



PONGOLA GAME RESERVE



PROTECTED AREA MANAGEMENT PLAN

2024 - 2033

Prepared By: Pongola Game Reserve Landowners

Developed 2024

RECOMMENDATION

The Protected Area Management Plan for the Pongola Game Reserve was developed by a multi-disciplinary team, the Pongola Game Reserve East Association in collaboration with Ezemvelo KZN Wildlife:

NAME	DESIGNATION
HW Meier	Landowner & Chairman: Pongola Game Reserve East Association (PGREA) Executive Committee (EXCO)
HK Kohrs	Landowner, Veterinarian & Member of PGREA EXCO
KP Landman	Landowner & PGREA Management Functions
KPK Landman	Landowner & Member of PGREA EXCO
CW Landman	Landowner
MP Thomson	General Manager Pongola Game Reserve & Secretary of PGREA EXCO
M Kohrs	Landowner
MC Welthagen	Landowner
DBSL Vorster	Landowner
S Boshoff	PGR Black Rhino & Elephant Monitor
M Goosen	Protected Area Management Planner: Ezemvelo KZN Wildlife
A Blackmore	Manager Conservation Planning: Ezemvelo KZN Wildlife

APPROVAL

TITLE	NAME	SIGNATURE	DATE
MEC: ECONOMIC DEVELOPMENT, TOURISM & ENVIRONMENTAL AFFAIRS (EDTEA)			
TITLE	NAME	SIGNATURE	DATE
CHAIRMAN: PONGOLA GAME RESERVE EAST ASSOCIATION			

TABLE OF CONTENTS		Page
RECOMMENDATION	_____	2
APPROVAL	_____	2
TABLE OF CONTENTS	_____	3
LIST OF TABLES	_____	6
LIST OF FIGURES	_____	6
LIST OF MAPS	_____	6
LIST OF APPENDICES	_____	6
EXECUTIVE SUMMARY	_____	7
ABBREVIATIONS	_____	10
DEFINITION OF TERMS	_____	11
LIST OF STATUTES FOR PROTECTED AREA MANAGEMENT	_____	13
1 CONTEXT	_____	14
1.1 INTRODUCTION TO THE MANAGEMENT PLAN	_____	14
1.1.1 Purpose of the Management Plan	_____	14
1.1.2 Structure of the Management Plan	_____	14
1.1.3 Management Plan Development	_____	16
1.1.4 Management Plan Implementation	_____	17
1.1.5 Review of the Management Plan	_____	17
1.2 PLANNING APPROACH	_____	17
1.2.1 Resource Management	_____	17
1.2.2 Adaptive Management	_____	18
1.2.3 Collaboration and Transparency	_____	18
1.3 LEGAL, POLICY AND INSTITUTIONAL FRAMEWORK	_____	18
1.3.1 The Legislative Basis for the Management of Protected Areas	_____	18
1.3.2 The Policy Framework Guiding the Management of Protected Areas	_____	19
1.3.3 Institutional Framework	_____	19
1.4 BACKGROUND TO PONGOLA GAME RESERVE AND ITS CONTEXT	_____	19
1.4.1 Background, Locality and Extent of Pongola Game Reserve	_____	19
1.4.2 Eco-cultural Tourism	_____	22
1.4.3 Boundary Deviations	_____	23
1.4.4 Local Agreements, Leases, Servitudes, MoAs	_____	23
1.4.5 History of Conservation	_____	23
1.4.6 Proclamation Status	_____	24
1.4.7 Protected Area Expansion and Regional Aspects of Pongola Game Reserve	_____	25
1.5 ECOLOGICAL CONTEXT	_____	26
1.5.1 Climate and Weather	_____	26
1.5.2 Topography	_____	27
1.5.3 Geology and Soils	_____	28
1.5.4 Hydrology	_____	29
1.5.5 Vegetation	_____	29
1.5.6 Fire Regime	_____	32

1.5.7	Invasive Species	_____	34
1.5.7.1	Invasive Flora	_____	34
1.5.7.2	Invasive Fauna	_____	35
1.5.8	Fauna	_____	35
1.5.8.1	Mammalian Fauna	_____	35
1.5.8.2	Avifauna	_____	36
1.5.8.3	Herpetofauna (Reptiles and Amphibians)	_____	38
1.5.8.4	Invertebrates	_____	39
1.5.8.5	Fish	_____	39
1.6	CULTURAL CONTEXT	_____	41
1.7	SOCIO-ECONOMIC CONTEXT	_____	42
1.8	STAFF, FUNDING AND INFRASTRUCTURE	_____	42
1.8.1	Human Resources	_____	43
1.8.2	Financial Resources	_____	43
1.8.3	Infrastructure	_____	44
1.9	MANAGEMENT EFFECTIVENESS	_____	45
1.10	RISK ASSESSMENT	_____	45
2	STRATEGIC MANAGEMENT FRAMEWORK	_____	47
2.1	PURPOSE	_____	47
2.2	VALUES	_____	48
2.3	VISION	_____	49
2.4	OBJECTIVES	_____	49
2.5	CONSERVATION DEVELOPMENT FRAMEWORK	_____	50
2.5.1	Zonation Plan	_____	50
2.6	ADMINISTRATIVE STRUCTURE	_____	53
2.7	FINANCIAL PLAN	_____	53
2.7.1	Funding Required to Effectively Manage Pongola Game Reserve	_____	54
2.8	CONSERVATION TARGETS	_____	55
2.9	MANAGEMENT OF KEY SPECIES	_____	56
2.10	MONITORING AND REPORTING	_____	59
2.11	GUIDING PRINCIPLES	_____	61
2.11.1	General	_____	61
2.11.2	Legal Context and Compliance	_____	62
2.11.3	Conservation Beyond Boundaries	_____	63
2.11.3.1	Protected Area Expansion	_____	63
2.11.3.2	Buffer Zone and Zone of Influence	_____	63
2.11.3.3	Stakeholder Engagement	_____	64
2.11.3.4	Co-Management	_____	65
2.11.3.5	Public Education and Awareness	_____	65
2.11.3.6	Ecotourism	_____	66
2.11.3.7	Fire Management	_____	67
2.11.3.8	Invasive Species Control	_____	68
2.11.3.9	Soil Resource Management	_____	68
2.11.3.10	Resource Utilisation	_____	69
2.11.3.11	Wildlife Management	_____	69
2.11.3.12	Sense of Place	_____	71
2.11.3.13	Water Management	_____	72
2.11.3.14	Ecological Integrity	_____	72
2.11.3.15	Use of Airspace	_____	73

2.11.3.16	Memorials and Plaques	73
2.11.3.17	Development and Maintenance of Infrastructure	73
2.11.3.18	Research, Monitoring and Reporting	74
2.11.3.19	Financial and Human Resources	75
3	REFERENCES	77
4	APPENDICES	78

LIST OF TABLES

Table 1:	Structure of the Management Plan _____	14
Table 2:	Summary of the process of developing a protected area _____ management plan	16
Table 3:	List of Properties, Sizes and Ownership that make up the PGR _____	24
Table 4:	Habitat types, soils and dominant species of the Pongola Game _____ Reserve East Section	30
Table 5:	Vegetation Classification: Dubula and Leeukop Sections _____	31
Table 6:	SWOT Analysis for Pongola Game Reserve _____	45
Table 7:	Values of the PGR _____	48
Table 8:	Zonation Categories for PGR _____	51
Table 9:	PGR Cost Estimate for Joint Operations _____	54
Table 10:	Conservation Targets of the PGR _____	56
Table 11:	Specific Management Strategies for the PGR _____	56
Table 12:	Management strategies for large herbivores and other key species _____	57

LIST OF FIGURES

Figure 1:	Annual Rainfall: Pongola Game Reserve 1996 to 2023 _____	27
Figure 2:	Deviation From the Average Rainfall: Pongola Game Reserve _____ 1996 to 2023	27
Figure 3:	Correct and Wrong Way to Handle and Take Photographs of Tiger Fish _____	40
Figure 4:	Fish Tagging Program Poster _____	41
Figure 5:	PGR Structure _____	53

LIST OF MAPS

Map 1:	Location of PGR in South African Context _____	20
Map 2:	Location of the PGR in Local Context and its Boundaries _____	21
Map 3:	Original Area Planned to be part of the Nsubane-Pongola TFCA _____	26
Map 4:	Elevation of the Area as per Original Map Generated for the TFCA _____	28
Map 5:	Hydrology of the Area as per Original Map Generated for the TFCA _____	29
Map 6:	Vegetation Types on PGR East _____	31
Map 7:	Vegetation Map: Dubula and Leeukop Sections _____	32
Map 8:	Infrastructure within the PGR _____	44
Map 9:	Zonation of PGR _____	53

LIST OF APPENDICES

Appendix 1:	PGREA Constitution _____	
Appendix 2:	PGR East Joint Management Plan _____	
Appendix 3:	Caretaker Agreement (KLT/DWA) _____	
Appendix 4:	Caretaker Agreement (PGRE/DWA) _____	
Appendix 5:	Black Rhino Range Expansion Project Custodianship Agreement _____	
Appendix 6:	PGR Fire Management Plan _____	
Appendix 7:	<i>Parthenium</i> Pre and Post Release Studies in the PGR _____	
Appendix 8:	PGR Mammalian Species List _____	
Appendix 9:	IBA Certificate _____	
Appendix 10:	Zululand IBA Master Checklist _____	
Appendix 11:	PGR Bird Species List _____	
Appendix 12:	PGR Reptile and Amphibian Species List _____	
Appendix 13:	PGR Invertebrate Species List _____	
Appendix 14:	PGR Fish Species List _____	
Appendix 15:	PGR Black Rhino Management Plan _____	
Appendix 16:	PGR Elephant Management Plan _____	
Appendix 17:	PGR Plant Species List _____	

EXECUTIVE SUMMARY

Introduction

The purpose of the Pongola Game Reserve (PGR) is to create a consolidated area allowing for the viable and sustainable consumptive and non-consumptive utilisation of natural resources, based on sound ecological and business principles. The PGR is rich in natural resources, forming part of the first game reserve in Africa, established on 13th June 1894 by Paul Kruger, State President of the Zuid Afrikaanse Republiek, which was since de-proclaimed and re-proclaimed several times.

In 1990, farmers bordering the PGR, together with the former Natal Parks Board and Transvaal Nature Conservation, began talks on converting commercial farmland back to conservation, which over time led to the formation of the Pongola Game Reserve East Association (PGREA). The PGREA is a group of landowners with similar visions for the area who decided to drop fences between their properties to create a larger co-managed ecological unit, under a Constitution (**Appendix 1**) and Joint Management Plan (**Appendix 2**) and managed by an Executive Committee (PGREA EXCO). The Joint Management Plan is specifically aimed at the management of all joint issues (such as game management, vegetation management, fire management, boundary fences and security management) and not specifically the plans of each landowner on his/her respective properties.

This system has worked very well for a long period and the landowners then decided to further protect the Pongola Game Reserve, including additional land north of the Pongola River and west of the N2, by declaring the Pongola Game Reserve as a Nature Reserve under the Protected Areas Act 57 of 2003, and appointing the PGREA EXCO as the Management Authority for the PGR.

This formed a consolidated area of **10749.0919** hectares in extent, situated in the Zululand District Municipality (D26) and the uPhongolo Local Municipality (KZ262) and borders the western shore of the Pongolapoort Dam. Added to this the PGR has Caretaker Agreements in place with the Department of Water Affairs and Sanitation (DWA&S) for the purchase boundary (state land) between their properties and the Pongolapoort Dam water surface, these remain in place until cancelled by DWA&S (**Appendix 3 & 4**).

Formal recognition for the conservation value was originally gained with the area being accepted as a Natural Heritage Site (No. 127) and The PGR continues to be used by numerous wildlife ranchers and conservation bodies as a case study for sound wildlife ranching and ecotourism management.

Vision

The Vision of the Pongola Game Reserve is to create a consolidated area that contributes significantly to sound conservation management through consumptive and non-consumptive sustainable resource utilisation, by providing visitors with an interactive, participatory and enlightening experience, based on sound business and ecological principles for current and future generations.

Key Issues

The management team identified the following specific issues to be addressed (identified through SWOT analysis):

- Maintaining an Elephant population that is exceeding their carrying capacity, whose management is hampered by current legislation. Despite other properties being sought over a long period to move excess elephants to, none have been sourced as all elephant populations in southern Africa are currently exceeding carrying capacities. Solutions to this problem need to be found.
- Although vegetation monitoring is conducted, a more robust system covering the entire reserve needs to be developed and implemented.
- Implementation of an effective Leopard monitoring program is required to guide the management of this species on the PGR.
- A railway line (managed by Transnet) passes through the reserve which has resulted in the mortalities of game species, such as White and Black Rhino, Vulture species, Giraffe, Buffalo and various other common game. This is being managed by the PGR and Transnet but remains a weakness in relation to game management.
- Illegal gill netting and other illegal activity currently taking place on the water surface of the Dam, mostly staged from the Eastern Shores of the Phongolo Nature Reserve, which increases the threat of potential illegal activity originating from the Dam itself.
- No currently defined formal authority is responsible for the management of the Pongolapoort Dam water surface, which creates a grey area and the potential for uncontrolled access and activities.

Management Interventions

As identified through SWOT analysis, the following management interventions have been identified:

- Investigate and find solutions for the Elephant over population issue, through working relationships with Ezemvelo KZN Wildlife and the relevant national departments
- Develop and implement a more robust vegetation monitoring system that will assist in achieving the reserve objectives
- Continue working with Transnet to minimise game mortalities on the railway line, and attempt to get a formal agreement in place with Transnet in this regard
- Continue working with Ezemvelo KZN Wildlife and other relevant authorities to solve the illegal gill netting problem on the Pongolapoort Dam
- Contact the Department of Water Services to obtain clarity on who is ultimately responsible for the management of the water surface of the Pongolapoort Dam

Annual Operational Plan

To effectively implement the management plan and address the critical issues in it, an Annual Operational Plan (AOP) will be prepared, which is based on the management plan objectives, targets and SWOT analysis, and will guide the implementation of the management plan.

Revision of the Management Plan

This management plan is valid from the date of signature for a minimum of 10 years. The annual assessments by the management team will guide the review requirements.

ABBREVIATIONS

PGR	- Pongola Game Reserve
PGREA EXCO	- Pongola Game Reserve East Association Executive Committee
AOP	- Annual Operations Plan
KZN	- KwaZulu-Natal Province of the Republic of South Africa
SWOT	- Strengths, Weaknesses, Opportunities, and Threats Analysis
NEMPAA	- National Environmental Management: Protected Area Act
ZoI	- Zone of Influence
NEMA	- National Environmental Management Act
EIA	- Environmental Impact Assessment
DFFE	- Department Fisheries, Forestry and the Environment
DWA&S	- Department Water Affairs & Sanitation
DWS	- Department of Water Services
PGR-E	- Pongola Game Reserve East
IUCN	- International Union for the Conservation of Nature
TFCA	- Transfrontier Conservation Area
IBA	- Important Birding and Biodiversity Area
PNR	- Phongolo Nature Reserve
GPS	- Global Positioning System
EKZNW	- Ezemvelo KZN Wildlife
SATIB	- South African Tourism Insurance Brokers
MoA	- Memorandum of Agreement
SANBI	- South African National Biodiversity Institute
SAPS	- South African Police Service
BRREP	- Black Rhino Range Expansion Project

DEFINITION OF TERMS

Alien Species - Species or genotypes that are not indigenous to the protected area 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]).

Buffer Zone - An area surrounding a protected area that has restrictions placed on its use or where collaborative projects and programs are undertaken to afford additional protection to the nature reserve.

Consumptive Utilisation - Use of natural resources in which these resources are utilised and removed from their natural environment, such as hunting, culling, and live capture.

Eco-cultural Tourism - Minimal impact tourism' or 'environmentally sound tourism' that includes the responsible travel of tourists, and appreciation of natural and cultural areas; and typically benefits local or hosting communities and increases conservation awareness for both the tourist and local communities affected

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]).

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

Indigenous Species - Concerning 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 - Means any species whose establishment and spread outside of its natural distribution range:

- a. Threaten ecosystems, habitats, or other species or have a demonstrable potential to threaten ecosystems, habitats, or other species.
- b. May result in economic and environmental harm or harm to human health.

(As per the National Environmental Management: Protected Areas Act, 2003 Act [No. 57 of 2003]).

Joint Management - The agreed co-ordination of management and/or management actions by landowners and/or mandated managers on their individual or combined properties to achieve common management objectives.

