



South African
NATIONAL PARKS

Tsitsikamma 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 Tsitsikamma National Park as stated in the Protected Areas Act.

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EXECUTIVE SUMMARY

In compliance with the National Environment: Protected Areas Act No. 57 of 2003, SANParks is required to develop management plans for each of its parks. In developing the management plan for Tsitsikamma National Park (TNP), SANParks has attempted to integrate, implement and review the biodiversity conservation, tourism and constituency building components that make up its core business, whilst ensuring continual learning and compliance.

The TNP, proclaimed in 1964, is situated on the southern Cape coast and forms part of the world renowned Garden Route. The TNP was the first marine park to be proclaimed in Africa. The park straddles the Eastern and Western Cape border and falls within both the Koukamma Municipality (Cacadu District Municipality area, Eastern Cape Province) and the Bitou Local Municipality (Eden District Municipality, Western Cape Province). The Tsitsikamma area is situated on a coastal plateau of about 85 km in extent with 8 rural communities. New housing projects around the park have led to a great influx of people, which in turn has seen the development of five bigger settlement areas. The Tsitsikamma economy is based on a few main industries: tourism, forestry, timber processing and dairy farming.

The park falls within the Cape Floristic Region (CFR) with its rich biodiversity under serious threat for a variety of reasons. The region has been identified as one of the worlds "hottest" biodiversity hotspots. The Cape Action Plan for the Environment (C.A.P.E) is a strategic plan to identify the key threats and root causes of biodiversity losses that need to be addressed in order to conserve the floral kingdom. The Garden Route Initiative (GRI) is one of the component landscape initiatives of the C.A.P.E. programme, working towards the implementation of the C.A.P.E strategy in the Garden Route region.

The process towards establishing a single consolidated mega-park in the Garden Route has been initiated by SANParks and forms a part of the larger GRI project. The mega-park includes the currently proclaimed **Tsitsikamma** and Wilderness NPs, as well as the former Knysna National Lakes Area. The vision is to manage all three of these protected areas along with national forests transferred to SANParks, and its contracting partners as an integrated whole in the regional mosaic. This will meaningfully conserve a representative sample of the Garden Route's biodiversity heritage under a single banner. Given this broader vision for the protected areas in the Garden Route, TNP's management plan needs to be consistent with and support the notion of the Mega-Park. The vision statement for TNP recognises the importance of having to conserve this areas' unique biodiversity in conjunction with its important cultural heritage and as a part of a larger socio- economic system.

To meet this vision a desired state for the proposed Garden Route NP to guide park management in its daily operations and longer term planning was developed. This required the formulation of the park's vital attributes (what makes it unique) factors determining/strengthening or threatening/eroding these attributes, and objectives to address them. In this way the management plan was customized for TNP, but within the Mega-Park context.

TNP plans specifically to improve its ecological sustainability through the inclusion of the transferred natural forests and contractual land into a contiguous mountain to sea footprint, in addition to enhancing the conservation of the crucial riverine corridors in conjunction with relevant stakeholders. On the marine side plans are to improve marine management, addressing issues of concern in the region.

With the tourism product well established and branded emphasis will be placed upon service delivery and diversifying concessionaire involvement as a means of increasing the parks socio-economic footprint. Further to the parks current zonation plan will be the development of an all-inclusive conservation development framework (CDF) for the mega-park that sets the limitations for development based upon regional, biological and social informants This would be fully in tune with local Integrated Development Plans (IDPs) to facilitate development and conservation issues.

Purpose and formulation of the park management plan

In compliance with the National Environment: Protected Areas Act No. 57 of 2003, SANParks is required to develop management plans for each of its parks. The purpose of a management plan is:

- To provide a **holistic view** of where the park is and where it is to go in the short and long term
- To **inform management** at all levels, from the section manager through to the CEO, Board and the Minister
- To **streamline**, where possible, management procedures
- To provide a **sound motivation for justifying budgets** and where necessary increasing them, as well as providing indicators to ensure that the budget is spent correctly
- To **build accountability** (internally and externally) into the management of the park
- To **provide for capacity building and future** green and economic thinking
- To enable the management authority to manage the park in line with all **relevant legislation and policies**

The park management plan is developed in line with SANParks Biodiversity Custodianship Framework (Rogers 2003) which proposes the means to plan, integrate, implement and review ecological, social and economic components of SANParks core business, whilst allowing continual learning and improvement. The essential feature of the system is the iterative way in which it will enable continual improvement in the management of the park through annual and five-year review (both internal and external) cycles. The park management plan is both informed by corporate policies, public consultation, which in turn feeds back to corporate.

The first step in compiling/revising a management plan is to develop the **desired state** of the park which guides both the direction of the park and its daily operations, all within SANParks general policy framework. This is followed by the generation of a park vision and mission, and the park objectives and specific management programmes to meet them. The setting of the desired state will be dealt in detail after the background contextual information sets the scene for the park.

Objectives Hierarchy for the TNP:

A hierarchy of objectives for the park have been formulated by park management in conjunction with key stakeholders with reference to the above background information, the park's vital attributes, perceived threats and constraints, guiding principles and the vision. The objectives are listed in Table 1 table below, along with initiatives and their associated park programmes to meet the objectives.

In addition, the table lists SANParks corporate balanced score card objectives as a means of indicating the link between the parks and SANParks corporate objectives. In 2004, SANParks implemented the Balanced Scorecard management tool to provide a comprehensive business measurement and management framework that allowed the organization to translate its value proposition into achievable objectives, measures and targets. These are divided into four operational quadrants affecting SANParks business, namely: Financial; Customer; Internal; and Learning & Growth. The balanced score card has the following advantages in that:

- Places SANParks business within a common framework
- Communicates strategy effectively to all levels
- Makes strategic goals operationally implement able
- Align departments and activities
- Links remuneration to performance
- Effects organisational change

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List of acronyms and abbreviations:

BSC	: Balanced Scorecard
C.A.P.E	: Cape Action Plan for People and the Environment
CBOs	: Community Based Organisations
CDF	: Conservation Development Framework
CMAAs	: Catchment Management Authorities
CRM	: Cultural Resource Management policy
EAP	: Employee Assistance Program
EMS	: Environmental Management System
EXCO	: Executive Committee
GGP	: Gross Geographic Product
GRI	: Garden Route Initiative
HDE	: Historically Disadvantaged Enterprise
IUCN	: International Union for the Conservation of Nature and natural resources
MPA	: Marine Protected Area
NGOs	: Non- Government Organisations
PAA	: Protected Areas Act
PFMA	: Public Finance Management Act
SAHRA	: South African Heritage Resources Agency
SANParks	: South African National Parks
SBR	: State of Biodiversity Report
SEA	: Strategic Environmental Assessment
SEDA	: Small Economic Development Association
SMME	: Small, medium and macro enterprises
TNP	: Tsitsikamma National Park
TPC	: Threshold of Potential Concern

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1. INTRODUCTION TO BACKGROUND INFORMATION

1.1. Location

The Tsitsikamma National Park (TNP) is situated on southern Cape coast, and straddles the boundary between the Western- and Eastern Cape provinces. The centre of the park is approximately 80 km west of Humansdorp and 50 km east of Plettenberg Bay.

1.2. Extent

The **terrestrial section** of the park is approximately 29 000ha in extent. The sectors are as follows:

- (i) the long (60 km) and narrow (0.9km) 'eastern' sector (c. 2 000 ha), stretching along the coast between Oubosstrand and Nature's Valley
- (ii) the broader (3-5 km) De Vasselot sector (c. 2 600 ha), extending westward from Nature's Valley to Grootbank
- (iii) the large (c. 24 400 ha) contractual Soetkraal area, which is situated in the Tsitsikamma Mountains Range some 15 km inland from the coast, and
- (iv) the small contractual areas near De Vasselot (*viz.* Erven 382, 444 and the Remainder of 434, Nature's Valley, and portions of Farm 299 and Matjies River 295)

The **marine section** of the park is about 35 100 ha in extent, and consists of:

- (i) the large (34 300 ha) TNP Marine Protected Area (TNPMPA), which extends between 0.5 and 3 nautical miles offshore along the length of eastern sector of the park, and is a no-take or restricted zone.
- (ii) the smaller (c. 800 ha) the marine section, which is adjacent to the TNPMPA and extended 0.5 nautical miles off the De Vasselot coast, where resource utilization is permitted in accordance with the legislation of the Marine Living Resources Act (Act No. 18 of 1998).

1.3. History

After extensive negotiations between the National Parks Board and the then Secretary of the Department of Forestry and his Minister, the Tsitsikamma Coastal and Forest National Parks were proclaimed in 1964 (Knobel 1989, Robinson 1989). The size of the park has changed over the years, with the following proclamations:

- (i) The seaward boundary of the park between the Groot (east) - and the Bloukrans rivers was extended to three nautical miles offshore (Government Gazette No 8871, Notice 125, 3 September 1983).
- (ii) De Vasselot Nature Reserve was added to the coastal park (Government Gazette No 11068, Notice No 2814 & 2815, 18 December 1987)
- (iii) The small Tsitsikamma Forest National Park was deproclaimed in 1989 (Government Gazette 1989), and the name of the coastal park was shortened to the Tsitsikamma National Park (Government Gazette No 17298, Notice 1077, 28 June 1996).
- (iv) In October 1991 a 30 year lease was signed with Rand Mines Properties Limited to contractually manage the Soetkraal area, and in 1997 Soetkraal was proclaimed a contractual park in terms of the National Parks Act, 1976 (Government Gazette No 17728, Notice 100. 17 January 1997, National Parks Act, 1976 (Act No. 57 of 1976).
- (v) The seaward boundary of the De Vasselot section was extended 0.5 nautical miles (0.9 km) offshore (Government Gazette No 17073, Notice 538, 4 April 1996), and in December 2000 the marine section of the park (excluding the above De Vasselot marine area) became the Tsitsikamma National Park Marine Protected Area (Government Gazette No. 21948, Notice 1429, 29 December 2000, Marine Living Resources Act 1998 (Act No. 18 of 1998).

- (vi) In 1995 Erven 382, 444 and the Remainder of Erf 434, Nature's Valley were proclaimed as a contractual section of the park (Government Gazette No 16293, Notice 368, 10 March 1995), followed in 1996 by (Buitenverwachting) Portion 1 of Farm 299 and Portion 3 of the farm Matjies River 295 (Government Gazette No 16927, Notice 30, 19 January 1996)

1.4. Urban /Rural Park Relation

The TNP is situated in a relatively rural area with no highly developed residential areas in close proximity. However, its' spectacular scenery and location have attracted developers of golf, sport and residential estates.

The park straddles the Eastern- and Western Cape border and falls within both the Koukamma Municipality (Cacadu District Municipality area, Eastern Cape Province) and the Bitou Local Municipality (Eden District Municipality, Western Cape Province).

Communities from the Bitou Municipal area (Western Cape) includes Kurland, The Crags, Nature's Valley (which is surrounded by the park) and Covie. The area referred to as the Western Coastal Zone of the Koukamma Municipal constitutes most of the Tsitsikamma and includes Coldstream, Storms River, Thornham, Nomphumelelo, Sanddrift, Witelsbos, Woodlands, Eersterivier and Oubos.

Contact and liaison with communities adjacent to the park takes place in a formal and informal manner. Formal structures include the Park Forum and Community Advisory committees for park projects. Regular contact is maintained with various levels of community structures as part of the parks daily operations.

Along the coast, the TNP is bordered mostly by plantation forests and dairy farms. The steep escarpment with its dangerous cliffs makes it inaccessible, except for a few places where the Park can be accessed on foot from neighbouring farms or forestry estates. The De Vasselot section of the park is an open access area, with a network of popular footpaths that is accessible from Nature's Valley and the Groot River Pass. The Soetkraal Contracted area is situated remotely in the mountains and can only be accessed by means of 4x4 vehicles.

1.5. Socio Economic context:

The TNP's service area can roughly be divided into three sub areas - the Tsitsikamma, the Langkloof and the Plettenberg Bay areas. The Tsitsikamma and Langkloof areas fall within the Eastern Cape under the jurisdiction of the Koukamma Municipality. It is estimated that the current population is around 34 309 (Census 2001). A study done by the Constituency office in 1997 shows a 55% unemployment rate. A Socio-Economic and Demographic Profile of the Province, done in February 2004 states the prevalence of HIV/Aids estimated at 16,8%.

The Tsitsikamma area is situated on a coastal plateau of about 85km in extent with eight rural communities. This area has had a great influx of people as result of the new housing developments, which are in the process of developing five bigger settlement areas. The Tsitsikamma economy is based on a few main industries – tourism, forestry, timber processing and dairy farming.

The Langkloof is a 140km long valley renowned for its fruit production (apples and stone fruit). It includes six rural communities and two bigger villages (Joubertina and Kareedouw). The Plettenberg Bay area is situated in the Western Cape and falls under the jurisdiction of the Bitou Municipality. In proximity to the town of Plettenberg Bay, and regarded as part of the parks' service area, is found the rural communities of the Crags, Kurland, Natures Valley and Covie. The total population for the Plettenberg Bay area is 31 900 (Census 2001), with an estimated unemployment rate of 33%. Competing land uses in this area range from industry (brick making) and diary farming to popular tourist destinations and polo fields.

1.6. The park in its bioregional context:

The park falls within the Cape Floristic Region (CFR). The CFR in South Africa is the smallest and richest of the six floral kingdoms in the world, and it is the only one to be found entirely within one country. Its rich biodiversity is under serious threat for a variety of reasons including conversion of natural habitat to permanent agriculture, inappropriate fire management, rapid and insensitive development, overexploitation of water resources, marine resources, and infestation by alien species. The region has been identified as one of the worlds "hottest" hotspots of biodiversity.

In response to this a process of extensive consultation involving various interested parties, including local government and non governmental organisations resulted in the establishment of a strategic plan referred to as Cape Action Plan for the Environment (C.A.P.E). It identified the key threats and root causes of biodiversity losses that need to be addressed in order to conserve the floral kingdom. This resulted in a spatial plan identifying areas which need to be conserved and a series of broad program activities which need to be undertaken over a 20 year period. Based on the situation assessment and analysis of threats, three overarching themes that complement and reinforce one another were developed: C.A.P.E. will:

- establish an effective reserve network, enhance off-reserve conservation, and support bioregional planning;
- strengthen and enhance institutions, policies, laws, co-operative governance, and community participation; and
- develop methods to ensure sustainable yields, promote compliance with laws, integrate biodiversity concerns into catchment management, and promote sustainable eco-tourism.

The Garden Route Initiative (GRI) is one of the component landscape initiatives of the C.A.P.E. programme, working towards the implementation of the CAPE strategy in the Garden Route region. The GRI is a partnership programme that aims to conserve and restore the unique biodiversity and sense of place in the Garden Route, while supporting the sustainable management of the area and the delivery of benefits to local communities. The GRI is supported by a grant as part of the C.A.P.E. Programme from the GEF (Global Environment Facility) through the World Bank to SANParks.

The GRI's strategic areas of implementation include the consolidation of priority biodiversity into protected areas, assisting land owners to appropriately manage biodiversity on their properties, and incorporating biodiversity priorities into land use planning and decision making, as well as ensuring the sustainable management effectiveness of the Garden Route's conservation areas.

SANParks is leading the implementation of the protected area land consolidation programme for the GRI, working towards the establishment of the single consolidated Garden Route National Park, as well as working with CapeNature with the Stewardship Programme to realize the protection and appropriate management of the biodiversity priorities on private land.

1.7. Climate

The climate along the coast is mild, and frost is rare. The mean monthly maximum air temperatures recorded over a 12 year period (1992 - 2003) at Storm River Mouth ranged from 19.0 - 24,8° C, and the minimum air temperatures from 9.9 - 17.8° C. The annual rainfall of 743 mm was fairly evenly distributed throughout the year (Hanekom 2005). The rainfall and ranges in maximum and minimum temperatures increases further inland on the coastal plateau and southern slope of the Tsitsikamma Mountains. A year round feature of the south coast is the prevailing westerly winds (Stone et al. 1998), while onshore easterly winds are prevalent during summer (Schumann *et al.* 1982).

