inappropriate fire regime (frequency, season, intensity, size), Management unit size, Climate change	Size of park limits natural fire regimes and herbivore movements, Trade-off between bontebok grazing needs and fire requirements of vegetation, Fire management capacity
	Herbivory	Inappropriate fires, Overstocking, Inappropriate species composition,	
	Plant pollination & dispersal	Fragmentation & Isolation, Alien invasive species, <i>Varroa</i> mite reducing bee populations, Inappropriate fires	Lack of expansion options, Size of park, Hostile surrounding environment (insecticide spraying on crops)
	Hydrology	Reduction in flow, Regulation of flow, Alteration of drainage patterns, Flow barriers	Hydrological influences are outside park, Increasing human population (water demands), Institutional inertia (DWAF), No reserve determination
	Sediment movement	Accelerated erosion due to outside development activities, Overstocking, Climate change, Altered drainage	Development pressure, Inability to influence outside development decisions and activities, Flow barriers
Rehabilitation	Alien fish removal (dams) & reduction (Breede river)	Continual invasion from outside, Continued degradation,	Ineffective control methods, Limited eradication options/methods
	Rehabilitation of river course	Artificial barrier, Bank destabilisation due to rest camp	Management buy-in, User demand, Promises re Die Stroom recreation, Technical difficulty, Proximity to rest camp, Difficulty with clean-up, Temporary detrimental sedimentation impacts
	Quantity & Quality of flow reserves in Breede River	Increasing abstraction, Increasing need to impound, Increasing pollution & sedimentation, Altered marine	Institutional capacity (DWAF), No control

Vital attributes	Determinants	Threats	Constraints
		connectivity,	
	Wetland rehabilitation	Road systems, Adjacent urban development, Loss of connectivity within catchment	Lack of connectivity, Attraction of funding unlikely
	Alien invasive plant removal	Continued invasion (existing & new species), Disturbance, Fires, Alien plants at reception.	Lack of efficient control methods (particularly alien grasses & other herbaceous), Efficient/systematic follow-up
	Active rehabilitation of areas where alien plants have been removed (where necessary)	Loss of topsoil, Insufficient indigenous seed bank, Climate change, Unsuitable weather, Alien reinvasion (persistent alien seed banks)	Seed availability, Lack of methodology (riparian & renosterveld), Irreversible change
	Rehabilitation of quarries, dongas, shooting range, former building sites and decommissioned roads		Above, plus possible lead & copper contamination at shooting range
Landscape	Land use - inside park (zoning)	Necessity to develop to be financially sustainable, Poor management policies & CDFs, Poverty relief development projects, Tourism pressure	Limited size of the park, Inappropriate existing infrastructure
	Land use – surrounding park	Inappropriate adjacent land use, Changing adjacent land use, Inappropriate regional development strategies (IDPs), N2 upgrading/realignment	Proximity to Swellendam & N2
Wildness	Size of park	Outside development	Limited expansion options
	Visual, Auditory & Olfactory experience	Further developments associated with Swellendam expansion	Topography, i.e. high visibility of structures due to flat terrain, Existing surrounding landuse (industrial, agricultural, residential, municipal dump, airfield activity, N2) limiting connectivity to Marloth Nature Reserve
	Human impact	Littering, visual, noise & other pollution, Increasing tourism pressure & road network	Need to generate revenue, Obligated to provide benefits from park to public

2.3 Objectives Hierarchy – Biodiversity and Landscape

<i>High level objective</i>	<i>Objective</i>	<i>Sub-objective</i>	<i>Initiative</i>	<i>Operational plan</i>
REPRESENTATION and PERSISTENCE: Ensure that Bontebok National Park conserves a representative sample of the regions' ecological patterns, landscapes and processes in a contiguous arrangement by establishing a connected landscape, enabling natural variation in structure, function and composition over space and time	Representation: Incorporate the spectrum of biodiversity patterns of the renosterveld/fynbos and Breede River systems characteristic of the Swellendam area, as well as the processes which support its long-term persistence, and re-introduce missing elements where possible	Consolidation: Incorporate into Bontebok NP the spectrum of biodiversity patterns representative of the Overberg Coast Renosterveld, Suurbraak Grassy Fynbos and Breede River systems characteristic of the Swellendam area, as well as the processes which support its long-term persistence	(1) Acquire land to incorporate surrounding vestiges of indigenous vegetation (e.g. Buffeljachts farm & farm on southwest bank of Breede River) (2) Establish ecological corridors linking Bontebok NP with other areas of untransformed habitat, e.g Marloth NR. (3) Consider the acquisition of adjacent farmland for bontebok grazing (to reduce pressure on natural vegetation) (4) Align park expansion with bioregional plans	Expansion plan
		Reintroduction: Investigate possibilities for the reintroduction of locally extinct species and implement these in accordance with IUCN principles and guidelines	Re-establish indigenous herbivore complement (e.g. eland) within given constraints (i.e. park size)	Herbivore management & reintroduction plan
	Persistence: Manage the park to ensure the long term persistence of biodiversity, enabling natural variation in	Fire: Apply appropriate fire regime (frequency, season, intensity, size) to fynbos and renosterveld vegetation	(1) Implement a fire management plan in accordance with objectives of conserving biodiversity and threatened biota (2) Monitor impact of fire management regime	Fire management plan

High level objective	Objective	Sub-objective	Initiative	Operational plan
	structure, function and composition over space and time	Herbivory: Maintain appropriate population sizes of medium-large herbivores and understand the role of herbivory as a modifier of biodiversity at different spatial and temporal scales (particularly in relation to fire regime)	(1) Undertake quarterly monitoring of population size, composition, and spatial distribution of med-large herbivore species (2) Undertake annual monitoring of utilisation of grass species preferred by concentrate grazers in relation to set TPCs (3) Undertake veterinary evaluations of animal condition when necessary (4) Apply adaptive management, i.e. results of above informing herbivore management practices.	Herbivore management & reintroduction plan
		Species of Special Concern: Understand and maintain viable populations of species of conservation concern (SCC) in order to meet SANParks' mandate and obligations in terms of international agreements and conventions	(1) Maintain viable populations of plant SCC (identify, locate & monitor populations of priority species) (2) Maintain viable populations of animal SCC (especially bontebok) in a manner compatible with the conservation of floral and other biodiversity (3) Implement disease management plan (incl. mountain zebra sarcoids) (4) Endeavour to maintain Red Data fish by means of other actions (e.g. river rehabilitation, alien removal, etc.)	Species of Special Concern plan Disease management plan
		Pollination & Dispersal: Improve understanding of pollination and dispersal agents in the maintenance of floral diversity within a fragmented environment]	(1) Encourage and/or undertake research on pollination and dispersal processes in fragmented lowland habitats (2) Ensure that information available on the subject influences park management approach	N/A at this stage

High level objective	Objective	Sub-objective	Initiative	Operational plan
		Hydrological regimes & water chemistry: Participate in activities for the maintenance of flow regimes and water chemistry within limits for the maintenance of ecosystem processes in the Breede River	(1) Encourage the determination of acceptable limits for flow and water chemistry by DWAF (2) Undertake River Health assessments	River management – statement of intent
	Rehabilitation: Drive towards re-establishment of pattern and process of degraded habitats that is incorporated into Bontebok National Park (including the restoration of key processes which support the long term persistence of biodiversity)	Hydrological regime: Improve and restore local hydrological regime and natural functioning of Breede River	(1) Remove defunct instream impoundments in Breede River (2) Monitor the effects resulting from (1) (3) Maintain/reinstate natural drainage in marshes and seeps	Rehabilitation plan - River & Wetland components
		Degraded land: Drive towards re-establishment of patterns and process of degraded land within the National Park	(1) Rehabilitate erosion gullies, stop walls (shooting range), old quarries (especially at Die Stroom) (2) Rationalise road network and infrastructure in relation to sensitivity-value analysis and tourism requirements (3) Rehabilitate decommissioned roads.	Rehabilitation plan
		Alien biota: Drive towards re-establishment of pattern and process of habitats degraded by the impacts of alien biota, by controlling and where possible eliminating these species	(1) Implement and continually update an invasive alien plant management plan (2) Investigate options for the control of alien fish	Rehabilitation plan - Alien plants
MITIGATE INTERNAL and EXTERNAL PRESSURES: Reduce threats and pressures and limit environmental impacts resulting from non-biodiversity	Reconciling other park activities with biodiversity objectives: Ensure that the all aspects of SANParks operations (revenue generation including tourism, resource use,	Impacts of developments: Minimise the impacts associated with the development of tourism and park management infrastructure, and ensure that the development of this infrastructure is only undertaken if it does not compromise biodiversity objectives	(1) Implement CDF, and in accordance with EIA process (NEMA) and corporate policies (2) Establish tourism carrying capacities	CDF Corporate policies on green standards, environmental best practice, etc.