Management - 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 - 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 the change in status, distribution, or integrity 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 the Nature Reserve.

Non-Consumptive Utilisation - The type of use of natural resources which does not require that the resources be removed from their natural environment or location (such as game viewing, etc.)

Protected Areas - 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 Any of the protected areas referred to in section 9 of the National Environmental Management: Protected Areas Act, 2003 Act [No. 57 of 2003].

Sustainable Use - The use of any component of biodiversity in a manner that:

- a) Is ecologically, economically, and socially sustainable;
- b) Does not contribute to its long-term decline in the wild or disrupt the genetic integrity of the population;
- c) Does not disrupt the ecological integrity of the ecosystem in which it occurs;
- d) Ensures continued benefits to people in a manner that is fair, equitable, and meets the needs and aspirations of present and future generations; and
- e) Ensures a duty of care towards all components of biodiversity for thriving people and nature. (as per The White Paper on Sustainable Use of South Africa's Biodiversity (GG48785, 2023).

Zone of Influence - the area outside the boundary of a protected area where activities of people or other influences may have a negative impact on the purpose, values, or objectives and/or efficient and effective management of the protected area and/or continued delivery of tourism and other societal benefits from the protected area, and consequently where protected area management seeks to actively engage with stakeholders in order to promote and retain compatible, and prevent or mitigate incompatible, activities and use of land.

LIST OF STATUTES FOR PROTECTED AREA MANAGEMENT

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 [No. 51 of 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 Integrated Coastal Management Act [No. 24 of 2008]
- National Environmental Management: Protected Areas Act [No. 57 of 2003]
- National Environmental Management Waste Act [No. 59 of 2008]
- 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]
- World Heritage Convention Act [No. 49 of 1999]
- Development Facilitation Act [No. 67 of 1995]
- Disaster Management Act [No. 57 of 2002]
- Fire Brigade Services Act [No. 99 of 1987]
- KwaZulu-Natal Planning and Development Act [No. 5 of 1998]
- Land Reform Labour Tenant Act [No. 3 of 1996]
- 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]
- Promotion of Access to Information Act [No. 2 of 2000]
- Promotion of Administrative Justice Act [No. 3 of 2000]
- Restitution of Land Rights Act [No. 22 of 1994]
- Spatial Planning and Land Use Management Act [No. 16 of 2013]
- Water Services Act [No. 108 of 1997]
- National Tourism Act [No. 3 of 2014]
- Promotion of Access to Information Act [No. 2 of 2000]
- Promotion of Administrative Justice Act [No. 3 of 2000]

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]
- Skills Development Act [No. 97 of 1998]
- Skills Development Levies Act [No. 9 of 1999]
- Unemployment Insurance Act [No. 63 of 2001]

1. CONTEXT

1.1 INTRODUCTION TO THE MANAGEMENT PLAN

1.1.1 Purpose of the Management Plan

The aim of the PGR Management Plan is to provide a broad policy framework, setting out key objectives, and defining responsibilities and operational guidelines for the sound conservation and business management of the PGR. As a planning tool, required for decision-making purposes, the PGR Management Plan guides the team responsible for the management of the reserve, as well as creating awareness amongst staff, neighbours, and guests as to the vision and objectives of the PGR.

The purpose of the management plan is to:

- provide the primary strategic tool for the management of the PGR,
- enable PGREA EXCO to develop and manage the protected area in such a way that its values and the purpose for which it was established are protected,
- provide for capacity building, future thinking, continuity of management, and
- facilitate compliance with the National Environmental Management: Protected Areas Act (NEMPAA), 2003 Act [No. 57 of 2003], and other relevant legislation

1.1.2 Structure of the Management Plan

The structure for the management plan is set out in Table 1.

Table 1: Structure of the Management Plan

CONTEXT (SECTION 1)	
Section 1 deals with contextual issues; it sets the scene for the management plan and deals with the protected area's current status. Any changes to this section can be recorded in the Annual Operations Plan (AOP).	
Section 1.1	Introduction to the management plan: This section explains the purpose of the plan, the plan structure, the process followed to develop the management plan, the implementation, monitoring and reporting and review of the management plan.
Section 1.2	Planning approach: This section deals with the primary planning principles that were incorporated into the management plan, and in the management of the protected area and includes the public trust, ecosystem-based management, adaptive management, collaboration and transparency.
Section 1.3	Legal, Policy and institutional framework: This section sets out the legislative basis and policy framework for the management of protected areas in KZN; it also includes the institutional framework of the management authority.
Section 1.4	Background to the protected area: This section provides the contextual information relating to the protected area, it includes the background of the protected area, records boundary deviations, proclamations, servitudes and any co-management

	agreements as well as the protected area expansion opportunities. Furthermore, all ecological, cultural, financial, socio-economic, human resources, infrastructure and detailed risk assessment aspects are covered in this section.
Section 1.5	Ecological context to the protected area: This section provides the ecological context for the protected area and include climate and weather, topography, geology and soils, hydrology, vegetation, fire regime, invasive species and information on fauna and flora.
Section 1.6	Cultural context of the protected area: This section provides the current cultural context of the protected area and include cultural heritage sites, living heritage and historical aspects.
Section 1.7	Socio-economic context of the protected area: This section provide the context of the protected area beyond its boundary. It include the land-use around, and socio-economic situation of communities living in areas bordering the protected area.
Section 1.8	Staff, funding & infrastructure: This section provide the current resources allocated to the management of the protected area from a financial and human resource perspective. Infrastructure in the protected area: This section provide for current infrastructure in the protected area and includes bulk infrastructure, management infrastructure and tourism infrastructure.
Section 1.9	Management effectiveness of the protected area: This section describes the latest management effectiveness assessment for the protected area (SWOT Analysis), highlights the key issues that have been highlighted that needs to be improved.
Section 1.10	Risk assessment of the protected area: This section provides a risk assessment and include a SWOT analysis that highlight both opportunities and threats.
STRATEGY (SECTION 2)	
This section provides a framework for the strategic direction of the protected area adopted by the MEC.	
Section 2.1	In terms of the National Environmental Management: Protected Area Act (NEMPAA), Section 40 prescribes that the protected area must be managed exclusively for the purpose it was declared, per the management plan and other relevant legislation. This section deals explicitly with the purpose of the protected area and is based on the values of the site.
Section 2.2	Sets out the values of the protected area, providing the basis for the management of the area. The values of a place are those remarkable attributes that exemplify it and are the primary reason for its declaration as a protected area. The values are essential in planning and management, as they are the aspects of the place that must be protected.
Section 2.3	Section 2.3 sets out the long-term vision or desired state of the protected area. This vision will be derived through a consultative process and will provide a road map for managing the protected area.
Section 2.4	Sets out the protected area's strategic objectives that must be achieved to conserve the protected area effectively. These site-specific strategic objectives will contribute to the achievement of the protected area vision. An objective has been identified for each of the protected area management spheres and is based on the critical functions and activities necessary to protect, develop and manage it effectively. The protected area's

	strategic objectives are translated into site-specific goals, actions, timeframes, responsibility, and budgets in the AOP.
Section 2.5	Conservation framework: Sets out the development framework and zonation of the protected area, outlining the permissible land uses in particular zones. It also establishes principles for the buffer/ Zone of influence (Zoi) contiguous to the protected area.
Section 2.6	The administrative structure describes the staff required to manage the protected area effectively.
Section 2.7	The financial section deals with budgets, budget shortfalls and funding requirements of the protected area.
Section 2.8	Biodiversity targets provide for the provincial and national targets towards which the protected area contributes.
Section 2.9	Management of key species: this section sets out the management strategies for key species. It provides for a strategy, targets and threat identification to these species.
Section 2.10	Monitoring and reporting requirements of the protected area: this section provides for all aspects of protected area management and activities that require monitoring and surveillance programmes as well as specified reporting requirements for these.
Section 2.11	Guiding principles: This section provides the guiding principles based on the policy framework of the PGR and best practice that will be used to manage the protected area.
ANNUAL OPERATIONS PLAN	
The AOP will be compiled on an annual basis. It will contain specific goals and actions required for the implementation of the management plan. The AOP combines site-specific goal setting, management interventions required to achieve objectives set out in the management plan, and the next steps required to improve the protected area's management effectiveness. It furthermore provides a mechanism to review the management plan, assess the requirement for a full review process should substantial changes be required, and record minor revisions for updating the management plan.	

1.1.3 Management Plan Development

The development of a management plan consists of three main steps.

Table 2: Summary of the process of developing a protected area management plan

Situational analysis	Preparation of draft management plan	Finalisation and adoption of the management plan
Identify stakeholders of the protected area, PGR Landowners	Develop vision and site-specific objectives	Internal review of the management plan
Information gathering and review – internal and external (management meeting and a stakeholder workshop advertised in provincial and/or local newspapers)	Develop goals and actions linked to the vision, objectives, and management issues identified in the SWOT analysis	Finalisation of the management plan

Identify key management issues through a SWOT analysis that must be addressed in the plan	Prepare the draft management plan	Submission to PGREA EXCO for approval
	Public review of the management plan	Submit to MEC/Minister for approval
		Make the adopted plan available to stakeholders and the broader public

1.1.4 Management Plan Implementation

The PGREA EXCO, as the appointed Management Authority of the PGR, is responsible for the implementation, actions, and monitoring of the management plan. The PGREA EXCO shall call and hold an Annual General Meeting of all participating landowners within the PGR. The purpose of the Annual General Meeting is to:

- As part of the annual review, assess any changes to the strategic direction or the context of the management plan,
- Determine management goals and activities for the coming year based on the management plan, and
- Determine how budgets will be spent to achieve the goals for the coming year.

1.1.5 Review of the Management Plan

The operational component of the management plan (i.e. the AOP) will be revised and updated annually by the PGREA EXCO, and if a substantial change to the strategic direction of the management plan is required then this must be presented and approved by the PGREA Annual General Meeting.

The management plan will be developed for a minimum of 10 years.

1.2 PLANNING APPROACH

1.2.1 Resource Management

The objective is to maximise income and other related benefits from the sustainable consumptive and non-consumptive utilisation of PGR's natural resources while still maintaining and enhancing the PGR's natural habitats and systems.

Recognising the fact that the system's biotic and abiotic components can no longer function as a truly natural ecological system, the policy is to apply management interventions for the achievement of ecological management objectives.

These management interventions will be based on current knowledge, technology, time, and financial resources, and limited to plant and animal species historically indigenous to the area.

1.2.2 Adaptive Management

Based on knowledge and technology improvement, and a stated policy of management intervention, the strategy will be to consistently apply an adaptive management process based on:

- a continuously updated natural resources database,
- clear and measurable goals and objectives,
- updated knowledge,
- efficient, effective, and reputable monitoring systems,
- regular evaluation and review, and
- a motivated and committed management team and staff trained and capacitated to meet the objectives.

1.2.3 Collaboration and Transparency

Stakeholder (PGR Landowners) involvement and support is an essential aspect of effective protected area management. Accordingly, this management plan has been developed through a collaborative process involving all landowners who have property within the PGR.

1.3 LEGAL, POLICY & INSTITUTIONAL FRAMEWORK

1.3.1 The Legislative Basis for the Management of Protected Areas

There is a large body of legislation relevant to the management of protected areas in South Africa. However, the primary legislation guiding the management of protected areas is the NEMPAA.

NEMPAA establishes the legal basis for the creation and administration of protected areas in South Africa. The PGR voluntarily commits to strict norms and standards aimed at ensuring minimal impact on the environment, while maximising income and guest experience.

This approach requires constant evaluation and updating to ensure that we keep abreast of legal requirements, as well as industry norms and standards. The legal framework continuously changes, and we will contribute wherever possible and meaningful to requests for inputs to ensure the creation of a conducive and equitable environment in which we can operate.

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 and eradication strategy in the protected area management plan.

In terms of the National Environmental Management Act (NEMA) Act [No. 107 of 1998] EIA Regulations, various activities require environmental authorisation before they may commence. In terms of Regulation R.985, Listing Notice No.3, several activities require environmental approval, specifically as a result of their proximity to a protected area. The implication is that if any of the activities listed are proposed in the protected area or within five kilometres of it, they will be subject to either a basic assessment or a full scoping and EIA process. Several general activities and those proposed for either tourism development or operational management within the protected area or its buffer areas will thus also require environmental authorisation.

1.3.2 The Policy Framework Guiding the Management of Protected Areas

The conservation, management and sustainable utilisation of the natural resources in the PGR is undertaken within a broad framework of policies and will be included within the management plan where they apply. At a national level, the overarching policy is set out in:

- White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity 2023,
- Bioregional Approach to South Africa's Protected Areas, 2001/2002, and
- National environmental management principles as set out in section 2 of the NEMA
- Norms & Standards for the Inclusion of Private Nature Reserves in the Register of Protected Areas in South Africa (2016).

1.3.3 Institutional Framework

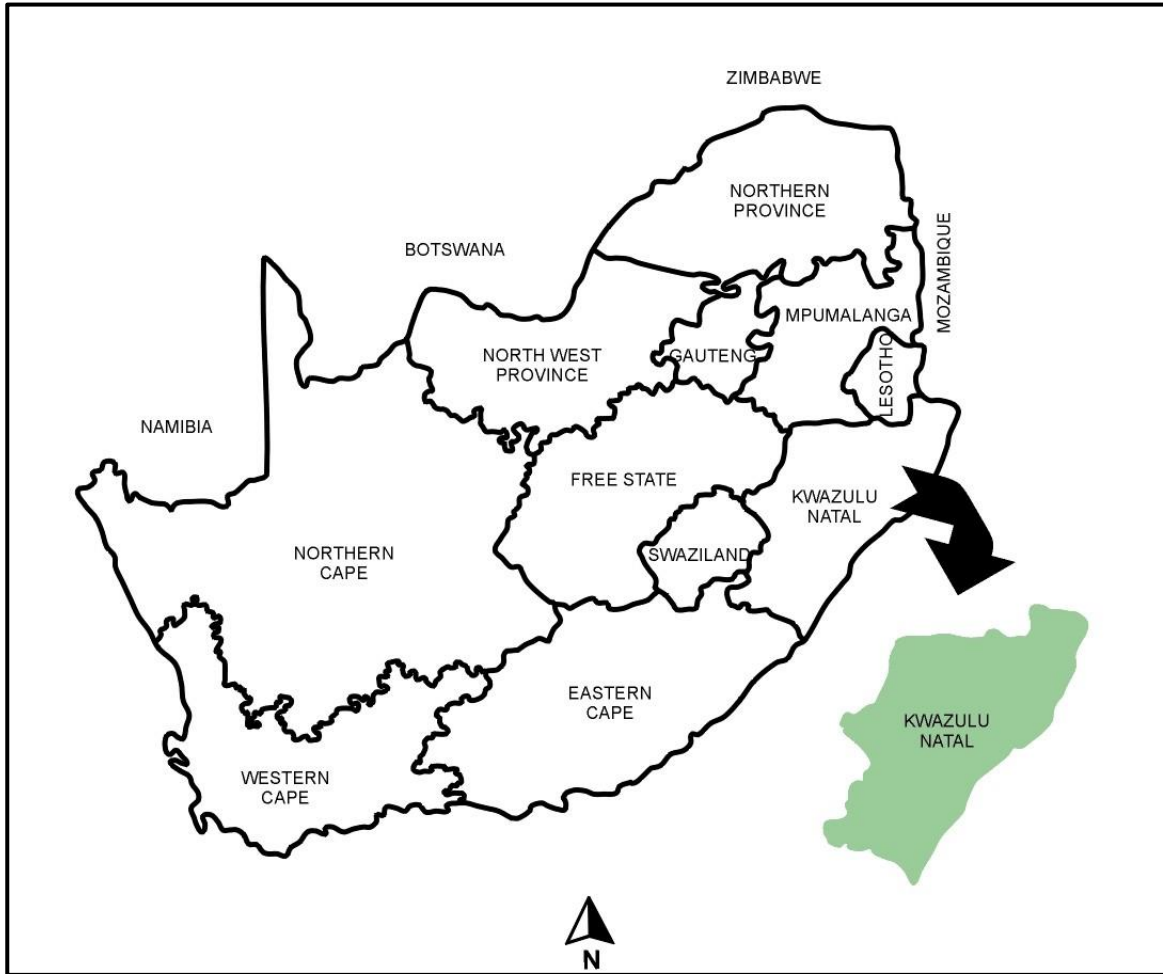
The PGR will be managed by the PGREA EXCO as the appointed Management Authority for the protected area.

