

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

Conservation, Partnerships & Ecotourism

IMPENDLE NATURE RESERVE
Protected Area
MANAGEMENT PLAN



Impendle Nature Reserve

**KwaZulu-Natal
South Africa**

Protected Area Management Plan

Prepared by
Ezemvelo KwaZulu-Natal Wildlife
Protected Area Management Planning Unit

Citation

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AUTHORISATION


This Protected Area Management Plan for Impendle Nature Reserve is recommended by the Nature Reserve Planning Committee (NRPC), a multi-disciplinary team consisting of:

Ezemvelo KZN Wildlife

Yoliswa Ndlovu	General Manager: West
Athol Marchant	Regional Ecologist
Barrie Barnes	Senior Community Conservation Officer
Steve McKean	Resource Use Ecologist
Mbuyiselo Gxashi	Conservation Manager
Dennis Mkhabela	Acting Biodiversity Coordinator
Andy Blackmore	Acting Manager Land Use Planning
Irene Hatton	Acting Co-ordinator Protected Area Planning
Magda Goosen	Protected Area Management Planner

This Protected Area Management Plan for the Impendle Nature Reserve is approved by:

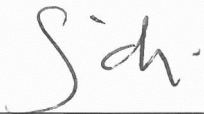


Recommended:

TITLE	NAME	SIGNATURE AND DATE
Chairperson: Operations Committee: West	D. MUKHASELA	 28/01/2013

This Protected Area Management Plan for the Impendle Nature Reserve is approved by:

TITLE	NAME	SIGNATURE AND DATE
KwaZulu-Natal MEC: Department of Agriculture, Environmental Affairs and Rural Development		See the next page for MEC approval. The change is due to reconfiguration of provincial government departments.

Recommended:

TITLE	NAME	SIGNATURE AND DATE
Chairperson: KZN Nature Conservation Board	Mr Zc Ngidi	
Chief Executive Officer: Ezemvelo KZN Wildlife	DR I. B. MKHIZE	
Chairperson: Ezemvelo KZN Wildlife, Operations Committee		 16 July 2013
Chairperson: Operations Committee: West		

APPROVAL

This Protected Area Management Plan for Impendle Nature Reserve is approved:


TITLE	NAME	SIGNATURE AND DATE
KwaZulu-Natal MEC: Department of Economic Development, Tourism and Environmental Affairs	Michael Mabuyakulu	 2/6

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PREFACE

This Protected Area Management Plan for Impendle Nature Reserve is its primary and overarching management document. It forms the framework within which the nature reserve will be managed and developed towards the achievement of its management objectives, derived in collaboration with the protected area's stakeholders during June 2012.

The protected area management planning process has been designed to meet the statutory requirements of the National Environmental Management: Protected Areas Act (No. 57 of 2003) and other relevant legislation.

The protected area management planning process requires participation from the protected area's stakeholders, the general public and specialists during the various stages of plan development and implementation. Although the 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 protected area's management objectives are operationalised and reflected through an Annual Plan of Operation. A Financial 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 nature reserve over the next five years.

Ezemvelo KwaZulu-Natal Wildlife, as the appointed Management Authority for Impendle Nature Reserve, hereby commits itself to the implementation of this plan.

Dr. Bandile Mkhize
Chief Executive Officer

Date:

EXECUTIVE SUMMARY

Introduction

Impendle Nature Reserve is situated in the province of KwaZulu-Natal, south of the town Impendle and in close proximity to the towns of Boston (south west) and north of Polela en route to the Southern Drakensberg Mountains. The 8759 ha reserve is divided by the Underberg road (R617) into a larger western and a smaller eastern section.

To the south west of the Impendle Nature Reserve lies the Bulwer complex of forest reserves consisting of Indhloveni Nature Reserve (NR), Ingelabantwana NR, Marustwa NR, Marwaqa NR and Xotsheyake NR. The uMkomazi River forms part of the southern boundary of the reserve and the protected area is an important part of the catchment of the uMkomazi River with some tributaries of the river that originate within the Impendle Nature Reserve. The altitude ranges from 935 to 1586 meters above sea level across the reserve.

The reserve is an area of unique natural beauty and plays a key role in conserving critically endangered Midlands Mistbelt Grassland. Two Critically Endangered species, the Blue swallow and Wattled cranes are present and breed in the area. A significant portion of South Africa's Blue swallow population breeds within the boundaries of Impendle Nature Reserve.

The area is extremely rich in biodiversity and supplies a range of ecosystem services which include but is not limited to the protection of the hydrological system including a series of wetlands which form part of the catchment of the uMkomazi River. These wetlands are classified as National Freshwater Priority Areas (FEPA's). The 4098 hectare stewardship site of Mount Shannon abuts the reserve to the north east and the area surrounding the reserve contains Critical Biodiversity Areas (CBA's) identified through the KZN Conservation plan minset (2010). The reserve falls within the Sisonke District Municipality and the Ingwe Local Municipality.

Management issues, challenges and opportunities at Impendle Nature Reserve

The Impendle Nature Reserve has been proclaimed in Government Gazette No 393 of 2005, but due to the absence of a Surveyor General's diagram the reserve has to be re-surveyed and all farms consolidated under one proclamation. The two land claims that fall within the boundary of the reserve are complex in nature and the non-resolution of claims affects the effective management of the reserve and have an impact on stakeholder relationships. Twelve kilometres of fencing is incomplete due to constant vandalizing and theft of the fence. Resources are insufficient to effectively manage the reserve and there are currently no formal eco-cultural tourism initiatives in the reserve.

The management effectiveness assessment also indicated that staff levels are below the optimal for the achievement of critical activities in the reserve. Human and financial resources are insufficient and resources from Impendle Nature Reserve are utilised for the management of the Bulwer complex.

Managing the issues, challenges and opportunities at Impendle Nature Reserve

Key management interventions required will include a feasibility study to determine appropriate tourism infrastructure and activities for the reserve. The state of the current infrastructure also needs to be improved and maintained and the most important of those will be the fencing of the reserve which could potentially facilitate introductions of species that historically occurred in the area, thereby improving the tourism value. The reserve objectives can only be fully achieved if sufficient human and financial resources are dedicated to the effective management of the reserve. The most critical intervention required is the settlement of the land claim (by the Department of Rural Development and Land Reform) and the implementation of the outcome of the land claim process.

ABBREVIATIONS

Amafa	Amafa aKwaZulu-Natali (KwaZulu-Natal Provincial Heritage Agency)
BCOMM	Ezemvelo KZN Wildlife Biodiversity Conservation Operations Management Meeting
CBA	Critical Biodiversity Area
CCA	Community Conservation Area
CDP	Concept Development Plan (Component of Ezemvelo KZN Wildlife protected area management planning process)
CEO	Chief Executive Officer
CRMP	Cultural Resource Management Plan
CMS	Co-management Structure
DAEARD	KwaZulu-Natal Provincial Department of Agriculture, Environmental Affairs and Rural Development
DEAET	Eastern Cape Department of Economic Affairs, Environment and Tourism
DCO	District Conservation Officer
DEA	National Department of Environmental Affairs
DWA	National Department of Water Affairs
EIA	Environmental Impact Assessment
EZEMVELO	Ezemvelo KwaZulu-Natal Wildlife
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Area
FP	Financial Plan (component of Ezemvelo KZN Wildlife protected area management planning process)
FPA	Fire Protection Association in terms of the National Veld and Forest Fire Act (No.1 of 1998)
GDP	Gross Domestic Product
GIS	Geographical Information System
IBA	Important Bird Area
IDP	Municipal Integrated Development Plan
IUCN	International Union for the Conservation of Nature
MCM	National Department of Marine and Coastal Management
MEC	Member of the Executive Council
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NEMA	National Environmental Management Act
NPAES	National Protected Area Expansion Strategy
NR	Nature Reserve
NRPC	Nature Reserve Planning Committee
NSBA	National Spatial Biodiversity Assessment
PA	Protected Area
ROC	Regional Operations Committee
SAHRA	South African Heritage Resources Agency
SAPPI	South African Pulp and Paper Industry
SDF	Municipal Spatial Development Framework

SMME	Small, Micro and Medium Enterprises
SWOT	Strengths, weaknesses, opportunities and threats analysis
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WWF	World Wildlife Fund

1) BACKGROUND

1.1 Purpose of the plan

Protected area management plans are high-level, strategic documents that provide the direction for the development and operation of protected areas. They inform management at all levels, from the staff on-site through to the CEO, the Board and the MEC. The purpose of the management plan is to:

- Align the management of the nature reserve with national policy and the National Environmental Management: Protected Areas Act No. 57 of 2003.
- Provide the primary strategic tool for management of Impendle Nature Reserve, informing the need for specific programmes and operational procedures.
- Provide motivations for budgets and provide indicators that the budget is spent correctly.
- Build accountability into the management of Impendle Nature Reserve.
- Provide for capacity building, future thinking and continuity of management.
- Enable Ezemvelo KZN Wildlife to develop and manage Impendle Nature Reserve in such a way that its values and the purpose for which it was established are protected.

1.2 Structure of the plan

Section 1:	Provides an introduction and background to the management plan and Impendle Nature Reserve.
Section 2:	Establishes the context of the nature reserve, providing the basis for the strategic and operational management frameworks that follow.
Section 3:	Sets out the vision and objectives that must be achieved in efforts to effectively conserve the nature reserve.
Section 4:	Sets out the zonation of the nature reserve, outlining the permissible land uses in particular zones.
Section 5:	Describes the administrative structure required to effectively manage Impendle Nature Reserve.
Section 6:	Sets out the detailed management targets that must be achieved in managing the nature reserve.

Section 7:	Sets out the monitoring measures required to determine if management targets are being met and the requirements for reporting on performance in implementing the plan.
Section 8:	Describes the components that must be included in the annual plan of operation.

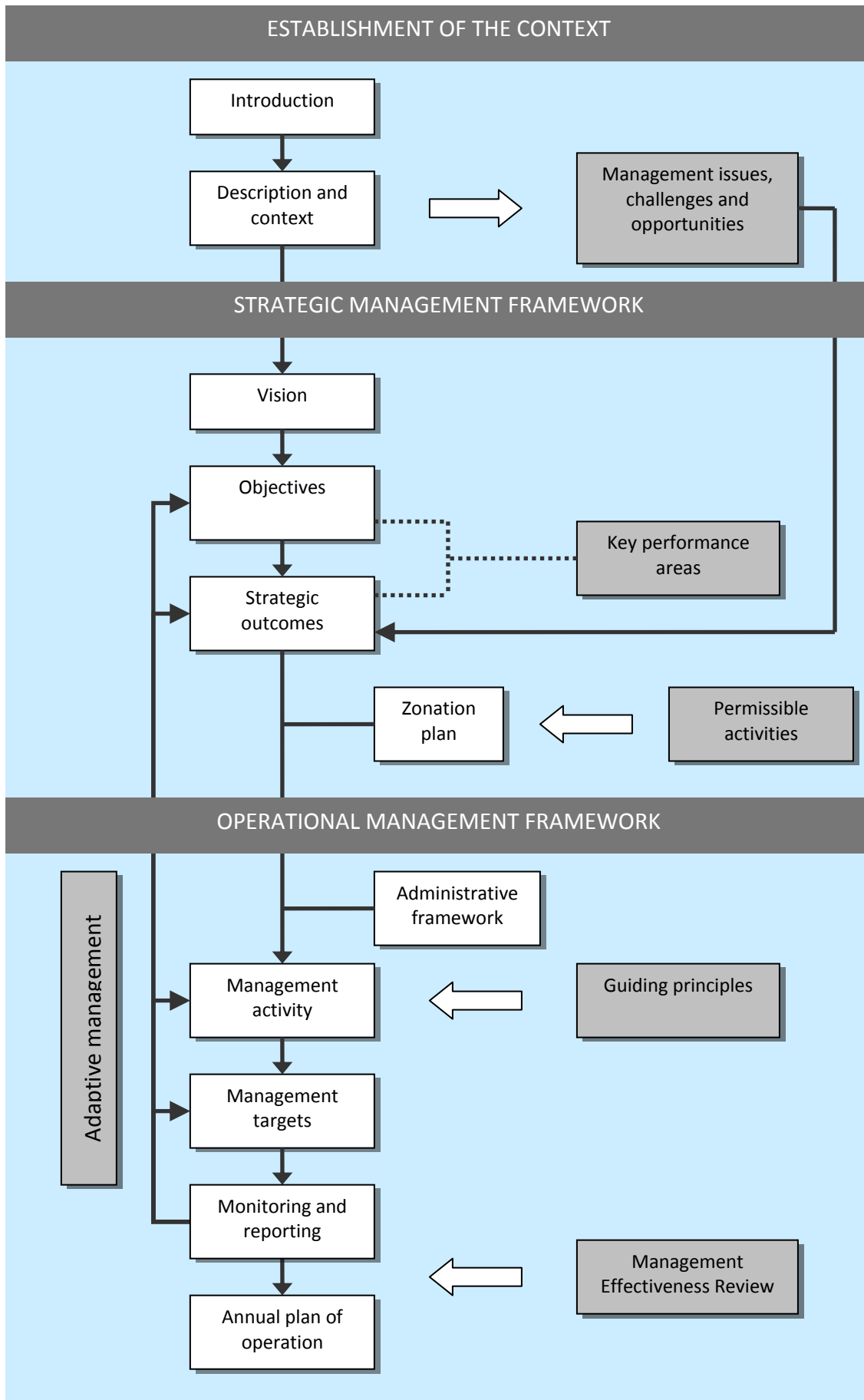


Figure 1.1 Structure of the Protected Area Management Plan

1.3 Introduction

Impendle Nature reserve is situated in the province of KwaZulu-Natal south of the town Impendle and in close proximity to the towns of Boston and Polela en route to the Southern Drakensberg Mountains. The reserve consists of 8759 hectares divided into a larger western and a smaller eastern section by the main road to Underberg (R617) that dissects the reserve. The protected area plays a key role in conserving critically endangered Midlands Mistbelt Grassland and two Critically Endangered species, the Blue swallow and Wattled cranes. A significant portion of South Africa's Blue swallow population breeds within the boundaries of Impendle Nature Reserve.

To the south west of the Impendle Nature Reserve lie the Bulwer reserves consisting of Indhloveni Nature Reserve (NR), Ingelabantwana NR, Marustwa NR, Marwaqa NR and Xotsheyake NR. The uMkomazi River forms part of the southern boundary of the reserve and the reserve is an important part of the catchment of the uMkomazi River. Eight tributaries of the river that starts within the boundaries of Impendle Nature Reserve and the altitude range from 935 to 1586 meters above sea level.

The 4098 hectare stewardship sites of Mount Shannon (MONDI) abut the reserve to the north east and the surrounding area contains Critical Biodiversity Areas (CBA's) identified through the KZN Conservation plan minset (2010). The wetlands in the reserve are identified through the national NFEPA programme as Freshwater priority areas (FEPA's).

1.4 The values of Impendle Nature Reserve

The values of a place are those remarkable attributes that exemplify it and are largely the reason that it has been proclaimed as a protected area. The values are important in planning and management, as they are the aspects of the place that must be protected. The values of Impendle Nature Reserve include:

Natural values	<ul style="list-style-type: none">▪ An area of unique natural beauty.▪ Contain habitats for threatened and protected species (Black stinkwood, Red hot pokers, Blue swallow, Crowned, Blue and Wattled crane species, Cape parrot, oribi etc.).▪ Contributes to representative portions of important vegetation types including Eastern Mistbelt Forest, Mooi River Highland Grassland, Southern KwaZulu-Natal Moist Grassland and Midlands Mistbelt Grasslands.▪ The reserve protects a component of a number of threatened discontinuous indigenous forests in Southern KwaZulu-Natal and is rich in biodiversity.▪ Provides a core area for protected area expansion or stewardship agreements, especially for consolidation of Blue swallow habitat and breeding sites.▪ Important Bird Area (IBA) contributing to the
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	conservation of various important bird species.
Ecosystem service values	<ul style="list-style-type: none"> ▪ Protection of the hydrological system including a series of wetlands which forms part of the catchment of the uMkomazi River. ▪ Soil stability, ground water recharge, water supply regulation and storage linked to the uMkomazi River. ▪ Climate change mitigation through carbon sequestration. ▪ Other ecosystem services such as fire damage control (barrier to fire), soil erosion and degradation reduction, a refuge for pollinators and many other.
Eco-cultural tourism values	<ul style="list-style-type: none"> ▪ Important potential for species interest tourism ▪ Potential to provide an environmental education destination.
Cultural and historic values	<ul style="list-style-type: none"> ▪ There is an old grave site in the reserve.
Social values	<ul style="list-style-type: none"> ▪ Provides employment in an area of rural impoverishment. ▪ Provides opportunity for controlled resource harvesting.

Consistent with Section 17 of the Protected Areas Act, the purpose of Impendle Nature Reserve is to:

- protect ecologically viable representative portions of Eastern Mistbelt Forest, Mooi River Highland Grassland, Southern KwaZulu- Natal Moist Grassland and Midlands Mistbelt Grasslands;
- preserve the ecological integrity of the area;
- conserve biodiversity in Impendle Nature Reserve;
- protect areas representative of ecosystems, habitats and species naturally occurring in Impendle Nature Reserve;
- protect Impendle's rare species and specifically the Blue swallows (*Hirundo atrocaerulea*);
- assist in ensuring the sustained supply of environmental goods and services;
- create or augment destinations for nature-based tourism;
- manage the interrelationship between natural environmental biodiversity, human settlement and economic development;
- rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species.

Public consultation has been undertaken throughout the development process and a key stakeholder workshop was held on the 7th of June 2012. Furthermore, the draft management plan has been made available for public review and comment prior to its finalisation. This process has ensured a great deal of valuable input into the development of the management plan, the outcomes of which have been incorporated into it. A detailed Public Participation Report is available upon request from the Impendle Nature Reserve management.

2) DESCRIPTION OF IMPENDLE NATURE RESERVE AND ITS CONTEXT

2.1 Institutional and administrative framework for the management of Impendle Nature Reserve

The KwaZulu-Natal Nature Conservation Board, established in terms of the KwaZulu-Natal Nature Conservation Management Act (No.9 of 1997), was appointed by the KwaZulu-Natal Member of the Executive Committee (MEC): Agriculture and Environmental Affairs as the management authority for all provincial protected areas in KwaZulu-Natal. The Board's implementing agency is Ezemvelo KZN Wildlife.

Management of Impendle Nature Reserve will be undertaken in accordance with relevant legislation and the management policies of Ezemvelo KZN Wildlife, which includes a commitment to maintain the character and ecological, cultural and aesthetic integrity of the site.

The KwaZulu-Natal Nature Conservation Board will be responsible for reporting on the management of Impendle Nature Reserve to the designated KwaZulu-Natal Provincial MEC and the Premier thus ensuring coordination of those matters that may affect the nature reserve through the relevant provincial departments, district and local municipality.

2.2 The legislative basis for the management of Impendle Nature Reserve

There is a large body of legislation that is relevant to the management of Impendle Nature Reserve, but the primary legislation guiding the management of protected areas is the National Environmental Management: Protected Areas Act (No.57 of 2003).

The Protected Areas Act establishes the legal basis for the creation and administration of protected areas in South Africa, as its objectives include provisions "for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes". The Act sets out the mechanisms for the declaration of protected areas and the requirements for their management.

A detailed list of relevant legislation is provided in Appendix B. Managers are required to familiarise themselves with the purpose and contents of the statutes and their subsequent amendments and regulations.

2.2.1 Proclamation status of Impendle Nature Reserve

Impendle Nature Reserve has been managed by Ezemvelo KZN Wildlife since 1990 and was proclaimed in the Government Gazette No 393 of 2005. Due to the absence of a proclamation diagram and the incomplete list of farm

names incorporated in the 2005 proclamation the reserve needs to be re-surveyed and proclaimed.

2.2.2 Invasive species control in terms of the Biodiversity Act

In terms of Section 76 of the National Environmental Management: Biodiversity Act (No.10 of 2004), the management authority of a protected area must incorporate an invasive species control plan in the protected area management plan. This is addressed in Sections 3 and 6 below.

2.3 The policy framework guiding the management of Impendle Nature Reserve

In conserving and managing the biodiversity of KwaZulu-Natal, Ezemvelo KZN Wildlife operations are undertaken within a broad framework of policies. At a national level, overarching policy is set out in:

- i) The White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity of 1997.
- ii) The Bioregional Approach to South Africa's Protected Areas, 2001/2002.
- iii) Community Based Natural Resource Management Guidelines, 2003.
- iv) National environmental management principles set out in section 2 of the National Environmental Management Act.
- v) Relevant norms and standards set by the Minister and MEC in terms of the Protected Areas and Biodiversity Acts.

Within the province, Ezemvelo KZN Wildlife has adopted a Five Year Strategic Plan and Performance Plan for 2009-2014, which has developed the following corporate strategic profile:

VISION

“To be a world renowned leader in the field of biodiversity conservation”

MISSION STATEMENT

“To ensure effective conservation and sustainable use of KwaZulu-Natal’s biodiversity in collaboration with stakeholders for the benefit of present and future generations.”

STRATEGIC GOALS

- i) To conserve indigenous biodiversity in KwaZulu Natal both within and outside of protected areas.
- ii) To be a sustainable, well resourced and capacitated biodiversity conservation and ecotourism organisation.
- iii) To foster the value of biodiversity conservation with stakeholders.
- iv) To be an efficient, effective and compliant organisation with good governance.
- v) To effectively promote the mandate of the organisation to stakeholders.

CORE VALUES

Integrity	At all times we act morally, ethically and with honesty.
Respect	We treat stakeholders with patience, politeness and acknowledge and value their right and those of the environment.
Accountability	We involve stakeholders in the organisation’s activities with a culture of openness and are answerable for the outcome of our actions and activities.
Team work	Working together to achieve our vision through goals.
Innovation	An adaptable organisation that embraces the culture of creativity and learning.
Excellence	We are a progressive organisation applying best practices to achieve the highest quality and standards.
Commitment	At all times we undertake our activities with passion, loyalty and dedication.
Productivity	We undertake to produce results timeously, efficiently and effectively.

A number of policies, specific to particular areas of operation, have also been developed by Ezemvelo KZN Wildlife (Appendix C). These policies have been considered and applied within the plan, where relevant. The nature reserve’s managers are required to be familiar with them and to apply them in managing Impendle Nature Reserve.

This management plan has utilised this body of policies to develop a strategic and operational management framework for Impendle Nature Reserve that is consistent with the broad goals and specific policy requirements of Ezemvelo KZN Wildlife.

2.4 The regional and local planning context of Impendle Nature Reserve

The Impendle Nature Reserve forms part of the protected area system in the south of KwaZulu-Natal. With its proximity to the uKhahlamba Drakensberg Park World Heritage Site and the Indhloveni NR, Marutswa NR, Marwaqa NR, Xotsheyake NR and Ingelabantwana NR the reserve has the potential to form an anchor for conservation initiatives in the region.

The land bordering the reserve belongs to the state, forestry companies, commercial farmers and local communities. The Mondi stewardship site of Mount Shannon borders the reserve and tribal lands used as cattle grazing including a portion of state owned land on the northern side abuts the reserve. The area surrounding the reserve includes Critical Biodiversity Areas (CBA) and specifically Blue swallow habitat and breeding sites that needs to be protected.

2.4.1 The National Protected Area Expansion Strategy

In an effort to address the lack of effective protection and representation of all vegetation types within the protected areas system, A national Protected Area Expansion Strategy (NPAES, DEAT 2008) has been developed and approved at national level with the purpose of providing a national framework for the expansion and consolidation of the protected area system with the focus on priority areas for representation of biodiversity.