High level objective	Objective	Sub-objective	Initiative	Operational plan
management aspects of SANParks operations and surrounding land and resource use	developments, management activities, etc.) are informed and constrained by biodiversity, and particularly that the impacts of these activities are minimised	Impacts of activities: Minimise the impacts associated with tourism and park management activities, and ensure that these activities are only undertaken if they do not compromise biodiversity objectives		
		Impacts of resource use: Minimise the impacts of extractive resource use, and ensure that extractive resource use is only undertaken if it does not compromise biodiversity objectives (including rebuilding resource stocks) and is within corporate guidelines and management capacity constraints	Implement resource use plan, defining opportunities and constraints in line with corporate guidelines	Corporate resource use policy
	Reconciling external threats with biodiversity objectives: Reduce external threats and pressures, and limit impacts of surrounding land & resource use on biodiversity within the park	External development pressures: Minimise the impacts associated with inappropriate developments outside the park	(1) Engage with regional land management authorities, incl. IDPs and SDFs at local & regional level (2) Negotiate to ensure that external developments are not visually obtrusive or out of character with the park	Cooperative governance & communication plan?
		External land and resource use: Negotiate to ensure that external resource and land use do not detrimentally affect ecological processes within the park	(1) Negotiate to mitigate or improve the management of external potentially detrimental impacts (i.e. hydrological influences, alien biota, insecticides, herbicides, fertiliser, municipal dump) (2) Encourage eco-friendly resource use and land management practices on adjacent properties	Cooperative governance & communication plan?
		Human-animal conflict: In consultation with stakeholders, minimise negative outcomes resulting from human-animal	(1) Implement strategy to control dogs entering park (2) Develop and implement disease management plan	Disease management plan

High level objective	Objective	Sub-objective	Initiative	Operational plan
		conflicts		
WILDNESS / REMOTENESS: To maintain and restore wildness/remoteness in Bontebok NP such that the spiritual and experiential qualities of wildness are maintained, enhanced, or where necessary restored	Range of experiences: Provide a range of visitor experiences		(1) Implement and update zoning (CDF) and sensitivity-value analysis (2) Establish appropriate tourism carrying capacity and activities	CDF
	Sense of place: Maintain or restore appropriate sense of place		(1) Implement & update CDF (2) Rationalise park infrastructure (incl. road network) (3) Investigate a new park entrance	Park expansion plan Rehabilitation plan

2.3.1 Desired State and Objectives for Socio-economic aspects

The desired state in this category stems mainly from the Balanced Scorecard strategic objectives, and can be formulated as

A park which constitutes a meaningful socio-economic asset to the region by:

- **Becoming a tourism draw card, thereby complementing other regional attractions to promote the local economy,**
- **Enhancing benefits to local communities,**
- **Being receptive and responsive to stakeholders through the Park Forum,**
- **Redressing past injustices by encouraging access and appreciation by historically disadvantaged groups,**
- **Being managed cost-effectively in accordance with principles of good governance.**

The objectives hierarchy designed to achieve this desired state is given in the table below.

<i>High level objective (from the SANParks Balanced Scorecard)</i>	<i>Objective</i>	<i>Sub-objective (where required)</i>	<i>Initiative</i>	<i>Low level plan</i>
Contribute to Local Educational and Socio Economic Development	Enhance benefits to local communities	N/A	Contribute to local community development by allocating a percentage of the income from identified projects, developed in conjunction with the neighbouring communities of Swellendam	Local socio economic development plan
			Determine criteria for awarding contract work - with an emphasis on unemployed persons and local SMME's	
			Maintain a database of local service providers as a source for contracting opportunities	
			Identify SMME opportunities within the planning domain	

			Facilitate the development of SMME's within the planning domain			
			Facilitate the consistent flow of benefits			
			Maintain existing and identify potential new, partnerships structures and arrangements with local community groups			
			Identify opportunities for outsourcing (short-term contract) Park operations			
	Increase environmental awareness				Develop and maintain links with environmental education networks to facilitate the development and sharing of education programmes and resources	Education development plan
					Explore cost-effective options for transporting disadvantaged groups to the Park	
Custodian of Choice for Protected Area Management	Good park/community/stakeholder relations	N/A	Establish an effective Park Forum	Stakeholder relationship plan		
			Identify and involve all relevant stakeholders for participation in the park forum			
			Explore and feasibly establish a mechanism for more effective community liaison / communication such as Park open days			
			Develop effective communication mechanisms and responsibilities for representatives			
	Effective co-operative government		Maintain Park Forums inclusive of relevant working groups, community, marine and other government departments			

			Develop and maintain discussion forums with key public agencies, authorities and bodies (such as the Swellendam Police Forum, Tourism Forum and Local Authorities Forums) on key issues	
			Establish political buy-in at a local government level.	
Become the Nature Based Tourism destination of choice in the overberg region	To develop, manage and enhance a range of sustainable tourism products	N/A	Identify and enhance a range of tourism opportunities	Tourism plan
			Analysis of current product usage and identification of opportunities	
			Plan for tourism infrastructure and facilities as identified by the CDF	Infrastructure plan
Optimize opportunities for the development of approved adventure activities in the Park such as canoeing trails with overnight options, horse riding and mountain bike trails				
Transform the domestic Guest Profile, through growth, to be representative of South African society	Transform the domestic guest profile of BNP, through growth, to be representative of regional demographics	N/A	Implement the marketing plan	Marketing plan
			Facilitate access for disadvantaged and educational groups on request	
			Identify the products /activities required / preferred by the target markets	
			Explore opportunities to enable local communities to have access to the wild card in a more equitable and affordable way	
Ensure Best Practices in Managing and Understanding HIV and AIDS (& associated diseases)	Implement Best Practices in Managing and Understanding HIV and AIDS and associated diseases	N/A	Implementation of SANParks guidelines	SANParks corporate HIV/AIDS program

Advance Strategic Human Resource Management	To ensure good human resource management	N/A	Personnel Surveys to determine satisfaction levels	Staff Capacity Building Program:
			Performance Management System in place	Institutional Development and Administration Program
Improve Income to Cost Ratio	Continuously Improve the Income to Cost Ratio of BNP to ensure that the park meets its conservation mandate and contributes to SANParks' overall conservation mandate	N/A	Optimize the income streams from park-based developments and services to help manage cost to income ratio	Financial sustainability program
Achieve Good Corporate Governance Management	Effective management of risk profile	N/A	Do legal review	Risk management program
			Develop compliance plan	
			Monitor against	

2.3.2 Desired State for Bontebok National Park – Cultural Heritage

To manage and sustain the significance, authenticity and integrity of the tangible and intangible cultural heritage resources for which SANParks is responsible, for the enjoyment and benefit of all South Africans and of the world.

2.4 Objectives - Cultural Heritage

Management Objectives	Measures	Initiatives
To further develop and continuously update an inventory of cultural resources in the Bontebok National park	Cultural heritage resources data for the National Park Palaeo-environmental investigation into the date of river terraces and flood patterns along the Breede River	<ul style="list-style-type: none"> ▪ Documentation of newly discovered cultural heritage sites and associated oral histories and indigenous knowledge (tangible & intangible heritage) ▪ Maps ▪ GPS coordinates; include information in the Cultural heritage data base
To formulate and implement a Cultural Heritage Management Plan (CHMP) for the Bontebok National Park as soon as inventorisation is fully done.	CH Resources Management plan	<ul style="list-style-type: none"> ▪ Assess significance of individual sites; ▪ Assess conservation/protection status for all cultural resources in the park; ▪ Site conservation measures ▪ Assess the potential utilisation of sites (current & future); ▪ involve stakeholder participation in the development process ▪ Maintain an appropriate balance between natural and cultural heritage in all aspects of park management. ▪ Allocate resources to implement the CHMP ▪ Identify cultural heritage research priorities
To formulate and implement Cultural Heritage Site Management Plan for heritage sites that have been identified for educational, research and tourism purposes	Cultural heritage site management plans	<ul style="list-style-type: none"> ▪ Visitor control measures ▪ Information boards & signage ▪ Conservation measures - restore and maintain stone walls ▪ Interpretation plan ▪ Maintain the sense of place at archaeological sites
To regularly monitor cultural resources in the Bontebok national park, in order to determine state or condition of resources, and to enable decision-making in terms of conservation measures or improved management.	Cultural heritage monitoring system	<ul style="list-style-type: none"> ▪ Design and implement a Monitoring System for cultural resources as required by the management plan ▪ Compile status files for all sites with condition reporting forms and photos. ▪ Assess sites as highly sensitive, sensitive or stable and monitor accordingly ▪ Annotate files after each visit

2.4.1 Desired State for Bontebok National Park – Tourism

The park management's desired state is to develop tourism infrastructure that caters for a wide variety of markets by providing a high quality service and experience without compromising the biodiversity of the park.

Required future developments include the opening a new gate on the N2 to more actively capture passing travellers. The outdated reception and park offices will be replaced by newer ones, with the old buildings being converted into an environmental education centre. An improved road surface will be created over part of the park. A new 18 bed rest camp will be built on the existing rest camp site as well as upmarket accommodation at an additional site.

Also under consideration, in accordance with the wishes of the Swellendam Municipality, is an enhanced tourist and recreation node that will include a light meal restaurant/coffee shop, a lapa and upgrading braai and swimming facilities at Die Stroom.

2.4.2 Objectives Hierarchy – Tourism

Bontebok has limited tourist facilities, with a 22 km of road network for self driven game viewing and an additional 12 km for mountain biking. There is a small rest camp of 3 “chalavans” and 31 camping sites. Additional activities are limited to birding, nature trails, fishing and bathing. The park has no restaurant, but does harbour a small shop.

In order to achieve the desired state for tourism, the following objectives need to be implemented in the park:

Objective 1: To develop the tourism infrastructure in order to enhance the tourist experience and increase revenue:

- To develop a new entrance gate that offers direct access from the N2.
- To develop a new reception area, management offices to be developed and the current office space to be redeveloped into an Environmental and Interpretation Education (EIE) Centre.
- To improve the road infrastructure by resurfacing 22 km of gravel roads.
- To evaluate a proposal to develop a recreation centre at Die Stroom that will consist of the following: kiosk/retail outlet, low intensity coffee shop/light meal restaurant, natural swimming pool, day-visitor facility (lapa)/picnic site/ablution facilities. This is subject to the following: (1) feasibility studies, (2) restriction to the current impacted footprint (as the site is surrounded by natural areas of high sensitivity and value), (3) detailed planning to avoid visual impacts especially as viewed from downstream.
- Investigation of the possibility of establishing a small bushcamp at Ou Tuin subject to assessments of (1) the market, (2) the desirability of an additional development node, and (3) the impact of the camp on the cultural heritage value. The latter is critical consideration because the need to make heritage sites available to visitors may restrict the use of the bushcamp as an exclusive venue. An alternative is to locate the proposed bushcamp close to the existing Lang Elsie's Kraal Restcamp.
- To complete the proposed 32-bed rest camp, a camp site with 10 serviced camp sites and 16 unserviced camp sites as well as ablution blocks. Project to be completed by March 2007.