1.4 BACKGROUND TO PONGOLA GAME RESERVE AND ITS CONTEXT

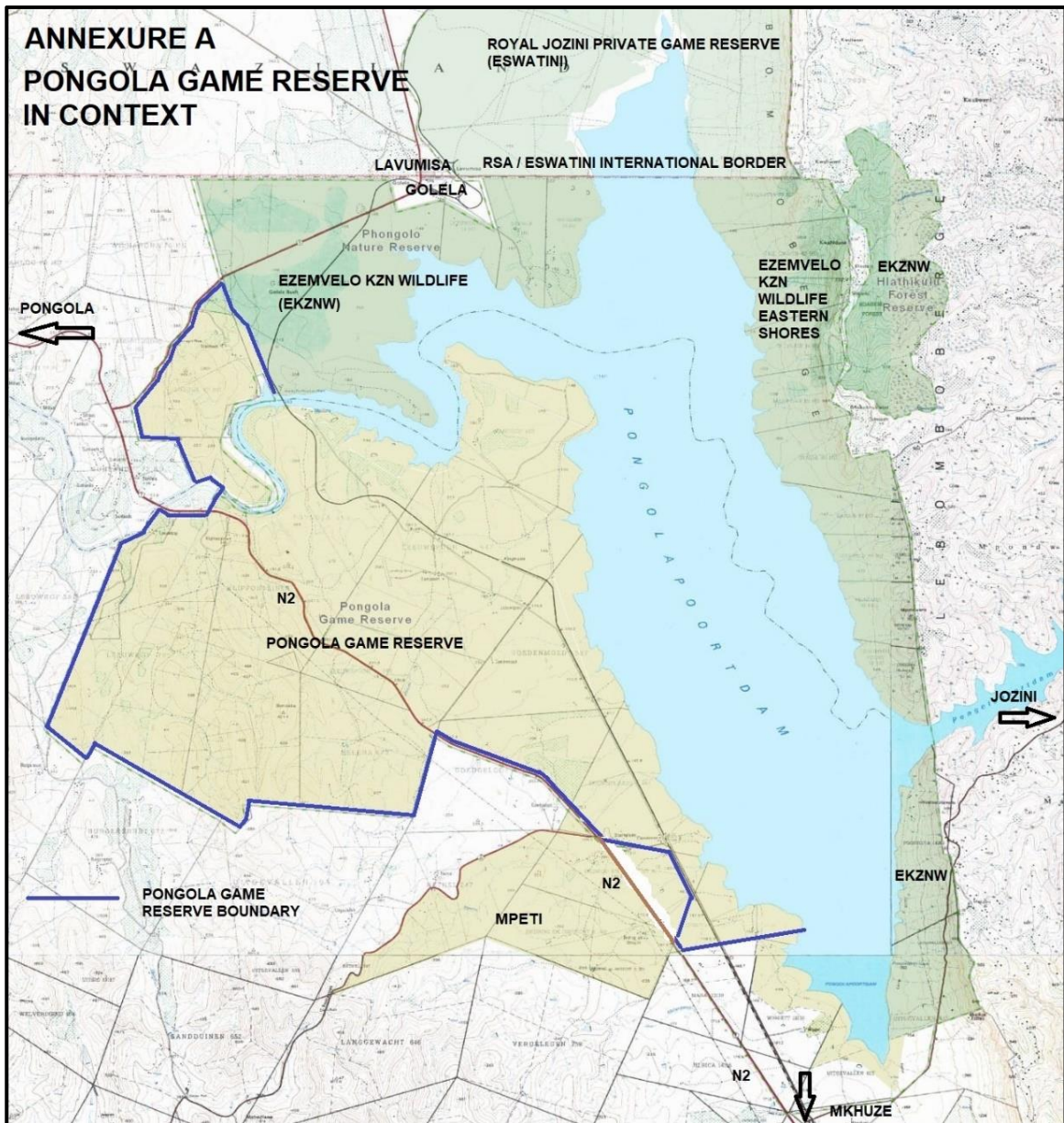
1.4.1 Background, Locality, and Extent of Pongola Game Reserve

The PGR is a consolidated area of **10749.0919** hectares in extent, situated in the Zululand District Municipality and the uPhongolo Local Municipality and borders the western shore of the Pongolapoort Dam between the towns of Pongola and Mkuze. Added to this the PGR has Caretaker Agreements in place with the DW&S for the purchase boundary (state land) between their properties and the Pongolapoort Dam water surface.

Map 1: Location of PGR in South African Context



Map 2: Location of the PGR in Local Context and its Boundaries



According to Mucina and Rutherford (2006), the dominant vegetation type on the eastern portion of the PGR is Zululand Lowveld (SANBI Vegetation Type Code: SVI 23) and according to the report on the Conservation Targets and Status of Vegetation Types in KZN (Jewitt, 2011) Zululand Lowveld is classified as Vulnerable. According to van Rooyen and van Rooyen (2008), Northern Zululand Sourveld occurs mainly in the more mountainous western portions of the PGR (From a geological perspective PGR-E is significant, as it conserves an extent of the Letaba Formation basaltic landscape and its associated dolerite and breccia intrusions. According to van Rooyen and van Rooyen (2008), the geology consists of basalt on the eastern plains and north-south bands of sandstone, shale, and siltstone. The altitude varies from approximately 145m to the east and 600m a.s.l in the west.

The reserve is custodian to Black Rhino (Critically Endangered, IUCN) under the Black Rhino Range Expansion Project. In addition, PGR-E is home to specially protected species such as Leopard, Serval and African Rock Python. PGR-E also provides a haven, feeding and nesting habitat for large raptors, the most significant being the Martial Eagle, Tawny Eagle, Wahlberg's Eagle, Bateleur, African Fish-Eagle, African Hawk-Eagle, Lappet-faced Vulture, African White-back Vulture, Marabou Stork and Secretary Bird. Lappet-faced Vultures (Endangered, IUCN) and African White-backed Vultures (Critically Endangered, IUCN) nest on PGR.

1.4.2 Eco-Cultural Tourism

The current Pongola Game Reserve falls within the original boundaries of the very first game reserve to be proclaimed in Africa on the 13th of June 1894 by the former President of the Zuid-Afrikaanhe Republiek, Paul Kruger, which was named Pongola Game Reserve, the cornerstone of the history of the PGR. It was sadly later de-proclaimed, but the Landman family of the current game reserve decided to name it the Pongola Game Reserve, because of its historical significance. On 13th June 2004, the Landman family of the Pongola Game Reserve started their own *Isivivane* on top of the hill behind Mvubu River Lodge, next to the viewpoint overlooking the Game Reserve and the Dam, to give their commitment to, and commemorate the foresight and significance of the original Game Reserve in true Zulu tradition and custom. Guests are also taken to the *Isivivane* to add their stones to it. Next to the *Isivivane* is a plaque with the following inscribed on it:

"This Isivivane was started to commemorate the proclamation of the Pongola Game Reserve on 13 June 1894 and serves affirmation of our commitment to care for our common heritage"

In Zulu, the word "*Isivivane*" literally means "throw your stone upon the pile" and is used to mark a place of spiritual or historical significance. It is also a concept that is derived from the word "viva" which means "to come together as a group" and commit to a common purpose. The *Isivivane* is a pile of rocks and by tradition travellers passing by the *Isivivane* would pick up a stone, spit on it and place it on the heap of stones. By doing this they pay respect to the spirits and so ensure that they have a safe journey.

Also, on the plaque are the following words:

On Wilderness & Human Spirit

*Indeed, wilderness is the original cathedral
the original temple,
the original church of life
in which they have converted
and healed
and from which they have emerged
transformed in a positive manner*

Lourens van der Post
(from Ian Player, Zululand Wilderness
Shadow and Soul, 1997)

No formal cultural heritage surveys have been done on the PGR, but there are historical sites close to the PGR; such as Hlathikhulu Forest Reserve (managed by Ezemvelo KZN Wildlife) with a rich cultural heritage for the Zulu community, as well as the historical grave site of King Dingaan. Some of the landowners used to take their guests to visit these sites but it has since become unsafe to do so.

1.4.3 Boundary Deviations

The PGR has no boundary deviations.

1.4.4 Local Agreements, Leases, Servitudes, MoAs

The following Agreements pertaining to the PGR are in place:

- Caretaker Agreement between Karel Landman Trust & DWA (**Appendix 3**)
- Caretaker Agreement between Pongola Game Reserve East & DWA (**Appendix 4**)
(Note - Both the above remain in place until cancelled by DWA)
- Black Rhino Range Expansion Project Custodianship Agreement (**Appendix 5**)
- Transnet have a railway line that passes through the PGR for which they have a servitude (Note - We do not have sight of the servitude documents)

1.4.5 History of Conservation

The PGR is rich in natural resources, forming part of the first game reserve in Africa, established on 13th June 1894 by Paul Kruger, State President of the Zuid Afrikaanse Republiek, which was since de-proclaimed and re-proclaimed a number of times.

In 1990, farmers bordering the PGR, together with the former Natal Parks Board and Transvaal Nature Conservation, began talks on converting commercial farmland back to conservation, which over time led to the formation of the Pongola Game Reserve East Association (PGREA). The PGREA is a group of landowners with similar visions for the area who decided to drop fences between their properties to create a larger co-managed ecological unit, under a Constitution (**Appendix 1**) and Joint Management Plan (**Appendix 2**) and managed by an Executive Committee (PGREA EXCO). The Joint Management Plan is specifically aimed at the management of all joint issues (such as game management, vegetation management, fire management, boundary fences and security management) and not specifically the plans of each individual landowner on his/her respective properties.

This system has worked very well for a long period and the landowners then decided to further protect the Pongola Game Reserve, including additional land north of the Pongola River and west of the N2, to declare the Pongola Game Reserve as a Nature Reserve under the Protected Areas Act 57 of 2003, and appointing the PGREA EXCO as the Management Authority for the PGR.

The name Pongola Game Reserve comes directly from the name of the game reserve originally proclaimed in 1894 in recognition of its significance.

1.4.6 Proclamation Status

Map 2 shows the area to be proclaimed (Change this to proclaimed with the correct references once the proclamation is finalised).

Table 3: List of Properties, Sizes and Ownership that make up the PGR

FARM NAME	REG. SECTION	SIZE (HA)	TITLE DEED NUMBER
KAREL LANDMAN TRUST			
Portion 2 of HELENA No. 673	HU KZN	20.2477	T 21270/2001
Portion 11 of PONGOLA No. 653	HU KZN	20.2477	T 21270/2001
Portion 24 of PONGOLA No. 653	HU KZN	272.5431	T 35642/1996
Portion of LEEUKOP No. 859	HU KZN	1770.9285	T 5728/1995
Portion of DUBULA No. 91	HU KZN	926.6676	T 49623/1994
Portion of KLIPFONTEIN No. 17542	HU KZN	1546.2591	T 1609/2003
Portion of HELENA No. 17543	HU KZN	923.4075	T 1610/2003
Portion 2 of Leeuwspeer No. 759	HU KZN	169.6922	T 31415/2021
	Sub Total	5649.9934	
HLANGANPISI BELEGGINGS BK			
Portion 25 of PONGOLA No. 653	HU KZN	919.7608	T 700185/1985
	Sub Total	919.7608	
PONGOLAPOORT WILDPLAAS TRUST			
Portion 7 (of 3) of WANHOOP No. 629	HU KZN	252.7375	T 55145/02
	Sub Total	252.7375	
TENNIS RANCH PROPERTY (PTY) LTD			
Remainder of Goedgeloof No. 197	HU KZN	523.3747	T 7508/1992
Remainder of Portion 1 of Goedenmoed No. 587	HU KZN	593.0418	T 31641/2001
Portion 3 (of 2) of Goedenmoed No. 587	HU KZN	7.7540	T 28128/2010
Portion 4 (of 2) of Goedenmoed No. 587	HU KZN	5.9786	T 28129/2010
Portion 5 (of 2) of Goedenmoed No. 587	HU KZN	5.9039	T 28130/2010
	Sub Total	1136.0530	
LEEUWSPoor TRUST			
Remainder of Sub 2 of Leeuwspeer No. 647	HU KZN	442.3145	T 32218/1995
Sub 1 of Leeuwspeer No. 647	HU KZN	682.5747	T 32219/1995
Leeuwspeer 647 Portion 3 (17535)	HU KZN	252.6489	T 55148/02
Sub 7 (of 2) of Leeuwspeer No. 647	HU KZN	3.8115	T 32218/1995
Remainder of Sub 4 (of 3) Leeuwspeer No. 647	HU KZN	237.4009	T 32219/1995
Remainder of Leeuwspeer No. 759	HU KZN	437.3917	T 32219/1995
	Sub Total	2056.1422	

BUSH BUSINESS (PTY) LTD			
Remainder of Portion 3 of Wanhoop No. 629	HU KZN	254.7079	T 55147/02
	Sub Total	254.7079	
PANORAMA VAKANSIE OORDE (PTY) LTD			
Portion 2 of Spons A No. 826	HU KZN	76.4270	T 10417/67
	Sub Total	76.4270	
PONGOLAPOORT SAFARI CAMP (PTY) LTD			
Portion 5 of Doornplaats No. 461	HU KZN	319.4699	T 5352/2019
	Sub Total	319.4699	
TANDWENI FARM (PTY) LTD			
Remainder of Spons A No. 826	HU KZN	83.8002	T 006159/09
	Sub Total	83.8002	
	TOTAL HA	10749.0919	

1.4.7 Protected Area Expansion & Regional Aspects of Pongola Game Reserve

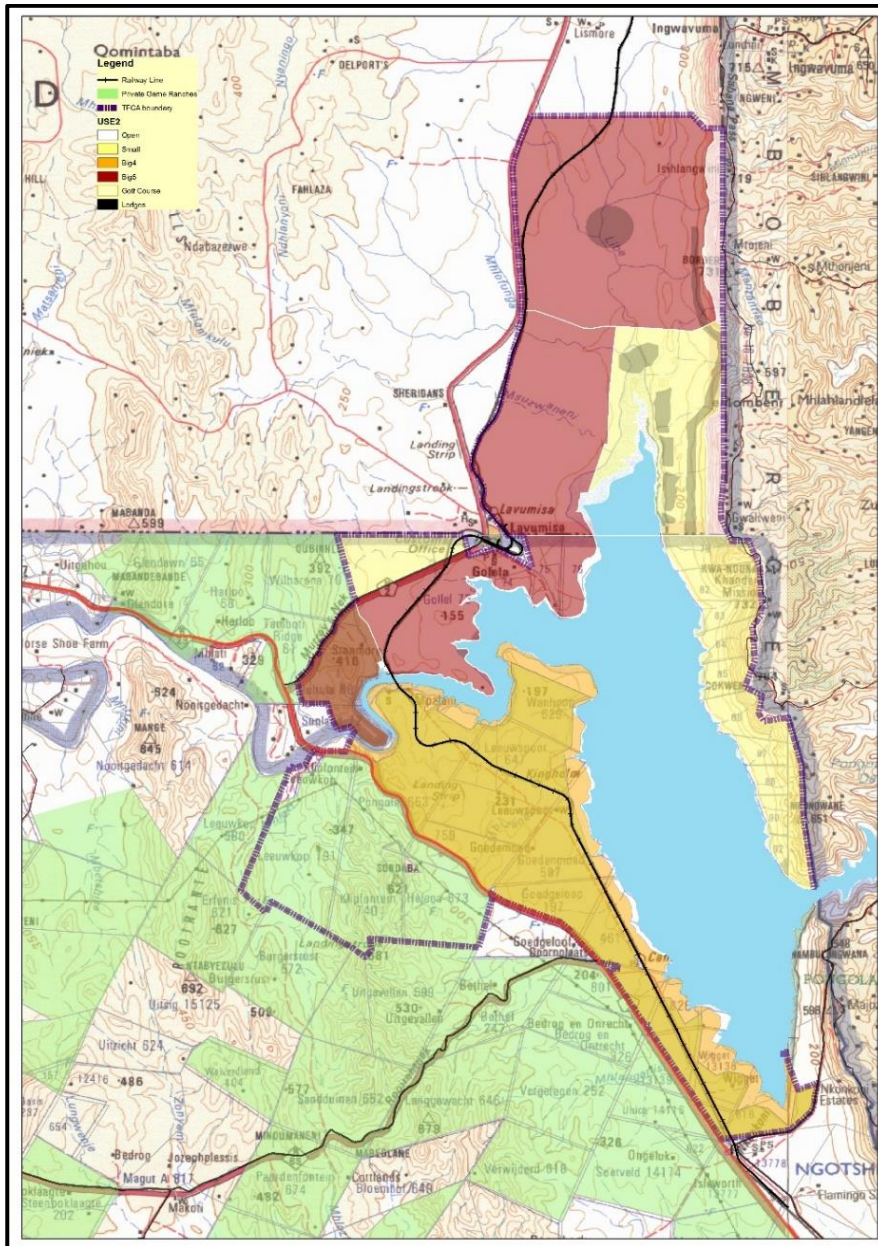
The PGR is a key component of the protected area system in KZN. With its proximity to Phongolo Nature Reserve (Ezemvelo KZN Wildlife), the Pongolapoort Dam and the Royal Jozini Private Game Reserve in eSwatini, the protected area has the potential to form an anchor for the development of further conservation initiatives in the area. The PGR, along with the above-named areas, forms a key component of the envisaged Nsubane-Pongola Transfrontier Area (TFCA) to which South Africa and