1.8. Topography, geology and soils

1.8.1. Topography

The water depth in the Marine Protected Area ranges from 0m to 90m and the sea floor is mostly soft bottom sediments. The major sub tidal rocky reefs are found between Sanddrif and Nature's Valley, and many of these outcrops are low platforms mantled in thin gravel sheets (Flemming *et al.* 1986). Except for a small sandy beach at Nature's Valley, the shoreline of the park is rocky, and it abuts a steep, high (c. 180m) coastal escarpment that flattens off onto a plateau (an ancient wave-cut platform), which extends approximately eight km to the base of the Tsitsikamma Mountain Range (Toerien 1976). The eastern- and De Vasselot sectors of the park are restricted to the coast, the escarpment and the seaward portion of the plateau, while Soetkraal in Tsitsikamma Mountains includes valleys and steep mountain slopes.

1.8.2. Geology

The eastern sectors of the park are underlain by the quartzitic sandstone of the Goudini- (Tchando) and Peninsula Formations of the Table Mountain Group (Toerien 1976), while the main formations of De Vasselot are the Gydo- (shales and subordinate siltstone); Skurweberg- and Baviaanskloof formations (Pretorius *et al.* 1980). At Soetkraal the formations are Goudini, Peninsula and to a lesser extent Skurweberg (quartzitic sandstone, profusely cross-bedded) and Cedarberg (shale, arenaceous shale). (Director-General of Surveys 1979).

1.8.3. Soils / Sediments

At De Vasselot (and probably in the rest of the park) the soils are strongly influenced by the removal of marine clays on the tertiary shoreline. 'Duplex' soils (i.e. sandy surface soils with a sharp transition to underlying clays) are common (Pretorius *et al.* 1980), and the underlying clays are often saline, impermeable and seasonally saturated. Seasonally saturated soils are prevalent on the plateau, while against the steep coastal slopes the soils are shallow and sandy. On the coast (especially in the Nature's Valley region) the wind influence is visible, and the soils are derived from a mixture of dune sand and clay material from underlying shale (Thwaites 1984b).

1.9. River and Estuarine systems

1.9.1. Rivers

Excluding the Groot River (east), which forms the eastern boundary of the park, 12 perennial rivers flow southward through the coastal sections of the park. The largest of these rivers are the Groot Bobbejaans River (west), the Bloukrans-Vark, Storms-Witteklip and Elands-Kruis systems, which have calculated catchments of between 80 -100 km². These rivers generally extended well beyond the boundaries of the park into the foothills of the Tsitsikamma Mountains, severely limiting the protection offered to these systems. Soetkraal conserves the important upper catchments of three rivers, Langbos-, Palmiet- and Diep rivers (Russell 2002).

1.9.2. Estuaries

Most of the rivers that flow through the coastal sectors of the park have small and poorly defined estuarine components. A notable exception is the temporarily open Groot River (west) estuary at Nature's Valley, with its substantial salt marshes and 'aquatic' plant component (Morant & Bickerton 1983), which relative to other estuaries in the Cape Province is of intermediate botanical importance (Coetzee *et al.* 1997). The water quality of the estuaries in the park ranges from reasonable to good, with elevated bacteria levels being a major factor decreasing the water quality (Harrison *et al.* 1995, 1996).

1.10. *Marine system*

The TNP is the oldest marine national park in Africa (Robinson & De Graaff 1994). Its marine protected area protects seven percent of rocky shoreline of the Agulhas Biogeographical region, which extends from the Mbashe River to Cape Point (Lombard *et al.* 2005). The sub tidal area of the park consists chiefly of soft bottom sediments and dispersed platforms and reefs. The inshore current system is complex. The surface water tends to flow in an easterly (long-shore) direction, while at depth of 31m the flow pattern varies with season (Roberts & van den Berg 2005). Associated with water movement are cold, inshore upwelling events that occur about eight times a year and predominantly in spring and summer (Hanekom *et al.* 1989). Dominant marine fauna can be grouped into marine mammals (seals, dolphins, whales), birds (penguins, gannets, terns), fish (migratory and reef species) and highly diverse benthic fauna on the reefs. The marine mammals and many of the seabirds are not resident in the park, but use it as a feeding or nursery area. The park does, however, provide a refuge for all life stages for 17 fish species that are exploited for commercial and recreational purposes (Wood *et al.* 2000), as well as spawning grounds for commercially exploited chokka squid (Sauer 1995).

1.11. **Flora**

1.11.1. *Marine algae*

The rugged coastline provides a diverse habitat of exposed and sheltered reefs, and 211 species (which is equivalent to 25% of the seaweed flora of South Africa) have been recorded in the park (Bolton & Stegenga 2002, Stegenga *et al.* in lit. 2002). These include two previously undescribed species of red algae (Stegenga *et al.* 2000; 2001).

1.11.2. *Terrestrial vegetation*

The vegetation of the park largely comprises two vegetation types/broad habitat units, i.e. Tsitsikamma Mountain Fynbos and Knysna Afromontane Forest (Cowling & Heijnis 2001), which were respectively named Tsitsikamma Sandstone Fynbos and Southern Afrotropical Forest by Mucina *et al.* (2005). The vegetation of the coastal sectors may be classified into three broad communities, namely Afrotropical Forest (2506 ha) and two Mesic Sandstone Fynbos communities (1386 ha) (Hanekom *et al.* 1989). The distribution of indigenous forest patches in the Tsitsikamma appears to be partly determined by recurrent, but sporadic and severe berg-wind fires (Geldenhuys 1987), and the forests are found on moist south facing slopes and in river gorges. The Groot River (west) area is important, because three forest species (Cape teak, false horsewood and wild tree banana), with limited representation elsewhere in the Southern Cape, have small, but expanding populations in this area (Geldenhuys 1992; 1993). The fynbos communities occur mostly on plateau and exposed slopes of the escarpment. Many of the indigenous forest species and common flowering plants in the southern Cape and TNP have been described in 'field guides' (Courtenay-Latimer *et al.* 1967; Von Breitenbach 1974; Rycroft 1980; Moriarty 1982), and approximately 500 species from 112 families have been recorded from the coastal sectors of the park, but few Red Data Book species.

The dominant vegetation of Soetkraal is Wet and Mesic Sandstone Fynbos (Mucina *et al.* 2005), with small patches of Afrotropical Forest on protected mountain slopes.

1.12. **Fauna**

1.12.1. *Invertebrates*

The freshwater invertebrate fauna in the various river systems of the Tsitsikamma region are poorly studied. Nevertheless preliminary surveys of the Salt River have indicated a diverse community and at least three previously undescribed genera, 13 undescribed species and some remarkable range extension of certain species (De Moor *et al.* 2004). Water abstraction from the catchment of the Salt River is the most serious threat to the continued existence of this macro-invertebrate community (De Moor *et al.* 2004).

The structure of inter-tidal invertebrate communities is strongly influenced by wave action (McQuaid & Branch 1984; 1985). In the park filter feeders (such as mussels and barnacles) dominate wave-exposed shores, and herbivores (such as limpets) sheltered gullies. The indigenous brown mussel *Perna perna* was a dominant invertebrate and population densities of up to 19 860 individuals per m² were recorded in the park in the early 1980s (Crawford and Bower 1983). However, from the mid 1990s the invasive Mediterranean mussel *Mytilus galloprovincialis* has steadily displaced most of the brown mussel population in the mid and high zones of the mussel beds (Hanekom, unpubl. data).

1.12.2. Fish

The fresh water streams in the Tsitsikamma region are generally impoverished (Smith & Smith 1966), and only four indigenous fish species have been recorded in the park (Russell 2002). However, one of these is the endangered slender redbfin *Pseudobarbus tenuis*.

Conversely, a rich diversity of fish is found in the marine section of the park, with a total 202 fish species from 84 families recorded (Buxton and Smale 1984; Burger 1991; Wood et al. 2000) The size and species composition of fish differ between shallow and deep reefs in the park (Buxton and Smale 1984), and the species diversity, and richness tended to increase with depth (Burger 1990).

The biology and life history changes of 10 commercial or recreationally exploited marine fish species conserved in the park have been studied. These include dageraad, roman (Buxton, 1987 1989, 1990, 1992, 1993), red steenbras (Smale 1988; Smale & Punt 1991), blue hottentot (Buxton & Clarke 1986), hottentot (Buxton & Clarke 1992), musselcracker (Buxton & Clarke 1991), poenskop (Buxton & Clarke 1989), blacktail, zebra (Mann & Buxton 1992, 1998) and carpenter (Brouwer & Griffiths 2004; 2005; Brouwer et al. 2003).

Most (c 80 %) of the above fish species are slow growing, long-lived species (>20 years), and many have a high degree of residency (Buxton 1987; Cowley 2000; Cowley et al. 2002; Brouwer et al. 2003), which makes them vulnerable to over-exploitation. A point highlighted by the fact that the catch rates during research studies in the park were considerably higher than those recorded for fishers in nearby exploited areas (Buxton & Smale 1989; Brouwer & Buxton 2002; Brouwer 1999; Cowley et al. 2002; Cowley 2000).

1.12.3. Amphibians

Thirteen frog species have been recorded in the park, including the Endangered Knysna leaf-folding frog *Afrivalus knysnae* and an endemic to the southern Cape, the plain rain frog *Breviceps fuscus* (Carruthers & Robinson 1977; Branch & Hanekom 1987; Minter et al. 2004.).

1.12.4. Reptiles

A total of 13 snake, 10 lizard, 2 tortoise and 4 turtle species have been recorded in the park (Branch and Hanekom (1987). While the blue spotted girdled lizard *Cordylus coeruleopunctatus* and Knysna dwarf chameleon *Bradypodion damaranum* are endemic to the southern Cape, all four turtle species are vagrants to the park (Branch and Hanekom 1987; Branch 1988).

1.12.5. Birds

The coastal sector of the park with its combination of forest, fynbos, estuarine and marine habitats has a diverse assemblage (c 200) bird species. These include 29 Red Data Book species, of which only ten are 'resident' and/or breed in this sector of the park. Those of special concern are the breeding seabirds (Cape cormorant *Phalacrocorax capensis* and African black oystercatcher *Haematopus moquini*), 'resident' forest species (Knysna warbler *Bradypterus sylvaticus*, Knysna woodpecker *Campethera notata* and crowned eagle *Stephanoaetus coronatus*) and water-birds (African finfoot *Podica senegalensis* and halfcollared kingfisher *Alcedo semitorquata*) (Skead & Liversidge 1967, Crawford 1983; Whittington 2004).

1.12.6. Mammals

Thirty-nine terrestrial mammal species have been recorded for the coastal sector of the park, including two species of special concern: blue duiker *Philantomba monticola* and honey badger *Mellivora capensis*. The park is narrow and largely unfenced and mammal species move freely in and out of the reserve. This is particularly true of the primate- (chacma baboon and vervet monkey), carnivore (leopard, caracal and honey badger) and antelope (bushbuck) species. Furthermore, fynbos and forests in the Southern Cape occur on nutrient-poor soils (Van Daalen 1981; 1984), and therefore have a low carrying capacity for sustaining large herbivores (Cody et al. 1983 in Rebelo 1992; Koen 1984). Consequently, the population density estimates of the two antelope species in these forests, blue duiker (c. 1 individual.5.5 ha⁻¹) and bushbuck *Tragelaphus scriptus* (c. 1 individual.20 ha⁻¹), as well as the bushpig *Potamochoerus porcus* (c. 1 individual.25 ha⁻¹) are very low (von Gadow 1978; Odendaal & Bigalke 1979; Seydack 1990; Bowland 1990; Hanekom & Wilson 1991).

Other noteworthy mammals are the Cape clawless otters *Aonyx capensis* and Egyptian fruit bats *Rousettus aegyptiacus*. Some 30 otters occur along the coast of the eastern sector (van der Zee 1982; Arden-Clarke 1983), while substantial numbers (c 3 000 individuals) of fruit bats have been noted in a cave along the Storms River gorge (Herzig-Straschel & Robinson 1978). The Vulnerable hump-back dolphin *Sotalia plumbea* appears to frequent the Tsitsikamma coast throughout the year, the bottle-nosed dolphins *Tursiops truncatus* mostly during spring and summer, and small numbers of the southern right whales *Eubalaena australis* during winter and spring, (Saayman *et al.* 1972; Best 2000).

2. The Protected Areas Management Planning Framework

The protected areas management planning framework that has been designed for the SANParks guides park management in setting up a management plan implementation thereof and the review of the plan. The essential feature of the system is the iterative way in which it will enable continual improvement in the management of the Park through annual and five-year review cycles. The first step in developing/revising a management plan is to develop the desired state of the park.

2.1. Setting the Desired State:

After an extensive negotiation period, the transfer of the management responsibility of the 97 000 ha of previously DWAF managed indigenous forest, mountain catchment and plantation areas to be rehabilitated to SANParks, took place in April 2005. This has initiated the process for the establishment of a single consolidated Mega-Park in the Garden Route, inclusive of the current proclaimed national parks, i.e. Tsitsikamma NP and Wilderness NP, as well as the Knysna estuary. The vision is to manage all the above mentioned areas as an integrated whole by meaningfully conserving a representative sample of the Garden Route's biodiversity. This is a vision SANParks is actively pursuing. Given this broader vision for the protected areas in the Garden Route, it is felt that the vision statement for the management of the TNP should be consistent and support the notion of the Mega-Park. The following vision statement and desired state for the consolidated Garden Route Mega-Park was derived at through an adaptive planning process at two protected area management planning workshops involving SANParks, CapeNature and key external stakeholders in the Garden Route.

2.2. Vision:

An integrated protected area that effectively conserves a functionally linked mosaic of diverse terrestrial, freshwater, estuarine and marine ecosystems, landscapes, and cultural heritage, representative of the Garden Route, that contributes to the well being of present and future generations."

In order that the current and future extent of the park is protected and managed effectively, a desired state for the proposed Garden Route NP to guide park management in its daily operations and longer term planning was developed. This desired state will be reviewed every five years in accordance with SANParks **Biodiversity Custodianship Framework (Rogers 2003)**. It forms a bridge between SANParks policy framework and its vision for the park, and the medium term (five year) priorities to attain the vision in cooperation with its stakeholders. To set this desired state focus was placed on the park's vital attributes making this park unique, or at least very special in its class. Each was discussed along with important factors determining/strengthening or threatening/eroding these attributes. Using this information helped focus the exact formulation of park objectives, which must strengthen positive determinants and weaken or remove negative ones, so those objectives are appropriate to the uniqueness and special nature of this national park. In this way the management plan is customized in its fullest local extent, without detracting from some of its more generic functions along with certain other parks.

2.3. Operating Principles & Vital Attributes of the park:

The operating principles and unique features (or vital attributes) that make Garden Route what it is and potentially can be listed below.

2.3.1. Operating Principles

SANParks has adopted eleven corporate values, which serve as guiding principles around which all employee behaviour and actions are governed and shaped. These corporate values include:

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

These may be modified to meet local requirements through interaction with its stakeholders.

2.3.2. Vital Attributes

Socio-Political Attributes:

- Relationships with local authorities strengthen relationships – IDP's, municipalities, town engineers
- Management forums (catchment, PFM, other forums - various levels of participation and governance)
- Institutional coordination (unification / inter organizational and other government departments)
- Passionate stakeholders that are organized in structured NGO's strengthen relationships and build ambassadors
- Established community structures (Active functioning street committees)
- Resources base with potential to deliver benefits to people
- Diverse cultures and cultural heritage sites that has tourism opportunities
- Polarized social support. (Polarized socio-economic society – two distinct groups (rich and poor) put different pressures on resources. Rich people have greater environmental footprint; poor people put pressure on natural resources for their survival and cultural needs.)
- Cultural and natural resources that are sensitive to human disturbance.
- Recreational and spiritual resources (experiences)

Economic Attributes:

- Established tourism route and brand
- Established partnerships (neighbouring conservation initiatives)
- Ecosystem services (water catchments, scenic landscapes with its impact on property values)
- Extractible resources (timber, etc.)
- Established tourism infrastructure
- Job creation opportunities
- Diverse Tourism product (cultural, nature based, adventure, coasta) - attracting funding (Poverty relief funding, etc.)
- Low crime level area
- Educational opportunities

Environmental Attributes:

- Important aquatic ecosystems (Wetlands (Ramsar); all estuary types)
- Potential to conserve whole ecosystems from catchments to sea. (Single largest indigenous block in South Africa)
- Outeniqua and Tsitsikamma sandstone fynbos
- Important ecologic goods and services
- Mountains forest and coast in close proximity + mosaic
- Rehabilitation drive and potential (resilience) because of high rainfall
- Scenic beauty
- Functional MPA system representing inshore marine environments.
- Important threatened lowland vegetation

2.4. Setting the Details of the Park Desired State:*Objectives Hierarchy for TNP:*

A hierarchy of objectives for the park have been formulated with reference to the above background information, the park's vital attributes, perceived threats and constraints, guiding principles and the vision. The objectives are listed in the table below, along with initiatives and their associated park programmes to meet the objectives,

In addition, the table lists SANParks corporate balanced score card objectives as a means of indicating the link between the parks and SANParks corporate objectives. In 2004 SANParks implemented the Balanced Scorecard management tool to provide a comprehensive business measurement and management framework that allowed the organization to translate its value proposition into achievable objectives, measures and targets. These are divided into four operational quadrants affecting SANParks business, namely: Financial; Customer; Internal; and Learning & Growth. The balanced score card has the following advantages in that:

- Places SANParks business within a common framework;
- Communicates strategy effectively to all levels;
- Makes strategic goals operationally implement able;
- Align departments and activities;
- Links remuneration to performance;
- Effects organisational change.