In terms of the NPAES, some areas around the borders of Impendle Nature Reserve are identified as priorities for protected areas expansion even though the reserve itself does not fall within a priority area. Certain areas of Region 9, the Drakensberg and midlands focus area is in close proximity to the Impendle Nature reserve boundary. The NPAES indicates that this focus area “provides opportunities for consolidating protection of moist high-altitude grassland, protecting eco-system services, and incorporating ecological gradients for resilience for climate change. It is the source area for several free-flowing rivers and includes critically endangered river types.”

2.4.2 The Provincial Protected Area Expansion Plan

The KwaZulu-Natal Protected Area Expansion Plan (Ezemvelo KZN Wildlife 2010) also identifies areas around the borders of Impendle Nature Reserve as priorities for protected area expansion. These areas are identified as Critical Biodiversity Priority areas in terms of the Ezemvelo Conservation plan (2007 MinSet analysis).

There is also the opportunity around Impendle Nature Reserve to consolidate Blue swallow habitat and breeding sites through stewardship agreements.

2.4.3 EIA Regulations in terms of NEMA

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, 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 nature reserve or its buffer areas will thus also require environmental authorisation. See Map 5 that indicates the 5km area surrounding the Impendle Nature Reserve that is affected by Listing Notice 3.

2.4.4 Local government planning mechanisms

In terms of the principles of cooperative governance as set out in the Constitution of South Africa, different spheres of government are required to coordinate their actions with one another. It is therefore critical that through cooperation appropriate land uses are applied in the areas surrounding Impendle Nature Reserve. Due to the importance of the water production ecosystem service values of the reserve, it is particularly important that these issues are addressed.

It is important to ensure that local government planning mechanisms are aligned with the conservation objectives and principles of protected areas in their jurisdiction. In terms of the Municipal Systems Act (No. 32 of 2000) the municipality is required to develop IDP's and SDF's for its jurisdiction.

The function of the SDF is to guide overall spatial distribution of current and desirable land uses within a municipality that would give effect to the vision, goals and objectives of the municipal IDP.

The Ingwe Local Municipality has identified in their IDP (2011) the direct road link between Central and Southern Berg to the Midlands meander through Impendle as a key area of investment to boost tourism. The municipality also acknowledged its environmental responsibility and recognises sites of conservation importance including the Impendle Nature Reserve.

The northern boundary of the reserve also reflects the boundary dividing the Ingwe Local Municipality from the Impendle Local Municipality. The reserve access road falls within the Impendle local Municipality and due to its proximity this municipality also impacts on the reserve and management has to closely liaise with both local municipalities.

The Impendle Local Municipality IDP review 2011/2012 indicated that the reserve is a significant asset which is under utilised and not delivering any benefits to Impendle. There was also a project put forward to develop a tourism plan for the area and this must be considered as an opportunity to collaborate with the municipality.

At district municipality level the Sisonke District Municipality IDP 2011 identified the promotion of tourism as one of its critical targets. The Sisonke IDP indicates that an Environmental Management Plan (EMP) approved in 2005 will form part of the IDP. The objectives of the EMP include minimising developments which are harmful to the environment.

It is important the Ezemvelo KZN Wildlife liaise closely with municipalities to incorporate the protected area requirements and further develop these special planning documents. These efforts should focus on encouraging appropriate land uses in areas surrounding the reserve. Bioregional planning for the Sisonke district is currently in process.

2.5 The history of Impendle Nature Reserve

2.5.1 Origins of the name of Impendle Nature Reserve

The origin of the name is uncertain but it might refer to a war or a place where the impi gathered during the Mfecane time period.

2.5.2 History of conservation in Impendle Nature Reserve

The Impendle Nature reserve, originally referred to as the Seven Mile Bush area was officially sanctioned for conservation in 1985. The areas that are currently incorporated in the Impendle Nature Reserve and surrounding areas were previously used predominantly as cattle farms. These farms were bought as replacement land for badly situated rural areas. These areas was known as the Impendle SAOT land was under the control of the Impendle Planning Committee with the dual purpose of establishing people in dense settlements and to establish an economic foundation for rural farmers.

Specific areas of the Impendle SAOT lands were then recognised as areas with conservation potential by the then Natal Parks Board and the Department of Development Help. The areas around Impendle that had conservation potential were identified during this process. Ezemvelo KZN Wildlife has been responsible for the management of the reserve since 1994.

2.5.3 History of eco-cultural tourism in Impendle Nature Reserve

Currently and historically there have not been any tourism activities in Impendle Nature Reserve. Certain species interest groups visit the reserve on an ad hoc basis, for example bird clubs that come to view the diversity of bird species in the reserve and specifically Blue swallows (*Hirundo atrocaerulea*) and Cape parrots (*Poicephalus robustus*). Environmental

Education groups also visit the reserve and the Impendle Eco-school project is active in the area.

2.6 ¹Ecological context of Impendle Nature Reserve

2.6.1 Climate and weather

Impendle Nature Reserve lies within the summer rainfall region. Rain alternates from light mist to heavy thundershowers. Uninterrupted periods of cold, wet weather can be expected in the rainy season during the summer period. Violent electric thunderstorms occur regularly especially in the summer months. Although hail occurs occasionally, snowfalls on the plateau areas of the reserve are rare and infrequent. Mist can move quickly, and decrease visibility to almost zero.

The general pattern of precipitation of Impendle Nature Reserve correlates with the reserve's height above sea level. Aspect and slopes are the main determinants of climatic differences, resulting in the southern and the eastern aspects receiving more precipitation than the northern and western aspects because the rainfall shadow effect caused by the escarpment areas impedes the flow of humid air. The annual average rainfall for Impendle is 995 mm.

The characteristic frequent occurrence of mist is normally associated with southerly wind. The mist often forms at night and dissipates after sunrise, although it can persist throughout the day during the summer months. Condensation of this mist on plants and other surfaces supplements the precipitation of the region, and is of special importance to the Mistbelt forest. The predominant wind direction is north-easterly. Strong westerly winds occur during the winter months.

The following approximate rainfall distribution therefore expected throughout the reserve:

Southern aspects		Valleys		The plateau areas	
The Rest	950mm	New Forncett	850mm	The Rest	1000mm
Camden	950mm	Hazeldene	850mm	Camden	1000mm
Deepdale	950mm			Claybourne	1000mm

2.6.2 Topography

The Eastern Cape and the southern regions of KwaZulu-Natal consist of a series of plateaus or land surfaces that developed as a result of a number of cycles of upheaval, erosion and displacement. The topography of the area as a whole is displayed as steps, where the individual steps are not always individually identifiable. This is because of the deep cuts as a result of rivers.

¹ The ecological context was extracted from an un-dated management plan that was reviewed in 2007

It is only on the peaks between the rivers where areas of flat land can be seen that represent what was once a continuous land surface.

The above-mentioned pattern is clearly illustrated at Impendle Nature Reserve, where two plateaus occur in the water catchment area. A main plateau area, at a height of between 1 300 and 1 500 meters above sea level, is evident at the northern extremity of the reserve and again at New Forncett at the south-eastern section of the reserve. A higher plateau, namely at the top of Impendle Mountain, occurs at a height of over 1 600 meters above sea level. Impendle Mountain is situated in close proximity to the reserve in a north-westerly direction.

The uMkomazi River has carved deep valleys into the highlands, and now flows as low as 800 meters below its catchment area. The large trough created by the uMkomazi River has led to two land surfaces being formed, namely a valley area that lies next to the uMkomazi River and an escarpment that lies between the plateau and the valley.

There are thus three differentiable land surfaces that occur in Impendle Nature Reserve, namely plateaus, escarpments and valleys. The plateaus and valleys have gradients of 0° to 15°, with gradients of 0° to 6° the most common. The escarpment areas have gradients of 16° to 90° with gradients of 20° to 30° the most common.

Impendle Nature Reserve ranges in height from 877 m above sea level, on the most southerly section on the former farms of Claybourne and The Rest, to just over 1 600 meter at the highest point at Thwaleeyaka situated at the northern area of Claybourn.

As a result of the topography of the area, the reserve is ecologically sensitive. This is because of the high gradient slopes, high rainfall and the presence of soils sensitive to erosion occurring in the area.

2.6.3 Geology and soils

The area consists of two rock layers. The sedimentary rock clearly shows similar layers to the karoo system, as it is to the surface from the highest to the lowest regions of the reserve. The coagulated rock layer (dolerite) occurs predominantly as large plates and dykes on the reserve. The largest dolerite plates occur on the plateau areas OF Claybourn, The Rest and Camden.

The three geological formations that occur on the reserve are dolerite, the Escourt formation and Volkrust formation.

- The dolerite is from the Juras age, which was pushed out of the lithosphere at the end of this time period.
- The Escourt formation (found in higher laying regions) is from the Beauford group of Karoo sediments that consists of mainly of shale, but also consists of grey sandstone.

- The Volkrust formation belongs to the low-lying Ecca group of the Karoo sediments. It consists mainly of dark blue-grey shales. This formation is restricted to the low-lying areas of Hazeldene.

2.6.3.1 *Dolerite*

Deep red clay soils, of the Hutton and Griffins forms, occur on high lying areas.

2.6.3.2 *Escourt formation*

On flatter areas predominantly deep structure-less clay-like soils, often with yellow-brown b-horizon in lowest areas.

2.6.3.3 *Volkrust formation*

Badly draining clay-like soils that consist of plinthic subsoil.

2.6.3.4 *Colluvial soils*

The soils occur on the low-lying areas on the boundary of the valley floor. The soils are derived from the Escourt formation consists of shale. These soils are clayish and generally shallow and badly drained.

2.6.3.5 *Alluvial soils*

These soils, classified as the Jozini and Koedoesvlei series of the Oakleaf form, have a limited distribution on the reserve.

2.6.3.6 *Dolerite and Shale*

In certain areas the soils consist of both dolerite and shale. The resulting soil type is predominantly of the Griffin form.

The soils can be summed up as follows:

<i>Plateau soils</i>	<i>Valley soils</i>	<i>Lithosols</i>
This soil consists of predominantly out of the Griffin, Hutton, Clovelly and Kranskop soil forms. In general, they are deeply leached and uncompacted clay like soils. These soils have a low ph with a high concentration of aluminum and low concentration of potassium carbonate, phosphate and zinc.	This soil consists of the Clovely, Bonheim, Hutton, Oakleaf, Longlands, Westleigh and Katspruit types.	The largest part of the reserve is mountainous terrain. The soil derived from shales usually very shallow Mispah soils, while those derived from dolerite are a mix of Hutton soils and rocky layers.

2.6.4 Geomorphology

There is a close relationship between the geology, soils and hydrological characteristics of the region. Shale is not as weathered and water absorbing as dolerite and this causes the drainage lines to be more narrowly spaced on the shale than on the dolerite areas.

Soils of the area are high in clay percentage, this is especially evident on the shale soils that are particularly sensitive to soil erosion. The soil formation came from seven mother materials, those are: dolerite, colluviums, alluvium, and various sediments of the Escourt and Volkrust formations.

2.6.5 Hydrology

Impendle Nature reserve is an important water catchment area of the uMkomazi River to which it supplies a significant amount of high quality water. The rivers and a few small wetlands and several man-made dams form the aquatic system of reserve. Birds and mammals associated with the aquatic system include the following:

<i>Circus ranivorus</i>	African Marsh Harrier
<i>Tachybaptus ruficollis</i>	Dabchick
<i>Ardea melanocephala</i>	Black-Headed Heron
<i>Ciconia ciconia</i>	White Stork
<i>Ana undulata</i>	Yellow-Billed Duck
<i>Anas erythrorhyncha</i>	Red-Billed Teal
<i>Plectropterus gambensis</i>	Spur-Winged Goose
<i>Balearica regulorum</i>	Crowned Crane
<i>Grus carunculatus</i>	Wattled Crane
<i>Aonyx capensis</i>	Cape Clawless Otter
<i>Lutra maculicollis</i>	Spotted-Necked Otter
<i>Atilax paludinosus</i>	Water Mongoose

2.6.6 Vegetation

The vegetation in Impendle Nature Reserve is classified as per the KZN Vegetation Map 2011 into four distinct vegetation types:

Mooi River Highland Grassland	Vulnerable
Eastern Mistbelt Forest	Least threatened
Southern Kwa-Zulu Natal Moist Grassland	Endangered
Midland Mistbelt Grassland	Critically endangered

Only a small percentage of these vegetation types are represented in formally protected areas and in order to achieve provincial and national targets it is extremely important to protect these vegetation types.

The following descriptions of the vegetation types have been extracted from Mucina and Rutherford (2006) unless otherwise stated:

Mooi River Highland Grassland:

This vegetation type consists mainly of rolling and partly broken landscape, covered in grassland dominated by short bunch grasses. *Heteropogon contortus*, *Themeda triandra* and *Tristachya leucothrix* are dominant in well-managed veld.

Eastern Mistbelt Forest:

These forests are tall (15-20m tall) and multi-layered (having two layers of trees, a dense shrubby understorey and a well-developed herb layer). The forests found on low-altitude scarps are low (in places having the character of a scrub forest), and although less structured into different tree layers, they are still species-rich. The tall forests show a mix of coarse-grained, canopy gap/disturbance-driven dynamics and fine-grained, regeneration characteristics. The Amathole Mistbelt forests are dominated by emergent trees of *Afrocarpus falcatus* and a range of deciduous and semi-deciduous species such as *Celtis africana*, *Calodendrum capense*, *Vepris lanceolata* and *Zanthoxylum davyi*. Further east (Eastern Cape, KwaZulu – Natal Midlands) *Podocarpus henkelii* becomes prominent in the canopy layer. Deciduous elements play an important role.

Southern Kwa-Zulu Natal Moist Grassland:

Gently sloping valley bottoms of tall mixed veld dominated by *Hyparrhenia hirta* and sparsely scattered *Acacia sieberiana*. *Themeda triandra* is the dominant grass on veld that has been well managed and many species of Drakensberg Foothill Moist Grassland are well represented and include *Diheteropogon filifolius*, *Harpochloa falx* and *Trachypogon spicatus*. Overgrazed areas become dominated by 'mtshiki' species such as *S. pyramidalis*. Selective overgrazing causes certain wiregrass species (*Elionurus muticus* and *Aristida junciformis*) to become abundant (Camp, 1999a;b).

Midland Mistbelt Grassland:

Hilly and rolling landscape mainly associated with a discontinuous east-facing scarp formed by dolerite intrusions (south of the Thukela River). Dominated by forb-rich, tall, sour *Themeda triandra* grasslands transformed by the invasion of native 'Ngongoni grass (*Aristida junciformis* subsp. *junciformis*). Only a few patches of the original species-rich grasslands remain.

The indigenous forests as a whole are of great conservation importance, and occur on steep south facing slopes. Mistbelt forest is the most poorly represented forest type in formally protected areas, which makes Impendle Nature Reserve vital for the long term conservation of this forest type.

The forests in general are of particular conservation importance because of their history of exploitation for timber, and the growing pressure on them for their medicinal plants. Of particular importance in some of the forests is the

occurrence of Black Stinkwood (*Ocotea bullata*), an endangered species which is exploited for medicinal purposes.

Important species that occur in Impendle Nature Reserve include the Drakensberg Cycad (*Encephalartos ghellinckii*), *Hesperantha woodii*, *Elincaene* (*Kniphofia buchananii*), *Senecio exuberans*, *Asclepias woodii* and *Bowiea volubilis*.

It should be noted that because of previous land use of much of the area now incorporated into the reserve and because of the land use of the surrounding areas, many of the ecological processes responsible for the functioning of the systems have been disrupted. Many of these processes are in process of recovery. Previous land uses such as cropping, grazing and the use of the forest for timber resulted in the alteration of plant communities and structure.

The alteration of the grassland community is evident in some of the heavily utilized areas and altered structure in the forests is evident in the absence of large trees, through harvesting, and in the dominance of creepers in many areas.

The relatively small size of the reserve is likely to result in high rates of local extinction through environmental and demographic stochasticity. The fact that the reserve is surrounded by plantations and grazing lands and the absence of natural communities, diminishes the possibility of re-colonisation. Management must seek to reduce the rate of accidental extinction, boost populations where necessary and attempt to reinstate migration corridors.

Many ecological processes responsible for system function (e.g. herbivory, competition, immigration, emigration/dispersal and predation) have been disrupted in the system due to previous land uses. While many of these processes have become functional again, many other important processes such as herbivore migration, large herbivore predation and mega herbivore disturbance and feeding are still dysfunctional.

2.6.7 Fire regime

Fire plays an important role in the cycling of nutrients at local and landscape scale. Fire is a primary determinant of the extent of the forest. In the absence of fire, forest and bushveld would expand at the expense of the grassland. Through unselective defoliation fire maintains grass vigour, reduces the effects of selective grazing and creates opportunities for certain cryptic grassland plant species to survive and reproduce. In the absence of fire the grassland would be less species rich. Defoliation and subsequent plant growth caused by fire provides nutritious food for herbivores, and is important for their survival (particularly Oribi). The frequency, timing and nature of fire, coupled with climatic conditions and herbivore numbers, determines the effect of fire on the system.

The current fire regime incorporates the burning of 62 km peripheral firebreaks and 60 km of internal firebreaks are burnt annually in compliance with the National Veld and Forest Fire Act (No 101 of 1998).

Block burns are determined through an annual planning process to determine the seasons fire requirements. The reserve is visited each year in March to assess which blocks require burning and which require a rest. The decision to burn is based on perceived fuel load, what was burnt in previous seasons, and which blocks require to be cleared of bramble (it is difficult to work on bramble if the grass is long and thick). An attempt is made not to burn blocks every year and also not to leave them unburnt for longer than three years, and every effort is made to achieve a mosaic of burnt and unburnt blocks.

2.6.8 Invasive species

The invasive species that occur in the reserve include bramble, Eucalyptus and wattle. Previous efforts to remove alien species brought sections of the reserve to maintenance levels and ongoing maintenance of these control efforts are done annually.

During 2011 a total of 1354 hectare of wattle, Eucalyptus and bramble have been cleared. Dense infestations of wattle and Eucalyptus at New Forncett are a priority as well as infestations in blocks where Blue swallow breeding sites occur.

2.6.9 Mammalian fauna

As a result of poaching, the destruction of the natural vegetation and other some species that occurred in the area are no longer present in the reserve. Appendix E indicates the current species list for the reserve as well as a list of threatened species. The Endangered Oribi (*Ourebia ourebi*) is present in the grasslands, and the rare Tree Dassie (*Dendrohyrax arboreus*) in the forest. Other mammals occurring in the reserve that are considered endangered include Serval and Natal Red Rock Rabbit.

2.6.10 Avifauna

The wetland area provides habitat for African Marsh Harrier (*Circus ranivorus*), Crowned Crane (*Balearica regulorum*) and Wattled Crane (*Bugeranus carunculatus*). The surrounding rolling grassland provide breeding habitat for four to five pairs of Blue Swallow (*Hirundo atrocaerulea*), depending on the weather during the breeding season. Blue Crane (*Anthropoides paradiseus*), Densham's Bustard (*Neotis denhami*), Ground Hornbill (*Bucorvus leadbeateri*) and Blackwinged Plover (*Vanellus melanopterus*) are also present.

The forest is home to Orange Ground Thrush (*Zoothera gurneyi*), and to South African Endemics such as Bush Blackcap (*Lioptilus nigricapillus*), Knysna Turaco (*Tauraco corythaix*) and Forest Canary (*Serinus scotops*). The

area is a listed Important Bird Area and the potential for species specific tourism should be investigated. See Appendix E for species list.

2.6.11 Herpetofauna (reptiles and amphibians)

Reptiles and amphibians form an important part of the ecosystem and certain species serve as bio-indicators due to their sensitivity to environmental factors. Much remains to be discovered about the reptile and amphibian species complement of the area, their life histories, inter-relationships and contributions to the functioning of its ecosystems.

Two threatened species that occurs in Impendle Nature Reserve are Bourquin's dwarf chameleon (*Bradypodion bourquini*) and Delalande's sandveld lizard (*Nucras lalandii*).

2.6.12 Invertebrates

Invertebrate fauna constitutes the greatest component of species diversity in natural systems but it is often poorly understood. The role of invertebrates in ecosystems is important and often overlooked. In terms of biodiversity and the provision of ecosystem services however, it is important to acknowledge that they are fundamentally important. Invertebrates form important components of food webs, assist nutrient cycling and aeration of soil, decomposition and pollination of plants and trees. For many of these invertebrate species habitat conservation is of the most important management intervention required with habitat loss being the biggest threat to their survival.

Several species of millipedes, molluscs and insects are considered important and these species are reflected in Table 6.7 Systematic biodiversity planning conservation targets to which Impendle Nature Reserve contributes.

2.7 Cultural context of Impendle Nature Reserve¹

The early and original inhabitants of Impendle area were the San/Bushmen people. Their numbers began to decline after the arrival of the Nguni clans, as they started moving into regions in the higher Drakensberg.

The northern Nguni clans inhabited the region north of the uThukela up to St Lucia. The Tsongas populated the area north of St Lucia into Mozambique. The southern Nguni clans inhabited the region south of the Tugela. Their kingdom was large but weak and unorganised.

Towards the end of the 18th century various clans of the northern Nguni's forged to increase their strength and there was a tendency to the formation of loose confederations. Four main confederations formed, the Zulu clan formed one of the smaller branches of one of these confederations. In 1816 the Zulu clan obtained a new leader who was to be highly influential character on the Nguni clan, his name was Shaka. In 1822 Shaka waged war

¹ The cultural context was extracted from an un-dated management plan that was reviewed in 2007

with the other branches of the confederations and rose as victor of the battle. Many people fled the area, but those who could not were initiated into the Zulu clan.

Under the leadership of Shaka the Zulus attacked the Nguni clans from the south of Thukela River until the Buffels River. The southern Nguni were driven southwards of into the Cape and spread over the Drakensberg. This was the beginning of the time known as Mfecane.

The first British settlers established themselves at Port Natal now known as Durban, in 1824. The settlers found the land south of the Thukela to be largely inhabited. This was because of the intimidation of Shaka, which had scared most of the previous inhabitants away, forcing them to find alternative lands either in the Cape or in the Drakensberg mountains range. Those that had stayed were sheltering in secluded areas. The Mfecane lasted until 1930, after which small numbers of the Zulu clan moved southwards over the Thukela.

Lumberjacks started inhabiting the area in about 1947 and started harvesting lumber, mainly yellowwood, from the indigenous forests of Impendle, known then as the Seven-Mile Bush. The first records of European people settling in the area of the Seven-Mile Bush were in 1950, of a family with the surname Lundy (Lundy's hill).

During this time period there were no native Africans living in the Impendle region. The nearest African inhabitants were the Thlangwani clan and were situated next to the upper regions of the uMkomazi River. They traded skins and ivory with a British company, Fynn and Fairwell stationed at Port Natal. The ivory was obtained from the elephants that still lived in the bush of the Impendle and Bulwer regions.

In 1849, 5 000 Europeans, originating from England and Scotland, established themselves near Richmond. This was known as the Burne settlement. They were drawn to South Africa by promises of plots of 20 acres of land to each family, which is much larger than the two acre plots they would have had in England or Scotland. The land they would have had in England and Scotland would have been flat and ended up having more potential than the plots they were given in Richmond. As a result of this, most of the families could not make living on the land that they were given and moved to the towns of Pietermaritzburg and Port Natal. Some of the Burne settlers established themselves on the Seven-Mile Bush.

After the establishment of European farmers, local Africans as well as Indians, originally brought in from India in 1860 to work on sugarcane plantations, began working on farms in the Seven-Mile Bush area or, as it were also known, Yellowwood forest.