The Lubombo Transfrontier Conservation and Resource Area	
<p>The Lubombo Transfrontier Conservation and Resource Area is a tri-lateral regional development programme incorporated under the Lubombo Spatial Development Initiative. As a 2010 Legacy Project it has been identified as a key international project for regional development by the South African, Mozambican and Swaziland governments. Conservation of biodiversity across international borders is also a major component of the project. On 22 June 2000, the governments of Mozambique, South Africa and Swaziland signed five protocols on the establishment of the Lubombo Transfrontier Conservation and Resource Area. It includes five distinct Transfrontier Conservation Area (TFCA) projects:</p> <ul style="list-style-type: none"> • Lubombo Conservancy-Goba TFCA (Mozambique/Swaziland) • Usuthu-Tembe-Futi TFCA (Mozambique/ South Africa /Swaziland) • Ponta do Ouro-Kosi Bay TFCA (Mozambique/South Africa) • Nsubane-Pongola TFCA (South Africa/Swaziland) – Now eSwatini • Songimvelo-Malolotja TFCA (South Africa/Swaziland) <p>EKZNW is one of the lead implementing agencies of the South African government in the Lubombo Transfrontier Conservation Area. As such, the organisation has been delegated the authority to implement the project on behalf of DWEA. EKZNW is also the lead agency in the implementation of the Usuthu-Tembe-Futi and Nsubane-Pongola TFCA Protocols and plays a direct role in the Kosi Bay – Ponto do Ouro TFCA Protocol. The Lubombo Transfrontier Conservation and Resource Area is a catalyst for development in the region and for the conservation of biodiversity across international borders. As it is incorporated under the Lubombo SDI (Spatial Development Initiative), it has international relevance and places obligations on South Africa. Regional socio-economic development, peace and stability can be achieved in the Lubombo region through this project. Socioeconomic projects linked to tourism have the potential to enlarge the area.</p> <p>Legal Protocols:</p> <ul style="list-style-type: none"> • The General Lubombo Spatial Development Initiative Protocol (1999) • The General Lubombo Transfrontier Conservation and Resource Area Protocol (2000) • The Usuthu-Tembe-Futi Transfrontier Conservation and Resource Area Protocol (2000) • The Nsubane-Pongola Transfrontier Conservation and Resource Protocol (2000) – Now eSwatini • MOA between KZN Province and Maputo Province regarding collaboration on environmental management. <p><i>(The above information was extracted from the publication: EKZNW – Managing Our Biodiversity, 2009. Published by Ezemvelo KwaZulu-Natal Wildlife, Pietermaritzburg.)</i></p>	

eSwatini are signatories, which forms part of the Lubombo Transfrontier Conservation and Resource Area Initiative. The PGR landowners all bought into the TFCA concept when it was originally

presented to them many years ago, and still do, and all their investments, operations and planning have been towards this end.

Map 3: Original Area Planned to be part of the Nsubane-Pongola TFCA



1.5 ECOLOGICAL CONTEXT

1.5.1 Climate and Weather

The climate of the area is subtropical with warm to hot summers, warm, frost-free winters and generally high humidity. According to van Rooyen and van Rooyen (2008), the mean annual temperature varies from 18.8°C in the higher terrain to 23°C in the valleys. The mean monthly temperatures are 24.5°C and 15.8°C for January and July, respectively. Summer temperatures can regularly reach highs of 42-44°C.

From the PGR rainfall records for the last 28 years, the average annual rainfall is 568mm, with a high of 871mm in the year 2000 and a low of 332mm in the year 1996.

Figure 1: Annual Rainfall: Pongola Game Reserve 1996 to 2023

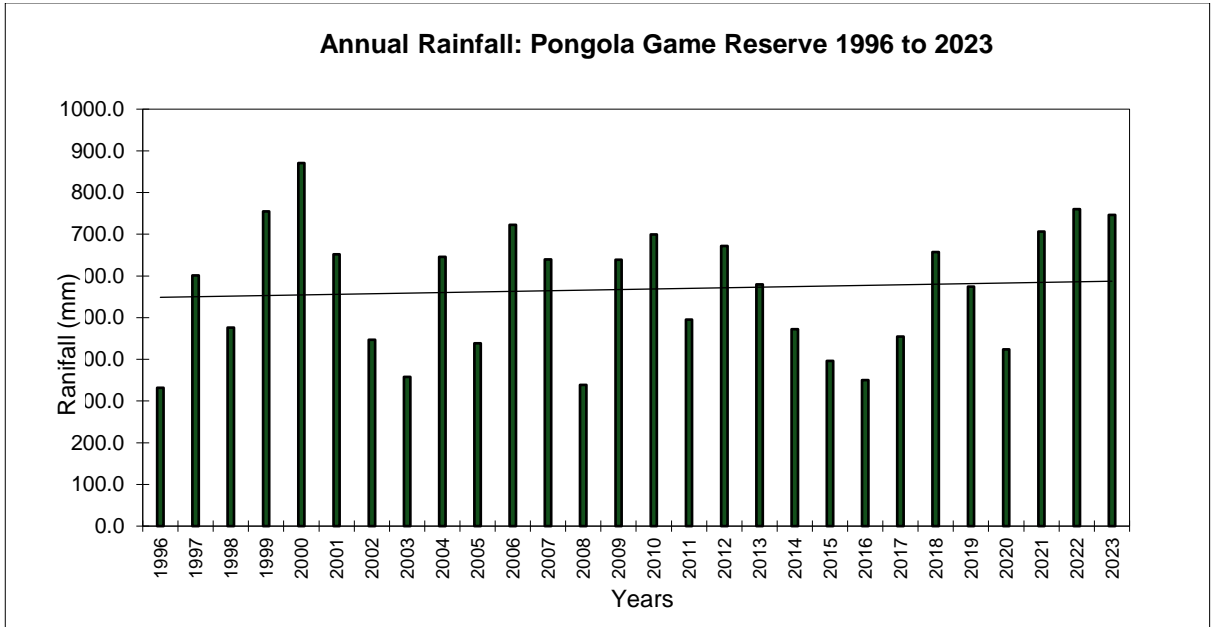
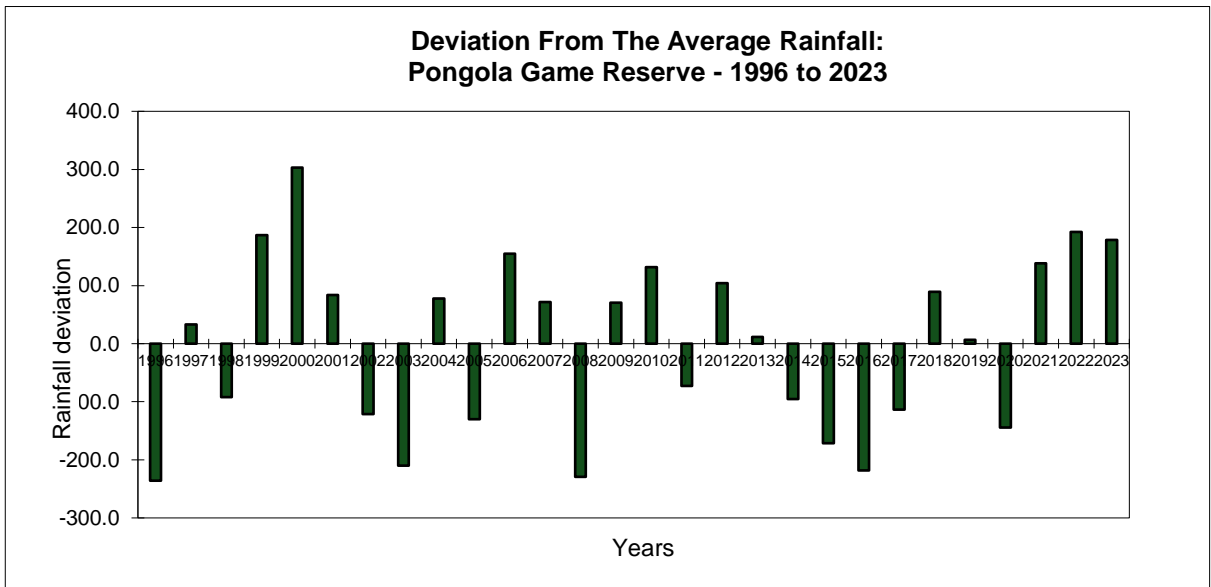


Figure 2: Deviation From the Average Rainfall: Pongola Game Reserve 1996 to 2023

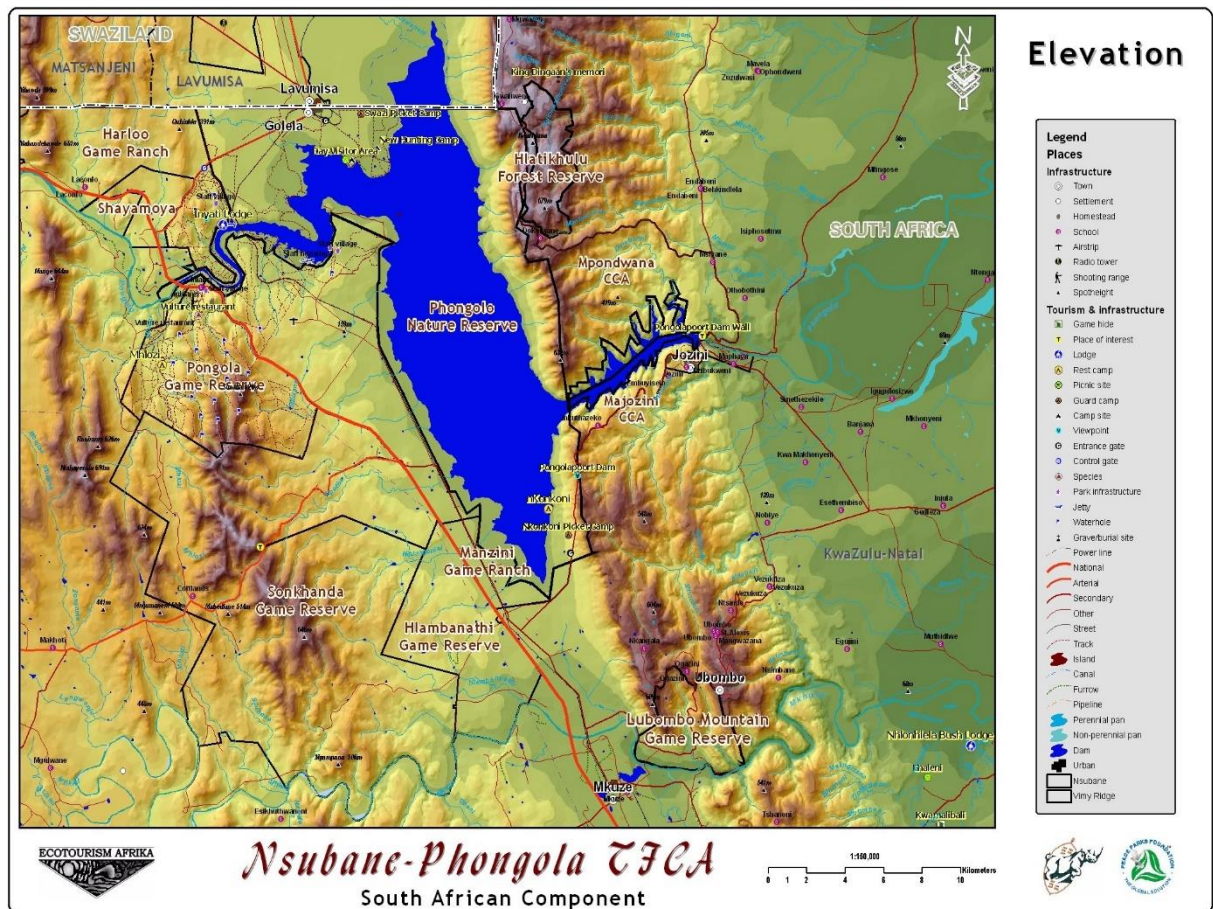


1.5.2 Topography

The PGR is situated mainly on the plains and hills west of the Lebombo Mountains, with an increase in altitude from 145m a.s.l. on the plains in the east to 600m a.s.l. on the summit of the hills in the

west. The variation in the physical environment and the associated climatic environment contributes to diverse habitats. (van Rooyen and van Rooyen, 2008).

Map 4: Elevation of the Area as per the Original Map Generated for the TFCA



1.5.3 Geology & Soils

The eastern plains consist of sediment of red, dark brown and black clay soils and duplex soils derived from amygdaloidal and non-amygdaloidal basalt of the Letaba Formation, Lebombo Group, Karoo Sequence. To the west, north-south bands of fine-grained sandstone (Clarens Formation); shale, siltstone and mudstone (Nyoka Formation); glittering sandstone (Ntabeni Formation); sandstone, siltstone and shale (Emakwezini Formation); dolerite intrusions, and alluvium along the Pongola River. (van Rooyen and van Rooyen, 2008).

Approximately one-quarter of the reserve consists of a steep (c.30°) west-facing scarp and talus slope with poorly developed Lithosoils. The remainder of the reserve which is either flat or undulating has red to dark brown and black clay and clay loam soils.

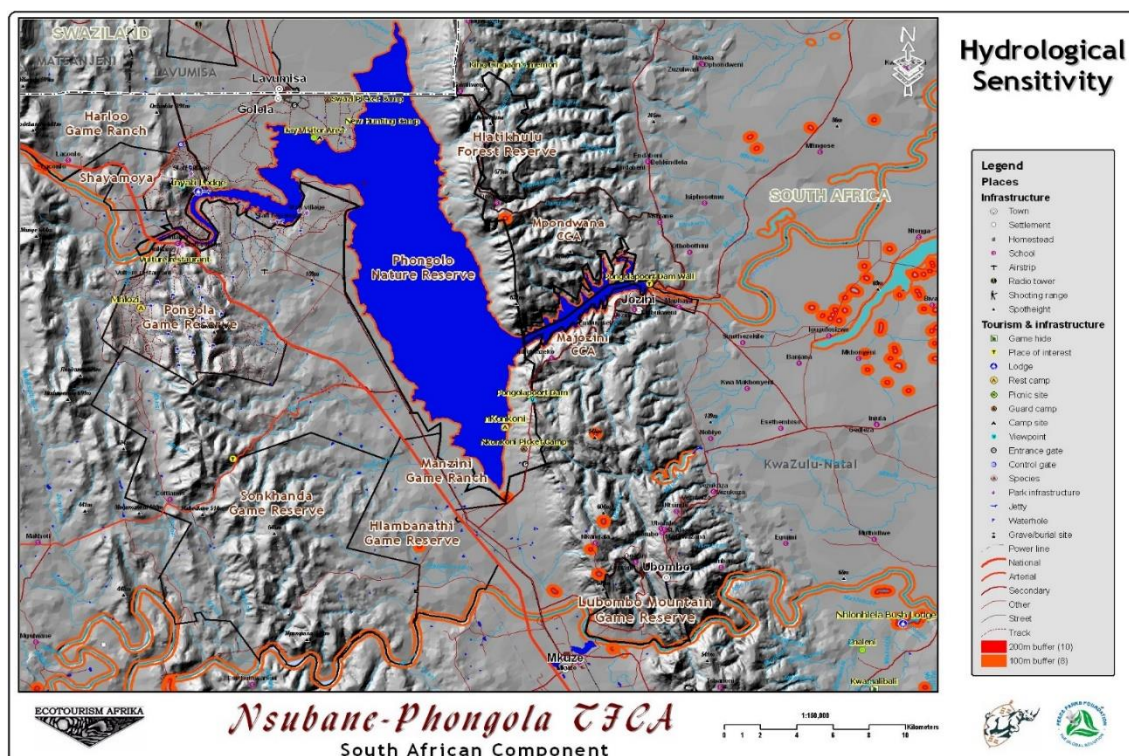
According to van Rooyen and van Rooyen (2008) the dominant soil-forming processes have been rock weathering, the formation of orthic topsoil horizons, and commonly, clay illuviation, giving rise

typically to lithocutanic horizons. The soil forms which epitomize these processes are Glenrosa and Mispah, characterized by a shallow soil layer on bedrock.