- Extend this camp by providing a further 12 to 18 beds, a camp kitchen and related facilities to be completed, such that at all the accommodation will be universally-accessible, and not less than 15% of the units in the camp will be special-needs adapted.

Objective 2: To effectively market the park as a nature based tourism destination of choice between Cape Town and the Garden Route:

- To provide interpretive information at the main gate and reception area
- To promote linkages with the R62, R319 and N2 tourism routes
- To improve current signage and interpretive information in the park with regard to geology, archaeology, cultural heritage and wildlife.
- To be actively involved in tourism LTOs (local tourism organisation), forums, associations et cetera in the region
- To firstly focus on the national and secondly, on the international markets, and specifically draw them from Cape Town, the Garden Route and Gauteng.

Objective 3: To introduce a variety of tourist and recreational activities that caters for a variety of markets and needs:

- To develop one look-out point and one bird hide
- To develop new mountain bike trails
- To improve guided/self-guided hiking trails
- To develop a horseback trail
- To upgrade the current playground facility for kids at Die Stroom
- To upgrade the game viewing self-drive experience
- To introduce water-related activities, e.g. fishing, canoeing, foofy-slide and swimming

Objective 4: To promote concessionaire and SMME opportunities:

- To involve stakeholders in potential concessionaire opportunities by linking them with various community structures. The potential concessionaire opportunities at Bontebok National Park include the following:
 - A kiosk and retail outlet
 - A coffee shop/light meal restaurant.
 - Tourism activities such as canoeing, guiding (for walks and drives), game viewing
 - Cleaning services.

Objective 5: To train staff in order to render a quality service in the following areas:

- Marketing
- Improved bookings efficiency (Roomseeker)
- Accommodation services (cleaning and maintenance)
- Field guiding
- Reception (improved service and customer care)

3 OPERATIONAL PLANS TO ACHIEVE OBJECTIVES HIERARCHY

This section deals with operational plans which together represent the Park's best attempt to achieve the desired state specified above. In some cases the plans given below represent summaries of more detailed *lower-level plans*. Where these more detailed lower-level plans exist they are referred to in the reference list but are not included here. The SANParks Policy Framework Governing Management Plans (SANParks 2006, accessible on the SANParks web site) provides guiding principles which will not be repeated here.

3.1 BIODIVERSITY AND HERITAGE CONSERVATION

3.1.1 Park expansion

Bontebok National Park falls within a nationally identified priority conservation area (Driver *et al.* 2005). As the park contains some of the largest intact samples of the critically endangered lowland fynbos and renosterveld vegetation types, it is considered of global conservation importance (Cowling *et al.* 1986). As such, the expansion of BNP remains important for SANParks in its attempt to consolidate the remaining fragments of the lowland fynbos and renosterveld in a highly fragmented and transformed landscape.

The desired state of the park, in the context of park expansion, includes:

- The consolidation of untransformed lowland fynbos associated with the renosterveld/fynbos and Breede River systems interface, into a contiguous park unit;
- Minimise visual and hard boundary impact of inappropriate surrounding developments on the park's aesthetic qualities.

An expanded BNP would seek to consolidate all the remaining surrounding fragments of lowland fynbos and renosterveld in the area. The park currently conserves important samples of the critically endangered Cape Lowlands Alluvial Vegetation and Eastern Ruens Shale Renosterveld, and endangered Swellendam Silcrete Fynbos vegetation types (Driver *et al.* 2005). All of these are poorly protected, with BNP being the principal conservation area for two of the vegetation types. Expansion should focus on the inclusion of the last remaining untransformed vegetation patches around the park and protecting the parks view-sheds.

3.1.2 Herbivore management and re-introduction

In accordance with SANParks' corporate herbivore management policy, the management of herbivores in BNP will undergo a shift in emphasis from the use of stocking rates to determine when management actions should be taken, to the use of monitoring of impacts on biodiversity to determine when management actions should be taken. This is to ensure that the influence of herbivory on the biodiversity of BNP is measured directly, and that the management action taken is based on when the extent of herbivore impacts on biodiversity begins to alter the Desired State for BNP unacceptably, or irreversibly. Similarly, herbivore reintroduction must take cognisance of the other biodiversity objectives of BNP. By means of the objectives hierarchy for herbivory and reintroduction, these goals are cross-linked with one another, and with other relevant management objectives, such as fire and Species of Conservation Concern (SCCs) in BNP. The goals of the herbivore management and reintroduction plan focus on reducing the threats to biodiversity posed by overgrazing and selective feeding on rare plant species, improving

our knowledge of herbivore/vegetation interactions in BNP, and re-establishing BNPs indigenous herbivore complement. Concerns regarding any of these issues are formulated as TPCs, and monitoring programmes (mostly cross-linked with those already in place for fire management and SCCs) assess the consequences of herbivory or reintroduction of species. Management action should primarily involve reducing the extent of herbivore impact (for example through the manipulation of artificial water where this is possible), and thereafter manipulating the population dynamics of the species. In BNP the latter will usually involve live removals and relocations to other parks or private landowners, as in the past.

Owing to sarcoids care will need to be taken when translocating mountain zebras out of the BNP. This should not be done if there is a chance that they may infect other mountain zebra populations.

For those populations that cannot be maintained at high numbers in the park (less than 50 individuals) attention should be given to minimizing the loss of genetic heterogeneity by periodically bringing in new breeding individuals. For the larger populations, bontebok and grey rhebok, severe population declines should be avoided as far as possible because of the loss of genetic heterozygosity that occurs as a result of such 'bottlenecks'.

3.1.3 Damage Causing Animals

Problem animals such as stray dogs in the Park can cause much damage if not managed properly. It should also be noted that any dog which successfully hunts and kills wild animals, be it a hare or other small animal, is unlikely to stop hunting within the Park. This is cause for concern as a decline in numbers of Steenbok (*Raphicerus campestris*), Cape Grysbok (*Raphicerus melanotis*) and Common Duiker (*Sylvicapra grimmia*) as a result of hunting by dogs in the park can no longer be overlooked. This problem has reduced in the last two years owing to a new predator-proof fence, but it is likely to increase in future due to the expansion of the informal settlement bordering the park and more people moving into the area. It is therefore necessary for the Park to actively manage this threat by investing in environmental interpretation and education to talk about dog-keeping and the dangers that dogs pose to biodiversity. In addition, the park should maintain predator-proof fences and continue eliminating dogs entering the park.

3.1.4 Species of Conservation Concern

Plants:

The renosterveld and fynbos of BNP are both vegetation types of high conservation significance, largely due to their transformed nature and high levels of threat outside the park. Twenty-one Red Data plant species have been recorded from the park, of which two species are classified as Critically Endangered, three as Endangered, five as Threatened and three as Rare. Moreover, three of these species are likely to be endemic to this small park. Added to the Red Data species are six other plant species of conservation concern (SCC) on account of their local rarity or threat status, unique distribution, or other special traits. The vegetation of BNP needs to be managed, with emphasis on the fire regime, herbivory, and alien invasive biota, to ensure the long-term persistence of the plant SCC. Developments and activities in and around the park should be ecologically sensitive and aim to maintain or create habitat and conditions favourable for the survival of plant SCC. Knowledge of the location, distribution and performance of populations of plant SCC is still inadequate and should be improved through active participation in an existing collaborative monitoring program with the Threatened Species Program of SANBI. Information gained from research/monitoring should inform future management actions at BNP, and feed into national assessments of the status of rare/threatened plant species.

Fishes:

Fifteen fishes have been recorded in the Breede River in BNP of which one, the Berg-Breede River Whitefish (*Barbus andrewi*) is classified as Vulnerable. Suitable habitat appears to exist within the park for a further two RDB species, namely the Breede River Redfin (*Pseudobarbus burchelli*) classified as Endangered, and the Cape kurper (*Sandelia capensis*) classified as Near Threatened, though both appear to be locally extinct. Eight of the fifteen fish species are alien to the Breede River, and with four of them being piscivorous, they pose a significant threat to indigenous species. Management actions to ensure the persistence of indigenous fishes and enable the reestablishment of locally extinct species should concentrate on firstly, reducing artificial predation and competition pressure by encouraging angling and removal of alien fishes whilst preventing the removal of indigenous species, particularly *B. andrewi*, and secondly, maintenance of favourable environmental conditions through the provision of flow and water quality in the Breede River suitable for indigenous fishes; protection of riparian and aquatic vegetation; and removal of instream weirs in BNP.

Mammals:

Three mammal species potentially qualify for the status of SCC in BNP – bontebok, Cape mountain zebra and grysbok. While the bontebok is the least common antelope species in the southern African subregion, Cape mountain zebra are internationally classified as Endangered. Grysbok are endemic to the southern Cape region. 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. The three Red-listed mammal species in BNP must be put through this prioritization process, and those that come out in the top two categories must have TPCs and a monitoring programme. Monitoring will focus on population sizes, sex and age ratios, while research will focus on improving our understanding of the interactions of these herbivores with BNP vegetation, and on modelling population viability.

3.1.5 River Management

Many of the challenges SANParks faces with respect to managing river ecosystem in national parks are common to all parks. Prominent issues include:

Fragmented catchment ownership: For most rivers in parks, only portions of river ecosystems or catchments occur within the park boundaries. In BNP only a small portion of the mid-reaches of the Breede River occurs within the park. Many anthropogenic changes to rivers originate in catchment areas outside of parks, and are consequently processes or activities over which SANParks has little or no influence.

Reduced ecosystem variability: Scientific studies have demonstrated that the maintenance of inherently variable physical processes, and in particular variability in the flow of water, is essential for healthy functioning of river ecosystems. Past river management by government agencies, however, was frequently directed at minimizing fluctuations in flow to ensure stability of supply for off-channel, non-ecological uses. This has resulted in a legacy of, for example, water storage behind dams and regulating flow for irrigation or domestic supply, which presents considerable operational challenges

when attempting to achieve a new ideal of managing for healthy river ecosystem rather than just predictable water supply.