Up until the 20th century the only income out of the Seven-Mile Bush was the wood that was chopped from the forest, and the yield of the wood out of the forests was progressively getting scarcer. Any livestock that was kept was

predominantly used as cart animals and the corn grown was chiefly for household use. Despite this lumberjacking continued at a large scale until late 1940's and 1950's. With the arrival of the railway in 1902 the harvested wood was transported to the railway station in Deepdale. Of the last lumberjacks were two men who inhabited Camden, one of the farms to be incorporated into the area of the reserve. One of these men had harvested wood from this forest for 30 years. During the time period of harvesting wood from the forest, there were four steam driven saws, one each at Claybourne, Camden, Deepdale and Claremont.

Originally the harvesting of wood from this forest was very specific, with only the older specimen of certain species being taken. This changed with the onset of the Second World War, as a large amount of wood from many species and many sizes were harvested for use as spade and pick handles.

Yellowwood was the most abundant wood in the Seven-Mile Bush, and was use made into planks for floors, walls and as beams. Other wood that was harvested included Sneeze wood, Black stinkwood, White stinkwood, Wild chestnut, Red stinkwood, Red pear, Assagaaewood, Wild peach, Lemonwood, White ironwood and Ironwood, each with their own specific use.

From the beginning of the 1900's there was a move from wood to beef as a means of survival. Cattle and goat farming started up on these farms to supplement the difficult living being made by harvesting wood.

In the 1940s the owners planted blue gum and wattle for various uses. In the beginning of 1900's there were very few Africans in the Impendle area, and in 1947 they're only 12 large kraals and only a small number of inhabitants.

The area of Impendle was poorly managed since the lumberjacks over harvested the trees and make some tree species to decline. Some species like black stinkwood and yellowwood are rare in the forest now.

Five gravesites are located within the reserve. No other known cultural sites occur in the reserve. There are no recorded archaeological sites within the reserve. There are, however several recorded late Iron Age sites adjacent to the reserve.

2.8 Socio-economic context

The land bordered the reserve belongs to the State, various forestry companies, commercial farmers and the local communities. Most of the land owned by the State and local communities are used as grazing land.

The following population statistics based on Census 2007 estimates was extracted from The Ingwe Local Municipality's 2011 IDP review:

- About 2.1% of KZN's population resides in Ingwe Local Municipality. According to the population census, in 2001 there were 107 558 individuals, made up of 21 332 households.

- There is an overrepresentation of females in Ingwe LM, with females accounting for 54.2% of the municipal population in 2007. This is an increase of 1.8% from 52.4% in 2001.
- The age structure of Ingwe Local Municipality reveals a youthful population profile with 57% of the population under the age of 20 and 71% under the age of 30. Around 36% of the population are within the working age category while 5% of the population is above 60.
- The population is concentrated in tribal areas where the majority of the municipal population resides. The close proximity of dense rural settlements and their location on R617, a major road make Bulwer and Donnybrook accessible to a wider municipal population.

It is also clear that there are low levels of literacy and high levels of unemployment in the area.

2.9 Operational management within Impendle Nature Reserve

2.9.1 Infrastructure

	<i>Main camp</i>	<i>New Forcett</i>	<i>Hazeldene</i>
Management infrastructure	<ul style="list-style-type: none"> ▪ 1x Office building ▪ 1 x Storeroom and shed ▪ 2x Staff Accommodation units ▪ 1x single quarters for casual workers ▪ 1 x Manager house ▪ 1x Staff attendant house ▪ 1 x Entrance gates 	<ul style="list-style-type: none"> ▪ 1 x Field ranger house 	1 x Field ranger house
Conservation infrastructure	<ul style="list-style-type: none"> ▪ 26 km of game fence ▪ 1 x Environmental Education Centre 	<ul style="list-style-type: none"> ▪ 5 km of game fence 	<ul style="list-style-type: none"> ▪ 12 km of game fence
Bulk Infrastructure	<ul style="list-style-type: none"> ▪ 12 Km of management tracks 	<ul style="list-style-type: none"> ▪ 200 m of management tracks 	<ul style="list-style-type: none"> ▪ 6 Km of management tracks

2.9.2 Staffing establishment

There are currently 19 permanent staff members (Two vacant positions) divided as follows:

Conservation manager x 1	Heavy duty driver x1
Administrative clerk x 1	Handy man x 1
Corporal Field rangers x 1	Tractor driver x 1
Senior field ranger x 1	General assistants x 5 (One serve as a cleaner)
Field rangers x 7	

The staff members based at Impendle Nature Reserve are also responsible for the management of the Bulwer complex that include five forest reserves and three erfs. According to Carbutt and Goodman 2010 the management effectiveness assessment for Impendle was 58%. According to the abovementioned report there is 0.0022 permanent staff per hectare. Even though this compare fairly favourable to other similar sized protected areas it needs to be considered that these staff members also responsible for management activities in Ingelabantwana NR, Indhloveni NR, Marutswa NR, Marwaqa NR, Xotsheyake NR and three erfs. Currently there are 2 vacant positions that need to be filled in order to improve management effectiveness at Impendle Nature Reserve.

2.9.3 Funding levels at Impendle Nature Reserve

Currently the operational budget for Impendle Nature Reserve is R 272 274 and there are no additional sources of funding even though this avenue should be investigated. The funding level at Impendle nature Reserve is therefore R 31.08/ hectare and considering that these resources are shared with the five forest reserves in the Bulwer complex, this is below the optimal level to effectively manage the reserve.

2.9.4 Management effectiveness in Impendle Nature Reserve

During the 2010 protected area management effectiveness assessment Impendle Nature Reserve scored 58% which is substantially below the accepted minimum standard of 73% for Ezemvelo protected areas.

The reserve is extremely rich in biodiversity and one of the most threatened protected areas. According to the 2010 Management Effectiveness report (Carbutt & Goodman, 2010) the reserve also experiencing high levels of threats and pressures. Pressures refer to current negative impacts on Impendle Nature Reserve while threats are potential negative impacts that might threaten the reserve in future.

The most important pressures for Impendle Nature Reserve include arson fire, alien plants, climate change, poaching and land invasion and disturbance. The most important threats to Impendle Nature Reserve are

climate change, poaching, alien animals and exotic diseases. It is important that management interventions are put in place to address these pressures and threats.

The Impendle Nature Reserve is proclaimed but there is no Surveyor General's diagram. Twelve km of fencing is incomplete due to constant vandalizing and theft of the fence. The two land claims are complex in nature and the non-resolution of the claims affect the effective management of the reserve.

The management effectiveness assessment also indicated that staff levels and financial resources are below the optimal level for the achievement of critical activities.

Adjacent land-use planning does not take into account the objectives of the protected area. Mechanisms to facilitate this should therefore be put in place through the development of bioregional and sector plans that will incorporate the protected area requirements into the municipal planning documents.

2.10 Summary of management issues, challenges and opportunities

Table 2.9.1 Management challenges and issues

Key performance area	Issue that must be addressed
Legal compliance and law enforcement	▪ Resolution of land claim has not been completed and this affect the management of the reserve and specifically stakeholder relationships.
	▪ Poaching (wood, animals, birds) takes place especially in areas where there is no fence to demarcate and secure the area.
	▪ Lack of boundary demarcation, securing and agreement with neighbours.
	▪ Thoroughfare of the protected area by the public.
Stakeholder engagement	▪ Lack of formal and effective communication with community.
	▪ The lack of understanding of the protected area values and management.
	▪ Lack of formalised strategic partnerships to assist the reserve with achieving its objectives.
Buffer zone protection and regional management	▪ There is the potential to ensure connectivity and corridors through potential stewardship sites.
	▪ Municipal planning documents do not reflect the buffer requirements for Impendle Nature Reserve.
	▪ Lack of effective liaison and cooperation with the municipalities.
	▪ The access road to Impendle Nature Reserve needs to be repaired and maintained (Issues to be addressed include ownership, responsibility, maintenance budget, current condition). These issues must be resolved especially if tourism development is addressed.
Eco-cultural tourism development	▪ There is a need for a comprehensive environmental education programme.
	▪ Lack of tourism facilities and activities.
	▪ Public access to the reserve is currently not formalised.
Conservation management	▪ Alien and invasive plant control and management.
	▪ Management and control of natural resource use.
	▪ Protection of threatened species.
	▪ Problem animals, specifically Bushpigs.
	▪ Fire management including arson fires and legal compliance.
	▪ Potential to introduce more species of game to provide a better product for tourism development.
	▪ Lack of a viable oribi population.
	▪ Domestic livestock in the area due to the lack of a fence.
	▪ Genetic integrity of Black Wildebeest is not known.
	▪ Soil erosion mostly linked to infrastructure such as roads and tracks.
Operational management	▪ The boundary is not fenced.
	▪ Lack of sufficient financial resources.
	▪ Lack of sufficient human resources.
	▪ State of infrastructure including staff housing, roads and fences and the education centre.

3) STRATEGIC MANAGEMENT FRAMEWORK

In an effort to ensure that Impendle Nature Reserve is effectively managed, the following strategic framework has been developed. It is aimed at providing the strategic basis for the protection, development and operation of the nature reserve over the next five years and has been prepared collaboratively through a process involving stakeholders within Ezemvelo KZN Wildlife, the communities around the nature reserve, local and provincial government departments and other stakeholders.

The vision describes the overall long-term goal for the operation, protection and development of Impendle Nature Reserve. The objectives and strategic outcomes that follow are intended to provide the basis for the achievement of the vision. The objectives provide a broad description of the goals for each key performance area. The strategic outcomes, which flow from the objectives, set out what is needed to achieve the objectives, based on the management challenges, issues and opportunities described in Section 2 above.

3.1 Impendle Nature Reserve vision

A reserve that protects the ecosystem integrity and important biodiversity of the area, provides a sustainable flow of eco-system services and is managed effectively with the support of the community

This vision of Impendle nature reserve includes the effective management of the reserve that incorporates the reserve having adequate resources. The community support is an important component of management and includes not only regular open channels of communication but also an extensive environmental awareness component as reflected in the objectives and in the management tables.

An effectively managed reserve also incorporate the potential economic opportunities that need to be investigated as per the management objectives and management tables.

3.2 Objectives and strategic outcomes

An objective has been identified for each of Impendle Nature Reserve key performance areas, which follow from the management challenges, issues and opportunities, and relate to the important functions and activities necessary to protect, develop and manage it effectively. The objectives have then been translated into strategic outcomes, which form the basis for the management activities and targets set out in the operational management framework, described in Section 6 below. Table 3.1 sets out the key performance areas, the objective for each key performance area and the strategic outcomes, required to realise the objectives.

Table 3.1 Objectives and strategic outcomes for Impendle Nature Reserve

Key performance area	Objective	Strategic outcome
Legal compliance and law enforcement	Comply with and enforce legislation and policies pertaining to protection, development and management of the Impendle Nature Reserve.	<ul style="list-style-type: none"> ▪ Ensure that there is adequate law enforcement in Impendle Nature Reserve to protect the reserve integrity. ▪ Legal protection for the full extent of the nature reserve and regulatory mechanism to facilitate access. ▪ Implementation of the outcome of the land claim process.
Stakeholder engagement	Establish good neighbour relationships through collaboration and open communication channels with stakeholders.	<ul style="list-style-type: none"> ▪ Establish and maintain a liaison forum for Impendle Nature Reserve to facilitate constructive community involvement. ▪ Development of strategic partnerships which could assist with the achievement of the reserve objectives.
Buffer zone protection and regional management	Protect the biodiversity of Impendle Nature Reserve from activities, processes and land uses outside its boundaries that may threaten it.	<ul style="list-style-type: none"> ▪ Incorporation of the Impendle Nature Reserve buffer requirements in municipal and regional planning documents. ▪ Sustainable access to Impendle Nature Reserve in order to provide safe access to tourist. ▪ Determination of the buffer zone requirements around the Impendle Nature Reserve. ▪ Prioritization of key areas in the Expansion plan /Biodiversity stewardship programme.
Eco-cultural tourism development	Promote opportunities for eco-cultural tourism and environmental awareness.	<ul style="list-style-type: none"> ▪ Determination of a tourism market profile, through tourism market research for the nature reserve. ▪ Preparation and implementation of a feasibility study indicating the tourism options that may be considered for Impendle Nature Reserve. ▪ Development and implementation of an environmental interpretation and education programme.
Conservation management	Protect the ecosystem functioning, ecological integrity and biodiversity through adaptive management	<ul style="list-style-type: none"> ▪ Development of a comprehensive fire management plan for the nature reserve. ▪ Adequate fire safety within the Impendle Nature Reserve is ensured. ▪ Annual planning is undertaken for the implementation of the season's burning plan. ▪ Implementation of procedures to identify, rehabilitate and manage areas that have been significantly impacted by soil erosion. ▪ Achievement of a significant reduction in levels of invasive plant infestations in the nature reserve. (Wattle,

		<p>bramble and Eucalyptus)</p> <ul style="list-style-type: none"> ▪ Development of an invasive species control plan for the nature reserve. ▪ If extractive resource use is undertaken, it is done legally, sustainably and conforms to Ezemvelo KZN Wildlife policy. ▪ If bioprospecting is undertaken, it is done legally and conforms to national legislation. ▪ Investigate and effectively communicate the value of Impendle Nature Reserve’s ecosystem goods and services to the relevant stakeholders. ▪ Implementation of procedures to manage alien animals. ▪ Investigate and effectively communicate the value of Impendle Nature Reserve’s ecosystem goods and services to the relevant stakeholders. ▪ Development of a strategy for the introduction and management of wildlife into the nature reserve in accordance with Ezemvelo KZN Wildlife policies. ▪ Development and implementation of a strategy for problem animal control. ▪ Processes are established to determine the success of management interventions in protecting the ecosystems, communities and species of the nature reserve. ▪ Rare and endangered species management is undertaken using best available scientific knowledge. ▪ Critical ecological processes and functions are maintained in Impendle Nature Reserve.
Operational management	Provide adequate human resources, equipment and funding to enable effective management Impendle Nature Reserve	<ul style="list-style-type: none"> ▪ All facilities and infrastructure in the nature reserve are adequately maintained. ▪ The nature reserve is adequately staffed for its effective management and operation. ▪ Development of a five-year financial plan that identifies the resource needs to achieve the objectives for the nature reserve.

4) ZONATION PLAN

The purpose of zonation within a protected area is to identify types and levels of usage that are acceptable based on an area's sensitivity and resilience, and to manage visitor experience and inter-user conflict. Zonation is also used to identify areas in which infrastructure may be located.

4.1 Zonation of Impendle Nature Reserve

A standardised zonation system has been developed for all of Ezemvelo KZN Wildlife's protected areas (Goosen, 2011). The zonation system recognises and reflects:

- Sensitive features associated with a protected area (i.e. biophysical, cultural and sense of place).
- A general gradation in the zonation categories, in which the next use level provides a buffer to the lower use level.
- Influence of existing and historic facilities, infrastructure and use.
- Opportunities and constraints (biophysical, social or managerial constraints) for use.
- Activities that are permitted in zones of higher protection are also allowed in zones of low protection. E.g. activities permitted in the Low Use Zone are also permitted in the Moderate Use Zone.

The final management zonation is a composite of ecological zonation (based on natural 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 eco-cultural tourism objectives for the protected area. Biophysical features that are readily located on the ground have been used to demarcate and delineate the zone boundaries.

See Map 6 and 7: Zonation of Impendle Nature Reserve and 5km buffer surrounding the nature reserve based on NEMA Listing No 3.

4.2 Concept development guidelines

The purpose of the zonation of Impendle Nature Reserve is to control the intensity and type of use within it, in efforts to ensure the overriding goals of biodiversity conservation are met whilst enabling acceptable levels of eco-cultural tourism and other resource use. On this basis, within some zones, the permissible intensity of use will be relatively higher than in others.

4.2.1 Key Feature Protection Overlay

Description: An area that is vulnerable and or scientifically important that require specific additional controls to prevent undesirable impacts on identified sensitive or threatened species, habitats, ecosystems, bio-control release sites, research sites, archaeological, living heritage and

palaeontological sites.	
Objective: This zone is for permanent, temporary or seasonal protection of important core protected area values and aims to provide additional protection for the integrity of key areas.	
<i>Permissible activities and infrastructure</i>	<i>Constraints and implementation</i>
<ul style="list-style-type: none"> ▪ The zone may overlay other zones where a range of infrastructure may already exist. ▪ In addition to restrictions of the underlying zone, site specific rules and regulations may apply. 	<ul style="list-style-type: none"> ▪ This is a protection zone and would only allow for access and development under site specific constraints. ▪ The zone does not cater for further developments or resource utilization. ▪ This zone provides a higher level of protection than the underlying zone. ▪ Could be for permanent, temporary or seasonal protection. ▪ Changes to this overlay can be implemented through the planning committee and the annual management meeting and recorded as such.

4.2.2 Low Use Zone

Description: An area where there is little evidence of modification of natural processes and landscapes, that is more sensitive than the moderate use zone and where the ecotourism principles of low human impact will prevail.	
Objective: To designate an area for tourism experiences and management activities that are focused primarily on low impact activities and where general sensitivity requires that management and tourism impacts on the natural landscape should be mitigated.	
<i>Permissible activities and infrastructure</i>	<i>Constraints and implementation</i>
<ul style="list-style-type: none"> ▪ Hiking and formalised trails. ▪ Facilities of a rustic nature such as rustic overnight hiking huts, hides and trails. ▪ Motorized access is low key and 4 x 2 access provided to points where trails start or to tourist facilities. ▪ Management activities must focus on protecting park 	<ul style="list-style-type: none"> ▪ Where possible, facilities should be developed on the periphery of the zone towards the less sensitive adjacent zone. ▪ Activities are mostly low impact and low density. ▪ No modern facilities such as restaurants and shops are permissible in this zone.

<p>resources and core values.</p> <ul style="list-style-type: none"> ▪ Limited management roads and tracks. ▪ Controlled extractive resource use in line with Ezemvelo KZN Wildlife policies and norms and standards. 	
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4.2.3 Moderate Use Zone

Description: An area where natural processes and the landscape may be altered to support protected area operation. This zone is less sensitive than the low use zone and this is where experiences, facilities, infrastructure and services are provided to visitors and where general park management activities can take place.

Objective: To designate a tourism area that is primarily focused on visitor experience while still securing the values of the protected area. To designate an area that serves the operational and support functions of the protected area.

<i>Permissible activities and infrastructure</i>	<i>Constraints and implementation</i>
<ul style="list-style-type: none"> ▪ Hiking on formalised trails. ▪ The tourism road network including access roads and game viewing roads. ▪ Traditional game viewing routes with associated more formalized infrastructure. ▪ Infrastructure is accessible by motorized access. ▪ Management roads and tracks. ▪ Management activities are directed to maintaining park infrastructure for biodiversity conservation, park operations, equipment and material storage. ▪ Controlled extractive resource use in line with Ezemvelo KZN Wildlife policy. 	<ul style="list-style-type: none"> ▪ Within the moderate use zone a specific Tourism development node will be defined which could include areas of commercial use. ▪ Where possible this node should be outside the protected area. ▪ This node should be developed in the less sensitive part of the moderate use zone. ▪ The Tourism development node can only be developed in areas where it does not compromise the values of the protected area. ▪ The node must have a specified footprint. ▪ Examples of developments in a Tourism development node include: <ul style="list-style-type: none"> ▪ Small, medium and large resorts. ▪ Lodges ▪ Rock Art Centre ▪ Restaurants ▪ Picnic Areas ▪ Camping sites ▪ Park Administrative Node (Within the Moderate use zone)

	<ul style="list-style-type: none"> ▪ Facilities include staff accommodation, administrative offices, other operational required infrastructure, bomas and waste handling sites etc. ▪ Wherever possible facilities and infrastructure related to park operations should be located outside of the protected area. If not possible they will form part of this node. ▪ The node must have a specified area as a footprint.
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4.2.4 Protected Area Buffer Zone

<p>Description: An area outside the boundary of the protected area where actions are taken and agreements are made to protect the integrity of the protected area and to enhance the livelihoods of protected area neighbours.</p>	
<p>Objective: To influence land use adjacent to the protected area to manage external pressures and threats that may threaten its values and objectives.</p>	
<i>Permissible activities and infrastructure</i>	<i>Constraints and implementation</i>
<ul style="list-style-type: none"> ▪ Alien and invasive species control ▪ Habitat consolidation ▪ Water resource protection ▪ Damage causing animal management ▪ Climate change adaptation ▪ Compatible land use ▪ Priority species management e.g. Cape Parrots. 	<ul style="list-style-type: none"> ▪ It is desirable for the intensity of land use to decrease closer to the protected area. ▪ Discourage activities that are not compatible with the adjacent protected area zonation. ▪ Management activities will focus on: <ul style="list-style-type: none"> ▪ Strategically promoting and monitoring compatible land-use and land-care on adjacent lands and upstream catchments ▪ Integrated alien species control ▪ Biodiversity stewardship and environmental awareness ▪ Working collaboratively with neighbours to secure sensitive sites that contribute to the protection of values and objectives of the protected area. ▪ Influencing and input into the

	municipal and regional planning tools such as SDF's, Schemes, IDP's and Bioregional plans.
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These guidelines are to be used when doing the feasibility study to identify potential sustainable tourism development opportunities for Impendle Nature Reserve. See Map 4 and 5 for the zonation and preliminary buffer for Impendle Nature Reserve. The Impendle zonation consists mainly of low Use Zone areas based on the sensitivity of the reserve.

5) ADMINISTRATIVE STRUCTURE

In terms of the staff structure required to support the management of Impendle Nature Reserve the long term goal is to have a staff component based at the Bulwer complex (except for the Conservation Manager who will continue to manage it from Impendle), thereby ensuring that the Impendle NR staff focus on Impendle. There is a need to investigate the staffing requirements for Impendle NR and to develop a recommended organisation structure for the reserve.

6) OPERATIONAL MANAGEMENT FRAMEWORK

This section translates the strategic framework described in Section 3 above into management activities and targets, which will be used to inform annual plans of operation and the resources required to implement them. The management targets will form the basis for monitoring of performance in implementing the plan and are thus measurable.

6.1 Determination of priorities for strategic outcomes

In the tables that follow in this section, a column has been included entitled “Priority”, which is intended to convey the level of priority attached to its management target. The purpose of prioritising activities is to direct funds and resources to the most important activities, in the event that there are insufficient funds or resources to undertake all of the activities outlined in a particular year. Priorities are ordered in three categories, which have been determined on the following basis:

Priority 1:	A management target that is central to the responsibilities and mandate of Ezemvelo KZN Wildlife or that addresses an aspect of management that is fundamental to the protection of the values and purpose of Impendle Nature Reserve.
Priority 2:	A management target that addresses an aspect of management that contributes towards community involvement and support for the conservation of Impendle Nature Reserve, which is a key principle of effective protected area management.
Priority 3:	A management target that indirectly contributes towards the protection of biodiversity or the development of social and/or economic benefits and opportunities for Impendle Nature Reserve and/or its surrounding local communities.

The priorities are presented in the tables below using the colour system above, which depicts the level of priority shown for the particular management target. In addition, a timeframe is indicated in the priorities column (year 1 to 5), which is intended to convey the end date by which the management target must have been achieved.

6.2 Legal compliance and law enforcement

Through its mandate to undertake the conservation and management of protected areas in KwaZulu-Natal, Ezemvelo KZN Wildlife must ensure that the province's protected areas are appropriately legally protected and that the laws governing the use of protected areas and the prohibition of particular activities are enforced. In fulfilling this role, the managers of Impendle Nature Reserve will adhere to the following guiding principles:

- All reasonable efforts must be made to ensure the effective conservation of biodiversity within and on the boundaries of the nature reserve.
- Cooperative structures should be established to enable participation by key stakeholders such as local communities and the South African Police Service in addressing offences and breaches of the law.
- Law enforcement within the nature reserve will be undertaken through surveillance, monitoring and appropriate reaction in the event of an offence.