1.5.4 Hydrology

The area is dominated by the Pongolapoort Dam. The dam and its major source river, the Pongola River are the only significant perennial water sources in the area. However, due to the large amount of consumptive use in the Pongola catchment, the river can cease to flow in very dry seasons. Subsurface water is however available in the river throughout the year. In the west and north there are a few non-perennial streams. The Pongolapoort Dam was completed in 1973 but only filled for the first time in 1984 during the Cyclone Domoina floods. There are a number of boreholes on the PGR which are used to supply domestic water as well water for wildlife at various water points situated throughout the reserve so that the wildlife species can be evenly distributed throughout the protected area. This prevents the overutilization of vegetation in close proximity to water points, and these points can be opened or closed depending on the circumstances.

Map 5: Hydrology of the Area as per Original Map Generated for the TFCA



1.5.5 Vegetation

The PGR has 3 main land units:

- PGR East Section (South of the Pongola River, between the Pongolapoort Dam and the N2)
- Dubula Section (North of the Pongola River, between the Golela Road and the Phongolo Nature Reserve western boundary)

- The Leeukop Section (West of the N2 – there are a number of underpasses under the N2)

The PGR falls in the Savanna Biome (Mucina & Rutherford 2006). 2 main vegetation types occur on the PGR:

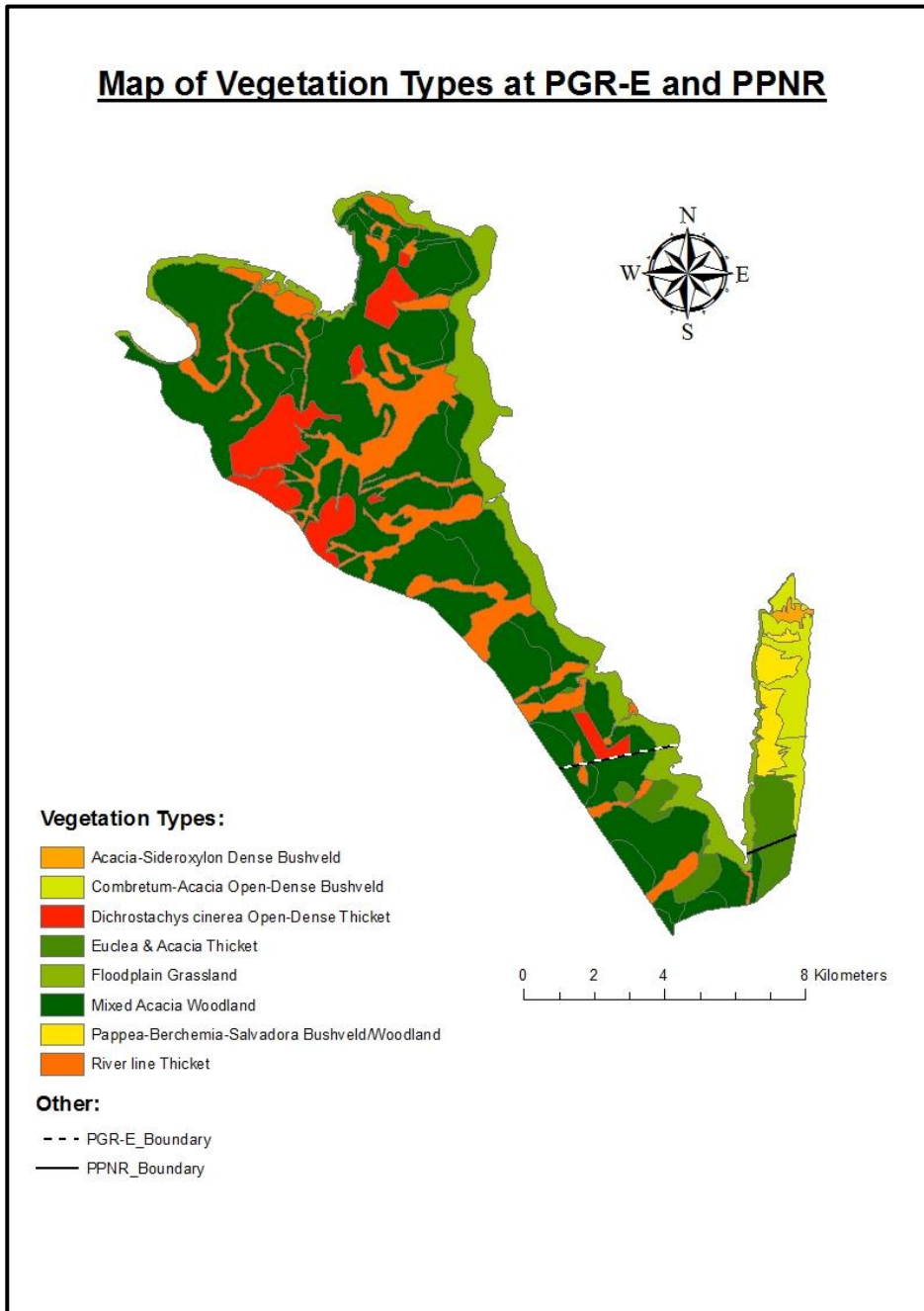
- Zululand Lowveld (SVI 23) - Occurs mostly on the eastern sections of the reserve and partially on the western section
- Northern Zululand Sourveld (SVI 22) – Occurs mostly in the higher elevations on the western sections

According to the report on the Conservation Targets and Status of Vegetation Types in KZN (Jewitt, October 2011) Zululand Lowveld is classified as Vulnerable.

Table 4: Habitat types, soils and dominant species of the Pongola Game Reserve East Section (Shannon *et al*, 2006):

Habitat Type	Soils	Dominant Species
Combretum Woodland	Rocky, well-drained soils of upper slopes	<i>Combretum apiculatum</i> , <i>Acacia nigrescens</i> , <i>Ozoroa engleri</i> , <i>Gymnosporia buxifolia</i> , <i>Grewia villosa</i> , <i>Grewia hexamita</i> , <i>Grewia caffra</i> , <i>Sclerocarya birrea</i> , <i>Ziziphus mucronata</i>
River Line Thickets	Clay-rich deep soils of drainage lines	<i>Ehretia rigida</i> , <i>Capparis tomentosa</i> , <i>Salvadora australis</i> , <i>Gymnosporia senegalensis</i> , <i>Acacia nilotica</i> , <i>Acacia tortilis</i> , <i>Schotia brachypetala</i> , <i>Sersia gueinzii</i> , <i>Acacia luederitzii</i> , <i>Acacia senegal</i> , <i>Gymnosporia buxifolia</i> , <i>Dichrostachys cinerea</i>
Flood Plain Grassland	Deep alluvial soils of lake shore	Mixed grasses and forbs
Mixed Acacia Woodland	Higher nutrient soils on lower slopes	<i>Acacia nilotica</i> , <i>Acacia tortilis</i> , <i>Acacia luederitzii</i> , <i>Dichrostachys cinerea</i> , <i>Ehretia rigida</i> , <i>Capparis tomentosa</i> , <i>Sersia gueinzii</i> , <i>Spirostachys africana</i>
Acacia & Marula Woodland	Shallow soils of mid to upper slopes	<i>Acacia nigrescens</i> , <i>Sclerocarya birrea</i> , <i>Ziziphus mucronata</i> , <i>Acacia tortilis</i> , <i>Grewia flava</i> , <i>Gymnosporia buxifolia</i> , <i>Grewia villosa</i> , <i>Dichrostachys cinerea</i> , <i>Ozoroa engleri</i> , <i>Canthium inerme</i>
Euclea Thickets	Alluvial soils on flat areas close to water	<i>Euclea racemosa</i> , <i>Euclea divinorum</i> , <i>Euclea natalensis</i> , <i>Pappea capensis</i> , <i>Gymnosporia nemorosa</i> , <i>Acacia nilotica</i> , <i>Capparis tomentosa</i> , <i>Salvadora australis</i> , <i>Acacia luederitzii</i> , <i>Ehretia rigida</i>
Old Land	Soils correspond to adjacent habitat type	Mixed Acacias & <i>Dichrostachys cinerea</i>

Map 6: Vegetation Types on PGR East



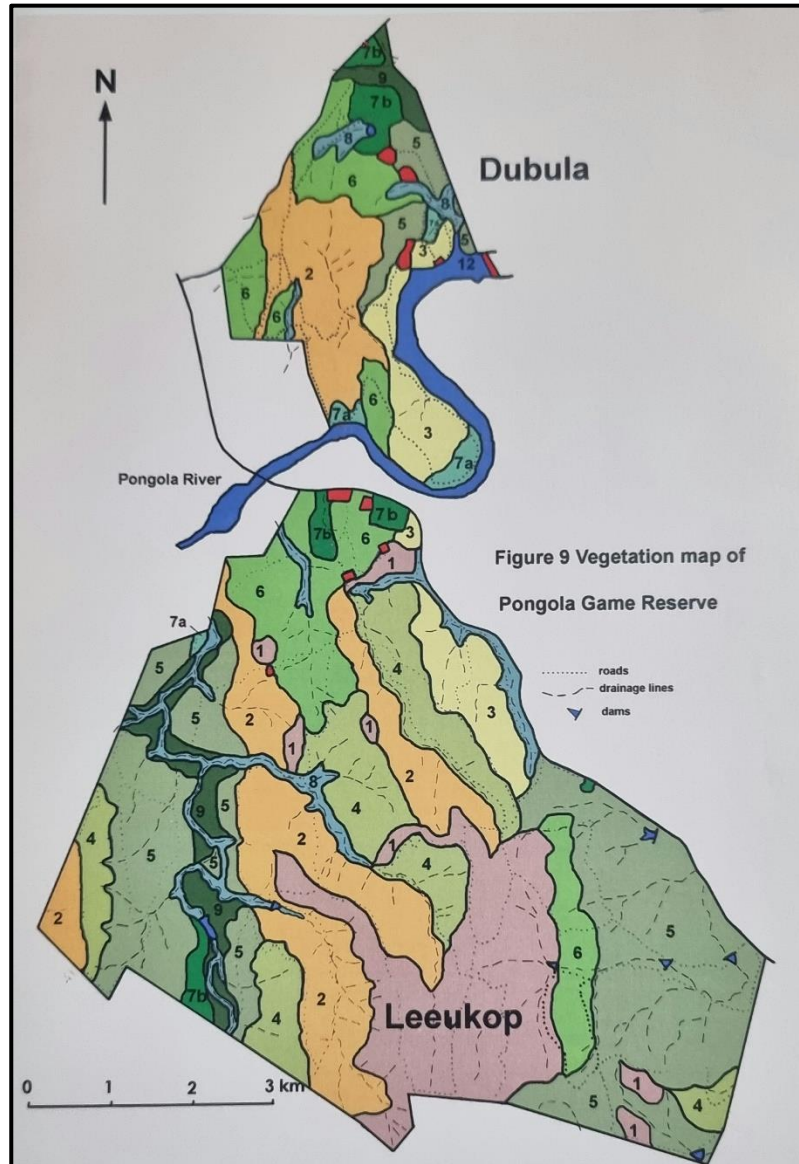
According to van Rooyen and van Rooyen (2008), the Dubula and Leeukop Sections' vegetation is classified as described in Table 5 and Map 6.

Table 5: Vegetation Classification: Dubula and Leeukop Sections

1	<i>Acacia caffra</i> - <i>Aloe marlothii</i> - <i>Cymbopogon caesius</i> open bushveld
2	<i>Acacia nigrescens</i> - <i>Euclea natalensis</i> bushveld and woodland
3	<i>Acacia nigrescens</i> - <i>Peltophorum africanum</i> - <i>Aloe marlothii</i> open woodland
4	<i>Acacia nigrescens</i> - <i>Sclerocarya birrea</i> - <i>Combretum apiculatum</i> bushveld
5	<i>Acacia nigrescens</i> - <i>Searsia gueinzii</i> - <i>Aloe marlothii</i> open to dense bushveld and woodland
6	<i>Acacia nigrescens</i> - <i>Grewia monticola</i> - <i>Diplachne eleusine</i> open to dense bushveld and woodland

7a	<i>Acacia tortilis</i> - <i>Gymnosporia senegalensis</i> - <i>Bothriochloa radicans</i> old field open thornveld
7b	<i>Acacia tortilis</i> - <i>Dichrostachys cinerea</i> - <i>Cenchrus ciliaris</i> old field open thornveld
8	<i>Olea europaea</i> - <i>Combretum hereroense</i> dense woodland
9	<i>Acacia grandicornuta</i> - <i>Euclea undulata</i> thickets
10	<i>Phragmites australis</i> riparian vegetation

Map 7: Vegetation Map: Dubula and Leeukop Sections



See **Appendix 17** for the PGR Plant Species List

1.5.6 Fire Regime

Extract of the PGR Fire Management Plan (**Appendix 6**) - Fire is regarded as an important physical disturbance that has a critical damaging role on the biodiversity, structure and function of African savannahs. In Lowland Zululand, fire seldom occurs as the result of lightning strikes; it is therefore speculated that the historical fire regime was largely man-induced and continues to be the case even

today. Proper management of fire therefore is critical for the maintenance of biodiversity at the local and regional levels, as well as for the enhancement of ecosystem productivity.

Fire is widely used in the mismanagement of savannah systems worldwide. Exactly how and when fire should and can be applied depends on the objectives of the area and the objective for burning. It is also important to take cognisance of any constraints that may apply. It is possible to manage a number of aspects of an individual fire. For example, by burning under conditions of low humidity and high winds the fire is likely to be hotter and have a higher flame height than when there is higher humidity and lower wind speed. Likewise, the actual fuel load is important in determining the nature of an individual fire. The devastating effects of a fire can be different, depending on the season of the burn, and this also needs to be taken into consideration.

The application of fire to the management of savannah vegetation cannot be prescriptive. It requires an understanding of the possible consequences of burning, or on the other hand, of not burning. There is no doubt that experience is an important component in the decision-making process, but understanding the biological effects of burning is a continuously growing field of learning. It is therefore important that decisions regarding burning each year take into account the effects of the previous season's burn and the desired goals of the current year's burn, as well as the latest research findings concerning burning. Avoid burning as far as possible. Burning of the veld can achieve a number of objectives, which include the following:

- To remove moribund grass material (dead carry over from previous year's growth) and thus improve the quality and quantity of resource for grazers
- The management of habitat structure (e.g. top-kill bush encroachment) to achieve particular conservation aims (e.g. maintaining black rhino browse)
- The creation of habitats of different post-fire ages which would favour different species
- Fire can sometimes be used to assist in controlling alien plants, e.g. if *Chromolaena odorata* is growing in grassland and there is enough of a grass fuel load to kill the *Chromolaena odorata*
- Reduce the possibility of runaway fires (e.g. reduce the fuel load around infrastructure) and create firebreaks
- Manipulate game movement where appropriate, i.e. to attract game from one part of the property to another. This strategy should be used with caution and only where the burnt area is big enough so that the extra grazing pressure does not cause undue pressure on the resource

Management options with regard to the use of fire are as follows:

- An annual burning programme should be decided on by the management team, following a field inspection at the end of the growing season, in about March/April
- An experimental approach can be taken in an attempt to learn from the effects of annual burns
- Wherever possible, natural boundaries should be used to demarcate burning areas. Using unnatural boundaries, such as roads, creates an unnatural-looking situation as one side of the road will look different from the other

The primary objectives of the fire management programme on PGR are as follows:

- Ensure an adequate quantity and quality of forage for both grazing and browsing large herbivores
- Ensure the maintenance of species and structural diversity, and spatial heterogeneity at the regional level *viz*;
 - A dynamic spatial and temporal balance between grassland and woodland habitats
 - Species richness at the regional level
 - Appropriate intra-seasonal distribution of burnt and unburnt patches/mosaics
- Manage fire in a manner that ensures that its negative impact on biologically important and fire-sensitive habitats and species is minimised
- Manage fire to ensure adequate basal and aerial cover on erosion-sensitive soils and slopes (addressing the threat of accelerated soil erosion in these areas)
- To reduce the risk of detrimental wild and arson fires from occurring

1.5.7 Invasive Species

1.5.7.1 Invasive Flora

No alien plants will be introduced to the PGR. The objective is to remove all existing alien plants in the PGR, including follow-up control procedures based on the latest alien plant control technology and knowledge. Methods will include physical removal, chemical, biological and fire control. Watercourses and valleys will mainly be physical and chemical, while for the hills fire will be used as part of the program. This is an existing program that has been ongoing for many years, focused mainly on *Chromolaena odorata*, *Lantana camara*, *Opuntia ficus-indica*, *Parthenium hysterophorus* and *Cereus jamacaru*.