2.5. Objectives:

Park specific conservation **objectives** are framed in a hierarchical order that are shown with links to the balanced scorecard quadrants via the far right hand column in the tables below.

**Table 1: Management Objectives
Biodiversity and Heritage Objectives:**

<i>High level objective</i>	<i>Objective</i>	<i>Sub-objective</i>	<i>Initiative</i>	<i>Low level plan</i>	<i>Balanced Scorecard Objectives</i>
<p>CONSERVATION OF REPRESENTATIVE, FUNCTIONAL ECOSYSTEMS : To conserve a representative sample of the regions ecosystems in a linked landscape/ seascape, and the maintenance or restoration of environmental processes to enable natural spatial and temporal variation in structural, functional and compositional components of biodiversity.</p>	<p>Representative ecosystems: To incorporate a spectrum of viable terrestrial, aquatic, and marine ecosystems characteristic of the Tsitsikamma region, and to re-introduce missing elements where possible.</p>	<p>Consolidation and expansion of land/ sea areas: Consolidation of protected areas focusing on under representative ecosystems, functional linkages and processes</p>	<ul style="list-style-type: none"> (1) Identification of under represented habitats/ecosystems. (2) Consolidate park boundaries. (3) Incorporate indigenous forests, wetlands and lowland plateau fynbos. (4) Establish corridors linking TNP with mountain catchments. (5) Secure land tenure of Soetkraal properties (6) Consolidate/ Extend Marine Protected Area with appropriate use zoning (including National Park status) 	Park expansion plan	<p>Custodian of Choice for Protected Area Management</p>
		<p>Reintroduction of biota: Reestablishment where possible, of locally extinct or depleted biodiversity components and populations in accordance with IUCN principles and guidelines</p>	<ul style="list-style-type: none"> (1) Re-establish indigenous herbivore complement within park size, location, infrastructure and other constraints. 	None (refer to Reintroduction Plan for consolidated Garden Route "Mega-Park")	
	<p>Functional ecosystems: To ensure the long-term persistence of biodiversity patterns and processes, enabling natural variation in structure, function and composition over space and time.</p>	<p>Estuary Management: Manipulate appropriate biophysical aspects of estuarine environment to achieve social and ecosystem conservation objectives.</p>	<ul style="list-style-type: none"> (1) Artificial breaching of Groot Estuary mouth. (2) Monitor the effects of anthropogenic changes to estuarine ecosystems 	Estuary Management Plan	
		<p>Marine Management: Strive to maintain long term persistence of biodiversity patterns and processes in marine ecosystems, particularly the protection of fish stocks</p>	<ul style="list-style-type: none"> (1) Pursue appropriate management arrangements of marine areas with MCM. (2) Ensure appropriate co-operative governance with relevant government departments/agencies. (3) Liaise with stakeholders to ensure protection of marine resources. (4) Enforce applicable marine legislation (MLRA) (5) Monitor marine biota, including resource stocks, harvesting, and alien invasions. 	Park Protection Plan, Marine program	

		<p>Fire management: Apply appropriate fire regime in fynbos areas (frequency, season, intensity, size).</p>	<ol style="list-style-type: none"> (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
		<p>Indigenous Forests: Maintain forest intactness and natural ecological processes.</p>	<ol style="list-style-type: none"> (1) Identification of natural intact forest ecotones, where ecological processes can be maintained. (2) Maintain appropriate fire regime in adjoining fynbos (3) Rehabilitate where possible degraded forest ecotones where a natural ecotone can be maintained. 	<p>(Fire Management Plan) (Alien Plant Management Plan) (Park Expansion Plan)</p>
		<p>Threatened biota: Maintain viable populations of threatened species.</p>	<ol style="list-style-type: none"> (1) Identify, monitor and evaluate the status of suspected threatened biota (including aquatic invertebrates in Tsitsikamma rivers, particularly Salt River, and amphibians). (2) Maintain viable population of known red-data fishes and amphibians. (3) Maintain viable populations of rare/threatened plant species (identify, locate & monitor populations of priority species). (4) Maintain conditions appropriate for the survival of known red-data species (including marine shore birds, blue duiker) 	Refer to Threatened biota plan for the Garden Route
	<p>Rehabilitation: Rehabilitate degraded areas, including the re-establishment of natural biodiversity patterns, and the restoration of key processes which support the long term persistence of biodiversity.</p>	<p>Wetlands: Re-establishment of physical, chemical and biological processes in degraded wetland areas.</p>	<ol style="list-style-type: none"> (1) Rehabilitate eroding channel banks and re-establish riparian zones. (2) Prevent chemical contamination of wetlands. (3) Reinstigate more natural hydrological regime (where possible). 	<p>Invasive alien plant management plan. River management</p>
		<p>Alien plants and other alien biota: Control and where possible eliminate alien biota to facilitate re-establishment of natural biodiversity pattern and process in invaded areas.</p>	<ol style="list-style-type: none"> (1) Establish the distribution and density of invasive species. (2) Prioritise areas for alien removal focusing biodiversity restoration. (3) Implement removal programs for priority species and areas. (4) Investigate options for the control of alien fishes. 	<p>Invasive alien plant management plan Alien biota management plan</p>

<i>High level objective</i>	<i>Objective</i>	<i>Sub-objective</i>	<i>Initiative</i>	<i>Low level plan</i>	<i>Balanced Scorecard Objectives</i>
MITIGATE INTERNAL and EXTERNAL PRESSURES: To reduce threats and pressures and limit environmental impacts resulting from non-biodiversity management aspects of SANParks operations and surrounding land and resource use.	Reconciling biodiversity with other park objectives: To ensure that non-biodiversity management aspects of SANParks operations (revenue generation including tourism, resource use, developments, management activities, etc.) are informed and constrained by biodiversity conservation objectives, and that the impacts of these activities on biodiversity are minimised.	Internal developments: Minimise the impacts associated with the development of tourism and park management infrastructure, and ensure that such developments do not compromise biodiversity objectives.	(1) Park zonation Develop and implement CDF. (2) Developments in accordance with EIA process (NEMA) and corporate policies. (3) Establish tourism carrying capacities. Implement green standards and environmental best practice based on corporate policy	CDF	
		Internal activities: Minimise the impacts associated with tourism and park management activities, and ensure that such activities do not compromise biodiversity objectives.			
	Extractive resource use: Minimise the impacts of extractive resource use, and ensure that such activities are aligned with corporate guidelines; are within management capacity constraints, and do not compromise biodiversity objectives.	(1) Quantify current extractive resource activities. (2) Define opportunities and constraints in line with corporate guidelines. (3) Regulate resource use, according to adaptive management process	Sustainable resource use management plan		
	Reconciling biodiversity with external threats: To reduce external threats and pressures, and limit impacts of surrounding land & resource use on biodiversity conservation within the park.	External developments: 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) Alignment with bioregional planning, including explicitly identified areas for the maintenance of importance for biodiversity pattern and processes with appropriate land use guidelines. (3) Provide input into planning and decision making process for external development that may compromise park biodiversity objectives. (4) Negotiate to ensure that external developments are not visually obtrusive or out of character with the park.	(Cooperative governance and communication plan)	

		<p>External activities: Negotiate to ensure that external resource and land use do not detrimentally affect ecological processes within the park.</p>	<ol style="list-style-type: none"> (1) Negotiate to mitigate or improve the management of external potentially detrimental impacts. (2) Encourage eco-friendly resource use and land management practices on adjacent properties. (3) Mitigate the impacts of oil and other marine pollution events, through appropriate contingency planning. 	<p>Oil Spill Contingency Plan</p> <p>(Cooperative governance and communication plan)</p>
		<p>Hydrological and water chemistry changes: Participate in activities for the maintenance of river flow regimes and water chemistry within limits for the maintenance of ecosystem processes in aquatic ecosystems within the park.</p>	<ol style="list-style-type: none"> (1) Lobby for appropriate catchment categorization (currently General Authorization). (2) Encourage the determination and implementation of ecological reserves for surface and subsurface aquatic resources. (3) Encourage enforcement of legislation applicable to the management and protection of aquatic resources. (4) Facilitate regular assessments of River Health. (5) Address the issue of sewage and other point source pollution into aquatic systems (particularly the Groot River Estuary) 	<p>Cooperative governance and communication plan</p>
		<p>Illegal harvesting of resources: Prevent the illegal collection, removal and destruction of physical and biological resources.</p>	<ol style="list-style-type: none"> (1) Public liaison. (2) Law enforcement. (3) Enhance interagency cooperation in law enforcement, compliance and prosecution. 	<p>(Park Protection Plan, Security and Safety Programme)</p>

High level objective	Objective	Sub-objective	Initiative	Low level plan	Balanced Scorecard Objectives
WILDNESS / REMOTENESS: To maintain and restore wildness/remoteness in Tsitsikamma 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) Park zonation. (2) Develop CDF and sensitivity-value analysis.	(1) CDF. (2) Park expansion plan. (3) Invasive alien plant management plan.	
	Sense of place: Maintain or restore appropriate sense of place.		(1) Implement & update CDF. (2) Establish and apply appropriate tourism carrying capacity. (3) Negotiate to ensure that external developments are not visually obtrusive or out of character with the park.		
Attain Leadership in Cultural Heritage Management	Conserve and manage cultural heritage assets	N/A	<i>Develop a database of all tangible and intangible cultural assets which include and inventory, maps and relevant documentation.</i>		Attain Leadership in Cultural Heritage Management
			<i>Develop site Management Plans for each Cultural Heritage site with monitoring systems in place for management priorities and prescriptions.</i>		
			<i>Facilitate appropriate Interpretation of cultural heritage associated with the park</i>		

Socio- economic objectives hierarchy

High level objective	Objective	Sub-objective (where required)	Initiative	Low level plan	BSC Objective	
<p>Nurture productive and mutually beneficial partnerships that result in gains in economic and/ or biodiversity equity.</p>	<p>Enhance socio-economic benefits to local communities</p>	N/A	<p>Contribute to local community development by supporting the Expanded Public Works / Poverty Relief Programmes Contribute to local skills development by supporting the Skills Programmes and Learnership programmes</p>	<p>Local socio economic development plan</p>	<p>Contribute to Local Educational and Socio Economic Development</p>	
			<p>Identification and facilitating the creation of business opportunities in association with the park. Support community based Social Development Initiatives.</p>			
	<p>Increase environmental awareness and encourage participation in conservation initiatives</p>	<p>Inspire visitors and communities towards considering the environment as an interrelated and interdependent system of which they are an integral part.</p>			<p>Education development plan</p>	
			<p>Educate learners, educators and other community focus groups to be able to take environmental action.</p>	<p>Develop and implement an Interpretation Plan that feeds into both the Education and zonation plans. Implement environmental education and youth development programmes suited to the needs of each focus group (I.e. Tailor made programmes for each focus group)</p>		
			<p>Support educators and community leaders with resource and information materials</p>	<p>Establish and market an environmental resource centre and outdoor classrooms with a range of interpretive and information resources.</p>		

High level objective	Objective	Sub-objective (where required)	Initiative	Low level plan	BSC Objective
Support co-operative governance that will build in custodianship	<i>Maintain good park/community/stakeholder relations</i>	N/A	<i>Identify and involve all relevant stakeholders for participation in the park forum. Develop effective communication mechanisms and responsibilities for representatives. Establish task teams and working groups (with inclusion of the Park Forum) around key issues.</i>	<i>Stakeholder relationship plan</i>	<i>Custodian of Choice for Protected Area Management</i>
	<i>Effective co-operative governance</i>	<i>Minimise degrading impact and consequences of inappropriate development in and surrounds of the park</i>	<i>Establish and maintain good working relationship with relevant government departments and local government.</i>		
		<i>Ensure support / buy-in for management decisions through participatory decision making processes</i>	<i>Define roles and responsibilities with stakeholder groups, partnerships and government through written agreements/ToR's/MoU's/commitment statements</i>		
			<i>Facilitate the management of natural resources through establishment of CBNRM projects.</i>		

High level objective	Objective	Sub-objective (where required)	Initiative	Low level plan	BSC Objective	
Become the Nature Based Tourism destination of choice in the region	<i>To develop, manage and enhance a range of sustainable tourism products</i>		<i>Design customer satisfaction survey</i>	<i>Tourism plan</i>	<i>Become the Nature Based Tourism destination of choice in the region</i>	
			<i>Analysis of current product usage and identification of opportunity</i>			
			<i>Plan for tourism infrastructure and facilities as identified by the CDF</i>	<i>Infrastructure program</i>		
			<i>Develop and implement the infrastructure management plan (in compliance with state of infrastructure report)</i>			
			<i>Compile a state of infrastructure report</i>			
	<i>Conserve and manage cultural heritage assets</i>		<i>Develop a database of all tangible and intangible cultural assets which include and inventory, maps and relevant documentation.</i>	<i>Cultural Heritage Management plan</i>	<i>Attain leadership in Cultural Heritage Management</i>	
			<i>Develop site Management Plans for each Cultural Heritage site with monitoring systems in place for management priorities and prescriptions.</i>			
			<i>Facilitate appropriate Interpretation of cultural heritage associated with the park</i>			
	Transform the domestic Guest Profile, through growth, to be representative of South African society	<i>Transform the domestic Guest Profile of Tsitsikamma Nat. Park, through growth, to be representative of regional demographics</i>	<i>N/A</i>	<i>Promote and manage access to the park</i>	<i>Marketing plan</i>	<i>Transform the domestic Guest Profile, through growth, to be representative of South African society</i>
				<i>Develop and support dedicated access programmes. Incorporate a "dedicated access" element into existing programmes</i>		
<i>Actively market park resources and services</i>						
Enhance SANParks Reputation	<i>Enhance Tsitsikamma Nat. Park's reputation</i>	<i>N/A</i>	<i>Develop and implement a Communication Plan to promote park activities</i>	<i>Communication program</i>	<i>Enhance SANParks Reputation</i>	

Ensure Best Practices in Managing and Understanding HIV and AIDS (& associated diseases)	<i>Implement Best Practices in Managing and Understanding HIV and AIDS and associated diseases</i>	N/A	<i>Implementation of SANParks guidelines</i>	<i>SANParks corporate HIV/AIDS program</i>	<i>Ensure Best Practices in Managing and Understanding HIV and AIDS (& associated diseases)</i>
			<i>Implementation of SANParks guidelines</i>		
			<i>Implementation of SANParks guidelines</i>		
Advance Strategic Human Resource Management	<i>To ensure good human resource management</i>	N/A	<i>Implement and support Learnerships and Volunteer Programmes</i>	<i>Staff Capacity Building Program/ Institutional Development and staff capacity building programme</i>	<i>Advance Strategic Human Resource Management</i>
Improve Income to Cost Ratio	<i>Continuously Improve the Income to Cost Ratio of TNP to ensure that the Park meets its conservation mandate and contribute to SANParks overall conservation mandate</i>	N/A	<i>Manage cost to income ratio</i>	<i>Financial sustainability program</i>	<i>Improve Income to Cost Ratio</i>
Achieve Good Corporate Governance Management	<i>Effective management of risk profile</i>	N/A	<i>Do legal review</i>	<i>Risk management program</i>	<i>Achieve Good Corporate Governance Management</i>

3. Guidelines and Programmes to achieve the desired state

This section deals with all the discrete, but often interlinked, programs which make up the approaches to issues, and lead to the actions on the ground. Together they are the Park's best attempt to achieve the desired state. Each subsection in this management plan is a summary of the particular programme, invariably supported by details in what are called *operational* or *lower-level plans*, referred to in appendices but not included here.

