



**E Z E M V E L O**  
**K Z N W I L D L I F E**

Conservation, Partnerships & Ecotourism

**H L U H L U W E**  
**I M F O L O Z I P A R K**



**H L U H L U W E - I M F O L O Z I P A R K**  
*Protected Area*  
**M A N A G E M E N T P L A N**



**Hluhluwe-iMfolozi Park,  
KwaZulu-Natal, South Africa**

**Protected Area Management Plan:  
2011**

Prepared by

Udidi Environmental Planning and Development Consultants and  
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## Authorisation

This Integrated Management Plan for Hluhluwe-iMfolozi Park was compiled and recommended by the Park Planning Committee (PPC), a multi-disciplinary team consisting of:

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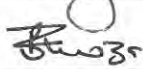
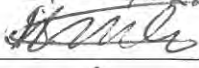
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Date of Next review:



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## Preface

*This Protected Area Management Plan for Hluhluwe-iMfolozi Park is the primary and overarching management document for the Park for the five year period from the date of approval. It forms the framework within which the Park will be managed and developed towards the achievement of its management objectives derived in collaboration with the Park stakeholders.*

*The protected area management planning process and the resultant planning documents (elaborated on in the next few pages, has been designed to meet the statutory requirements of the National Environmental Management: Protected Areas Act and other relevant legislation.*

*The protected area management planning process requires participation from the Park stakeholders, the general public and specialists during the various stages of plan development and implementation. Although the Protected Area Management Plan and its sub-components are five year planning documents, an annual review process will ensure an active adaptive management planning approach.*

*A long term business approach has also been introduced that ensures that the Parks management objectives are operationalised and reflected in the Park's operational budget over the next five years. A Business Plan will at the same time actively pursue additional and improved funding and income towards the achievement of the natural and cultural heritage conservation objectives of the Park over the next five years.*

*Emzemvelo KwaZulu-Natal Wildlife as the designated Management Authority for Hluhluwe-iMfolozi Park hereby commits itself to the implementation of this plan.*

**Dr Bandile Mkhize**  
**Chief Executive Officer**

**Date:**



# Protected area management planning process framework for Hluhluwe-iMfolozi Park

## Overview

The Protected Area Management Planning process used for the Park has Integrated Planning components and Operational Planning components, **each with a five-year timeframe** that is **reviewed annually**.

They are:

## Integrated Planning Components

1. **Protected Area Management Plan (PAMP)** is the primary overarching protected area planning document that describes the administrative and legal framework, contextual background, public participation processes followed, vision / mission statements, prioritised management objectives, zonation as well as a management policy framework and guidelines. The management plan forms the framework within which all the other planning components are developed.
2. Within the framework of the Protected Area Management Plan, a **Conceptual Development Plan (CDP)** provides a strategic guideline for the development and maintenance of conservation management infrastructure and visitor facilities / activities within the constraints of the receiving environment.

Operational plans, programmes and procedures that support the Protected Area Management Plan and CDP are either in place or will be compiled where these do not exist.

## Authorisation of Protected Area Management Plan and CDP

These plans are authorised by the provincial KwaZulu-Natal MEC: Agriculture, Environmental Affairs and Rural Development.

## Operational Planning Component

A **Business Plan (BP)** will be developed for the Park. The BP is primarily aimed at describing the manner in which the IMP and CDP are to be financially resourced. It may address issues of operational efficiency and the optimisation of income generation opportunities in order to bridge any possible shortfalls between required operational expenditure and committed provincial government budget allocations.

## Legal

This management planning process has been implemented cognisant of the requirements of SA environmental legislation and in particular the National Environmental Management: Protected Areas Act No. 57 of 2003.

## Public Participation

- The Park Vision and Objectives contained in the Protected Area Management Plan were derived at Stakeholders' Workshops (see paragraph 4.1), the proceedings of which were advertised for public comment.
- The Protected Area Management Plan and CDP will have been advertised for public comment before being authorised.

The BP and Protected Area Management Plan will form the basis for regular progress reporting to the Park's Local Board, Land Owners and the Board. Each year an annual plan of operation will be prepared, based on the objectives, strategic outcomes, management activities and targets contained in the protected area management plan.

Each year an annual management meeting is held for each protected area managed by Ezemvelo KZN Wildlife. In terms of the implementation of the management plan, the purpose of the annual management meeting for the park will be to:

- Finalise the annual report, as part of the annual management plan implementation review described in Section 7.2 above.
  - As part of the annual performance review, determine the need to modify or change any of the management plan's objectives, strategic outcomes, management activities or targets.
  - Determine management activities for the coming year and to set goals for each quarter, based on the key performance areas set out in the management plan.
  - Determine how budgets will be spent in an effort to achieve the goals for each of the quarters of the coming year.
- The minutes and notes of the annual management meeting will be compiled in an annual plan of operation, which will include all of the information, set out above, and will determine what management activities need to be completed for the coming year, based on the management plan.

The essential active adaptive nature of the process enables the continual improvement of the management of the Hluhluwe iMfolozi Park.

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## **1. PURPOSE AND SIGNIFICANCE OF HiP:**

### **1.1 Purpose**

The purpose of Hluhluwe-iMfolozi Park (HiP) is to:

- Contribute to the achievement of provincial and national nature conservation objectives and targets, as a component of the national protected area system, through protection of a representative sample of the indigenous ecosystems, communities, ecotones and representative landscapes of the area, their indigenous biodiversity, and the ecological and evolutionary processes that generate and maintain this diversity;
- Protect and conserve species of conservation significance (e.g. endangered, rare and endemic plant and animal species) indigenous to the area;
- Conserve the ecological integrity and the wild character of the park;
- Conserve the integrity of the iMfolozi Wilderness Area;
- Safeguard the archaeological, historical, palaeontological and living cultural heritage of the area;
- Promote awareness and appreciation of the natural environment, scenic beauty and outstanding aesthetic value of the area;
- Provide controlled access by the public to the area and its resources;
- Contribute to local, regional and national economies through the provision of ecosystem services, eco-cultural tourism, and the sustainable use of natural resources;
- Provide a major destination for eco-cultural tourism in SA; and
- Provide opportunities for management-orientated and other forms of research, monitoring, education, interpretation and awareness programmes that contribute to improved understanding and awareness of the values of the area and excellence in the management of the park.

### **1.2 Significance**

HiP significance extends to the regional, national and international levels. It encompasses natural, cultural, ecological, wilderness, outdoor recreation and eco-cultural tourism values.

#### **Natural values**

- The park is a flagship protected area of Ezemvelo KwaZulu-Natal Wildlife (EzemveloW) which has a long history of innovative conservation research and development of conservation techniques;
- Was the first designated protected area on the African continent established in 1895 to prevent the extinction of the Southern white rhino;
- The rhino population of HiP is rated as one of 6 global key populations by the IUCN African Rhino Specialist Group;
- Despite its relatively small size the park has a rich biodiversity including a number of threatened, protected and endemic species;

- The park is an Important Bird Area (Nu SA 060) in terms of the African IBA programme providing sanctuary and nesting sites for globally threatened as well as endemic bird species, especially raptors;
- The conservation of biodiversity encompassing landscapes, ecosystems, communities, species and the processes on which they depend;
- The outstanding natural beauty and aesthetic of the area and specifically the wilderness aspect;

### **Ecological goods and services values**

During 2009 **Ezemvelo KZN Wildlife** initiated a study to quantify the Ecological Services provided by 6 protected areas including HiP. Tens of thousands of households are benefiting directly due to the existence of HiP and the Ezemvelo KZN Wildlife Protected Area's Ecosystems Services report (Mander *et al.* 2009) emphasizes the following:

- The importance of the catchments in HiP in prolonging the lifespan of the Hluhluwe Dam;
- Flood attenuation, disaster damage control, fire damage control, salinity control, climate management and improved water security for downstream users;
- Services that are critical to the surrounding community include water supply, soil stability, disease control and water distribution;
- Benefits to the community include biocontrol, biodiversity refugia, seed dispersal, waste assimilation, soil formation and groundwater recharge;
- Carbon sequestration through holding carbon stocks in woodlands and grasslands;
- Genetic vigour of biodiversity and game distribution.

### **Research values**

- HiP provides significant opportunities for conservation related research;
- The highest scoring importance values according to the Mander et al. 2009 report were related to knowledge generation and learning;
- Research conducted within HiP is influencing international perspectives on savannah ecology and conservation practices;
- Research forms the basis of scientific-based adaptive management and comparative studies on ecosystems;
- Provision is made for training through research allowing opportunities for graduates to further their studies.

### **Wilderness values**

- The iMfolozi Wilderness Area in HiP was the first to be designated as such in South Africa and on the African continent, and where the wilderness conservation as a desirable and defensible form of protected area land use was formally adopted;
- The iMfolozi Wilderness Area provides an opportunity for the 'leave no trace' concept emphasizing the need to reduce human impact on the environment;
- The wilderness experience encompasses closeness to nature, solitude and simplicity which provide opportunities for environmental education, spiritual and personal growth and leadership development;
- Provision of opportunities for environmental education through interpretation of ecology and other aspects of the wilderness environment;

- Opportunities for scientific studies that collect benchmark data on ecosystem processes and natural ecosystem functions are provided.

#### **Outdoor recreation and eco-cultural tourism values**

- HiP contributes significantly to enhance provincial, national and international tourism opportunities;
- Employment opportunities are created through eco-tourism in the park;
- A unique set of tourism assets are provided and these optimize the Recreational Opportunity Spectrum in the province;
- Contributes to local, regional and national economies through eco-tourism.

#### **Cultural values**

- HiP has a rich archaeological history with sites dating from the early Stone Age through to the late Iron Age;
- The park is internationally renowned for its Zulu heritage and is a repository of sacred Zulu sites.

## 2. ADMINISTRATIVE AND LEGAL FRAMEWORK

### 2.1 Institutional arrangements

#### HiP management authority

Ezemvelo KwaZulu-Natal Wildlife is the management authority of HiP and is responsible and accountable to the provincial MEC and the Premier ensuring coordination of matters affecting HiP through provincial departments, local and district municipalities.

#### Land claims and co-management

Since 1996 three land claims have been registered in HiP.

**Table 1: Land claims in HiP (See Map 3)**

Area	Size	Claimant	Status
The Corridor Game Reserve	24100 ha	Mpukunyoni and Hlabisa Communities under the Corridor of Hope Community Trust	This claim was settled on 8 June 2008 and a Co-Management Agreement was signed.
Section of iMfolozi near Cengeni Gate and including Okhukho loop	4000 ha	Zungu or Okhukho Community	In process of settlement.
Section next to Cengeni Gate	4000 ha	Mlaba or kwaXimba Community	In process of settlement.

A co-management structure was formed, involving all the landowner community of the claim that is settled and the management authority, where a co-management agreement was negotiated. The land-use will not change and Ezemvelo KZN Wildlife will continue managing the entire HiP including the restored or claimed land according to the co-management agreements.

#### Legislation guiding administration of HiP

It is important to note that Hluhluwe-iMfolozi Park is a Protected Area in terms of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003 [NEMPAA]). In terms of this Act, any conflicts with other legislation must be dealt with in accordance with Section 7 of NEMPAA. In essence it stipulates that where a provision of NEMPAA specifically concerns the management or development of protected areas, and there is conflict with other national legislation, the relevant section of NEMPAA prevails.

The operational administration and management of the park is subject to certain key statutes. Managers must familiarize themselves with the purpose and contents of these statutes as well as their subsequent amendments and regulations. Many of these statutes can be downloaded from the following SA Government Documents internet website: <http://www.info.gov.za/>.



Ezemvelo KZN Wildlife protected area regulations are enforced in accordance with Section 15 of the Nature Conservation Ordinance, 1974 (Act No.15 of 1974) read together with the KwaZulu-Natal Nature Conservation Management Act, 1997 (Act No. 9 of 1997).

***See Appendix 1 – List of legislation affecting the management of HiP and Appendix 16 – Ezemvelo KZN Wildlife policies***

***Regional planning context***

In terms of the principles of cooperative governance set out in the Constitution of South Africa, the different spheres of government are required to coordinate their actions with one another. In terms of the conservation objectives of a protected area, this is an important aspect in ensuring that appropriate land uses are applied in the areas around a protected area, as they may influence the operation of the protected area and the ecological functioning within it. On this basis, it is important to ensure that local government planning mechanisms such as integrated development plans (IDPs) and spatial development frameworks (SDFs) are aligned with the conservation objectives and principles of protected areas within their jurisdiction.

It is important that Ezemvelo KZN Wildlife, in particular the managers of HiP, work closely with the municipalities in further developing these spatial plans. The focus of these efforts must be to ensure that inappropriate land uses, which may lead to impacts in the park, are discouraged in the buffer areas and in areas identified as national or provincial priorities for protected area expansion around the park. The park falls within the uMkhanyakude District Municipality.

In terms of the National Environmental Management Act (No.107 of 1998) environmental impact assessment (EIA) Regulations, various activities require environmental authorisation before they may commence. In addition, in terms of Regulation RN.546, Listing Notice No.3, there are a number of activities that require environmental approval specifically as a result of their proximity to a protected area. The implication of this is that if any of the activities listed in Appendix D are proposed in the park, or within five kilometres of it, they will be subject to either a basic assessment or a full scoping and EIA process. A number of general activities and those proposed for either tourism development or operational management within the park or its buffer areas will thus require environmental authorisation.

***Table 2: Municipalities bordering HiP:***

<b>UMkhanyakude</b>	Hlabisa	KZ274
	Big 5 False Bay	KZ273 (small portion)
<b>Zululand</b>	Ulundi	KZ266
	Nongoma	KZ265
<b>uThungulu</b>	Ntambanana	KZ283
	Mbonambi	KZ281

***See Map 2 – Location and municipal boundaries of HiP***

***Declaration status of HiP***

The following is a summary of the history of proclamations of the various components of the park:

Hluhluwe Game Reserve was first proclaimed as the “Hluhluur” Valley Reserve by Zululand Government Notice No12, gazetted on April, 1895 and subsequently as the Hluhluwe Game Reserve on April 1897 and Government Notice (Zululand) 16 of 1897.

The Corridor was known by this name because it constituted a corridor zone between the Hluhluwe Game Reserve and the then Umfolozi Game Reserve through which the road from Mtubatuba to Nongoma passes. It was formally proclaimed as the Corridor Game Reserve on 21 July 1989 (Notice No. 35 of 1989).

Umfolozi Game Reserve was first proclaimed as the Umfolozi Junction Reserve by Zululand Government Notice.12, gazetted on April 30,1895 and subsequently as the Umfolozi Game Reserve on April 27,1897, in terms of G.N. (2) No. 16 of 1897. Subsequent amendments were detailed in the following proclamations:

G.N. 322/07 dated 4 June 1907  
P.N. 74/16 dated 12 April 1916  
P.N. 57/17 dated 7 March 1917  
P.N. 147/20 dated 12 May 1920  
P.N. 231/20 dated 13 August 1920  
P.N. 15/30 dated 15 January 1930  
P.N. 140/39 dated 6 April 1939  
P.N. 131/41 dated 17 April 1941  
P.N. 53/62 dated 16 August 1962

The current fenced boundary is also the proclaimed boundary with the following exceptions:

- The portion of boundary where the eastern boundary of the Native Reserve No. 11; No. 7638 meets the middle of the White Umfolozi River (Nqolothi river crossing); thence along the middle of the White Umfolozi river, to the point where the White Umfolozi River becomes the boundary of the Okuku Reserve No.14376 (Mhlokokazane).
- The portion of the boundary from the point where the Black Umfolozi River becomes the boundary of the Okuku Reserve No. 14376 (Nqutshine) thence in an easterly direction along the middle of the Black Umfolozi River to the junction of the Mona river with the Black Umfolozi River.

***See Map 1 - Declared boundary of HiP and Appendix 2 Government notice for declaration of HiP.***

#### **2.4 Local agreements, leases, servitude arrangements and MoU's**

The formal documentation and maintenance of all local agreements, leases, servitude arrangements and MoU's concerning HiP must be undertaken to promote transparency and good governance. All such agreements must be scrutinized by the Manager: Ezemvelo KZN Wildlife Legal Services for direction, prior to any Ezemvelo member signing such documents.

The HiP Manager/s must be familiar with the content of such authorised documents and must ensure that there is compliance with the conditions contained therein. Copies of all documentation must also be filed manually and digitally at the HiP management and regional management offices for easy reference. These copies must be updated in accordance with any authorised amendments.

***See Appendix 3 - List of local agreements, leases, servitude arrangements and MoU's.***

## **2.5 Broadening conservation land use management and buffer zone management in areas surrounding HiP**

### **Buffer areas**

It is desirable for the intensity of land use to decrease closer to a protected area. In terms of the National Environmental Management Act (No.107 of 1998) environmental impact assessment (EIA) Regulations, various activities require environmental authorisation before they may commence. In addition, in terms of Regulation RN.546, Listing Notice No.3, there are a number of activities that require environmental approval *specifically* as a result of their proximity to a protected area. The implication of this is that if any of the activities listed in Appendix D are proposed in the nature reserve / park, or within five/ ten kilometres of it, they will be subject to either a basic assessment or a full scoping and EIA process. A number of general activities and those proposed for either tourism development or operational management within the nature reserve or its buffer areas will thus require environmental authorisation.

In terms of the principles of cooperative governance set out in the Constitution of South Africa, the different spheres of government are required to coordinate their actions with one another. In terms of the conservation objectives of a protected area, this is an important aspect in ensuring that appropriate land uses are applied in the areas around a protected area, as they may influence the operation of the protected area and the ecological functioning within it. On this basis, it is important to ensure that local government planning mechanisms such as integrated development plans (IDPs) and spatial development frameworks (SDFs) are aligned with the conservation objectives and principles of protected areas within their jurisdiction.

It is important that Ezemvelo KZN Wildlife, in particular the managers of HiP, work closely with the municipalities in further developing these spatial plans. The focus of these efforts must be to ensure that inappropriate land uses, which may lead to impacts in the park, are discouraged in the buffer areas and in areas identified as national or provincial priorities for protected area expansion around the park.

HiP is effectively an “island” surrounded by a sea of development. The objective for broadening conservation land use in areas surrounding HiP is to establish compatible (buffer) zones around the core Protected Area. This may take on various forms including Community Conservation Areas, Biosphere Reserves, and game farms. Co-operative agreements must be identified and developed with neighbours in order to enhance the ecological processes and viability of biodiversity in HiP. These agreements must enhance the financial and existence value of the asset to the land owner and provide for informed and coordinated sustainable management of the asset. Assistance for these projects must be on a cost-recovery basis and must encourage public participation. Scientific, technical and monitoring capacity of the management body must be maintained at a high level by regular communication and assistance where required.

Investigations have been undertaken to determine whether it might be possible to link the park to other major protected areas such as the iSimangaliso Wetland Park, through corridors of co-operation, with the consent and support of private and communal land-owners, where migratory species could resume at least some seasonal movements. According to the Ezemvelo KZN Wildlife Biodiversity Sector Plan for Zululand District Municipality (2010), the maintenance of connectivity is essential to a number of movement-related ecological processes, including species migrations, seasonal and altitudinal dispersal, and range displacement in response to climate change. Three corridors have been identified through Nongoma, linking HiP and other important conservation areas in the adjacent district to critically important areas in the Zululand District Municipality. The

corridors have also been aligned to cater for wild dog migrations, critically important species, and critical linkages into areas adjacent to the District.

The KwaZulu-Natal Protected Area Expansion Plan also identifies areas around the borders of HiP as priorities for protected area expansion. The park forms a key hub in creating a connected protected area system. Many areas around the nature reserve are characterised by high levels of irreplaceability, largely due to losses of natural habitat within the grassland biome and the individual vegetation types in which they occur. Land identified as a priority for protected area expansion may be incorporated into HiP through land acquisition, or it may be statutorily protected through stewardship agreements, established with individual landowners.

Priority areas that have been identified include:

- Ntambanana (Obuka initiative)
- Ntambanana (Mthethwa initiative)
- Mpembeni Community Conservation Area (CCA)
- Ngolotshe CCA
- Ezibayeni CCA
- Ximba CCA
- Mdletsheni Triangle/ Eco-tourism Project
- Ophathe iMfolozi

Opportunities may arise that will enable the establishment of new formal protected areas or other conservation management areas on land bordering or in vicinity of HiP in collaboration and co-operation with the relevant communities and landowners. This is likely to contribute to the Ezemvelo conservation planning targets through more effective natural and cultural heritage conservation. Indirectly, new tourism opportunities could also develop with the resulting socio-economic benefits.

All Ezemvelo KZN Wildlife officials associated with HiP must remain sensitive to these opportunities and ready to engage with the relevant role-players, assisting them with the most appropriate options for establishing conservation areas. This may be in the form of conservancies, private, community or local authority protected areas, contractual protected areas, public open space or even incorporation of land into HiP in so doing the extent of core protected areas within KZN will be increased.

### 3. BACKGROUND

#### 3.1 *Origin of the name*

The present name is a portmanteau word derived from the names of the original two protected areas.

##### **Hluhluwe**

UmHluhluwe is the isiZulu name for the plant *Dalbergia armata*. This plant is a common, armed woody climber up to 15 cm, in diameter, growing in coastal forest, wooded kloofs and on river banks. The stem and branches bear long, sharp, stout spines 5-10 cm long. The Zulu people use the plant to make a muzzle to fix around the noses of calves when being weaned, to discourage suckling.

##### **iMfolozi**

iMfolozi is an abbreviation of the isiZulu words "Umfula Wulazi" which means "River of Fibre". It was so named because both the White and Black Umfolozi Rivers had a number of large sycamore fig trees growing on the banks, especially at the confluence. The bark from the trees is used for making sewing fibre "uluzi".

#### 3.2 *Location and extent*

The park falls in the KwaZulu-Natal Province of South Africa and lies some 20 km northwest of Mtubatuba, at the junction of the coastal plain and the foothills of the KwaZulu-Natal interior, between 27° 59' 55" and 28° 26' 00"S, and between 31° 41' 40" and 32° 09' 10"E. HiP has an altitude range from 70 m above sea level to approximately 580 m above sea level at the highest point in the north. The park consists of the following sections with a total size of 94984 hectares:

**Table 3: HiP section size and proclamation date**

Section	Size	Percentage of HiP	Original Proclamation
Hluhluwe Game Reserve	25 633 ha	26.98%	1895
iMfolozi Game Reserve	47 753 ha	50.27%	1895
The Corridor Reserve	21598.225 ha	22.73%	1989

**See Map 2 - Location and municipal boundaries of HiP**

#### 3.3 *Previous land use*

People have lived in and around the park since the early Stone Age through to the late Iron Age including San and Nguni tribes from the Middle Ages. In more recent history the rise of the Zulu nation played out across the Zululand landscape. Evidence from this period still exists in the form of kraals, burial and smelting sites.

During the Stone Age, the Khoisan exploited most environmental resources at their disposal. These early hunter gatherers, living in the valleys and hills of HiP probably followed the seasonal movements of animals between the uplands and lowlands where they left behind stone tools, many of which have survived to be located and recorded by archaeologists.

Between 200 and 300 AD, archaeological evidence reveals that people with a very different lifestyle and technology began entering Zululand. They kept domesticated animals such as cattle, sheep, goats and dogs, practised agriculture and possessed knowledge of smelting, metalworking and ceramics. Seeking out the richer soils for their crops, these early farmers soon moved inland along the valleys of the larger rivers such as the Hluhluwe and Umfolozi Rivers, where important archaeological sites now bear testimony to this early settlement. These people of the Iron Age were ancestors to the Nguni speaking communities, which now inhabit south-eastern Africa.

Iron Age farmers probably used an agricultural system known as 'swiddering' in which small fields were cleared in woodlands or forests, the wood and branches burnt to provide rich nutrients for growing crops. After a few seasons, the plot was abandoned to allow the trees and shrubs to grow again. Clearly, such a system would have had a profound effect on the vegetation and it is likely that many of the woodlands and savannas in HiP are not pristine plant communities, but are areas which were once cleared of agriculture and are now slowly returning to a condition typical of many thousands of years ago.

The western part of iMfolozi and the higher-lying Corridor were populated up to the time of the Anglo-Zulu War in 1879, although there is evidence of inter-tribal conflict, and periods when the area was not occupied. The lower-lying areas were unsuitable for occupation because of malaria and the presence of tsetse fly. Extensive use was made of the animal populations occurring in the area, and it is recorded that Shaka established a private hunting ground between the Black and White Umfolozi Rivers, where the remains of hunting pits are still visible near the confluence of these rivers.

### **3.4 Conservation history**

The influx of hunters in the 1800's had a significant impact on the fauna of the area and ultimately the destruction of wildlife, particularly concerns over white rhino, prompted the proclamation of the park. Many species, including both rhino species and elephant, had been reduced to the verge of local extinction by the end of the nineteenth century. The number of white rhinos was probably less than 100, and most of these were in Zululand, in what is now HiP. The act of shooting six white rhino in 1894 by a white hunter caused an outcry, which finally resulted in the proclamation by the Zululand Colonial Government of five reserved areas in 1895. These included Umdletshe, St Lucia (now included in the iSimangaliso Wetland Park World Heritage Site), Hluhluur Valley (now Hluhluwe Game Reserve - HGR, within HiP) and Umfolozi Junction (now iMfolozi Game Reserve - iGR, within HiP). The Corridor, which is now included in HiP, was not part of these original proclamations (Pringle 1982). In 1905 Hlabisa was proclaimed and incorporated what today is the Corridor Game Reserve (or the area between HGR and iGR) and extended east to the shores of Lake St. Lucia. Today HiP consists of three areas, the two reserves set aside in 1895 as sanctuaries for wild animals and officially proclaimed in 1897 as game reserves and the Corridor Game Reserve linking the two (proclaimed in 1989).

From 1895 to 1903, Southern Africa was ravaged by a severe outbreak of rinderpest which took a massive toll on wildlife and also reduced the occurrence of nagana (caused by trypanosomes carried by tsetse flies). After the rinderpest epidemic, nagana never returned to the eastern parts of the Transvaal Lowveld, but in Zululand, the tsetse fly's recovery followed that of the game populations. By 1907 the occurrence of nagana had reached its former levels. In the early 1900's settlement and cattle farming in the area increased and nagana became a problem for farmers who applied political pressure on the authorities to take action to reduce nagana. Concern regarding the spread of tsetse fly led to the removal of people and cattle populations in the Corridor area by the veterinary authorities. The main wagon routes traversed the reserve and due

to the presence of tsetse fly, oxen were killed. Subsequently the area was de-proclaimed in 1907. Demands were made to eradicate the wildlife, thought to be the carriers of the disease. Despite evidence that the solution to the tsetse problem was not to destroy the wildlife (Pringle, *ibid.*), the authorities in both Zululand and elsewhere in southern Africa embarked on campaigns between 1907 and 1929 to slaughter large numbers of the larger mammals, in the hope of depriving the tsetse fly of its major food source.

In the intervening period, a series of de-proclamations of the reserves when control of the area reverted to the veterinary authorities, accompanied by vegetation clearing were made in order to intensify the anti-tsetse campaign. It is estimated that more than 100 000 head of game were needlessly slaughtered in this period (Brooks & Macdonald, 1983), although other references estimate the number to have been significantly higher.

In 1909 the Natal and Zululand Game Protection Society was formed in order to protect wildlife, encourage introduction of game, effect the destruction of vermin and look at legislation regulating game reserves. In 1911 the informed medical fraternity proposed that the answer did not lie in the destruction of game; however this fell on deaf ears. In 1913 the onslaught started afresh with the outlawing of kudu, reedbuck, bushbuck and steenbuck within 1 km (later 4 km's) of certain transport routes. Various initiatives, promulgated by the Division of Veterinary Education and Research in 1916, were implemented to eliminate wildlife inside and outside of the reserves. The resultant effect was a dispersal of game into new areas and thus spread of the disease into previously unaffected areas. The killings of 1916 were a 'preliminary warm up' and in 1917 Operation Game Extermination started in earnest.