6.3 Stakeholder engagement

Constructive relationships with adjacent landowners, communities and other stakeholders are an important aspect of the effective conservation of protected areas. Stakeholder engagement should be aimed at developing a strong sense of partnership between the communities around the nature reserve and its managers. The following guiding principles should be adhered to:

- Efforts should be made to ensure that the communities living around the nature reserve are aware of the role that it fulfils in biodiversity protection and the provision of ecological services to the region.
- Community participation should be undertaken to engender a sense of ownership of the nature reserve, within the communities, and support for its biodiversity conservation objectives.
- A common understanding of the issues that affect both the nature reserve and the surrounding communities should be developed and efforts to resolve them should be undertaken cooperatively.

The operational requirements for legal compliance and enforcement, and stakeholder engagement are set out in Table 6.1 below.

Table 6.1 Framework for legal compliance and law enforcement, and community participation

Strategic outcome	Management activities	Management targets	Indicators of Concern	Priority	Responsibility
LEGAL COMPLIANCE					
Legal protection for the full extent of the nature reserve and regulatory mechanism to facilitate access.	<ul style="list-style-type: none"> Survey the boundary of Impendle Nature Reserve. Re-proclamation of the nature reserve based on the updated SG diagram. Formalise access agreements with communities to ensure consistency in the implementation of these agreements. 	<ul style="list-style-type: none"> Surveillance report and proclamation diagram. Proclamation gazette. Formal access agreements. 	<ul style="list-style-type: none"> Lack of formal protection due to absence of SG diagram and correct list of farms in the formal proclamation. Inconsistent interpretation of the boundaries and the servitudes of Impendle Nature Reserve. 	Year 1	Biodiversity Conservation Coordinator
Implementation of the outcome of the land claim process.	<ul style="list-style-type: none"> Liaise with the regional Lands Claims Commissioner (RLCC) to assist in resolving the land claim. (The authority for this lies with the RLCC and Ezemvelo can only assist where required) Regular engagement with the land owners (once the claims are resolved) on all relevant management issues. 	<ul style="list-style-type: none"> Completed land claim process with agreements where relevant. Minutes of quarterly meetings with land owners. 	<ul style="list-style-type: none"> Not resolving the land claim in an acceptable time frame. Lack of effective communication with stakeholders. 	Year 1 then ongoing	Biodiversity Conservation Coordinator
LAW ENFORCEMENT					
Ensure that there is adequate law enforcement in Impendle Nature Reserve to protect the reserve's integrity.	<ul style="list-style-type: none"> Develop an integrated security strategy for the nature reserve, which ensures collaboration with all relevant security institutions and stakeholders. 	<ul style="list-style-type: none"> Creation of cooperative structures with local communities and law enforcement officials. 	<ul style="list-style-type: none"> Frequent recovery of snares. Arson fires. Recorded losses of game species. Recorded losses of known rare and endangered plant species. 	Year 2	Conservation Manager
	<ul style="list-style-type: none"> Ensure that staff are equipped and trained to undertake patrols within the nature reserve for law enforcement purposes. Implement a programme of patrols of the nature reserve 	<ul style="list-style-type: none"> Regular patrols covering the full extent of the nature reserve. Prosecution of any offender caught committing an offence. 		Ongoing	Conservation Manager

	and its boundaries.				
STAKEHOLDER ENGAGEMENT					
Establish and maintain a liaison forum for Impendle Nature Reserve to facilitate constructive community involvement.	<ul style="list-style-type: none"> Ensure the maintenance of the functions of the liaison forum. Integrate the management activities of Impendle nature reserve with the neighbouring stewardship site Mount Shannon. 	<ul style="list-style-type: none"> Quarterly meetings of the Liaison forum. Open lines of communication between stakeholders and the nature reserve's management. 	<ul style="list-style-type: none"> Lack of regular meetings and community dissatisfaction with the nature reserve. 	Ongoing	Conservation Manager
Development of strategic partnerships which could assist with the achievement of the reserve objectives.	<ul style="list-style-type: none"> Actively pursue strategic partnerships with key stakeholders in order to achieve the reserve's objectives. (Working for water, Wildlands Conservation Trust, WESSA and Birdlife SA and other relevant) 	<ul style="list-style-type: none"> Formal agreements with partners to facilitate e.g. invasive plant control, environmental education, bird monitoring and other. 	<ul style="list-style-type: none"> Not achieving reserve objectives due to lack of resources and lack of strategic partnerships. 	Ongoing	Biodiversity Conservation Coordinator

6.4 Buffer zone protection and regional management

6.4.1 Protected area expansion and buffer zone management

In terms of Ezemvelo KZN Wildlife's protected area expansion plan, it has identified a number of areas as priorities for protected area expansion in close proximity to the nature reserve. In order to safeguard the biodiversity within the nature reserve and to counter any threatening processes or edge effects, suitable buffer zones and appropriate land uses in these zones should be identified. Appropriate actions may then be taken to secure these buffer zones through protected area expansion mechanisms and local planning tools, as described in Section 6.4.2 below. In ensuring the protection of its biodiversity, the following guiding principles will be adopted in terms of protected area expansion and buffer zone management:

- If under threat, efforts must be made to formally protect the areas of critical habitat, located outside of the nature reserve.
- Threatening processes and edge effects on the nature reserve's boundary and beyond it must be identified e.g. invasive species.
- Appropriate actions must be taken to manage threatening processes and edge effects on the nature reserve's boundary and beyond it.

6.4.2 Local and regional planning

It is important, in managing the buffer areas around the nature reserve, that Ezemvelo KZN Wildlife work with local government authorities to ensure that their land use planning considers the biodiversity conservation imperatives of Impendle Nature Reserve. In this regard it is necessary to ensure that buffer zone considerations are captured in planning tools such as IDPs and SDFs. In developing relationships with the local and district municipality, Ezemvelo KZN Wildlife will adhere to the following guiding principles:

- Relationships with local government and other provincial and national departments will be developed in the spirit of cooperative governance.
- Ezemvelo KZN Wildlife will endeavour to assist the local and district municipality in determining appropriate land uses and development strategies in the areas surrounding the nature reserve. In an effort to address this there is currently a process to develop a Biodiversity sector plan for the Sisonke municipality.
- Ezemvelo KZN Wildlife will endeavour to align its plans and strategies with the programmes and strategies of the local and district municipality, where appropriate.

The detailed operational requirements for buffer zone protection and regional management are set out in Table 6.2 below.

Table 6.2 Framework for buffer zone protection and regional management

Strategic outcome	Management activities	Management targets	Indicators of Concern	Priority	Responsibility
PROTECTED AREA EXPANSION					
Determination of the buffer zone requirements around the nature reserve.	<ul style="list-style-type: none"> Determine the ecological impacts and edge effects influencing the ecology of the nature reserve on its boundary. Determine the areas that should be demarcated as buffer zone for the purposes of protecting the biodiversity within the nature reserve. 	<ul style="list-style-type: none"> Identification of threatening processes on the nature reserve's boundary e.g. invasive species 	<ul style="list-style-type: none"> Edge effects such as invasive plant encroachment along the nature reserve's boundary. 	Year 2	Conservation Manager with Ezemvelo KZN Wildlife Ecological Advice Unit
Prioritization of key areas in the Biodiversity stewardship programme.	<ul style="list-style-type: none"> Focus efforts of the biodiversity stewardship programme on priority areas in the buffer around Impendle Nature Reserve specifically focussing on Blue swallow habitat and breeding sites outside the protected area. 	<ul style="list-style-type: none"> Legal protection of critical biodiversity priority areas through the stewardship programme. 	<ul style="list-style-type: none"> Detrimental impacts due to land use changes in the nature reserve's buffer. 	Year 2	Conservation Manager with Ezemvelo KZN Wildlife Ecological Advice Unit
LOCAL AND REGIONAL PLANNING					
Incorporation of the Impendle Nature Reserve buffer requirements in municipal and regional planning documents.	<ul style="list-style-type: none"> Make inputs into the development of local and district municipality IDPs and SDFs in an effort to encourage compatible land uses in Impendle Nature Reserve's buffer zones. 	<ul style="list-style-type: none"> Adoption of environmentally appropriate land uses in IDPs and SDFs in the areas immediately surrounding the nature reserve. Retention of existing benign land uses in the areas immediately surrounding the nature reserve. 	<ul style="list-style-type: none"> Identification/approval of environmentally harmful land uses on the boundaries of the nature reserve. 	Annually	Ezemvelo KZN Wildlife Planning Unit
Sustainable access to Impendle Nature Reserve in order to provide safe access to tourist.	<ul style="list-style-type: none"> Work collaboratively with the Local and District Municipality to find a solution and agreement on the maintenance of the district road that provides access to Impendle Nature Reserve 	<ul style="list-style-type: none"> Upgraded and well maintained access road. 	<ul style="list-style-type: none"> Inability to access the reserve due to the condition of the access road. 	Year 1 and then ongoing	Conservation Manager

6.5 Eco-cultural tourism development

6.5.1 Tourism product development

Ezemvelo KZN Wildlife has the mandate to sustainably develop Impendle Nature Reserve to fully realise its eco-cultural tourism and associated income-generating potential, within the context of protecting its biodiversity and cultural values. There is the potential to develop nature-based and cultural-based tourism products in the reserve subject to the outcomes of a feasibility study. In further developing tourism within the nature reserve, the following guiding principles should be adhered to:

- Tourism products developed within the nature reserve must be appropriate to the values and purpose for which the nature reserve has been proclaimed and must not threaten its biodiversity or ecological function.
- In developing tourism products, requirements for environmental authorisation must be considered and adhered to.
- Tourism products should be designed to capitalise on the unique beauty and biodiversity features of the nature reserve.
- Tourism products should be developed in response to tourism market demands and opportunities within the nature reserve and should be carefully assessed to determine their viability.
- The development of tourism products within the nature reserve must be integrated with tourism strategies and plans in the region.
- Tourism should be used as a tool for the generation of economic activity and employment in the communities surrounding the nature reserve.
- Any tourism activities and infrastructure should be aligned to the zonation plan of the reserve.

6.5.2 Environmental interpretation and education

Environmental interpretation and education of Impendle Nature Reserve natural and cultural resources will be aimed at creating awareness, understanding and appreciation of its biodiversity and ecological function, and their significance. In developing an environmental interpretation and education programme, the following guiding principles should be adhered to:

- There should be a strong focus on neighbouring communities, in efforts to engage, inform and benefit them.
- Wherever possible, local community members should be trained to assist and operate environmental interpretation and education tours.

The detailed operational requirements for eco-cultural tourism development and environmental interpretation and education are set out in Table 6.3 below.

Table 6.3 Framework for eco-cultural tourism

Strategic outcome	Management activities	Management targets	Indicators of Concern	Priority	Responsibility
TOURISM PRODUCT DEVELOPMENT					
Determination of a tourism market profile, through tourism market research for the nature reserve.	<ul style="list-style-type: none"> Initiate feasibility study to determine sustainable eco-cultural tourism products and activities. 	<ul style="list-style-type: none"> An understanding of the tourism market profile for the nature reserve. 	<ul style="list-style-type: none"> Developing tourism products that are not sustainable. 	Year 3	Ezemvelo KZN Wildlife Ecotourism and Marketing Unit
Preparation and implementation of a feasibility study indicating the tourism options that may be considered for Impendle Nature Reserve.	<ul style="list-style-type: none"> Identify in consultation with stakeholder's tourism products that could sustainable be developed to meet the reserve's tourism market requirements based on the feasibility study. Develop a detailed map outlining potential tourism products including hiking trails within the context of the reserves zonation plan. In accordance with the feasibility study and the map implement the agreed upon tourism products. 	<ul style="list-style-type: none"> A feasibility report and map to guide the development of tourism products in Impendle Nature Reserve. Sustainable tourism products within the reserve. 	<ul style="list-style-type: none"> Ad hoc development and unsustainable development of tourism products within the nature reserve. Lack of sustainable tourism products in the nature reserve. 	Year 3	Ezemvelo KZN Wildlife Ecotourism and Marketing Unit
	<ul style="list-style-type: none"> Ensure that all access roads to the reserve are signposted in the standard Ezemvelo format. Ensure that there is a standardized entrance signs. Ensure that there are effective directional, interpretation and information signage and brochures based on the feasibility study. 	<ul style="list-style-type: none"> Directional signage to the reserve and tourism facilities. Standard entrance signs at all entrance points. Directional and interpretive signage and brochures in place. 	<ul style="list-style-type: none"> Lack of interpretive, directional and entrance signage. 	Year 1 then phased based on the outcome of the feasibility study	Conservation Manager

ENVIRONMENTAL INTERPRETATION AND EDUCATION

<p>Development and implementation of an environmental interpretation and education programme.</p>	<ul style="list-style-type: none"> ▪ Focus on environmental interpretation and education amongst the nature reserve’s neighbouring communities. ▪ Support the functioning of the Impendle Eco-schools project. ▪ Develop environmental education resource material for the education centre at Impendle Nature Reserve. ▪ Provision of support to the community in developing its capacity to understand the management of and the values of Impendle Nature Reserve. 	<ul style="list-style-type: none"> ▪ Provision of an environmental interpretation and education tour to each school in the neighbouring local communities. ▪ Partnerships to facilitate sustainability of Impendle Eco-schools project. ▪ Updated environmental education and resource material at the education centre. ▪ Capacity building initiative through the liaison forum. 	<ul style="list-style-type: none"> ▪ Lack of an effective environmental interpretation and education plan. ▪ Lack of understanding of the protective area values in the neighbouring communities. 	<p>Year 2</p>	<p>Ezemvelo KZN Wildlife Community Conservation Officer</p>
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6.6 Conservation management

6.6.1 Fire management

Fire plays an important role in the ecological dynamics of grasslands and wetlands, and has important effects on vegetation composition, primary productivity and nutrient cycling. In developing burning and fire management strategies for the nature reserve, the following guiding principles should be adhered to:

- Burning should be undertaken in such a way that it maintains spatial and temporal heterogeneity within the landscape.
- A patch mosaic of burnt and un-burnt areas should be maintained.
- The burning of areas should be undertaken in such a way that promotes patchy burns (i.e. within the block being burnt, some patches will remain un-burnt rather than aiming for a complete burn or “clean” burn).
- Burning must be undertaken with due consideration to the biodiversity conservation requirements of the nature reserve and the need to protect rare and endangered species.
- Burning and fire management must be undertaken in a safe manner that is legally compliant with the National Veld and Forest Fire Act (No.101 of 1998).

In terms of Section 17 of the National Veld and Forest Fires Act, a landowner (in this case the nature reserve) must have such equipment, protective clothing and trained personnel for extinguishing fires as may be prescribed or, if not prescribed, reasonably required in the circumstances. It is therefore necessary to consider the following in relation to fire fighting:

- The need to maintain a system of firebreaks to enable the management of controlled burns and to effectively fight wildfires.
- The size of the nature reserve and the requirements necessary to access different areas in the event of a wildfire. This relates to both roads and vehicles.
- The number of personnel necessary to effectively fight wildfires.
- The equipment necessary to effectively fight wildfires. This would include:
 - Water tankers and pressure pumps pulled behind tractors.
 - Fire fighting equipment mounted on the backs of vehicles.
 - Backpack sprayers.
 - Beaters.
 - Safety equipment for personnel involved in fire fighting.

The detailed operational requirements for fire management are set out in Table 6.4 below.

Table 6.4 Framework for conservation management – fire management

Strategic outcome	Management activities	Management targets	Indicators of Concern	Priority	Responsibility
FIRE MANAGEMENT					
Development of a comprehensive fire management plan for the nature reserve.	<ul style="list-style-type: none"> Develop a fire management plan that addresses fire management objectives, scientific understanding, legal compliance, equipment, personnel training requirements, monitoring and research required. 	<ul style="list-style-type: none"> Adoption and implementation of the fire management plan. 	<ul style="list-style-type: none"> Burning regimes that result in ecological degradation of the nature reserve. 	Year 1	Conservation Manager and Ecological Advice Unit
Adequate fire safety within the Impendle Nature Reserve is ensured.	<ul style="list-style-type: none"> Maintain a system of firebreaks within the nature reserve that are of adequate extent, which are prepared at the correct time of the year under the appropriate weather conditions. Ensure that staff are trained and that adequate fire fighting equipment is available within the nature reserve. Maintain membership of the local Fire Protection Association, or if one does not exist, champion the creation of one. 	<ul style="list-style-type: none"> Compliance with the National Veld and Forest Fires Act. 	<ul style="list-style-type: none"> Inadequate personnel, equipment or an inability to communicate effectively in fighting fires. Wildfires spreading from the nature reserve to neighbouring properties. 	Ongoing	Conservation Manager
Annual planning is undertaken for the implementation of the season's burning plan.	<ul style="list-style-type: none"> Review the previous fire season burns (planned and unplanned) to determine the burning plan for the coming season. Determine the annual burning requirements. 	<ul style="list-style-type: none"> Burn according to the annual plan based on ecological advice. 	<ul style="list-style-type: none"> Unplanned fires. 	Annually	Conservation Manager and Ecological Advice Unit

6.6.2 Invasive plant control

A listed invasive species means any species, which is listed in terms of section 70 of the Biodiversity Act, whose establishment and spread occurs outside of its natural distribution range. Such plants are considered to be a serious threat to the ecological functioning of natural systems and to water production, and must be strictly controlled. In undertaking invasive plant control, the following guiding principles will be adhered to:

- Invasive plant control will require an ongoing programme that prioritises key infestations along water courses, drainage lines and upper catchment areas.
- Initial clearing efforts should focus on containing infestations that are most likely to spread into new areas.
- All follow-up requirements must be strictly adhered to otherwise the problem will be exacerbated.
- Strategic partnerships and poverty relief programmes such as the Working for Water programme should be utilised in controlling invasive plants.

6.6.3 Soil erosion control

In addressing soil erosion, the following guiding principles should be adhered to:

- Areas impacted by soil erosion should be stabilised and re-vegetated with indigenous plant species to prevent the spread of listed invasive plant species.
- Areas susceptible to soil erosion, or showing early signs of soil erosion such as loss of vegetation cover, must be managed to prevent soil erosion.

Soil erosion control and rehabilitation measures may include the need to re-vegetate disturbed areas. A detailed assessment of the nature and extent of soil erosion within the reserve will determine the appropriate responses required and the costs associated with them.

The detailed operational requirements for invasive plant and soil erosion control are set out in Table 6.5 below.

Table 6.5 Framework for conservation management – invasive plant control and soil erosion control

Strategic outcome	Management activities	Management targets	Indicators of Concern	Priority	Responsibility
INVASIVE PLANT CONTROL					
Development of an invasive species control plan for the nature reserve.	<ul style="list-style-type: none"> ▪ Develop a detailed inventory of the listed invasive species. ▪ Map the areas and extent of invasive species infestations. ▪ Describe previous efforts to control and eradicate invasive plants. ▪ Outline the measures required to monitor, control and eradicate the listed invasive species. ▪ Identify measurable indicators of progress and success in implementing the invasive species control plan. 	<ul style="list-style-type: none"> ▪ Compliance with the Biodiversity Act No. 10 of 2004. 	<ul style="list-style-type: none"> ▪ Further spread of existing levels of infestation of listed invasive species. ▪ Persistence of existing infestations. ▪ New infestations of listed invasive species. 	Year 1	Conservation manager, Ecological advice unit and Alien plant control unit
Achievement of a significant reduction in levels of invasive plant infestations in the nature reserve. (Wattle, bramble and Eucalyptus)	<ul style="list-style-type: none"> ▪ Implement the control plan for the nature reserve. ▪ Implement concerted, sustained control efforts in identified areas of heavy invasive plant infestation. ▪ Undertake suitable rehabilitation measures, including re-vegetation using indigenous plant species, to prevent soil erosion, following clearing of invasive plant species. ▪ Develop partnerships with Working for Water and other strategic programmes. 	<ul style="list-style-type: none"> ▪ 50% reduction in wattle infestation levels in five years. ▪ 50% reduction in infestations of all other invasive plants in five years. 			Year 1
SOIL EROSION CONTROL					
Implementation of procedures to identify, rehabilitate and manage areas that have been significantly impacted by	<ul style="list-style-type: none"> ▪ Undertake a detailed survey of the nature reserve to identify the extent and severity of soil erosion. ▪ Identify the requirements for soil erosion control and rehabilitation within the nature reserve. 	<ul style="list-style-type: none"> ▪ A detailed map depicting areas of soil erosion within the nature reserve. ▪ Implementation of soil erosion control measures in areas in 	<ul style="list-style-type: none"> ▪ Further erosion of impacted areas. ▪ Sedimentation impacts in watercourses and wetland areas. 	Year 1 and then ongoing	Conservation manager

soil erosion.	<ul style="list-style-type: none"> ▪ Implement soil erosion control and rehabilitation measures, focussing strategically on key areas such as those impacting on watercourses or that are growing larger. ▪ Undertake preventative measures in areas with low plant cover that may be at risk of soil erosion. 	which plant cover is low, which are susceptible to erosion.			
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6.6.4 Alien animal control

Alien animal species can threaten the ecological, genetic or natural aesthetic integrity of Impendle Nature Reserve and can be vectors for the spread of diseases. In dealing with the control of alien animals, procedures to deal with animals that stray into the reserve should be developed. In addressing alien animal control, the following guiding principles should be adhered to:

- Domestic animals such as horses and donkeys will only be considered for official purposes such as patrolling and anti poaching work.
- Feral animal species that pose a threat to indigenous species will be destroyed (as humanely as practicably possible with due regard to the tourist experience).

6.6.5 Resource utilisation

It is an accepted tenet of biodiversity conservation in South Africa and KwaZulu-Natal that the sustainable use of natural and biological resources may be undertaken within a protected area, provided that it does not compromise its ecological functioning or biodiversity conservation imperatives. Accordingly, applications for the extractive use of resources within the nature reserve will be considered, based on the following guiding principles and in accordance with approved norms and standards:

- The context of the nature reserve's zonation plan, in particular the ecological sensitivity of particular areas.
- The benefits that such resource use will provide to the neighbouring communities around the nature reserve.
- The equitable access of members of the neighbouring communities to such resource use opportunities.
- Whether activities such as the collection of biological materials/samples are for legitimate scientific purposes, are from *bone fide* South African research institutions and are undertaken in accordance with relevant Ezemvelo KZN Wildlife policies.
- The ability of the nature reserve's managers to effectively control and monitor such resource use.

The detailed operational requirements for alien animal control and resource utilisation are set out in Table 6.6 below.