Legislated management: Section 3 of the National Water Act (Act 36 of 1998) clearly identifies the National Government as the public trustee of the nation's water resources, which acting through the Minister of Water Affairs and Forestry has the power to regulate the use, flow and control of all water in South Africa. SANParks thus does not directly, and in most cases also indirectly, manage hydraulic processes and resource use in rivers. The Act also states that the Department of Water Affairs and Forestry must devolve most of the catchment management issues to Catchment Management Agencies (CMA's) that include representatives of local interest groups and relevant government agencies. In the case of the Breede River this is the Breede CMA.

The most productive future role for SANParks in the management of rivers in parks would be the active participation in structures and processes for cooperative catchment management involving all stakeholders. Via such mechanisms the case could be made for resource utilization that is not only equitable and efficient, but also results in the protection of a healthy aquatic environment for present and future generations. Prominent activities would most likely include lobbying for and active participation in determination of ecological reserves; facilitating assessment of ecosystem and river health; and provision of information and insight obtained through research and monitoring to facilitate informed decision making and the successful implementation of catchment-scale adaptive management systems.

3.1.6 Fire management

The Overberg Coast Renosterveld and Suurbraak Grassy Fynbos found within BNP are vegetation types of high conservation significance. Both systems are fire-maintained, i.e. fire is required to stimulate plant recruitment and retain maximum species richness. The frequency, intensity, season and size of fires are critical determinants of floristic composition and structure. Fire furthermore enhances the acceptability of the vegetation as forage for herbivores, and in particular the vulnerable bontebok. The burning of vegetation to provide forage for bontebok should however not be done in a way that is detrimental to the flora.

A block-burning system is employed at BNP whereby renosterveld and fynbos are burnt at ca. 8- and 16-year intervals respectively. Burning is done in alternate years in late summer/early autumn, during weather conditions facilitating fires sufficiently hot to stimulate plant recruitment. Riparian vegetation along the Breede River is not burnt. Implementation of the fire plan should not be too rigid as variation in all components of the fire regime is desirable to attain patchiness in the vegetation and maximise diversity. Over-utilisation of recently burnt vegetation should be avoided by managing populations of medium-large herbivores (particularly bontebok) in an adaptive fashion. The provisional recommendation is for the bontebok population to range between 130 and 170. The level of herbivory will continually be re-evaluated and informed by the results of monitoring.

Vegetation monitoring focuses on the abundance and degree of utilisation of preferred grass species, whereas herbivore monitoring looks at the condition/performance of animals and the time spent in recently burnt habitat. Alien plant control efforts have to be aligned with burning operations. Mitigation measures need to be in place to limit the effect of undesirable wild fires on habitat within park, as well as preventing the spread of fires from the park to adjacent properties. Fire management procedures should at all times comply with the regulations of the National Veld and Forest Fire Act (101 of 1998).

3.1.7 Rehabilitation (soils, vegetation, alien invasive plants, river, wetlands)

Soil rehabilitation:

A number of disturbed sites (erosion gullies, quarries, borrow pits, dump sites, etc.) occur within BNP resulting from previous land uses. Currently, various Poverty Relief funded activities are underway in the park, including an upgraded restcamp a new link road between the restcamp and the recently-acquired Die Stroom section. These developments will make various materials available to rehabilitate the areas with soil erosion. Soil erosion is a problem at Fonteintjieskloof, Die Stroom and various other places in the park. No additional management intervention is currently needed for the gully erosion at Fonteintjieskloof since natural rehabilitation in the form of the trapping of finer material on the gully floor and the establishment of vegetation on the floor and sides is occurring. Silt traps/check dams can be used to control rill and gully erosion in the other areas of the park.

Seedbank/vegetation rehabilitation:

Natural recovery of vegetation at disturbed sites where soil rehabilitation has been done needs to be facilitated. Intensive rehabilitation measures (e.g. replanting) are often prohibitively expensive. Instead, good use of topsoil, harvested from new development sites (e.g. link road), is recommended. Harvested topsoil should be applied to areas with matching habitat in need of rehabilitation. The indigenous seed bank contained in the topsoil, should facilitate the natural recovery of indigenous vegetation cover and composition. Indigenous plant material removed from development sites can likewise be applied to rehabilitation sites as brush/mulch to provide a source of seed and to prevent loss of topsoil.

Alien invasive plant control:

The vegetation of BNP, and in particular the fynbos and riparian vegetation, is susceptible to encroachment by alien invasive plants (AIPs). The problem is exacerbated by the urban/peri-urban context of the park. The Working for Water funded alien invasive plant control program focuses on invaded areas at Die Stroom, especially along the southern bank of the Breede River, the railway line and N2, and the areas on the northern boundary of the park adjacent to the low-cost housing development and commonage. Ten AIP species are listed for BNP, although this list may exclude emergent weeds. Woody alien species, such as *Acacia mearnsii*, *A. saligna* and *Eucalyptus spp* are most problematic. All areas that have been cleared of AIP need to be followed up on at the prescribed minimum rotation. Areas infested with AIP but not yet treated need to be demarcated and monitored. New infestations, potential emergent weeds and sources of disturbance (e.g. roads) need close and continuous monitoring.

River rehabilitation:

Fencing undertaken to try and contain buffalo within BNP necessitated construction of two weirs across the Breede River during 1969 and 1970 – one just below the restcamp, and one at Die Stroom. The attempted containment of buffalo within the park was unsuccessful, and the last buffalo were removed in 1974. Although the buffalo were removed the weirs and associated fences remained. Both weirs, and particularly the structure at Die Stroom, effectively impound the Breede River. The weirs alter several physical and biological processes locally within the Breede River, in particular river hydraulics (e.g. timing, velocity and volume of flow); sediment deposition and erosion patterns and subsequently substratum composition; creation of barriers to migrating fishes; and the creation of habitat suitable for alien fishes. The weirs should be removed in the most efficient manner possible, which could entail either the use of explosives, power tools, or manual labour, or a combination thereof. The weir at Die Stroom has the greater impact on physical and ecological processes within the Breede River and should be removed first.

That being said, there remains, however, a potential conflict between the negative ecological impact and the positive tourism value of the weir: the weir maintains a high water level at Die Stroom day-visitor zone, which has major importance for the functionality of that site – and furthermore, the Park has a contractual commitment to the local community to maintain the recreational amenity of that site. This issue should therefore be explored in depth by a multi-disciplinary team of ecologists, Park management and local stakeholders before a final decision is taken.

Wetland rehabilitation:

Rehabilitation of wetlands within BNP should aim at reinstating natural drainage patterns in two focus areas, i.e. the 'Old Race Course' floodplain in the west of the park, and the seasonal wetlands in the southeast of the park. Funding will be sought from Working for Wetlands and/or Working for Water. The major actions will be to decommission roads and remove other man-made structures that currently impede natural hydrological functioning of wetlands. The roads will be closed and ripped to encourage natural recovery of indigenous vegetation, seeded by the surrounding vegetation. It is hoped that restoration of the hydrological functioning of wetlands will facilitate the re-establishment of historical vegetation assemblages and associated fauna.

3.1.8 Cultural Heritage Resource

Brief overview of the cultural values of the Park:

- Summary of Archaeological Survey in 2005

A rich oral history recorded in the early 20th century describes two eighteenth century Khoekhoen settlements within the Bontebok National Park. Archaeological investigation by the University of Cape Town Archaeology Department focused on these two locations. So far, eight archaeological sites have been identified, including two archaeologically significant stone structures, a 19th and possibly 18th century track-way, a possible burial cairn and six significant artefact scatters. In summary the results so far indicate that Bontebok National Park is relatively rich in archaeological remains. Further survey of the park has been recommended in order to assess, manage and develop this aspect of the parks heritage as a public as well as academic resource.

- Park management priorities and future intent

As mentioned above, a preliminary survey of one aspect of Bontebok National Park Cultural Heritage resources has been conducted in which detailed records and GPS locations were recorded. An archaeological survey report is available for reference in which details of the survey and the sites discovered and a series of recommendations can be found.

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. SANParks legal obligations and management principles regarding cultural heritage resources are included in the Cultural Heritage Cooperate Policy Framework.

3.1.9 Conservation development framework (CDF)

The primary objective of a Conservation Development Framework (CDF) is to establish a coherent spatial framework in and around a park to guide and co-ordinate conservation, tourism and visitor experience initiatives. A key part of the CDF is the zoning plan, which 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 Bontebok National Park 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.

Overview of the use zones of Bontebok National Park:

The use zoning plan for Bontebok National Park is shown in Figure 2. 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 Bontebok National Park Conservation Development Framework (CDF) Document which is available on request.