A nagana research centre was set up in 1925 on the southern boundary of Umfolozi and groundbreaking studies on the life cycle of the tsetse fly were carried out. In 1926 the Chief of Entomology at the nagana research centre maintained that the removal of game was the only solution and the Umfolozi Junction Reserve was de-proclaimed. The park was again proclaimed in 1929 in an effort to isolate the fly so that a concentrated attack could be attempted against it.

During 1930 research led to the development of an improved Harris Fly Trap which successfully trapped 7 299 992 flies in 1000 traps in the first year. In 1932 Umfolozi was officially handed over to the Department of Veterinary Services. The Harris project was stepped up and expanded into Hluhluwe and Mkuzi. Over the coming years the number of traps increased from the initial 1000 traps to eventually 8900 traps (1937) in Umfolozi and a combined total of 26000 traps in Umfolozi, Hluhluwe and Mkuzi. Numbers of flies being caught dropped steadily from top score of 7 million flies from 487 traps to 57000 flies from 8900 traps.

The second nagana campaign took place from 1949-1952 when over 10 000 km<sup>2</sup> were sprayed with BHF containing DDT in and around the area which, in 1952, resulted in a reduction of tsetse flies to the point where authorities declared the war on tsetse's won. The Natal Parks Board (now Ezemvelo) was responsible for the area since 1952.

During 1990 an outbreak of trypanosomiasis in cattle occurred in areas surrounding Hluhluwe Game Reserve. This outbreak was dealt with differently to the initial 1900 outbreak and efforts were concentrated around treatment and the dipping of sick cattle. After two years the outbreak was brought under control (Kappmeier *et al* 1998). Subsequently various research projects investigating the tsetse fly and nagana outbreaks in the area has contributed to a better understanding of the disease and its control methods.

The first visitor camp was built at Hilltop in 1934 and since that time has played a prominent role in influencing political decision making and facilitating the opportunity for the public to enjoy and learn about wildlife and nature conservation. In 1958-59, a portion of the iGR was zoned as wilderness area by resolution of the Board (i.e. by administrative means, not by proclamation). The record of the first wilderness area in Umfolozi Game Reserve is found in the eleventh annual, April 1958 – March 1959, of the Natal Parks Board which states; “Some 12 150 hectares were set aside by the board as a wilderness area, in which all forms of motor traffic are prohibited, and only rangers, or visitors on foot accompanied by a ranger, are permitted to enter” (Geddes-Page, 1979, 240). This was the first wilderness area on the African Continent. Its demarcation played and continue to play an important role in the maintenance of a state of naturalness of the park (Player, 1972), as well as creating educational opportunities. In 1959 the first members of the public were allowed to participate on a Wilderness Trail, prior to this it was regarded as absolutely out of the question.

In the early 1960's, “Operation White Rhino” (Player *ibid.*) was implemented. From less than 100 individuals, the park now has an approximate population of 2300, with re-introductions of over 4500 animals having taken place from HiP. The rhino population is now recognized as a globally important population by the IUCN. During the introduction and removal of many herbivore, mega-herbivore and carnivores into and from the park, a significant contribution to the knowledge base of drugs used to immobilize wild animals as well as game capture techniques were made.

Over the years there have been active partnerships with external tertiary institutions to undertake research relevant to management. Recommendations based on research conducted within HiP have been integrated into local management decisions and interventions and at the national and international level, have also influenced the understanding of savannah ecology and conservation.

### **3.5 Climate**

HiP has a coastally modified climate with much of the variability in local weather being related to topography. Annual rainfall is strongly seasonal with most rain falling between October and March. At the longer time scale there is evidence for an 18-year cycle of wet and dry years: nine wet years followed by nine dry years. The probability of an above or below average rainfall year being followed by another above or below average rainfall year is close to 50%, implying that it is not possible to predict the rainfall from one year to the next. Within the park the mean annual rainfall ranges from 985 mm in the high altitude regions in the north to 650 mm in the low-lying western areas. The coefficient of variation for long term data for Egodeni (HGR) is 27%, while for Mpila (iGR) it is greater at 34%.

Annual temperatures range from  $\pm 13$  °C to  $\pm 35$  °C and are also strongly influenced by altitude. Frosts are rare and hail storms occur one to three times per year. Thunderstorms are a common feature of the summer rainfall season and lightning strikes occur in densities of approximately five ground-flashes per square kilometre per year. These strikes were probably the main source of ignition of fire in the region before significant human habitation occurred.

The prevailing winds, which are generally light to moderate, blow in both directions aligned along a general north-south axis. The influence of the coast is felt through north-easterly to easterly winds which bring moisture laden air and mists in the summer season, while drier westerly winds are experienced during winter. The southerly winds are the main rain-bearing winds. The autumn and winter winds tend to be dry and have a strong evaporative effect on the vegetation, particularly on the herbaceous grass layer, and enhance its general flammability from June onwards.



### **3.6 Topography, geology and soils**

In HiP the higher altitude hilltops are gentle and rolling and these feed into steeper more deeply incised valleys which bottom out in the undulating lowlands carrying the larger Umfolozi Rivers and their flood plains. Although there is reasonable geological diversity underlying this topography, it is very limited in extent and most of the park is underlain by fairly uniform sandstones and shales.

A tilt of the African continent about 120 million years ago, and again one million years ago, of about one degree eastward, caused what was previously a gently rolling landscape to become progressively more elevated. In Zululand this resulted in the development of steep slopes and the rapid increase in relief in a westward direction. HiP lies on the east flank of the Natal Monocline and is characterised by three land surfaces from the Meiocene, Pleiocene and Quaternary ages.

The topography of the area includes steep broken landscapes, rolling hills and valleys dominated by an eastward sloping monocline with undulating lowlands rising into steeper uplands in the west and spanning an altitudinal range of 540 m. Regions characterised by steep, broken landscapes include the area north of the Hluhluwe River, especially in the west and north west; the Seme area; some areas between the Corridor Road and the Black Umfolozi River; the Mpila region; the extreme west of iGR and parts of the region south of the White Umfolozi River. The remaining areas of the Corridor are characterised by more gently undulating landscapes. The remainder of iMfolozi is characterised by very gently undulating landscapes, which are broken intermittently by relatively high isolated, outcrops.

The general geological structure of the region of KwaZulu-Natal is expressed in HiP and is characterised by intense fracturing and faulting which occurred during both the attempted Gondwana break-up (180 million years ago) and the final drifting (140 million years ago). There is an approximate 20° eastward dip of all strata resulting in the older rocks being exposed in the western regions. The stratigraphic composition of the park comprises 13 geological formations as well as recent deposits of soil and alluvium.

The oldest formation, the Nseleni Gneiss, forms the basement granite for the region. The age of these rocks is in the region of 3200 million years and unlike the younger basement rocks found further south these rocks are part of the Archaean nucleus (or kaapvaal craton) which underlies much of northern and eastern southern Africa. This rock is visible to the west of the Nzimane River (Tshempofu) in HGR.

The Natal Group Sandstone overlies the Nseleni Gneiss in the region and is thought to be about 450 million years old. The outcrops in HGR (Mphanzakazi and Matshemhlope) and iGR (Madlozi) are the northern most exposures of this group. The Natal Group tends to form rolling hills and weathering results in well-drained sandy soils.

Overlying the Natal Group Sandstone is material from the Dwyka Formation, commonly referred to locally as the Dwyka tillites. Originally deposited by glacier, this rock is approximately 300 million years old. Examples of the rock can be seen at the crossing of the Nzimane River (Hippo Pools) where glacial striations show that there was a south-westerly movement of the ice.

Ecca Group rocks, including the Pietermaritzburg, Vryheid and Volksrust formations overlie the Dwyka formation. These rocks, of approximately 280 million years old, form by far the most dominant surface geology in the park. The Pietermaritzburg formation, consisting of fairly uniform mudstones and shales, can be seen near the Maphumulo area in HGR but extends in a disrupted strip toward the south as far as the Corridor Road.

The Vryheid formation is the most widespread and common rock in HiP and consists mainly of sandstones, shales and siltstones. These rocks are exposed and visible on the western cliffs of Ungalonde in HGR and at Mphafa in iGR. The Volksrust formation overlies the Vryheid formation but is not well exposed in HiP. The last two formations are those in which most of the coal deposits in the area are found.

The Ntabene formation ( $\pm$  200 million years old), overlies the Volksrust formation and is visible in restricted areas in the north east of HGR. Rocks of this group are represented by fine to medium grained sandstones. The Nyoks formation consisting of fine grained sandstones and mudstones, interspersed in the upper layers by calcareous nodules, is the next layer in a succession that represents the sediments of rivers meandering in an environment of increasingly arid conditions about 200 million years ago. In more arid conditions the next formation, the Clarens Formation, was formed by aeolian deposition. This is a thin small formation only represented in the northern reaches of HGR.

On top of these sedimentary rocks, and at the time of the attempted break up of Gondwanaland, a basaltic layer (the Sabi River Basalt Formation) was deposited ( $\pm$  180 million years ago). These basalts are part of the continental basalt flood and are clearly visible in the Manzibomvu River in HGR. They are the original materials for the rich black soils found in the area. The feeders to this rock type are found throughout HiP in the form of dykes and sills and are responsible for much of the dolerite found in the park.

Virtually indistinguishable from the Sabi formation dolerites are the dolerites of the Rooi Rand Dyke Swarm. This formation is largely responsible for the north-south trending dykes in HiP and the high less eroded ridges of HGR. The ageing of this rock is similar to that of the Sabi River Basalt.

The most recent hard rock in the park is represented by the fault breccias resulting from the fracturing and re-cementing of faulted rock. Percolating water often carries the material that results in the cementing of the fractured particles. As quartz is very resistant to erosion, it is often common in this rock type e.g. Mgwanxa in HGR.

The position of the park on a scarp implies that there will be erosion zones. These are noticeable particularly where there have been areas of more intense cultivation in the past or areas of human habitation. Fortunately the park is of a size where there are also areas of deposition and thus deep bottom soils. The areas of most dynamic soil movement are in the two Umfolozi Rivers and the two tributaries of the Hluhluwe River (the Mansiya and Nzimane Rivers) where the impact of external hydrological factors is resulting in considerable silt deposition. Soil forming processes are ongoing and there is the continuous introduction of soils into the system. However, from a regional topographical perspective, the park is situated in an area where there is likely to be relatively high erosion as well. The rate of erosion is directly related to the degree of ground cover on the soil and this must be borne in mind when managing the system. Periodic heavy grazing and denudation of the soils in some areas is likely to be a part of the natural functioning of the system.

The relatively varied climate, geology and topography have resulted in a wide variety of soil types in HiP. Three principal soil associations, which are related to the topography, are present in the park. The soils have been classified into three main associations based on topographic position. Soils of the upland association occur on hilltops, hill slopes and debris slopes. These are usually stony, shallow (< 50 cm) leached and have low moisture storing capacity. During the dry season plants may experience severe moisture stress. The soils are derived *in situ* and closely resemble the parent rock. Five soils were identified on the Pliocene surfaces and include; the Williamson,

Arcadia, Springfield, Mispah and Kiaora series. The upland and midslope soils of HGR are predominantly Hutton and Shortlands (deep phase), and Glenrosa, Mispah, Mayo and Milkwood (shallow phase). In many instances dolerite was found to be the major pedogenic substrate, giving rise to soil forms high in clay content.

Bottomland soil associations occur in localities where runoff water drains away slowly, or binds to accumulate in valley bottoms. The soils are from one to several meters deep, and are generally illuviated which results in the accumulation of many large carbonate nodules (diameter 2-3 cm) in the B-horizon. In contrast to the soils of the upland association these soils are highly fertile. Generally stones are rare, but easily erodible. B-horizon is hard and often almost impermeable to plant roots. These soils have a high moisture storage capacity, and may remain fairly moist during the rainless periods in summer, but are dry during the winter season. Eight soil series were described in bottomlands and include: van Rensburg, Sun Valley, Doveton, Makatini and Shorrocks. The major bottomland soils in HGR are; Oakleaf, Valsrivier, Fernwood, Bonheim and Inhock (all deep phase). Melanic A-horizon were found generally north of the Hluhluwe River mainly as a result of geological and drainage factors.

***See Map 4 - Soils of HiP.***

### **3.7 Hydrology**

HiP is trisected by three main watercourses, the White Umfolozi River, the Black Umfolozi River and the Hluhluwe River with its main tributaries the Mansiya, the Manzibomvu and the Nzimane Rivers.

The White Umfolozi River, with its source near to the town of Vryheid, has the largest catchment and flows through iGR in a predominantly west-east direction. The Black Umfolozi River has its origins east of Vryheid and flows through iGR from north-west to south-east. The confluence of the two rivers is at Siyembeni on the eastern boundary of iGR after which the river is known as the Umfolozi River. The ecological status of this river is moderately to largely modified. The substantial flood plain of this river system is of considerable importance for fish conservation, as it contains a number of large pans, which are linked to the river in times of flood.

The Hluhluwe River has its origins to the west of the park in the hills surrounding Hlabisa. It flows from here in a largely north-east direction to Maphumulo, the point where it exits the reserve and enters the Hluhluwe Dam. When the dam is full, the headwaters back up into HGR. From the Hluhluwe Dam the river drains into False Bay of Lake St Lucia. The ecological status of this river is moderately to largely modified.

The catchments of two rivers, the Nyalazi River in iGR and the Manzamnyama in HGR are wholly contained within the park and as such are not impacted by upstream land uses other than conducted by park management. The Nyalazi River is entirely contained in quarternary sub-catchment W32G.

Most of the smaller rivers and streams in the park, including the Nyalazi and the Manzamnyama Rivers are non-perennial and only the three main rivers generally have water throughout the year.

The status of most of these rivers has declined significantly in the stretches above and below the park, due to human-induced environmental degradation. As indicated, the ecological status of all the rivers in the park (according to Kleynhans, 1996 and 1999) is largely significantly below satisfactory, to the detriment of the ecological integrity as well as dependent aquatic biodiversity.

Both water quality and regularity of flow have deteriorated significantly in recent years, as a result of the non-sustainable land uses and increased abstraction upstream of the park.

Permanent water bodies are represented by numerous seasonal and permanent pans distributed throughout the park such as the eMgqizweni and Dlabe Pans south of the White Umfolozi (in iGR) and Hidli Vlei (in HGR). Some of these pans are fairly large and will only dry out after an extended dry season while others are only a few metres across. There are also a number of small perennial springs and seepage lines in HiP.

### **3.8 Vegetation**

#### **Indigenous vegetation**

HiP falls in the savannah biome of Southern Africa (Rutherford and Westfall, 1986), in the southern extremity of the Maputaland-Pondoland Region Biodiversity Hotspot. The vegetation of HiP may in some respects be considered to be atypical with respect to the bulk of savannah vegetation as it occupies a narrow strip along the coastal margin. Of the total area of savannah found within protected areas in KwaZulu-Natal, 60% is contained within the park. In HiP there are  $\pm 300$  tree and  $\pm 150$  grass species.

There are a number of distinct communities in the park including fire-driven communities, herbivore-driven communities and climate-driven communities. The fire maintained, open grassland is found on the ridge tops in HGR. The transition zone between this and the savannah grasslands, which are being encroached by *Acacias* and *Dichrostachys cinerea*, is very abrupt. The moist hilltops and gullies in the north also contain scarp forest. A large percentage of the park comprises savannah, which ranges from open fire-maintained grasslands through open woodlands to densely encroaching woodlands, thicket and closed woodlands as well as grazing lawns maintained by white rhino. Most of the streams are fringed by riverine woodlands except for the two Umfolozi Rivers where the gallery fig forests dominated by *Ficus sycamorus* were removed by the Cyclone Domoina floods in 1984. There is however evidence of recruitment of substantial numbers of riparian plant species.

The vegetation communities in HiP are diverse in terms of species composition, structural and functional diversity, life history strategies and stability. Grass, tree and forb diversities are high and communities differ across environmental gradients (grazing pressure, fire, rainfall and altitude). Vegetation classifications can take place at varying scales. At the broadest classification scale the vegetation in HiP has been divided into Zululand Thorn Veld (Veld Type 6; a form of Coastal Tropical Forest; Acocks 1953, traditionally quoted as being 30% of the park in the north), and low veld (Veld Type 10; Tropical Bush and Savannah, traditionally quoted as being 60% of the park). These two communities correspond closely to Mucina *et al.* (2005) types Zululand Sourveld and Zululand Lowveld. Grassveld, scarp forest, vleis, wetlands and riverine forests make up the balance of the vegetation community percentages within the park; however these percentages may not reflect the current situation. The higher altitude forests (and grasslands) are largely confined to the less eroded basement granites with higher rainfall while the low lying riverine and wetland communities closely follow the eroded water courses and flood plains in the low lying valleys (Whateley and Porter, 1975). On less eroded plains and ridges between rivers there is predominantly savannah vegetation ranging from open grassland to closed *Acacia* and broad-leaved woodlands.

The following sub-vegetation communities are recognised by the C-plan for which HiP is fulfilling conservation targets: Coast Scarp Forests, Interior Lowveld, Zululand Thornveld, Hlabisa Moist

Lowland Tall Grassveld, Interior Lowveld, Mkuze Valley Lowveld, Dry Zululand Thornveld, Moist Zululand Thornveld and Dry Lowland Tall Grassveld.

Between 1975 and 1979 the first vegetation mapping exercise covering the whole of HiP including the Corridor was conducted by Whateley & Porter (1979 & 1983). These classifications represent the most detailed descriptions of vegetation communities within the park. A comparative vegetation mapping exercise using the Whateley and Porter classification and methods is currently underway and will provide a solid basis for assessing vegetation change through time in the park. The mapping process will take place on a ten year interval.

**See Appendix 4 - Whateley and Porter's classification of vegetation communities in HiP and Map 5 - Vegetation of HiP.**

One trend that is certain is that since the proclamation of the park there has been an increase in woody species communities in many areas. Provisional research indicates that increased CO<sup>2</sup> levels may be responsible for bush encroachment. This trend is threatening grassveld and savannah communities, replacing them with broad-leaf, unpalatable, thicket species such as *Euclea*. Recent surveys of the Coast Scarp Forest have revealed that these forests have unique species assemblages. Further phytosociological studies are needed to resolve all the forest communities.

Table 4 indicate plant species protected by national legislation in terms of NEMBA. Park managers must familiarize themselves with listed activities specified for these species in the TOPS regulations. It is not only species that has formal protection status that are of conservation importance and additional conservation targets for species of importance in HiP is set out in Section 4.5.

**Table 4: Protected plant species in HiP**

Species	TOPS status
<i>Encephalartos natalensis</i> (Natal Giant Cycad)	Protected
<i>Stangeria eriopus</i> (Stangeria)	Protected
<i>Warburgia salutaris</i> (Pepper Bark Tree)	Endangered

#### Alien and invasive vegetation

Alien and invasive species have the following negative impacts on areas of natural vegetation:

- Displace indigenous plants and animals,
- Increase the severity or intensity of fire,
- Consume more water than indigenous vegetation and cause loss of water in catchment areas,
- Cause obstruction, erosion and increase flood damage.

Alien invasive species are one of the biggest threats to the biodiversity of HiP. The tropical moist climate of the area is conducive to alien plant invasions. Currently there are over 63 invasive alien plant species within HiP.

**See Appendix 5 – Alien plant species in HiP.**

Significant infestations of *Chromolaena odorata* (spread by wind) in HiP prompted an intensive management intervention to control this plant through the Ezemvelo KZN Wildlife developed alien invasive species control program. Since 2003 a considerably greater investment has been made in the control of alien plant species in HiP. It is imperative that this investment continues in order to

ensure the threat of alien invasions is controlled and minimised. It is envisaged that this needs to be an ongoing management intervention to prevent the further spread of these plants from both inside and outside the park.

According to te Beest (2010), the level of invasion of *C. odorata* differs significantly between the various habitat types. In the savanna systems it forms monospecific stands, in other habitats it grows interspersed with native vegetation and in other habitat types it barely persists. This study indicates that woodlands (which are the dominating habitat type in HiP) are more susceptible to invasion than grasslands, causing a source-sink dynamic with continual re-invasion from woodland to grassland.

*C. odorata* occurs mainly in HGR on mesic soils and in 2001 more than 20% of HGR was covered with dense infestations (Howison 2009a in te Beest 2010). Invaded areas are currently under active mechanical and chemical control through a Department of the Environment and Agriculture project which also provides employment and skills transfer opportunities to people from the surrounding communities.

### **3.9 Wildlife**

HiP is one of the most important protected areas in the province for the conservation of the fauna of the southern extremity of the savannah biome. Its relatively large size, combined with a very diverse abiotic template (geology, soils, altitudinal variation and rainfall gradients) onto which natural disturbance events are super imposed, has resulted in a dynamic diversity of habitat types which in turn support a diversity of animal species. As with the flora component additional conservation targets for species of importance in HiP are set out in Section 4.5.

The current status of species has been indicated and managers must familiarize themselves with the restrictions and conditions stipulated in terms of NEMBA and TOPS for managing these species.

#### **Mammals**

HiP contains the majority of the fauna that were historically present in the area. This is partially the result of re-introductions that have been made during the past half century following local extinctions that took place as a result of the intemperate hunting in Zululand in the nineteenth and twentieth centuries. Threatened species occurring in HiP include wild dog and black rhino. Biannual distance sampling methods on foot using cut line transects and GPS transects are used to determine population trends. Aerial counts are done annually for white rhinos in iMfolozi Game Reserve.

All the African mega-herbivores (black and white rhino, elephant, buffalo, hippo and giraffe), numerous smaller herbivore species and a full compliment of large carnivores (lion, spotted hyena, cheetah, leopard, wild dog and Nile crocodile; Rowe-Rowe 1991, 1992) as well as smaller carnivores (such as several species of mongoose) are currently found in HiP. Species such as black-backed jackal, honey badgers, serval, aardwolf and aardvark are infrequently seen in HiP, although certain of these species may have been uncommon in the area for centuries. Wild dogs were re-introduced in 1980 and 1981 (Rowe-Rowe 1992) and again in 2002 and 2003. Cheetahs were re-introduced post-1966 (Rowe-Rowe 1992) and elephants were introduced in various groups between 1981 and 2000. A threatened species that is known to have declined in HiP since the 1970's is the blue duiker which was common early in the 20<sup>th</sup> century but is now infrequently seen. Other species that have declined in number in recent years include bushbuck, waterbuck, and kudu. The reason for the decline in certain species can be contributed to changes in

vegetation, parasite infestations, the fencing of the park which has impeded historical migration routes and movements in and out of the area, intensive culling and high predation levels.

HiP may be described as “relatively large” in the context of the extent of other savannah protected areas in the province; however, Owen-Smith *et al* (2006) suggests that protected areas less than 1000 km<sup>2</sup> fall below the typical home-range size of elephant, and will thus restrict or prevent wider movement. The extent of HiP must thus be regarded as marginal, rather than optimal for the conservation of elephant, and emphasises the need for some form of management of elephant in the park.

The park is guided by process-based management principles, to ensure that all the necessary regulatory processes are in place, or alternatively simulated, in order to regulate animal populations. These processes include predation, dispersal (removals) and immigration (introductions). In line with the organisation’s policies on the sustainable use of wildlife resources, when feasible and sustainable, herbivore species have been captured and sold on the Ezemvelo annual game auction to other protected areas and private estates throughout the subcontinent. The sustainable provision of game for sale to other land owners has catalysed shifts in land use from domestic livestock to game ranching making game ranching a sustainable and viable land use option.

The fauna forms a key component of the tourism resource base, and the park, is recognized as the flagship tourism destination in the province, for the outstanding opportunities it offers for the viewing of big game, in conjunction with high quality bird watching. Both of these may be done from vehicles or on foot, the latter as part of a wilderness experience.

**Table 5: Status of game populations in HiP:**

Species	Possible reason for decline/ extinction
<b>Species historically present that has become locally extinct.</b>	
<i>Tragelaphus oryx</i> (Eland)	Not previously resident, ticks and disease
<i>Oreotragus oreotragus</i> (Klipspringer)	Unknown
<b>Species that were previously abundant but have been reduced in abundance</b>	
<i>Cephalophus monticola</i> (Blue duiker)	Habitat loss
<i>Redunca arundinum</i> (Common reedbuck)	Suspected habitat change and probably not resident
<i>Redunca fulvorufula</i> (Mountain reedbuck)	Unknown
<i>Kobus ellipsiprymnus</i> (Waterbuck)	Unknown
<i>Tragelaphus scriptus</i> (Bushbuck)	Competition with nyala suggested
<i>Hyaena brunnea</i> (Brown hyena)	Probably not resident
<i>Canis mesomelas</i> (Black-backed jackal)	Disease
<b>Key species that have successfully been re-introduced following local extinctions</b>	
<i>Lycaon pictus</i> (Wild dog)	
<i>Acinonyx jubatus</i> (Cheetah)	
<i>Loxodonta africana</i> (African elephant)	
<i>Panthera leo</i> (Lion)	
<b>Species that have been introduced</b>	
<i>Giraffa camelopardalis</i> (Giraffe)	
<i>Aepyceros melampus</i> (Impala)	
<b>Species whose populations have been supplemented</b>	
<i>Tragelaphus angasii</i> (Nyala)	
<i>Connochaetes taurinus</i> (Blue wildebeest)	

<i>Cephalophus monticola</i> (Blue duiker)	
<i>Canis mesomelas</i> (Black-backed jackal)	
<i>Oreotragus oreotragus</i> (Klipspringer)	

**Table 6: Protected mammal species in HiP:**

Species	TOPS status
<i>Acinonyx jubatus</i> (Cheetah)	Vulnerable
<i>Ceratotherium simum</i> (white rhino)	Protected
<i>Crocuta crocuta</i> (Spotted Hyena)	Protected
<i>Diceros bicornis minor</i> (Black rhino)	Endangered
<i>Loxodonta Africana</i> (Elephant)	Protected
<i>Lycaon pictus</i> (Wild dog)	Endangered
<i>Manis temminckii</i> (Pangolin)	Vulnerable
<i>Mellivora capensis</i> (Honey badger)	Protected
<i>Panthera pardus</i> (Leopard)	Vulnerable
<i>Panthera leo</i> (lion)	Vulnerable
<i>Philantomba monticola</i> (Blue duiker)	Vulnerable

### Invertebrate fauna

HiP has a rich and diverse invertebrate fauna, however, very little is known about their dynamics within the park. The park is the only known locality in the world for at least seven invertebrate species. It is home to at least six other species that are only known from (i.e. that are endemic to) Zululand, and a further seven species and subspecies that are endemic to the Zululand & Maputaland regions of KwaZulu-Natal. In addition, a further seven species and subspecies occurring in the Hluhluwe-iMfolozi Park are endemic to KwaZulu-Natal.

Invertebrate species that are key in the functioning of ecosystems, such as honeybees (pollinators), earthworms (soil engineers) and the rich dung beetle fauna (dung decomposers), are protected within HiP. Much remains to be discovered about the invertebrate species complement of the park, their life histories, interrelationships and contributions to the functioning of its ecosystems.