The various programmes are classified into the five activity groupings as reflected in the SANParks biodiversity custodianship framework, namely Biodiversity and Heritage Conservation, Sustainable Tourism, Building Co-operation, Effective Park Management, and Corporate Support. Corporate SANParks policies provide the guiding principles for most of the subsections, and will not be repeated here, except as references and occasionally key extracts.

3.1. Biodiversity and Heritage Conservation

3.1.1. Park expansion programme:

The TNP falls within a priority terrestrial and marine conservation area as identified by the South African national conservation assessment (Driver *et al.* 2005, Lombard *et al.* 2005). The expansion of TNP remains important for SANParks in its attempt to consolidate the essential ecological patterns and processes associated with the marine-forest-mountain fynbos associations characteristic of the eastern portion of the Garden Route. The proposed expansion programme is in full congruence with SANParks accepted biodiversity values and follows the SANParks land acquisition framework. In this regard the park falls within the Garden Route Initiative (GRI), part of the wider regional CAPE (Cape Action Plan for the Environment) programme, that is aimed at building a comprehensive protected area system in the Cape Floristic Region fully integrated into the regional land use mosaic (Lochner *et al.* 2003). The envisaged expansion would include a multiple number of different land agreements across the marine, terrestrial and wetland environments, and as such expected to be affected by the environmental legislation governing these different environments. The desired state of the park, in the context of park expansion, includes:

- The consolidation of ecological linkages from the Outeniqua Mountains to the sea, inclusive of the important river catchment (Groot-Bobbejaans, Bloukrans-Vark, Storms-Witteklip, Eland-Kruis) catchment systems, and their marine interfaces via their respective river mouths
- Rehabilitation of degraded lands included into the park
- Encourage conservation friendly land management activities in the surrounding land-use mosaic, and catchments to further the identified important aquatic processes

The 58 512 ha (inclusive of 29 954 ha marine and 23 512 ha contractual parts) large park currently forms part of the largest block of Afromontane forest in the country, and includes important representation of endangered Eastern Coastal Shale band and Garden Route Shale Fynbos that remain hardly protected (Cowling & Heijnis 2001). The area remains under threat from expanding agriculture, development and forestry. To meet the desired state, via the least conflicting route, the park would need to expand to a total of about 140 000 ha (Fig 1). This would be achieved through the inclusion of 43 609 ha of state land primarily managed by DWAF (Table 1). Furthermore, it would require the inclusion of 33 268 ha of conservation land under some co management agreement with Cape Nature and Eastern Cape Parks Board. About 4 600 ha private land be required to fill in the minor gaps and could be done on some form of contractual - stewardship arrangement or purchased if available. This expanded TNP would link to the Wilderness National Park to form a mega park of about 250 000 ha involving land transfers, co-managements and the odd acquisition.

Garden Route NP - Tsitsikamma: Current Land Tenure and Expansion

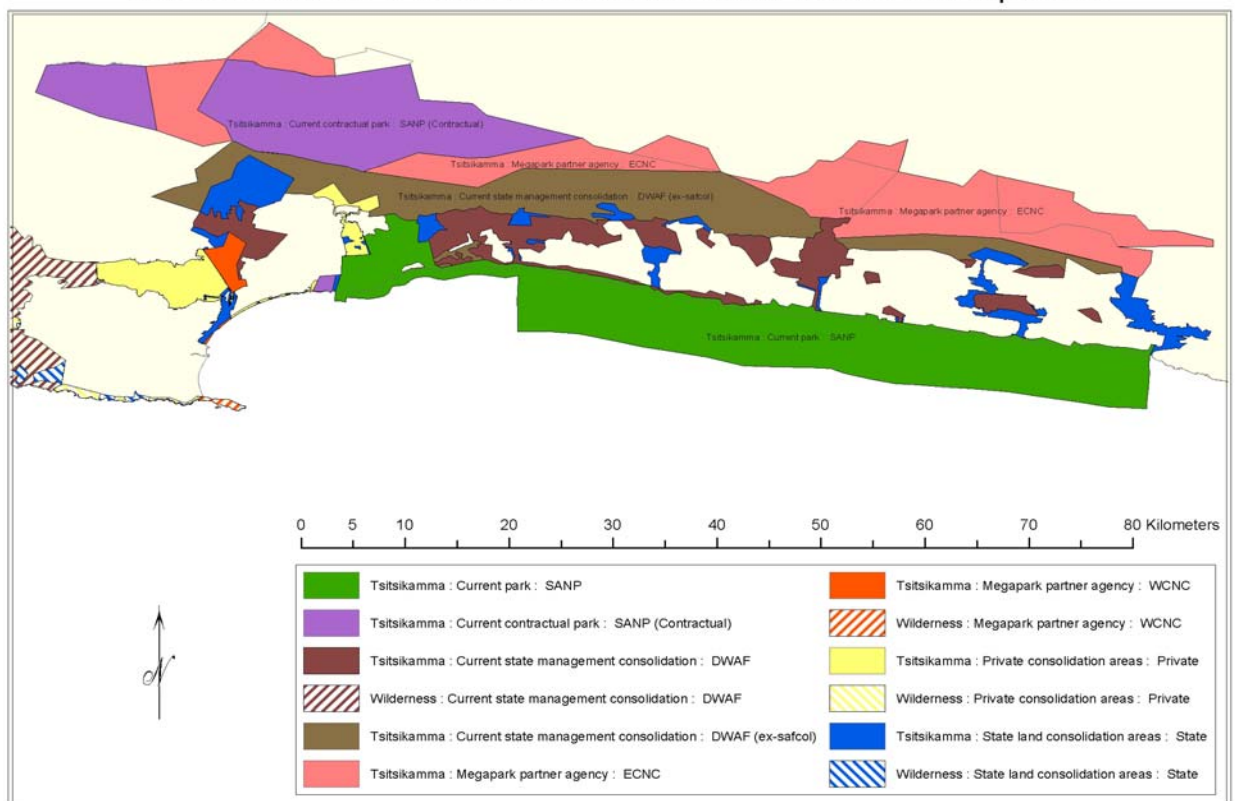


Figure 1. Park expansion programme

3.1.2. Sustainable use of natural resources programme:

SANParks is committed to a policy which includes investigating avenues for communities to derive benefits through participation in national park development, while still maintaining effective conservation of resources.

At present, the only extractive resource utilization practices permitted in TNP occurs along a nine km stretch of the De Vasselot section of coast, outside the marine protected area (TNPMPA). Here recreational bait collecting and fishing is permitted in accordance with the Marine Living Resources Act (1998). These activities are prohibited in the eastern section of the park in accordance the proclamation of the area, in the year 2000, as a no take Marine Protected Area in terms of the Marine Living Resources Act. In TNP SANParks personnel have been appointed as fisheries control officers responsible for the enforcement of the Marine Living Resources Act. They undertake regular patrols to encourage compliance with the legislation.

The no take status of the MPA was decided in recognition of the growing evidence that extractive resource use is the biggest threat to the marine environment in the southern Cape (Lombard *et al.* 2004). The stock status of 10 angling fish species, which are recorded in the park, is regarded as collapsed in South Africa and in urgent need of protection (Wood *et al.* 2000; Mann 2000; SAMLMA 2001). In the past legislated quotas, bag limits, size limits and closed seasons have often proved ineffective to control fishing pressure (Bennett *et al.* 1994), and the role of marine protected areas in fisheries management is becoming increasingly prominent (Attwood *et al.* 1997; Gell & Roberts 2005). For example, within five years of closing the Koppie Alleen section at De Hoop Nature Reserve to fishing, there was a significant ($p < 0.05$) increase in the catch rates of six shore-angling species at this site (Bennett & Attwood 1991).

The protection afforded to no take MPAs results in increases in juvenile and adult abundance, which in turn leads to greater egg production and therefore more fish larvae being dispersed by sea currents to adjacent exploited areas (Tinley *et al.* 1986; Brouwer *et al.* 2003). In addition small, but a substantial proportion (5 - 7%) of the post larval stock of fish, such as galjoen and carpenter, in the TNPMPA migrate beyond the boundaries of the park and thereby seed adjacent exploited areas (Brouwer *et al.* 2003; Attwood & Cowley 2005).

It is therefore noteworthy that a survey of shore-angling between Nature's Valley and Robberg recorded the highest catch per unit effort in terms of mass in the De Vasselot area immediately adjacent to the TNPMPA, being more than double that recorded in the other sectors studied (King 2005). Kyle Smith (Rhodes University Department of Fisheries and Ichthyology, pers. comm. 2006, Smith 2005) reported that long term studies have shown a progressive migration of shore anglers towards the areas adjacent to the TNP MPA in response to the better catch opportunity there.

These studies demonstrate the important role of MPAs as sources of stock to replenish adjacent exploited areas. The progressive concentration of shore angling in areas immediately adjacent to the TNPMPA suggest that out-flowing stocks may be exploited before they disperse very far, and that the MPA is in fact too small to replenish the exploitation over a wide area.

The park with its protected marine environment and large fish stocks provide an important study area for fish research. Much of the past research work concentrated on the biology and ecology of commercially and recreationally exploited fish species. An important monitoring project being undertaken by Cowley (South African Institute of Aquatic Biodiversity) investigates long-term temporal and spatial variations in shore-based scientific angling catches in the marine protected area, and will provide data from which quantifiable thresholds of potential concern (TPCs) may be determined.

After the establishment of the TNP in 1964 in terms of the old National Parks Act, SANParks allowed fishing, but progressively reduced the areas open to fishing based upon concerns about the state of line fish stocks. Later work at TNP revealed that even moderate rates of exploitation were unsustainable (catch rate statistics in TNP are provided by Hanekom et al. 1997). The first step was the closure of the offshore zone to fishing. Thereafter the extent of the shoreline from which shore angling was permitted was steadily reduced from the entire coastline in 1964 to 15 sites in 1975, one site in 1978 and finally complete closure of this section in January 2001, immediately after it was proclaimed an MPA.

There have been ongoing demands from local anglers bordering the eastern sector of the park for rights to access the coast and fish within the TNP MPA. There have also been representations by other interested and affected parties to retain the area as a no-take zone. SANParks is not empowered to alter the no take status of the MPA, in terms of the Marine Living Resources Act this is vested with the Minister: Department of Environmental Affairs and Tourism. Currently the Marine and Coastal Management Branch of DEAT and SANParks are engaging with local stakeholders on the question of angling rights in the MPA. However, until such time as the MPA may be rescheduled in accordance with the legislation, SANParks is obliged to enforce its current status.

3.1.3. Rehabilitation programme:

3.1.3.1. Alien plants

The dominant vegetation types within the greater TNP are Sandstone Fynbos, a fire dependent vegetation type, and Afrotemperate Forest (Mucina *et al.* 2005). The Sandstone Fynbos is the most susceptible to encroachment by alien invasive plants followed by ecotonal and disturbed areas of Afrotemperate Forests. Such invasions can disturb natural persistence and process by displacing the indigenous vegetation, increasing the pressure on water resources and generally increasing the frequency and intensity of fires through increased fuel loads. In the past a multi-phased management approach to dealing with the alien invasive plants was used in the park. It included mechanical, chemical and biological agents, and was undertaken primarily in fynbos areas. In forests management focused on forest ecotone. Future research studies should investigate the rate at which the three bio-control agents that have been established within the park spread to other uninfected areas, as well as the best methods to rehabilitate areas cleared of black wattles. Areas of concern would be a lack of follow up work.

3.1.3.2. *Alien mussels*

The Mediterranean mussel *Mytilus galloprovincialis* was accidentally introduced on the west coast of South Africa between the late 1970s and early 1980s, and soon became invasive (Griffiths *et al.* 1992). From the mid 1990s its abundance in the Storms River Mouth area (and elsewhere in the park) increased dramatically, displacing the majority of the indigenous brown mussels in the mid and high zones of the mussel beds (Hanekom unpublished data). Experimental data suggests that selectively harvesting of the Mediterranean mussel results in only a small improvement in the 'rehabilitation' of the indigenous mussel population (Branch and Steffani 2004; Hanekom unpublished data). This together with the substantial alien larval recruitment that occurs along this coast, which is rugged and difficult to access, suggests that it would be extremely difficult to implement a programme that could meaningfully control the alien mussel and enhance the rehabilitation of the indigenous mussel population.

3.1.3.3. *Erosion Management*

Most unnatural erosion experienced in the park occurs on hiking trails and along service roads. Erosion along trails is carefully monitored during regular patrols of the area. Mitigation measures implemented includes, the use of water barriers, side drainage, filling, construction of bridges and boardwalks. In some cases the walkway is realigned and rehabilitated.

When erosion control work is conducted on hiking trails that are regularly used e.g. the Otter Trail, a detailed survey of the trail is first conducted. The objectives of such a survey is to assess:

- (i) the condition of the trail
- (ii) problem areas requiring more detailed planning
- (iii) sensitive areas requiring specialized planning
- (iv) areas that may need re-routing
- (v) types of erosion
- (vi) appropriate rehabilitation methods. The survey informs mitigating work on the trail

Erosion along service roads is monitored regularly and ongoing repairs are made as part of the parks field maintenance programme. The erosion problems experienced on the access road to Soetkraal has been surveyed and a cost assessment for the repairs thereof has been calculated. The extent of repairs to this road will not be covered by the parks operational budget. It is intended to submit the repairs to this road as part of the parks Expanded Public Works Programme application. SANParks Work Instruction for Managing Quarrying and Soil Erosion in the Integrated Environmental Management System for TNP deals with the management of erosion.

3.1.4. **Damage causing animal programme:**

Damage causing animals in the park are chacma baboons *Papio ursinus* and vervet monkeys *Chlorocebus aethiops*. Baboons and vervet monkeys often frequent rest camps and picnic sites in the park. They are primarily attracted by food and refuse bins. On occasions these animals do loose their fear of humans, resulting in "food grabbing" and raiding of chalets and tents. Park staff members have embarked on a program to raise awareness levels among park visitors about the problems experienced in these conflict areas. The park is also modifying all refuse bins so that they are animal proof. These two initiatives are focused at minimizing the people/animal conflict.

Any sick or injured animal is carefully assessed. Should the need arise the individual animal is euthanized in accordance with the Standard Operating Procedures for the Management of Wildlife in South African National Parks.

3.1.5. Species of special concern (Rare & endangered species) programme

The most threatened biota in the Tsitsikamma region is associated with river and wetland habitats. They include the Endangered slender redfin (minnow) *Pseudobarbus tenius* in the rivers of Soetkraal (Russell 2002), the Endangered Knysna leaf-folding frog *Afrixalus knysnae* in wetlands of the De Vasselot region (Branch & Hanekom 1987), and probably some of the previously undescribed genera (3) and species (13) of aquatic invertebrate recorded in the Salt River (De Moor *et al.* 2004). Current management actions to protect:

(a) the slender redfin include striving to:

(i) secure long-term control or possession of Soetkraal, and

(ii) ensure that the alien invasive plant programme continues in order to maintain good water quality and quantity in the rivers;

(b) the Knysna leaf-folding frog involves limiting inappropriate development on the borders of the park through involvement in public scoping processes;

(c) aquatic invertebrate species includes encouraging: (i) initiatives to undertake both a reserve determination of this river and surveys of the aquatic macro-invertebrates in neighbouring rivers, (ii) better working relationships between government, provincial and conservation agencies and curtail inappropriate developments in the Salt River catchment, and (iii) stricter enforcement of the Water Act by DWAF.

The terrestrial biota of special concern include several fynbos and forest plant species, such as the Rare *Erica zitzikammaensis* and *Mimetes pauciflorus* (McIlleron 2002b; 2003b) and the park endemic *Delosperma saxicolum* (Van Jaarsveld 2005), as well as the Vulnerable blue duiker *Philantomba monticola* (Hanekom & Wilson 1991). No special management action is taken to protect the above species, other than limiting human disturbance, as well as the spread of alien plants and inappropriate fires. The similar management measures would be taken to protect the avifauna, which includes Red Data seabirds breeding in the park (e.g. Cape cormorant *Phalacrocorax capensis* (Crawford 1983)), 'resident' forest species (Knysna warbler *Bradypterus sylvaticus* & Knysna woodpecker *Campethera notata* and crowned eagle *Stephanoaetus coronatus*) and water-birds (African finfoot *Podica senegalensis* and halfcollared kingfisher *Alcedo semitorquata*) (Skead & Liversidge 1967). Future research studies should determine the detailed distribution of the above species within the park, and undertake periodic assessments of their abundance.