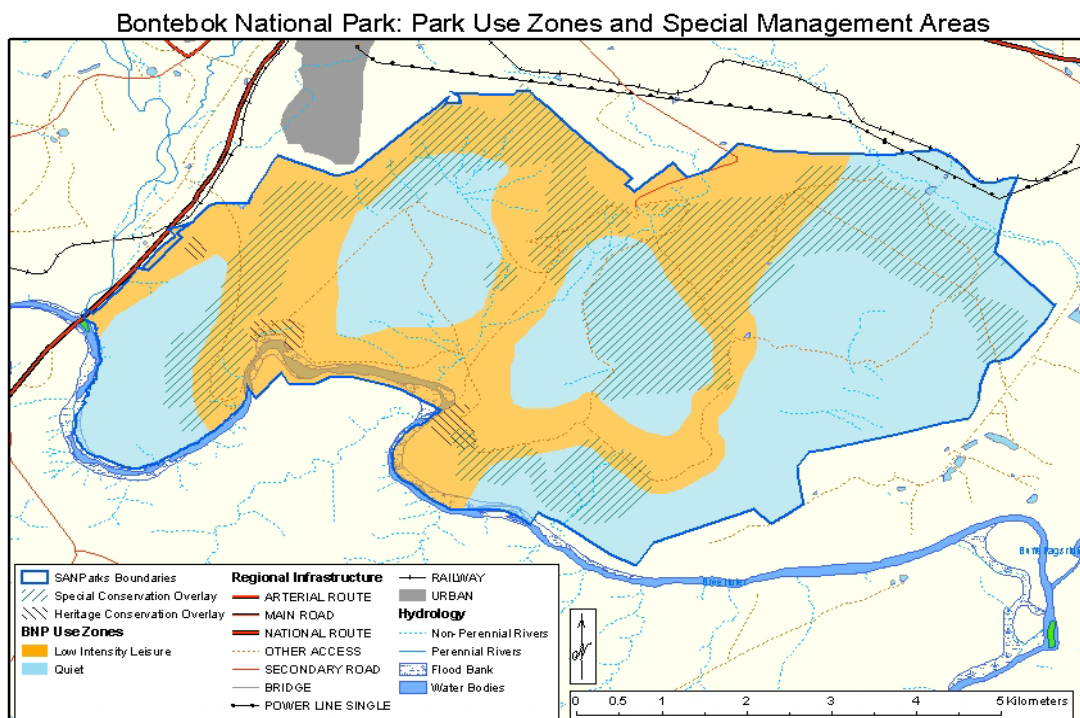


Figure 2: Use Zoning Plan of the Bontebok National Park.

Quiet Zone: This zone is characterized by unaccompanied (or accompanied under some circumstances) non-motorized access, where visitors can walk or cycle and experience nature without the intrusion of any form of motorized transport. Visitor numbers and density are relatively high given the limited area of the park and contact between visitors is frequent. In Bontebok NP, rationalization of the road network allowed Quiet areas to be designated in eastern and western sections of the park, as well as in two central areas circled by the main tourist roads. Quiet areas also serve the function of restricting infrastructure development in certain environmentally sensitive sections of the park such as seasonal wetlands and renosterveld areas of the park.

Low Intensity Leisure Zone: The Low Intensity Leisure Zone is characterized by relatively high levels of tourist activity, motorized self-drive access to certain areas, and the potential for small basic camps without facilities such as shops and restaurants. Low intensity leisure areas were designated around a rationalized road network for game viewing, along a proposed linkage to a new entrance along the N2 highway, along the park's boundary with urban areas to the north, the actively used section of the Breede River from Die Stroom to Aloe Hill containing most visitor facilities including the rest camp, and around the current administrative complex. At Die Stroom it is accepted that the visitor node needs to be able to accommodate a lapa, a kiosk (especially during peak times), and potentially a low intensity coffee shop/light meals restaurant. In addition, the ablution facilities will be upgraded to potentially allow the use of the site (on a booked basis) by sports and overland groups.

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 Bontebok NP, a High intensity leisure zone is proposed for a node accommodating visitor entrance and reception facilities, as well as park management facilities.

Overview of the Special Management Overlays of Bontebok National Park:

Special management overlays which designate specific areas of the park that require special management interventions were identified. Two areas were designated:

Special Conservation Areas – Rare, endemic and endangered plant species: Areas within Bontebok National Park containing key populations of rare, endemic and endangered species were identified as Special Conservation Areas. These areas were identified to ensure that management and development activities do not result in any degradation of habitat for these species, and particularly to ensure that no loss of habitat occurs.

Heritage Conservation Areas: The key cultural heritage sites of Bontebok were included into this Special Management Overlay to ensure the protection of cultural resources in this zone.

Current status and future improvements:

The Bontebok National Park CDF will be updated, as required, during the current five year update cycle. Additional work will be undertaken on precinct plans for various sections of the park.

3.1.10 Tourism Potential

The BNP presents an attractive stop over point for travellers following the Garden Route, being situated 8km from Swellendam, 240 km from Cape Town and 200 km from George. The park is well known for its riverside rest camp at the Lang Elsie's Kraal which provides access to the Breede River, and also provides an experience of South African culture where one can connect to the people of the past and learn about how indigenous people once lived and how this lifestyle was modified by colonial settlement.

There are various projects currently taking place at the park including the re-development of the Lang Elsie's Kraal rest camp and the construction of a link road, which will link the old park to the new section (Die Stroom). New projects being planned include the

relocation of the entrance gate, improving the park's infrastructure and developing the amenities in Die Stroom as discussed above under Tourism Objectives. It is hoped that these developments will ensure many opportunities for local SMMEs and Entrepreneurs in the area in the form of concessionaires, as well as job creation for the community of Swellendam at large. The BNP can also supplement and add value to other major tourist attractions in the area, notably the wine and cultural tourism destinations. To achieve this objective the park is engaging with the Local Tourism Organisation (LTO) of the area. Although currently there is no restaurant in the park, there is a shop where books, refreshments and other nature-based material may be purchased.

The BNP earned R 550,884.32 in tourism revenue during 2005.

3.1.11 Marketing

A marketing plan is being developed in cooperation with the Local Tourism Organization.

3.1.12 Building cooperation

Education Development Program

The purpose of this program is to provide an educational and interpretive resource for all visitors to the Park aimed at fostering a better understanding and appreciation of the natural and cultural resources of Bontebok National Park. The focus will be on youth outreach, communities on a broader scale and environmental education in order to build a conservation constituency for the future. Owing to lack of personnel, the BNP has been dependent on Global Vision International (GVI) interns with the assistance from interested park rangers and the support from the park manager to run education development. The situation will improve in future in that a position has been approved that will be filled before end 2006 or beginning 2007. This will ensure better management of the education program.

Schools

The BNP invites excursions by schools to the park, and also visits schools to talk about its conservation value. It is currently building a database of schools in the surrounding area of Swellendam, which will be visited from time to time to present and evaluate the effectiveness of different education programs. Although there are no specific programs which are currently running, the park strongly focuses on calendar days such as World Wetlands Day, Water Week, etc. Depending on the theme of that specific year, these programs could include exhibitions supported by visual displays including but not limited to posters and/or data projectors at either schools or libraries. The park will in future apply to run specific programs such as Kids in Parks, Eco Schools, Outreaches and other relevant Community programs in a more focused way.

Visitors

Education and interpretation facilities are available on the short walking/hiking trails such as Aloe Hill and Acacia trails, which start and end at the Lang Elsie's Kraal. A brochure on the history of the BNP also gives important information such as Mammal, Plant and Bird Lists. A Photographic Guide of the park, as well as flora and fauna identification books are available on sale at the park's retail outlet. The BNP does not offer any specific guided activities unless arranged by schools for a sole purpose of education and interpretation, but it does offer interpretative materials on displays at the park's reception area.

Youth Development Programs

There are currently no specific youth programs running, but the park has identified a need for it and will initiate it as soon as the required capacity is established within the park.

Teacher development

There is currently no specific teacher development program running, but the park has identified a need for it and will initiate it as soon as the required capacity is established. This will include the enhancement of the educational programmes and linkages of the schools curriculum with biodiversity conservation.

Staff

The BNP staff is very enthusiastic about the future of the park hosting programs such as Kids in Park, Eco Schools etc. The park has already develop a Kids in Parks business plan, which will be submitted in the near future for funding request and it will be made available on request. The interested parks rangers and the GVI are currently playing a huge role in the marketing and running of any educational schools programs, which are requested by various schools.

Special interest groups

The park works with university students and volunteering groups in order to develop a good interpretative and education programs in the Park.

3.1.13 Local socio economic development program

The purpose of this program 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 BNP by partnering with Local Government to form part of the Integrated Development Plans (IDP's). The Park will participate in the Expanded Public Works Programme (EPWP), particularly Working for Water (WfW). It is also to contribute to local skills development by implementing and supporting needs-related training programmes such as learnerships and by creating business opportunities thus enhancing opportunities for Small Medium and Micro Enterprises (SMMEs).

The Expanded Public Works Programme (EPWP) and other local economic development related programs will remain a significant focus area to effectively contribute to the creation of temporary jobs and sustainability by investigating exit and/or entrepreneurial opportunities for local communities.

Recognising the importance of research and monitoring, the BNP Park will strive to do more in order to yield better understanding of further skills needed to develop various types of SMMEs.

3.1.14 Stakeholder Relationship Management

The purpose of this programme is to establish and maintain meaningful and beneficial relationships with a wide range of stakeholders supporting SANParks core business. To build good stakeholder relationships, the BNP will engage with all spheres of government, conservation entities, communities, research institutions/NGOs and business partners. The BNP will communicate all current and future projects to the relevant stakeholders. This will either be done through community meetings or meetings with the local government with the hope that whatever discussed would reach those who will benefit from such projects. The park is currently working with the following stakeholders:

Government

- Local government
 - Overberg district and Swellendam municipalities
 - Swellendam SAPS
 - Fire Protection Association (FPA)
- National government
 - DWAF (Department of Water Affairs and Forestry)
 - DEAT (Department of Environmental Affairs and Tourism)
 - SANRAL (South African National Road Agency Limited)

Conservation entities

- Provincial, National and International conservation agencies
 - IUCN International Union for Conservation of Nature and Natural Resources
 - WCNCB trading as CapeNature

Research institutions and universities

- SANBI (South African National Botanical Institute)
- Universities of Cape Town, Stellenbosch and others.
- CREW (Conservation of Rare and Endangered Wildflowers)

Relevant conservation related Non-governmental Organisations

- WESSA (Wildlife and Environment Society of South Africa)
- WWF (World Wildlife Fund)
- Honorary rangers (independent volunteers who work hand in hand with the Park)
- And local conservancies e.g. Lower Breede River Conservancy

Business partners

- Concessionaires operating businesses in Bontebok National Park
 - The Park currently has no concessionaires, but anticipates hosting a few after the completion of the developments at Die Stroom (in the future to be named De Stroom). The plan is to have a restaurant/coffee shop and kiosk managed by SMMEs.
- *Contracted commercial operators*
 - No contracted commercial operators currently operate within the Park, however, if opportunities arise, they will be evaluated and necessary measures will be taken to engage accordingly. This will include but not limited to the following business opportunities horse riding, horse-drawn wagon rides, guided tours either by foot or by vehicle etc.
- *Suppliers of key products and services*
 - The Park supports local and national suppliers. A list of all key product suppliers will be made available on request

Communities

The Park engages with local communities through the local council and community leaders of Railton and the town of Swellendam at large. Either the council or the

community leaders arrange community meetings on request of the Park to discuss relevant issues, such as job opportunities or upcoming projects.