**Table 7: Important invertebrates in HiP**

Taxon	Distribution	Habitat	Ecological role
<b>Class Gastropoda (Slugs &amp; snails)</b>			
<b>Order Stylommatophora (Terrestrial snails)</b>			
<b>Family Charopidae (Pinwheels and afrodontas)</b>			
<i>Trachycystis aenea</i> (Bronze pinwheel)	Near-KZN	Forest	Fungus & algae feeder
<b>Family Streptaxidae (Hunter snails)</b>			
<i>Gulella aliciae</i> (Alice Burnup's hunter snail)	Zululand-M	Forest & thicket	Predator
<b>Class Oligochaeta (Earthworms)</b>			
<b>Order Oligochaeta (Earthworms)</b>			
<b>Family Microchaetidae (Giant earthworms)</b>			
<i>Microchaetus quaerus</i> (Hluhluwe earthworm)	HiP	Forest stream clearings	Ecosystem engineer & detritivore



<i>Proandricus beddardi</i> (Beddard's earthworm)	Zululand-M	Forest stream clearings & grassland	Ecosystem engineer & detritivore
<i>Tritogenia zuluensis</i> (Large Zululand earthworm)	KZN	Forest & grassland	Ecosystem engineer & detritivore
<b>Class Arachnida (Spiders, scorpions, ticks, mites)</b>			
<b>Order Scorpiones (Scorpions)</b>			
<b>Family Liochelidae (Thin-tailed scorpions)</b>			
<i>Hadogenes zuluanus</i> (Zululand rock scorpion)	Near-KZN	Rocky <i>Acacia</i> savanna	Predator
<b>Class Branchiopoda (Fairy shrimps, water fleas, etc.)</b>			
<b>Order Anostraca</b>			
<b>Family Streptocephalidae</b>			
<i>Streptocephalus bourquinii</i> (Bourquin's fairy shrimp)	KZN	Temporary freshwater pools	Suspension feeder

## Fish

Because of the deteriorating conditions beyond its boundaries, HiP plays a key role in the conservation of the 26 fish species that have been recorded. Species of importance and with protection status are indicated below.

**Table 8: Important and protected fish species in HiP:**

Species	TOPS status
<i>Barbus argenteus</i> (Rosefin Barb has not been recorded south of the Pongola River (Bourquin 1971) and its presence is unconfirmed)	
<i>Brycinus lateralis</i> (Striped Robber)	Protected
<i>Labeobarbus natalensis</i> (KZN Yellow fish or Scaly endemic to KwaZulu-Natal)	
<i>Microphis fluvianalis</i> (Freshwater Pipefish)	
<i>Myxus capensis</i> (Freshwater Mullet)	

Some separation between catchments is manifest and not all species are present in all rivers. The information available on fish species and their ecology within the ecosystem is limited and conservation efforts pertaining to fish have not been optimal. Further work is required to update the present data and to obtain a better understanding of the importance of the role of the park for fish conservation to guide appropriate management interventions.

## Amphibians

Bourquin *et al.* (1971) state that HiP contains 26 species of amphibians. Frogs are an important part of the ecosystem and serve as bio-indicators due to their sensitivity to environmental factors. As with invertebrates, much remains to be discovered about the amphibian species complement of HiP, their life histories, inter-relationships and contributions to the functioning of its ecosystems. The variety and importance of these fauna are poorly studied and little understood, although the park is considered important for the conservation of this group, as it is for other faunal groups.

**Table 9: Protected amphibians in HiP:**

Species	TOPS status
<i>Pyxicephalus edulis</i> (African Bullfrog)	Protected

## Reptiles

HiP has a rich and diverse suite of reptiles which total 59 species (Bourquin *et al.*, 1971). These range from prominent forms such as the Nile crocodile and the African python, to various inconspicuous, small forms, many of which are hardly known. The variety and importance of this fauna are poorly studied and little understood.

**Table 10: Protected reptile species in HiP:**

Species	TOPS status
<i>Crocodylus niloticus</i> (Nile crocodile)	Protected
<i>Python natalensis</i> (African Rock Python)	Protected

## Birds

HiP is a very important avifaunal sanctuary, known to support over 400 bird species, almost half of the bird species of the entire southern African sub-region. Approximately 67% of the bird species recorded in the province is present in the park (Johnson *et al.*, 1998). An estimated 65 (16%) of the birds present in the park are recognized Red Data species (Barnes, 2000). At least 20 bird species are southern African endemics and seven are near-endemics, as listed by Hockey *et al.* (2005). The considerable diversity of birds present in HiP is directly attributable to its size, as well as the heterogeneity and good condition of habitat types.

Importantly, HiP offers protection to a significant number of large birds with widespread distribution, which are under threat and in decline outside the park (Johnson *et al.*, *ibid*). There have been regular surveys of large raptors in and around HiP, the results of which demonstrate the importance of HiP as a breeding ground and foraging area for these species. All breeding raptors are therefore considered key species for HiP, due to the limited opportunities and suitable breeding sites and foraging areas outside HiP. Johnson *et al.* [*ibid*], Barnes (2000), and Hockey *et al.* (2005) all agree that there are a number of raptor species that are rare outside large protected areas in the country, but which are locally common in HiP and appear to be dependent on it for survival. A recent study (Mander *et al.*, 2007) highlighted significant threats to vulture and raptor species and predicted potential extinctions of a number of species if conservation efforts for these species are not strengthened. The study emphasised that HiP is a key conservation area for a number of these species. Ezemvelo KZN Wildlife has developed a vulture conservation strategy which will assist HiP management in determining priority activities. Species of special conservation status requiring conservation attention in HiP include: Martial Eagle, Crowned Eagle, Bateleur, Tawny Eagle, White-backed Vulture, Lappet-faced Vulture, White-headed Vulture and African Grass-Owl. Ground Hornbill, Denham's Bustard and Pallid Harrier are present, but in smaller numbers. HiP is one of the most important protected areas in the province for ensuring breeding success of these species.

The African Important Bird Area programme, established by Birdlife International, recognizes HiP as an Important Bird Area of Global Importance (SA 060), in three categories, A1 - regularly holds globally threatened species; A2 -holds a significant component of a group of species whose breeding distributions define an Endemic Bird Area; and A3 -holds a significant component of

biome-restricted species (Johnson *et al.*, 1998). In view of the significance of HiP as an avifaunal sanctuary, it is an important destination for avi-tourism.

Krook (2005) undertook a comparative study of bird populations within HiP and in communal lands adjacent to the park, which showed that bird populations in the communal areas surrounding HiP are experiencing significant anthropogenic pressure, both through habitat modification, but also through hunting and egg harvesting. The average person is estimated to hunt and consume about 50 birds each year, resulting in a very high total annual harvest. These findings are provisional, but indicate that the park is important for the local conservation of birds, and that the peripheral areas are unable to conserve avifaunal species. HiP therefore provides safe refuge for these birds for breeding purposes.

**Table 11: Protected bird species in HiP:**

Species	TOPS status
<i>Ciconia nigra</i> (Black Stork)	Vulnerable
<i>Circaetus fasciolatus</i> (Southern Banded Snake Eagle)	Vulnerable
<i>Ephippiorhynchus senegalensis</i> (Saddle-billed stork)	Endangered
<i>Falco peregrinus</i> (Peregrine falcon)	Vulnerable
<i>Gyps africanus</i> (White-backed Vulture)	Endangered
<i>Polemaetus bellicosus</i> (Martial Eagle)	Vulnerable
<i>Scotopelia peli</i> (Pel's Fishing Owl )	Endangered
<i>Torgos tracheliotus</i> (Lappet faced Vulture)	Endangered
<i>Trionocephs occipitalis</i> (White headed Vulture)	Vulnerable
<i>Terathopius ecaudatus</i> (Bateleur)	Vulnerable
<i>Aquila rapax</i> (Tawny Eagle)	Vulnerable

### 3.10 Cultural heritage

Heritage refers to natural and man-made attractions and HiP has a lot to offer that has conservation, spiritual and cultural significance, such as Nqabaneni Cave. The park also has a variety of heritage resources such as Stone Age rock art, Iron-Age settlements and fossils. Although physical access to all of these resources is not possible, access in terms of informing visitors about their existence and locality could have an add-on appeal to other recreation activities. For example, guided walks can include visits to particular sites, and auto-trails can take advantage of them. Adequate protection measures are required for sites which are accessible to the public.

Cultural heritage and in particular local and traditional knowledge of the people who live in the peripheries of the park (sometimes described as 'living heritage'), inherited from previous generations, presently resides in the oral history and traditional knowledge of local communities, and constitutes an extremely important asset. It encompasses an extensive and intimate knowledge of the physical environment, the plants and animals of Northern KwaZulu-Natal, hunting, tracking and survival skills. It can be observed throughout the whole of HiP, particularly in the western section, that African clans at one time very densely populated the area.

According to Hall (1979) there is evidence of the occupation of the HiP area by early Iron-Age man. Current evidence for Natal suggests that the first Iron-Age communities settled along the coast and in the lower-lying river valleys from 300 AD onwards. Iron smelting was conducted on a wide-spread scale in the river valleys. This suggests a politically centralised nature of settlement during the period prior to the formation of the Zulu nation and the demand for iron goods (Hall,

1979).

### **3.11 Socio-economic context**

HiP lies in a region which is marginalised with respect to its geographic location and rate of government expenditure. This region has a population of approximately 2 million people, growing at approximately 2, 5% per annum and is the most impoverished region in KZN, with 75% of all individuals living in poverty. In excess of 80% of the inhabitants in these areas are economically inactive, in excess of 12% earn less than R12 000 per annum and just over 4,5% earn more than R10 000 per annum. Low levels of education are encountered in these areas with approximately 37% of the population having primary education, slightly over 14% having secondary, 4% with matric and just over 1% having tertiary education.

The area has suffered from a large measure of neglect in the past, resulting in a general lack of proper infrastructure. Roads are bad or non-existent; there is a lack of telephone communications, electrification and water supplies, while the provision of schooling (including school equipment) and other services are generally of a poor standard. The problem, furthermore, seems to lie in the absence of an economic base, with the greater part of the population making a living from subsistence farming and the harvesting of available natural resources. The existing situation is also exacerbated by very high population growth, while growing figures relating to people infected with the HIV virus might also have a serious impact on the future development of the socio-economic environment in the area. The rural communities neighbouring HiP are no exception to this impoverished status, and support their families through engaging in subsistence agriculture (cattle, maize, sugar cane, and vegetables), working for government and community services and providing migrant labour to the industrial areas of Gauteng, Durban and Richards Bay.

HiP offers hundreds of direct job opportunities to local community members as well as numerous eco-tourism related opportunities. The direct job opportunities are mostly linked to the alien plant control project. These include small service centres (Machibini and Hlabisa), accommodation (B&B's), curio markets, shops in the park that are leased out to local business operators and gardens providing vegetables to both the tourist and local market.

The park has a wide variety of accommodation options, from luxurious accommodation at Hilltop Resort, Mpila Resort and various satellite camps. Furthermore, there are several tourist facilities located near HiP providing approximately 1580 beds. These comprise of hotels, bed & breakfast facilities, chalets, game lodges, school camps and camping facilities. Most of these are privately owned and situated on small-holdings and private game-farms within the Hluhluwe district, i.e. north-east of HiP. Whilst the concept of developing tourism facilities on community land and involving communities in the management of these facilities appears to be an emerging trend, there are currently few such ventures operating and most of the tourism facilities in the district around HiP do not have any significant community participation. There are several curio shops selling local handcrafts in the area. Although providing local communities with retail outlets for their own goods, a proportion of the products sold are obtained outside the region. Curio outlets have an interest value in their own right, apart from providing entrepreneurial opportunities for communities. A craft market has been developed at Memorial Gate and at the Centenary Centre.

A major advantage from a tourism and marketing perspective is that HiP is relatively malaria-free as a result of the anti-malaria campaign of the health authorities, especially in comparison to other destinations such as the Kruger National Park where malaria is endemic and preventative medication is mandatory. Another reason for the popularity of the park is its location, an easy

drive from Durban, and on very good roads. Most visitors to the area travel by road and foreign tourists rely on transport provided by car hire or tour companies. Travel arrangement services are poorly developed in the towns of Mtubatuba and Hluhluwe and it is difficult for visitors to hire vehicles. However independent travellers can use the bus services and there are Publicity Associations in both towns which are able to provide assistance to visitors. Air transport services are limited other than King Shaka International in Durban, Richard's Bay Airport and Prince Mangosuthu Buthelezi Airport in Ulundi. The runways at Hluhluwe Town and Mkuzi have been upgraded to take small aircraft. The other airstrip with potential to serve the region is the ex-military airfield at Dukuduku. iGR has a landing strip, but this is only suitable for management purposes.

Tourism<sup>1</sup> KZN research has indicated the following:

- Tourists to SA (6.7 million people) were here for visiting natural attractions (25%), wildlife (25%), culture, historical and heritage (21%), and adventure (7%).
- Foreign tourists to KZN (1.3 million) were here for natural attractions (74%), wildlife (69%), culture, historical and heritage (59%) and adventure (27%). That indicates that one of the main reasons for foreign tourists coming to KZN is the wildlife - the main destination being HiP.
- Twenty five percent of domestic tourists to KZN (13.9 million) travelled to or around KZN for nature reserves.
- Twenty seven percent of the delegates surveyed at ICC conferences during the past year said that they were influenced by the wildlife opportunities to attend the conference in SA, these delegates also noted that safety was their major concern.
- Domestic tourists were overwhelmingly influenced to visit KZN due to word-of-mouth (usually over 80% said this)
- Thirty to thirty five percent visit game or nature reserves, but over 50% of those surveyed are very interested in doing so – (i.e., the potential is there but marketing needs to be sorted out)
- Approximately 25% of domestic tourists visit the Zululand/Elephant Coast areas, between 3 and 5% of these stated specifically that they visited Hluhluwe-iMfolozi (in 2003)
- Foreign visitors noted that they were attracted to KZN due to its wildlife experiences and natural scenery, according to our international tourism consumer surveys.
- Thirty percent of foreign visitors went to nature reserves, but 84% were very interested in going – indicating immense potential awaiting proper marketing campaigns to turn desires into action.
- Between 20 and 30% of foreign visitors went specifically to HiP.
- These visitors noted that safety was a serious concern as was public transport and there were concerns too around cleanliness and poor service.

Two coal deposits are being mined near HiP. On the western side, the Zululand Anthracite Colliery produces high-quality, low-sulphur anthracite. The impact of the colliery on HiP has been reduced because of an effective environmental management plan. To the east of HiP in the Hlabisa district, Somkhele Mine also mines high-quality, low-sulphur anthracite. Currently this operation is extending their mining in a direction away from the park. There are, however, numerous prospecting applications which extend almost completely around iGR (including the area zoned as wilderness) and along certain boundaries of HGR.

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<sup>1</sup> The Worldbank: Nature Tourism, Conservation, and Development in KwaZulu-Natal, South Africa 2003

**Table 12: Census statistics of communities surrounding HiP: Census 2001**

<b>Census statistics indicating where communities surrounding HiP derive income</b>						
<b>Service sector</b>	<b>uMkhanyakude</b>		<b>Zululand</b>		<b>uThungulu</b>	
	<b>Hlabisa</b>	<b>Big 5 False Bay</b>	<b>Ulundi</b>	<b>Nongoma</b>	<b>Ntambanana</b>	<b>Mbonambi</b>
<b>Agriculture, Forestry, Fishing</b>	9.4%	25.94%	3.34%	1.63%	19.68%	24.97%
<b>Community/Social/Personal services</b>	25.66%	20.14%	44.63%	42.9%	9.22%	10.31%
<b>Construction</b>	4.5%	6.69%	4.27%	3.99%	5.31%	4.89%
<b>Electricity, Gas and Water services</b>	0.76%	0.94%	0.48%	0.35%	0.85%	0.37%
<b>Financial / Business</b>	4.29%	4.87%	7.68%	3.66%	3.92%	5.14%
<b>Manufacturing</b>	5.05%	3.96%	2.4%	2.03%	7.81%	9.26%
<b>Mining</b>	0.91%	0.47%	3.47%	2.69%	1.72%	4.23%
<b>Private Household employment</b>	11.28%	5%	8.73%	5.04%	6.74%	10.03%
<b>Transport, Storage, Communication</b>	4.09%	7.34%	3.41%	2.38%	6.26%	5.52%
<b>Wholesale and retail</b>	12.09%	14.73%	9.18%	10.65%	8.62%	9.96%
<b>Other</b>	21.76%	9.94%	12.41%	24.68%	29.87%	15.22

### **3.12 Infrastructure**

The provision of services and infrastructure to HiP's hinterland has improved steadily since 1994. Whilst municipal services are restricted to the towns and villages, many rural homesteads now have access to electricity, cell phone towers, schools, clinics and telephones. The major access routes to HiP are from the N2 national road along the R618 from Mtubatuba, and along the D453 road from the N2 to Memorial Gate. There is also access in the south-west from Ulundi to the park via Cengeni Gate. All roads to the park are tarred.

HiP has a complex road network consisting of primary roads, secondary roads and management tracks. The primary roads are those roads that permit visitors to access game drives, viewpoints and to sample a greater variety of environments/settings within the park. Both primary and secondary roads are accessible to the public, but not all secondary roads are suitable for 44 seater buses. Management tracks are required for the effective execution of protected area management functions and are not open to the public. The possibility does exist for the utilisation of these tracks by visitors in guided tours and night drives, especially in the Corridor area. Use of these tracks is constrained by the protected area zonation and the condition of the track. In

general, HiP has experienced a significant increase in visitors and this has placed pressure on the internal road network.

HiP has approximately 229 km of road (excluding management tracks). Of this network, only the road from Memorial Gate to Mpila via Hilltop is tarred. With over 200 km of gravelled roads, high maintenance costs are being incurred, especially in areas where high traffic volumes are experienced and where the road is susceptible to a higher rate of erosion. The resurfacing of gravel roads requires the quarrying of weathered rock, and these quarries have negative environmental and aesthetic impacts. Research has indicated that tarred roads have a lower environmental impact on adjacent areas than gravel and sand roads. Road segments experiencing high traffic volumes and which accommodate larger vehicles include the road between Memorial Gate and Hilltop and the road from Nyalazi Gate to Mpila. Trails in HiP are restricted to delineated permanent paths for self-guided trails (in Hilltop) and walking areas for guided walks and wilderness trails.

The effective management and conservation of HiP requires a variety of structures. These include administrative buildings, workshops, game capture facilities, ranger outposts and staff housing. Structures built for management purposes are neither accessible nor visible to the public. However, the placement of certain structures, such as staff housing units and workshops have created zones that may not be conducive to future tourist activities, due to noise and visual disruptions.

A variety of electrical sources to meet the energy demands in the park have been developed, owing to the widely distributed and generally isolated nature of the facilities. The park makes use of other energy sources including electrical, gas, solar panels and generators. The various energy sources have different impacts on the environment, which could negatively influence visitor perceptions.

Water infrastructure consists mostly of pumps drawing water directly from the rivers for tourist and management facilities. Rivers have high siltation rates which influence the water quality and renders water extraction difficult. Smaller pumps are maintained for water supplies to field-ranger outposts and entrance gates. In addition, there are a number of facilities which make use of rainwater collection from buildings and some remote facilities where water is transported using tractor and water-trailer. In certain areas, boreholes are used to supply water such as Bhejane Hide and Nyalazi Gate.

Fences are required to protect the integrity of the protected area, and ensure the safety of neighbours, their crops and livestock. There are also veterinary considerations, requiring the separation of wildlife and domestic stock. It is therefore essential that an appropriate fence is maintained which encompasses the whole of HiP.

Most visitor facilities employ french drains and septic tanks. The effective and efficient use of these systems depends on informed visitor use and effective management of the system. Some of the bush camps ablution facilities are served by soak-pits which do not always function at an acceptable level.

Telkom provides HiP with a microwave telecommunication system and with raised lines in places close to the fence (e.g. Hluhluwe Field Staff and Makhamisa Outpost). Internal reticulation in camps is underground. Visitor units do not have their own telephones, but public telephones are situated at the reception areas/offices of the camps. The principal method of communication in the park is by radio, using a number of repeater stations. This ensures that problems, even in remote areas can be handled independently of telephone systems. Radios are used at bushcamps,

bush lodges, on wilderness trails, guided walks and night drives, both to facilitate management, but also to respond to emergencies.

Conservation infrastructure includes the Game Capture Centre close to Centenary Centre consisting of offices, a clinic, capture pens and bomas as well as garages, storerooms and a registered abattoir at iMfolozi Field Staff. There are three entrance gates that cater for visitors. The north entrance via Hluhluwe Town is through Memorial Gate; from Mtubatuba the entrance is via Nyalazi Gate, and from Ulundi in the west it is through Cengeni Gate. The entrance gates serve to register visitors, collect entrance fees and provide information on the park. Gate opening hours vary seasonally and no entry is permitted after gates have closed due to the risk of collisions with wildlife, breakdowns after dark and security risks.

HiP offers a variety of facilities and services to ensure visitor comfort and enjoyment. The facilities and services provided are designed to be compatible with the natural environment of HiP, and to create opportunities for visitors, based on this rich resource. The spectrum of visitors has a variety of needs and expectations.

***See Appendix 6 and Map 6 – Infrastructure of HiP.***



## **4. MISSION STATEMENT, MANAGEMENT OBJECTIVES AND CONSERVATION TARGETS**

### **4.1 Public participation process**

The mission and management objectives for HiP were derived at a Key-stakeholder workshop held in HiP Centenary Centre on 23/11/2006 and 12/6/2008 as part of the HiP Protected Area Management Planning process. Uddi Environmental, Planning & Development Consultants facilitated this workshop on behalf of Ezemvelo. Provision was made for translation into Zulu throughout the workshop. The workshop proceedings have been fully documented to ensure that further critical review of the product can be done in context and with the confidence that a fully integrated process was followed. Key-stakeholders that attended the workshop included government departments, traditional authorities, special interest groups and Ezemvelo KZN Wildlife staff.

The Key-stakeholder Workshop included the following sessions and activities:

- Sharing of information
- Derivation of a mission statement
- Articulation of preliminary management objectives
- Rationalisation of preliminary management objectives
- Prioritisation of management objectives
- Closure and a way forward

The proceedings of the Workshop were advertised for comment in national and regional newspapers and on the Internet through the Ezemvelo website. The mission and management objectives together with the zonation plan and management policies for HiP are all contained in this IMP which provides an integrated management planning framework for the park. The objectives will be operationalised within this framework through Strategic Management and Business Plans. The latter will form the basis from which all management activities in and around HiP are initiated, financed, resourced and monitored.

### **4.2 Mission**

To manage towards a fully functioning natural ecosystem that supports indigenous biodiversity and wildness, through sound conservation management and research excellence and, in so doing, promotes a spirit of public pride in Hluhluwe-iMfolozi Park. This will be achieved in partnership with local communities and other stakeholders to ensure a sustainable and meaningful contribution to the physical, educational, recreational and spiritual needs of people.

### **4.3 Vision**

A consolidated park that is secured and legally protected containing an intact, viable, fully functioning spectrum of ecosystems with a full compliment of species and processes where the ecological integrity is assured. A park which is supported by local and international communities, and which contributes significantly to the economic development of the region, through sound best-practice management and the provision of eco-cultural opportunities, as well as providing sustainable and tangible benefits to people.

#### **4.4 Management objectives (priority ratings in parenthesis)**

- 1.** Restore and maintain all components of indigenous biodiversity and ecosystem function at the appropriate scales given surrounding land use transformation and the confines of the fence **(1)**
- 2.** Ensure that particular conservation attention is given and strategies are implemented to ensure the successful conservation of endangered species and habitats (black rhino, vultures, wild dog, scarp forest, rare plant species and rare habitat types) **(2)**
- 3.** Ensure the control and eradication of alien invasive species, through effective integrated management strategies **(3)**
- 4.** Engage with land claimants to ensure tangible benefits and acceptance of responsibilities and develop strategic partnerships to enable sound management **(4)**
- 5.** Ensure the proclamation and integrity of the iMfolozi Wilderness Area and its related biological and spiritual values **(5)**
- 6.** Develop and implement management strategies for key species and processes required to ensure ecosystem integrity is maintained and potential negative impacts of other biodiversity assets are minimised (e.g. fire management, elephant management and herbivore management) **(6)**
- 7.** Conserve the wildness of the park (sense of place), and control development **(6)**
- 8.** Ensure continued partnership and effective transparent communication with local traditional councils, communities, government, parastatals, non-governmental organisations and other stakeholders **(7)**
- 9.** Provide a range of tourism opportunities that caters to a range of income brackets especially for neighbouring communities within the constraints of the approved CDP **(7)**
- 10.** Ensure that the park and its staff are adequately resourced and trained to achieve all its objectives **(7)**
- 11.** Identify and facilitate, in partnership with adjacent land owners and residents, potential conservation corridors. **(8)**
- 12.** Maintain effective and professional law enforcement to ensure park integrity **(8)**
- 13.** Create a sense of identity within the neighbouring community (specifically amaZulu) with the cultural and historical importance of the park **(9)**
- 14.** Actively promote eco-cultural tourism within the park through service excellence and appropriate marketing **(9)**
- 15.** Contribute to the local economic development through encouragement of local entrepreneurial and employment opportunities associated with the park **(9)**
- 16.** Allow, where appropriate and feasible, sustainable utilisation of natural resources to the benefit of neighbouring communities **(10)**
- 17.** Maintain HiP as a centre of management and scientific research excellence **(10)**
- 18.** Undertake effective interpretive, education and awareness programmes **(11)**
- 19.** Ensure that any development or activity within the park adheres to best environmental practice and is in line with the CDP **(11)**
- 20.** Create an adequate buffer zone, where possible and feasible, in consultation with surrounding communities to reduce conflicts between external and internal management objectives. **(12)**
- 21.** Achieve a high standard of infrastructure development and maintenance thereof **(12)**
- 22.** Develop and maintain effective information management systems **(13)**

#### 4.5 Conservation targets

In order to develop a strategy linked to budget and resources, it is necessary to have specific conservation objectives or 'targets' in conservation planning terms. Monitoring of status relative to these targets will then allow for measuring success of management interventions (and consequent budget and resource adjustments where required), and to trigger management interventions when certain thresholds are reached. This removes the 'monitoring to extinction' problem that has arisen in many organisations.

Apart from the need to monitor the success of implementation of the strategy in terms of achievement of conservation targets, a basic requirement for a systematic approach to conservation planning, impact assessment and protected area management effectiveness assessment is the identification of a clear set of conservation goals for the province, which for operational use needs to be translated into a more specific set of quantitative 'targets'. A key assumption made in the KZN Systematic Conservation Plan in terms of conservation priorities outside the protected area network is that protected areas continue to conserve key species and habitats at the same levels at which they occurred when the plan was developed. Failure to do this will result in an underestimate of conservation requirements outside protected areas and hence the real possibility of provincial conservation objectives and targets not being achieved. It is therefore essential to design and implement management and monitoring strategies to ensure that the park continues to conserve those species and habitats which are important at a provincial, national and international level.

Conservation targets for biodiversity are not easily set, and indeed, conservation managers, scientists, decision makers and politicians have been reluctant to formalise and agree to targets. In reality our understanding of 'how much is enough', in what spatial configuration this must be, what the most critical processes are for the maintenance of biodiversity and how one can conserve these is poor, and debate and research around this topic will continue for some time to come. This information will be continuously updated over time as our knowledge of area, connectivity and other process requirements improves for the conservation of ecosystems, communities and species. However, management has to take place despite these deficiencies so it is necessary to make best use of available information, stating the assumptions and limitations, and to see conservation targets as a set of working hypotheses around which conservation planning and evaluation can take place. Another advantage of developing strategies around targets is that this process serves to highlight the critical knowledge deficits thus guiding future research and monitoring priorities.

Some species that are not contained in the C-plan are also considered important for either their conservation status or the potential impact they might have on other species.

#### **The following species are priorities for conservation in HiP:**

##### **Fauna:**

- *Diceros bicornis minor* (black rhino)
- *Lycaon pictus* (wild dog)
- *Ceratotherium simum simum* (Southern white rhino)
- *Panthera pardus* (leopard)
- *Panthera leo* (lion)
- *Acinonyx jubatus* (cheetah)
- *Crocuta crocuta* (spotted hyena)

### **Invertebrate species:**

- *Allawrencius nodulosus*
- *Allawrencius gladiator*
- *Centrobolus fulgidus* (*Shining millipede*)
- *Allawrencius comple*
- *Doratogonus hoffmani* (*Hofmann's black millipede*)

The park is also a globally recognized Important Bird Area (No. SA 060), which provides sanctuary for globally threatened as well as endemic bird species and has been recognised as a **vitaly important area for the conservation of raptor and vulture species** by providing safe breeding and foraging area for these species which are heavily persecuted outside of protected areas.