Most of the reserve is in a maintenance phase regarding the control of alien plants, but *Parthenium hysterophorus* is a species of concern where it is prolific mainly on the floodplain areas of the Pongolapoort Dam and along road verges.

We were a test site for the biological control of *Parthenium hysterophorus*, but for various reasons this was terminated (Pre-and post-release studies in Pongola Game Reserve for Biological Control of

Parthenium hysterophorus [Asteraceae], (L. Strathie, Agricultural Research Council - Plant Protection Research Institute, Weeds Division, 2008). Attached is **Appendix 7**.

The above study recommended the following: For management purposes, it is advisable to take advantage of the drier years to further reduce the population by implementing chemical control measures. Additionally, caution should be taken in wetter years when parthenium populations can increase and spread rapidly, and control actions should be taken

Biological control will be used where technology and knowledge have proven it to be acceptable and even preferable.

1.5.7.2 Invasive Fauna

Alien animals that are present and are a threat / potential threat to the ecological processes / tourism experience in the Nature Reserve will be dealt with as standard practice. Only species that occurred naturally and historically in the area will be maintained on the reserve. All other species will be classified as alien or invasive.

1.5.8 Fauna

1.5.8.1 Mammalian Fauna

The primary objective of wildlife management on the PGR is to maintain, within the ecological carrying capacity of the reserve, viable indigenous wildlife populations that historically occurred in the area and are suited to the particular habitats offered by PGR. The primary objective of the PGR in terms of wildlife management, apart from ecotourism (non-consumptive utilisation), is the sustainable utilisation of these species (consumptive utilisation), both as a management tool and as a critical income stream. Consumptive utilisation will include:

- Culling
- Local biltong hunting
- Trophy hunting (local and foreign)
- Live capture and sales

Wildlife that are visibly suffer from injury or disease and are highly unlikely to survive may be destroyed, except for White Rhinoceros, Black Rhinoceros and Elephant (dependent on the situation at the time) which may only be destroyed with the written recommendation of a practising Veterinarian (Note - one of the PGR Landowners, Dr. Heinz Kohrs is a practicing Veterinarian).

The PGR is part of the Black Rhino Range Expansion Project (one of the original reserves to receive Black Rhino from this project), which is managed, including monitoring and reporting requirements, in terms of the Black Rhino Range Expansion Project Custodianship Agreement (**Appendix 5**).

Other iconic species occurring on the PGR include the African Elephant, White Rhino, Cape Buffalo (Registered as a Buffalo Reserve), Leopard and Spotted Hyena, which are all managed in terms of the reserve sustainable utilisation (consumptive and non-consumptive) objectives but guided by current legislation on the restrictions placed on the utilisation of certain species, such as Leopard.

A point of concern is the current legislation regarding the management of African Elephants and Leopard (both of which have a major impact on the overall wildlife management, including their impact on the habitat and other species maintained on the reserve). The Legislation and Norms and Standards for the management of these species will need to be adapted for more practical management to ensure long-term survival on private reserves. The PGR does have an Elephant Management Plan **(Currently under review)**.

The introduction of species to supplement populations on the PGR must first be approved by the PGREA EXCO (The Management Authority) before any introductions are made.

Animals that become dangerous or an excessive nuisance to persons or property, due to either habituation, delinquent or divergent behaviour, may be destroyed or captured and removed from the PGR.

A mammalian species list is attached as **Appendix 8**.

1.5.8.2 Avifauna

The PGR lies in ecotone between the Eastern Lowveld, Eastern Tropical littoral and the Eastern-Grassveld regions, with both the wetlands and Lebombo mountain range serving as significant stopover points for migratory species as well as breeding sites for significant number of vultures.

The PGR is one of the founders of the Zululand Important Birding and Biodiversity Area (IBA). The IBA Certificate is attached as **Appendix 9**. The Zululand IBA Master Checklist is attached as **Appendix 10**. The PGR, Pongolapoort Dam and the Lebombo Mountains environs are important from a bird conservation perspective, as various bird species rely on this area for critical breeding habitat, overwintering grounds and as a stop-over (migratory species).

PGR-E also provides a safe haven, feeding and nesting habitat for large raptors, the most significant being Martial Eagle, Tawny Eagle, Wahlberg's Eagle, Bateleur, African Fish-Eagle, African Hawk-Eagle, Lappet-faced Vulture, African White-back Vulture, Marabou Stork and Secretary Bird.

PGR forms part of what is known as the Northern Cluster of tree nesting birds, as per the Ezemvelo KZN Wildlife (EKZNW) monitoring plan for all three tree nesting vulture species in the province: namely the White-headed Vulture (WH), the African White-backed Vulture (AWB), and the Lappet-faced Vulture (LF).

Historically the Northern Cluster has been home to near 100 nesting pairs of these species. However, over the past 10 years this numbers has dropped to below 20 and has been directly linked to the targeted poisoning and harvesting taking place across the greater Magudu-Pongola-Mkuze area. The PGR recognise its role as an important nesting site for critically endangered AWB and endangered LF Vultures. The PGR ensures it follows the latest recommended guidelines with regards to the provision of safe food for vultures in the area, to limit exposure to lead contaminated meat, or threats from infrastructure in the immediate vicinity to its vulture restaurants. Furthermore, PGR actively engages with EKZNW and the Zululand Vulture Project to supply valuable monitoring information through EKZNW's annual aerial survey.

As Vultures are an important part of the ecosystem within the PGR, and Vulture restaurants can contribute to their survival, the following guidelines will be implemented (A summary of information obtained from an article entitled Vulture Restaurants, written by S. Piper, Birds of Prey Program, Endangered Wildlife Trust):

- Only fresh and poison-free meat and/or carcasses are put out for vultures and other scavengers.
- Ensure carcasses placed at Vulture restaurants have not been treated with poisons, or veterinary drugs, such as diclofenac and other non-steroidal anti-inflammatory drugs.
- Should be placed on open veldt where vultures can easily land and take off without interference.
- Best to be placed out of sight of roads or human traffic so that Vultures can feed without disturbance.
- Should be placed away from power lines to prevent collisions and electrocutions.
- Should be at least 50m x 50m in size.
- If possible the grass should be kept short as vultures feel unsafe in tall grass.
- Placement of a dead tree, or something similar, for them to perch on.
- If possible break up bones into smaller fragments to enable Vultures to consume these for calcium content. On the PGR, Spotted Hyena, Black-backed Jackal and other scavengers generally perform this function.

As part of the consumptive utilisation objective of the PGR, there are a number of slaughter areas, as well as two formally registered abattoirs and venison butchery (Dubula Butchery/Abattoir, Reg. No:

11/3/32/1-N5/05G and Leeukop Abattoir, Reg. No: Reg. No: 11/3/32/1-N5/106G), with two qualified game meat examiners. All unused venison by-products, such as skeletons, skulls, and condemned materials are put out at Vulture restaurants on a regular basis; nothing from a carcass is wasted. This has been done over many years on the PGR and has proven very successful.

The PGR also significantly contributes towards information regarding the illegal poisoning of vultures in the area. The guidelines to monitor any suspected Vulture poisoning incidences are (obtained from the Wildlife Act Intentional Vulture Poisoning poster, Northern Zululand Vulture Breeding Cluster):

- Keep an eye out for suspicious activity including possession of Vulture parts, carcasses with many dead insects, and compromised Vultures.
- If poisoning is suspected, do not touch anything, or disturb the scene and call 078 816 4608 immediately.

The bird species list for the PGR attached as **Appendix 11**.

1.5.8.3 Herpetofauna (Reptile & Amphibians)

Reptiles and amphibians form an essential 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. **Appendix 12** indicates the reptile and amphibian species list for the PGR.

As the PGR is situated on the western shores Pongolapoort Dam and a portion the Pongola River flows through the reserve into the Dam (for which we have Caretaker Agreements in place for the purchase boundary with DWA as previously stated, which is managed as part of the PGR but not included in the proclamation hectares as this is state land) there is a significant and important Nile Crocodile population. It must be noted that we have directly supported two MSc. studies conducted on this population:

- The Ecology of Nile Crocodile (*Crocodylus niloticus*) in Pongolapoort Dam, Northern KwaZulu-Natal, South Africa by Garreth Champion, 2010
- Aspects of Nile Crocodile (*Crocodylus niloticus*) Population Ecology and Behaviour in Pongolapoort Dam, KwaZulu-Natal, Mark Summers, 2015

A new Nile Crocodile monitoring program is due to start entitled “Pongolapoort Dam Nile Crocodile Monitoring Program” to be undertaken by the African Ecological Conservation Projects. Ezemvelo

KZN Wildlife have compiled an MOU and is waiting for final sign off in order to begin. The program will focus on the following aspects which will help to get a better understanding of the population and the management thereof:

- Crocodile population monitoring
- Crocodile nest monitoring.
- Crocodile capture for scute notching, measurements, transmitter application, ecotoxicological studies from fat and blood sampling, and genetic sampling.
- Satellite and GSM tracking of large adults

The PGR fully supports this new program.

1.5.8.4 Invertebrates

Invertebrate fauna constitutes the greatest component of species diversity in natural systems but are often poorly understood, while their role in ecosystems is essential and often overlooked. However, they are fundamentally important in terms of biodiversity and the provision of ecosystem services. Invertebrates form essential components of food webs; as predators, parasitoids, parasites and prey, they assist in nutrient cycling, enriching, aerating, maintaining the structure of, and moistening the soil (via improving the percolation of water into the soil) for plant growth, they are important decomposers of organic matter, they pollinate most plant species, and they disperse seeds.

For many of these invertebrate species, habitat conservation is the most critical management intervention required, with habitat loss being the biggest threat to their survival. Most of the invertebrates in the PGR are likely undescribed. **Appendix 13** indicates some invertebrate species recorded but many more species may occur, as there is a limited knowledge of the invertebrate fauna of the area.


1.5.8.5 Fish

The PGR fish species checklist notes that 13 species have been recorded in the Pongolapoort Dam (**Appendix 14**), the most notable being *Hydrocynus vittatus* (Tiger Fish), *Tilapia rendalli* (Red-breasted Tilapia), *Oreochromis mossambicus* (Mozambique Tilapia) and *Clarias gariepinus* (Sharptooth Catfish). These species are a very important attraction for recreational fishing.

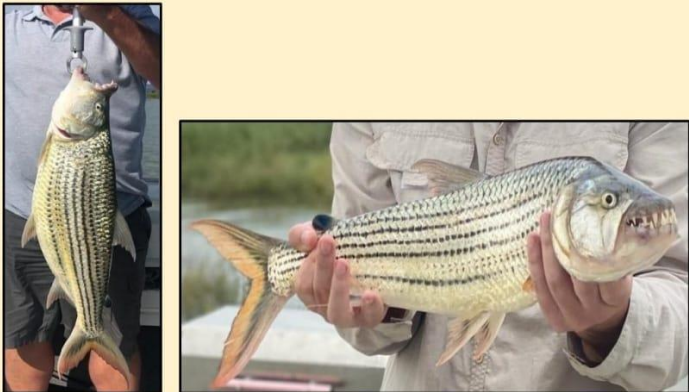
The Pongolapoort Dam is the southern-most limit of where Tiger Fish occur naturally and is listed on the Threatened or Protected Species Lists (ToPS). The PGR has a strict policy of catch and release of Tiger Fish for all our recreational anglers to protect this resource, as well as educating our guests on the safe handling and taking photos of the fish once caught (**See Figure 3**).

FIGURE 3: Correct and Wrong Way to Handle and Take Photographs of Tiger Fish

CORRECT WAY TO TAKE A PHOTO: ✓



WRONG WAY TO TAKE A PHOTO: ✗



- DON'T HANG THE FISH BY THE JAW
- DON'T PUT YOUR FINGERS IN THE GILLS OF THE FISH

(THE ABOVE CAUSES DAMAGE TO THE FISH)

IMPORTANT

- HANDLE THE FISH AS LITTLE AS POSSIBLE
- RELEASE BACK INTO THE WATER AS QUICKLY AS POSSIBLE

The PGR also directly supports a Tiger Fish Tagging Program on the Pongolapoort Dam being conducted by Mavungana Flyfishing in association with the University of Mpumalanga. The aim of the program is to gather data to get better understanding of numbers, condition, growth rates and movement. This is dependent on anglers recapturing tagged fish and submitting certain information back to the program to www.riversoflife.co.za where the information is recorded and collated.

The target is to tag 1500 Tiger Fish of which to date 100 have been tagged and 7 recaptures have been recorded. See Figure 4 showing a poster giving information on the program, which is distributed to all our guests.

FIGURE 4: Fish Tagging Program Poster

Tigerfish tagging at Jozini Dam

The Rivers of Life team from the University of Mpumalanga have teamed up with Mavungana Flyfishing on a project to find out more about the Tigerfish in Jozini Dam (Pongola).

We are tagging 1500 Tigerfish in Jozini over the 2022/2023 seasons with the help of anglers fishing with the Mavungana Flyfishing guides.

When captured, we take several measurements, record where the fish was caught, and insert the tags before releasing the fish as soon as possible.

We need **YOU** to recapture these tagged fish, and let us know at www.riversoflife.co.za where you caught it, as well as its new weight and measurements and a few other bits of info (see overleaf for information we need).

With this information we can calculate the numbers, condition, growth rates, and movement. With your help, we can use data to ensure it remains a sustainable fishery for the future, and make sure there are still monster Tigers to smash your lures for years to come!

DO NOT REMOVE THE TAG

Log on to www.riversoflife.co.za and submit your report of a tagged fish to stand a chance to win fishing gear worth over R5000

Information we need from you

- Tag number
- Date & Time
- Location
- Weight
- Length
- Photographs!

Optional extras

- Water temperature
- Weather
- Water depth
- Substrate (rocks/open)
- Cover (lillies/weed/trees)
- Lure/bait type

What we do:

1. Measure and Weigh
2. Implant PIT Tag
3. Insert Dart Tag
4. RELEASE

For more information, contact:
 Email: gordon.obrien@ump.ac.za
 Tel: 084 580 4161

Book your flyfishing trip to help contribute to the project, contact:
 Mavungana Flyfishing
 Email: info@flyfishing.co.za
 Tel: 011 268 5850

Visit our websites at:
www.riversoflife.co.za
www.flyfishing.co.za

@Rivers of Life Research - UKZN & UMP
 @MavunganaFlyfishing

MAVUNGANA FLYFISHING
 UNIVERSITY OF MPUMALANGA
 Rivers of Life

1.6 CULTURAL CONTEXT

No formal cultural heritage surveys have been conducted in the Phongolo Nature Reserve. There are quite a few identified Early Stone Age (c. 1, 6 million years ago) and Middle Stone Age (c. 200,000 years ago) sites bordering the Pongolapoort Dam. However, none of these sites have been intensively researched or described. The only site in the vicinity of the PNR that has been researched in much detail is Border Cave, where representations from the Later Iron Age and all divisions of the Stone Age have been found. These include evidence of the manufacture of cultural artefacts from stone and from other materials. Border Cave is significant as it gives evidence for the presence of anatomically modern people (Border Cave skull) in possible association with modern behavioural features such as graves and advanced stone tool technology. It therefore compliments the evidence of other sites in SA, such as Segubudu shelter, Blombos Cave, and Klasies River Mouth, for evidence early modern behaviour between 120 000 and 80 000 years ago.