The media

To reach the communities of Swellendam, local newspapers such as the Langeberg Bulletin, Swellendam Gazette and Swellendammertjie are utilized. However, to supplement this, the Park also utilizes the local council to arrange meetings as it has been confirmed by the local council that not all the communities have access to local newspapers. It is at these meetings where job opportunities and future park projects are presented. This is also seen as an excellent vehicle insofar as it allows people to ask questions, which are clarified before any applications are engaged into.

Customers/Visitors

As visitors are also recognised as part of our stakeholders, when in the Park or when seen in public, they are allowed to share their views in relation to tourism and the management of the Park in general. This is encouraged in that it allows the Park to bring exactly the type of infrastructure and tourism amenities, which have been informed by the people who uses such facilities. The Park also takes cognisance of the fact that it should not lose its focus by accommodating whatever the public recommend, but all views are weighed and incorporated according to SANParks standards and policy guidelines.

Park Forums

The Park has a functional forum called the Swellendam Protected Areas Forum (SPAF). It is through this forum that the Park liaises with different departments such as Schools, Agriculture, South African Police Services, local government/planning e.g. IDP's and LED's and other local business entities. All the stakeholders meet on a quarterly basis and sometimes ad hoc meetings are attended whenever there are events to be planned.

Bioregional initiatives

BNP is committed to act and contribute as core conservation area within a wider natural landscape and social context. This ensures that the Park functions within a wider system supportive of bioregional conservation. This includes participating in existing programs and initiatives, the most important being the Cape Action plan for People and Environment (C.A.P.E). This Bioregional Program forms part of the Provincial Government of the Western Cape (PGWC) Bioregional Planning Framework.

As noted, BNP protects one of the last remnants of the natural lowland vegetation, and furthermore fulfils a linkage function in the emergence of a regional biodiversity network. Its location is pivotal in the regional biodiversity network given its proximity and linkages to:

- 1) conservation areas along the mountain chain (i.e. Marloth Nature Reserve),
- 2) its frontage onto the Breede River corridor - upstream and downstream of which significant progress in biodiversity conservation is being made with the establishment of riverine conservancies, and
- 3) its links down the Breede River to the coast where the Agulhas Biodiversity Initiative (ABI) is making good progress with the consolidation of the biodiversity network.

Tourism bodies, operators; Service Providers; Volunteer programs

As of 20th June 2006, the Park is part of the Tourism Association in Swellendam, it also engages with local service providers, and volunteer programmes such as GVI (Global Vision International) and Honorary Rangers. There are currently no operators in the Park, but this has been recognised as an opportunity and it will be investigated and engaged into accordingly in the near future.

3.1.15 Effective park management

Environmental management

Having an environmental management system (EMS) will assist park management with the achievement of their environmental management responsibility regarding ongoing operational environmental impacts. Bontebok NP's brief description of how impacts are currently managed:

- Waste management: The Park recognises that health is an important issue at any working place and in doing this, it collects all refuse, which is kept together in their refuse bags and taken to the dumpsite every Friday of every week.
- Pollution control: This is not largely experienced in the Park, as all stores are kept clean and all unwanted or old materials are disposed of and immediately.
- Managing impacts from tourist, contractors: Whenever necessary, the Park utilises the relevant staff to monitor, control and guide tourists and/or contractors to behave in an appropriate/responsible manner within the Park. The monitoring of tourists and contractors includes but not limited to littering in the park and diverging from dedicated paths and roads.
- Building sites: Building sites such as the storerooms and the generator house are kept clean, any other leaks whatsoever, which cannot be fixed, are dealt with by using sand or sawdust to absorb it, which is later collected and disposed of at the municipal landfill. The Park tries to keep all building sites/areas as clean as possible to avoid high cleaning costs. Construction sites falling under the EPWP programme are regulated according to individually tailored Environmental Management Plans.

An 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 directly manage. The outcome of this standard must be integrated with the national park management framework to ensure an integrated approach. The following objectives will be achieved by implementing this plan:

- continual improvement of environmental management;
- compliance to environmental law; and
- show casing environmental responsibility.

Bontebok 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:

- 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.
- Legal and other requirements: The park identifies and communicates legal and other requirements that are applicable to the park.
- 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.
- 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.

- 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.
- 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.
- Emergency Preparedness and Response: The park identifies potential for and responds to accidents and emergency situations, and for preventing and mitigating the environmental impacts that may be associated with them.

3.1.16 Security and Safety

The objectives of the safety and security plan are to ensure:

- that effective visitor safety measures are in place,
- the safety and security of SANParks employees and concessionaires,
- that tourist perceptions are managed in order to protect the reputation of SANParks and the South African tourism industry at large.

This plan comprehensively addresses both the strategic and operational aspects of the Safety and Security within the framework set out by the SANParks Security Plan.

The Plan is informed by analysis of the following aspects:

- The identification of high risk/use areas.
- Associated crime statistics for each identified area.
- The associated risks and criminal behaviour for each area.

The above information coupled with the combined operational experience of the parties involved enabled BNP to detail the needs for each area including infrastructure, budget and human resources requirements.

BNP receives ± 15 000 visitors per annum. Most potential threats are linked to other illegal activities in and around the park; this includes illegal entry/ trespassing, hunting with dogs, fishing, flower picking, resource use etc. Daily park activities that are implemented to control these activities form an important part of this plan.

3.1.17 Infrastructure Development & Maintenance Plan

Description of current infrastructure

Tourism Infrastructure:

Rest Camps

- Bontebok National Park (BNP) presently has one rest camp: Lang Elsie's Kraal.
 - This is being upgraded from 18 beds to 32 beds in 2006 via EPWP funds; due online March 07.
 - A further 12-18 beds, camp kitchen and other facilities to complete the camp are to be provided in 2007 by Infrastructure Development (ID) funds (provisionally allocated) see also roads,
 - Plans for a bush camp/ lodge near the cultural heritage site 'Ou Tuin' are at an early concept stage.

Day Visitors, Restaurant, and other Facilities

- BNP has no functional day-visitor site; potential exists at Die Stroom, which currently has only basic facilities and is closed due to
 - lack of manpower to ensure safety/security,
 - dangerous swimming areas
 - lack of a connecting road (being constructed in 2006), and
 - very poor state of road to site

Tourism roads network

The current entrance is substandard and the BNP needs a new entrance. BNP currently has 34 km of tourist roads; the CDF calls for rationalization to 22km by rehabilitating inappropriate roads across wetlands, and/or converting to walks, cycle tracks etc.

The provisional allocation of ID funds, plus the next round of EPWP funding will hopefully provide the funds for a new entrance and roads, so as to address the above.

The need for investment in roads cannot be overstated – it is the priority action needed to achieve the potential of the BNP.

Management and Support Infrastructure

Park Administration Offices

The Park has a ~100m² office building, comprising a shop, three small offices, and a store/kitchen. The buildings need certain internal modifications and external renovations. With improvements, these buildings will be sufficient to service our visitors for the next couple of years, but are completely inadequate in size and amenity for all future scenarios. Serious thought is being applied to conversion of the reception and the Park Manager's house to an Environmental Interpretation and Education Centre. This can happen once the new entrance off the N2 is built.

Staff Accommodation

In the last two years, BNP has relocated its entire resident staff out of the Park, with the exception of the senior ranger. This has allowed demolishing of six semi-derelict staff houses, which were empty and located in visually sensitive areas, as per the CDF. BNP now has the following staff housing:

- A 3-bedroom Park Managers house: utilised as accommodation for students / transitory accommodation for new staff;
- A 2-bedroom cottage, occupied by the Senior Ranger
- A 2-bedroom flat (formerly the Park Manager's office) utilised by the Global Vision International (GVI) Intern.

All are in fair condition, having been externally renovated through EPWP over the last 2 years, but all need an internal facelift, and some attention to accessibility.

Ranger workshops, stores etc

The Park has a number of dilapidated workshop and store buildings. These need to be renovated such that they are safe for storing fuels, oils, herbicides, gas etc. As part of the new entrance development, it is best that these old buildings be demolished entirely and replaced with a new ranger/technical station on the other side of the Park.

Management Roads

BNP has over 70km of so-called 'management roads'. Apart from the perimeter fence line/firebreak (~30km) the remainders are old roads remaining from the time before the Park was proclaimed in 1961.

The closure and rehabilitation of these roads as a priority is currently being addressed, guided by a plan for road rationalisation contained in the Park CDF. This is best done through EPWP funding, as this work can deliver sufficient man-days to make associated infrastructure projects viable within EPWP criteria (30% of total project value payable as wages).

Fences

BNP has ~25km of new 'big game' perimeter fence (2.1m game fence) provided through the EPWP in 2004-5. Until the Park expands, no new fencing will be required, but there will need to be money to maintain this new fence, and to take down some 10km of obsolete fencing at Die Stroom.

Bulk Services

BNP does not enjoy mains electricity or water at any site other than at the current reception – this is being addressed through the present EPWP, which will provide mains electricity and water to the rest camp.

Electrical power comes from overhead lines to the present reception site: should this site be redeveloped as an Environmental Interpretation and Education Centre (see above) these lines should be buried underground, along with the telephone lines, as they are visually intrusive and pose a hazard to rare/endangered endemic bird species such as the Blue Crane, Black Harrier and Stanley's Bustard.

The present waterworks, which chlorinate and clarify river water, are near derelict and they are in a visually sensitive location. These should be demolished as soon as the current EPWP project is finished and the mains water supply is installed.