### **Flora:**

- *Diospyros glandulifera*
- *Albizia suluensis* (Zulu albizia)
- *Stangeria eriopus* (Stangeria)
- *Warburgia salutaris* (Pepper bark tree)
- *Protea roupelliae* (Silver sugarbush) - edge of distribution
- *Protea caffra* (Common sugarbush) - edge of distribution
- *Adenia natalensis* - possibly extinct
- *Adenia gummifera* (Snake stem adenia) - status unknown
- *Encephalartos natalensis*

There may be additional species but baseline surveys work is lacking. Potential impacts of elephant on certain tree species may elevate the need for conservation targets of these species to be reassessed.

### **Plant communities contributing to provincial targets include:**

- *Eastern Scarp Forest*
- *Zululand Lowveld*
- *Northern Zululand Sourveld*
- *Lowveld Riverine Forest*
- *Subtropical Alluvial Vegetation*
- *Subtropical Freshwater Wetlands*

In addition, there is only a rudimentary understanding of the biology and ecology of many of the species and it is currently assumed that controlling alien plant invasions and applying a shifting mosaic of burns (see Fire Management) is the best strategy to maximize the persistence of these species and vegetation types as well as specific species management plans where appropriate. It is essential to better understand the biology and ecology of these biodiversity features and to design and implement appropriate monitoring and research programmes.

The KZN Systematic Conservation Plan (C-plan) is a spatial representation of the biodiversity importance of specific planning units relative to each other. The classification has been developed by Ezemvelo and is based on the SANBI Vegetation maps. In addition to the elements of national and provincial importance identified in the KZN Systematic Conservation Plan there are species of local concern and/or species that have not yet been incorporated into the KZN Systematic

Conservation Plan but are known to be of national or provincial importance (priority species). Specific conservation targets have been set for these species and in most cases monitoring programmes are implemented to measure status relative to targets and hence audit effectiveness of conservation interventions. It is particularly important to recognize that several species are currently well below target, thus identifying priority interventions. Conservation and monitoring strategies must be developed for all of these conservation target species.

***See Appendix 7 – HiP C - Plan targets.***

## 5. ZONATION

### 5.1 Zonation categories

Zonation within protected areas is an internationally accepted practice for the purpose of effecting management and recreation opportunities. The use of a nationally standardised system of classification which characterises the various zones will ensure that protected area managers and users have a clear indication of the management and recreational opportunities within the various zones.

The Recreational Opportunity Spectrum (ROS) is being used for zoning of the HiP. This system was developed by the United States Forest Service and has been applied by parks in the US and Canada (amongst others). The ROS system enables the protected area to be zoned, in context, according to seven categories. These categories are spread along a continuum, from wilderness to rural recreational development namely: Pristine Wilderness, Primitive Wilderness, Semi-Primitive Wilderness, Semi-Primitive Non-Motorised, Semi-Primitive Motorised, Roaded Natural and Rural. Of the seven categories, the Pristine Wilderness, Primitive Wilderness and Semi-Primitive Wilderness zones fall within the wilderness areas and collectively form the Wilderness Opportunity Spectrum (WOS) within the ROS.

Each category within the WOS and ROS is defined in terms of activity, setting and experience opportunities which guide both the manager and the recreationist. The manager can provide the opportunity for obtaining the experiences that the recreationist expects within a particular category.

The ROS zonation system, with respect to the wilderness area recognises and reflects:

- Sensitive features associated with the reserve (i.e. biophysical, cultural and sense of place),
- Range of existing and potential visitor experiences in and adjacent to wilderness,
- Influence of existing development and use on these features and experiences,
- Opportunities and constraints (biophysical, social or managerial constraints) for use,
- Existing / potential threats to wilderness either within or adjacent to wilderness.

As a result, the final management zonation is a composite of ecological zonation (based on natural and cultural resource sensitivity), sense of place, cultural features, patterns of environmental settings, and existing development and use patterns. The final zonation map is represented as a desired state, i.e. directing management towards a vision for each zone, which reflects and respects the broader conservation and ecotourism objectives for the reserve. A zonation table detailing the boundaries and rationale for each zone, as well as the zone's natural and cultural features supports the zonation map. Biophysical features that are readily located on the ground will be used to demarcate and delineate the zone boundaries.

***See Appendix 8 – Zonation categories of HiP and Map 7 - Zonation of HiP.***

The wilderness area in iGR was the first wilderness zone designated in Africa and has significance in its influence in the wilderness movement in Southern Africa. As a zone within the Hluhluwe-iMfolozi Park, it will be managed to maintain its wilderness character according to accepted international wilderness management principles through the Limits of Acceptable Change process and guided by the Wilderness Area Steering Committee.

ROS has been applied in the iMfolozi Wilderness Area through the Limits of Acceptable Change process. After establishing area issues, concerns as well as differing goals within context of the area's proposed or existing proclamation, LAC explicitly defines the amount of change to be allowed by means of quantitative standards applied to specifically selected ecological and aesthetic indicators. These standards are collaboratively applied to the area after the results of monitoring are reviewed, resulting in the area being zoned in terms of the Recreation Opportunity Spectrum. It also identifies the appropriate management interventions to be applied when the defined acceptable standards within the area are not met. Thereafter, it establishes procedures for monitoring and evaluating management performance.

***See Appendix 9 – LAC process.***

## **5.2 Zonation plan**

The ROS system is being used to divide HiP into sections based on the different categories. The iMfolozi Wilderness Area is comprised of the first 3 categories: Pristine Wilderness Zone, Primitive Wilderness Zone and Semi-Primitive Wilderness Zone.

### **Pristine Wilderness Zone:**

In the context of the iMfolozi, **Pristine** is described as an un-modified area in the most remote parts of the wilderness area. No human-impacted paths are visible. Camping techniques must be the least invasive to wildlife. Only primitive campsites are present and these must not be immediately, if ever, visible outside the park.

### **Primitive Wilderness Zone:**

In the context of the iMfolozi Wilderness Area, Primitive is described as an un-modified area usually not on the periphery of the wilderness area. Semi-permanent fly-camps may be present. There is no sign of impacted human paths outside the fly-camps. Groups are restricted such that encounters would be exceptional. Human habitation within or outside the park is seldom visible.

### **Semi-Primitive Wilderness Zone:**

In the context of the iMfolozi Wilderness Area, Semi-Primitive is described as an un-modified area usually on the periphery of the wilderness area. Impacted human paths are visible and semi-permanent base camps may be present. Although encounters are minimized and group sizes restricted, other people may well be in the area. The area will commonly have views, which would include human habitation outside the wilderness area or park.

The rest of the park will, on completion of the zonation system, consist of Semi-Primitive Motorized Zones and Roded Natural Zones with no Rural Zones within the park. Currently the park north of the wilderness area is zoned in terms of the CDP, which describes areas as "largely unmodified" partially modified" and "modified".

The Wilderness Area Management Plan is currently under revision following a study done by Cryer (2009) on the implementation of an environmental monitoring and management system in the iMfolozi Wilderness Area. Results and suggestions made in this study are currently implemented. Visitors to the wilderness area have access to the area through guided wilderness trails which are done by both Ezemvelo and the Wilderness Leadership School (NGO).

**See Map 7 – Zonation of HiP and Appendix 10 – Standards generated through the LAC process.**

**Table 13: Zonation**

Management objectives (Priority rating in parenthesis)			
5.	Ensure the proclamation and integrity of the iMfolozi Wilderness Area and its related biological and spiritual values <b>(5)</b>		
7.	Conserve the wildness of the park (sense of place), and control development <b>(6)</b>		
19	Ensure that any development or activity within the park adheres to best environmental practice and is in line with the CDP <b>(11)</b>		
Action projects		Responsible	Time frame
5.2.1	Revise the iMfolozi Wilderness Area Management Plan.	Wilderness Steering Committee	Year 1
5.2.2	Motivate for recognition of the iMfolozi Wilderness Area by the IUCN.	Wilderness Steering Committee	Year 1
5.2.3	Ensure direct proclamation of the iMfolozi Wilderness Area under law in terms of NEMPAA Section 26.	Wilderness Steering Committee	Year 2
5.2.4	Update the zonation system for the portion of the park north of the wilderness area and update zonation map. This includes determining the buffer zone requirements as well as permissible activities in other zones in line with the Ezemvelo KZN Wildlife standard zonation system.	HiP Conservation Managers and Eco-advice	Year 1
5.2.5	Ensure that the buffer zone requirements are captured in municipal IDP, SDF and land use schemes.	HiP Conservation Managers	Year 1

**See Appendix 11 – Correlating action projects and management objectives.**



## 6. OPERATIONAL STRATEGIES, INDICATORS OF CONCERN AND ACTION PROJECTS

### 6.1 *Potential threats*

The principal threats to the integrity of HiP, and its biodiversity, are listed below. These are not ranked in any order of priority.

1. Poor planning/ communications with municipal authorities and Traditional Councils resulting in inappropriate development that has the potential to impinge negatively on the park.
2. Uncontrolled tourism and development near the park, or in its peripheries (including settlements, roads, mining and traffic), that has the potential to impact negatively on the physical environment, natural ecosystem functioning, the biota, or on the sense of place of the park and especially of the wilderness area. Growth of settlement on the peripheries, especially in the immediate vicinity of the park, associated with increased land use transformation (reduced opportunities for corridors, increased environmental degradation, disruption of landscape level processes, compromised ecosystem integrity).
3. Poverty within neighbouring communities, leading to non-sustainable land use practices such as over grazing, over burning and unsustainable use of natural resources such as medicinal and food plants on the periphery.
4. Poverty within local communities, leading to poaching and illegal resource use both within the park and its peripheries.
5. Depletion of water supplies, declining water quality and increased silt loads in the river systems.
6. Exotic diseases in domestic animals adjacent to the park such as bovine tuberculosis, parvo virus, distemper and rabies.
7. Proliferation of alien invasive species, especially plants such as *Chromolaena odorata* and *Melia azedarach*; and predation by feral animal species.
8. HIV pandemic negatively impacts on staff retention and socio economic dynamics.
9. Inadequate provision of funds, lack of resources and incapacitated staff to effectively manage the park to accepted norms and standards, as specified according to the provisions of the NEM: Protected Areas Act.
10. High staff turn-over leading to skills attrition and loss of institutional knowledge specific to HiP.
11. The volume of traffic on the Corridor Road is at a level where animal road deaths and poaching are unacceptable.
12. The use of environmentally unfriendly herbicides and pesticides in the control of indigenous diseases (eg. nagana and malaria).
13. Failure of co-management agreements, resulting in community disillusionment and dissatisfaction.
14. Global climate change.
15. Bush encroachment.
16. Wildfire emanating from outside the park an uncontrolled sources or points inside the park.
17. Industrial and other non-sympathetic development such as mining and infrastructural development both in the peripheries and in the park.

18. Crime and political instability or unrest.

19. Large-scale natural phenomena (such as floods at the scale of the Domoina Cyclone).

### Management Effectiveness and pressures and threats

In 2010 Ezemvelo KZN Wildlife conducted management effectiveness assessments for all of its protected areas (Carbutt and Goodman 2010). Management effectiveness assessments consider protected area design, the appropriateness of management systems and processes, and delivery of protected area objectives. Such assessments are intended to enable conservation organisations to refine their conservation strategies, re-allocate budget expenditures, and develop strategic, system-wide responses to the most pervasive threats and management weaknesses (Carbutt and Goodman 2010). They are not performance assessments of individuals but serve to reflect an organisation's proficiency for protected area management as a whole. The score achieved by HiP in 2010 was 64% which is below the Ezemvelo minimum standard of 77% for protected areas.

Some of the issues include low staffing levels at 0.0022 staff per ha and low funding levels R 40.08/ha operational budget and R 311.84 per ha total budget. Other issues highlighted include:

- Buffer zones and compatible land uses
- Adjacent water-use planning does not take into account the objectives of the PA, to the PAs detriment
- Community collaboration and communication

## 6.2 Financial and human resources

### Financial resources

Capital and operational funding for HiP is sourced primarily from the KwaZulu-Natal Provincial Government. Funding is furthermore generated from commercial operations within the park and various external sources. Levels of funding have remained stable over time. The management of the park is dependant on this funding to sustain the required levels of management and maintenance of capital assets, including infrastructure.

***It must be emphasized that without the necessary resources of sufficient funding and human resource capacity the park objectives will not be fully achieved.*** The development of a HiP Business Plan is a priority and must indicate past income and expenditure trends, as well as a five year projection of income and expenditure targets that will allow for effectively achieving the HiP management objectives. In addition, planning to address any budget shortfalls after the annual grants from the KwaZulu-Natal Provincial Government must be accounted for and included in the Business Plan.

**Table 14: Financial management**

Management objectives	
10.	Ensure that the park and its staff are adequately resourced and trained to achieve all it's objectives <b>(7)</b>
Operational strategies	
➤	Financial management must be in accordance with the financial policies of Ezemvelo KZN Wildlife and the Public Finance Management Act No 1 of 1999.

<ul style="list-style-type: none"> <li>➤ The total self-sufficiency of commercial operations within the park is a minimum requirement, while it will be expected that commercial operations must respect the natural and cultural heritage values of HiP.</li> <li>➤ Maintain all assets to best possible standards with resources provided.</li> </ul>			
Indicators of concern			
<ul style="list-style-type: none"> <li>➤ Non-compliance with the financial policies of Ezemvelo and the Public Finance Management Act No 1 of 1999.</li> <li>➤ Increase in internal and external audit queries.</li> <li>➤ Over-expenditure on annual basis of operational budget.</li> <li>➤ Non-achievement of Management Objectives and specific programme targets except due to financial and human capacity constraints.</li> </ul>			
Action projects		Responsibility	Time frame
6.2.1	Develop a realistic five year Business Plan in order to secure funding to effectively support the mission, vision and management objectives for HiP.	Coordinated by the Regional Conservation Coordinator	Year 1
6.2.2	Initiate a study to determine the direct and indirect economic value of the park to the local and regional economy in order to market the park, ensure continued government funding and where appropriate, leverage additional funding from other sources.	Conservation Managers to initiate.	Year 3

**See Appendix 13 – Ezemvelo KZN Wildlife policies.**

### Human resources

The existing human resource structure and capacity is insufficient to fully meet HiP Management Objectives.

**Table 15: Human resource management**

Management objectives	
10.	Ensure that the park and its staff are adequately resourced and trained to achieve all it's objectives <b>(7)</b>
Operational strategies	
<ul style="list-style-type: none"> <li>➤ The staff compliment of HiP will be managed in accordance with the Ezemvelo Human Resource Policies, Basic Conditions of Employment Act No 75 of 1997; Skills Development Act No 97 of 1998; Labour Relations Act No 66 of 1995 and Occupational Health and Safety Act No 85 of 1993 and all other relevant legislation.</li> </ul>	

<ul style="list-style-type: none"> <li>➤ When employment opportunities arise, the HiP Local Board will always be informed.</li> <li>➤ Unskilled labour will be employed from neighbouring communities and the Local Board and landowners informed.</li> <li>➤ Appointments will be made in accordance with the relevant employment legislation (See Appendix 4 for list of relevant legislation), employment policy framework of Ezemvelo and the required experience, skills, proven ability and qualifications of applicants.</li> </ul>			
Indicators of concern			
<ul style="list-style-type: none"> <li>➤ Non-compliance with Human Resource Policies and previously mentioned legislation.</li> <li>➤ Low staff morale.</li> <li>➤ Staff with incorrect or without relevant skills to effectively fulfil functions.</li> <li>➤ Increase in labour complaints from the Department of Labour or through the internal processes.</li> </ul>			
Action projects		Responsibility	Time frame
6.2.3	Align with organizational mentorship and career path programme.	Conservation Manager iGR and HGR	Year1

### 6.3 **Community and stakeholder participation**

Ezemvelo KZN Wildlife encourages community involvement in the management of the park through collaboration with adjoining communities in the following programmes and projects:

#### **Local board**

Community participation in the park is realised, mainly, through a Local Board which is established in terms of Chapter 5 of the KZNNCMA. The **Ezemvelo KZN Wildlife** Policy on Conservation Partnerships provides an operational relationship framework for the park and its Local Board to ensure effective community participation in the management of the park. Currently the HiP Local Board is operational. It is imperative that this forum is supported and continues to exist.

#### **Community levy trust fund**

Communities adjacent to the park benefit from income generated by the park through a community levy paid by visitors. These funds are administered through the Community Trust Fund and provided to communities for development needs as prescribed by Ezemvelo Board Policies.

#### **External funding projects**

Due to insufficient funding for all park operations it is sometimes necessary to look at alternate funding opportunities. HiP can procure external funding for specific park-related projects; priority is given to core projects currently not funded within the operational budget. These extend from monitoring to building maintenance projects.

#### **Land claims**

Three areas in the park are subject to land claims by communities that were historically dispossessed of their land and rights due to historical racially discriminatory laws and practices.

One claim have been settled and title deeds have been handed over under agreement that land use practice shall not change, the other two is still in process. An operational Co-Management Agreement was developed and signed to facilitate the interaction and management of the park into the future.

### **Environmental education**

The Ezemvelo environmental education programme is aimed at creating awareness within communities about the value and sustainable use of biodiversity in KwaZulu-Natal. This programme is called Khwezela and has two sub-programmes, the Biodiversity Environmental Education Programme (BEEP) and Kids and Parks.

BEEP is aimed at creating awareness about the threatened species and their habitats and also to equip the educators with curriculum planning elements and tools to achieve the environmental outcomes of the curriculum as per the requirements of the National Curriculum Statement (NCS).

Kids and Parks is a proactive programme aimed at creating awareness about the value of protected areas and focuses on measures that can be used to prevent further deterioration of biodiversity and our environments. One of the outlets is the Wilderness and Cultural Awareness Programme (WACAP), which focuses on cultural and environmental aspects for children from the local communities.

Environmental education (EE) presentations are also given to other community structures such as traditional councils, interest groups, traditional health practitioners, land claimants and the HiP Local Board. The Sontuli Education Camp is critical in the implementation of all these programmes; however, financial constraints are a serious hindrance to the success of EE in HiP. Environmental education is a function of Ezemvelo wilderness trails and the concession operating trails in the iMfolozi Wilderness Area.

**Table 16: Community and stakeholder participation**

Management objectives	
4.	Engage with land claimants to ensure tangible benefits and acceptance of responsibilities and develop strategic partnerships to enable sound management <b>(4)</b>
8.	Ensure continued partnership and effective transparent communication with local traditional councils, communities, government, parastatals, non-governmental organisations and other stakeholders <b>(7)</b>
11.	Identify and facilitate, in partnership with adjacent land owners and residents, potential conservation corridors. <b>(8)</b>
13.	Create a sense of identity within the neighbouring community (specifically amaZulu) with the cultural and historical importance of the Park <b>(9)</b>

15.	Contribute to the local economic development through encouragement of local entrepreneurial and employment opportunities associated with the Park <b>(9)</b>		
16.	Allow, where appropriate and feasible, sustainable utilisation of natural resources to the benefit of neighbouring communities <b>(10)</b>		
<b>Operational strategies</b>			
<ul style="list-style-type: none"> <li>➤ Management will work collaboratively with institutions, adjacent landowners and stakeholders to improve communication as well as conservation management in and around the park for the benefit of all.</li> <li>➤ Neighbour relations and partnerships must be guided by relevant Ezemvelo Board Policies.</li> <li>➤ Ezemvelo must play an important role in community empowerment and capacity building.</li> <li>➤ Management of the areas owned by communities resulting from settled land claims must be managed in accordance with the co-management agreements signed with the relevant communities.</li> <li>➤ Where possible, projects sourced from external funding must focus on job creation and skills transfer for members from the local community. E.g. Community Guide Project and the Wilderness and Culture Awareness Programme.</li> <li>➤ Promote and support conservation initiatives in adjacent communal/ private land.</li> </ul>			
<b>Indicators of concern</b>			
<ul style="list-style-type: none"> <li>➤ Non Compliance with Ezemvelo policies and national and provincial legislation.</li> <li>➤ Breakdown in relations with the neighbouring communities.</li> </ul>			
<b>Action projects</b>		<b>Responsibility</b>	<b>Time frame</b>
6.3.1	Align with organisational environmental education plan for neighbouring communities, guests and staff that include a specific programme on the importance of protected areas and wilderness areas benefits and values to all sectors of society and build a supportive constituency.	Community Conservation Officer	Year 1
6.3.2	Conduct a study to determine the impact and effectiveness of the Environmental Education Programme.	Environmental Education Officer	Year 2
6.3.3	Investigate and facilitate potential conservation corridors.	Regional Conservation Coordinator through the Biodiversity	Year 1

		Stewardship programme	
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#### 6.4 Security and safety

South Africa is fast becoming a popular tourist destination. Illegal activity and violent crime are, however, on the increase, which poses a significant threat to the tourism industry. HiP is a prime, world-renowned tourist destination which contributes significantly to the regional and local economies as well as to Ezemvelo revenue. It is recognised that the levels of illegal activities within and around the park are a severe threat to the safety of its users and neighbouring communities. One of the major sources of illegal activity threats pertain to organised crime as well as opportunistic criminal activity. Central to effective security management is having appropriately trained and resourced staff that could ensure compliance with the HiP domestic rules and regulations.

**Table 17: Safety and security**

Management objectives	
12.	Maintain effective and professional law enforcement to ensure park integrity (8)
Operational strategies	
<ul style="list-style-type: none"> <li>➤ Comply with Standard Operating Procedures, <b>Ezemvelo KZN Wildlife</b> policies, environmental and other relevant legislation.</li> </ul>	
Indicators of concern	
<ul style="list-style-type: none"> <li>➤ Increased incidents of criminal activity in HiP.</li> <li>➤ Increased incidents of non-compliance by staff or visitors in terms of park and/or organizational rules and regulations.</li> <li>➤ The number of unsuccessful court cases.</li> </ul>	

#### 6.5 Ecological management

Ecological management aims to conserve biodiversity through addressing threats and ensuring the maintenance and/or re-instatement of the ecological processes (considered the main determinants of ecosystem structure and function). A process-based management approach has been implemented and applied in the park since 1983. The intention of this approach is to simulate, reinstate and/or adjust natural ecological processes to the appropriate scale given the confines of a fenced area. This approach stems from the understanding that ecological processes, if operating correctly, will create and maintain biodiversity. However, it is recognised that fences, land transformation and human-induced environmental changes (e.g. climate change) disrupt natural ecological processes. Therefore, where appropriate and feasible, management intervention needs to mitigate these disruptions to ensure ecological processes are operating appropriately. Included in this approach are management strategies aligned to organisational strategies and operational plans for ecological processes and key species.

**See Appendix 12 - Process-based management (Balfour 1999)**

According to Cain *et al.* (2008) ecological management is a collaborative process with maintenance of the long-term ecological integrity as the core value. It is a complex and dynamic process and is most effectively achieved by using an adaptive management system. The principle of adaptive management (Walker, 1998) is a systematic approach where, based on present and often incomplete knowledge of the operation of the system, a clearly defined objective is chosen and the most appropriate management is implemented to achieve this objective. The management procedure is recorded and evaluated and the results are monitored. Because the outcomes of management are not always guaranteed, the results are evaluated against the assumptions on which the management was based. Divergence from the expected results will provide knowledge that enables greater understanding of the system. Adaptive management will be used within the framework of process-based management and making use of the best management practices, local knowledge and scientific understanding available in collaboration with partners and stakeholders.

## Veld management

### Accelerated soil erosion control:

Gradual natural soil erosion processes are an important part of the ecological process within HiP and are responsible for shaping landscapes and soil. Human-induced soil erosion in the park is primarily the result of poor alignment and management of foot paths, management tracks, fence lines and roads as well as the creation of paths by livestock on the periphery of the fence. Old quarry sites/borrow pits and areas that have been cleared of invasive alien vegetation may need rehabilitation, primarily to prevent soil erosion. Accelerated erosion is not acceptable as it represents a valuable loss of resources and it can increase sediment loads into the park's river systems. This also affects water quality to downstream users and must be minimized at all cost.

**Table 18: Accelerated erosion control**

Management objectives	
1.	Restore and maintain all components of indigenous biodiversity and ecosystem function at the appropriate scales given surrounding land use transformation and the confines of the fence <b>(1)</b>
6.	Develop and implement management strategies for key species and processes required to ensure ecosystem integrity is maintained and potential negative impacts of other biodiversity assets are minimised (e.g. fire management, elephant management, herbivore management) <b>(6)</b>
Operational strategies	
<ul style="list-style-type: none"> <li>➤ All management activities must consider and be in line with relevant national, provincial environmental legislation and <b>Ezemvelo KZN Wildlife</b> policies.</li> <li>➤ All human-induced or accelerated erosion must be controlled and minimized through appropriate planning, maintenance of infrastructure and remedial management actions where impacts exist.</li> <li>➤ Control must be implemented on a priority, budget-based level.</li> <li>➤ All human-induced accelerated erosion must be prevented by minimizing human induced</li> </ul>	



<p>disturbances.</p> <ul style="list-style-type: none"> <li>➤ Park management must ultimately rely on adequate vegetation cover rather than artificial structures to minimize soil erosion.</li> <li>➤ The natural ecological function of erosion and soil formation must be maintained at natural levels.</li> <li>➤ Erosion that is threatening rare or endangered species, habitats or infrastructure must be identified and prioritized.</li> </ul>
<b>Indicators of concern</b>
<ul style="list-style-type: none"> <li>➤ Increase in areas where significant soil erosion is visible.</li> <li>➤ Increased damage to infrastructure due to erosion.</li> <li>➤ Increased water runoff due to erosion.</li> <li>➤ Increased loss of basal cover due to erosion.</li> <li>➤ Decrease in water quality as a result of higher sediment loads.</li> </ul>

**Fire management:**

According to Tainton (1999), fire is regarded as a natural factor of Southern Africa and has occurred from time immemorial. Today, fire is widely used in the management of protected areas worldwide. It is recognised that humans and their associated impacts, including fire, were part of natural disturbance processes that contributed to diversity patterns in the savannah system in and around HiP. During drier periods veld has also been set alight periodically by lightning strikes.

Within the context of process-based management and the objective of maintaining biodiversity, the intention of fire management in HiP is to actively manage for a shifting mosaic of differing fire impact and size, thereby creating a diversity of habitats that must ensure the conservation of the biodiversity representative of the area. The mosaic is achieved through managing the spread of fire in the landscape and the conditions under which fires are ignited and burn.

HiP is obligated in terms of the National Veld and Forest Fire Act to be a member of the local Fire Protection Association/s (FPA). In this regard management staff will actively champion the establishment and maintenance of FPA's on and bordering HiP in order to gain the full legal advantages of being a member of the FPA and to promote, where possible, fire management regimes surrounding HiP that would benefit the conservation of biodiversity and ecological processes.

**Table 19: Fire management**

Management objectives	
1.	Restore and maintain all components of indigenous biodiversity and ecosystem function at the appropriate scales given surrounding land use transformation and the confines of the fence (1)
Operational strategies	
<ul style="list-style-type: none"> <li>➤ All management activities must consider and be in line with relevant national and provincial legislation.</li> <li>➤ Fire must be applied in accordance with the objectives of the Fire Management Plan and must be monitored and fed into the HiP database.</li> </ul>	

<ul style="list-style-type: none"> <li>➤ Park management must timeously secure all infrastructure and boundary fences to prevent loss due to fire damage.</li> <li>➤ Fire must be used as a management tool to achieve vegetation and other park objectives with due consideration for negative impacts it could potentially have on soils through accelerated erosion and impact on rare and endangered species and habitats.</li> <li>➤ Process-based management must form the basis of all fire decision-making.</li> <li>➤ All fire records must be maintained as part of the biological monitoring programme.</li> </ul>			
Indicators of concern			
<ul style="list-style-type: none"> <li>➤ Non-compliance with National Veld and Forest Fire Act No 101 of 1998.</li> <li>➤ Increase in civil claims against HiP in terms of fire damage to neighbouring communities and farmers.</li> <li>➤ Increase in damage to internal infrastructure due to inadequate firebreaks.</li> </ul>			
Action projects		Responsibility	Time frame
6.5.1	Compile and implement Fire Management Plan for HiP.	Compile: Eco Advice – Regional Ecologist Implement: Conservation managers	Year 1

### **Vegetation management and alien plant control**

Alien, invasive plant species have been planted or have established themselves within the park over time. They can, to varying degrees impact negatively on water production, the natural environment and biodiversity as well as the natural landscape character of the park. Alien, invasive plants pose a threat by replacing indigenous vegetation communities and by altering habitat characteristics for the indigenous fauna. Furthermore they detract from the naturalness and aesthetic qualities of the landscape.