Table 6.6 Framework for conservation management – alien animal control and resource utilisation

Strategic outcome	Management activities	Management targets	Indicators of Concern	Priority	Responsibility
ALIEN ANIMAL CONTROL					
Implementation of procedures to manage alien animals.	<ul style="list-style-type: none"> Develop a policy to address the control of feral animals and live stock found within the nature reserve and communicate this policy through the liaison forum to communities. 	<ul style="list-style-type: none"> Creation of cooperative structures between Ezemvelo KZN Wildlife, local communities and law enforcement officials. Control of any alien animals found within the nature reserve. 	<ul style="list-style-type: none"> Uncontrolled access of domestic animals or livestock within the nature reserve. 	Ongoing	Conservation Manager
RESOURCE UTILISATION					
If extractive resource use is undertaken, it is done legally, sustainable and conforms to Ezemvelo KZN Wildlife policy.	<ul style="list-style-type: none"> Consider, with relevant scientific and management staff, requests for extractive use from immediate neighbours only and in accordance with accepted norms and standards and resource use guidelines. If extractive use approved, agree on the approach to sustainable extractive resource use in the nature reserve with neighbouring communities. Ensure that any approved extractive resource use is managed, monitored and reported on. Ensure that any approved extractive resource use is in line with the concept development guidelines and zonation of the reserve 	<ul style="list-style-type: none"> An agreed upon approach to any approved extractive resource use. Approved extractive resource use is managed, monitored and reported on. 	<ul style="list-style-type: none"> Uncontrolled or unsustainable resource extraction 	When required	Conservation Manager
If bioprospecting is undertaken, it is done legally and conforms to national legislation (NEMBA	<ul style="list-style-type: none"> Only allow the collection of biological materials or samples if the appropriate written permission has been given in accordance with national legislation (NEMBA Act No. 10 of 2004 Chapter, 6) and appropriate permit/s issued by 	<ul style="list-style-type: none"> No illegal collection of biological material or samples. 	<ul style="list-style-type: none"> Illegal collection of biological material or samples. 	When required	Conservation manager and Resource Use Ecologist

Act No 10 of 2004 Chapter 6).	Ezemvelo KZN Wildlife.				
Investigate and effectively communicate the value of Impendle Nature Reserve's ecosystem goods and services to the relevant stakeholders.	<ul style="list-style-type: none"> ▪ Initiate a study to identify, assess and value ecosystem goods and services of Impendle Nature Reserve. 	<ul style="list-style-type: none"> ▪ Knowledge of the value of ecosystem goods and services on which funding requirements etc. could be motivated. 	<ul style="list-style-type: none"> ▪ Lack of an understanding of the value of ecosystem services provided by the nature reserve. 	Year 4	Resource Use Ecologist

6.6.6 Wildlife management

Management interventions related to indigenous wildlife will be limited to those that are for the purposes of safeguarding populations of rare and endangered species or to meet set conservation targets. Interventions may also be required for problem animal management. In addressing wildlife management, the following guiding principles should be adhered to:

- Wildlife management must be focussed primarily on protecting the ecological functioning of the nature reserve and meeting set provincial conservation targets for species and vegetation types.
- The introduction of indigenous species into the nature reserve must be undertaken in accordance with relevant Ezemvelo KZN Wildlife policies and should not compromise the priority species.
- Population management of wildlife species may be required to ensure that such species are not causing ecological degradation of the nature reserve.
- Animals that become a danger or excessive nuisance to persons and property due to either habituation or aberrant behaviour must be managed in accordance with relevant Ezemvelo KZN Wildlife policies.

6.6.7 Conservation targets

The 2010 version of the KwaZulu-Natal systematic biodiversity plan identifies the provincial conservation targets referred to in Section 6.6.6 above. The conservation of Impendle Nature Reserve contributes towards the achievement of a portion of some of these targets. Targets will continue to be updated as knowledge develops about the ecology of areas, connectivity between them, and other process requirements for ecosystems, communities and species. On this basis, the conservation targets should be viewed as a set of working hypotheses around which conservation planning and evaluation can take place. An advantage of developing strategies around targets is that this process highlights critical knowledge deficits thus guiding future research.

Table 6.7 Systematic biodiversity planning conservation targets to which Impendle Nature Reserve contributes

Feature	Description	Percentage of target located within Impendle Nature Reserve	Notes
<i>Southern KwaZulu-Natal Moist Grassland</i>	Vegetation Types	9.4	% OF HISTORIC DISTRIBUTION
<i>Drakensberg Foothill Moist Grassland</i>	Vegetation Types	1.2	VERY SMALL PRESENCE
<i>Eastern Mistbelt Forests: Midlands</i>	Vegetation Types	4.2	% OF HISTORIC DISTRIBUTION
<i>Midlands Mistbelt Grassland</i>	Vegetation Types	0.5	VERY SMALL PRESENCE
<i>Temperate Alluvial Vegetation: Midlands floodplain Grassland</i>	Vegetation Types	0.1	VERY SMALL PRESENCE
<i>Eastern Temperate Wetlands</i>	Vegetation Type	0.1	VERY SMALL PRESENCE
<i>Encephalartos ghellinckii</i>	Plant	85.8	% OF HISTORIC DISTRIBUTION
<i>Hesperantha woodii</i>	Plant	33.1	% OF HISTORIC DISTRIBUTION
<i>Kniphofia buchananii</i>	Plant	7.3	VERY SMALL PRESENCE
<i>Senecio exuberans</i>	Plant	7.6	% OF HISTORIC DISTRIBUTION
<i>Asclepias woodii</i>	Plant	0.6	VERY SMALL PRESENCE
<i>Bowiea volubilis</i>	Plant	10.0	% OF HISTORIC DISTRIBUTION
<i>Ocotea bullata</i>	Plant	6.7	
<i>Euonyma lymneaeformis</i>	Molusc	25.6	
<i>Bradypodion thamnobates</i>	Reptile	597	% OF HISTORIC DISTRIBUTION
<i>Bradypodion bourquini</i>	Reptile	144.3	% OF HISTORIC DISTRIBUTION
<i>Capys penningtoni</i>	Butterfly	75.8	% OF HISTORIC DISTRIBUTION
<i>Eremidium erectus</i>	Grasshopper	20.8	% OF HISTORIC DISTRIBUTION
<i>Transvaalana draconis</i>	Grasshopper	39.0	% OF HISTORIC DISTRIBUTION
<i>Charaxes xiphares penningtoni</i>	Butterfly	18.1	% OF HISTORIC DISTRIBUTION

<i>Whitea coniceps</i>	Grasshopper	1.5	VERY SMALL PRESENCE
<i>Whitea alticeps</i>	Grasshopper	1.5	VERY SMALL PRESENCE
<i>Sheldonia burnupi</i>	Molusc	30.5	% OF HISTORIC DISTRIBUTION
<i>Gulella inhluzaniensis</i>	Molusc	2.3	% OF HISTORIC DISTRIBUTION
<i>Gulella juxtidentis</i>	Molusc	1.6	VERY SMALL PRESENCE
<i>Orachrysops ariadne</i>	Butterfly	4.1	% OF HISTORIC DISTRIBUTION
<i>Transvaaliana draconis</i>	Grasshopper	0.1	VERY SMALL PRESENCE
<i>Eremidium erectus</i>	Grasshopper	0.0	VERY SMALL PRESENCE
<i>Pagopedilum martini</i>	Grasshopper	0.2	VERY SMALL PRESENCE
<i>Neolophonotus hirsutus</i>	Diplopoda	4.8	
<i>Proandricus bulwerensis</i>	Annelid	25.0	
<i>Tritogenia hiltonia</i>	Annelid	25.0	
<i>Tritogenia lunata</i>	Annelid	12.5	
<i>Hirundo atrocaerulea</i>	Ave	11.8	% OF HISTORIC DISTRIBUTION
<i>Doratogonus montanus</i>	Millipede	0.9	VERY SMALL PRESENCE
<i>Centrobolus tricolor</i>	Millipede	1.8	VERY SMALL PRESENCE
<i>Spinotarsus triangulosus</i>	Millipede	116.2	% OF HISTORIC DISTRIBUTION
<i>Hirundo atrocaerulea</i>	Ave	6.7	% OF HISTORIC DISTRIBUTION
<i>Anthropoides paradiseus</i>	Ave	8.4	% OF HISTORIC DISTRIBUTION
<i>Doratogonus montanus</i>	Millipede	13.8	% OF HISTORIC DISTRIBUTION
<i>Doratogonus natalensis</i>	Millipede	12.3	% OF HISTORIC DISTRIBUTION
<i>Centrobolus tricolor</i>	Millipede	2.5	VERY SMALL PRESENCE
<i>Doratogonus peregrinus</i>	Millipede	11.6	% OF HISTORIC DISTRIBUTION
<i>Poicephalus robustus</i>	Ave	4.0	% OF HISTORIC DISTRIBUTION
<i>Spinotarsus glomeratus</i>	Millipede	0.7	VERY SMALL PRESENCE

The detailed operational requirements for wildlife management and the achievement of conservation targets are set out in Table 6.8 below.

Table 6.8 Framework for conservation management – wildlife management and conservation targets

Strategic outcome	Management activities	Management targets	Indicators of Concern	Priority	Responsibility
WILDLIFE MANAGEMENT					
Development of a strategy for the introduction and management of wildlife into the nature reserve in accordance with Ezemvelo KZN Wildlife policies.	<ul style="list-style-type: none"> Ensure that any proposals for the introduction of wildlife species conform to Ezemvelo KZN Wildlife policies. Ensure that only species known to have historically occurred in the nature reserve are re-introduced. Ensure that species introductions are adequately documented. <p>(The above stated actions are dependant on the 12 kilometres required to complete the reserve boundary being fenced.)</p>	<ul style="list-style-type: none"> An agreed upon approach to future wildlife species introductions and management. 	<ul style="list-style-type: none"> Ad hoc introductions of species, particularly those that may not have historically occurred in the nature reserve. 	Year 1	Ezemvelo KZN Wildlife Ecological Advice Unit and Conservation manager
	<ul style="list-style-type: none"> Ensure that adequate population control measures are included in the strategy for the management of wildlife in the nature reserve. 	<ul style="list-style-type: none"> Control of population numbers of species that are exceeding identified carrying capacities. 	<ul style="list-style-type: none"> Ecological degradation as a result of overstocking of wildlife species 		
Development and implementation of a strategy for problem animal control.	<ul style="list-style-type: none"> Undertake preventative measures, such as boundary fence maintenance, to minimise the need for problem animal control. Apply appropriately humane methods, if problem animals must be destroyed or captured. Monitor and record all incidents reported and the actions taken. 	<ul style="list-style-type: none"> Effective procedures and relationships with neighbours in dealing with problem animal control. 	<ul style="list-style-type: none"> Frequent complaints from neighbours with no clear response. 	Year 1	Conservation Manager

CONSERVATION TARGETS					
Processes are established to determine the success of management interventions in protecting the ecosystems, communities and species of the nature reserve.	<ul style="list-style-type: none"> Develop surveillance and monitoring plans for key management interventions in accordance with the Ezemvelo KZN Wildlife policies and norms and standards. 	<ul style="list-style-type: none"> Surveillance and monitoring plans for key threatening processes. Monitoring plans for key rare and endangered species. 	<ul style="list-style-type: none"> Lack of awareness of the status of key threatening processes including infestations of invasive plant species and severity and extent of soil erosion. 	Year 1	Ezemvelo KZN Wildlife Ecological Advice Unit
Rare and endangered species management is undertaken using best available scientific knowledge.	<ul style="list-style-type: none"> Ensure that the Impendle Nature Reserve is included in and aware of any research being conducted on rare and endangered species that occur in the reserve, especially those that has conservation targets. Adopt procedures for the management of rare and endangered species within the reserve based on known best practices. 	<ul style="list-style-type: none"> Maintenance of optimum population numbers of rare and endangered species. 	<ul style="list-style-type: none"> Declining population numbers of rare and endangered species. 	Ongoing	Conservation Manager with Ezemvelo KZN Wildlife Ecological Advice Unit
	<ul style="list-style-type: none"> Undertake monitoring of key rare and endangered species (all species for which conservation targets have been set) Jointly undertake Blue swallow and crane monitoring with relevant NGO's such as Birdlife South Africa. 	<ul style="list-style-type: none"> Monitoring of flagship species. Integration of nature reserve within NGO's species monitoring programmes. 	<ul style="list-style-type: none"> Lack of understanding of flagship species. 	Ongoing	Conservation Manager with Ezemvelo KZN Wildlife Ecological Advice Unit
Critical ecological processes and functions are maintained in Impendle Nature Reserve.	<ul style="list-style-type: none"> Implement a wetland monitoring programme to ensure that wetland processes and functions in the reserve are maintained. 	<ul style="list-style-type: none"> Wetland monitoring report. 	<ul style="list-style-type: none"> Ecological degradation of wetlands. 	Ongoing	Conservation Manager with Ezemvelo KZN Wildlife Ecological Advice Unit

6.7 Operational management

6.7.1 Financial and human resources

Impendle Nature Reserve cannot be effectively managed without adequate sustained funding and sufficient human resources. In addressing the financial and human resource needs of the nature reserve, the following guiding principles should be adhered to:

- Adequate funding must be provided for the management of the nature reserve to ensure the protection of its biodiversity and cultural values and the continued provision of its ecosystem services.
- Commercial operations within the nature reserve must be self-sufficient and, if profitable, should be used to subsidise its conservation and community programmes.
- Adequate, properly trained and experienced staff must be employed at the nature reserve to undertake the operations required for its effective management.

6.7.2 Facilities and infrastructure

In order for Impendle Nature Reserve to operate appropriately, adequate facilities and infrastructure need to be developed and maintained both for management and eco-cultural tourism purposes. In addressing facilities and infrastructure needs in the nature reserve, the following guiding principles will be adhered to:

- Facilities and infrastructure must be maintained to avoid any damage to the environment and ensure the safety of staff and visitors to the nature reserve.
- Facilities and infrastructure must be provided to ensure the effective management and operation of the nature reserve.
- Practical solutions to the provision of electricity should be sought at the nature reserve based on available renewable energy technologies.
- Facilities and infrastructure must be provided to support the eco-cultural tourism activities in the nature reserve.

The detailed operational requirements for financial and human resource, and facilities and infrastructure development and management are set out in Table 6.9 below.

Table 6.9 Framework for operational management – financial and human resources, and facilities and infrastructure

Strategic outcome	Management activities	Management targets	Indicators of Concern	Priority	Responsibility
FINANCIAL RESOURCES					
Development of a five-year financial plan that identifies the resource needs to achieve the objectives for the nature reserve.	<ul style="list-style-type: none"> Undertake an assessment of past income and expenditure trends in the nature reserve. Develop a five-year projection of income and expenditure targets that will allow for the effective achievement of the nature reserve’s objectives. 	<ul style="list-style-type: none"> Adequate funding to achieve the objectives of the nature reserve. 	<ul style="list-style-type: none"> Inadequate funding to effectively protect and operate the nature reserve. 	Year 1	Ezemvelo KZN Wildlife Regional Management Unit and Conservation Manager.
HUMAN RESOURCES					
The nature reserve is adequately staffed for its effective management and operation.	<ul style="list-style-type: none"> Employ sufficient, appropriately skilled staff to fill all vacant positions to meet the management and operational requirements of the nature reserve. Provide the Human resource department with a list of training requirements and skills development to ensure that staff is able to effectively complete their duties. Develop and submit a recommended organisational structure for the effective management of the reserve. 	<ul style="list-style-type: none"> Appointment of staff in all vacant positions in the nature reserve. Documented training requirements and attended. 	<ul style="list-style-type: none"> Inadequate staff numbers or skills for the effective management of the nature reserve. 	Year 1	Ezemvelo KZN Wildlife Regional Management Unit
FACILITIES AND INFRASTRUCTURE					
All facilities and infrastructure in the nature reserve are adequately maintained.	<ul style="list-style-type: none"> Implement a programme to fence the remainder of the Impendle Nature Reserve Ensure that the boundary fence is regularly inspected and adequately maintained to ensure security and to contain game species within the nature reserve. 	<ul style="list-style-type: none"> A secure protected area boundary. 	<ul style="list-style-type: none"> An incomplete boundary that do not secure biodiversity inside the reserve. 	Year 2 and then ongoing	Conservation Manager
	<ul style="list-style-type: none"> Develop and implement a schedule maintenance programme to maintain facilities and infrastructure in a condition that meets relevant environmental, health and 	<ul style="list-style-type: none"> Regular scheduled maintenance of all facilities 	<ul style="list-style-type: none"> Environmental, health or safety incidents 		

	safety requirements.	and infrastructure.	associated with inadequately maintained facilities and infrastructure.		
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7) MONITORING AND REPORTING

Monitoring and reporting is a critical component of the adaptive management cycle. It enables the effective assessment of management interventions and, if necessary, can be used to direct modifications of management in an effort to achieve the outcomes required.

7.1 Annual monitoring

The annual monitoring schedule should be designed to monitor the implementation of aspects of the plan. It should be designed to be straightforward and relatively easy to implement by on-site staff. In accordance with the Ezemvelo KZN Wildlife norms and standards for surveillance and monitoring (Goodman 2011), monitoring is characterised by:

- An objective, target or desired state of the attribute or resource (as described in the management targets in Section 6 above).
- Being part of a formalised adaptive management cycle.
- Establishing and repeatedly evaluating the measures of success of conservation project or management intervention.

Records should be maintained of all key management interventions and of problem events or incidents such as uncontrolled access, poaching, illegal plant collection or uncontrolled/arson fires. In terms of the norms and standards set for surveillance and monitoring (Goodman 2011) these incidents would be deemed to be surveillance.

Scientific monitoring programmes may be established to monitor specific management interventions such as measures for the protection of flagship species. Not all of the management interventions will be monitored through the monitoring schedule. Most of the outcomes of the monitoring process will be captured in an annual report, which will be used to inform the following year's annual plan of operation.

On this basis, a monitoring schedule for Impendle Nature Reserve is set out in Table 7.1.

Table 7.1 Annual surveillance and monitoring schedule for Impendle Nature Reserve

Management issue	Parameters to be monitored	Monitoring measures	Monitoring frequency	Responsibility	Reporting requirements
Law enforcement	Schedule of patrols	Written record	Weekly	Conservation Manager	Annual report
	Recovery of snares	Photographs/written record	Weekly		Annual report
	Illegal incidents	Photographs/written record	Per event		Record of event
Stakeholder engagement	Minutes of meetings of the liaison forum.	Written record	Quarterly	Conservation manager	Annual report
Buffer zone management	Influx of listed invasive vegetation on the nature reserve's boundaries.	Surveillance plan	To be determined	Conservation manager supported by Ecological Advice Unit	Annual report
Local and regional planning	Land uses that are approved in the areas around the nature reserve in local and regional IDPs and SDFs	Written record	Annually	Ezemvelo KZN Wildlife Senior Conservation Manager	Annual report
Eco-cultural tourism	Visitor statistics	Completion of questionnaire	Ongoing	Conservation manager	Annual report
Fire management	Burning of firebreaks as part of fire management	Written record/map/photography	Annually	Conservation manager	Annual report
	Burning of blocks as part of controlled burning		Annually		Annual report
	Unplanned wildfires	Written record/map/photography	Per event		Record of event
Invasive plant control	Areas subject to invasive plant control	Monitoring plan	To be determined	Conservation manager supported by Ecological Advice Unit	Annual report
	State of areas in which invasive plants have been eradicated				Annual report
	Records of labour hours/days	Written record	Annually		Annual report
	Herbicide usage	Written record	Annually		Annual report

Table 7.1 (cont.)

Management issue	Parameters to be monitored	Monitoring measures	Monitoring frequency	Responsibility	Reporting requirements
Soil erosion control	Areas subject to erosion control	Monitoring plan	To be determined	Conservation manager supported by Ecological Advice Unit	Annual report
	State of rehabilitated areas of erosion				Annual report
Conservation targets	Incidents related to flagship species	Photographs/written record	Per event	Conservation manager	Record of event
	Status of key rare and endangered species, particularly those for which conservation targets have been set	Monitoring plan	To be determined	Conservation manager supported by Ecological Advice Unit	Annual report
Resource utilisation	Extraction of resources from the nature reserve	Photographs/written records	Per event	Conservation manager	Annual report
Human resources	Staffing levels	Number of full-time staff	Annually	Conservation manager	Annual report
Facilities and infrastructure	State of roads, 4x4 tracks and paths	Photographs/written records	Quarterly	Conservation manager	Annual report
	State of the boundary fence	Photographs/written records	Monthly		Annual report
	Weather data	Surveillance plan	To be determined	Ezemvelo KZN Wildlife Ecological Advice Unit	Annual report
	State of facilities and service infrastructure	Maintenance schedule/written records	Monthly	Conservation manager	Annual report
	Pollution events	Photographs/written records	Per event		Record of event

As set out in Table 7.1 the following issues require a surveillance plan:

- The influx of listed invasive vegetation on the nature reserve's boundaries.
- The capture of weather data – it is recommended that the Ezemvelo KZN Wildlife Ecological Advice Unit approach the South African Weather Service to request that they install a proper weather station at the nature reserve.

In addition, the following issues require a monitoring plan:

- Measures taken to control invasive plant species.
- Measures taken to control soil erosion.
- Measures taken to manage rare and endangered species, particularly those for which conservation targets have been set.
- The ecological status of the wetlands within the nature reserve.

These surveillance and monitoring plans must be developed and implemented in accordance with the Ezemvelo KZN Wildlife Norms and Standards: Surveillance and Monitoring Plans for Biodiversity (Goodman 2011).

The preparation of these plans must be undertaken by the Ezemvelo KZN Wildlife Ecological Advice Unit with the support of the Surveillance and Monitoring Working Group of Ezemvelo KZN Wildlife.

7.2 Annual protected area management plan implementation review

The purpose of undertaking an annual performance review of implementation of the protected area management plan will be to:

- Determine how effectively the management plan has been implemented.
- Assist in determining the focus for the annual plan of operation and the setting of appropriate time frames and budgets.
- Enable effective adaptive management by identifying changes and modifying management interventions.

The report produced from the annual protected area management plan implementation review should be submitted to the Regional Operations Committee, prior to the annual management meeting for Impendle Nature Reserve, for its review and comment. Records of recommendations for update/changes to the five-year plan should be kept so that when the five-year plan is revised for the subsequent five years, these recommendations can be assessed and included where necessary. This should be undertaken in the form of a running list, which is updated in each annual report so that the final annual report before the five-yearly review of

the management plan contains the complete list of recommendations. The review process should include:

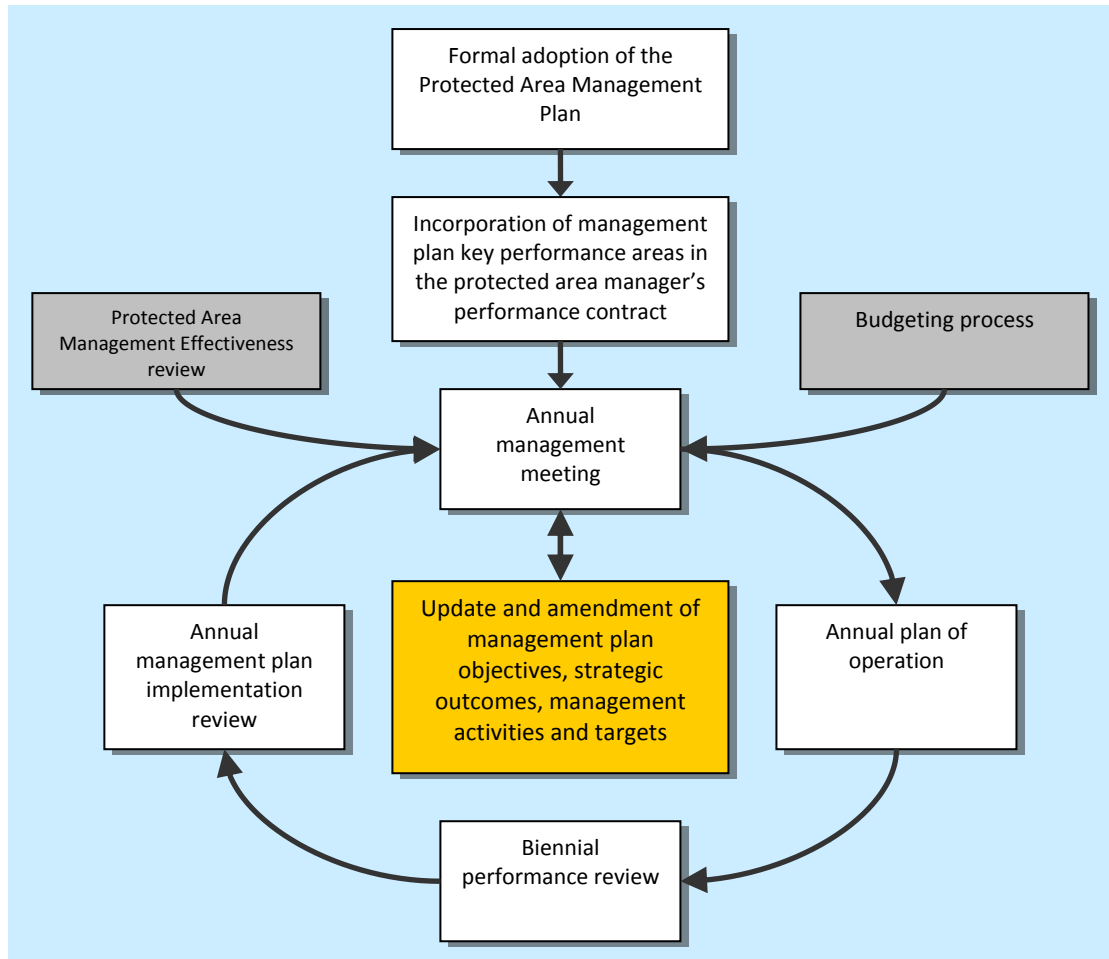
- Any recommended minor amendments to the management plan that do not affect the substance of the vision, objectives or zonation.
- The results of an evaluation of the management effectiveness achieved for the protected area, calculated using the WWF and World Bank Protected Area Management Effectiveness Tool (Stolton *et al.* 2007).