The historical grave site of King Dingane of the Zulu is located in the Hlathikhulu Nature Reserve on the eastern banks of the Pongolapoort Dam. A small commemorative plaque, which was unveiled by Dr Buthelezi of the Inkhatha Freedom Party, has been placed close to the actual site. The grave site

of the Nyawo Chief, Sambane, and his successors are also in close proximity to the Hlathikhulu Forest. Other historical grave sites are in close proximity to the PNR in the Ghost Mountain and the Tshaneni Mountain where Soshangane and other Gaza Kings were buried. Furthermore, the PNR is the oldest proclaimed reserve in Africa and plays a significant role in the larger heritage and history of southern African nature conservation.

Compiled by:

Dr R.J. Kloppers

References:

Wright, J. & C. Hamilton 1989. *'Tradition and transformations. The Phongolo-Mzimkhulu region in the late eighteenth and early nineteenth centuries.'* In A. Duminy and B Guest (eds.) Natal and Zululand from Earliest Times to 1910. A New History.

Pietermaritzburg: University of Natal, 49-82.

Van Wyk, J.J. 1983. *'Ingwavuma – 'n Etno-historiese oorsig.'* Journal of Racial Affairs, 34 (2), 54-64.

Pringle, J. 1982. *The Conservationists and the Killers.* Cape Town; Books of Africa

The current Pongola Game Reserve falls within the original boundaries of the very first game reserve to be proclaimed in Africa on the 13th of June 1894 by the former President of the Zuid-Afrikaan Republiek, Paul Kruger, which was named Pongola Game Reserve, the cornerstone of the history of the PGR. It was sadly later de-proclaimed.

1.7 SOCIO-ECONOMIC CONTEXT

The PGR lies within the Zululand District and uPhongolo Local Municipalities. It also borders on the Phongolo Nature Reserve on the northern side, managed by Ezemvelo KZN Wildlife. On its western and southern sides, the area is bordered by commercial agriculture and the Gumbi community. On its eastern side the PGR borders the Pongolapoort Dam. Local people are mainly *isiZulu* speakers, and the predominant ethnic affiliation is with the Zulu.

Apart from the owners of the commercial agriculture properties, the majority of the reserve's neighbours are from previously disadvantaged communities. Subsistence agriculture is practiced, but most people rely on state welfare grants for survival, as the rate of employment and availability of jobs is extremely low. 95% of the employees of the PGR are from the neighbouring local communities, and much of the PGR funds are spent in the local economy, making it a significant contributor to employment, businesses, investment and skills development in the local economy.

The socio-economic context of local people is well documented by the respective local and district municipalities. The PGR lies close to a developmental node with the Golela / Lavumisa border post, which is to be transformed to a 24 hour border post. The road from the border leads to the N2 and then south to Richards Bay and Durban and north to Pretoria / Johannesburg. The PGR also lies on the Lebombo Tourism Route and is a major component of the envisaged Nsubane-Pongola Transfrontier Conservation Area.

1.8 STAFF, FUNDING AND INFRASTRUCTURE

1.8.1 Human Resources

The objective of the PGR Management Plan is to guide the PGR Management Authority (PGREA EXCO) to achieve the key objectives of the game reserve.

Recognising the important role that we as conservation orientated reserve managers have as custodians of this asset, we commit ourselves to the sound sustainable management of our natural resources and the creation of enjoyable and enlightening experiences for our guests.

As the PGR is made up of a number of landowners and the properties, the PGR as an entity does not maintain compliment of its own permanent staff; instead, each landowner employs their own staff to manage and maintain their respective facilities and properties at their own cost. They may at some point in the future employ staff as required, such as a reserve manager, as an entity who will then be managed by the Management Authority (PGREA EXCO).

1.8.2 Financial Resources

As the PGR is made up of a number of landowners and their properties, each landowner is responsible for their own financial management regarding their operations and maintenance of their respective facilities and properties.

There are joint management aspects that are jointly financed and managed by the landowners, under the leadership of the Management Authority (PGREA EXCO). These being:

- Security
- Boundary fence maintenance
- Boundary road and common road maintenance
- Game management
- Veld management

These are financed through funds received from:

- Joint capture operations

- Joint hunting or live capture and sale of specific species which are defined as “Special Species” which are jointly owned by the landowners within the PGR, such as:
 - Cape Buffalo
 - African Elephant
 - Black Rhino
 - Giraffe
 - Waterbuck
 - Mountain Reedbuck
 - Predators
- Or funded by one of the landowners within the PGR, and those expenses are then held against a “Loan Account” where expenses are allocated to each landowner as per their landholding percentage within the PGR

All other game on the PGR, apart from “Special Species” listed above, defined as “Ordinary Game”, belongs to all the landowners as per their landholding percentage within the PGR, for which each landowner is allocated and annual quota as per their landholding percentage. Each landowner derives an income from the consumptive utilisation of their quotas, either through dead removals or live capture and sales.

This system has worked very well over many years within the reserve.

1.8.3 Infrastructure

The objective is to ensure that all infrastructure development enhances the sense of place, is cost effective and appropriate. All infrastructural development will comply with formal Environmental Impact Assessment (EIA) regulations and other authorisations where applicable. Authorisations, licences and accreditation will be sought wherever applicable and relevant.

See Map 8: Infrastructure within the PGR (Insert Map)

(Wim to help develop this map for us – Landowners to liaise with Wim regarding their respective properties please)

Although each individual landowners is responsible for the maintenance of the roads on their respective properties, the PGR’s basic principles are that the road network is developed appropriately to attain the objectives of the reserve and according to local conditions. No roads will be developed in sensitive areas. All roads will be GPS logged, mapped and maintained according to set standards. Wherever possible roads will be contoured and provided with drainage. Off-road driving should be avoided wherever possible, except under circumstances where it is unavoidable.

Wherever possible, services such as telephone lines, electricity and water will be underground and other services provided in an aesthetically pleasing manner. All services will be GPS logged, mapped and maintained, where applicable.

Facilities such as accommodation (visitor and staff), hides, trails, picnic areas, waterholes and jetties will be developed according to approved plans with all relevant authorisations and in line with the reserve objectives.

Where possible a management road will be developed along the fence line to facilitate maintenance and security of the fence. Fences will be sprayed regularly with herbicide and cleared to prevent the build-up of vegetation on the fence and to ensure the electrics function effectively.

Only three official gates will be provided (manned and controlled), White Elephant Gate on the N2, Leeukop Gate on the N2 and the Dubula Gate on the Golela road and will be maintained to the same standard of all tourism infrastructure in the reserve.

1.9 MANAGEMENT EFFECTIVENESS

The PGR’s objective is to continually strive to improve the management effectiveness of the reserve and part of the management effectiveness review process involves the qualitative identification of pressures and threats based on the views of the landowners, managers and Management Authority (PGREA EXCO) of the reserve. Pressures are defined as issues that are currently impacting on the reserve, whilst threats are issues that have the potential to impact on the reserve in future.

In order to achieve this, a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis needs to be conducted annually to identify the pressures and the threats.

1.10 RISK ASSESSMENT

A SWOT analysis must be updated annually to understand the threats and opportunities relating to the PGR to establish issues that must be addressed. These include all matters that may impact the values, purpose and objectives of the PGR. Table 6 summarises key management issues, strengths, weaknesses, opportunities, and threats for Pongola Game Reserve.

Table 6: SWOT Analysis for Pongola Game Reserve

STRENGTHS
1. The PGR has been operating successfully for many years and is recognised as a credible reserve in the industry.
2. The PGR is unique in that it is situated on the shores of the Pongolapoort Dam offering both land and water-based activities and wildlife management, creating a “Kariba Like” atmosphere.
3. Maintains a vulnerable vegetation type, Zululand Lowveld (SVI 23).

4. Maintains a healthy and productive population of Black Rhino, as one of the original participants in the BRREP Program.
5. The PGR is rich in natural resources, forming part of the first game reserve in Africa, established on 13 th June 1894 by Paul Kruger, State President of the Zuid Afrikaanse Republiek, a critical marketing tool.
6. The PGR lies in ecotone between the Eastern Lowveld, Eastern Tropical littoral and the Eastern-Grassveld regions, with both the wetlands and Lebombo mountain range serving as significant stopover points for migratory species as well as breeding sites for significant number of vultures, African White Backed and Lappet Faced Vultures, as well as other large Raptors.
7. The PGR is one of the founders of the Zululand Important Birding and Biodiversity Area (IBA).
8. The PGR has diversity of landscapes, from mountains to lower lying areas, to riverine and floodplain areas.
9. The PGR is recognised for having and maintaining a robust and successful security and law enforcement system.
10. The PGR is widely recognised as a reserve that manages its consumptive and non-consumptive sustainable utilisation objective successfully, without conflict between the two.
11. The PGR forms a critical area used in the local and district municipality's tourism marketing strategies.
12. Most of the staff employed on the reserve come from the surrounding local communities, and so many understand the reason for and significance of the PGR.
13. PGR serves as a base model for other reserves, due to the wide variety of land uses and ownerships that need to work together to form one large conservation area (private properties, community land, different state entities [EKZNW, DWS, DFFE], transfrontier park across international borders [TFCA], as well as land and water use).
WEAKNESSES
1. Maintaining an Elephant population that is in excess of their carrying capacity, whose management is hampered by current legislation. Despite other properties being sought over a long period to move excess Elephant to, none have been sourced as all Elephant populations in southern Africa are currently in excess of carrying capacities.
2. Although vegetation monitoring is conducted, a more robust system covering the entire reserve needs to be developed and implemented.
3. Implementation of an effective Leopard monitoring program is required to guide their management on the PGR. Current legislation limiting or preventing the effective management of proven excessive leopard numbers is a big constraint.
4. A railway line (managed by Transnet) passes through the reserve which has resulted in the mortalities of game species, such as White and Black Rhino, Giraffe, Buffalo and various other common game. This is being managed by the PGR and Transnet but remains a weakness to game management.
OPPORTUNITIES
1. The PGR is uniquely situated to form the link in creating a larger conservation area, namely the envisaged Nsubane-Pongola Transfrontier Park.
2. Forming a working relationship, through formal agreements, with the Mabevu Trust (Ntshangase Community) who have successfully land claimed the Phongolo Nature Reserve (EKZNW).

3. Forming a working relationship with the relevant authorities to ensure the Pongolapoort Dam surface area and its surrounds are properly managed; ecologically, security and ecotourism activities.
4. Proving to the game and ecotourism industries that effective conservation management can be achieved through applying sound and sustainable business principles.
THREATS
1. Situated close to the RSA/eSwatini international border, which increases the threat potential of illegal activity origination from across the border.
2. The PGR western boundaries border on the N2, which increases the threat potential of illegal activity originating from that national road.
3. Illegal gill netting and other illegal activity currently taking place on the water surface of the Dam, mostly staged from the Eastern Shores of the Phongolo Nature Reserve, which increases the threat of potential illegal activity origination from the Dam itself.
4. Potential habitat destruction due to an over population of Elephant.
5. No currently defined formal authority is responsible for the management of the Pongolapoort Dam water surface, which creates a grey area and the potential of uncontrolled access and activities.
6. A railway line (managed by Transnet) passes through the reserve, which increases the threat of illegal activity origination from the railway line, including game mortalities as a result of animals being hit on the railway line.

2. STRATEGIC MANAGEMENT FRAMEWORK

To ensure that PGR is effectively managed, the following strategic framework has been developed. It aims to provide the strategic basis for the sustainable utilisation (consumptive and non-consumptive), protection, development and operation of the reserve.

The vision describes the overall long-term desired state for the sustainable utilisation (consumptive and non-consumptive), operation, protection and development of the protected area. The objectives and strategic outcomes that follow are intended to provide the basis for achieving the vision.

2.1 PURPOSE

The purpose of PGR is to:

- Provide for the sustainable use of natural and biological resources (consumptive and non-consumptive) based on sound management principles, business principles and long-term viability,
- Create or augment destinations for nature-based ecotourism,
- Preserve the ecological integrity of the area on which the long term sustainable utilisation of the natural resources is based,
- Create a larger area/unit for the movement of African Elephant and Black Rhino,

- Provide the catalyst for which fences can be dropped with neighbours, including Phongolo Nature Reserve (EKZNW), to realise the ultimate vision of the Nsubane-Pongola Transfrontier Park,
- Protect areas representative of ecosystems, habitats and species naturally occurring in the area,
- Manage the interrelationship between natural environmental biodiversity and economic development,
- Contribute to human, social, cultural, spiritual and economic development,
- Rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species, and
- Demonstrate that a financially sound and viable wildlife ranching business can be based on the principles underlying conservation and ecotourism.

2.2 VALUES

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 essential in planning and management, as they are the aspects of the place that must be protected.

Table 7: Values of the PGR

Resource Values	
Natural Values	<ol style="list-style-type: none"> 1. Maintains a vulnerable vegetation type, Zululand Lowveld (SVI 23) 2. Maintains a healthy and productive population of Black Rhino, as one of the original participants in the BRREP Program 3. The PGR lies in ecotone between the Eastern Lowveld, Eastern Tropical littoral and the Eastern-Grassveld regions, with both the wetlands and Lebombo mountain range serving as significant stopover points for migratory species as well as breeding sites for significant number of vultures; African White Backed and Lappet Faced Vultures 4. The PGR is one of the founders of the Zululand Important Birding and Biodiversity Area (IBA) 5. The PGR has diversity of landscapes, from mountains to lower lying areas, to riverine and floodplain areas 6. The PGR is widely recognised as a reserve that manages their consumptive and non-consumptive sustainable utilisation objective successfully, without unnecessary conflict between the two. 7. Sports fishing and especially Tiger fishing on the adjoining Pongolapoort Dam, gives a unique wildlife experience, a resource that few other conservation areas in South Africa have. 8. Large portions of state land are undeveloped and have huge potential for partnerships that can benefit local disadvantaged communities. 9. The natural beauty of the area with the Lebombo Mountains in the backdrop has a huge aesthetic value.

Heritage Values	1. The PGR is rich in natural resources, forming part of the first game reserve in Africa, established on 13 th June 1894 by Paul Kruger, State President of the Zuid Afrikaanse Republiek, a critical heritage marketing tool.
Beneficiation/ Service Values	
Socio-Economic Values	<ol style="list-style-type: none"> 1. Most of the staff employed on the reserve come from the surrounding local communities, and so many understand the reason for and significance of the PGR. 2. The PGR contributes significantly to the local economy through employment, skills development, purchasing products from local businesses and so improves the socio-economic status of the area. 3. Communities are supported with meat from hunting activities.
Ecosystem Services to people	<ol style="list-style-type: none"> 1. The PGR is unique in that it is situated on the shores of the Pongolapoort Dam offering both land and water based activities and wildlife management, creating a “Kariba Like” atmosphere. 2. The PGR is widely recognised as a reserve that manages their consumptive and non-consumptive sustainable utilisation objective successfully, which benefits those in need of food (consumptive use) and natural environment enjoyment and relaxation (non-consumptive use). 3. The PGR forms a critical component of the protection of the Pongolapoort Dam as a resource, as it is situated on its shoreline, which benefits all users.
Human Health and Wellbeing	World Health Organization’s definition of health as “a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity”. The PGR is the perfect location for guests to visit in order to enjoy and relax in the natural environment, which contributes to their health and wellbeing by positively impacting on their body, mind and spirit.

2.3 VISION

The Vision on the PGR is:

To create a consolidated conservation area which contributes significantly to sound resource management based on sustainable utilisation principles (consumptive and non-consumptive), by providing visitors with an interactive, participatory and enlightening experience, based on sound business and ecological principles for current and future generations.

2.4 OBJECTIVES

In order to achieve the Vision of the PGR, the following Objectives have been defined as:

- The sustainable utilisation (consumptive and non-consumptive) of the natural resources based on sound management principles and long-term viability.
- The conservation of the PGR’s biodiversity, abiotic resources, biophysical processes, landscape, historical and archaeological resources,
- The creation of a visitor experience that is enjoyable, unique and authentic,

- The provision of socio-economic benefits to the region and its people,
- The protection of the resources within the reserve through an effective security, law enforcement and information management system,
- Demonstrate that a financially sound and viable business can be based on the principles underlying conservation and ecotourism, and
- Participate as a key-stakeholder in the promotion of overall conservation objectives, such as:
 - Nsubane-Pongola Transfrontier Conservation Initiative
 - District and Local Municipality Initiatives
 - Private and Communal Initiatives

2.5 CONSERVATION DEVELOPMENT FRAMEWORK

The purpose of zonation is to control the intensity and type of use within PGR to ensure the overriding goals of the PGR are met. The general principles of zonation are:

- There is a general gradation in the zonation categories ranging from high to low protection
- An overlay zone provides additional protection and may be overlaid onto another zone to strengthen the protection, e.g. Key Feature Protection Zone
- A sub-zone is an area where tourism, management and service infrastructure can be developed
- The development of infrastructure should preferably be on the periphery of the zone towards a higher impact/less sensitive adjacent zone where possible
- Deviations or exceptions in any zones require approval from the Management Authority (PGREA EXCO)

All activities and/or developments must align with agreements, norms and standards, and the local protected area rules and policies.