(For detail see Operational/ Lower Level Plan for Species of Special Concern)

3.1.6. 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 portion of river ecosystems or catchment occur within the park boundaries. In TNP only the very lower reaches of the major rivers (Salt, Groot [West], Bloukrans, Lottering, Elandsbos, Storms, Elands, Groot [East]), and the upper reaches of the Palmiet River in the contractually managed Soetkraal properties, occur 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. Although CMA's will provide opportunity for cooperative catchment management, the Gouritz CMA and Tsitsikamma-to-Fish CMA to whom management of river catchments in the Tsitsikamma area will be devolved, have not yet been established.

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.

3.1.7. Estuary Management

Estuary management to effect hydraulic and water chemistry changes is confined to the Groot (West) Estuary and entails the periodic artificial breaching of the sandbar at the estuary mouth when the water level is lower than when breaching could occur naturally, to prevent flooding of some facilities (access road, parking area, septic tanks) in waterfront properties in Nature's Valley, and camping sites in the Nature's Valley restcamp. The estuary is breached when water levels achieve between 2.0 and 2.2m

amsl. The method and timing of breaching are intended to maximise sediment scour by out-flowing waters. Deviation from the defined breaching heights could be considered in response to extreme conditions, such as where there is strong evidence that it would be essential for the restoration of environmental processes or reduction in an immediate threat to estuarine biota, or where it reduces an immediate and significant pollution or flooding treat. SANParks will enter into discussion with all role-players and/or undertake relocation of facilities to attempt to enable future natural breaching.

(For detail see Operational/ Lower Level Plan for Estuarine Management)

3.1.8. Marine Management

In the marine environment extreme endemism is relatively rare (Hockey & Branch 1994), and the ecological case for protection of an area is often based on the safeguarding of an important habitat for commercially or recreationally important species, or protection of a particularly good example of a habitat type and its associated communities (Robinson & De Graaff 1994). Major threats to the marine environment in this Southern Cape region are extractive resource use and pollution (Lombard *et al.* 2005). Therefore, a key conservation function of the TNP Marine Protected Area is to provide a safe and pristine refuge for exploited fish and invertebrate species. Management functions are to coerce fishermen to comply with the legislation of the Marine Living Resources Act and reduce illegal fishing/harvesting activities through the issuing of summons and legal prosecution, as well as mitigate the impacts of any pollution event, especially oil spill (see Park Protection Plan).

3.1.9. Integrated fire programme

The vegetation of the park largely comprises two vegetation types/broad habitat units, i.e. Tsitsikamma Mountain Fynbos and Knysna Afromontane Forest (Cowling & Hejnis 2001), which were respectively named Tsitsikamma Sandstone Fynbos and Southern Afrotemperate Forest by Mucina *et al.* (2005). The Fynbos component occurs primarily in the mountainous Soetkraal area. Fire is the most important disturbance agent in fynbos vegetation, and essential in maintaining biodiversity and natural ecological processes (Stock & Allsopp 1992, Van Wilgen *et al.* 1992). Of critical importance in the management of fynbos, is fire frequency, fire season and fire intensity (Van Wilgen *et al.* 1992, Bekker 1994). The management system envisaged is an Adaptive Interference Fire Management system, as described by Seydack (1992). Use would be made of both natural (particularly lightning) and artificial ignition and fires will be controlled in space and time according to a predetermined set of rules. These will be determined by the appropriate fire regime for the Tsitsikamma fynbos, fire risk to private property, veld age configuration at a particular time, etc. Particular attention would be given to requirements and measures to protect commercial plantations against fire damage, without jeopardizing the objectives of biodiversity conservation

Forest is not a fire-prone vegetation type and it is only in exceptional circumstances and extreme weather conditions that fires penetrate the forest proper (Moll, 1983; Van Wilgen 1987). Fire, however, has an important ecological function in fynbos ecosystems and thus also with regard to the maintenance of natural forest/fynbos ecotones. A too short rotation will not allow for the recovery of damaged ecotones before the next fire, while a too long fire rotation can lead to a high fire intensity, which could destroy small forest patches. Records should be kept of fires occurring in and around the park, preferably in GIS format. Little additional monitoring is done or proposed on account of capacity constraints and the small extent of fire-dependent habitat.

Fire security is maintained in compliance with the National Veld and Forest Fire Act (101 of 1998). The Visitor Safety and Security Plan for the TNP includes an emergency response and contingency plan for veld fires.

3.1.10. Cultural heritage resource programme:

The Tsitsikamma area incorporates various cultural heritage sites. These range from Khoisan cultural heritage sites such as caves, shell middens and rock art to the more historical sites such as the ruins of small fishing settlements, remnants of the past forestry industries and grave sites. The conservation of these sites and their related oral history are part and parcel of the conservation mission of the park.

Running concurrently is an Oral History Collection and a Cultural Mapping Project, both of which are implemented with the purpose of identifying and cataloguing all Cultural Heritage assets (tangible and intangible) associated with the Park. These projects are currently being developed in conjunction with local community members, the organisations representing community interests, as well as relevant academic institutions and researchers.

Discussion groups and presentations were hosted to create awareness and encourage involvement in the proposed projects. It is envisaged that a local Cultural Heritage Forum will be established to form working groups that will co-ordinate activities. Local youth will be trained as field researchers and will work in conjunction with the community working groups.

The project will be managed in line with legislation relating to property rights and intellectual property rights

Programme Objectives:

- To facilitate the **research** of information and documentation of available resources through a series of projects
- To recover the **oral history** and information relating to cultural heritage, specifically related to the areas incorporated within the park in collaboration with local communities, academic researchers and other relevant sources and stakeholders
- To enhance the relationship between the park and communities by **interpreting** information relating to **cultural heritage** in collaboration with local communities, academic researchers and other relevant sources and stakeholders
- To identify and **map Cultural Heritage sites** incorporated within and related to sites within the park
- To develop **management plans** to ensure the conservation of cultural heritage site, relics and the related intangible heritage associated with the park
- Enhance the relationship between the park and communities through the implementation of a partnership approach to achieve the above

3.2. Sustainable Tourism

3.2.1. Park Zoning Plan:

The primary objective of a park zoning plan is to establish a coherent spatial framework in and around a park to guide and co-ordinate conservation, tourism and visitor experience initiatives. A zoning plan plays an important role in minimizing conflicts between different users of a park by separating potentially conflicting activities such as quiet forest walks and busy 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 TNP was based on an analysis and mapping of the sensitivity and value of a park's biophysical, heritage and scenic resources; an assessment of the regional context; and an assessment of the park's current and planned infrastructure and tourist routes/products; all interpreted in the context of park objectives. The zoning for Tsitsikamma National Park needs to be seen in the context of the park being integrated in the short term into the Garden Route National Park.

Overview of the use zones of Tsitsikamma National Park:

The use zoning plan for TNP is shown in Figure 1. 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 Garden Route National Park Zoning Document which is available on request.

Remote Zone: This is an area retaining an intrinsically wild appearance and character, or capable of being restored to such and which is undeveloped and road less. There are no permanent improvements or any form of human habitation. It provides outstanding opportunities for solitude, with awe inspiring natural characteristics with sight and sound of human habitation and activities barely discernable and at far distance. In TNP, Remote areas were designated in the mountainous Soetkraal sections of the park, as these areas are both logistically difficult for development and sensitive to development pressures (in particular disruption of catchment areas). Remote areas were designated to protect sensitive coastline east of the Dolphin Trail. Although this area is adjacent to pine plantations, it is below the coastal escarpment and is visually and aesthetically isolated from these transformed landscapes. Consolidation of the coastal buffer in this section is important in order to maintain the Remote characteristics of this zone.

Primitive Zone: The prime characteristic of the zone is the experience of wilderness qualities with access controlled in terms of numbers, frequency and size of groups. The zone shares the wilderness qualities of the Remote zone, but with limited access roads, hiking trails and the potential for basic small-scale self-catering accommodation facilities such as small bush camps or trail camps. Views of human activities and development outside of the park may be visible from this zone. In TNP, Primitive areas were designated to protect most of the remaining sensitive areas that were not incorporated into Remote zones from high levels of tourism activity. The controlled access Otter and Dolphin trails are in this zone. Primitive areas were also designated in relatively low sensitivity valleys in the Soetkraal section to allow management and controlled tourist 4x4 access into the Remote zone. Primitive areas were designated at both ends of the coastal Remote zones to buffer them from higher use tourist areas and external impacts from outside the park. In areas where Remote zones border on the park boundary, a 100m wide Primitive zone was designated to allow park management access to boundaries.

Quiet Zone: This zone is characterized by unaccompanied non-motorized access without specific access control and permits. Tourist infrastructure is limited to trails, viewpoints and hides. Larger numbers of visitors are allowed than in the Primitive zone and contact between visitors is frequent. In TNP, Quiet zones were designated to allow visitors access on foot to hiking trails around the major access nodes of Nature's Valley and Storms River. Sensitive estuary areas such as the Salt River were included in this zone to preclude infrastructure development. The Groot River estuary was zoned Quiet to limit access to non-motorized vessels only. As far as possible, the sensitive sections of the park which were not included into the Primitive zone were zoned Quiet to protect them from infrastructure development and excessive tourist impacts.

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 TNP, High Intensity Leisure areas designated around the Storms River and Nature's Valley Camps (including the staff and administrative areas), the main access routes to these camps, and to accommodate major public access roads through the Nature's Valley section of the park.

Overview of the Special Management Overlays of TNP:

Special management overlays which designate specific areas of the park that require special management interventions were identified. Three special conservation area types were designated:

Special Conservation Areas – Catchments: The Palmiet River catchment in the Soetkraal section was designated for special protection to strictly control any development, tourism activity or management activity which may impact on the river (including its catchment and especially the riparian zone) and its biota.

Special Conservation Areas – Forest Special Protection: Particular areas of specified forest types were designated for special protection in order to reduce the risk of habitat loss and mitigate any ongoing environmental impacts.

Special Conservation Areas – Fishing and bait collection exclusion area: The marine areas of the park except the Groot River estuary, the marine areas west of Nature's Valley, and Nature's Valley beach, were designated as fishing exclusion areas to prevent impacts associated with fishing and bait collection. The marine zoning is detailed below.

In addition to the above Special Management Overlays, two marine zones were designated:

Marine Restricted: The marine areas of the park except the Groot River estuary and the marine areas west of Nature's Valley residential area were classified as Restricted Marine Protected Areas in accordance with the appropriate legislation (Marine Living Resources Act). Effectively this declares the areas a "no-take" zone for any marine living resources.

Marine Controlled: The remaining marine areas of the park were identified as Marine Controlled areas. As noted in section 3.1.2, specified and strictly controlled use of marine living resources is allowed in this zone.

Current status and future improvements:

The zoning for TNP needs to be seen in the context of it being integrated in the short term into the Garden Route National Park. This rapidly changing context will potentially require re-assessment of the current park zoning. The current park use zonation is based on the same biodiversity and landscape analyses undertaken for a Conservation Development Framework (CDF); however certain elements underlying the CDF such as a tourism market analysis are not fully incorporated into the park use zonation. A full CDF will be developed for Garden Route National Park within the current update cycle.

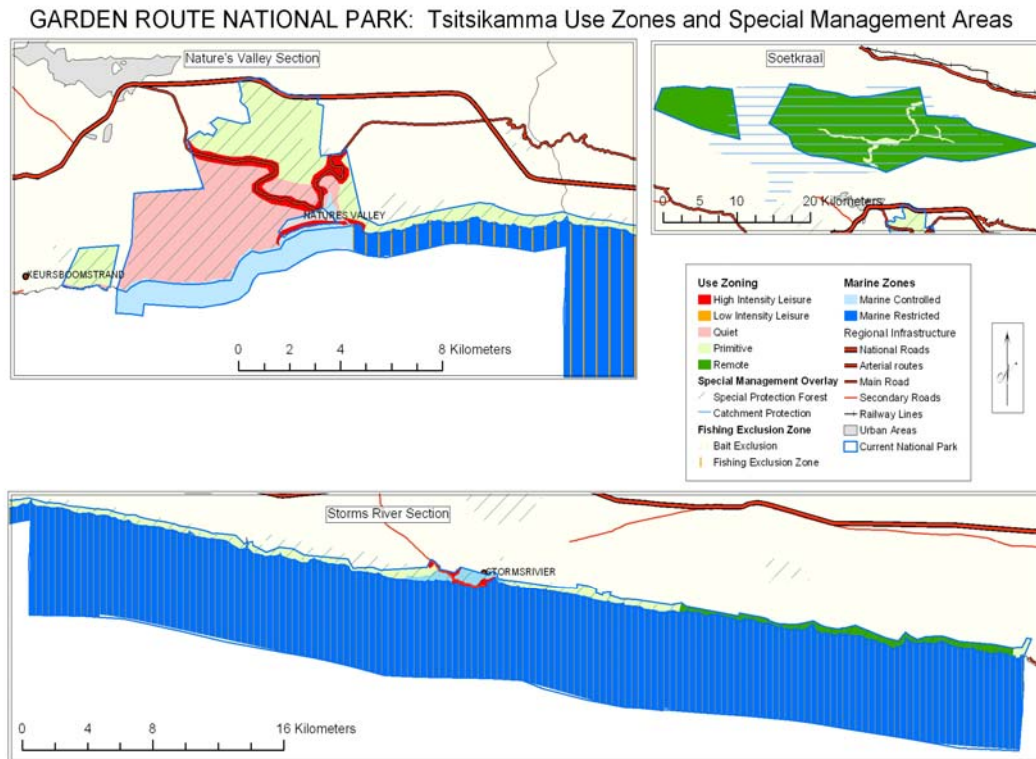


Figure 2. Tsitsikamma National Park Zoning Plan

3.2.2. Tourism Programme:

The most developed areas of the park are found at Storms River Mouth and Nature's Valley. Storms River Mouth Rest-camp is one of the top tourist destinations in South Africa, and even though it is well developed, it is in dire need of an upgrade and some infrastructural changes. With such changes developments the park could provide substantial socio-economic benefits to the area.

Storms River is a coastal camp boasting of a number of camping and caravan sites, chalets, cottages, forest cabins, forest huts, guest houses and oceanettes, making up a total of 251 beds and 91 camping sites. All of these are rated from a 2 to 4 star grading. Nature's Valley has 52 beds available and the camping area has a 2 star grading with 45 stands available. This is an area that needs further development since the current accommodation has separate ablution facilities and these impacts on the price that the park can charge. Occupancy rates in 2005 ranges from 43% in Nature's Valley to 73% in Storms River. Facilities include that of an outsourced restaurant (the largest in the Garden Route with a magnificent view) and shop, a conference facility, which seats up to 50 people, chalets, and a swimming pool. Activities include those of canoeing, day walks, overnight hikes (including the world renowned Otter trail), snorkelling and boat rides. In total there are 49 employees in tourism of which one is temporary.

The park is easily accessible via the Port Elizabeth and George airports and from there on the N2. Road within the park is in a relative good condition. The total number of funds generated by tourism activities in the park in 2005 comes to R 18 million. A study conducted by Saayman and Saayman (2004) used different multipliers to determine the economic impact on the region for this park shows that the park generates R86 million in terms of tourist spend. Using a multiplier of 0.45 the economic impact translates R39 million generated by this park.

The park's desired state for tourism is to: **To remain a flagship product which is financially sustainable and to further develop the tourism brand in order to support tourism and conservation regionally and nationally as part of the Garden Route protected areas.**

The objectives to achieve this desired state are as follows:

- To consolidate tourism products and expand tourism activities in order to enhance the tourist experience.
- To enhance quality of service by means of training.
- To effectively market the TNP brand in order to increase the unit occupancy rate by 10%.
- To create opportunities for concessionaires

Any future development in the park will be in accordance to the park zonation plan (3.21) and the infrastructure plan (3.3.2). Developing of the existing tourism plan will focus on increasing visitor experiences. This tourism plan must be integrated with all other aspects of the management plan especially to ensure that there is no conflict of interest with the biophysical objectives, which according to the SANParks values, must take precedence.