Detailed 5-year plans, with costing, have been prepared for:

- Infrastructure maintenance.
- Infrastructure development
- Income generating and local economic development projects.
- Basic infrastructure projects.
- Labour intensive rehabilitation/green projects.

4 ADAPTIVE AND INTEGRATIVE STRATEGIES TO SUSTAIN THE DESIRED STATE

Previous sections have dealt with the desired state for the BNP and the specific programmes that are necessary to achieve the desired state. However, the desired state cannot be effectively maintained without explicit attention being given to prioritization, integration, operationalisation, and above all, reflection and adaptation in accordance with adaptive management principles.

4.1 Key prioritization, integration and sequencing issues

The desired state regarding the biodiversity of BNP centres on conserving examples of the heavily impacted renosterveld and lowland fynbos, as far as this may be compatible with the presence of a complement of large herbivore species that occurred in the area in historical times. The BNP, being almost surrounded by cultivated lands, is essentially a relatively small island ecosystem. The vulnerability of this system is underlined by the fact that a number of plant species in BNP are not currently known to occur anywhere else in natural habitat. The extent to which the threat of biodiversity loss can be overcome will depend on (1) our knowledge of biodiversity heterogeneity patterns, processes and functions and (2) the potential to create ecological corridors linking BNP to other biodiversity islands in the region. The establishment of ecological corridors is of vital importance and for BNP this objective fortunately enjoys the support of local stakeholders.

Given that it is in a region that is extremely vulnerable to biodiversity losses, environmental education should be a high priority in BNP. The potential to present the cultural heritage of the region is also excellent. The realization of the educational potential of the BNP will require resources to implement.

The BNP is currently far from realizing its tourism potential. Key priorities to realize the desired state are: (1) the upgrading of overnight facilities at the rest camp, (2) the development of day visitor facilities and (3) the expansion of the variety of activities on offer to visitors.

4.2 Steps to Operationalisation

The resources required for the BNP to achieve its desired state are higher than historically allocated. This management plan needs to make explicit the additional resources required to attain the desired state.

First among these additional resources is capacity to attain a level of understanding necessary to assess the long term potential of the BNP to retain its biodiversity. Since the establishment of the BNP at its current site in 1960 some knowledge of the functioning of the system has been accumulated. However, this is inadequate for a predictive understanding. Field monitoring capacity is a shortcoming common to all parks. To provide for this capacity the operating and human resources costs of additional field biologists and technicians has been added to the SANParks corporate budget (SANParks business plan). Aspects that are urgent to monitor include:

- The current and likely future status of rare species.
- Patterns of herbivory and fire in a confined and limited system, and the compatibility of these processes with the maintenance of the diversity of the flora.
- Dispersal and pollination as processes maintaining diversity in a fragmented landscape.
- River health assessment.

Also critical is capacity to develop ecological linkages in the landscape. Costs of land acquisition to consolidate the remaining fragments of renosterveld and lowland fynbos in the region have been included in the additional budget needed for the BNP to achieve its desired state. Over the longer term continued cooperative efforts will be needed to

sensitize all parties, including authorities responsible for land management and with private landowners, to the need to maintain biodiversity-friendly landscape linkages.

Programs, with costing, for the implementation of the desired state regarding visitor facilities and education are also put forward.

4.3 Key Ongoing Adaptive Management and Evaluation Interventions

Lack of informative and effective feedback, which should stimulate proper reflection by managers, is the commonest underlying cause of failure of adaptive management, and hence of reaching the desired outcomes we set for parks. The hallmark of adaptive management is ongoing learning, and this only results if users apply their minds to the adaptive cycle. Generic procedures are needed by which the integrity of these feedbacks, and hence learning, will be guaranteed. These procedures are described in the SANParks Policy Framework Governing Management Plans (SANParks 2006). A functional monitoring program, with established report-back mechanism, is an essential component of the adaptive management cycle. As noted above, additional capacity will be required to put an adequate biodiversity monitoring system in place for BNP.

An additional feedback process will be the annual State of Biodiversity Report for BNP. This report is one of the Balanced Scorecard performance measures that will be critical for tracking the achievement of the biodiversity desired state through adaptive management.

Report-back to stakeholders is of course also a critical part of adaptive management and this will be dealt with in the 5-yearly public meetings that will be held to review the management plan. Between five yearly reviews, the Park Forum provides a platform for more frequent exposure of issues to stakeholders.

5 BNP BUDGET: COST OF ATTAINING THE DESIRED STATE

The 2006/07 budget for BNP included an operating cost of R 8,986,132.00 and an income, largely from tourism, of R658 000.00. A future annual budget of this magnitude will allow BNP to persist in its current state, but it could never reach the full potential of its desired state. The table below lists the additional funds required over the next five years to achieve the various priorities detailed in this management plan.

ITEM	2007/8	2008/9	2009/10	2010/11	2011/12
Expansion to create ecological corridors (873 ha over 5 years).	R 2,700,000	R 2,700,000	R 2,700,000	R 2,700,000	R 2,700,000
Rehabilitation (mostly removal of unwanted structures)	R 2,341,000	R 1,955,460	R 570,788	R 617,035	R 634,257
Knowledge management and monitoring	R235,000	R246,100	R 257,866	R 270,338	R 283,558
Regional socio-economic integration (Breede river, CAPE programme, Swellendam IPD)	R 130,000	R 63,300	R 67,098	R 71,124	R 75,391
Infrastructure (rest camp establishment/improvement, day visitor facilities, road resurfacing, trail upgrades, education centre).	R 8,154,300	R 12,276,900	R 4,036,000	R 773,000	R 400,000
People and Conservation (cultural resource management plan, Park Forum, educational materials, skills development)	R 240,000	R 242,460	R 70,068	R 72,832	R 75,762

Safety and security	R 0	R 42,800	R 5,800	R 5,800	R 5,800
TOTAL	R 13,565,300	R 17,281,020	R 7,707,620	R 4,510,129	R 4,174,768

6 REFERENCES

- Barnard, K.H. 1943. Revision of the indigenous freshwater fishes of the S.W. Cape region. *Annals of the South African Museum* 36:101-262.
- Barnard, P.J. & Van der Walt, K. 1961. Translocation of the bontebok (*Damaliscus pygargus*) from Bredasdorp to Swellendam. *Koedoe* 4:105-109
- Baron, S.T. 1981. An updated list of birds of the Bontebok National Park. *Koedoe* 24:79-98.
- Bateman, J.A. 1961. The mammals occurring in the Bredasdorp and Swellendam districts, C.P., since European settlement. *Koedoe* 4:78-100.
- Beukes, P.C. 1984. *Sommige aspekte van die ekologie van die vaalribbok (Pelea capreolus Forster 1790) in die Bontebok Nasionale Park*. MSc thesis, University of Stellenbosch, Stellenbosch.
- Beukes, P.C. 1987. Responses of grey rhebuck and bontebok to controlled fires in coastal renosterveld. *South African Journal of Wildlife Research* 17:103-108.
- Beukes, P.C. 1988. Diet of grey rhebuck in the Bontebok National Park. *South African Journal of Wildlife Research* 18:11-14.
- Beukes, P.C., Novellie, P.A. & Bigalke, R.C. 1989. Preliminary observations on grass layer productivity and utilization by bontebok at the Bontebok National Park. *Fort Hare Papers* 9:41-50.
- Boshoff, A.F. & Kerley, G.I.H. 2001. Potential distributions of the medium- to large-sized mammals in the Cape Floristic Region, based on historical accounts and habitat requirements. *African Zoology* 36(2):245-273.
- Bothma, J. du P. 1986. Die dinamika van wildbevolkings. In *Wildplaasbestuur*, J. du P. Bothma (ed.), pp. 114-136. Van Schaik, Pretoria.
- Braack, H.H. 1981. Lower vertebrates of the Bontebok National Park. *Koedoe* 24:67-77
- Coates, T.J. 1970. Check-list of the Collembola of South African Parks (Part 1). *Koedoe* 13:181-184.
- Coetzer, A.H. 1986. Benthic invertebrate communities and the biological assessment of the water quality of the Breede River during 1975 and 1976. *Bontebok* 5:42-51
- Cowan, G. 2006. Management Plan Framework: Guidance for the Development of Management Plans in Terms of the National Environmental Management Protected Areas Act (Act 57 of 2003). Dept. Environmental Affairs and Tourism, Pretoria.
- Cowling, R.M. & Heijnis, C.E. 2001. The identification of Broad Habitat Units as biodiversity entities for systematic conservation planning in the Cape Floristic Region. *South African Journal of Botany* 67:15-38.
- Cowling, R.M., Pierce, S.M. & Moll, E.J. 1986. Conservation and utilisation of South Coast Renosterveld, an endangered South African vegetation type. *Biological Conservation* 37:363-377.
- Cowling, R.M., Pressey, R.L., Lombard, A.T., Heijnis, C.E., Richardson, D.M. & Cole, N. 1999. *Framework for a conservation plan for the Cape Floristic Region*. A report of the CAPE Project for world Wide Fund South Africa. Institute for Plant Conservation Report 9902, University of Cape Town, Cape Town.
- David, J.H.M. 1970. *The behaviour of the bontebok, Damaliscus dorcas dorcas, with special reference to territorial behaviour*. MSc thesis, University of Cape Town, Cape Town
- David, J.H.M. 1971. Territorial behaviour of bontebok. *African Wildlife* 25:66-69.
- David, J.H.M. 1973a. Observations on the frequency of drinking in the bontebok *Damaliscus dorcas dorcas*: short communications. *Zoologia Africana* 8:135-137.
- David, J.H.M. 1973b. The behaviour of the bontebok *Damaliscus dorcas dorcas*, (Pallas, 1776), with special reference to territorial behaviour. *Zeitschrift fur Tierpsychologie* 33:38-107.