Any proposed significant changes to the management plan that are likely to result in amendment to the vision, objectives and zonation must be supported by the Regional Operations Committee and the Biodiversity Conservation Operations Management Meeting (BCOMM) before being subjected to the appropriate stakeholder participation process and before BCOMM recommends that the proposed amended protected area management plan be submitted for authorisation to the Ezemvelo KZN Wildlife Board and to the MEC.

8) IMPENDLE NATURE RESERVE ANNUAL PLAN OF OPERATION

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.

8.1 Implementation of 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 protected area management plan, the purpose of the annual management meeting for Impendle Nature Reserve will be to:

- Finalise the annual report, as part of the annual protected area 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 plans 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, in accordance with the Impendle Conservation manager's performance contract.

- 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 annual plan of operation will be tied to staff performance contracts, and goals set in them will be categorised within the same key performance areas as the integrated management plan. A pro forma annual plan of operation is set out in Appendix F.

8.2 Responsibilities in implementing the protected area management plan

In the tables in the operational management framework, the responsibilities for the completion of management activities are identified. In many cases the people responsible for implementing the activities will be in attendance at the annual management meeting and the requirements for the achievement of the management activities can be discussed and agreed to at the meeting. In some cases, however, the management activities may be required to be referred to the Regional Operations Committee and the Biodiversity Conservation Operations Management Meeting (BCOMM) in order to assign responsibility for the completion of the management activity. In this instance an action of the annual management meeting would be to refer this management activity to the BCOMM so that the correct unit can be assigned responsibility to complete the management activity.

8.3 Impendle Nature Reserve resource requirements

In developing annual plans of operation for Impendle Nature Reserve the resource requirements, associated with management activities and targets set out in the operational management framework must be considered and budgeted for. The following section broadly identifies the issues that must be considered in determining adequate human resources, funds and equipment for the nature reserve.

8.3.1 Staff and equipment

Annual plans of operation must consider the staff and equipment needs to undertake the following activities:

- Administration and management of the nature reserve.
- Patrolling of the nature reserve and its boundaries.
- An annual burning programme and fire fighting response to wildfires.
- An ongoing invasive plant species control programme.
- An ongoing soil erosion control and rehabilitation programme.
- Ecological monitoring and data capture.
- Maintenance of roads, paths and fences within the nature reserve.
- Maintenance of facilities and infrastructure within the nature reserve.
- Capture of visitor information and statistics.
- Admitting visitors to the nature reserve and charging entrance fees.
- Community liaison and cooperation.
- Environmental interpretation and education.

8.3.2 Projects

In addition to the requirements for annual recurrent funding for the issues outlined above, there will be a need to identify funding requirements for the following capital projects:

- Fencing of the reserve - 12 km boundary fence.
- Major maintenance and upgrade (specifically of the roof) of the education centre.
- Upgrade of staff houses and administrative facilities within the nature reserve.
- Installation of signage directing tourists to the nature reserve.
- Installation of directional and interpretive signage within the nature reserve.
- Development of facilities and infrastructure to support new tourism products identified in the concept development plan.
- The possible re-introduction of game species into the nature reserve subsequent to measures to secure the area has been effectively implemented.

8.4 Annual financial plan

The annual plan of operation must contain a financial plan, which must be approved by the Regional Operations Committee. The annual goals, contained in the annual plan of operation, will be prioritised with the approved budget and guided by the strategic direction of the protected area management plan.

8.5 Financial accounting system

It is accepted that all fiscal management will be guided by the Public Finance Management Act (No.1 of 1999) and the Ezemvelo KZN Wildlife Financial Policy and Procedures directive. Funding sources not generated internally will be accounted for in the prescribed process as determined by the donor source.

8.6 Financial reporting

Annual and quarterly fiscal reports will be submitted as directed by the Regional Operations Committee.

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DEFINITIONS OF TERMS

Alien species	Species or genotypes, which are not indigenous to Impendle Nature Reserve 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 Impendle Nature Reserve 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 (ecotourism):	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 2003]).
Ecosystem	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	<p>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:</p> <ol style="list-style-type: none"> Benefits obtained from ecosystems such as food, fuel and fibre and genetic resources. Benefits from the regulation of ecosystem processes such as climate regulation, disease and flood control and detoxification. Cultural non-material benefits obtained from ecosystems such as benefits of a spiritual, recreational, aesthetic, inspirational, educational, community and symbolic nature;” <p>For the purposes of this IMP, sustainable water production is also specifically included under this definition.</p>
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]).
Invasive species	<p>Means any species whose establishment and spread outside of its natural distribution range –</p> <ol style="list-style-type: none"> Threaten ecosystems, habitats or other species or have a demonstrable potential to threaten ecosystems, habitats or other species. May result in economic and environmental harm or harm to human health. <p>(As per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]).</p>
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 KZN WILDLIFE and a third party that supports the achievement of the Game Reserve management objectives.
Protected areas	<ul style="list-style-type: none"> • 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.)

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]).
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).

LIST OF STATUTES TO WHICH THE IMPENDLE NATURE RESERVE IS SUBJECT

Biodiversity and Cultural Resource Management and Development:

- Animals Protection Act [No. 71 of 1962]
- Atmospheric Pollution Prevention Act [No. 45 of 1965]
- Conservation of Agricultural Resources Act [No. 43 of 1983]
- Constitution of the Republic of South Africa [No. 108 of 1996]
- Criminal Procedures Act [1977]
- Environment Conservation Act [No. 73 of 1989]
- Forest Act [No. 122 of 1984]
- Hazardous Substances Act [No. 15 of 1973]
- KwaZulu Nature Conservation Act [No. 8 of 1975]
- KwaZulu-Natal Heritage Management Act [No. 10 of 1997]
- KwaZulu-Natal Nature Conservation Management Act [No. 9 of 1997]
- National Environmental Management Act [No. 107 of 1998]
- National Environmental Management: Biodiversity Act [No. 10 of 2004]
- National Environmental Management: Protected Areas Act [No. 57 of 2003]
- National Forests Act [No. 84 of 1998]
- National Heritage Resources Act [No. 25 of 1999]
- National Water Act [No. 36 of 1998]
- National Water Amendment Act [No. 45 of 1999]
- National Veld and Forest Fire Act [No 101 of 1998]
- Nature Conservation Ordinance [No. 15 of 1974]

General Management:

- Development Facilitation Act [No. 67 of 1995]
- Disaster Management Act [No. 57 of 2002]
- Fire Brigade Services Act [No. 99 of 1987]
- Local Government: Municipal Systems Act [No. 32 of 2000]
- National Road Traffic Act [No. 93 of 1996]
- National Building Standards Act [No. 103 of 1977]
- Natal Town Planning Ordinance [No. 27 of 1949]
- Occupational Health and Safety Act [No. 85 of 1993]
- KwaZulu-Natal Planning and Development Act [No. 5 of 1998]
- Water Services Act [No. 108 of 1997]

Financial Management:

- Public Finance Management Act [No. 1 of 1999]

Human Resource Management:

- Basic Conditions of Employment Act [No. 75 of 1997]
- Broad-Based Black Economic Empowerment Act [No. 53 of 2003]
- Compensation for Occupational Injuries and Diseases Act [No. 130 of 1993]
- Employment Equity Act [No. 55 of 1998]
- Labour Relations Act [No. 66 of 1995]
- Occupational Health and Safety Act [No. 85 of 1993]
- Pension Funds Act [No. 24 of 1956]
- Skills Development Act [No. 97 of 1998]
- Skills Development Levies Act [No. 9 of 1999]
- Unemployment Insurance Act [No. 63 of 2001]

LIST OF UNPUBLISHED AND SUPPORTING DOCUMENTATION

Copies available from: a) Reserve Management and / or,
b) Regional Ecologist

Item:

1. Ezemvelo KZN Wildlife Corporate Strategic Plan and Performance Plan for 2009 - 2014.
2. Ezemvelo KZN Wildlife Corporate Policies and Procedures (Norms & Standards) listed in the table below.
3. Ezemvelo KZN Wildlife Biodiversity Database Checklists for Impendle Nature Reserve.
4. Proclamations of Impendle Nature Reserve
5. Impendle Nature Reserve Public Participation Report, October 2012.
6. Hazeldene and The Rest servitude.

The table below lists the Ezemvelo KZN Wildlife corporate policies (norms and standards) referenced from the intranet that are most relevant to Ezemvelo KZN Wildlife protected area management. It is the responsibility of all management and other personnel associated with management of protected areas to ensure that they familiarise themselves and comply with the most recent versions of all Ezemvelo KZN Wildlife Board Approved Policies.

<u>EZEMVELO KZN WILDLIFE CORPORATE POLICIES (NORMS & STANDARDS)</u>	
<u>Policy File No.</u>	CORPORATE AFFAIRS
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 KZN WILDLIFE.
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.
<u>Policy File No.</u>	INTERNAL AUDIT
C 5	➤ Management Control
	BIODIVERSITY CONSERVATION OPERATIONS
	1. NATURAL RESOURCE SUSTAINABILITY
<u>Policy File No.</u>	Threatened Species and Ecosystems
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.
BIODIVERSITY CONSERVATION OPERATIONS	
1. NATURAL RESOURCE SUSTAINABILITY	
<u>Policy File No.</u>	Exotic and Invasive Species
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.
	➤
<u>Policy File No.</u>	Migratory Species
D 1.14	➤ Black Wildebeest and Blue Wildebeest Hybridization and Conservation.
D 1.15	➤ Permit authorising the collection of Biological Material within Board Areas.
2. CONSERVATION EFFECTIVENESS	
<u>Policy File No.</u>	Strategic Applications
D 2.1	➤ Involvement of the KwaZulu-Natal Nature Conservation Board in Project 8 of the MAB (Man and Biosphere) Programme.
<u>Policy File No.</u>	Conservation Management: Protected Area Management
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	➤ Zonation and Regulations for the control of off-road vehicles on beaches controlled by the Board.
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.
<u>Policy File No.</u>	Integrated Environmental Management
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).

Policy File No.	Ex Situ Wild Animal Management
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.
	BIODIVERSITY CONSERVATION OPERATIONS
	2. CONSERVATION EFFECTIVENESS
Policy File No.	Human Animal Conflict - Inside and Outside Protected Areas
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.
Policy File No.	Environmental Awareness
D 2.34	➤ Environmental Education Policy.
	3. BIODIVERSITY PROTECTION
Policy File No.	Co-management
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
Policy File No.	Resource-use benefits
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.

Policy File No.	4. RELATIONSHIPS
D 4.1	➤ Neighbour Relations.
D 4.2	➤ Participation - Non Government Organisations.
D 4.3	➤ Data Access.
D 4.4	➤ Consultation and Communication with Stakeholders: Policy and Guidelines.
Policy File No.	COMMERCIAL OPERATIONS
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.

LISTED ACTIVITIES REQUIRING ENVIRONMENTAL AUTHORISATION IN TERMS OF REGULATION R.546, LISTING NOTICE NO.3

If any of the following activities are proposed in a protected area, proclaimed in terms of the Protected Areas Act, or within five kilometres of one, they will be subject to either a basic assessment or full scoping and environmental impact assessment process:

- The construction of billboards exceeding 18 square metres in size.
- The construction of reservoirs for bulk water supply with a capacity of more than 250m³.
- The construction of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast:
 - Is to be placed on a site not previously used for this purpose.
 - Will exceed 15 metres in height but excluding attachments to existing buildings and masts on rooftops.
- The construction of a road wider than four metres with a reserve less than 13.5 metres.
- The construction of resorts, lodges or other tourism accommodation facilities.
- The conversion of existing structures to resorts, lodges or tourism accommodation facilities that sleep 15 people or more.
- The construction of aircraft landing strips and runways.
- The construction of above ground cableways and funiculars.
- The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good.
- The construction of tracks or routes for the testing, recreational use or outdoor racing of motor powered vehicles excluding conversion of existing tracks or routes for the testing, recreational use or outdoor racing of motor powered vehicles.
- The clearance of an area of 1ha or more of vegetation where 75% of the vegetative cover constitutes indigenous vegetation, except where such removal is required for:
 - The undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from this list.
 - The undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No.544 of 2010
- The construction of facilities and infrastructure or structures of any size for any form of aquaculture (*this applies only inside a protected area, not within five kilometres of it*).

- The construction of:
 - Jetties exceeding 10m² in size.
 - Slipways exceeding 10m² in size.
 - Buildings with a footprint exceeding 10m² in size.
 - Infrastructure covering 10m² or more.

Where such construction occurs within a watercourse or within 32 metres of watercourse, measured from the edge of the watercourse, excluding where such construction will occur behind the development setback line.
- The expansion of reservoirs for bulk water supply where the capacity will be increased by more than 250m³.
- The expansion of a resort, lodge, hotel and tourism or hospitality facilities where the development footprint will be expanded.
- The widening of a road by more than four metres or the lengthening of a road by more than one kilometre.
- The expansion of runways or aircraft landing strips where the expanded runways or aircraft landing strips will be longer than 1.4 kilometres in length.
- The expansion of above ground cableways and funiculars where the development footprint will be increased.
- The expansions of tracks or routes for the testing, recreational use or outdoor racing of motor powered vehicles excluding conversion of existing tracks or routes for the testing, recreational use or outdoor racing of motor powered vehicles, where the development footprint will be expanded.
- The expansions of facilities or infrastructure for the storage, or storage and handling of a dangerous good.
- The expansion of:
 - Jetties where the jetty will be expanded by 10m² in size or more.
 - Slipways where the slipway will be expanded by 10m² or more.
 - Buildings where the buildings will be expanded by 10m² or more in size.
 - Infrastructure where the infrastructure will be expanded by 10m² or more.

Where such construction occurs within a watercourse or within 32 metres of watercourse, measured from the edge of the watercourse, excluding where such construction will occur behind the development setback line.

- The expansion of facilities, infrastructure or structures of any size for any form of aquaculture (*this applies only inside a protected area, not within five kilometres of it*).
- Phased activities for all activities listed in the Schedule and as it applies to a specific geographical area, which commenced on or after the effective date of the Schedule, where any phase of the activity may be below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold.

SPECIES LISTS

Plants of Impendle Nature Reserve:

Taxon Name	English Name
<i>Aristida junciformis galpinii</i>	
<i>Acalypha punctata</i>	
<i>Acalypha schinzii</i>	
<i>Ajuga ophrydis</i>	
<i>Albuca setosa</i>	
<i>Albuca sp.</i>	
<i>Alepidea natalensis</i>	
<i>Alloteropsis semialata</i>	
<i>Anthospermum herbaceum</i>	
<i>Argyrolobium harveyanum</i>	
<i>Argyrolobium sericosemium</i>	
<i>Argyrolobium tuberosum</i>	
<i>Aristea angolensis</i>	
<i>Asclepias cucullata</i>	
<i>Aster bakeranus</i>	Wild Aster
<i>Berkheya setifera</i>	
<i>Berkheya speciosa</i>	
<i>Brachiaria serrata</i>	
<i>Bulbostylis schoenoides</i>	
<i>Chaetacanthus burchellii</i>	
<i>Chionanthus foveolatus foveolatus</i>	
<i>Clutia hirsuta</i>	
<i>Commelina africana</i>	Yellow Wandering Jew, Yellow Commelina
<i>Cyanotis speciosa</i>	Doll's Powderpuff
<i>Cymbopogon excavatus</i>	Broad-leaved Turpentine Grass
<i>Cymbopogon validus</i>	
<i>Cyperus sp.</i>	
<i>Cyperus sphaerocephalus</i>	
<i>Cyrtanthus flanaganii</i>	
<i>Dicoma anomala</i>	
<i>Dierama latifolium</i>	
<i>Digitaria diagonalis var. diagonalis</i>	
<i>Digitaria eriantha</i>	
<i>Digitaria sanguinalis</i>	
<i>Diheteropogon amplexens</i>	
<i>Diheteropogon filifolius</i>	
<i>Disperis fanniniae</i>	
<i>Elionurus muticus</i>	

<i>Encephalartos ghellinckii</i> var. var nov dwarf type	
<i>Eragrostis capensis</i>	
<i>Eragrostis curvula</i>	
<i>Eragrostis plana</i>	
<i>Eragrostis racemosa</i>	
<i>Eriosema distinctum</i>	
<i>Eriosema kraussianum</i>	
<i>Eriosema salignum</i>	Brown Bonnet,Narrow-leaved Salignum
<i>Eriospermum ornithogaloides</i>	
<i>Eucomis autumnalis</i>	
<i>Eulophia ovalis</i>	
<i>Eulophia zeyheriana</i>	
<i>Euphorbia clavarioides</i> var. <i>clavarioides</i>	
<i>Euphorbia epicyparissias</i> var. <i>epicyparissias</i>	
<i>Ficinia stolonifera</i>	
<i>Gazania krebsiana</i>	
<i>Gerbera ambigua</i>	
<i>Gerbera piloselloides</i>	Small Yellow Gerbera
<i>Gladiolus</i> sp.	
<i>Graderia scabra</i>	Wild Penstemon,Pink Ground-Bells
<i>Grewia occidentalis</i> var. <i>occidentalis</i>	
<i>Habenaria dives</i>	
<i>Haplocarpha scaposa</i>	
<i>Harpochloa falx</i>	
<i>Helichrysum acutatum</i>	
<i>Helichrysum aureonitens</i>	Golden Everlasting
<i>Helichrysum aureum</i>	
<i>Helichrysum glomeratum</i>	
<i>Helichrysum grandibracteatum</i>	
<i>Helichrysum herbaceum</i>	
<i>Helichrysum pallidum</i>	
<i>Helichrysum pilosellum</i>	
<i>Helichrysum rugulosum</i>	
<i>Helictotrichon turgidulum</i>	
<i>Hermannia woodii</i>	
<i>Heteropogon contortus</i>	
<i>Hibiscus aethiopicus</i>	
<i>Hyparrhenia dregeana</i>	
<i>Hyparrhenia hirta</i>	
<i>Hypericum aethiopicum</i>	
<i>Hypericum lalandii</i>	
<i>Hypochoeris radicata</i>	
<i>Hypoxis angustifolia</i>	
<i>Hypoxis argentea</i>	

<i>Hypoxis costata</i>	
<i>Hypoxis hemerocallidea</i>	Star Flower
<i>Hypoxis rigidula</i>	
<i>Kniphofia buchananii</i>	
<i>Kniphofia linearifolia</i>	
<i>Koeleria capensis</i>	
<i>Kohautia amatymbica</i>	
<i>Kyllinga odorata</i>	
<i>Lactuca inermis</i>	
<i>Ledebouria ovalifolia</i>	
<i>Lobelia erinus</i>	
<i>Lotononis corymbosa</i>	
<i>Loudetia simplex</i>	
<i>Melinis nerviglumis</i>	
<i>Microchloa caffra</i>	
<i>Monocymbium ceresiiforme</i>	
<i>Ocotea bullata</i>	Stinkwood,Black Stinkwood
<i>Oxalis obliquifolia</i>	
<i>Oxalis semiloba</i>	
<i>Oxalis smithiana</i>	
<i>Pachycarpus campanulatus</i>	
<i>Pachycarpus dealbatus</i>	
<i>Panicum aequinerve</i>	
<i>Panicum ecklonii</i>	
<i>Panicum natalense</i>	
<i>Paspalum urvillei</i>	
<i>Pelargonium luridum</i>	
<i>Pentanisia angustifolia</i>	
<i>Pentanisia prunelloides</i>	
<i>Plectranthus calycinus</i>	
<i>Polygala gracilentia</i>	
<i>Polygala hottentotta</i>	Small Purple Broom
<i>Protea roupelliae</i>	
<i>Ptaeroxylon obliquum</i>	Sneezewood
<i>Pteridium aquilinum</i>	
<i>Pycnostachys reticulata</i>	
<i>Ranunculus baurii</i>	
<i>Rendlia altera</i>	
<i>Rhus discolor</i>	
<i>Rhynchosia adenodes</i>	
<i>Rhynchosia totta</i>	
<i>Rubus ludwigii</i>	
<i>Satyrium cristatum</i>	
<i>Satyrium longicauda</i>	
<i>Satyrium neglectum</i>	
<i>Scabiosa columbaria</i>	

<i>Scadoxus puniceus</i>	Blood Lily,Natal Paintbrush,Pincushion
<i>Schoenoxiphium burttii</i>	
<i>Scilla natalensis</i>	Large blue scilla, blue hyacinth,Blue Squill
<i>Scilla nervosa</i>	
<i>Sebaea sedoides</i>	
<i>Senecio bupleuroides</i>	
<i>Senecio hastatus</i>	
<i>Silene burchellii</i>	Bladder Champion,Gunpowder Plant
<i>Spermacoce natalensis</i>	
<i>Sporobolus africanus</i>	
<i>Sporobolus centrifugus</i>	
<i>Stachys natalensis</i>	
<i>Stachys simplex</i>	
<i>Stipa dregeana</i> var. <i>dregeana</i>	
<i>Striga bilabiata</i>	
<i>Tephrosia macropoda</i>	
<i>Themeda triandra</i>	
<i>Thesium pallidum</i>	
<i>Trachypogon spicatus</i>	
<i>Tristachya leucothrix</i>	
<i>Valeriana capensis</i>	
<i>Vernonia capensis</i>	
<i>Vernonia hirsuta</i>	
<i>Vernonia natalensis</i>	
<i>Vernonia oligocephala</i>	
<i>Vigna vexillata</i>	
<i>Wahlenbergia virgata</i>	
<i>Watsonia densiflora</i>	
<i>Zaluzianskya natalensis</i>	
<i>Zornia capensis</i>	
<i>Alloteropsis semialata</i>	
<i>Helictotrichon turgidulum</i>	
<i>Cymbopogon excavatus</i>	Broad-leaved Turpentine Grass
<i>Cymbopogon validus</i>	
<i>Monocymbium ceresiiforme</i>	
<i>Eragrostis capensis</i>	
<i>Eragrostis curvula</i>	
<i>Eragrostis plana</i>	
<i>Eragrostis racemosa</i>	
<i>Loudetia simplex</i>	
<i>Diheteropogon amplexans</i>	
<i>Diheteropogon filifolius</i>	
<i>Brachiaria serrata</i>	
<i>Elionurus muticus</i>	
<i>Spermacoce natalensis</i>	
<i>Pentanisia angustifolia</i>	