**Table 20: Vegetation management and alien plant control**

Management objectives	
1.	Restore and maintain all components of indigenous biodiversity and ecosystem function at the appropriate scales given surrounding land use transformation and the confines of the fence <b>(1)</b>
2.	Ensure that particular conservation attention is given and strategies are implemented to ensure the successful conservation of endangered species and habitats (black rhino, vultures, wild dog, scarp forest, rare plant species, and rare habitat types) <b>(2)</b>
6.	Develop and implement management strategies for key species and processes required to ensure ecosystem integrity is maintained and potential negative impacts of other biodiversity assets are minimised (e.g. fire management, elephant management, herbivore

management) (6)			
Operational strategies			
<ul style="list-style-type: none"> <li>➤ The management philosophy is one of process-based management. Vegetation management aims to conserve biodiversity through addressing threats and ensuring the maintenance and or re-instatement of the ecological processes that are considered the main determinants of ecosystem structure and function. Where these processes or regulatory mechanisms have been disrupted and cannot be re-instated, management will attempt to simulate their effects; otherwise management intervention in the system will be minimised.</li> <li>➤ All management activities must consider and be in line with relevant national, provincial legislation and <b>Ezemvelo KZN Wildlife</b> policies.</li> <li>➤ Maintain representative, functioning communities of Zululand thornveld, scarp forest, grasslands and riverine vegetation.</li> <li>➤ Management of vegetation must maintain a diversity of habitats.</li> <li>➤ All management actions affecting vegetation must be monitored, documented and records kept in the park biological database.</li> <li>➤ All invasive species must be managed and monitored in terms of the ten year alien control plan that is currently developed by the Working for Water project in HiP.</li> </ul>			
Indicators of concern			
<ul style="list-style-type: none"> <li>➤ Decrease in the area of intact scarp forest conserved.</li> <li>➤ Increase in area and/or infestation levels of alien and invasive plants.</li> <li>➤ Increase in emerging weeds.</li> </ul>			
Action projects		Responsibility	Time frame
6.5.2	Facilitate a research project to identify indicators for intact scarp forest.	Eco-Advice: regional Ecologist	Year 1

### Wildlife management

Process-based management is applied to HiP with the specific purpose of ensuring multiple species and community survival, without having to manage all species explicitly, but rather managing the processes that create and maintain appropriate habitat/species. Exceptions to this practice are species where national norms and standards exist as well as provincial strategies for particular species. A Biennial game count is undertaken according to scientifically accepted distance sampling method on foot using cut line and GPS transects. This method provides numbers and trends and accounts for variation in vegetation densities. An annual aerial white rhino counts are done for iMfolozi.

**Table 21: Wildlife management**

Management objectives	
1.	Restore and maintain all components of indigenous biodiversity and ecosystem function at the appropriate scales given surrounding land use transformation and

	the confines of the fence <b>(1)</b>		
2.	Ensure that particular conservation attention is given and strategies are implemented to ensure the successful conservation of endangered species and habitats (black rhino, vultures, wild dog, scarp forest, rare plant species, and rare habitat types) <b>(2)</b>		
6.	Develop and implement management strategies for key species and processes required to ensure ecosystem integrity is maintained and potential negative impacts of other biodiversity assets are minimised (e.g. fire management, elephant management, herbivore management) <b>(6)</b>		
<b>Operational strategies</b>			
<ul style="list-style-type: none"> <li>➤ Manage the wildlife populations of HiP according to the process-based management principles.</li> <li>➤ Manage the white and black rhinos and wild dogs in HiP in accordance with the provincial strategies and norms and standards (i.e. Ezemvelo KZN Wildlife strategy for biological management of in KwaZulu-Natal, Ezemvelo KZN Wildlife strategy for the management of Southern white rhino <i>Ceratotherium simum simum</i> in KwaZulu-Natal, Norms and Standards for the Management of African wild dog <i>Lycaon pictus</i> populations in the KwaZulu-Natal Province.</li> <li>➤ Management of important species with a high security risk such as rhinos must align with the park security plan.</li> <li>➤ Re-establish and maintain an indigenous animal community (the historical diversity) of genetically viable populations in which the specificity of the local gene pool is conserved.</li> <li>➤ Management of wildlife must contribute to the meta-population management of species.</li> <li>➤ Monitoring programmes developed for key species must be maintained and documented in the park database.</li> </ul>			
<b>Indicators of concern</b>			
<ul style="list-style-type: none"> <li>➤ Decreased breeding success of white and/or black rhino.</li> <li>➤ Skewed population demographics for priority species.</li> <li>➤ Decreased ecosystem resilience.</li> </ul>			
<b>Action projects</b>		<b>Responsibility</b>	<b>Time frame</b>
6.5.3	Facilitate research project to determine indicators for ecosystem resilience.	Eco-Advice: Regional Ecologist	Year 2
6.5.4	Complete Elephant Management Plan.	Coordinated by Regional Conservation Coordinator with Eco-Advice	Year 1

6.5.5	Compile Predator Management Plan.	Eco-Advice	Year 1
6.5.6	Develop management strategies for herbivore species in line with <b>Ezemvelo KZN Wildlife</b> policies and norms and standards.	Conservation Manager HGR and iGR	Year 1
6.5.7	Review and update the White Rhino Management Plan.	Coordinated by Eco-Advice: Regional Ecologist	Year 2

### **Disease control:**

African wildlife is susceptible to diseases which pose a potential threat to biodiversity with regard to animal population dynamics, heterogeneity and, worse case scenario, a local extinction of species. Two examples are Bovine tuberculosis (Btb) and Rinderpest. Bovine tuberculosis (*Mycobacterium bovis*) is present in HiP and was most likely introduced by domestic cattle sometime during the 1960's. Buffalo are considered to be the primary maintenance host in HiP and to date spill over has occurred into lion, bush pig, baboon and kudu. Rinderpest is presently confined to a small area in North Africa. In contrast, indigenous diseases are those that are uniquely African and African wildlife species have had the opportunity to evolve with these diseases. Examples include Trypanosomiasis and Theileriosis.

The recognition and diagnosis of diseases in free-ranging wildlife is notoriously difficult and remains a challenge to wildlife managers and veterinarians. Diseases such as anthrax and rinderpest, which in the past have resulted in significant game mortalities, and those diseases that are important to the livestock industry, have been well documented. Sporadic reports have been generated on a host of other conditions and diseases in free-ranging wildlife, most of which probably play an insignificant role in a well balanced ecosystem, where local populations are well adapted to their surroundings through natural selection. In the past, disease may have played a regulatory role in such well balanced and large ecosystems, however, these same diseases may become agents of local extinction in smaller and more isolated ecosystems such as HiP. It is imperative, therefore, that where diseases are known to impact directly or indirectly on biodiversity, control programs are put in place, and routine monitoring to pick up other potential disease threats become standard practice.

An ongoing management strategy to reduce the incidence of Bovine tuberculosis in HiP was developed and implemented in 1999. Consideration has already been given to the imposition of a moratorium banning all movement of game species, including black and white rhino from Btb infected areas. Such a moratorium would have significant conservation and financial implications to **Ezemvelo KZN Wildlife** and the importance of the HiP black and white rhino populations for the conservation of rhino in Africa would be reduced. Already certain countries in Africa and on other continents will not allow the importation of rhino from a Btb infected area.

Carnivores, in particular wild dogs, are prone to diseases carried by domestic dogs. Rabies is currently present in epidemic proportions in domestic dogs within KZN. It has zoonotic potential and poses a risk to staff that may be called upon to handle a suspected case. For this reason a

standard operating procedure has been adopted for the handling of suspect rabies cases within and adjacent to protected areas.

**Table 22: Disease control**

Management objectives			
1.	Restore and maintain all components of indigenous biodiversity and ecosystem function at the appropriate scales given surrounding land use transformation and the confines of the fence <b>(1)</b>		
2.	Ensure that particular conservation attention is given and strategies are implemented to ensure the successful conservation of endangered species and habitats (black rhino, vultures, wild dog, scarp forest, rare plant species, and rare habitat types) <b>(2)</b>		
6.	Develop and implement management strategies for key species and processes required to ensure ecosystem integrity is maintained and potential negative impacts of other biodiversity assets are minimised (e.g. fire management, elephant management, herbivore management) <b>(6)</b>		
Operational strategies			
<ul style="list-style-type: none"> <li>➤ Comply with Animal Diseases Act No 35 of 1984 and <b>Ezemvelo KZN Wildlife</b> policies and protocols.</li> <li>➤ The disease surveillance protocol that was implemented in HiP in 1999 must continue.</li> <li>➤ Ensure that disease control, particularly the HiP BtB program, is adequately resourced</li> <li>➤ Comply with the contingency plan in the event of a notifiable diseases being present in or near HiP.</li> </ul>			
Indicators of concern			
<ul style="list-style-type: none"> <li>➤ Increased prevalence of BtB and other notifiable diseases.</li> </ul>			
Action projects		Responsibility	Time frame
6.5.8	Review disease surveillance protocol.	Coordinated by Conservation Manager iGR and HGR	Year 3

### **Damage causing animal control:**

Animals that become a danger or excessive nuisance to persons and property due to either habituation or aberrant behaviours may be destroyed humanely or captured and removed from HiP. This also applies to animals that escape or leave and return periodically and cause damage outside HiP.

To minimize the need to control problem animals, pro-active and preventative measures (e.g. fencing) must be considered a priority, while affected public, visitors or neighbours need to be informed appropriately regarding the relevant animal behaviour and/or dangers. Where the only solution to the problem lies in destroying or capturing animals, the methods decided upon must be with due regard for possible public criticism.

All human / wildlife conflict matters relating to problem animal management (damage causing animals) must be dealt with in terms of the NEMBA Norms and Standards for Management of Human and Wildlife Conflict in SA, and as operationalised by the **Ezemvelo KZN Wildlife** Damage Causing Animal Control Protocol and Guidelines. This is applicable to animals within and outside of the park.

**Table 23: Damage causing animal control**

Management objectives	
8.	Ensure continued partnership and effective transparent communication with local traditional councils, communities, government, parastatals, non-governmental organisations and other stakeholders <b>(7)</b>
12.	Maintain effective and professional law enforcement to ensure park integrity <b>(8)</b>
Operational strategies	
<ul style="list-style-type: none"><li>➤ Damage causing animals must be managed in accordance with relevant legislation, National Norms and Standards and Standard Operating Procedures.</li><li>➤ To minimize the need to control damage causing animals, pro-active and preventative measures will be considered a priority, while affected public or neighbours need to be informed appropriately regarding the relevant animal behaviour and/or dangers.</li><li>➤ Monitoring systems must be maintained of all incidents involving damage causing animals and their outcomes.</li></ul>	
Indicators of concern	
<ul style="list-style-type: none"><li>➤ Increase complaints of damage causing animals effecting neighboring communities.</li><li>➤ Increased levels of destruction of damage causing animals.</li></ul>	

### **Alien animal control:**

Introductions of alien animals to HiP will not be tolerated except:

- as part of culture-based, community-based or management projects; or

- domestic animals and livestock (incl. donkeys and horses) kept for official purposes or privately by staff according to specific rules for each management centre / protected area.

It is critically important that these exceptions do not negatively influence the integrity and sustainability of the park’s ecological processes.

A standardised and equitable HiP policy for keeping domestic animals and livestock is in place including procedures to deal in a consistent manner with alien animals that stray into HiP. This policy clearly addresses:

- Threats to biodiversity conservation as a priority.
- Reducing the numbers of such animals to an absolute minimum.
- Designating areas where these animals must be kept. They must not be allowed to roam or feed in the park (except for official patrol horses when on patrol) or interfere in any way with tourists.
- The proper and hygienic care of these animals.
- Minimum standards (aesthetic acceptability, sizes, neatness and cleanliness) of facilities housing these animals e.g. stable, camps cages etc.

**Table 24: Alien animal control**

Management objectives	
3.	Ensure the control and eradication of alien invasive species, through effective integrated management strategies <b>(3)</b>
Operational strategies	
<ul style="list-style-type: none"> <li>➤ Comply with relevant legislation, <b>Ezemvelo KZN Wildlife</b> policy and Standard Operating Procedures.</li> <li>➤ Prioritize species that negatively impact on indigenous species such as the Common mynah.</li> </ul>	
Indicators of concern	
<ul style="list-style-type: none"> <li>➤ Increased occurrence of alien animals in HiP.</li> <li>➤ Increased incidents of destruction of alien animals in the park.</li> </ul>	

## Hydrology

Rivers within HiP support important biodiversity assets and provide crucial water resources for the fauna of the park. In addition, the area contributes to the greater St. Lucia estuary catchment system and must be managed within this context.

As water demand increases with increasing human activity around the periphery of the park, the threat to water sources flowing into the park as well as water quality (siltation) increase. This has been recognised as an imminent and significant threat that requires attention. Extraction, development and pollution of rivers entering and leaving the park must be minimised.

The catchments of three rivers, the Nyalazi and Mphafa in iMfolozi Game Reserve and the Manzimnyama in Hluhluwe Game Reserve are wholly contained within HiP and as such are not impacted by upstream land uses.



**Table 25: Hydrology**

Management objectives			
1.	Restore and maintain all components of indigenous biodiversity and ecosystem function at the appropriate scales given surrounding land use transformation and the confines of the fence <b>(1)</b>		
2.	Ensure that particular conservation attention is given and strategies are implemented to ensure the successful conservation of endangered species and habitats (black rhino, vultures, wild dog, scarp forest, rare plant species, and rare habitat types) <b>(2)</b>		
6.	Develop and implement management strategies for key species and processes required to ensure ecosystem integrity is maintained and potential negative impacts of other biodiversity assets are minimised (e.g. fire management, elephant management, herbivore management) <b>(6)</b>		
Operational strategies			
<ul style="list-style-type: none"> <li>➤ All management activities must be in line with relevant provincial and national legislation and specifically the National Water Act No 36 of 1998.</li> <li>➤ Natural distributions of wildlife must not be altered by the creation of artificial water bodies.</li> <li>➤ Care must be taken that no management activities and/or infrastructure cause pollution or obstruct the natural flow of any water system.</li> <li>➤ Maintain water systems as far as possible free of human impacts from within as well as outside the park.</li> <li>➤ Environmental education programmes must promote sound conservation and environmentally friendly operations in the communities living upstream.</li> <li>➤ All water bodies / systems must be managed as priority areas for alien plant control.</li> </ul>			
Indicators of concern			
<ul style="list-style-type: none"> <li>➤ Decreased flow of the river systems.</li> <li>➤ Deterioration of water quality through various human impacts.</li> <li>➤ Increased alien plant densities along river systems.</li> </ul>			
Action projects		Responsibility	Time frame
6.5.9	Identify and monitor catchment dynamics in relation to: <ul style="list-style-type: none"> <li>➤ Water quality</li> <li>➤ Increasing water demand: future projections and establishment of ecological reserve for rivers affiliated within the park and outside.</li> </ul>	Eco-Advice: regional Ecologist	Year 3

## Security of natural resources

Illegal activities within HiP and illegal utilisation of the park's natural resources are a real threat and it is assumed that these threats have the potential to increase significantly. It must be noted that the park contains a number of species with high black market value such as vultures, black and white rhino, elephant and *Warburgia*, all of which require stringent effective and professional law enforcement strategies. In order to achieve this, the park has an established security management plan that aims for the protection of all species (fauna and flora) against illegal harvesting. In addition, the plan promotes preventative strategies and aims at enforcing park regulations

**Table 26: Security of natural resources**

Management objectives			
2.	Ensure that particular conservation attention is given and strategies are implemented to ensure the successful conservation of endangered species and habitats (black rhino, vultures, wild dog, scarp forest, rare plant species, and rare habitat types) <b>(2)</b>		
12.	Maintain effective and professional law enforcement to ensure park integrity (8)		
Operational strategies			
<ul style="list-style-type: none"> <li>➤ Park management must carry out its law enforcement mandate to ensure reserve integrity in accordance with the security management plan, relevant legislation and <b>Ezemvelo KZN Wildlife</b> policy.</li> <li>➤ Environmental education and awareness programs must aim to enhance knowledge and reduce illegal resource harvesting by creating an understanding, appreciation and sense of co-ownership of biodiversity assets.</li> <li>➤ All staff performing security related functions must be regularly trained and equipped.</li> </ul>			
Indicators of concern			
<ul style="list-style-type: none"> <li>➤ Increase in illegal resource harvesting in the park.</li> <li>➤ Increase in incursions into the park.</li> </ul>			
Action projects		Responsibility	Time frame
6.5.10	Implement a GPS based patrol system in HiP	Conservation manager iGR and Conservation Manager HGR	Year 1

## Resource utilisation

Requests for extractive use of plant, animal and abiotic resources will be considered provided that such resource use is sustainable, controlled and the natural or cultural heritage conservation management objectives of the park are not compromised. Furthermore, the resource must not

degrade the aesthetic landscape character of HiP and management must have adequate capacity to ensure effective control over the resource utilization without compromising its essential functions.

The iMfolozi Wilderness Areas will serve as a control or 'benchmark' area and therefore no extractive resource utilisation will take place in these areas except for the removal of alien vegetation or alien animals.

Currently limited reed harvesting is taking place on the periphery of the Semi-primitive wilderness area and this will be addressed through the review of the Wilderness management plan.

### **Fauna and Flora, Bioprospecting and Abiotic Resources:**

Extractive resource use must be considered within the framework of, amongst others, Board Policies No's D2.15 as well as D3.12 to D3.19.

Applications must be evaluated in accordance with the above mentioned policies and with due consideration of:

- Any applicable land restitution or other agreements,
- The precautionary principle,
- Ecological and social acceptability,
- Impact on the aesthetic character of the landscape,
- Impact on eco-cultural tourism,
- Sustainable and wise use of the resources,
- Benefit to neighbouring communities,
- Equitable access to the resource,
- That any benefit transaction is acceptable within the PFMA framework,
- That the harvesting operations are effectively controlled and monitored,
- A written agreement stipulating resource price and/or conditions of harvest, and
- Viable alternatives.

### **Bioprospecting**

Requests to collect biological material / samples from HiP will only be considered in accordance with, amongst others, **Ezemvelo KZN Wildlife** Board Policy D2.15 from bona fide South African research institutions until national (NEMBA) and provincial legislation governing bioprospecting is in place.

Bioprospecting activities within the Park must be closely monitored and regulated in terms of present environmental legislation.

### **Abiotic Resources**

The extraction of abiotic resources will not be permitted unless it has direct bearing on achievement of the HiP management objectives and any application for extraction will be reviewed according to applicable legislation.

Road repair gravel is sourced from quarries outside of HiP only and is only used for the maintenance of the present gravel roads. Any extension of the gravel road network is not supported and will not be considered because:

- It increases road maintenance costs,

- It promotes the spread of invasive alien plants within HiP,
- It is aesthetically unacceptable.

**Table 27: Resource utilization - Fauna and flora, bioprospecting and abiotic resources**

Management objectives			
12.	Maintain effective and professional law enforcement to ensure park integrity <b>(8)</b>		
16.	Allow, where appropriate and feasible, sustainable utilisation of natural resources to the benefit of neighbouring communities <b>(10)</b>		
Operational strategies			
<ul style="list-style-type: none"> <li>➤ Resource use will be done in accordance with the Ezemvelo norms and standards, policies, the HiP Resource Use Standard Operational Procedure and the iMfolozi Wilderness Area Management Plan.</li> <li>➤ Applications for bioprospecting will be considered in accordance with national legislation and Ezemvelo Policies.</li> <li>➤ Human use of all natural resources must be done in a sustainable way.</li> <li>➤ All information on applications received and implemented must be monitored, recorded and documented in the park database.</li> </ul>			
Indicators of concern			
<ul style="list-style-type: none"> <li>➤ Increased number of applications approved for resource use.</li> <li>➤ Increase in applications for bioprospecting.</li> </ul>			
Action Projects		Responsibilities	Time frame
6.5.11	Develop HiP Resource Use Operational Management Plan.	Eco-Advice: Regional Ecologist	Year 2

## 6.6 Cultural resource management.

Management of the cultural heritage is guided by the relevant legislation, as well as the Amafa/**Ezemvelo KZN Wildlife** Cooperative Conservation Management of Cultural Heritage Agreement (signed July 2005) and aims to promote the conservation and public appreciation of the cultural heritage in the park.

**Table 28: Cultural resource management**

Management objectives	
13.	Create a sense of identity within the neighbouring community (specifically amaZulu) with the cultural and historical importance of the park <b>(9)</b>
Operational strategies	

<ul style="list-style-type: none"> <li>➤ Cultural resource management must be in line with <b>Ezemvelo KZN Wildlife</b> policies and relevant legislation such as the National Heritage Resources Act No 25 of 1999.</li> <li>➤ Management of these sites will be in accordance with the park zonation.</li> <li>➤ Management must promote conservation, public awareness and appreciation of the HiP cultural resources.</li> </ul>			
Indicators of concern			
<ul style="list-style-type: none"> <li>➤ Loss of cultural heritage resources due to vandalism or other.</li> </ul>			
Action projects		Responsibility	Time frame
6.6.1	Develop, in conjunction with AMAFA, a comprehensive Cultural Heritage Management Plan for the park.	Conservation Manager iGR and HGR	Year 3

## 6.7 Eco-cultural tourism

If eco-tourism is managed wisely, it could provide valuable opportunities for generating revenue for conservation (Aylward & Lutz, 2003). Eco-tourism also provides valuable community upliftment opportunities through job creation, skills transfer, interpretation and education.

**Table 29: Eco-cultural tourism**

Management objectives	
5.	Ensure the proclamation and integrity of the iMfolozi Wilderness Area and its related biological and spiritual values <b>(5)</b>
9.	Provide a range of tourism opportunities that caters to a range of income brackets especially for neighbouring communities within the constraints of the approved CDP <b>(7)</b>
14.	Actively promote Eco-tourism within the park through service excellence and appropriate marketing <b>(9)</b>
Operational strategies	
<ul style="list-style-type: none"> <li>➤ Tourism management in the park must take place within the Concept Development Framework, regional plans, <b>Ezemvelo KZN Wildlife</b> policies, national legislation and the iMfolozi Wilderness Area Management Plan.</li> <li>➤ Eco-tourism activities must be conducted in a manner which minimises impacts on the environment and biodiversity.</li> <li>➤ Promote a consistently high standard of tourism services and facilities.</li> <li>➤ External tourism operators must be managed in accordance with the relevant service level agreements.</li> <li>➤ Enforcement of local regulations for public, residents and service departments must be an</li> </ul>	

ongoing priority.			
Indicators of concern			
<ul style="list-style-type: none"> <li>➤ Increased environmental impact due to tourism activities.</li> <li>➤ Decrease in numbers of tourist visiting the park.</li> <li>➤ Decrease in number of incidents of non-compliance to park rules by tourist operators or guest.</li> </ul>			
Action Projects		Responsibilities	Time frame
6.7.1	Re-assess and update the tourism carrying capacity for HiP.	Conservation Manager to coordinate	Year 2

## 6.8 Environmental interpretation, awareness and education

Environmental interpretation, awareness and education of HiP's natural and cultural resources will be aimed at creating an awareness, understanding and appreciation of the value of these resources as well as an understanding of the relevant legislation and associated policies and protocols among the general public and visitors to the Park.

An environmental awareness and education programme must be developed to pro-actively engage, inform and benefit the park's range of neighbouring communities and visitors. Board Policies D 2.34 (Environmental Education) and D 4.1 (Neighbour Relations) apply. Ideally such programmes must not only be primarily aimed at children, but provision must be made for developing various programmes, applicable to a wide spectrum of ages and education levels.

Programmes for groups and communities from other areas will be accommodated on request whenever possible. The Kids and Parks Programme requires school groups visiting the park, to submit a lesson plan before the visit to qualify for a concession. The visit must also take place during schooling days. Where and whenever possible members of the local community (e.g. community tour guides) must be empowered and used to run appropriate environmental education tours.

**Table 30: Environmental interpretation, awareness and education**

Management objectives	
18.	Undertake effective interpretive, education and awareness programmes <b>(11)</b>
Operational strategies	
<ul style="list-style-type: none"> <li>➤ Environmental interpretation and education of HiP's natural and cultural resources must be in accordance with <b>Ezemvelo KZN Wildlife</b> environmental education programmes.</li> <li>➤ An interpretation programme using signage, displays and information media must be maintained to effectively direct and inform visitors in respect of appropriate natural and cultural features of the area.</li> <li>➤ Apply HiP communication protocol (e.g. guides, Izindunas)</li> </ul>	

Indicators of concern			
<ul style="list-style-type: none"> <li>➤ Increase levels of conflict between HiP and public.</li> <li>➤ Lack of support for HiP from public as a result of misinformation.</li> </ul>			
Action projects		Responsibility	Time frame
6.8.1	Update and expand information media.	Environmental Education Officer	Year 3

## 6.9 Research

The functioning of the ecosystems and vegetation communities that HiP was declared to conserve are presently inadequately understood. Research is necessary to provide information that will assist in ensuring that the natural and cultural heritage management objectives of the park are realised.

**Table 31: Research**

Management objectives	
17.	Maintain HiP as a centre of management and scientific research excellence <b>(10)</b>
22.	Develop and maintain effective information management systems <b>(13)</b>
Operational strategies	
<ul style="list-style-type: none"> <li>➤ Priority will be given to research that provides information and understanding that is of direct benefit to HiP and will guide the management interventions required to achieve the protected area's biodiversity conservation objectives.</li> <li>➤ Partnerships and agreements with appropriate academic and research institutions must be promoted to stimulate and encourage the desired research in the park.</li> <li>➤ All proposals to undertake research within the park must be submitted and evaluated using the procedures outlined in the Guidelines for the Registration and Administration of Research Projects undertaken by or through Ezemvelo KZN Wildlife.</li> <li>➤ Maintain an updated, prioritised park biodiversity research project list.</li> </ul>	
Indicators of concern	
<ul style="list-style-type: none"> <li>➤ Lack of interest from tertiary research institutions to conduct research within the park.</li> <li>➤ Inability to attract researchers to conduct priority research within the park.</li> <li>➤ Skewed ratio between approved applied versus pure academic research projects.</li> </ul>	

## 6.10 Surveillance and Monitoring

Baseline data collection (surveillance) and monitoring (with analysis, evaluation and recommendations) are essential in order to determine whether conservation objectives and targets are being achieved, and to ascertain the effectiveness of management interventions.

Much of this information is required in order to meet the legal reporting requirements of the NEMBA, NEMPAA, and **Ezemvelo KZN Wildlife** Corporate Business Plan.

Due to (a) the stochastic nature of the environment, (b) the effects of long-term climate cycles and change, and (c) the length of time for treatment effects to manifest themselves, it is desirable and necessary to implement long-term baseline collection and monitoring programmes. It is also important to monitor and record all management interventions and their influence on the biophysical environment in order to understand the causes for any biological and environmental changes. The termination of any monitoring programme must be documented.