- David, J.H.M. 1975a. Fidelity to a fixed territory in some male bontebok in the Bontebok National Park, Swellendam, Cape Province. *Journal of the South African Wildlife Management Association* 5:111-114.
- David, J.H.M. 1975b. Observations on mating behaviour, parturition, suckling and the mother-young bond in the bontebok (*Damaliscus dorcas dorcas*). *Journal of Zoology* 177:203-223.
- De Graaff, G. 1974. Notes on the occurrence of rodents in South African national parks. *Koedoe* 17:173-183
- De Graaff, G., Van der Walt, P.T. & Van Zyl, L.J. 1976a. Populasie-samestelling van die bontebok *Damaliscus dorcas dorcas* in die Bontebok Nasionale Park, gedurende Januarie 1974. *Koedoe* 19:67-74.
- De Graaff, G., Van der Walt, P.T. & Van Zyl, L.J. 1976b. Lewensloop van 'n elandbevolking *Taurotragus oryx* in die Bontebok Nasionale Park. *Koedoe* 19:185-188.
- Driver A, K Maze, M Rouget, AT Lombard, J Nel, JK Turpie, RM Cowling, P Desmet, P Goodman, J Harris, Z Jonas, B Reyers, K Sink, & T Strauss. 2005. National Spatial Biodiversity Assessment 2004: Priorities for biodiversity in South Africa. *Strelitzia* 17. South African National Biodiversity Institute, Pretoria
- Essop, M.F., Harley, E.H., Lloyd, P.H. & Van Hensbergen, H.J. 1991. Estimation of the genetic distance between bontebok and blesbok using mitochondrial DNA. *South African Journal of Science* 87:271-273.
- Fabricius, C., Van Hensbergen, H.J. & Zucchini, W. 1989. A discriminant function for identifying hybrid bontebok x blesbok populations. *South African Journal of Wildlife Research* 19:61-66.
- Greyling, T. & Huntley, B.J. 1984. Directory of southern African conservation areas. *South African National Scientific Programmes Report* 98, CSIR, Pretoria.
- Grobler, P.J. & Marais, J. 1967. Die plantegroei van die Bontebok Nasionale Park, Swellendam (Deel 1). *Koedoe* 10:132-146.
- Jackson, T. 2001. Parking off: Bontebok National Park. *Africa Birds & Birding*, Vol 5, Issue 6, December-January, pp. 58-61.
- Kemper, J., Cowling, R.M., Richardson, D.M., Forsyth, G.G. & McKelly, D.H. 2000. Landscape fragmentation in South Coast Renosterveld, South Africa, in relation to rainfall and topography. *Austral Ecology* 25:179-186
- Le Roux, M. 1980. *Reuksintuiglike kommunikasie: chemiese samestelling van eksokriene klierafscheidings van die bontebok (Damaliscus dorcas dorcas), springbok (Antidorcas marsupialis) en grysbok (Raphicerus melanotis)*. PhD thesis, University of Stellenbosch, Stellenbosch.
- Marais, H. 1990. Great White Heron in Bontebok National Park. *Ostrich* 39:41.
- Martin, R., Martin, J. & Martin, E. 1987. Greenspotted dove: a possible error on the Bontebok National Park list. *Bokmakierie* 39:117.
- Moll, E.J. & Bossi, L. 1984. Assessment of the extent of the natural vegetation of the fynbos biome of South Africa. *South African Journal of Science* 80:355-358.
- Mucina, L., Rutherford, M.C. & Powrie, L.W. (eds) 2005. *Vegetation map of South Africa, Lesotho and Swaziland*. 1:1 000 000 scale sheet maps. South African National Biodiversity Institute, Pretoria.
- Nell, A.E. 1992. *Reuksintuiglike kommunikasie: chemiese karakterisering van die interdigitale en preorbitale afscheidings van die bontebok, Damaliscus dorcas dorcas, en die blesbok, Damaliscus dorcas phillipsi*. PhD thesis, University of Stellenbosch, Stellenbosch
- Novellie, P. 1986. Relationships between rainfall, population density and the size of the bontebok lamb crop in the Bontebok National Park. *South African Journal of Wildlife Research* 16:39-46.
- Novellie, P. 1987. Interrelationships between fire, grazing and grass cover at the Bontebok National Park. *Koedoe* 30:1-17.

- Novellie, P.A. 1981. The responses of a captive bontebok ram to faecal pellets from conspecific rams. *South African Journal of Zoology* 16:265-266.
- Novellie, P.A. & Knight, M. 1994. Repatriation and translocation of ungulates into South African national parks: an assessment of past attempts. *Koedoe* 37(1):115-119.
- O'Keeffe, J.H. 1986. Ecological research on South African Rivers – a preliminary synthesis. *South African National Scientific Programmes Report* 121:1-121.
- Penzhorn, B.L. 1977. Further bird records from the Bontebok and Mountain Zebra National Parks. *Koedoe* 20:205-207
- Prinsloo, P. & Robinson, T.J. 1992. Geographic mitochondrial DNA variation in the rock hyrax, *Procavia capensis*. *Molecular Biology & Evolution* 4:447-456.
- Rebelo, T. Undated. *Two new Protea species added to the Bontebok National Park plant list*. Available from: <http://protea.worldonline.co.za/p14bon.htm> (Accessed 16/5/2003).
- Robinson, T.J. & Elder, F.F.B. 1993. Cytogenetics and its role in wildlife management and the genetic conservation of mammals. *Biological Conservation* 63:47-51.
- Robinson, G.A., Van der Walt, P.T., De Graaf, G. & Pieterse, C.P. 1981. *Bestuursplan – Bontebok Nasionale Park*. Official document, National Parks Board.
- Rodrigues, J. 1996. Discover the floral spectacle of national parks. Richtersveld National Park celebrates five years of prosperity. *Custos*, September, pp. 14-20.
- Rogers, K. 2003. A Biodiversity Custodianship Framework for SANParks. Unpublished document, SANParks, Pretoria.
- Rowlands, B. 1988. Sympatry in land tortoises. Resource partitioning: a need for research. *Naturalist*, March, pp. 16-21.
- Russell, I.A. 2001. Freshwater fishes of the Bontebok National Park. *Koedoe* 44(2):71-77.
- Skead, C.J. 1980. *Historical mammal incidence in the Cape Province, Volume 1: The Western and Northern Cape*. The Department of Nature and Environmental Conservation of the Provincial Administration of the Cape of Good Hope, Cape Town.
- Skinner, J.D., Dott, H.M., De Vos, V. & Millar, R.P. 1980. On the sexual cycle of mature bachelor bontebok rams at the Bontebok National Park, Swellendam. *South African Journal of Zoology* 15:117-119
- Staegmann, J. 2003. New species for Bontebok Park. *Promerops* 254:20 (May 2003).
- Strydom, C. 1995. Last sanctuary for rhenosterbush. *Custos*, September, pp. 14-20.
- Stuart, C.T. & Braack, H.H. 1978. Preliminary notes on the mammals of the Bontebok National Park. *Koedoe* 21:111-117.
- Theron, J.M. 1967. Die geologie van die Bontebokpark, Distrik Swellendam. *Koedoe* 10:147-148
- Tomlinson, L.L. 1943. *Geskiedkundige Swellendam*. Publisher unknown
- Van der Merwe, N.J. 1968. Die bontbok. *Koedoe* 11:161-168
- Van der Walt, P.T. 2003. Renosterbosveld. *SA Game & Hunt*, February, pp. 16-19.
- Van der Walt, P.T., De Graaff, G. & Van Zyl, L.J. 1976a. Lewensloop van 'n rooihartebesbevolking *Alcelaphus buselaphus caama* in die Bontebok Nasionale Park. *Koedoe* 19:181-184.
- Van der Walt, P.T., Van Zyl, L.J. & De Graaff, G. 1976b. Lewensloop van 'n Kaapse buffelbevolking *Syncerus caffer* in die Bontebok Nasionale Park. *Koedoe* 19:189-199.
- Van Rensburg, A.P.J. 1975. Die geskiedenis van die Nasionale Bontebokpark, Swellendam. *Koedoe* 18:165-190.
- Van Zyl, L.J. 1978. *Die waterbehoefte en drinkgewoontes van die bontebok, Damaliscus dorcas dorcas (Pallas, 1766), in die Bontebok Nasionale Park*. MSc thesis, University of Stellenbosch, Stellenbosch.
- Von Hase, A., Rouget, M., Maze, K. & Helme, N. 2003. *A fine-scale conservation plan for Cape lowlands renosterveld: technical report*. Report No. CCU 2/03, Cape

Conservation Unit, Botanical Society of South Africa, Claremont.
(www.botanicalsociety.org.za/ccu)

- Von Kaschke, O. 1994. Bontebok, an ever-changing spectacle of fynbos in bloom / Bontebok, kort-kort ander fynbosspesie in blom. *Custos*, September, pp. 20-21.
- Watson, J.P., Skinner, J.D., Erasmus, B.H. & Dott, H.M. 1991. Age determination from skull growth in blesbok. *South African Journal of Wildlife Research* 21:6-14.
- Whittington, P. 2001. One of those days. *Promerops* 248:24-25 (November 2001).
- Winterbottom, J.M. 1961. Birds at Bontebok National Park. *Bokmakierie* 13:36-37.
- Winterbottom, J.M. 1962. List of the birds of Swellendam District. *South African Avifauna Series of the Percy Fitzpatrick Institute for African Ornithology* 5:1-20.
- Winterbottom, J.M. 1965. Black Harrier in Bontebok National Park. *Ostrich* 36:90.
- Winterbottom, J.M. 1967a. Additions to the list of birds of the Bontebok National Park. *Ostrich* 38:159.
- Winterbottom, J.M. 1967b. A revised list of birds of the Bontebok National Park, Swellendam. *Koedoe* 10:122-131.
- Winterbottom, J.M. 1968. Bird densities in Coastal Renosterbosveld of the Bontebok National Park, Swellendam, Cape Province. *Koedoe* 11:139-144.

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