3.2.3. Marketing Programme:

Based on market research that has been conducted by the Institute for Tourism and Leisure Studies at North-West University over a period of five years during the months of May, November and December a condensed profile has been developed. The profile indicates that the domestic tourist is mainly Afrikaans or English-speaking and the international and domestic tourist is predominantly German. These tourists stay three days on average. The level of service in this park is rated as good, although problems still exist at the restaurant and kiosk. Chalets are still the preferred type of accommodation. The park attracts many foreign visitors, although they only stay a short period. Most tour operators visit the park for half a day.

Based on the above profile a marketing programme is currently under development.

3.2.4. Commercial Development Programme:

At Storms River there are two concessionaires, namely the restaurant and shop that generate approximately R1.1 million per year. Over a period of three years the income has increased by 3, 4%. This is much lower than the inflation rate which is a cause for concern; however these operations are making a profit and improve the facilities. Commercial operators and concessions potentially offer an important source of income for the TNP, but their operations could have a negative effect on the environment and would therefore require careful monitoring and evaluation. Equally although outsourcing a number of park activities may provide the park with complimentary skills and efficiencies, this has its own set of management challenges. It is envisaged that all concessionaires will continue to contribute to the TNP income through the establishment of fixed fees or a percentage of turnover. Opportunities for public private partnerships will continued to be explored. Opportunities will especially be sought with small, medium and macro enterprises (SMMEs) from the immediate communities.

3.3. Building Cooperation:

3.3.1. Stakeholder relationship Programme:

The park aims to enhance biodiversity conservation through the promotion of a conservation ethic and developing healthy community custodianship for the park. Co-operative, collaborative and mutually beneficial relationships are essential to reach park goals and ultimately to ensure the sustainability of the Park. To this end both formal and informal partnerships are initiated, maintained and nurtured with **National and Provincial Government** such as the Department of Environmental Affairs and Tourism (DEAT), The Department of Water Affairs and Forestry (DWAFF), Public works, Agriculture, regional and local government planning to have park plans integrated into the Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs); **Conservation entities** such as Marine and Coastal Management (MCM) , Fire Associations , etc ; **Tourism entities** such as South African Tourism Association (SATOUR), Easter Cape Tourism (ECTOUR), Cacadu Tourism , etc ; and the **local communities** through the park forum, ward committees and the local sub-committees.

Park Forums were established to encourage the building of constituencies in support of natural and cultural heritage conservation goals of SANParks. The Park Forum facilitates constructive interaction between the park and surrounding communities and other stakeholders. Park Forums are a means of providing a legitimate platform to communicate park / SANParks issues and to ensure participation of stakeholders on matters of mutual relevance affecting the Park.

Co-operative governance systems are being developed and strengthened for the Park. These aim to promote inclusively and to ensure compliance with legislation through improved relationships and collaboration with government and various governing bodies. The park liaises with various conservation entities to ensure that it keeps up to date with global and national trends and that it collaborates on management strategies that are relevant to be implemented for the local context. Where feasible, the park enters into agreements with various business partners to enable SANParks to focus on its core mandate as a conservation agency, whilst continuing to yield financial benefit from the provision of quality products and services to its customers.

The park enhances biodiversity conservation through developing a healthy community custodianship that in it self would be able to be regarded as part of the parks' conservation equity. Where required, special task teams are set up to address issues of mutual interest or to resolve potential conflict of interest. SANParks regards its

employees as a most valuable asset and foundation for organisational competency. Therefore the park invests in staff development, strives towards employment equity and endeavour to uphold employee rights.

Visitors to the park are regarded as the number one financial resource that enables SANParks to fulfil the organisations' conservation mandate. SANParks fosters good medial relations. Not only is the media regarded as an ally to market our tourism products, but also as key communication tool to keep stakeholders informed and to promote a positive image of SANParks, including this park.

3.3.2. Educational Development Programme:

The greatest part of the work conducted by the People and Conservation Department is directly or indirectly related to Environmental Interpretation & Education and focuses on the various park user groups and local communities. Local schools and communities were highlighted as potential focus groups that are not yet part of the main park user groups by the initial analysis process that guided the design of the various educational programmes. Hence, the programmes that form part of this plan aims to address this "imbalance".

The various programmes have each been designed with specific focus groups in mind. However they are often integrated with one another. This combination of processes forms an integrated network of solutions that work together to support each other and so ensure their sustainability (cross pollination) as well as the enhancement of park-community relations.

The park offers a range of day programmes as well as overnight programmes to interpret the park's rich natural and cultural heritage. Every programme has its own set of interpretive activities complemented with various interpretive displays, signage and information resources. Activities have different themes to ensure a variety of experiences that cater for wide participant interest. Self-guided and / or guided experiences are offered. Self-guided options are supported with the necessary information resources. When guided, the level of detail and presentation are adapted to suit the audience. The various activities are sometimes grouped and offered as packages or conducted as part of different programmes. This makes it possible to be integrated with community outreach programmes, training programmes, programmes for conference groups, holiday programmes, tourist programmes, etc.

To reach park goals and develop a healthy community custodianship for the park, most projects are implemented in partnership with various Non Government Organisations (NGOs); Community Based Organisations (CBOs) and community liaison structures as well as the private sector. A detailed Programme Document is developed for each programme to serve as guide for the implementation of programmes and activities. These documents are developed in liaison with the relevant stakeholders to ensure relevance and effectiveness. All programmes are included in the applicable Business Plans with its relating Budgets and Annual Plan of Operations (APOs).

A high degree of *reflexivity* is built into programme design. All activities are continuously monitored and adjusted to ensure their continuing relevance to the various user groups as well as to the park context that is subject to change. Monitoring tools such as feedback questionnaires, a suggestion box, guides' report forms, etc. will facilitate a continuous process of critical reflection, contextual review, and formative evaluation of programme processes and activities.

3.3.3. Local socio economic development Programme:

The park contributes to local socio economic development in the following ways:

Skills development and capacity building

Skills development and capacity building is regarded as a cornerstone to enable economic activity. The park facilitates Skills and/or Learnership programmes annually. Both processes involve park staff and unemployed members from local communities.

Business opportunities and support of local entrepreneurs

The park procures contracted services ranging from maintenance to tourism related services. Where possible, local Small, Medium and Macro Enterprises (SMMEs) and especially HDEs are favoured when sourcing contractors, provided that all procurement conditions as stated in the SANParks Procurement Policy can be adhered to.

The park continues to support and develop local initiatives or small businesses that provide services that are required during special events or functions. These initiatives have in the past included craft groups, choirs or traditional dance groups, small catering businesses, etc. Where more continued collaboration is required, mutually beneficial initiatives or partnerships are established. One such partnership is the Dolphin Trail Initiative that involves the park and two adjacent landowners. Another example is the local community Eco-guides that guide all the trails for visiting schools or special interest groups.

Social Development Support

Local social development initiatives are supported through collaboration on environmental calendar campaigns and other programmes where mutually beneficial arrangements supports SANParks goals and contribute to local social upliftment.

Government Expanded Public Works Programmes

The Expanded Public Works Programme (EPWP) remains a significant focus area of the organisation to effectively contribute to local socio economic development. The park currently manages 3 programmes, namely Working for Water, Coast Care Working for the Coast and a Special Public Works Programme. These programmes all focus on poverty alleviation and are therefore labour intensive projects that create temporary jobs in the short term (three year cycles). Great importance is also afforded to the skills development component of these programmes, with specific targets set for both hard and soft skills development. Sustainability is further supported by investigating and implementing exit strategies through the development of entrepreneurial opportunities for local communities.

Local Government involvement

Co-operative governance systems are being developed and strengthened for the Park with the aim to promote inclusivity and to ensure compliance with legislation. Improved relationships with Regional and Local Government will also ensure a more effective contribution to local economic development. Collaboration currently focuses on planning i.e. the integration of park plans into the Integrated Development Plans (including Local Economic Development plans and Spatial Development Frameworks.)

3.3.4. Communications Programme:

The Communication objectives of TNP are to build, maintain and to constantly improve relations between the park's relevant stakeholders. To ensure that there is effective representation in both the print and electronic media, to create and maintain a positive image of SANParks, to manage media coverage of contentious issues and to inform the media of relevant emerging conservation and tourism issues.

The objectives will be achieved by the formulation of a comprehensive Communication Strategy for the park that will ensure that stakeholders and clients alike are interacted with on a continuous basis through various medium such as Park Forums, Newsletters, PR Campaigns and the SANParks website.

3.4. Effective Park Management

3.4.1. Environmental Management Programme:

The Management Policy for the TNP details the intent and commitment of Park Management to a course of action that will enable the realization of the vision for the Park. The TNP Strategic Management Plan sets out strategies, actions, deliverables, indicators and time frames. Each Key Result Area is directed by a number of strategies. Each strategy is implemented through a set of actions and will result in a number of deliverables. The implementation of the strategies by the implementing department(s) will be monitored using indicators within a set time frame. The Park Manager is ultimately responsible for all activities of the Park, and plays a supervisory role for all implementing departments.

The Key Result Areas are introduced by brief statements of the SANParks corporate approach, the current situation for the Park and the strategic intent in addressing these.

Indicators are established and tracked for all key result areas. For the purposes of monitoring the progress and performance of the TNP management in achieving the defined strategic objectives for the park, the measurable progress on actions and the delivery of defined products shall be used as indicators in this SMP.

(For detail see Operational plan for Strategic Management)

3.4.2. Security and Safety Programme:

The Safety Security Programme for the TNP is included in three different plans:

3.4.2.1 TNP Visitor Safety and Security Plan.

The strategic intent of this safety and security plan is to:

- ensure that effective visitor safety measures are in place,
- ensure the safety and security of SANParks employees and concessionaires,
- ensure that tourist perceptions are managed in order to protect the brand and reputation of SANParks and SA Tourism at large.

This document comprehensively addresses both the strategic and operational aspects of Visitor 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 strategic intent of the safety and security plan is to firstly ensure that effective visitor safety measures are in place, and secondly to ensure that tourist perceptions are managed in order to protect the brand and reputation of SANParks and SA Tourism Industry at large.

Most potential threats are linked to other illegal activities in and around the park; this includes illegal entry, fishing, flower picking, - etc. Daily park activities that are implemented to mitigate these activities form an important part of this plan. Management measures include the regular analysis of gathered intelligence, the aim to increase the number of Conservation staff to the required level, appropriate and sufficient on-going training of Conservation staff in terms of Law Enforcement and First Aid, acceptance of responsibility by all staff for Visitor and Staff Safety and Security, general awareness of potential of possible criminal activities and the relevant response action to be used in the case of criminal activity taking place and hiking trails to be more regularly patrolled/observations carried out, including at night, especially the Otter Trail.

3.4.2.2 TNP Protection Plan:

The purpose of the park protection plan is to provide park management with a dynamic reference document to describe strategies decided upon to be applied in response to problems identified.

The plan addresses the following aspects:

- a) Criminal Information and Intelligence
- b) Threat Analysis
- c) Operational Security
- d) Species Security
- e) Physical Security
- f) Authority and Jurisdiction
- g) Planning for Crisis Management
- h) Performance Crisis Management

3.4.2.3 TNP Emergency Plan

This plan addresses various identified scenarios and actions prescribed on how to deal with various emergencies.

(For detail see 1/TNP Visitor Safety and Security Plan; 2/.TNP Protection Plan; 3/. TNP Emergency Plan.)

3.4.3 Infrastructure Programme:

Tourism infrastructure in the park comprises of accommodation, roads and trails. The different types of accommodation ranges from family units, two sleepers, and camping. Of the roughly 200 000 visitors visiting the park every year, about 90% visit the main rest camp at Storms River Mouth. The different types of accommodation in this area, comprise of a small block of flats (oceanettes), two caravan/camping sites, forest huts, forest cabins, honey moon suites and family units. These 82 accommodation units provide 253 beds and 112 camping sites. The main visitor areas in Storms River Rest-camp are the restaurant, shop picnic sites and suspension bridge. The Nature's Valley Rest camp is mainly a caravan/camping site although some accommodation is available.

The tourism infrastructure is maintained in a good condition through regular maintenance. Upgrades planned in this cycle include extension of boardwalks, replacement of two chalets, parking at family units, lapas on the Otter Trail, a new gate at Nature's Valley, tree-top accommodation at Storms River, boardwalk trails at Nature's Valley, environmental education centre, etc. (For full planned list see Operational Plan for Infrastructure). The board walk to and suspension bridge at the Storms River Mouth, both a major attraction to the park, have just been upgraded, as has the Otter trail, with its new reception and starting point.

The provincial **road** R393 links the Storms River Mouth Rest-camp to the N2. Although this road forms the lifeline of the park in terms of tourists, the responsibility for its maintenance rest with the Province. The Nature's Valley rest camp is accessed through the R102 which is also a provincial road. No major tourism road is necessary in the Nature's Valley Rest- camp while SANParks maintain an 11 kilometre road system in the Storms River Mouth Rest-camp. A 20 kilometre gravel road into Soetkraal is also maintained as a 4X4 trail and main access route to the Soetkraal area. Some management roads such as the gravel roads to Bloukrans, Nature's Valley and Soetkraal also exist.

The main **offices** building for administration is situated in the Storms River Mouth Rest-camp. This building is old and will be upgraded in the next five years. Others include the reception office and technical workshop near the entrance gate and the Conservation offices at Bloukrans about 40 kilometres from the Storms River Rest-camp and the main administrative building.

The main **staff accommodation** in the park is in Storms River Mouth. Limited staff accommodation is also available in Bloukrans, Natures Valley, and the Outposts along the Otter trail. It must also be noted that the number of accommodation for staff has been reduced in the park since some staff live outside the park.

Only a small portion of the perimeter of the park is fenced, and within the reserve only a few offices and the waste dump are cordoned off by fencing.

The **sewerage system** at Storms River Mouth consists of septic tanks and bio filters and the treated water is discharged into the ocean. This sewerage system and the water purification plant are due to be replaced and upgraded within the next two years. At Nature's Valley conservancy tanks are used.

3.4.4 Staff Capacity Building Programme:

The park has an establishment figure of eighty six (86). Most of these vacancies have been filled. The competency of the staff component is high, and if the performance level of the park has to be maintained, a staff capacity building programme is required.

The corporate balanced score card for SANParks measures the percentage of employees who have achieved set goals within the agreed time frame. Every employee will have his/her individual development plan that will include training needs. The park management will therefore ensure that all the training and capacity building programmes are implemented, as well as identify training needs, budget for the training, and ensure that training occurs. The use of the SETAs for funding the training will be explored both at head office and park level.

A Work Place Skills Development Plan is also produced for the park every year as required by legislation. This is coordinated at head office level, with input from the park and the Employment Equity Forum. Most of the staff is involved and encouraged to make inputs into the plan.

Following the transfer of management responsibility of the staff of the Indigenous Forest Management section of DWAF in the Garden Route to SANParks in April 2005, SANParks is undertaking a re-organisation of the operations for the Garden Route region.

3.4.5 Institutional Development and Administration Programme:

The TNP is fully aligned to the corporate policy, guidelines and protocol on institutional development programmes and actions. This is communicated to the park from time to time by corporate HQ in Pretoria. Administration and is also based on accepted norms & standards as set out in various sets of legislation pertaining to administrative procedures.

3.4.6 Financial Sustainability Programme:

Table 2 provides an estimation of the costs involved in striving towards the desired state for TNP within the proposed Garden Route NP over the next 5-year period through all of the objectives and associated programmes detailed in this management plan. For logistical purposes this budget reflects the budgets for the areas Soetkraal, Tsitsikamma, Nature's Valley, Bloukrans, Tsitsikamma Forest estate and the marine catchment area. The allocated costs account for Infrastructure Development Plans, Working for Water, Coast Care, Extended Public Works Programmes and the TNP and DWAF operational budgets. It is significant to note that there is shortfall of approximately R113 million over the next five years. This shortfall mostly accounts for additional developments, infrastructure and forestry and marine operating costs, which had been applied for but allocation is unknown. The shortfall decreases significantly in the last two years as most development would be in place by then. An important omission that requires urgent attention is an estimated costing for liability and risk. Corporate support (i.e. not included in the TNP's budget) will be required in the form of a technician and operating budget to undertake the monitoring necessary to evaluate TPCs and feedback as part of the adaptive management process. No cost estimates have yet been included for the adaptive management components of non-biophysical aspects of the plan. A detailed breakdown of these figures can be found in the associated lower level plan, available from the park manager upon request.