The **Ecological advice component** is responsible for:

- Designing all biodiversity/biological surveillance programmes (including the data collection, capture and storage procedures) to allow for reporting at the required frequency.
- Designing all biodiversity/biological monitoring programs (at the right precision, accuracy and frequency), undertaking analysis in order to provide information on the success of various management interventions and providing recommendations in order to guide management decision-making as part of an adaptive management approach.
- Biodiversity/biological data management, secure storage, analysis, reporting and regular feedback to management.
- All baseline abiotic and biotic data collected must be collated and stored in databases as well as GIS data layers to assist researchers in the planning of research projects and interpretation of data.
- Undertaking advanced scientific monitoring and data collection.

The **Management component** is responsible for:

- The accurate collection of biodiversity/biological surveillance and monitoring data, data storage and data transfer as agreed with the Ecological Advice component.
- Monitoring the use of natural areas by visitors through Limits of Acceptable Change criteria.
- Monitoring energy and water use by conservation management facilities.
- Monitoring development or land use change in HiP for compliance with set environmental conditions linked to authorisation.

The **Ecotourism and marketing component** is responsible for:

- Monitoring eco-cultural tourism statistics and revenue generation and reporting against revenue targets.
- Monitoring energy and water use by eco-cultural tourism and associated management facilities.



**Table 32: Surveillance and monitoring**

Management objectives	
2.	Ensure that particular conservation attention is given and strategies are implemented to ensure the successful conservation of endangered species and habitats (black rhino, vultures, wild dog, scarp forest, rare plant species, and rare habitat types) <b>(2)</b>
22.	Develop and maintain effective information management systems <b>(13)</b>
Operational strategies	
<ul style="list-style-type: none"> <li>➤ Priority will be given to the monitoring of conservation targets.</li> <li>➤ All biological monitoring data must be collected accurately, archived in the park's biological monitoring database/s and stored on file for reference purposes.</li> <li>➤ Monitoring and reports of alien plant control must be a priority.</li> <li>➤ Estimates of key herbivore species population estimates will be determined through bi-annual line transects.</li> <li>➤ Maintain all biological monitoring and surveillance programmes in the park.</li> </ul>	
Indicators of concern	
<ul style="list-style-type: none"> <li>➤ Lack of an appropriate monitoring and surveillance programme.</li> <li>➤ Lack of baseline data on which management decisions may be based.</li> <li>➤ Incomplete data being sent for data capture and archiving.</li> <li>➤ Increase in complaints from Ecological Advice and/or Management components and/or external researchers regarding the quality of data provided.</li> </ul>	

### 6.11 Infrastructure management

Park management has the mandate to maintain, remove, expand or develop infrastructure within HiP according to the approved Concept Development Plan. The park is completely fenced according to at least the minimum specifications required to contain mega-herbivores, predators and other potentially dangerous game.

**Table 33: Infrastructure management**

Management objectives	
19.	Ensure that any development or activity within the park adheres to best environmental practice and is in line with the CDP <b>(11)</b>
21.	Achieve a high standard of infrastructure development and maintenance thereof <b>(12)</b>
Operational strategies	

- All requirements of the Occupational Health and Safety Act, **Ezemvelo KZN Wildlife** policies and other relevant legislation must be followed.
- Proposals for new development projects must comply with the CDP.
- Adhere to the integrated waste management plan for **Ezemvelo KZN Wildlife**.
- Any developments in the park must be considered with cognisance of the Municipal Integrated Development Plans (IDP's)
- Park managers must liaise with local municipalities and submit input into the IDP's in order to promote sound development practices in areas surrounding the park.
- All infrastructure must be maintained in order to ensure efficient management of the park and to the highest possible standard with cognisance of available resources.
- Maintain a suitable transport network for tourist and management use.
- Maintain an effective radio communication system within the park.

Indicators of concern

- Infrastructure that are in a state of disrepair and are in an unsafe, unsightly and/or unhygienic condition.
- Increased complaints from tourist about the state of visitor facilities.

Action projects		Responsibility	Time frame
6.11.1	Update the HiP Concept Development Plan.	Coordinated by Regional Conservation Coordinator	Year 4
6.11.2	Adopt organisational systems that stipulate the use of environmentally friendly products and energy/ water saving technology.	Conservation Manager HGR and iGR	Year 1

## 7 REVIEW AND AMENDMENT PROCEDURES

### 7.1 *Five-yearly review and amendment procedures*

The HiP IMP will be reviewed every five years with the next review period planned for 2016 to revise and amend the IMP for the following five years, namely 2017 to 2021. If deemed appropriate by the PPC, the review can take place sooner.

The **Ezemvelo KZN Wildlife** Management Planning Steering Committee in collaboration with the Coordinator: Management Planning will give guidance on the extent of public / stakeholder participation required before submitting the amended / updated IMP for approval to the MEC. The extent of the public / stakeholder participation (apart from that undertaken with the Local Board) will depend on the nature and extent of amendments recommended by the relevant HiP PPC.

### 7.2 *Annual review and amendment procedures*

The Park management Committee will convene annually to monitor and evaluate the management plan progress, plan and, if necessary, recommend the re-prioritisation of management activities for the next year. The committee must, as record of these meetings, submit a report to the **Ezemvelo KZN Wildlife** Management Planning Co-ordination Unit which contains the following:

- Any recommended **minor amendments or corrections** to the management plan that do not affect the substance of the Mission, Management Objectives, Zonation;
- The result of an annual evaluation by the Committee of the Management Effectiveness Level achieved for HiP. This must be calculated using the World Bank Protected Area Management Effectiveness Evaluation Tool (Stolton et al., 2007);
- The cumulative number of Action Projects per Management Objective that have been completed, activated or not activated; as well as an indication of progress towards achieving Conservation Targets set in the management plan.

The Park management Committee will also be responsible for the recommendation of any policies, projects and plans that are developed as a result of the implementation of this Protected Area Management Plan or other *ad hoc* projects etc. not covered by the management plan that have operational, financial and human resource or ecological implications (e.g. research projects that have not been identified according to management plan guidelines, or *ad hoc* funding received for the development of unplanned recreational facilities).

**Any proposed significant amendments that are deemed necessary / urgent and that are likely to result in the amendment of the Mission, Management Objectives, Management Policy Framework and Guiding Principles** contained in the HiP Protected Area management Plan must be supported by the Park Management Committee, the Management Planning Steering Committee and BCOMM before being subjected to the appropriate public/stakeholder participation process and before BCOMM recommends that the proposed amended management plan is submitted for authorisation through the **Ezemvelo KZN Wildlife** Board to the MEC.

The **Ezemvelo KZN Wildlife** Management Planning Coordinator must ensure that any minor or significant management plan amendments that are appropriately approved, are duly noted / recorded and that a new digital 'master copy' (Word) version is generated and archived with the

**Ezemvelo KZN Wildlife** Management Planning Co-ordination Unit as well as ensuring that updated 'read only' copies are distributed to the relevant Head Office sections and Regional General Manager who must ensure that the updated 'read only' digital and/or hard copies are distributed to all staff requiring these. The **Ezemvelo KZN Wildlife** Management Coordinator will furthermore be responsible to ensure that website/intranet copies are updated at the same time.

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# APPENDICES

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## Appendix 1

### List of legislation affecting the management of HiP

#### Natural and Cultural Heritage / Resource Management and Development:

- Animals Protection Act, 1962 (Act No. 71 of 1962).
- Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965).
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).
- Constitution of the Republic of South Africa, 1997 (Act No. 108 of 1997).
- Criminal Procedure Act, 1977 (Act No. 51 of 1977).
- Environment Conservation Act, 1989 (Act No. 73 of 1989).
- Forest Act, 1984 (Act No. 122 of 1984).
- Game Theft Act, 1991 (Act No 105 of 1991).
- KwaZulu Animal Protection Act, 1987 (Act No. 4 of 1987)
- KwaZulu Nature Conservation Act, 1975 (Act No. 8 of 1975).
- KwaZulu-Natal Heritage Act, 2008 (Act No. 4 of 2008).
- KwaZulu-Natal Nature Conservation Management Act, 1997 (Act No. 9 of 1997).
- National Environmental Management Act, 1998 (Act No. 107 of 1998).
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).
- National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003).
- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).
- National Forests Act, 1998 (Act No. 84 of 1998).
- National Heritage Resources Act, 1999 (Act No. 25 of 1999).
- National Water Act, 1998 (Act No. 36 of 1998).
- National Water Amendment Act, 1999 (Act No. 45 of 1999)
- National Veld and Forest Fire Act, 1998 (Act No.101 of 1998).
- Nature Conservation Ordinance, 1974 (Act No. 15 of 1974)

#### General Management:

- Development Facilitation Act, 1995 (Act No. 67 of 1995).
- Disaster Management Act, 2002 (Act No. 57 of 2002).
- Fencing Act, 1963 (Act No. 13 of 1963)
- Firearms Control Act, 2000 (Act No. 60 of 2000)
- Fire Brigade Services Act, 1987 (Act No. 99 of 1987).
- KwaZulu-Natal Planning and Development Act, 1998 (Act No. 5 of 1998).
- Intergovernmental Relations Framework Act, 2005 (Act No.13 of 2005).
- Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000).
- Local Government: Municipal Structures Act, 1998 (Act No. 117 of 1998).
- Natal Town Planning Ordinance, 1949 (Act No. 27 of 1949).
- National Building Standards Act, 1977 (Act No. 103 of 1977).
- National Road Traffic Act, 1996 (Act No. 93 of 1996).
- Occupational Health and Safety Act No, 1993 (Act No. 85 of 1993).
- Restitution of Land Rights Act, 1994 (Act No. 22 of 1994).
- State Land Disposal Act, 1961(Act No. 48 of 1961).
- Water Services Act, 1997 (Act No. 108 of 1997).

#### Financial Management:

- Public Finance Management Act, 1999 (Act No. 1 of 1999).



**Human Resource Management.**

- Basic Conditions of Employment Act, 1997 (Act No. 75 of 1997).
- Compensation for Occupational Injuries and Diseases Act, 1993 (Act No. 130 of 1993).
- Employment Equity Act, 1998 (Act No. 55 of 1998).
- Labour Relations Act, 1995 (Act No. 66 of 1995).
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).
- Pension Funds Act, 1956 (Act No. 24 of 1956).
- Skills Development Act, 1998 (Act No. 97 of 1998).
- Skills Development Levies Act, 1999 (Act No. 9 of 1999).
- Unemployment Insurance Act, 2001 (Act No. 63 of 2001).

## Appendix 2

### Government notice for proclamation of HiP

718

The Official Gazette of the Province of Natal

10 Aug

\*+No. 35, 1989

*[English text signed by  
the Administrator]*

### PROCLAMATION

by the Administrator of the Province of Natal

**U**NDER the powers vested in me by section 2(1) of the Nature Conservation Ordinance, 1974 (Ordinance 15 of 1974), I do hereby proclaim, declare and make known that with effect from the date of publication hereof, the property described as the Corridor Reserve No. 14418 situate in the Administrative District of Natal, in extent 21 598,225 ha as shown on approved Surveyor-General Diagram S.G. 4643/62, shall be a game reserve and shall be known as the Corridor Game Reserve.

Given under my hand at Pietermaritzburg, Natal this 21st day of July one thousand nine hundred and eighty-nine.

R. M. CADMAN  
Administrator

\*+No. 35, 1989

*[Nederse tek-  
Administrateur van die Provinsie Natal]*

### PROKLAMASIE

van die Administrateur van die Provinsie Natal

**K**RAGTENS my bevoegdheids ingevolge artikel 2(1) van die Ordinance op Natuurbehouding, 1974 (Ordonnansie 15 van 1974) meer, verklaar en maak ek hierby bekend dat die eiendom op The Corridor Reserve No. 14418 geleë in die Administratiewe Natal, groot 21 598,225 ha soos aangetoon op goedgekeurde S.G. 4643/62 van die Landmeter-generaal, met ingang van die datum hiervan 'n wildtuin is en as die Wildtuin Corridor bekend.

Gegee onder my handtekening te Pietermaritzburg, Natal die 21ste dag van Julie eenduisend nege-honderd nege-en-tegtig.

R. M. C.  
Adm.

\*+No. 36, 1989

*[English text signed by  
the Administrator]*

### PROCLAMATION

by the Administrator of the Province of Natal

**I**N terms of section 282(4) of the Local Authorities Ordinance, 1974 (Ordinance 25 of 1974), I do hereby declare that Mr B. Jago has, with effect from the date of publication hereof, been appointed in the place of Mr L. D. Oosthuizen as a member of the Mandini Town Board for a term of office ending on the day of the quinquennial election in 1993.

Dated at Pietermaritzburg, Natal, this 31st day of July one thousand nine hundred and eighty-nine.

R. M. CADMAN  
Administrator  
13/2/74

\*+No. 36, 1989

*[Engelste tek-  
Administrateur van die Provinsie Natal]*

### PROKLAMASIE

van die Administrateur van die Provinsie Natal

**I**NGEVOLG artikel 282(4) van die Ordinance op Plaas-  
Lede, 1974 (Ordonnansie 25 van 1974), verklaar ek hierby  
Jago met ingang van die publikasiedatum hiervan in die plek  
D. Oosthuizen tot lid van die Dorpsraad van Mandini benoem  
ampstermyn wat op die dag van die vyfjaarlikse verkiesing in 19

Gedateer te Pietermaritzburg, Natal, op hierdie 31ste da  
eenduisend nege-honderd nege-en-tagtig.

R. M. C.  
Adm.

[ZULULAND. No. 12, 1895.]

Government Notice.

HIS Excellency the Governor of Zululand desires it to be notified for general information that Reserved Areas for Game, within the boundaries of which the killing of game will be altogether prohibited, have been established in Zululand.

The Reserved Areas are as hereinafter described :—

1. The range of hills and lagoons bounded on the north and west by the Umfolozi River, and on the east by the Indian Ocean.

2. The country between the Black and White Umfolozi Rivers from the junction of the rivers to the Mandlagaazi footpath.

3. Hluhluwe Valley. A straight line from the highest point of the Zangofe Ridge to the Mpanzakazi Hill; from thence to the present sites of the kraals of Umdundwane, Mantingana, Saziwayo, and Umswazi; from the latter kraal to the nearest point of the Umzinene Stream; thence to the Mbulwana Hill, south of the Hluhluwe River; thence to the Mtolo Hill; from thence in a direct line with the same hill to the Hluhluwe River, and from there to the highest point of the Zangofe Hill.

4. The Umdkletshe Preserve, bounded on the south by the Ingweni Stream, from its source near the Dukumbane Hill, to a point near the Ntambane Hill; from thence in a direct line with the Bumbene Store to the Mungwane Stream; thence up the course of that stream to its source; thence on to the Bombo Range and along its watershed to the Umsundesi River; thence up the course of that river to its source; thence in a straight line to the Bombolo Hills, and thence in a straight line to the source of the Ingweni Stream near the Dukumbane Hill.

5. The country between the Pongola and Umkusi Rivers and the Bombo Mountains, bounded on the east by a line from where the Pongola makes its sharp northern bend to where the Umkusi is joined by the Umhlohlela Stream.

A description of the Reserved Areas will be attached to every license to shoot game. Arrangements are being made for erecting beacons where necessary, and for providing for the efficient patrol of the boundaries.

Holders of licenses to shoot game are warned that the sanctity of the Reserved Areas will be strictly enforced.

The boundaries of the Reserved Areas will be explained, by the Magistrate of the district in which permission to shoot is sought, to any persons who seek permission to shoot in that district.

In the event of any trespass on the Reserved Areas in pursuit of game being brought to the notice of a Magistrate, all permits to shoot granted to the offenders will at once be cancelled, in addition to any penalty to which they may have made themselves liable.

The boundaries of the Reserved Areas have been sketched on a map which may be inspected on application to the Secretary for Zululand.

By His Excellency's command,

W. E. PEACHEY,  
Acting Secretary for Zululand.

Government House, 26th April, 1895.

[ZULULAND, No. 12, 1895.]

Government Notice.

HIS Excellency the Governor of Zululand desires it to be notified for general information that Reserved Areas for Game, within the boundaries of which the killing of game will be altogether prohibited, have been established in Zululand.

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2. The country between the Black and White Umfolozi Rivers from the junction of the rivers to the Mandhlagazi footpath.

3. Hluhluwe Valley. A straight line from the highest point of the Zangofe Ridge to the Mpanzakazi Hill; from thence to the present sites of the kraals of Umdindwane, Mantingana, Saziwayo, and Umswazi; from the latter kraal to the nearest point of the Umzinene Stream; thence to the Mehlwana Hill, south of the Hluhluwe River; thence to the Mtolo Hill; from thence in a direct line with the same hill to the Hluhluwe River, and from there to the highest point of the Zangofe Hill.

4. The Umdhletsho Preserve, bounded on the south by the Ingweni Stream, from its source near the Dukumbane Hill, to a point near the Ntambane Hill; from thence in a direct line with the Bumbone Store to the Mungwane Stream; thence up the course of that stream to its source; thence on to the Bombo Range and along its watershed to the Umsundusi River; thence up the course of that river to its source; thence in a straight line to the Bombolo Hills, and thence in a straight line to the source of the Ingweni Stream near the Dukumbane Hill.

5. The country between the Pongola and Umkusi Rivers and the Bombo Mountains, bounded on the east by a line from where the Pongola makes its sharp northern bend to where the Umkusi is joined by the Umhloblela Stream.

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The boundaries of the Reserved Areas will be explained, by the Magistrate of the district in which permission to shoot is sought, to any persons who seek permission to shoot in that district.

In the event of any trespass on the Reserved Areas in pursuit of game being brought to the notice of a Magistrate, all permits to shoot granted to the offenders will at once be cancelled, in addition to any penalty to which they may have made themselves liable.

The boundaries of the Reserved Areas have been sketched on a map which may be inspected on application to the Secretary for Zululand.

By His Excellency's command,

W. E. PEACHEY,

Acting Secretary for Zululand.

Government House, 26th April, 1895.

### **Appendix 3**

#### **List of local agreements, leases, servitude arrangements and MoU's**

- Co-management agreement
- Eskom servitudes
- Service level agreement for the operation of safari vehicles
- Tour operators contract
- User rights agreements
- MoU with landowners
- Wilderness Leadership School Agreement

**Appendix 4**  
**Whateley and Porter's vegetation communities of HiP**

Vegetation Community	Description
<i>Celtis africana</i> – <i>Harpephyllum caffrum</i> Forest	Occur on the high hills in the north-western section of HGR. It covers extensive areas on south facing slopes and the hills are steep sided and incised by several dry, rocky water courses. The hills rise to 570 m above sea level and these forests provide suitable habitat for a variety of faunal species.
<i>Celtis africana</i> – <i>Euclea schimperi</i> Forest	This forest covers extensive areas in the north and north-east of HGR, small patches are also found in iGR and in the Corridor. The forest is associated mostly with the relatively moister south and south east hillsides. This mixed deciduous-evergreen forest is closely related to the <i>Celtis africana</i> – <i>Harpephyllum caffrum</i> forest but is found on lower altitudes and is a drier form than the first.
<i>Ficus sycamorous</i> – <i>Schotia brachypetala</i> Forest	This community represents a narrow stand of riverine community confined to the banks of the larger rivers and their major tributaries. This community is well utilized by herbivores and is important as a food source in dry months.
<i>Spirostachys africana</i> – <i>Euclea schimperi</i> Riverine Forest	This community occurs throughout HiP as a narrow strip along seasonal water courses.
<i>Spirostachys africana</i> Woodland	This community covers extensive areas in all bottomlands in iGR, particularly in the catchments of seasonal watercourses. It is not found in the Corridor and has limited distribution in HGR in riverine terraces along the Hluhluwe and Nzimane Rivers.
<i>Combretum apiculatum</i> Woodland	The distribution of this community is restricted to the rocky hillsides of iGR. The community is often penetrated by fires which are usually of a high intensity.
<i>Combretum molle</i> Woodland	This community occurs mainly north of the Hluhluwe River on steep rocky slopes. Fire penetrates this community usually during high rainfall seasons.
<i>Euclea divinorum</i> Woodland	The distribution of this community is found on extensive areas on gentle sloping ground in the Hluhluwe River valley. Fires rarely penetrate this community and if it does it is only contained to the marginal areas. The community is mostly found on marginal soils such as Bonheim, Glengazi and Dumasi and both sheet and gulley erosion is commonly found.
<i>Acacia karoo</i> Woodland	Largely confined to the river valleys in the north-eastern section of HGR this community occurs on steep hillsides.

<i>Acacia nilotica</i> Woodland	Extensive areas in the Corridor and HGR is covered by this community mostly south of the Hluhluwe River and below the 300 metre contour. Termitaria with their associated vegetation are a common feature of this community.
<i>Acacia burkei</i> Woodland	The community covers extensive areas in the west of HGR where it occur moderately steep hillsides and flat riverine terraces in the valley bottoms. It also occur in various localities throughout HiP and in iGR is found on low flat ridges at lower altitudes. This community grows on yellow apedal soils which are sandy loam soils.
<i>Acacia gerrardii</i> Woodland	South of the Black Umfolozi River this community covers large gently undulating areas on shales.
<i>Acacia nigrescens</i> Woodland	This community is confined to the catchment areas of the Black and White Umfolozi rivers and cover extensive areas of the iGR. It is almost always found on hillsides with a dolerite substrate. The community also grows on marginalitic soils.
<i>Acacia tortilis</i> Woodland	Confined to the catchments of the Black and White Umfolozi Rivers this community occurs throughout iGR usually on east facing slopes.
<i>Acacia caffra</i> Thicket	This community is found in uplands throughout the area and usually above 300 m on hillsides and ridges throughout the area.
<i>Acacia karoo</i> – <i>Dichrostachys cinerea</i> Induced Thicket	Found throughout the area in steeply undulating hillsides this community occurs at all altitudes particular in the Corridor and HGR. The structure and density of this community is mainly determined by the frequency and intensity of fire. It is well utilized by both grazers and browsers and provide the most important feeding grounds for game after a burn and they are the most frequently burnt areas of the reserve. Because of the role man-made fires play affecting the community the term induced is used to describe this thicket community.
<i>Themedia triandra</i> Grassland	Has a limited distribution occurring only above 300 metres on top of high hills and ridges.
<i>Sporobulus africanus</i> – <i>Cyperus textiles</i> Sedge-Grassland	This community is present on marginalitic soil in valley bottoms in northern HGR.
<i>Acacia davyi</i> Thicket	This is a rare community covering only a few hectares in HGR.

**Appendix 5**  
**Most important alien plant species in HiP**

<p><b>Cara Act No 43 of 1983</b>  <b>Category 1: Plants that must be controlled on land and water surfaces by all land users.</b></p>
<i>Chromolaena odorata</i> (Triffid weed)
<i>Caesalpinia decapetala</i> (Mauritius thorn)
<i>Datura</i> (Thorn Apple)
<i>Lantana camara</i> (Tickberry)
<i>Opuntia spp</i> (Pricly pear)
<i>Sesbania punicea</i> (Red sesbania)
<i>Solanum mauritianum</i> ( Bugweed)
<i>Solanum seaforthianum</i> (Potato creeper)
<p><b>Cara Act No 43 of 1983</b>  <b>Category 2: Plants that can for commercial purposes be kept in demarcated areas. Outside the demarcated areas these plants must be controlled and because of high levels of water consumption the land user needs to acquire a water use licence if used for commercial purposes.</b></p>
<i>Leucaena leucocephala</i> (Leucaena)
<i>Psidium gualava</i> (Guava)
<i>Ricinus communis</i> (Caster – oil plant)
<i>Salix babylonica</i> (Weeping willow)
<p><b>Cara Act No 43 of 1983</b>  <b>Category 3: Plants that are considered to have ornamental value and do not have to be removed by the land user, they must however be kept under control and no new planting may be initiated.</b></p>
<i>Acacia baileyana</i> (Bailey’s wattle)
<i>Melia azedarach</i> (Syringa)
<i>Senna didymobotrya</i> (Peanut Butter Cassia)



**Appendix 6  
Infrastructure in HiP**

<b>Eco-Cultural Tourism Infrastructure</b>	
<b>Gates</b>	
<b>Infrastructure</b>	<b>Description</b>
Memorial Gate	
Nyalazi Gate	
Cengeni Gate	
<b>Visitor Facilities</b>	
<b>iMfolozi</b>	
<b>Infrastructure</b>	<b>Description</b>
Picnic Site Umbombe	
Picnic Site Sontuli	
Centenary Centre	Exhibition Hall, Auditorium, Take Away kiosk, Craft Market,
Mpila Camp	Picnic Site, Curio Shop, 350 m self guided trail
Hide Bhejane	
Hide Mphafa	
Bush Camp Hlatikhulu	8 bed
Bush Camp Gcoyeni	8 bed
Bush Camp Nselweni	
<b>Visitor Facilities</b>	
<b>Hluhluwe</b>	
<b>Infrastructure</b>	<b>Description</b>
Picnic Site Maphumulo	
Picnic Site Siwamakhosikazi	
Hide Thiyeni	
Hilltop	7 x 2 bed chalets, 22 x 4 bed chalets, 18 x 2 bed Rest Huts, 20 x 2 bed non- self catering Rest Huts, Restaurant, Curio Shop, Conference Centre catering for...people,
Bush Lodge Muntulu	8 bed
Bush Lodge Munyawaneni	8 bed
Mthwazi Lodge	1 x 6 bed and 2 bed chalet
<b>Management Infrastructure</b>	
<b>iMfolozi</b>	
Staff Camps	3 Outpost Camps and 9 Pickets Camps
Houses	14
Multi Rooms	2
Squaredavels	3

Pool	1 (5m X 10m)
Fuel Shed	4
Waste Deposit Site	1
Park Home	1
Filter Houses	1
Stables	4
Storerooms	20
Office Block	3 Buildings (6 Rooms)
Predator Boma	1 (52.6m X 53 M)
Buffalo Boma Centenary Centre	1 (39m X 83 M)
<b>Management infrastructure</b>	
<b>Hluhluwe</b>	
Staff Camps	2 Section ranger outpost and 8 field ranger camps, 5 large rondavels, 8 small rondavels, 5 wooden rondavels, 4 tweedy huts
Houses	11 x 3 bedroom, 1 x 2 bedroom, 8 x 1 bedroom, 1 parkhome
Multi rooms	8 x 10 room units, 2 x 8 room units
Storeroom, shed and workshop	1
Vehicle workshop	1 at Hilltop
Research Camps	1
Research Houses	3
Office block	Field staff office 1 x meeting room and 3 offices and 4 offices at the alien plant site.
<b>Bulk Infrastructure</b>	
<b>Infrastructure</b>	<b>Description</b>
Fencing	102 km fence: 2.4 Metre Bonnox Electrified
Roads	27 km Tar Road, 157 km Gravel Road
Waste Management Site	1 Room
Helipad	
Airstrip	1 60m X 950m