<i>Pentanisia prunelloides</i>	
<i>Anthospermum herbaceum</i>	
<i>Kohautia amatymbica</i>	
<i>Aristea angolensis</i>	
<i>Dierama latifolium</i>	
<i>Gladiolus sp.</i>	
<i>Watsonia densiflora</i>	
<i>Hypoxis angustifolia</i>	
<i>Hypoxis argentea</i>	
<i>Hypoxis costata</i>	
<i>Hypoxis hemerocallidea</i>	Star Flower
<i>Hypoxis rigidula</i>	
<i>Pycnostachys reticulata</i>	
<i>Plectranthus calycinus</i>	
<i>Stachys natalensis</i>	
<i>Stachys simplex</i>	
<i>Ajuga ophrydis</i>	
<i>Lobelia erinus</i>	
<i>Oxalis obliquifolia</i>	
<i>Oxalis semiloba</i>	
<i>Oxalis smithiana</i>	
<i>Hermannia woodii</i>	
<i>Eriospermum ornithogaloides</i>	
<i>Sebaea sedoides</i>	
<i>Pelargonium luridum</i>	
<i>Ranunculus baurii</i>	
<i>Cyrtanthus flanaganii</i>	
<i>Scadoxus puniceus</i>	Blood Lily,Natal Paintbrush,Pincushion
<i>Alepidea natalensis</i>	
<i>Kniphofia buchananii</i>	
<i>Kniphofia linearifolia</i>	
<i>Bulbostylis schoenoides</i>	
<i>Cyperus sp.</i>	
<i>Cyperus sphaerocephalus</i>	
<i>Schoenoxiphium burttii</i>	
<i>Kyllinga odorata</i>	
<i>Ficinia stolonifera</i>	
<i>Hypericum aethiopicum</i>	
<i>Hypericum lalandii</i>	
<i>Hibiscus aethiopicus</i>	
<i>Asclepias cucullata</i>	
<i>Pachycarpus campanulatus</i>	
<i>Pachycarpus dealbatus</i>	
<i>Scabiosa columbaria</i>	
<i>Habenaria dives</i>	
<i>Eulophia ovalis</i>	

<i>Eulophia zeyheriana</i>	
<i>Satyrium cristatum</i>	
<i>Satyrium longicauda</i>	
<i>Satyrium neglectum</i>	
<i>Disperis fanniniae</i>	
<i>Dicoma anomala</i>	
<i>Berkheya setifera</i>	
<i>Berkheya speciosa</i>	
<i>Gazania krebsiana</i>	
<i>Haplocarpha scaposa</i>	
<i>Senecio bupleuroides</i>	
<i>Senecio hastatus</i>	
<i>Lactuca inermis</i>	
<i>Hypochaeris radicata</i>	
<i>Gerbera ambigua</i>	
<i>Gerbera piloselloides</i>	Small Yellow Gerbera
<i>Aster bakeranus</i>	Wild Aster
<i>Helichrysum acutatum</i>	
<i>Helichrysum aureonitens</i>	Golden Everlasting
<i>Helichrysum aureum</i>	
<i>Helichrysum glomeratum</i>	
<i>Helichrysum grandibracteatum</i>	
<i>Helichrysum herbaceum</i>	
<i>Helichrysum pallidum</i>	
<i>Helichrysum pilosellum</i>	
<i>Helichrysum rugulosum</i>	
<i>Vernonia capensis</i>	
<i>Vernonia hirsuta</i>	
<i>Vernonia natalensis</i>	
<i>Vernonia oligocephala</i>	
<i>Rubus ludwigii</i>	
<i>Valeriana capensis</i>	
<i>Cyanotis speciosa</i>	Doll's Powderpuff
<i>Commelina africana</i>	Yellow Wandering Jew, Yellow Commelina
<i>Polygala gracilentia</i>	
<i>Polygala hottentotta</i>	Small Purple Broom
<i>Ptaeroxylon obliquum</i>	Sneezewood
<i>Pteridium aquilinum</i>	
<i>Eucomis autumnalis</i>	
<i>Albuca setosa</i>	
<i>Albuca sp.</i>	
<i>Scilla natalensis</i>	Large blue scilla, blue hyacinth, Blue Squill
<i>Scilla nervosa</i>	
<i>Ledebouria ovalifolia</i>	
<i>Chaetacanthus burchellii</i>	
<i>Silene burchellii</i>	Bladder Campion, Gunpowder Plant

<i>Encephalartos ghellinckii</i> var. var nov dwarf type	
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Animals of Impendle Nature Reserve:

Taxon Name	English Name
Mammals	
<i>Connochaetes gnou</i>	Black wildebeest
<i>Leptailurus serval serval</i>	Serval
<i>Ourebia ourebi ourebi</i>	Oribi
<i>Pronolagus crassicaudatus</i>	Natal red rock rabbit
<i>Redunca arundinum</i>	Common reedbuck
Reptiles	
<i>Bradypodion bourquini</i>	Bourquin's dwarf chameleon
<i>Nucras lalandii</i>	Delalande's sandveld lizard
Insects	
<i>Atrichelaphinis tigrina</i>	Spotted fruit chafer
<i>Bicyclus safitza safitza</i>	Common Bush Brown
<i>Bittacus kimminsi</i>	Kimmins's hanging fly
<i>Bittacus testaceus</i>	Brick-red hanging fly
<i>Bittacus walkeri</i>	Walker's hanging fly
<i>Damalis monochaetes</i>	
<i>Dasophrys fortis</i>	Strong robberfly
<i>Dasophrys sp 1</i>	
<i>Hecalus dubius</i>	Doubtful leafhopper
<i>Lentula obtusifrons</i>	
<i>Melampsalta leucoptera</i>	White-winged cicada
<i>Melampsalta sp.</i>	
<i>Microstylum sp.</i>	
<i>Nemestrinid sp.</i>	
<i>Neolophonotus variabilis</i>	
<i>Philoliche aethiopica</i>	African long-tongued tabanid fly
<i>Promachus sp.</i>	
<i>Stenus mostovskii</i>	Mostovski's rove beetle
<i>Streblognathus peetersi</i>	
Earthworms and leeches	
<i>Acanthodrilid sp.</i>	
<i>Amyntas diffringens</i>	
<i>Bimastos parvus</i>	
<i>Dendrodrilus rubidus</i>	
<i>Dendrodrilus rubidus</i>	
<i>Dendrodrilus rubidus</i>	
<i>Geogenia parva</i>	Little earthworm
<i>Octolasion lacteum</i>	
<i>Proandricus bulwerensis</i>	Bulwer earthworm
<i>Tritogenia hiltonia</i>	Hilton earthworm

<i>Tritogenia lunata</i>	Crescent-shaped earthworm
Slugs, snails, limpets	
<i>Cochlitoma granulata</i>	Granular agate snail
<i>Nata vernicosa</i>	
Millepedes	
<i>Centrobolus lawrencei</i>	Lawrence's red millipede
<i>Gnomeskelus arcuatus</i>	
<i>Gnomeskelus attemsii</i>	
<i>Orthoporoides pyrhocephalus</i>	
<i>Sphaerotherium sp.</i>	
<i>Spinotarsus sp.</i>	
Spiders, scorpions, ticks, mites	
<i>Cheloctonus anthracinus anthracinus</i>	Coal-black scorpion

Birds of Impendle Nature Reserve:

Taxon Name	English Name
<i>Accipiter melanoleucus</i>	Black sparrowhawk
<i>Accipiter rufiventris</i>	Rufous-chested Sparrowhawk, Red-breasted Sparrowhawk
<i>Alcedo cristata</i>	Malachite Kingfisher
<i>Amblyospiza albifrons</i>	Thick-billed Weaver
<i>Anas erythrorhyncha</i>	Red-billed Teal
<i>Anas undulata</i>	Yellow-billed duck
<i>Andropadus importunus</i>	Sombre Greenbul, Sombre Bulbul
<i>Anthropoides paradiseus</i>	Blue Crane
<i>Anthus cinnamomeus</i>	African Pipit, Grassveld Pipit
<i>Anthus leucophrys</i>	Plain-backed Pipit
<i>Apalis thoracica</i>	Bar-throated Apalis
<i>Apaloderma narina</i>	Narina Trogon
<i>Aplopelia larvata</i>	Lemon Dove, Cinnamon Dove
<i>Apus affinis</i>	Little Swift
<i>Apus apus</i>	Common Swift, European Swift
<i>Apus barbatus</i>	African Black Swift, Black Swift
<i>Apus caffer</i>	White-rumped Swift
<i>Apus horus</i>	Horus Swift
<i>Aquila pennatus</i>	Booted Eagle
<i>Aquila verreauxii</i>	Verreauxs' Eagle, Black Eagle
<i>Ardea melanocephala</i>	Black-headed Heron
<i>Balearica regulorum</i>	Grey Crowned Crane, Crowned Crane
<i>Batis capensis</i>	Cape Batis
<i>Bostrychia hagedash</i>	Hadedda Ibis
<i>Bradypterus baboecala</i>	Little Rush-Warbler, African Sedge Warbler
<i>Bubo africanus</i>	Spotted Eagle-Owl
<i>Bubulcus ibis</i>	Cattle Egret
<i>Bucorvus leadbeateri</i>	Southern Ground-Hornbill, Ground Hornbill

<i>Bugeranus carunculatus</i>	Wattled Crane
<i>Buteo rufofuscus</i>	Jackal Buzzard
<i>Buteo vulpinus</i>	Steppe Buzzard
<i>Camaroptera brachyura</i>	Green-backed Camaroptera, Bleating Warbler
<i>Caprimulgus pectoralis</i>	Fiery-necked Nightjar
<i>Certhilauda curvirostris</i>	eastern Long-billed Lark, Long-billed Lark
<i>Ceryle rudis</i>	Pied Kingfisher
<i>Chalcomitra amethystina</i>	Amethyst Sunbird, Black Sunbird
<i>Chloropeta natalensis</i>	Dark-capped Yellow Warbler, Yellow Warbler
<i>Chrysococcyx caprius</i>	Diederick Cuckoo, Diederik Cuckoo
<i>Chrysococcyx klaas</i>	Klaas's Cuckoo
<i>Ciconia ciconia</i>	White Stork
<i>Cinnyris afer</i>	Greater Double-collared Sunbird
<i>Cinnyris chalybeus</i>	Southern Double-collared Sunbird, Lesser Double-collared Sunbird
<i>Circus ranivorus</i>	African Marsh-Harrier
<i>Cisticola ayresii</i>	Wing-snapping Cisticola, Ayres' Cisticola
<i>Cisticola cinnamomeus</i>	Pale-crowned Cisticola
<i>Cisticola juncidis</i>	Zitting Cisticola, Fan-tailed Cisticola
<i>Cisticola lais</i>	Wailing Cisticola
<i>Cisticola natalensis</i>	Croaking Cisticola
<i>Cisticola textrix</i>	Cloud Cisticola
<i>Cisticola tinniens</i>	Levaillant's Cisticola
<i>Coccygia melanotis</i>	Sweet Waxbill
<i>Colius striatus</i>	Speckled Mousebird
<i>Columba arquatrix</i>	African Olive-Pigeon, Rameron Pigeon
<i>Columba guinea</i>	Speckled Pigeon, Rock Pigeon
<i>Corvus albus</i>	Pied Crow
<i>Corvus capensis</i>	Cape Crow, Black Crow
<i>Cossypha caffra</i>	Cape Robin-Chat, Cape Robin
<i>Cossypha dichroa</i>	Chorister Robin-Chat, Chorister Robin
<i>Coturnix coturnix</i>	Common Quail
<i>Crex crex</i>	Corn Crake
<i>Crithagra scotops</i>	Forest canary
<i>Cuculus clamosus</i>	Black Cuckoo
<i>Cuculus solitarius</i>	Red-chested Cuckoo
<i>Delichon urbicum</i>	Common House-Martin, House Martin
<i>Dendropicos griseocephalus</i>	Olive Woodpecker
<i>Dicrurus adsimilis</i>	Fork-tailed Drongo
<i>Dryoscopus cubla</i>	Black-backed Puffback, Puffback
<i>Elanus caeruleus</i>	Black-shouldered Kite
<i>Emberiza flaviventris</i>	Golden-breasted Bunting
<i>Estrilda astrild</i>	Common Waxbill
<i>Euplectes ardens</i>	Red-collared Widowbird, Red-Collared Widow

<i>Euplectes axillaris</i>	Fan-tailed Widowbird, Red-shouldered Widow
<i>Euplectes capensis</i>	Yellow Bishop, Yellow-rumped Widow
<i>Euplectes progne</i>	Long-tailed Widowbird, Long-tailed Widow
<i>Falco biarmicus</i>	Lanner falcon
<i>Falco rupicolus</i>	Rock Kestrel
<i>Gallinula chloropus</i>	Common Moorhen
<i>Geocolaptes olivaceus</i>	Ground Woodpecker
<i>Geronticus calvus</i>	Southern Bald Ibis, Bald Ibis
<i>Gyps coprotheres</i>	Cape vulture
<i>Halcyon albiventris</i>	Brown-hooded Kingfisher
<i>Haliaeetus vocifer</i>	African Fish-Eagle
<i>Hedydipna collaris</i>	Collared Sunbird
<i>Hirundo albigularis</i>	White-throated Swallow
<i>Hirundo atrocaerulea</i>	Blue Swallow
<i>Hirundo cucullata</i>	Greater Striped Swallow
<i>Hirundo fuligula</i>	Rock Martin
<i>Hirundo rustica</i>	Barn Swallow, European Swallow
<i>Indicator minor</i>	Lesser Honeyguide
<i>Jynx ruficollis</i>	Red-throated Wryneck
<i>Lamprotornis nitens</i>	Cape Glossy Starling, Glossy Starling
<i>Laniarius ferrugineus</i>	Southern Boubou
<i>Lanius collaris</i>	Fiscal Shrike
<i>Lanius minor</i>	Lesser Grey Shrike
<i>Lophaetus occipitalis</i>	Long-crested Eagle
<i>Macronyx capensis</i>	Cape Longclaw, Orange-throated Longclaw
<i>Melaenornis pammelaina</i>	Southern Black Flycatcher, Black Flycatcher
<i>Milvus migrans</i>	Black Kite, Yellow-billed Kite
<i>Motacilla capensis</i>	Cape Wagtail
<i>Muscicapa adusta</i>	African Dusky Flycatcher, Dusky Flycatcher
<i>Myrmecocichla formicivora</i>	Ant-eating Chat
<i>Nectarinia famosa</i>	Malachite Sunbird
<i>Neotis denhami</i>	Denham's Bustard, Stanley's Bustard
<i>Numida meleagris</i>	Helmeted guineafowl
<i>Oenanthe bifasciata</i>	Buff-streaked Chat
<i>Onychognathus morio</i>	Red-winged Starling
<i>Oriolus larvatus</i>	Black-headed Oriole
<i>Ortygospiza atricollis</i>	African Quailfinch, Quail Finch
<i>Parus niger</i>	Southern Black Tit
<i>Phoeniculus purpureus</i>	Green Wood-Hoopoe, Red-billed Woodhoopoe
<i>Phyllastrephus terrestris</i>	Terrestrial Brownbul, Terrestrial Bulbul
<i>Phylloscopus ruficapilla</i>	Yellow-throated Woodland-Warbler, Yellow-throated Warbler

<i>Phylloscopus trochilus</i>	Willow Warbler
<i>Plectropterus gambensis</i>	Spur-winged goose
<i>Ploceus capensis</i>	Cape Weaver
<i>Pogoniulus pusillus</i>	Red-fronted Tinkerbird, Red-fronted Tinker Barbet
<i>Pogonocichla stellata</i>	White-starred Robin, Starred Robin
<i>Poicephalus robustus</i>	Cape Parrot
<i>Polemaetus bellicosus</i>	Martial eagle
<i>Polyboroides typus</i>	African Harrier-Hawk, Gymnogene
<i>Prinia hypoxantha</i>	Drakensberg Prinia
<i>Promerops gurneyi</i>	Gurney's Sugarbird
<i>Psalidoprocne holomelaena</i>	Black Saw-wing, Black Saw-wing Swallow
<i>Psophocichla litsitsirupa</i>	Groundscraper Thrush
<i>Pternistis afer</i>	Red-necked Spurfowl, Red-necked Francolin
<i>Pycnonotus tricolor</i>	Dark-capped Bulbul, Black-eyed Bulbul
<i>Riparia cincta</i>	Banded Martin
<i>Riparia paludicola</i>	Brown-throated Martin
<i>Sagittarius serpentarius</i>	Secretarybird
<i>Saxicola torquatus</i>	African Stonechat, Stonechat
<i>Schoenicola brevirostris</i>	Broad-tailed Warbler
<i>Scleroptila levaillantii</i>	Red-winged Francolin
<i>Serinus canicollis</i>	Cape Canary
<i>Sphenoeacus afer</i>	Cape Grassbird, Grassbird
<i>Stephanoaetus coronatus</i>	African Crowned Eagle
<i>Streptopelia capicola</i>	Cape Turtle-Dove
<i>Tachybaptus ruficollis</i>	Little Grebe, Dabchick
<i>Tachymarptis melba</i>	Alpine Swift
<i>Tauraco corythaix</i>	Knysna Turaco, Knysa Lourie
<i>Telophorus olivaceus</i>	Olive Bush-Shrike
<i>Telophorus zeylonus</i>	Bokmakierie
<i>Terpsiphone viridis</i>	African Paradise-Flycatcher, Paradise Flycatcher
<i>Tringa nebularia</i>	Common Greenshank, Greenshank
<i>Turdus olivaceus</i>	Olive Thrush
<i>Upupa africana</i>	African Hoopoe, Hoopoe
<i>Vanellus armatus</i>	Blacksmith Lapwing, Blacksmith Plover
<i>Vanellus melanopterus</i>	Black-winged Lapwing, Black-winged Plover
<i>Vidua macroura</i>	Pin-tailed Whydah
<i>Zosterops virens</i>	Cape White-eye
<i>Anhinga rufa</i>	African Darter, Darter
<i>Cisticola lais</i>	Wailing Cisticola
<i>Cisticola natalensis</i>	Croaking Cisticola
<i>Cisticola textrix</i>	Cloud Cisticola
<i>Cisticola tinniens</i>	Levaillant's Cisticola
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<i>Poicephalus robustus</i>	Cape Parrot
<i>Polyboroides typus</i>	African Harrier-Hawk, Gymnogone
<i>Prinia hypoxantha</i>	Drakensberg Prinia
<i>Promerops gurneyi</i>	Gurney's Sugarbird
<i>Riparia cincta</i>	Banded Martin
<i>Riparia paludicola</i>	Brown-throated Martin
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<i>Pycnonotus tricolor</i>	Dark-capped Bulbul, Black-eyed Bulbul
<i>Phylloscopus ruficapilla</i>	Yellow-throated Woodland-Warbler, Yellow-throated Warbler
<i>Zosterops virens</i>	Cape White-eye
<i>Cisticola cinnamomeus</i>	Pale-crowned Cisticola
<i>Certhilauda curvirostris</i>	Cape Long-billed Lark, Long-billed Lark

<i>Psophocichla litsitsirupa</i>	Groundscraper Thrush
<i>Saxicola torquatus</i>	African Stonechat, Stonechat
<i>Chalcomitra amethystina</i>	Amethyst Sunbird, Black Sunbird
<i>Hedydipna collaris</i>	Collared Sunbird
<i>Cinnyris chalybeus</i>	Southern Double-collared Sunbird, Lesser Double-collared Sunbird
<i>Cinnyris afer</i>	Greater Double-collared Sunbird
<i>Crithagra scotops</i>	Forest canary
<i>Aquila pennatus</i>	Booted Eagle
<i>Dendropicos griseocephalus</i>	Olive Woodpecker
<i>Buteo vulpinus</i>	Steppe Buzzard
<i>Coccygia melanotis</i>	Sweet Waxbill
<i>Anhinga rufa</i>	African Darter, Darter

Protected species of Impendle Nature Reserve

Taxon Name	English Name
Birds	
<i>Accipiter melanoleucus</i>	Black sparrowhawk
<i>Accipiter rufiventris</i>	Rufous-chested Sparrowhawk, Red-breasted Sparrowhawk
<i>Anthropoides paradiseus</i>	Blue Crane
<i>Aquila verreauxii</i>	Verreaux's Eagle, Black Eagle
<i>Balearica regulorum</i>	Grey Crowned Crane, Crowned Crane
<i>Bubo africanus</i>	Spotted Eagle-Owl
<i>Bucorvus leadbeateri</i>	Southern Ground-Hornbill, Ground Hornbill
<i>Bugeranus carunculatus</i>	Wattled Crane
<i>Buteo rufofuscus</i>	Jackal Buzzard
<i>Circus ranivorus</i>	African Marsh-Harrier
<i>Cossypha dichroa</i>	Chorister Robin-Chat, Chorister Robin
<i>Crex crex</i>	Corn Crake
<i>Elanus caeruleus</i>	Black-shouldered Kite
<i>Falco biarmicus</i>	Lanner falcon
<i>Falco rupicolus</i>	Rock Kestrel
<i>Geocolaptes olivaceus</i>	Ground Woodpecker
<i>Geronticus calvus</i>	Southern Bald Ibis, Bald Ibis
<i>Gyps coprotheres</i>	Cape vulture
<i>Haliaeetus vocifer</i>	African Fish-Eagle
<i>Hirundo atrocaerulea</i>	Blue Swallow
<i>Lophaetus occipitalis</i>	Long-crested Eagle
<i>Milvus migrans</i>	Black Kite, Yellow-billed Kite
<i>Neotis denhami</i>	Denham's Bustard, Stanley's Bustard
<i>Oenanthe bifasciata</i>	Buff-streaked Chat
<i>Ploceus capensis</i>	Cape Weaver
<i>Poicephalus robustus</i>	Cape Parrot
<i>Polemaetus bellicosus</i>	Martial eagle

<i>Polyboroides typus</i>	African Harrier-Hawk, Gymnogene
<i>Prinia hypoxantha</i>	Drakensberg Prinia
<i>Sagittarius serpentarius</i>	Secretarybird
<i>Schoenicola brevirostris</i>	Broad-tailed Warbler
<i>Stephanoaetus coronatus</i>	African Crowned Eagle
<i>Tauraco corythaix</i>	Knysna Turaco, Knysa Lourie
<i>Vanellus melanopterus</i>	Black-winged Lapwing, Black-winged Plover
Mammals	
<i>Leptailurus serval serval</i>	Serval
<i>Ourebia ourebi ourebi</i>	Oribi
<i>Panthera pardus melanotica</i>	Leopard
<i>Pronolagus crassicaudatus</i>	Natal red rock rabbit
Reptiles	
<i>Bradypodion bourquini</i>	Bourquin's dwarf chameleon
<i>Nucras lalandii</i>	Delalande's sandveld lizard
Insects	
<i>Bittacus kimminsi</i>	Kimmin's hanging fly
<i>Bittacus walkeri</i>	Walker's hanging fly
<i>Damalis monochaetes</i>	
<i>Dasophrys fortis</i>	Strong robberfly
<i>Stenus mostovski</i>	Mostovski's rove beetle
Earthworms and leeches	
<i>Geogenia parva</i>	Little earthworm
<i>Proandricus bulwerensis</i>	Bulwer earthworm
<i>Tritogenia hiltonia</i>	Hilton earthworm
<i>Tritogenia lunata</i>	Crescent-shaped earthworm
Millipedes	
<i>Centrobolus lawrencei</i>	Lawrence's red millipede
<i>Gnomeskelus arcuatus</i>	
<i>Gnomeskelus attemsii</i>	
Plants	
<i>Aster bakeranus</i>	Wild Aster
<i>Cyanotis speciosa</i>	Doll's Powderpuff
<i>Cymbopogon excavatus</i>	Broad-leaved Turpentine Grass
<i>Disperis fanniniae</i>	
<i>Encephalartos ghellinckii</i> var. var nov dwarf type	
<i>Eriosema salignum</i>	Brown Bonnet, Narrow-leaved Salignum
<i>Eriospermum ornithogaloides</i>	
<i>Eulophia ovalis</i>	
<i>Eulophia zeyheriana</i>	
<i>Euphorbia clavarioides</i> var. <i>clavarioides</i>	
<i>Euphorbia epicyparissias</i> var. <i>epicyparissias</i>	
<i>Gerbera piloselloides</i>	Small Yellow Gerbera
<i>Graderia scabra</i>	Wild Penstemon, Pink Ground-Bells