Table 2 – Estimated costs (in Rands) of reaching the desired state for TNP

Costing	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
Acquire the park	R19,550,000	R 0,000,000	R0,000,000	R0,000,000	R0,000,000
Develop the park	R 37,773,278	R 29,660,049	R 32,527,672	R 8,587,000	R 9,883,000
Manage the park	R 18,560,964	R 19,499,022	R 20,612,623	R 21,852,881	R 23,305,973
Total	R 75,884,242	R 49,159,071	R 53,140,295	R 30,439,881	R 33,188,973
<i>Allocated costs</i>	<i>R 32,862,528</i>	<i>R 30,006,022</i>	<i>R 20,612,623</i>	<i>R 21,852,881</i>	<i>R 23,305,973</i>
Shortfall	R 43,021,714	R 19,153,049	R 32,527,672	R 8,587,000	R 9,883,000

3.4.7 HIV/AIDS

HIV & AIDS requires special attention because it is also spreading within SANParks. Whilst it is an integral component of the EAP (Employee Assistance Programme), it is accorded priority within the SANParks programming. In the most severely affected settings, there is mounting evidence that HIV/AIDS is eroding human security and capacity, undermining economic development and threatening social cohesion. Inevitably, this situation has serious impacts on business. HIV & AIDS in the Tsitsikamma communities will also concern the tourism progress and general economic growth of the area.

South Africa's hospitality and tourism industry, of which the organization is a key role player, allows for job creation throughout the country, including rural areas, where HIV prevalence is often high. It impacts on all businesses, both directly and indirectly, resulting in **increased costs** and **reduced productivity**. Against this backdrop and because SANParks values its human capital, it has now introduced a comprehensive HIV & AIDS Programme which includes Developing an HIV & AIDS Policy; Education and Awareness; Anonymous and Unlinked Prevalence Surveys; Know-Your-Status Campaigns; Lifestyle Management; Care, Treatment & Support as well as Scientific Impact Analyses. The purpose of a TNP HIV & AIDS programme will be to enable SANParks and its adjacent communities to maintain a healthy and productive workforce. The park will inform and educate the children and communities of lifestyle management, prevention, care and treatment and support of those who are infected. SANParks could play a pivotal role in sending a positive message in this regard.

3.4.8 Risk management Programme:

Risk awareness and management within the TNP is adhered to on an ongoing basis. This entails the implementation of corporate policies, procedures and protocol.

The purpose of corporate risk management is to ensure that strategic, business and operational objectives are met and that continued, sustained growth and biodiversity management takes place. This is achieved by proactively identifying and understanding the factors and events that may impact the achievement of the set objectives, then managing, monitoring and reporting on these risks.

The process for the identification of risk is an objective driven process which assesses the impact that risks would have on the viability of the objectives. Senior executives and line management within divisions, down to each business unit are accountable for risk. Each individual Park Scorecard (Balanced Scorecard) reflects the goals, objectives, targets and performance indicators for all its operations. They need to meet all applicable laws and regulations as a minimum and, where appropriate, apply best practice (Table 1).

Section 51 (1) (a) (i) of the PFMA requires of the Accounting Authority of a Public Entity to establish and maintain effective, efficient and transparent systems of financial and risk management and internal control.

Reporting on Risk Management occurs monthly at EXCO. Currently the existing corporate risk registers (per division) are being aligned with the divisional scorecard objective-setting. The process to integrate park level scorecards with that of the Director: Parks is currently in progress but park managers must in the interim advise the

Manager Admin Parks of any significant risk arising for that park that falls outside the scope of ongoing management issues. The Head Risk Management or Manager: Corporate Insurance can be contacted in this regard.

3.4.9 Adaptive and Integrative strategies to sustain TNP desired state

The desired state cannot be effectively maintained without explicit attention given to prioritization, integration, operationalisation, and above all, reflection and adaptation according to the principles in the biodiversity custodianship framework. This will be further developed in consultation with public participation, especially in the light of the proposed Garden Route National Park.

Most objectives as indicated in objective hierarchy table contained above need to be seriously addressed in the next 5 year management cycle. A balance must be struck between the energy needed to deal with immediate threats, and the necessity of laying the all-important groundwork for longer-term strategic success. The desired state will take long and be tough to reach, and difficult trade-offs will need to be made along the way. It is hoped that the guidance offered in this section assists that decision-making in a structured way, though obviously ongoing evaluation is imperative.

Biophysical and socio economic goals seem compatible given the current formulation of the desired state. The effort to work towards the proclamation of the Garden Route National Park need to be kept high in convincing the stakeholders of the key objectives to do so. On the other hand, it may be difficult to achieve all the goals within the next five years.

Given the desired state, the next step is for Park management to use this management plan to draw up a detailed plan of action to for annual operationalisation and wherever necessary down to the level of tasks and duties. The Park Manager must be satisfied that all this serves the desired state as contained in this report. A further cross-check is contained in the Balanced Scorecard system implemented by SANParks, which serves not to replace any objectives contained in this plan, but to support their effective implementation.

If these obligatory feedbacks are effectively honoured, it is believed that the TNP will be practicing an acceptable if not sophisticated level of adaptive management, and in accordance with SANParks' overarching values around complex systems, will have a good chance of achieving the desired state in a sustainable way.

REFERENCES:

- ARDEN -CLARKE, C. 1983. *Population density and social organization of the Cape clawless otter Aonyx capensis Schinz in the Tsitsikamma National Park*. Msc thesis. University of Pretoria. Pretoria, R.S.A. 202 pp.
- BARBER-JAMES, H.M. 2000. Preliminary investigation of the freshwater macroinvertebrates in the Salt River, in relation to the proposed stocking of trout into the upper salt river, Farm236, the Craggs. Albany Museum Environmental Impact Assessment Report. 18pp
- BEKKER, S.J. 1994. The management of fynbos mountain catchments. In: Van der Sijde, H.A. (Ed.). *South African forestry handbook*. Southern African Institute of Forestry. Pretoria. pp. 691-714.
- BEST, P.B. 2000. Coastal distribution, movement and site fidelity of right whales *Eubalaena australis* off South Africa 1969 – 1998. *South African Journal of marine Science* 22: 43 - 57.
- BOLTON, J.J. & H. STEGENGA 2002. Seaweed species diversity in South Africa. *South African Journal of marine Science* 24: 9 – 18.
- BOWER, D. F. & CRAWFORD, R.J.M. 1983. Two new bird records for the Tsitsikamma National Park. *Koedoe* 26.: 173
- BOWLAND, A.E. 1990. *The ecology and conservation of blue duiker and red duiker in Natal*. Ph.D. thesis, University of Natal.
- BRANCH, G.M. & STEFFANI, C.N. 2004. Can we predict the effects of alien species? A case-history of the invasion of South Africa by *Mytilus galloprovincialis* (Lamarck). *Journal of Experimental Marine Biology and Ecology* 300: 189–215.
- BRANCH, W.R. & N. HANEKOM 1987. The herpetofauna of the Tsitsikamma National Park. *Koedoe* 30: 49 - 61.
- BROUWER S.L. & C.D. BUXTON 2002. Catch and effort of the shore and skiboat linefisheries along the South African Eastern Cape coast. *South African Journal of marine Science* 24: 341 - 354.
- BROUWER S.L. & M.H. GRIFFITHS 2004. Age and growth of *Argyrozona argyrozona* (Pisces: Sparidae) in a marine protected area: an evaluation of methods based on whole otoliths, sectioned otoliths and mark-recapture. *Fisheries Research* 67: 1 - 12.
- BROUWER S.L. & M.H. GRIFFITHS 2005. Reproductive biology of carpenter seabream (*Argyrozona argyrozona*) (Pisces: Sparidae) in a marine protected area. *Fisheries Bulletin* 103 (2): 258 - 268.
- BROUWER S.L. 2004. Biology, population structure and management of carpenter (*Argyrozona argyrozona*) an endemic South African reef fish. Ph.D. thesis. Rhodes University, Grahamstown.
- BROUWER S.L., GRIFFITHS, M.H. & M.J. ROBERTS 2003. Adult movement and larval dispersal of *Argyrozona argyrozona* (Pisces: Sparidae) from a temperate marine protected area. *African Journal of marine Science* 25: 395 - 402.
- BURGER, L.F. 1990. *The distribution patterns and community structure of the Tsitsikamma rocky littoral ichthyofauna*. M.Sc. thesis. Rhodes University, Grahamstown, R.S.A.
- BUXTON, C.D. & J.R. CLARKE 1986. Age, growth and feeding of the blue hottentot *Pachymetopon aeneum* (Pisces : Sparidae) with notes on reproductive biology. *South African Journal of Zoology* 33 - 38.
- BUXTON, C.D. & J.R. CLARKE 1989. The growth of *Cymatoceps nasutus* (Teleostei: Sparidae), with comments on diet and reproduction *South African Journal of Marine Science* 8: 57 - 67.
- BUXTON, C.D. & J.R. CLARKE 1991. The biology of the white musselcracker *Sparodon durbanensis* (Pisces: Sparidae) on the eastern Cape coast, South Africa. *South African Journal of Marine Science* 10: 285 - 296.
- BUXTON, C.D. & J.R. CLARKE 1992. Aspects of the biology of the bronze bream, *Pachymetopon grande* (Teleostei: Sparidae) from the southeast Cape coast. *South African Journal Zoology* 27: 21 - 32.

- BUXTON, C.D. & M. J. SMALE. 1984. A preliminary investigation of the marine ichthyofauna of the Tsitsikamma Coastal National Park. *Koedoe* 27: 13 - 24.
- BUXTON, C.D. & M. J. SMALE. 1989. Abundance and distribution patterns of three temperate marine reef fish (Teleostei: Sparidae) in exploited and unexploited areas off the southern Cape coast. *Journal of Applied Ecology* 26: 441 - 451.
- BUXTON, C.D. 1987. *Life history changes of two reef fish species in exploited and unexploited marine environments in South Africa*. Ph.D. thesis, Rhodes University, Grahamstown.
- BUXTON, C.D. 1989. Protogynous hermaphroditism in *Chrysolephus laticeps* (Cuvier) and *C. cristiceps* (Cuvier) (Teleostei: Sparidae). *South African Journal of Zoology* 24 (3): 212 - 216.
- BUXTON, C.D. 1990. The reproductive biology of *Chrysolephus laticeps* and *C. cristiceps* (Teleostei: Sparidae). *Journal of Zoology, London* 220: 497 - 511.
- BUXTON, C.D. 1992. The application of per-recruit models to two South African sparid reef species, with special consideration of sex change. *Fisheries Research* 15: 1 - 16.
- BUXTON, C.D. 1993. Life-history changes in exploited reef fishes on the east coast of South Africa. *Environmental Biology of Fishes*. 36: 47 - 63.
- CARRUTHERS, V. C. & G. A. ROBINSON. 1977. Notes on amphibians in the Tsitsikamma National Parks. *Koedoe* 20: 115 - 124.
- CLARKE, J.R. & C.D. BUXTON. 1989. A survey of the recreational rock-angling fisheries at Port Elizabeth, on the South-east Coast of South Africa. *South African Journal of Marine Science* 8: 183 - 194.
- CODY, M. L., BREYTENBACH, G.J., FOX, B., NEWSOME, A.E., QUINN, R.D. & W.R. SIEGFRIED. 1983. Animal communities: diversity, density and dynamics. In *Mineral nutrients in Mediterranean ecosystems* (ed Day, J.A.) South African National Scientific Programmes Report 71, 91 - 110.
- COETZEE, J.C., ADAMS, J.B. & G.C. BATES. 1997. A botanical importance rating of selected Cape estuaries. *Water SA* 23 (1): 81 - 93.
- COURTNEY-LATIMER, M, SMITH, G.G., BOKELMANN, H. & A. BATTEN. 1967. The flowering plants of the Tsitsikamma Forest and Coastal National Park. National Parks Board. Pretoria.
- COWLEY, P. D., BROUWER, S.L. & R.L. TILNEY. 2002. The role of the Tsitsikamma National Park in the management of four important shore angling fishes along the south-east Cape Coast. *South African Journal of Marine Science* 24: 27 - 36.
- COWLEY, P. D. 2000. Shore-tagging in the Tsitsikamma National Park. *Tagging News* 13: 9 - 11.
- 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.
- . *Document for Cape Action Plan for the Environment Conference. September 2000. 83 pp.*
- CRAWFORD, R.J.M. & D.F. BOWER. 1983. Aspects of growth, recruitment and conservation of the brown mussel *Perna perna* along the Tsitsikamma Coast. *Koedoe* 26: 123 - 135.
- CRAWFORD, R.J.M. & G.A. ROBINSON. 1984. History of the blue duiker *Cephalophus monticola* populations in the Tsitsikamma Forest and Coastal National Parks. *Koedoe* 27: 61 - 73.
- CRAWFORD, R.J.M. 1983. Seabirds breeding in the Tsitsikamma Coastal National Park. *Koedoe* 26: 145 - 153.
- CRAWFORD, R.J.M. 1984. Activity group structure and lambing of blue duikers *Cephalophus monticola* in the Tsitsikamma National Parks, South Africa. *South African Journal of Wildlife Research*. 14 (3) 65 - 68.
- DAY, J.H. 1981. Coastal hydrodynamics, sediment transport and inlet stability. In: Day, J.H. (Ed.) *Estuarine Ecology with particular reference to southern Africa*. A.A. Balkema Cape Town. 7-25.
- DE MOOR F. C. AND BARBER-JAMES H. M. 2001. Report on the second survey of macroinvertebrates to assess the potential impact of trout stocking in the upper Salt River, the Crags. *Albany Museum Environmental Impact Assessment Report*. 32pp.

- DE MOOR, F.C., DE MOOR, I.J., JAMES, N.P.E. & H.M. BARBER-JAMES 2004. An autumn survey of the freshwater macroinvertebrates in the Salt River, Southern Cape. Albany Museum Investigational Contract Report for Nature's Valley Trust. September 2004.
- DE RONDE, N. 1995. Exploring the Southern Cape. Human & Rousseau. Cape Town.
- DIRECTOR-GENERAL OF SURVEYS 1979. 1: 250 000 Geological series. Sheet 3322 Oudtshoorn. Government Printers
- FLEMMING, B., MARTIN, K. & W. AKKERS. 1986. *Agulhas Bank studies. Marine geology off the Tsitsikamma Coast*. Poster paper, Agulhas Bank Symposium, Cape Town.
- FRIEDMANN, Y. & B. DALY (eds) 2004. Red Data Book of the mammals of South Africa: A conservation assessment: CBSG Southern Africa, Conservation Breeding specialist Group (SSC/IUCN) Endangered Wildlife Trust. South Africa.
- GELDEBLUM, C. & L. ROWLINSON 1999. *Working for Water Programme. Management plan for alien vegetation in the Keurbooms catchment*. Report No. ENV/S-C 98057A. Environmentek, CSIR, Stellenbosch.
- GELDENHUYS, C.J. 1986. Nature's Valley: Refugium for rare Southern Cape Forest species. *Palaeoecology of Africa* 17: 173- 181.
- GELDENHUYS, C.J. 1987. Bergwind fires determine forest distribution in the southern Cape. Poster paper. National conference on long-term data series relating to South Africa's renewable natural resources. CSIR, Pretoria.
- GELDENHUYS, C.J. 1992. Disjunctions and distribution limits of forest species in the Southern Cape. *South African Forestry Journal* 161: 1 - 14.
- GELDENHUYS, C.J. 1993. Floristic composition of the southern Cape forests with an annotated checklist. *South African Journal of Botany*. 59 (1): 26 - 44.
- GRIFFITHS, C.L. & HOCKEY, P.A.R. 1987. A model describing the interactive roles of predation, competition and tidal elevation in structuring mussel populations. In: Payne, A.I.L., Gulland, J.A. & K.H. Brink (eds). The Benguela and Comparable Ecosystems, *South African Journal of Marine Science* 5: 547 – 556.
- GRIFFITHS, C.L., HOCKEY, P.A.R., VAN ERKOM SCHURINK, C. and LE ROUX, P.J. 1992. Marine invasive aliens on South African shores: implications for community structure and trophic functioning. In: Payne, A.I.L., Brink, K.H., Mann, K.H. and R. Hilborn (eds). Benguela Trophic Functioning, *South African Journal of Marine Science* 12: 713 – 722.
- HAMMOND, W. 2001. Factors affecting the infauna associated with mussel beds. M.Sc. thesis. Department of Zoology, University of Cape Town, Cape Town, South Africa.
- HAMMOND, W. and GRIFFITHS, C.L. 2004. Influence of wave exposure on south African mussel beds and their associated infaunal communities. *Marine Biology* 144: 547–552.
- HANEKOM, N. & D. BOWER 1996. Management Plan for the Tsitsikamma National Park. 2nd Draft. Internal report for Tsitsikamma National Park.
- HANEKOM, N. & V. WILSON. 1991. Blue duiker *Philantomba monticola* densities in the Tsitsikamma National Parks and probable factors limiting these populations. *Koedoe* 34 (2) 1991.
- HANEKOM, N. 2005. Weather and sea temperature patterns occurring in the Tsitsikamma National Park. . Progress report for SANParks. 2 pp
- HANEKOM, N., HUTCHINGS, L., JOUBERT, P. & P. VAN BYL. 1989. Upwelling and fish mortalities off the Tsitsikamma Coast. *South African Journal of Marine Science* 8: 145 - 153.
- HANEKOM, N., JOUBERT, P. & P. KENYON, 1987. New bird and mammal records for the Tsitsikamma Coastal National Park. *Koedoe* 30: 168 - 171.
- HANEKOM, N., MANN-LANG, J.B., MANN, B.Q. & T.V.Z. CARINUS 1997. Shore-angling catches in the Tsitsikamma National Park, 1989 - 1995. *Koedoe* 40(2): 37 - 56.
- HANEKOM, N., SOUTHWOOD, A. & M. FERGUSON. 1989. A vegetation survey of the Tsitsikamma Coastal National Park. *Koedoe* 32 (1): 47 -66.
- HARRISON, T.D., COOPER, J.A.G., RAMM, A.E.L. & R.A. SINGH. 1995. Health of South African estuaries, Palmiet - Sout. *Executive Report for Department of Environment Affairs*. CSIR, Congella.