**Appendix 7**  
**HiP C - Plan targets**

<b>TAXON NAME</b>	<b>DESCRIPTION</b>	<b>% REQUIRED TARGET LOCATED WITHIN HIP</b>	<b>NOTES</b>
Northern Zululand Sourveld	Vegetation Type	21.84	% OF HISTORIC DISTRIBUTION
Zululand Lowveld	Vegetation Type	52.81	% OF HISTORIC DISTRIBUTION
Eastern Scarp Forests : Northern Zululand Lebombo Scarp Forest	Vegetation Type	42.11	% OF HISTORIC DISTRIBUTION
Lowveld Riverine Forests	Vegetation Type	1.39	% OF HISTORIC DISTRIBUTION
Subtropical Alluvial Vegetation	Vegetation Type	2.30	% OF HISTORIC DISTRIBUTION
Subtropical Freshwater Wetlands	Vegetation Type	7.62	% OF HISTORIC DISTRIBUTION
<i>Albizia suluensis</i>	Plant	2978.00	MORE THAN ADEQUATELY ADDRESSED IN THIS RESERVE
<i>Diospyros glandulifera</i>	Plant	1070.68	MORE THAN ADEQUATELY ADDRESSED IN THIS RESERVE
<i>Warburgia salutaris</i>	Plant	6.67	% OF HISTORIC DISTRIBUTION
<i>Gulella aliciae</i>	Molusc	98.13	% OF HISTORIC DISTRIBUTION
<i>Edouardia conulus</i>	Molusc	71.24	% OF HISTORIC DISTRIBUTION
<i>Gulella genialis</i>	Molusc	736.10	MORE THAN ADEQUATELY ADDRESSED IN THIS RESERVE
<i>Gulella aliciae</i>	Molusc	0.00	KNOWN TO OCCUR HERE, BUT TARGET FULFILLED IN OTHER MORE SUITABLE AREAS
<i>Stagira zuluensis</i>	Cicad	100.00	ALL KNOWN RECORDS FROM THIS LOCALITY : 1 OF 1 KNOWN LOCALITIES - VERY SENSITIVE DATA
<i>Aegyptius occipitalis</i>	Ave	67.37	ALL OF THESE RELATE TO IDENTIFIED FEEDING AREAS - SHOULD RATHER LOOK AT NESTS NUMBERS LOCATED WITHIN THE RESERVE
<i>Aegyptius tracheliotus</i>	Ave	57.73	ALL OF THESE RELATE TO IDENTIFIED FEEDING AREAS - SHOULD RATHER LOOK AT NESTS NUMBERS LOCATED WITHIN THE RESERVE
<i>Columba delegorguei</i>	Ave	9.58	ALL OF THESE RELATE TO IDENTIFIED FEEDING AREAS - SHOULD RATHER LOOK AT NESTS NUMBERS LOCATED WITHIN THE RESERVE
<i>Gyps africanus</i>	Ave	70.85	ALL OF THESE RELATE TO IDENTIFIED FEEDING AREAS - SHOULD RATHER LOOK AT NESTS NUMBERS LOCATED WITHIN THE RESERVE
<i>Diceros bicornis minor</i>	Mammal	12.98	% OF MODELLED DISTRIBUTION BASED ON VEGETATION CARRYING CAPACITY
<i>Allawrencius complex</i>	Millipede	9.30	% OF HISTORIC DISTRIBUTION

Allawrencius gladiator	Millipede	180.83	MORE THAN ADEQUATELY ADDRESSED IN THIS RESERVE
Allawrencius nodulosus	Millipede	180.83	MORE THAN ADEQUATELY ADDRESSED IN THIS RESERVE
Centrobolus fulgidus	Millipede	4.17	% OF HISTORIC DISTRIBUTION
Centrobolus rugulosus	Millipede	139.94	MORE THAN ADEQUATELY ADDRESSED IN THIS RESERVE
Doratogonus hoffmani	Millipede	180.83	MORE THAN ADEQUATELY ADDRESSED IN THIS RESERVE
Orthoporoides laccatus	Millipede	4.01	% OF HISTORIC DISTRIBUTION
Zinophora laminata	Millipede	49.47	% OF HISTORIC DISTRIBUTION
<b>NESTS PRESENT</b>			
Aegyptius occipitalis			
Aegyptius tracheliotus			
Columba delegorguei			
Gyps africanus			

***Certain Species has been omitted due to biodiversity sensitive information***

**Appendix 8**  
**Zonation categories of HiP**

ROS Condition Class	General Description	Specific Description in the Context of Hluhluwe-iMfolozi Park
Pristine Wilderness	Area is characterized by essentially unmodified natural environment of fairly large size. Interaction between users is very low, and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use not permitted.	An un-modified area in the most remote parts of the wilderness area. No human impacted paths are visible. Camping techniques must be the least invasive to wildlife. Only primitive campsites are present and these must not be immediately visible. Groups are restricted such that encounters would be exceptional. Human habitation within or outside the Park is barely, if ever, visible.
Primitive Wilderness	Extremely high probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquillity and self-reliance through the application of woodsman and outdoor skills in an environment that offers a high degree of challenge and risk.	An un-modified area usually not on the periphery of the wilderness area. Semi-permanent fly-camps may be present. There is no sign of impacted human paths outside the fly-camps. Groups are restricted such that encounters would be exceptional. Human habitation within or outside the Park is seldom visible.
Semi-Primitive Wilderness	Area is characterized by a predominantly natural or natural appearing environment of moderate to large size, interaction between users is low, but there is often evidence of other users. The area is managed such that minimum on-site controls and restrictions may be present, but are subtle. Motorised use is not permitted.	An un-modified area usually on the periphery of the wilderness area. Impacted human paths are visible and semi-permanent base camps may be present. Although encounters are minimized and group sizes restricted, other people may well be in the area. The area will commonly have views, which would include human habitation outside the wilderness area or Park.
Semi-Primitive Motorized	Area is characterized by predominantly natural or natural-appearing environment of moderate-to-large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is allowed.	Not yet described.
"Roaded" natural	Area is characterized by predominantly natural-appearing environments with moderate evidences of the sights and sounds of humankind. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modifications and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities.	Not yet described.

Source: Adapted from United States Forest Service

## Appendix 9 LAC Process

LAC Step	Summary of Actions
Step 1: Planning goals	How is the area defined and protected and for what purpose? What is being protected? Who uses the Wilderness Area and are there differing goals?
Step 2: Identifying Area Issues and Concerns	Call for input from managers, users, service providers. Identify and record differing or conflicting objectives. Compile a report reflecting the different facets of the area, the various opportunities and the concerns.
Step 3: Define and Describe the Opportunity Classes	Select from the Recreation Opportunity Spectrum system which opportunity classes (pristine, primitive, semi-primitive, natural with roads, rural, and urban) best suit the situation in the iMfolozi Wilderness and describe them in terms of iGR's characteristics.
Step 4: The Selection of Indicators	The indicators must be selected such that they reflect the opportunity classes. They must list social conditions (solitude, types of recreation, visible signs and noise) and resource conditions (trail and camp conditions, wildlife, air and water quality). Indicators must be cost effective, acceptably accurate, sensitive to the type and amount of use occurring, responsive to change and they must be related to the effects of the impact.
Step 5: Inventory the Existing Resource and Social Conditions	Record the existing conditions within the wilderness with regards to human impact. Collect the information within the categories of the selected indicators.
Step 6: Specify Standards for Resource and Social Indicators for each Opportunity Class	The acceptable levels for each indicator are defined for each Opportunity Class. This is presented in tabular form.
Step 7: Identify Alternative Opportunity Class Allocation, Reflecting Area Issues and Concerns and Existing Resource and Social Conditions	The different user groups allocate the described Opportunity Classes to each of the 12 Wilderness Management Areas on the map in terms of their objectives for the wilderness area. Their allocation can be motivated in writing. Managers are consequently provided with a range of alternatives reflecting the variety of views.
Step 8: Identifying Management Objectives for each Alternative	The various Opportunity Class allocations for each of the submitted alternatives are compared to the existing conditions in the wilderness area (recorded in step 5) and then the management action to align desired conditions of each alternative allocation and existing conditions are recorded.
Step 9: Evaluation and Selection of a Preferred Alternative	Each of the 12 Wilderness Management Areas (see map) will be allocated its Opportunity Class (defined in step 3) and the specified standards for that class (determined in step 6) would be applied to that area.
Step 10: Implement Actions and Monitor Conditions	A discrepancy between existing conditions in the Wilderness Area and the standards specified for that areas Opportunity Class would justify management intervention to re-align the existing condition with the specified condition standards.

## Appendix 10

### Standards generated through the LAC process and exceptions

**Sourced from:** Cryer, P. B. 2009. The implementation of an environmental monitoring and management system in the wilderness area of the Hluhluwe-iMfolozi Park. MSc. University of KwaZulu-Natal

Indicator (R= Resource, S= Social)		Semi-primitive Standards	Primitive Standards	Pristine Standards
No. of human Encounters (R&S)	Immediate/ Physical	<3/month	<3/6months	<3,year
	Recent evidence (spoor)	Regular	>1 other group/trail-day	</=1 other group/trail-day
	Entrenched evidence (camp sites)	Base camps, satellite camps and primitive camps present	Satellite camps and primitive camps present	Primitive class 1 camps present
Maximum No. of camps/WMA (R&S)	Base camps/WMA	3	0	0
	Satellite camps/WMA	1	1	0
	Primitive camps/night/WMA	2	2	1 class 1a camp
No. of management sites/WMA (R&S)		4	0	0
Litter events/ site(R)	Base camps and management sites	Margin for error: 0-10	N/A	N/A
	Satellite camps	Margin for error: 0-5	Margin for error: 0-5	N/A
	Primitive camps	Margin for error: 0-3	Margin for error: 0-3	Margin for error: 0-2
	Other (wind and river bourne)	a<=10	a<=10	a<=10
Vestiges of human-induced disturbance (S)	Base camp	Margin for error: 0-49	N/A	N/A
	Satellite camp	Margin for error: 0-19	Margin for error: 0-19	N/A
	Primitive camp	Margin for error: 0-3	Margin for error: 0-3	Margin for error: 0-2
No. of cut trees or branches		For specific management practices (with recordings and rectification). Harvesting of reeds is permissible	0 (with the exception of game capture with recordings and rectification)	0 (with the exception of game capture with recordings and rectification)
Areas of bare ground (R)	Base camps and management sites	3500m <sup>2</sup>	N/A	N/A
	Satellite camps	200m <sup>2</sup>	200m <sup>2</sup>	N/A
	Primitive camps	</=9m Diameter (65m <sup>2</sup> )	</=9m Diameter (65m <sup>2</sup> )	0
Human-made paths (R)	Maximum number	10/Base camp, 5/Satellite camp and 2/ Primitive camp	5/Satellite camp and 2/ Primitive camp	0

## Exceptions to the above Standards

Activity/infrastructure	Semi-primitive	Primitive	Pristine
Vehicle intrusions for lion call-up and loading large carcasses after culling	Within 500m of the wilderness boundary	None	None
Vehicle intrusions for conventional rhino capture	Within 500m of the wilderness boundary. The 500m restriction can be exceeded if the animals life would be risked by waking/walking or if the capture operation is targeting a specific animal	None except where an animal's life would be risked by waking/walking	None except where an animal's life would be risked by waking/walking
Buffalo TB testing site	Within 500m of the wilderness boundary.	None	None
Airstrip	Temporary; a management decision has been made to relocate the airstrip away from the wilderness area.	no	no
Flights for rhino capture and monitoring operations including aerial up-lifts.	Yes	Yes	None, unless targeting a specific individual
Helicopter evacuations for life or limb injuries	Yes	Yes	Yes
Flights for reactive and incident specific security issues.	Yes	Yes	Yes
Flights for other wilderness specific monitoring or management activities	Yes (within the terms of the Wilderness Management Plan)	Yes (within the terms of the Wilderness Management Plan)	Yes (within the terms of the Wilderness Management Plan)
Cut branches (to be recorded with GPS and corrected)	For management sites and game capture	game capture and only for guaranteeing the well-being of the animal	game capture and only for guaranteeing the well-being of the animal
Litter	Marking capture sites with toilet roll. Harris fly-traps?	Marking capture sites with toilet roll Harris fly-traps?	Marking capture sites with toilet roll Harris fly-traps?
Outposts (Makhamisa and Masinda)	Managed as islands	none	none
Vehicle tracks to the following base camps: Mlangenweni, Tshokolwane, Mduba, Qaqeni, Qikiyane Mdindini and Madlozi	Yes	no	no



**Appendix 11**  
**Correlation of action projects and management objectives of HiP**

Management objectives number	Number	Action project
5, 7 & 19	5.2.1	Revise the Park Wilderness Area Management Plan.
	5.2.2	Motivate for recognition of wilderness area by the IUCN.
	5.2.3	Ensure direct proclamation of the wilderness area under law in terms of NEMPAA Section 26.
	5.2.4	Update the zonation system for the portion of the park north of the wilderness area and update zonation map. This includes determining the buffer zone requirements as well as permissible activities in other zones in line with the Ezemvelo KZN Wildlife standard zonation system.
	5.2.5	Ensure that the buffer zone requirements are captured in municipal IDP, SDF and land use schemes.
10	6.2.1	Develop a realistic five year Business Plan in order to secure funding to effectively support the mission, vision and management objectives for HiP.
	6.2.2	Initiate a study to determine the direct and indirect economic value of the Park to the local and regional economy in order to market the Park, ensure continued government funding and where appropriate, leverage additional funding from other sources.
	6.2.3	Align with organizational mentorship and career path programme.
1	6.5.1	Compile Fire Management Plan for HiP.
1,2 & 6	6.5.2	Research project to identify indicators for intact scarp forest.
	6.5.3	Research project to determine indicators for ecosystem resilience.
	6.5.4	Complete Elephant Management Plan.
	6.5.5	Compile Predator Management Plan.
	6.5.6	Develop management strategies for herbivore species that are not managed in terms of process-based management such as out of range species and other.
	6.5.7	Review and update the white rhino management plan.
	6.5.8	Review disease surveillance protocol.
	6.5.9	Identify catchment dynamics in relation to: <ul style="list-style-type: none"> <li>➤ Water quality</li> <li>➤ Increasing water demand: future projections and establishment of ecological reserve for rivers affiliated within the Park and outside.</li> </ul>
2&12	6.5.10	Implement a GPS based patrol system in HiP
12&16	6.5.11	Develop HiP Resource Use Operational Management Plan.
13	6.6.1	Develop, in conjunction with AMAFA, a comprehensive Cultural Heritage Management Plan for the Park.
18	6.8.1	Update and expand information media.
19&21	6.11.1	Update the Park Concept Development Plan.
	6.11.2	Adopt organisational systems that stipulate the use of environmentally friendly products and energy/ water saving technology.
9 & 14	6.7.1	Re-assess and update the tourism carrying capacity for HiP.
8, 13 & 18	6.3.1	Align with organisational environmental education plan for neighbouring communities, guests and staff that include a specific programme on the importance of protected areas and wilderness areas benefits and values to all sectors of society and build a supportive constituency.
	6.3.2	Conduct a study to determine the impact and effectiveness of the Environmental Education Programme.
	6.3.3	Investigate and facilitate potential conservation corridors.

## Appendix 12 Process-Based Management

D Balfour (1999)

### 1. Introduction

In the early 1980s there was a growing recognition by conservation staff that many of the norms guiding conservation management at the time were appropriate for agricultural goals and objectives but not for managing multi-species systems for diversity. In particular it was recognised that the concepts of carrying capacity and stable stocking levels as used for single species production (e.g. cattle) needed to be revisited and more emphasis placed on understanding and allowing natural fluctuations in numbers to occur. For example, constant low levels of grazing by herbivores would promote an environment with abundant grass and thus high fuel loads for fires in the dry season. The whole landscape would be subject to burning and thus little opportunity would exist for fire intolerant species to persist. Constant high levels of grazers (even at a level below which erosion is enhanced) on the other hand, would result in relatively open, grazed landscapes providing little opportunity for other species (e.g. rodents requiring cover). By allowing grazer numbers to fluctuate, as they did prior to the proclamation of protected areas, greater opportunity is created for a diversity of species to persist. By allowing natural fluctuations, one is further allowing populations to be stressed (generally when numbers are high and food is relatively scarce) and thereby maintaining the healthier, fitter animals as the survivors. The more dynamic system with greater diversity is thus also a more resilient system, better able to persist through times of perturbations, e.g. drought.

Out of this awareness, a number of workshops were held and a new approach aimed at managing for diversity was developed. Process-based management is essentially about recognising the role that natural processes (such as migration, predation, competition, fire etc.) play in regulating populations of certain species and including an understanding of those processes in guiding management actions. It takes into account knowledge of the scale, frequency, intensity and spatial patterning of these processes. A prime assumption of process-based management is that the effective conservation of biological diversity is enhanced by ensuring that the natural processes are functioning in their natural operating range.

### 2. Examples of the application of process-based management:

The history of the biological management of protected areas, particularly those areas with populations of large mammals is, to a remarkable extent, synonymous with the management of those populations. In early days the protection of the individual species from persecution was commonly the reason for establishing a protected area in the first place. Under these refuge conditions, the populations increased and the first step in the conservation effort had been achieved, but there was commonly also an 'overshoot' in which populations of some species became too large. This was because the success of these early efforts was often accompanied by two sets of

circumstances. Firstly the increased numbers of many herbivore species occurred in the absence (or at least low densities) of natural predators. Secondly, the fencing of the protected areas resulted in many species being isolated from the larger landscape and forced to occupy a smaller, commonly unrepresentative, segment of its original range. Both these factors resulted in many large herbivore populations increasing rapidly as two of the natural regulators, predation and the capacity to disperse, were no longer present.

To prevent the local overabundance developing in one, or a few, of these populations, earlier management approaches would, through the experience and "gut feel" of staff, set levels which populations should not be allowed to exceed - usually in order to protect the vegetation from over utilisation. At these levels, the management response would be to cull or capture and translocate 'excess' animals. The process-based approach would be to ask the question 'what processes were regulating these populations that are now missing and how can they be reinstated or simulated'? Examples of the type of response under process-based management would include the reintroduction of predators (or simulation of their effects if the area is unfenced and predators cannot be introduced). This has been successfully done in HiP where the populations of many of the smaller herbivores either fluctuate about a value or are only slowly increasing. For the larger herbivores, such as white rhino, when predation does not adequately prevent the population growing to a stage where the ground cover is removed (and erosion could be enhanced), there is evidence that dispersal was the process that used to regulate their numbers. To simulate dispersal (because the presence of a fence prevents individuals moving out of the park), low density dispersal zones have been created where white rhino numbers are kept artificially low through removal, allowing individuals in the unmanaged core to disperse and for the population in the unmanaged core to become self regulating.

Thus the role of game proof fencing surrounding a reserve, in isolating and disrupting natural ecological processes, should not be underestimated when managing a protected area. The management of landscape scale processes such as fire and the migration of species in response to seasonal changes in water distribution or habitat quality need to be considered if adopting a process-based approach to management. Further examples of where process-based management influences management of protected areas includes the setting of burning regimes as well as the distribution of artificial water points.

It would however be inappropriate to apply any strategy for the management of conservation areas without a process of regular review. Thus the analysis of the biennial game counts and regular vegetation monitoring is an essential activity undertaken to ensure that the objectives of maintaining the indigenous diversity is not being compromised. This review process enables management of the park to be adaptive in nature and to respond to negative changes that might be taking place.

## Appendix 13

<b><u>Ezemvelo KZN Wildlife CORPORATE POLICIES (NORMS &amp; STANDARDS)</u></b>	
<b>Policy File No.</b>	<b>CORPORATE AFFAIRS</b>
B 2	➤ Access to Ezemvelo KZN Wildlife Areas and Employment.
B 5	➤ Outsourcing of Functions and Services
B 7	➤ Monuments, Memorials and Names of Protected Areas under the control of Ezemvelo.
B 8	➤ Restricted use of Board Theatres, Halls and Conference Facilities etc.
B 9	➤ Code of Ethics / Conduct.
B 10	➤ Photography in Board Protected Areas.
B 13	➤ Mission Statement
B 14	➤ Access to Information.
<b>Policy File No.</b>	<b>INTERNAL AUDIT</b>
C 5	➤ Management Control
	<b>BIODIVERSITY CONSERVATION OPERATIONS</b>
	<b>1. NATURAL RESOURCE SUSTAINABILITY</b>
<b>Policy File No.</b>	<b>Threatened Species and Ecosystems</b>
D 1.1	➤ Disposal of Black Rhino.
D 1.2	➤ Disposal of Surplus White Rhino.
D 1.3	➤ Strategy for the Management of Southern White Rhino in KwaZulu-Natal.
D 1.4	➤ Strategy for the Biological Management of Black Rhino in KwaZulu-Natal.
D 1.5	➤ Rhinoceros Products.
D 1.6	➤ Crocodilians
D 1.7	➤ Cycads.
D 1.8	➤ Disposal of Threatened Species.
<b>Policy File No.</b>	<b>Exotic and Invasive Species</b>
D 1.9	➤ Release of Alien Species.
D 1.10	➤ Control Measures for Red-billed Quelea.
D 1.12	➤ Grass Carp.
D 1.13	➤ Establishment of Alien Plantations.
<b>Policy File No.</b>	<b>Migratory Species</b>
D 1.14	➤ Black Wildebeest and Blue Wildebeest Hybridization and Conservation.
D 1.15	➤ Permit authorising the collection of Biological Material within Board Areas.
	<b>2. CONSERVATION EFFECTIVENESS</b>
<b>Policy File No.</b>	<b>Strategic Applications</b>
D 2.1	➤ Involvement of the KwaZulu-Natal Nature Conservation Board in Project 8 of the MAB (Man and Biosphere) Programme.
<b>Policy File No.</b>	<b>Conservation Management: Protected Area Management</b>
D 2.2	➤ Management of Wilderness Areas.
D 2.3	➤ Protected Area Development.

D 2.4	➤ Prohibition of Works and Servitudes in Board Areas.
D 2.5	➤ <a href="#">Zonation and Regulations for the control of off-road vehicles on beaches controlled by the Board.</a>
D 2.6	➤ Quarries in KZN Protected Areas.
D 2.7	➤ Re-establishment and Management of Vegetation on Development Sites in the Ezemvelo KZN Wildlife Protected Areas.
D 2.8	➤ Ecotourism and Protected Areas.
D 2.9	➤ Solid Waste Management within Protected Areas.
D 2.10	➤ State Security Service Activities within Board Areas.
D 2.11	➤ Shark Nets in or bordering KwaZulu-Natal Nature Conservation Board Controlled Areas.
<b>Policy File No.</b>	<b>Integrated Environmental Management</b>
D 2.12	➤ Integrated Environmental Management - incorporating the procedure for the assessment of the impact of proposed development projects on nature conservation concerns.
D 2.13	➤ Precautionary Principle.
D 2.14	➤ Shark Net Installations.
D 2.15	➤ Bioprospecting in KwaZulu-Natal.
D 2.17	➤ Use of Pesticides by the Ezemvelo KZN Wildlife: Safety to Humans and the Environment.
D 2.18	➤ Interference with the Mouth of a Lagoon or River (Breaching).
<b>Policy File No.</b>	<b>Ex Situ Wild Animal Management</b>
D 2.21	➤ Re-establishment of Terrestrial Mammals in Board Areas.
D 2.22	➤ Translocation of Animals.
D 2.25	➤ Elephant Introductions and Elephant in Enclosures.
D 2.27	➤ Introduction and Keeping of Large Predators in Enclosures in KZN.
D 2.28	➤ Use of Narcotic Drugs.
D 2.29	➤ Falconry.
<b>Policy File No.</b>	<b>Human Animal Conflict - Inside and Outside Protected Areas</b>
D 2.30	➤ Disposal of Leopard from Ezemvelo KZN Wildlife Protected Areas.
D 2.31	➤ Problem Animal Control.
D 2.32	➤ Compensation claims in respect of damage caused by Lion, Cheetah, Wild Dog and Elephant to Stock and Crops.
D 2.33	➤ Instances of Death as a result of an Unprovoked Attack by a Wild Animal Normally contained and originating from within a Fenced Protected Area under the Control of the KwaZulu-Natal Nature Conservation Board.
<b>Policy File No.</b>	<b>Environmental Awareness</b>
D 2.34	➤ Environmental Education Policy.
<b>3. BIODIVERSITY PROTECTION</b>	
<b>Policy File No.</b>	<b>Co-management</b>
D 3.1	➤ Supply of Game to Conservancies, Community Conservation Areas and Biosphere Reserves in KwaZulu-Natal
D 3.2	➤ Establishment and Management of Community Conservation Reserves (CCR)
D 3.4	➤ Community Conservation Programmes

D 3.5	➤ Neighbours' Access to Board Protected Areas
D 3.6	➤ Relationship with Local Boards
D 3.7	➤ Conservation Partnerships Between KwaZulu-Natal Nature Conservation Board and Adjacent Landowners
D 3.8	➤ Community Trust
D 3.9	➤ Community Levy Policy and Guidelines
D 3.10	➤ Land Claims on Proclaimed and Unproclaimed Provincial and Assigned National Protected areas in KwaZulu-Natal
D 3.11	➤ Amafa Policy Guidelines for the access of rock art sites in KwaZulu Natal
<b>Policy File No.</b>	<b>Resource-use benefits</b>
D 3.12	➤ Disposal of Venison from Ezemvelo KZN Wildlife Management Operations.
D 3.13	➤ Sustainable use of wildlife resources.
D 3.14	➤ Freshwater Angling.
D 3.15	➤ Freshwater species utilisation.
D 3.16	➤ Use of plant resources from protected areas.
D 3.17	➤ Use of doomed biological material.
D 3.19	➤ Provision of hunting by Ezemvelo KZN Wildlife.
<b>Policy File No.</b>	<b>4. RELATIONSHIPS</b>
D 4.1	➤ Neighbour Relations.
D 4.2	➤ Participation - Non Government Organisations.
D 4.3	➤ Data Access.
D 4.4	➤ <a href="#">Consultation and Communication with Stakeholders: Policy and Guidelines.</a>
<b>Policy File No.</b>	<b>COMMERCIAL OPERATIONS</b>
E 1	➤ Concessions for Welfare Groups.
E 2	➤ Hiking and Mountaineering.
E 3	➤ Educational Concessions.
E 4	➤ Club Facilities within Board Areas.
E 5	➤ Hutted Camps.
E 6	➤ Joint Venture Scheme.
E 7	➤ Allocation of Sites in terms of the Joint Venture Scheme.
E 8	➤ Access to Protected Areas through Unofficial Entry Points.
E 9	➤ Visitor Facilities Management by Ezemvelo KZN Wildlife.
E 10	➤ Lease of Lakeshore at State Dam Protected Areas.
E 11	➤ Execution, Control and Management of Leases and Concession Contracts (excluding Biodiversity Conservation Partnerships and Leases of Wildlife).
E 12	➤ Private Sector Reservations Policy.
E 13	➤ Partnerships for Eco-Tourism Development within or Adjacent to Protected Areas.
E 14	➤ Discounting of Tariffs for Walk-in Guests.
E 15	➤ Ecotourism Discounting Strategy.
E 16	➤ Travel Trade Commissions: Tour Operator/ Travel Agency.
E 17	➤ Policy and Procedure for the establishment and monitoring of Commercial Operations Public Private Partnership (PPP) Agreements.
E 18	➤ Administrative and operational policy on Professional hunting in South Africa.
E 19	➤ Commercialisation.