<i>Habenaria dives</i>	
<i>Helichrysum aureonitens</i>	Golden Everlasting
<i>Hypoxis hemerocallidea</i>	Star Flower
<i>Kniphofia buchananii</i>	
<i>Lotononis corymbosa</i>	
<i>Ocotea bullata</i>	Stinkwood, Black Stinkwood
<i>Polygala hottentotta</i>	Small Purple Broom
<i>Protea roupelliae</i>	
<i>Ptaeroxylon obliquum</i>	Sneezewood
<i>Satyrium cristatum</i>	
<i>Satyrium longicauda</i>	
<i>Satyrium neglectum</i>	
<i>Scadoxus puniceus</i>	Blood Lily, Natal Paintbrush, Pincushion
<i>Scilla natalensis</i>	Large blue scilla, blue hyacinth, Blue Squill
<i>Silene burchellii</i>	Bladder Campion, Gunpowder Plant

PRO FORMA ANNUAL PLAN OF OPERATION

**Notes of a management meeting for Impendle Nature Reserve held at
... office on ...**

Present:

Apologies:

CC:

Management target	2011/12 Progress	2012/13 goals	Completion date	Responsibility	Action
LEGAL COMPLIANCE AND ENFORCEMENT					
Surveillance report and proclamation diagram		▪	Year 1	Biodiversity Conservation Coordinator	
Proclamation gazette		▪			
Formal access agreements		▪			
Completed land claim process with agreements where relevant.		▪	Year 1 and then ongoing	Biodiversity Conservation Coordinator	With assistance from the Community Conservation Unit and legal Unit
Minutes of meetings with land owners. (once land claim is settled)		▪			
Creation of cooperative structures with local communities and law enforcement officials.		▪	Year 2	Conservation Manager	
Regular patrols covering the full extent of the nature reserve.		▪	Ongoing	Conservation Manager	
Prosecution of any offender caught committing an offence.		▪			
STAKEHOLDER ENGAGEMENT					
Quarterly meetings of the Liaison forum.		▪	Ongoing	Conservation Manager	

Open lines of communication between stakeholders and the nature reserve's management.		▪	Ongoing	Conservation Manager	
Formal agreements with partners to facilitate, alien plant control, environmental education, bird monitoring and other.		▪	Ongoing	Biodiversity Conservation Coordinator	With assistance of Legal Unit
BUFFER ZONE PROTECTION AND REGIONAL MANAGEMENT					
Identification of threatening processes on the nature reserve's boundary.		▪	Year 2	Conservation Manager	With assistance of Eco-Advice Unit
Legal protection of critical biodiversity priority areas through the stewardship programme.		▪	Year 2	Conservation Manager with Ecological Advice Unit.	With assistance from the Stewardship Unit
Adoption of environmentally appropriate land uses in IDPs and SDFs in the areas immediately surrounding the nature reserve.		▪	Annually	Planning Unit	With Assistance from the Planning Unit
Retention of existing benign land uses in the areas immediately surrounding the nature reserve.		▪			
Upgraded and well maintained.		▪	Year 1 and then ongoing	Conservation Manager	Through collaboration with the Impendle Local Municipality
ECO-CULTURAL TOURISM					
An understanding of the tourism market profile for the nature reserve.		▪	Year 3	Ecotourism and Marketing Unit	

A feasibility report and map to guide the development of tourism products in Impendle Nature Reserve.		▪	Year 3	Ecotourism and Marketing Unit	
Sustainable tourism products within the reserve.		▪			
Directional signage to the reserve and tourism facilities		▪	First phase Year 1 with internal directional and interpretive signage and brochure with tourism product development	Conservation Manager	
Standard entrance signs at all entrance points.		▪			
Directional and interpretive signage and brochures in place.		▪			
Provision of an environmental interpretation and education tour to each school in the neighbouring local communities.		▪	Year 2	Community Conservation Officer	
Partnerships to facilitate sustainability of Impendle Eco-schools project.		▪			
Updated environmental education and resource material at the education center.		▪			
Capacity building initiative through the liaison forum.		▪			

Management target	2011/12 Progress	2012/13 goals	Completion date	Responsibility	Action
CONSERVATION MANAGEMENT					
Adoption and implementation of the fire management plan.		▪	Year 1	Conservation Manager and Ecological Advice Unit	
Compliance with the National Veld and Forest Fires Act.		▪	Ongoing	Conservation Manager	
Burn according to the annual plan based on ecological advice.		▪	Annually	Conservation Manager	
Compliance with the Biodiversity Act No. 10 of 2004.		▪	Year 1	Conservation Manager, Ecological Advice Unit and Alien Plant Unit	
50% reduction in wattle infestation levels in five years.		▪	Year 1	Conservation Manager, Ecological Advice Unit and Alien Plant Unit	
50% reduction in infestations of all other invasive plants in five years.		▪			
A detailed map depicting areas of soil erosion within the nature reserve.		▪	Year 1 and then ongoing	Conservation Manager	
Implementation of soil erosion control measures in areas in which plant cover is low, which are susceptible to erosion.		▪			

Creation of cooperative structures between Ezemvelo KZN Wildlife, local communities and law enforcement officials.		▪	Ongoing	Conservation Manager	
Control of any alien animals found within the nature reserve.		▪			
An agreed upon approach to any approved extractive resource use.		▪	When required	Conservation Manager	With assistance from the Resource Use Ecologist
Approved extractive resource use is managed, monitored and reported on.		▪			
No illegal collection of biological material or samples.		▪	When required	Conservation Manager	With assistance from the Resource Use Ecologist
Knowledge of the value of ecosystem goods and services on which funding requirements etc could be motivated.		▪	Year 4	Resource Use Ecologist	
An agreed upon approach to future wildlife species introductions and management.		▪	Year 1	Conservation Manager and Ecological Advice Unit	
Control of population numbers of species that are exceeding identified carrying capacities		▪	Ongoing	Conservation Manager and Ecological Advice Unit	

Effective procedures and relationships with neighbours in dealing with problem animal control.		▪	Year 1		Conservation Manager
Surveillance and monitoring plans for key threatening processes.		▪	Year 1	Ecological Advice Unit	
Monitoring plans for key rare and endangered species.		▪			
Maintenance of optimum population numbers of rare and endangered species.		▪			
Monitoring of flagship species.		▪	Ongoing	Conservation manager with Ecological Advice Unit	
Integration of nature reserve within NGO's species monitoring programmes.		▪			
Wetland monitoring report.		▪	Ongoing	Conservation manager with Ecological Advice Unit	
OPERATIONAL MANAGEMENT					
Adequate funding to achieve the objectives of the nature reserve.		▪	Year 1	Conservation Manager and Regional Management	
Appointment of staff in all vacant positions in the nature reserve.		▪	Year 1	Regional Management	
A secure protected area		▪	Year 2 and then	Conservation	This is subject to

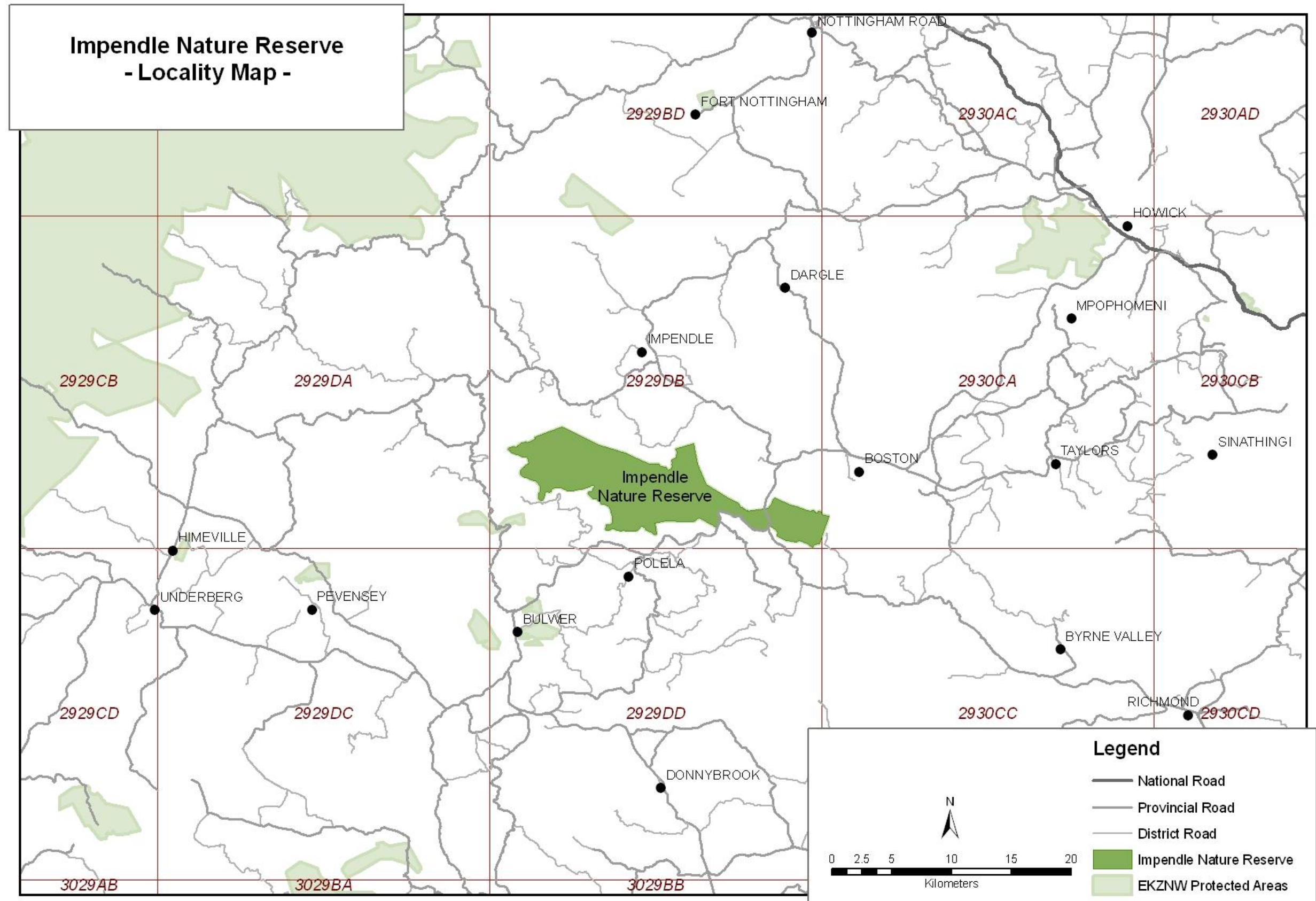
boundary.			ongoing	Manager	receiving funds for the fencing project.
Regular scheduled maintenance of all facilities and infrastructure.		▪			

2012/13 Budget for Impendle Nature Reserve

The budget should be apportioned to those items that are the responsibility of the Impendle Nature Reserve Conservation manager and should be based on the goals for the 2012/13 financial year.

2012/13 Goals	Budget
LEGAL COMPLIANCE AND LAW ENFORCEMENT	
COMMUNITY PARTICIPATION	
BUFFER ZONE PROTECTION AND REGIONAL MANAGEMENT	
ECO-CULTURAL TOURISM DEVELOPMENT	
CONSERVATION MANAGEMENT	
OPERATIONAL MANAGEMENT	

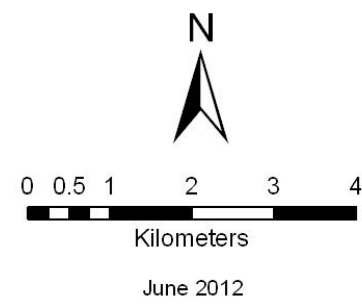
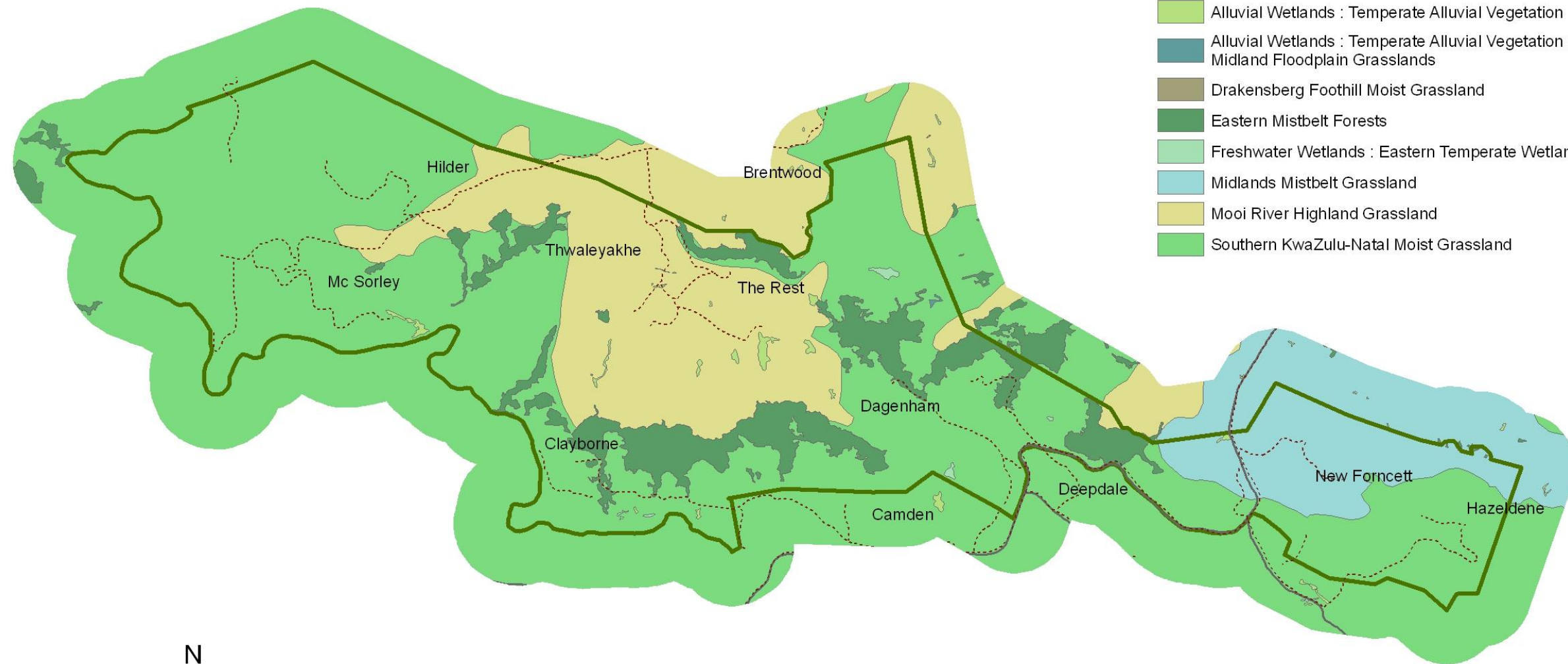
MAP 1



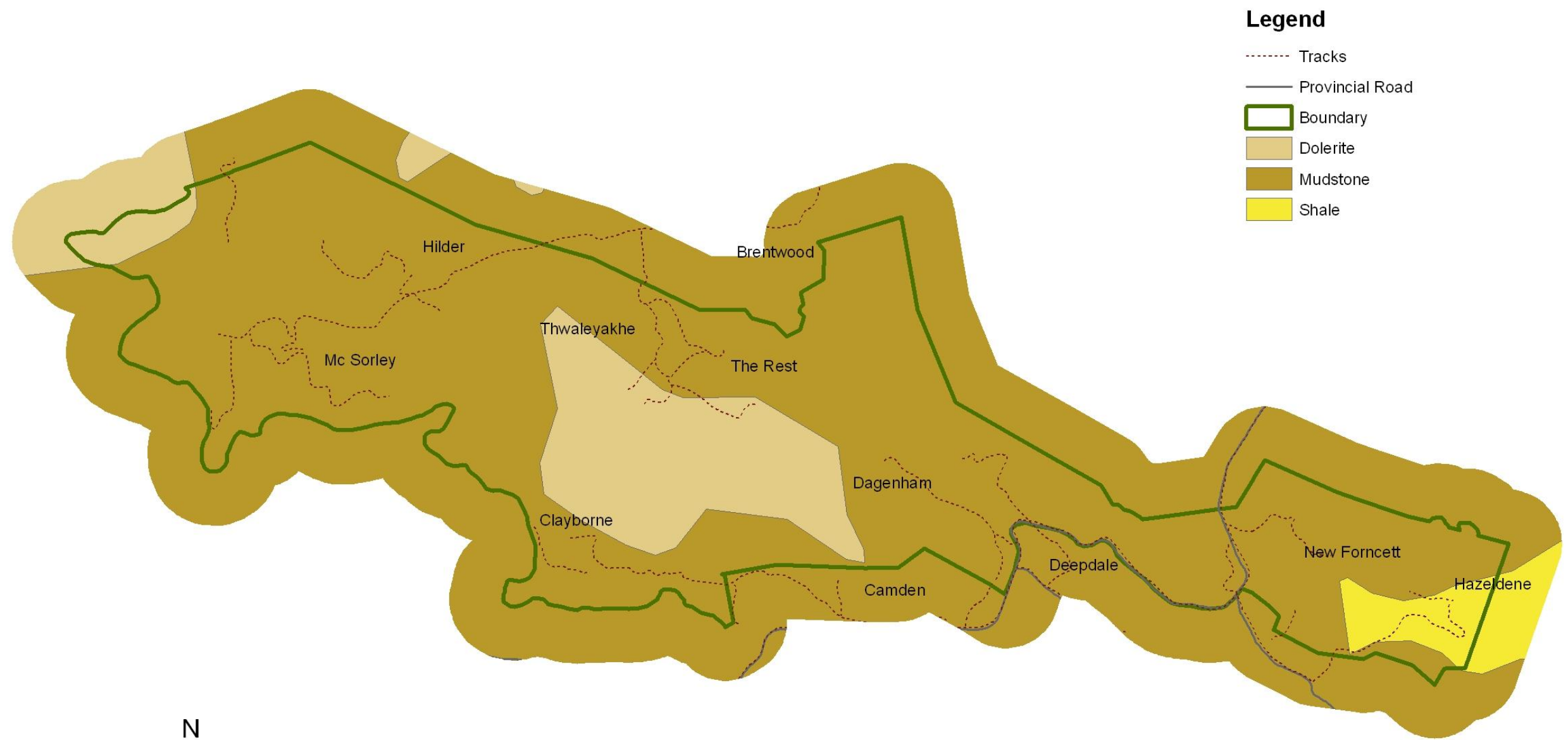
Impendle Nature Reserve - Vegetation -

Legend

- Tracks
- Provincial Road
- Boundary
- Alluvial Wetlands : Temperate Alluvial Vegetation
- Alluvial Wetlands : Temperate Alluvial Vegetation :
Midland Floodplain Grasslands
- Drakensberg Foothill Moist Grassland
- Eastern Mistbelt Forests
- Freshwater Wetlands : Eastern Temperate Wetlands
- Midlands Mistbelt Grassland
- Mooi River Highland Grassland
- Southern KwaZulu-Natal Moist Grassland

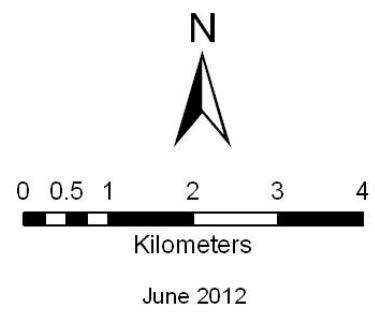


Impendle Nature Reserve - Geology -

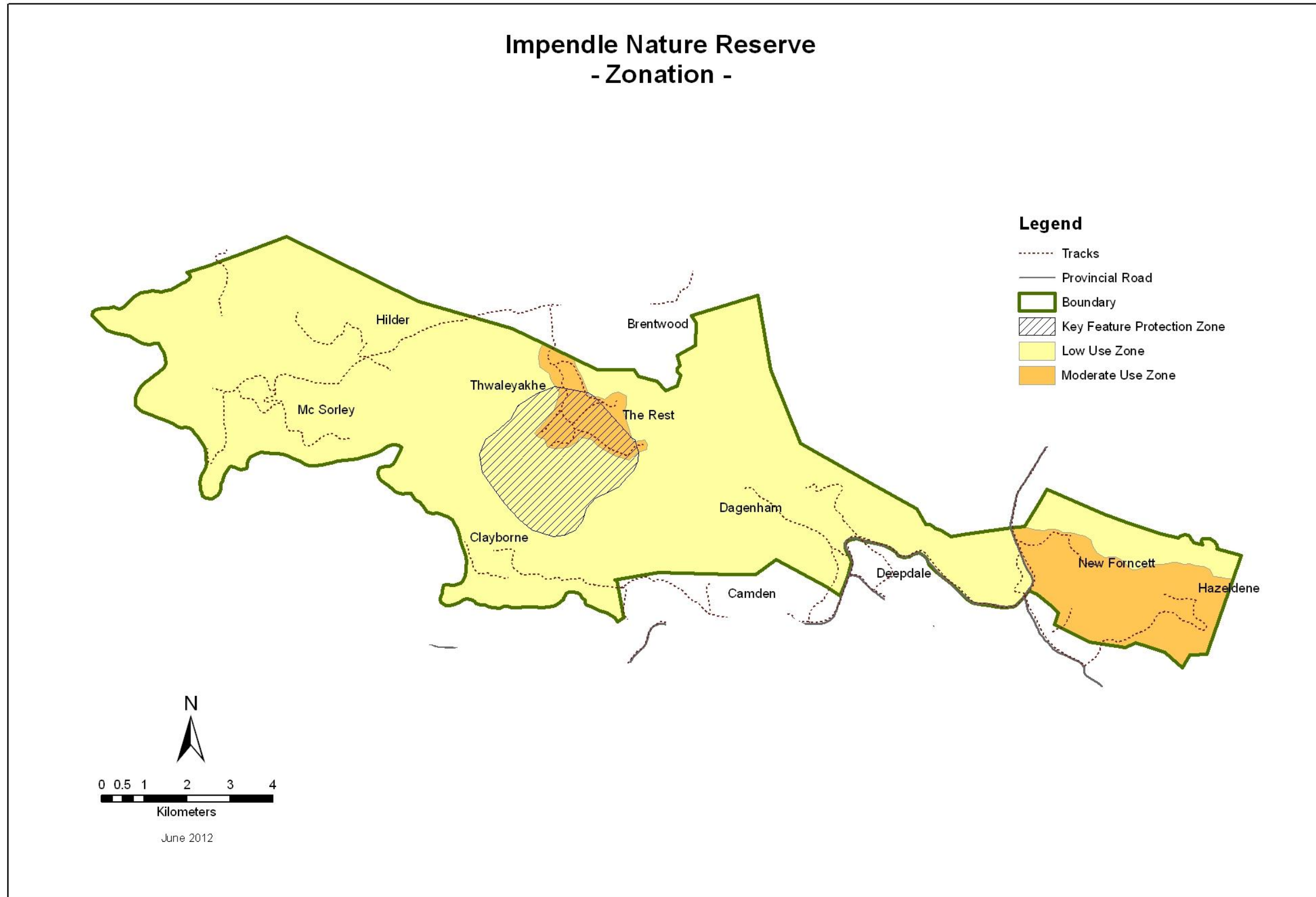


Legend

- Tracks
- Provincial Road
- Boundary
- Dolerite
- Mudstone
- Shale



MAP 4



Impendle Nature Reserve - 5 km Buffer -