- HARRISON, T.D., COOPER, J.A.G., RAMM, A.E.L. & R.A. SINGH. 1996. Health of South African estuaries, Groot (wes) - Great Fish. *Executive Report for Department of Environment Affairs*. CSIR, Congella.
- HARRISON, T.D., COOPER, J.A.G., RAMM, A.E.L. & SINGH, R.A. 1996. Health of South African estuaries, Groot (Wes) – Great Fish. Executive Report, Coastal and Catchment Environmental Programme, CSIR, Durban.
- HERZIG - STRASCHIL, B. & G.A. ROBINSON. 1978. On the ecology of the fruit bat *Rousettus aegyptiacus leachii* (A. Smith, 1829) in the Tsitsikamma Coastal National Park. *Koedoe* 21: 101 - 110.
- HOCKEY, P.A.R. & G.M. BRANCH. 1994. Conserving marine biodiversity on the African coast: implications of a terrestrial perspective. *Aquatic Conservation: Marine and Freshwater Ecosystems* 4: 345 - 362.
- HOCKEY, P.A.R. & VAN ERKOM SCHURINK, C. 1992. The invasive biology of the mussel *Mytilus galloprovincialis* on the southern African coast. *Transactions of the Royal Society of South Africa* 48 (1): 123-139.
- KNOBEL, R. 1989. Knibbel oor see-grens. *Custos* 18 (6): 6.
- KOEN, J.H. 1984. A study of the distribution, population composition, movement and feeding of the Knysna elephants *Loxodonta africana africana* (Blumenbach 1797). Unpublished report. S84/6. Department Environment Affairs.
- LE ROI LE RICHE, H. & D. HEY 1947. *Survey of the southwestern districts*. Cape Town: Inland Fisheries Department, Provincial Administration of the Cape of Good Hope. Report No. 4: 19 – 27).
- LOMBARD, T.A., STRAUSS, T., HARRIS, J. SINK, K. ATTWOOD, C. & L. HUTCHINGS 2005. South African National Spatial Biodiversity Assessment 2004: Technical Report. Volume 4: Marine Component. Pretoria: South African National Biodiversity Institute.
- MANN, B.Q. (ed.) 2000. Southern African Marine Linefish Status Reports. *Special Publication Oceanographic Research Institute* 7: 1-257.
- Mc ILLERON, J. 2002b. A checklist of the plant species of Soetkraal and De Vasselot. . Progress report for South African National Parks for 2002. 3pp + attachment.
- Mc ILLERON, J. 2003b. A checklist of the plant species of Soetkraal and De Vasselot. . Progress report for South African National Parks for 2002. 2pp
- McQUAID C.D. & G.M. BRANCH. 1984. Influence of sea temperature, substratum and wave exposure on rocky intertidal communities: an analysis of faunal and floral biomass. *Marine Ecology Progress Series* 19: 145 - 151.
- McQUAID C.D. & G.M. BRANCH. 1985. Trophic structure of rocky shore intertidal communities: response to wave action and implications for energy flow. *Marine Ecology Progress Series* 22: 153 - 161.
- MINTER, L.R., BURGER, M. HARRISON, J.A. BRAACK, H.H., BISHOP, P.J. & D. KLOEPFER, (Eds) 2004. Atlas and Red data Book of the frogs of South Africa, Lesotho and Swaziland. SI/MAB Series #9. Smithsonian Institution, Washington, D.C.
- MOLL, E.J., 1983. The Southern Cape Forests. *South African Forestry Journal* 127: 31-34.
- MOLL, E.J. & L. BOSSI. 1984. Vegetation map of the fynbos biome. Director of Survey and Mapping, Mowbray.
- MORANT, P.D. & I.B. BICKERTON. 1983. Estuaries of the Cape. Part II: Synopses of available information on individual systems. Report no 19: Groot (wes) (CMS23) & Sout (CMS 22). *CSIR Research Report* 418. CSIR Stellenbosch.
- MORIARITY, A. 1982. *Outeniqua, Tsitsikamma and eastern Little Karroo*. South African Wild Flower Guide 2. Botanical society of South Africa, Kirstenbosch, Claremont. 206 pp.
- MUCINA, L. & RUTHERFORD, M.C. 2006. *The vegetation map of South Africa, Lesotho and Swaziland*. South African National Biodiversity Institute, Pretoria.
- ODENDAAL, P.B. & R.C. BIGALKE. 1979. Home range and groupings of bushbuck in the southern Cape. *South African Journal of Wildlife Research* 9 (3/4): 96 - 101.
- PRETORIUS, G., BOND, W., ODENDAAL, P., GELDENHUYS, C. & J. BREYTEN-BACH. 1980. De Vasselot Natuureservaat Bestuurplan 1979/80 - 1983 - 84. Internal Report. Department of Forestry, RSA.

- REBELO, A.G. 1992. Preservation of biotic diversity. In *The Ecology of Fynbos: nutrients, fire and diversity*. Ed. Cowling, R.M. Oxford University Press. Cape Town. 309 – 344
- Roberts C.M. & N.V.C. Polunin. 1991. Are marine reserves effective in management of reef fisheries. *Reviews in Fish Biology and Fisheries* 1: 65 - 91.
- Roberts, M.J. & M. van der Berg 2005. Currents along the Tsitsikamma coast, South Africa, and potential transport of squid larvae and ichthyoplankton. *African Journal of marine Science* 27 (2): 375 – 388.
- ROBINSON, G.A. 1976a. Notes on the mammals encountered in the Tsitsikamma National Parks. *Koedoe* 19: 145 - 152.
- ROBINSON, G.A. 1976b. Two new bird records for the Tsitsikamma National Parks. *Koedoe* 19: 175.
- ROBINSON G.A. & G. DE GRAAFF 1994. Marine protected areas of the Republic of South Africa Council for the Environment. IUCN
- ROBINSON, G.A. 1989. Tsitsikamma – 25 years of marine conservation. *Custos* 18 (6) 4 – 5.
- ROBINSON, T.B. & GRIFFITHS, C.L., McQUAID, C.D. & M. RIUS. 2005. Marine alien species of South Africa – status and impact. *African journal of Marine Science* 27 (1): 297 – 306.
- ROUX, P.J. 1992. Marine invasive aliens on South African shores: implications for community structure and trophic functioning. In: Payne, A.I.L., Brink, K.H., Mann, K.H. and R. Hilborn (eds). Benguela Trophic Functioning, *South African Journal of Marine Science* 12: 713 – 722.
- RUSSELL, I.A. 2002. Freshwater fishes of Tsitsikamma National Park. *Koedoe* 45 (2): 13 – 17.
- RYCROFT, H.B. 1980. *Trees of the Tsitsikamma National Parks*. Aurora Press for National Parks Board. Pretoria, R.S.A. 126 pp.
- SAAYMAN, G.S., BOWER, D. & C.K. TAYLOR. 1972. Observations on inshore and pelagic dolphins on the south eastern Cape coast of South Africa. *Koedoe* 15: 1 -24.
- SAMLMA 2001. South African Marine Linefish Management Association Executive Committee meeting minutes. January 2001. Oceanographic Research Institute.
- SAUER, W.H.H. 1995. South Africa's Tsitsikamma National Park as a breeding area for the commercially exploited chokka squid *Loligo vulgaris reynaudii*. *South African Journal of marine Science* 16: 365 - 373.
- SCHUMANN, E.H., PERRINS L.A. & I.T. HUNTER 1982. Upwelling along the South Coast of the Cape Province. *South African Journal of Science* 78: 238 - 242.
- SCOTT, H.A. & K.C.D. HAMMAN. 1984. *Freshwater fishes of the Cape*. Cape Town: Cape Department of Nature and Environmental Conservation (Cape Conservation series no. 5)
- SEYDACH, A.H.W, HUISAMEN, J. & R. KOK 1998. Long-term antelope population monitoring in Southern Cape Forests. *South African Forestry Journal* 182: 9 - 19.
- SEYDACK, A.H.W. 1990. Ecology of the bushpig *potamochoerus porcus* linn. 1758 in the Cape Province, South Africa. Ph.d. thesis. University of Stellenbosch, Stellenbosch
- SEYDACK, A.H.W. 1992. Fire management options in fynbos mountain catchment areas. *South African Forestry Journal* 161: 53-58.
- SKEAD, C.J. & R. LIVERSIDGE. 1967. Birds of the Tsitsikamma Forest & Coastal National Parks. *Koedoe* 10: 43 - 62.
- SKELTON, P.H. 1980. Systematics and biogeography of the redfin *Barbus* species (Pisces: Cyprinidae) from southern Africa. Unpublished Ph.D. thesis. Rhodes University, Grahamstown.
- SKELTON, P.H. 1988. A taxonomic revision of redfin minnows (Pisces: Cyprinidae) from southern Africa. *Annals of the Cape Provincial Museum* 16 (10): 201 – 307..
- SKINNER, J.D., & R.H.N. SMITHERS 1990. *The Mammals of the Southern African Subregion*. University of Pretoria. Pretoria.
- SMALE, M.J. & A.E. PUNT. 1991. Age and growth of the red steenbras *Petrus rupestris* (Pisces:Sparidae) on the southeast coast of South Africa. *South African Journal of Marine Science* 10 : 131 - 139.
- SMALE, M.J. 1988. Distribution and reproduction of the reef fish *Petrus rupestris* (Pisces:Sparidae) off the coast of South Africa. *South African Journal of Zoology* 23 (4): 272 - 287.

- STEFFANI, C.N. & BRANCH, G.M. 2003a. Growth rate, condition, and shell shape of *Mytilus galloprovincialis*: response to wave exposure. *Marine Ecology Progress Series* 246: 197–209.
- STEFFANI, C.N. and G.M. BRANCH 2003b. Spatial comparisons of populations of an indigenous limpet *Scutellastra argenvillei* and the alien mussel *Mytilus galloprovincialis* along a gradient of wave energy. *African Journal of Marine Science* 25: 195–212.
- STEFFANI, C.N. and G.M. BRANCH 2003c Temporal changes in an interaction between an indigenous limpet *Scutellastra argenvillei* and an alien mussel *Mytilus galloprovincialis* along a gradient of wave energy. *African Journal of Marine Science* 25: 213–229.
- STEGENGA, H., ANDERSON, R.J. & J.J. BOLTON 2000. Notes on Ceramicaceae from the eastern Cape Province, south Africa III. Three new records Tsitsikamma Coastal National Park, with a description of *Scageliopsis tsitsikammae* nov. spec. *Blumea* 45: 485 – 494.
- STEGENGA, H., ANDERSON, R.J. & J.J. BOLTON 2001. *Hypoglossum imperfectum* nov. spec. (Rhodophyta, Delesseriaceae), a new species from the South African south coast. *Botanica Marina* 44: 157 – 162.
- STOCK, W.D. & ALLSOPP, N. 1992. Functional perspective of ecosystems. In: Cowling, R.M. (Ed.). *The ecology of fynbos. Nutrients, fire and diversity*. Oxford University Press, Cape Town. pp. 241-259.
- STONE, A.W., WEAVER, A.B., AND W.O. WEST 1998. – Climate and weather. In Field guide to the eastern and Southern Cape Coasts. Eds Lubke, R. & I. De Moor. University of Cape Town Press, Cape Town. 41 – 49.
- THWAITES, R.N. 1984. Cenozoic reconnaissance study on the Tsitsikamma Plateau. Directorate of Forestry Report No. S.84 / 21, File A23/2/2/2/2. Saasveld Forestry Research Centre, George, RSA. 18 pp & appendices.
- TOERIEN, D.K. 1976. Geologie van die Tsitsikammakusstrook. *Koedoe* 19: 31 -41.
- VAN DAALEN, J.C. 1981. The dynamics of the indigenous forest-fynbos ecotone in the southern Cape. *South African Forestry Journal* 119: 14 - 23.
- VAN DAALEN, J.C. 1984. Distinguishing features of forest species on nutrient-poor soils in the Southern Cape. *Bothalia* 15, 1 & 2: 229 - 239.
- VAN DER MERWE, I. 1998. *The Knysna and Tsitsikamma forests - their history, ecology and management*. Chief Director Forestry: Department of Water Affairs and Forestry. Pretoria.
- VAN ERKOM SCHURINK, C. & GRIFFITHS, C.L. 1990. Marine mussels of southern Africa – their distribution patterns, standing stocks, exploitation and culture. *Journal of Shellfish Research* 9 (1): 75 – 85.
- VAN ERKOM SCHURINK, C. & GRIFFITHS, C.L. 1991. A comparison of reproductive cycles and reproductive output in four southern African mussel species. *Marine Ecology Progress Series* 76: 123 – 134
- VAN JAARSVELD, E. 2005. Finale navorsingverslag - Besoek aan Tsitsikamma Nasionale Park, Vrydag 12 Nov.2004 - Saterdag 13 November 2004. Progress report for South African National Parks. 4pp.
- VAN WILGEN, B.W., 1987. Fire regimes in the fynbos biome. In: Cowling, R.M., Le Maitre, D.C., McKenzie, B., Prys-Jones, R.P. & Van Wilgen, B.W. (Eds.). *Disturbance and the dynamics of fynbos biome communities*. *South African National Scientific Programmes Report No. 135*. CSIR, Pretoria. pp. 6-14.
- VAN WILGEN, B.W., BOND, W.J. & RICHARDSON, D.M. 1992. Ecosystem management. In: Cowling, R.M. (Ed.). *The ecology of fynbos. Nutrients, fire and diversity*. Oxford University Press, Cape Town. pp. 345-371.
- VON BREITENBACH, F. 1974. *Southern Cape forests and trees*. Government Printers, Pretoria. R.S.A. 328 pp.
- VON GADOW, K. 1978. A pellet count of blue duiker and bushbuck in the Knysna forests. *South African Forestry Journal* 107: 77 - 81.
- WHITFIELD, A.K. 2000. Available scientific information on individual South African estuarine systems. Water Research Commission Report No. 577/3/00. WRC, Pretoria. 217pp.
- WHITTINGTON, P. A. 2004. New breeding locality for Crowned cormorant. *Koedoe* 47 125 – 126.

WOOD, A.D., BROUWER, S.L., COWLEY, P.D. & T.D. HARRISON 2000. An updated checklist of the ichthyofaunal species assemblage of the Tsitsikamma national Park, South Africa. *Koedoe* 43 (1): 83 – 95.

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