**Appendix 14:  
Terminology and Abbreviations**

Alien species	Species or genotypes, which are not indigenous to HiP and the surrounding area including hybrids and genetically altered organisms.
Biodiversity	The variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems (as per the National Environmental Management: Biodiversity Act, 2004 [Act No. 10 of 2004]).
Bioprospecting	In relation to indigenous biological resources, means any research on, or development or application of, indigenous biological resources for commercial or industrial exploitation, and includes – the systematic search, collection or gathering of such resources or making extractions from such resources for purposes of such research, development or application (as per the National Environmental Management: Biodiversity Act, 2004 [Act No. 10 of 2004])
Board	The KwaZulu-Natal Nature Conservation Board as defined by the KwaZulu-Natal Nature Conservation Management Act, 1997 (Act No.9 of 1997).
Buffer zone	An area surrounding HiP that has restrictions placed on its use or where collaborative projects and programmes are undertaken to afford additional protection to the nature reserve.
Co-management	The term ‘Co-management’ must be understood within the context of Section 42 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003).
Cultural heritage	As defined in Article 1 of the World Heritage Convention (UNESCO) 1972 , ‘cultural heritage’ is considered as “monuments, architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of (...) value from the point of view of history, art or science, groups of buildings, groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of significance from the point of view of history, art or science, sites, works of man or the combined works of nature and man, and areas including archaeological sites which are of (...) value from the historical, aesthetic, ethnological or anthropological point of view.” For the purpose of this IMP, living heritage features such as mountains, pools, rivers, boulders, etc. as well as palaeontological features are included under this definition.
Eco-cultural Tourism (eco-tourism):	The travel to natural areas to learn about the way of life and cultural history of people, the natural history of the environment, while taking care not to change the environment and contributing to the economic welfare of the local people (adapted from a definition of ecotourism by Hecto Ceballos Lascurain).
Ecological integrity	The sum of the biological, physical and chemical components of an ecosystem and its products, functions and attributes (as per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of

Ecosystem	2003]). A dynamic complex of animal, plant and micro-organism communities and their non-living environment interacting as a functional unit (as per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]).
Ecosystem services	As defined in Section 1 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) as “environmental goods and services” meaning: a. Benefits obtained from ecosystems such as food, fuel and fibre and genetic resources. b. Benefits from the regulation of ecosystem processes such as climate regulation, disease and flood control and detoxification. c. Cultural non-material benefits obtained from ecosystems such as benefits of a spiritual, recreational, aesthetic, inspirational, educational, community and symbolic nature;” For the purposes of this IMP, sustainable water production is also specifically included under this definition.
Environmental degradation	The deterioration of the environment through depletion of resources such as air, water and soil; the destruction of ecosystems and the loss of species or undesirable reduction of species population numbers from a specific area from an environmental health perspective
Ezemvelo KZN Wildlife	Nature Conservation Service as established in terms of the KwaZulu-Natal Nature Conservation Management Act No. 9 of 1997.
Indigenous species	In relation to a specific protected area, means a species that occurs, or has historically occurred, naturally in a free state of nature within that specific protected area, but excludes a species introduced in that protected area as a result of human activity (as per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]).
Integrated Management Plan	The integrated management plan and the protected area management plan have been used interchangeable in this document.
Invasive species	Means any species whose establishment and spread outside of its natural distribution range – a. Threaten ecosystems, habitats or other species or have a demonstrable potential to threaten ecosystems, habitats or other species. b. May result in economic and environmental harm or harm to human health.  (As per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]).
Joint management	The agreed co-ordination of management and/or management actions by landowners and/or mandated managers on their individual or combined properties in order to achieve common management objectives.
Local community	Any community of people living or having rights or interests in a distinct geographical area (as per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]).



Management	In relation to a protected area, includes control, protection, conservation, maintenance and rehabilitation of the protected area with due regard to the use and extraction of biological resources, community-based practices and benefit sharing activities in the area in a manner consistent with the Biodiversity Act (as per the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)).
Management authority	In relation to a protected area, means the organ of state or other institution or person in which the authority to manage the protected area is vested (as per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]).
Monitoring	The collection and analysis of repeated observations or measurements to evaluate change in status, distribution or integrity in order to track the impacts of directed management implemented to achieve a stated management objective.
Nature conservation	The conservation of naturally occurring ecological systems, the sustainable utilisation of indigenous plants and animals therein, and the promotion and maintenance of biological diversity (as per the KwaZulu-Natal Nature Conservation Management Act, 1997 [Act No.9 of 1997]).
Neighbouring community	The communities and people permanently living in the local municipal area/s bordering onto the Nature Reserve.
Natural heritage	As defined in Article 2 of the World Heritage Convention (UNESCO) 1972 'natural heritage' is as: "natural features consisting of physical and biological formations or groups of such formations, which are of (...) value from the aesthetic or scientific point of view, geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of (...) value from the point of view of science or conservation, natural sites or precisely delineated natural areas of (...) value from the point of view of science, conservation or natural beauty." For the purposes of this IMP, this would include the required ecological integrity of the protected area for the production of ecosystem services.
Partnerships	A co-operative and / or collaborative arrangement between the Game Reserve management / Ezemvelo and a third party that supports the achievement of the Game Reserve management objectives.
Precautionary Principle	Means the principle that states that if the environmental consequences of a particular project, proposal or course of action are uncertain, then the project, proposal or action should not be undertaken. (Guidelines for Applying the Precautionary Principle to Biodiversity Conservation and Natural Resource Management. <a href="http://www.pprinciple.net">www.pprinciple.net</a> )
Protected areas	Means any area declared or proclaimed as such in terms of section 3 or listed in the Second Schedule to the KwaZulu-Natal Nature Conservation Management Act, 1997 (Act No. 9 of 1997); or Means any of the protected areas referred to in section 9 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003).
Protected area management committee	Is the management body that deals with the day-to-day management of the protected area and is chaired by the OIC.

Ramsar Convention	Means: “The Convention on Wetlands of International Importance, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty, which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.” (There are presently 158 Contracting Parties to the Convention, the Convention has broadened its scope to cover all aspects of wetland conservation and wise use, recognising wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities.)
Sense of place	People develop a “sense of place” through experience and knowledge of a particular area. A sense of place emerges through knowledge of the history, geography and geology of an area, its flora and fauna, the legends of a place, and a growing sense of the land and its history after living there for a time. <a href="http://www.importanceofplace.com">http://www.importanceofplace.com</a>
Stakeholders/ interested parties	These are interested individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public. According to the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), “stakeholder” means a person, an organ of state or a community contemplated in section 82 (1) (a), or an indigenous community contemplated in section 82(1) (b).
Surveillance	The collection and analysis of single or repeated measurements to establish status or distribution or integrity at a point in time in the absence of a specific management context or objective.
Sustainable	In relation to the use of a biological resource, means the use of such resource in a way and at a rate that would not lead to its long-term decline; would not disrupt the ecological integrity of the ecosystem in which it occurs; and would ensure its continued use to meet the needs and aspirations of present and future generations of people (as per National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).
Wilderness area	Means an area designated in terms of section 22 or 26 for the purpose of retaining an intrinsically wild appearance and character, or capable of being restored to such and which is undeveloped and roadless, without permanent improvements or human habitation (as defined by the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]).
Wilderness Experience	Wilderness experience is what people feel when they are in wilderness areas in terms of adventure, closeness to nature and wild animals, spectacular scenery, solitude, freedom, spiritual and aesthetic aspects. Source: Hendee JC, and Dawson CP (2002). (Editors). Wilderness Management: Stewardship and Protection of Resources
World heritage site	Means a World Heritage Site as defined in the World Heritage Convention Act, No. 49 of 1999 under Chapter 1, section 1 subsection (xxiv).

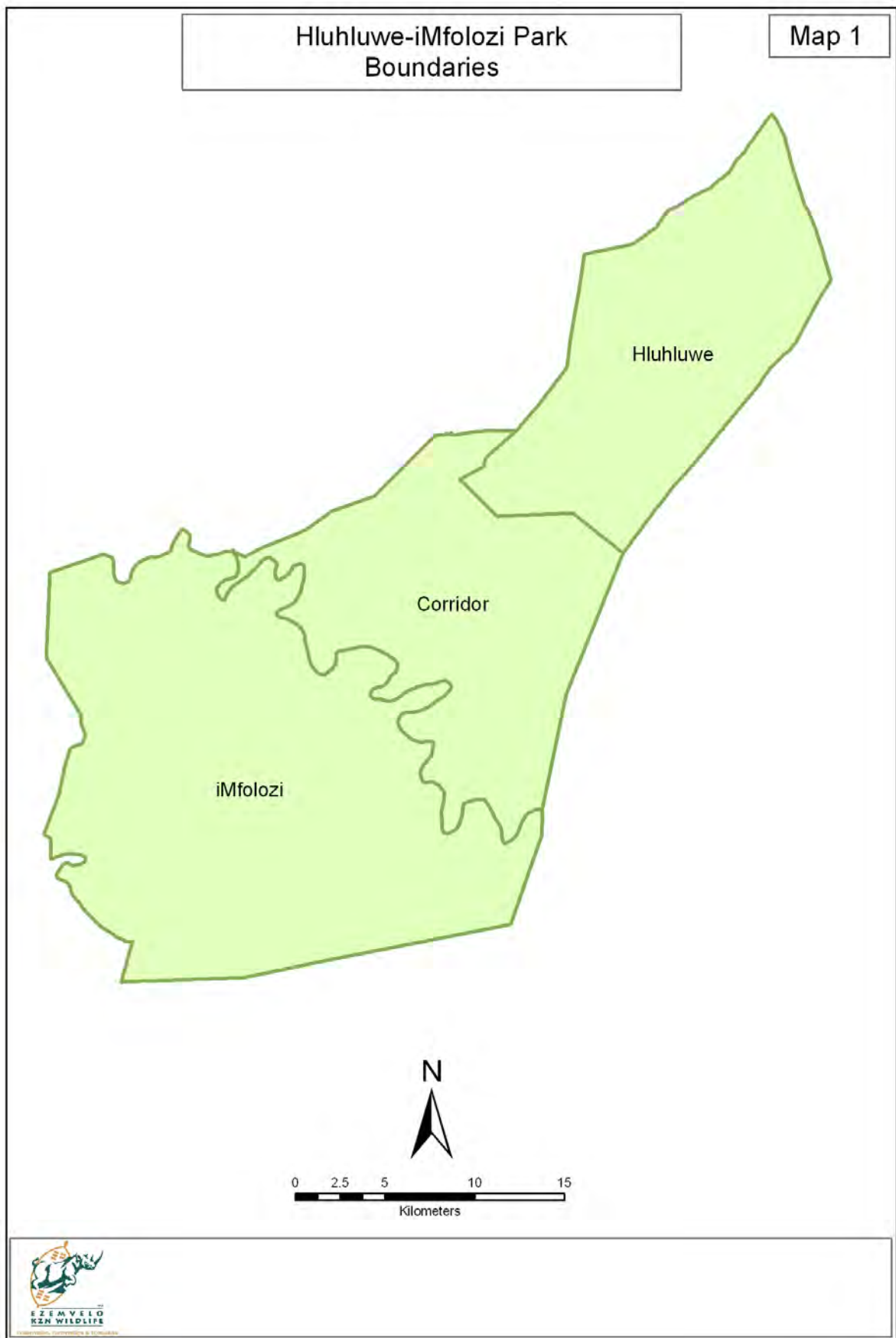
## Abbreviations

Amafa	Amafa aKwaZulu-Natali (KZN Heritage Agency)
BEEP	Biodiversity Environmental Education Programme
BP	Business Plan
CDP	Concept Development Plan
DEARD	Department of Environmental Affairs and Rural development
DWAF	National Department of Water Affairs and Forestry
DWEA	Department of Water and Environmental Affairs
Ezemvelo	Ezemvelo KwaZulu-Natal Wildlife as defined in Act 9 of 1997 to be the KZN Nature Conservation Service Ezemvelo
FPA	Fire Protection Association
GIS	Geographical Information Systems
HiP	Hluhluwe-iMfolozi Park
HGR	Hluhluwe Game Reserve
IBA	Important Bird Area
IDP	Integrated Development Plan
iGR	iMfolozi Game Reserve
IMP	Integrated Management Plan
IUCN	World Conservation Union (as commonly referenced)
KZN	KwaZulu-Natal
KZNNCS	KwaZulu-Natal Nature Conservation Service
LAC	Limits of Acceptable Change
MOU	Memorandum of Understanding
PPC	Park Planning Committee
ROC	Regional Operations Committee
ROS	Recreational Opportunity Spectrum
SA	Republic of South Africa
SAHRA	South African Heritage Resources Agency
SMP	Strategic Management Plan
TOPS	Threatened or Protected species in terms of NEMBA
WOS	Wilderness Opportunity Spectrum

## Commonly used abbreviations used specific statutes (Legislation)

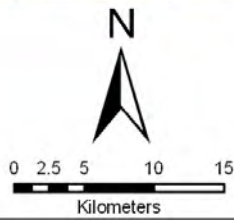
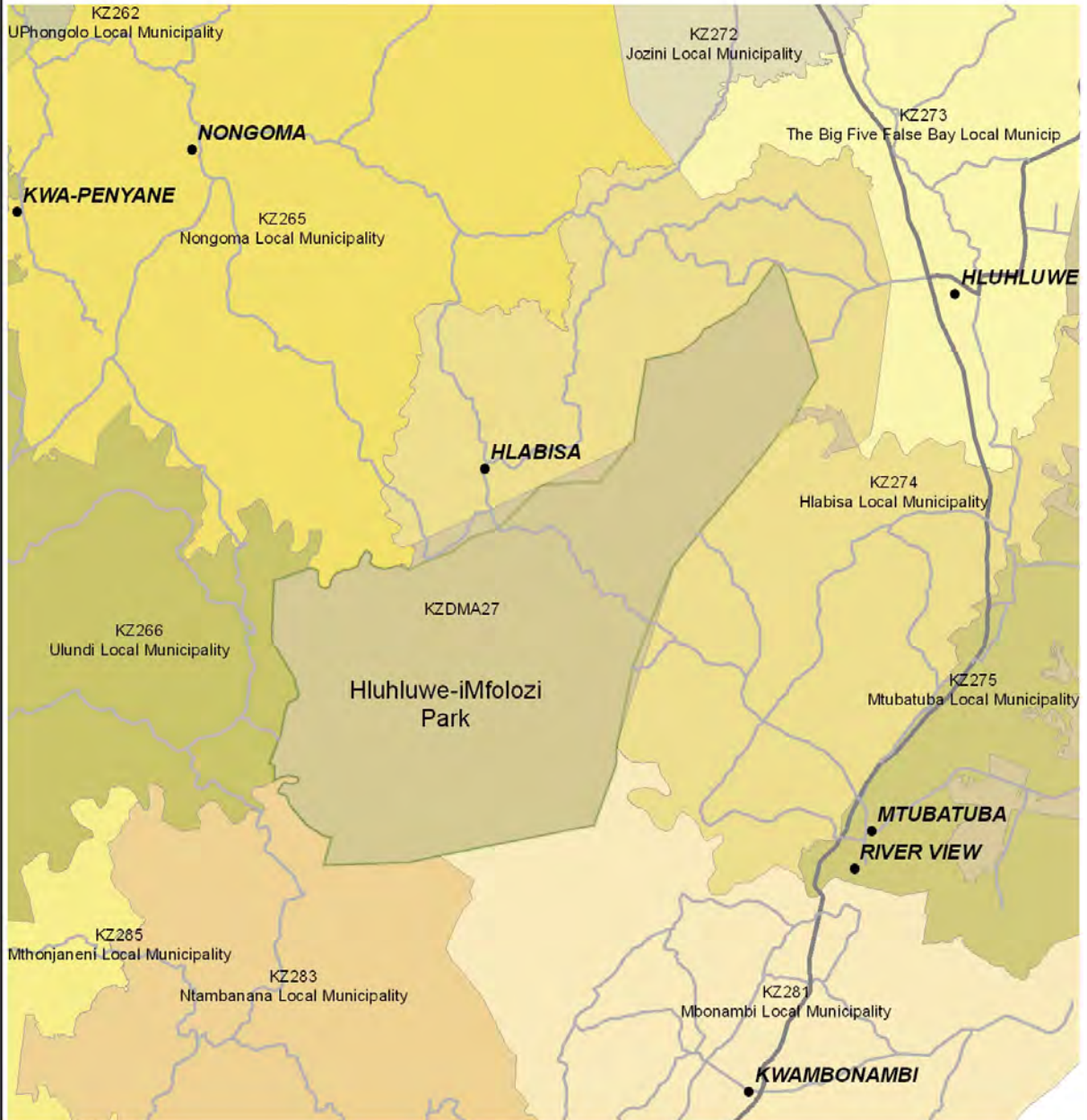
CARA:	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
KZNNCMA:	KwaZulu-Natal Nature Conservation Management Act, 1997 (Act No. 9 of 1997)
NEMA:	National Environmental Management Act, 1998 (Act No. 107 of 1998).
NEMBA:	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMPAA:	National Environmental Management: Protected Areas Act 2003 (Act No. 57 of 2003)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
PFMA:	Public Finance Management Act, 1999 (Act No. 1 of 1999)

# MAPS



# Hluhluwe-iMfolozi Park Location

Map 2



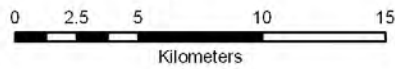
### Legend

- National Roads
- Provincial Roads
- KZ 283 Local Municipality




Hluhluwe-iMfolozi Park  
Land Claims

Map 3



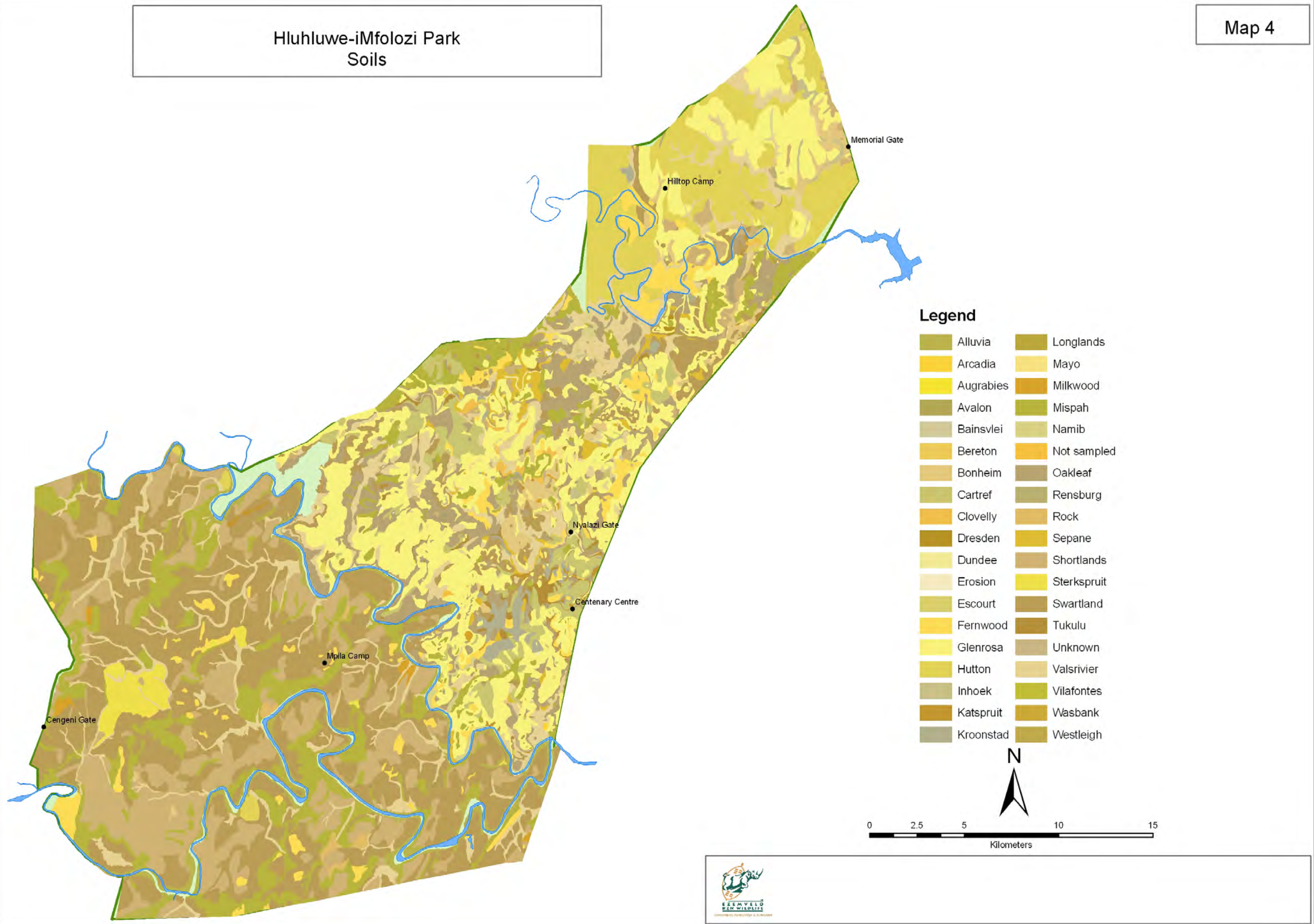
**Legend**

 Area of HiP under Claim



Hluhluwe-iMfolozi Park  
Soils

Map 4

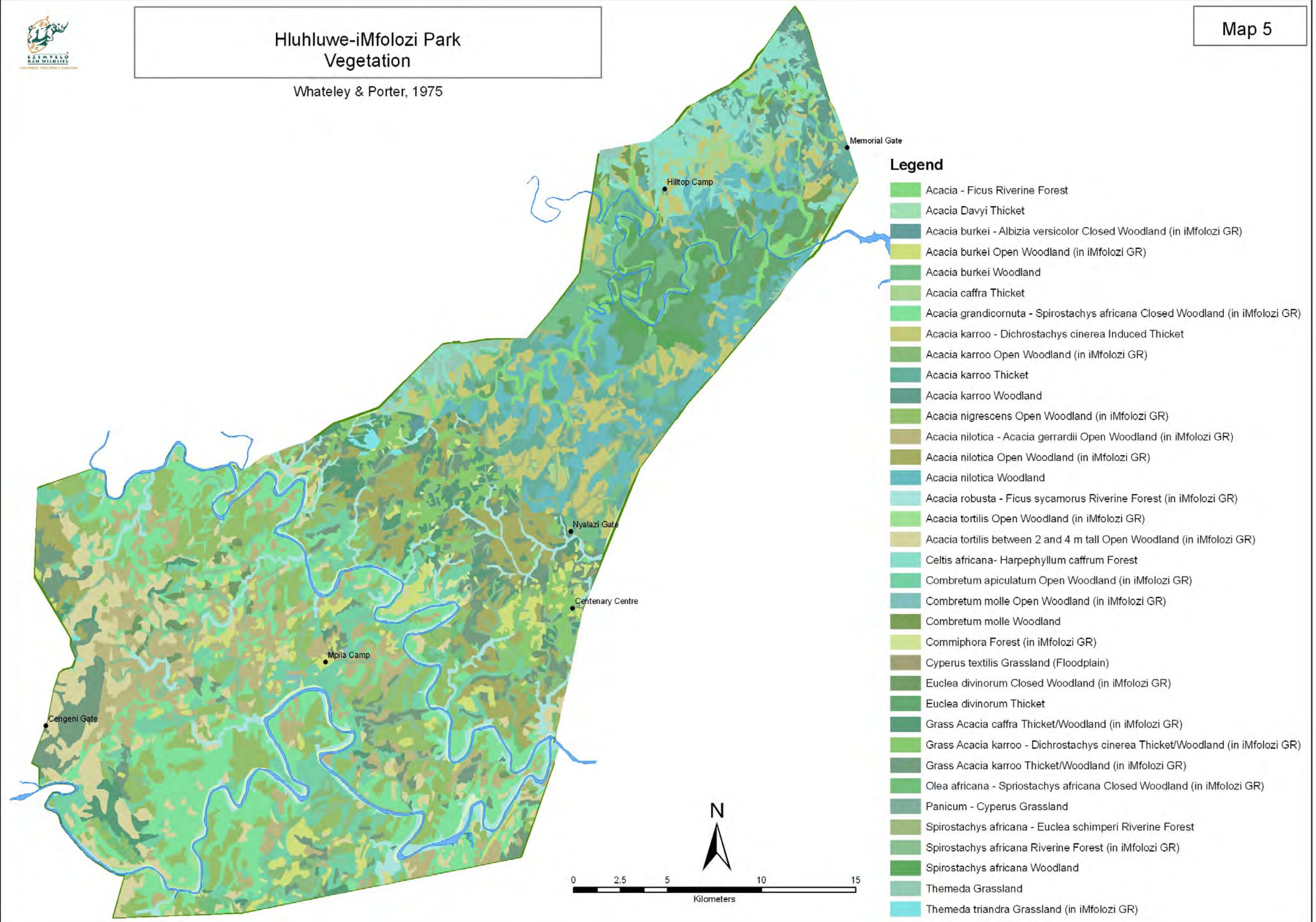




# Hluhluwe-iMfolozi Park Vegetation

Whateley & Porter, 1975

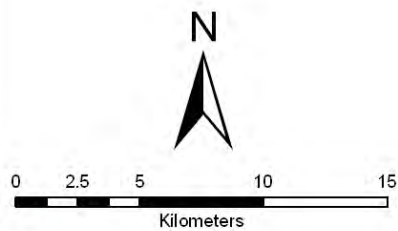
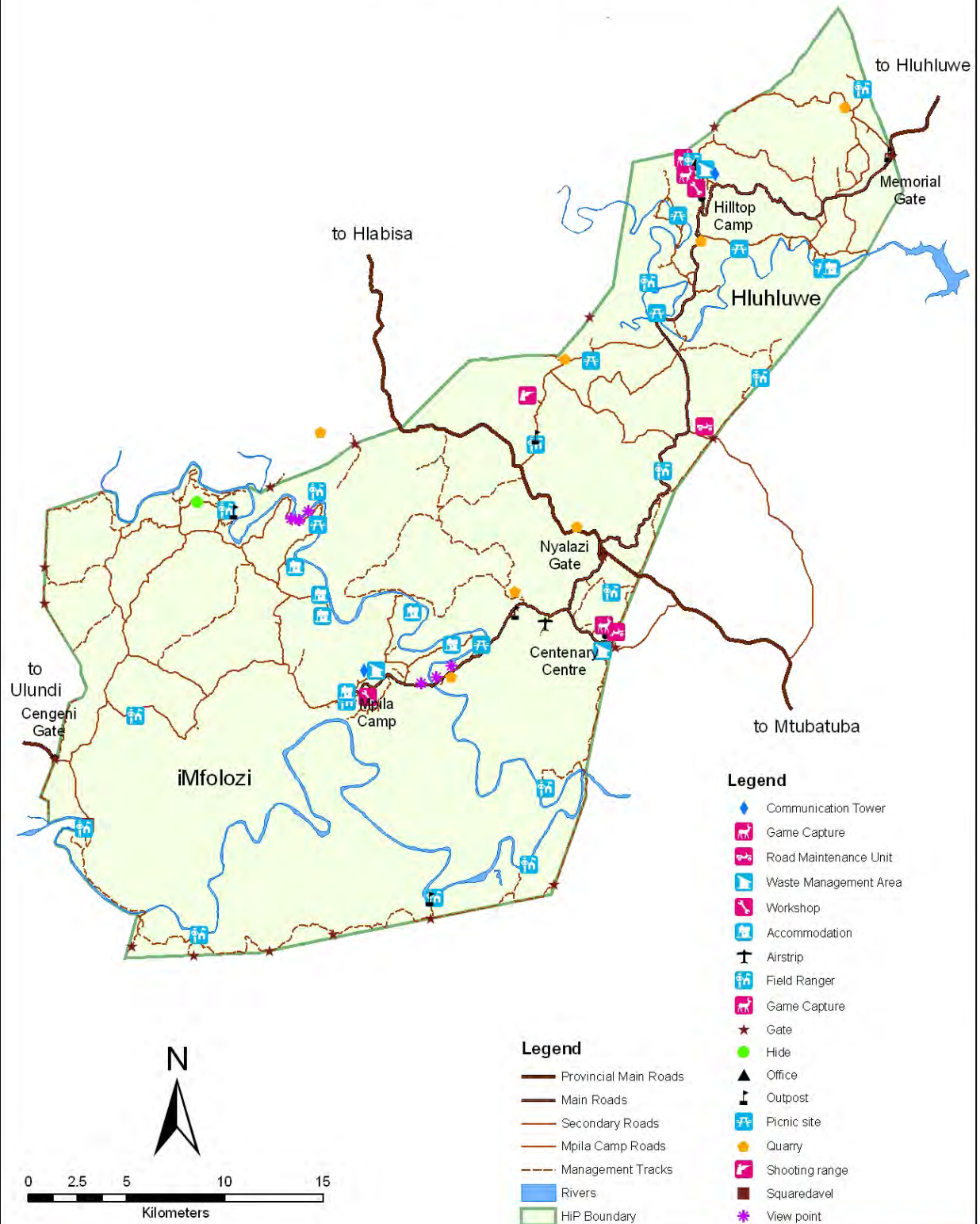
Map 5





# Hluhluwe-iMfolozi Park Infrastructure

Map 6



Hluhluwe-iMfolozi Park  
Zonation

Map 7