2.5.1 Zonation Plan

The purpose of zonation is to identify types and levels of usage that are acceptable, based on the reserve's sustainable utilisation (consumptive and non-consumptive) objectives, to manage visitor experience and inter-user conflict. Zonation is used to identify areas in which infrastructure and/or activities may be located or take place.

The zonation system recognises and the following zones in the reserve:

- Low Use Zone

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 principles of low human impact will prevail.

- Moderate Use Zone

An area where natural processes and the landscape may be altered to support reserve operations. 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 activities can take place. This is where visitor facilities such as lodges, self-catering camps, land and water based activities, etc. are developed and operated. This zone also recognises pre-existing infrastructure.

Note: Activities permitted in the Low Use Zone may also be conducted in the Moderate use zone, but not *vice versa*.

- Zone of Influence

A Zone of Influence is the area outside the boundary of the reserve where activities of people or other influences may have a negative impact on the purpose, values or objectives and/or efficient and effective management of the reserve and consequently where protected area management seeks to actively engage with stakeholders in order to promote and retain compatible, and prevent or mitigate incompatible, activities and land use.

Table 8: Zonation Categories for PGR

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 principles of low human impact will prevail.
Objective	To permit hunting activities, which is conducted on foot and is considered as a low impact activity. To designate areas 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.
Activities and infrastructure	<ul style="list-style-type: none"> ▪ Medium intensity (20 visitors or less), guided walks using little or no formalised paths ▪ Development of low-scale infrastructure such as hides and viewpoints ▪ Development of operational management infrastructure such as 4x4 vehicle trails
Constraints and implementation	<ul style="list-style-type: none"> ▪ Activities are mostly low impact and low density ▪ No modern facilities such as restaurants and shops are permissible in this zone ▪ Where possible, facilities should be developed on the periphery of the zone towards the less sensitive adjacent zone

Moderate Use Zone	
Description	An area where natural processes and the landscape may be altered to support reserve operations. 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 activities can take place. This is where visitor facilities such as lodges, self-catering camps, land and water based activities, etc. are developed and operated. This zone also recognises pre-existing infrastructure.
Objective	To permit hunting and other game management activities, a critical objective of the reserve. To designate a tourism area that is primarily focused on visitor experience while still securing the values of the protected area and an area that serves the operational and support functions of the reserve.
Activities and infrastructure	<ul style="list-style-type: none"> ▪ Medium intensity (20 visitors or less), guided walks utilising minimal formalised pathways ▪ Development of low-scale infrastructure such as hides and viewpoints ▪ Development of operational management infrastructure such as 4x4 vehicle trails ▪ Development of lodges, self-catering camps, land and water based activities, etc. ▪ Development of operational support infrastructure to support the functions of the reserve.
Constraints and implementation	<ul style="list-style-type: none"> ▪ This zone should be developed in the less sensitive part of the Moderate Use Zone ▪ Developed in areas where it does not compromise the values of the protected area ▪ This zone caters for facilities such as staff accommodation, administrative offices, other operational required infrastructure, waste handling sites, etc.
Zone of Influence	
Description	A Zone of Influence is the area outside the boundary of the reserve where activities of people or other influences may have a negative impact on the purpose, values or objectives and/or efficient and effective management of the reserve and consequently where protected area management seeks to actively engage with stakeholders in order to promote and retain compatible, and prevent or mitigate incompatible, activities and land use.
Objective	<ul style="list-style-type: none"> ▪ Actively promoting and supporting compatible/complimentary land and water uses and activities ▪ Active engagement with relevant stakeholders ▪ Developing a positive working relationship with municipal planners to achieve sustainable development ▪ Providing mitigation options for existing incompatible land uses and activities and alternative development options for planned incompatible land uses and activities

- Foster community/neighbour and stakeholder support for the reserve
- Facilitating sustainable benefits to neighbouring communities and landowners

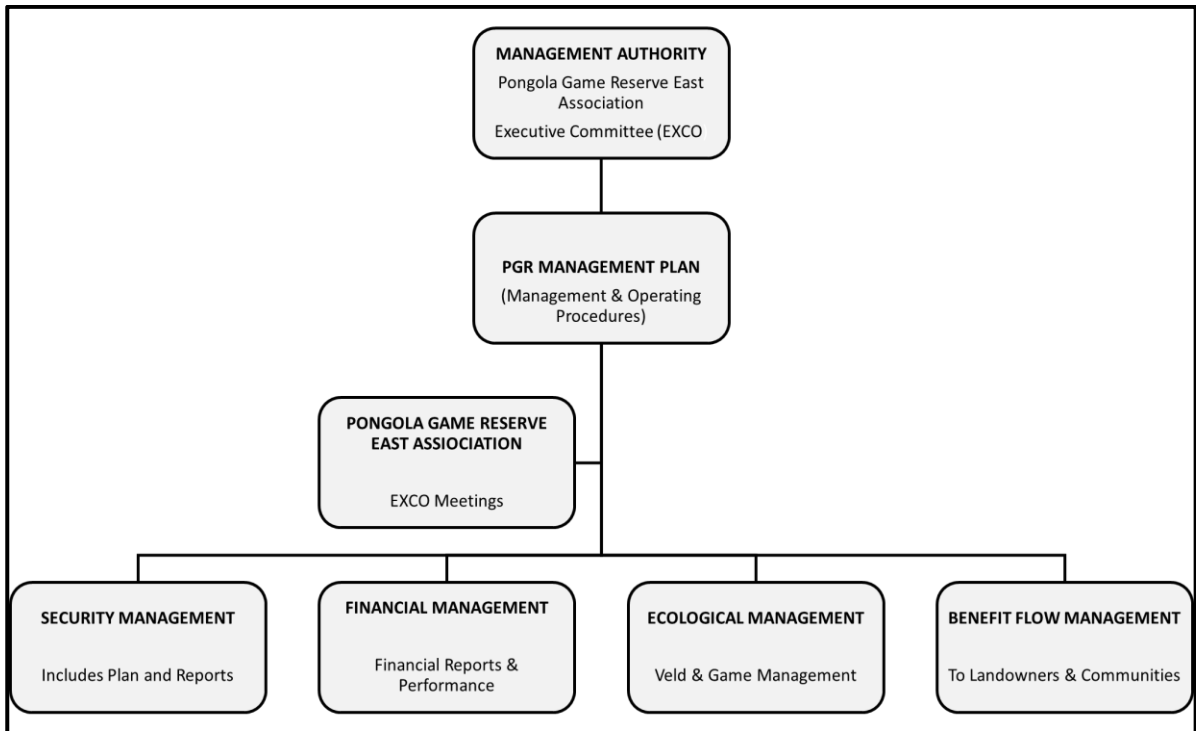
Map 9: Zonation of PGR (Insert Map)

(Wim to help develop this map for us – Landowners to liaise with Wim regarding their respective properties please)

2.6 ADMINISTRATIVE STRUCTURE

A recommended organisational structure for the PGR is set out in Figure 5. The figure represents the structure to enable the effective operation, management and protection of the reserve.

Figure 5: PGR Structure



2.7 FINANCIAL PLAN

As per 1.8.2 the PGR is made up of a number of landowners and the properties, each landowner responsible for their own financial management regarding their operations and maintenance of their respective facilities and properties.

There are joint management aspects that are jointly financed and managed by the landowners, under the leadership of the Management Authority (PGREA EXCO). These being:

- Security
- Boundary fence maintenance
- Boundary road and common road maintenance
- Game management
- Veld management

These are financed through funds received from:

- Joint capture operations
- Joint hunting or live capture and sale of specific species which are defined as “Special Species” which are jointly owned by the landowners within the PGR, such as:
 - Cape Buffalo
 - Elephant
 - Black Rhino
 - Giraffe
 - Waterbuck
 - Mountain Reedbuck
 - Predators
- Or funded by one of the landowners within the PGR, and those expenses are then held against a “Loan Account” where expenses are allocated to each landowner as per their landholding percentage within the PGR

All other game on the PGR, apart from “Special Species” listed above, defined as “Ordinary Game”, belongs to all the landowners as per their landholding percentage within the PGR, for which each landowner is allocated and annual quota as per their landholding percentage. Each landowner derives an income from the consumptive utilisation of their quotas, either through dead removals or live capture and sales.

This system has worked very well over many years within the reserve.

2.7.1 Funding Requirement to Effectively Manage the Pongola Game Reserve

Table 9: PGR Cost Estimate for Joint Operations

These costs are for joint responsibilities only, as each landowner is responsible for the individual costs on their own properties. These are estimates based on current costs, and anticipated costs, which will increase annually by the published inflation rate, or as and when circumstances dictate for the effective management of joint operations. **It must be noted that these are only estimated costs and can change as and when circumstances change, so are not set in stone.**

Description	Amount (Rand)
Operational (Joint Operations)	
Management Fee (Includes maintenance of boundary fences, electric fences, boundary roads, common use roads, etc.). R75,600 per month x 12 months	907,200.00
Security / Law Enforcement (includes staff on the ground, internal and external service providers)	408,000.00
Additional Contractor (Service Provider) Security Fees	200,000.00
Communications (Digital Radio System) – Maintenance and replacement of unserviceable equipment)	50,000.00
Tools & Equipment (such as for Black Rhino Monitoring) – Maintenance of camera traps, surveillance equipment, etc.	50,000.00
Maintenance & Running Costs (Black Rhino / Elephant Monitor Vehicle)	80,000.00
Infrastructure Maintenance (Entrance Gates)	50,000.00
General Public Liability Insurance (SATIB)	20,000.00
Black Rhino / Elephant Monitor R3500 per month x 12 months	42,000.00
Maintenance of Security Wi-Fi Cameras at Entrance Gates & Camera Signal Hubs	60,000.00
Aireal Game Count (Helicopter) – Once every 3 years	95,000.00
Leopard Monitoring Program (*)	100,000.00
Vegetation Monitoring Program (**)	100,000.00
Total Operational (Joint Operations)	2,162,200.00
Capital (Joint Operations)	
Movable Assets	
Buildings (Caravan, Wendy Houses, etc.)	100,000.00
Wi-Fi Security Cameras and System Equipment	80,000.00
Infrastructure	
Buildings (Such as Entrance Gates)	80,000.00
Roads (such as Boundary Roads and Joint Use Roads)	100,000.00
Fences (Boundary Fences)	150,000.00
Total Capital	510,000.00

(*) & (**) This cost can be significantly reduced by approaching Universities, and other academic institutions to provide MSc. and PhD. students to do the work

2.8 CONSERVATION TARGETS

In order to assist in developing a conservation management strategy more effectively linked to budget and resources, it is necessary to have specific conservation objectives (or 'targets' in conservation planning terms) in place. Monitoring of status relative to these targets will then allow for measurement of success of management interventions (and consequent budget and resource

adjustments where required), and to trigger management interventions when certain thresholds are reached. This removes the ‘monitoring to extinction’ problem that has arisen in many organisations.

Management has to take place and so it is necessary to make best use of available information, stating the assumptions and limitations, and to see conservation targets as a set of working hypotheses around which conservation planning and evaluation can take place. Another advantage around targets is that this process serves to highlight the critical knowledge deficits, thus guiding future research and monitoring priorities.

References: Margules, C. and Pressey, R. 2000. *Systematic conservation planning*. Nature 405:243-253.

Table 10: Conservation Targets of the PGR

Feature	Description	Area within the PGR (ha)
Zululand Lowveld (SVI 23) - Occurs mostly on the eastern sections of the reserve and partially on the western section	To be determined	To be determined (ACTION)
Black Rhino Habitat	Black Rhino Management Plan in Place and population is managed in terms of this Plan (Appendix 15)	8497.7234 (As per Black Rhino Management Plan)
Large Trees (<i>Acacia nigrescens</i>) for tree nesting Vultures: <ul style="list-style-type: none"> ▪ Lappet-Faced Vulture ▪ African White-Backed Vulture ▪ White Headed Vulture 	EKZNW conduct bi-annual aerial surveys to determine nest success and fledging success rates. Monitoring program on large <i>Acacia nigrescens</i> to be developed.	To be determined (ACTION)
African Elephant Habitat	Elephant Management Plan in Place (Currently under review) (Appendix 16). Habitat and population monitored by the Elephant Monitor	8497.7234 (As per Elephant Management Plan)

2.9 MANAGEMENT OF KEY SPECIES

The following management strategies are used to manage all large herbivore species in the PGR.

Table 11: Specific Management Strategies for the PGR

No Management
Apply to species in a system that can be allowed to achieve ecological carrying capacity without knowingly endangering other important biodiversity components in the protected area. This management option assumes that the important ecological processes responsible for establishing the equilibrium between the species and its resources are largely intact; such as Grey/Common Duiker and Steenbok.
Ecological Process Management

<p>Applies to species in a system where one or more ecological processes are dysfunctional and need to be simulated or re-established to create an equilibrium between the species and its resources. Management interventions include one or a combination of the following:</p> <ul style="list-style-type: none"> ▪ Reconfiguring landscape drivers of population dynamics e.g. artificial water supply, range expansion, corridor development etc. ▪ Simulating ecological process e.g. dispersal (via dispersal sinks), predation (via predator simulation removals), removal or introduction of predators (such as Leopard, which currently occur in densities higher than the ecological carrying capacity). ▪ Curtailment of population eruption e.g. managing the growth rate and age and sex structure of a population to stay within the economic carrying capacity (to optimise production to meet the sustainable consumptive utilisation objective of the reserve) – removals, limited duration contraception (such as African Elephant), etc.
<p>Biodiversity Management</p> <p>Management associated with a recognised direct threat to other biodiversity that the species to be managed poses e.g. impacts on resources or competition with threatened or declining species. This management option often entails a fixed upper limit for species and is usually applied to smaller protected areas that are fenced, or species such as African Elephant that are ecosystem engineers that could potentially have a large impact on the environment and could cause irreversible changes to the state of vegetation.</p>
<p>Conservation Management</p> <p>Management associated with live removal of a proportion of the population explicitly for establishing additional populations within the species natural range e.g. black rhino removal and range expansion programme. Populations to be maintained at economic carrying capacity to optimise production.</p>
<p>Sustainable Harvest Management (Sustainable Utilisation)</p> <p>Population management associated with a commitment to harvest species for economic purposes, such as hunting, culling and live sales. Sustainable utilisation is a key objective of the reserve.</p>
<p>Scientific Research</p> <p>The removal of plants/animals to collect material required to achieve a research objective must be identified, and research proposals submitted to, and approved by, the Management Authority (PGREA EXCO). The results of any research must benefit and support the objectives of the PGR. The above to be compliant with EKZNW permitting requirements.</p>

Table 12: Management strategies for large herbivores and other key species

Species	Target / Carrying Capacity	Rationale	Management Strategy	Key threats
Common Game other than Special Species	Economic Carrying Capacity	Optimise production & economic return	Maintain populations at economic carrying capacity to allow for maximum recruitment rate to allow for sustainable consumptive utilisation through, hunting, live sales and culling.	<ul style="list-style-type: none"> ▪ Poaching (on PGR this threat is efficiently and effectively managed).
Cape Buffalo	Economic Carrying Capacity	Optimise production &	Maintain populations at economic carrying capacity to allow for maximum recruitment	<ul style="list-style-type: none"> ▪ Restrictions that may be placed on utilization in the future due to the spread of diseases such

Species	Target / Carrying Capacity	Rationale	Management Strategy	Key threats
		economic return	rate to allow for sustainable consumptive utilisation through, hunting, live sales and culling.	and Foot-and-Mouth (FMD), Bovine TB and <i>Brucellosis</i>
Black Rhino	Ecological Carrying Capacity of 12	To meet the objectives of the BRREP Program	Allow the population to grow to 12, remove 3/4 animals (live or hunt as per legislative quotas allocated) and allow population to reach ecological carrying capacity again. Continue this cycle.	<ul style="list-style-type: none"> ▪ Poaching (on PGR this threat is efficiently and effectively managed). ▪ The disposal (removal) of Excess Black Rhino Bulls. Very difficult to find buyers for bulls only and criteria to allow hunting is impractical under current legislation.
African Elephant	20 with a maximum upper limit of 30	Allow for the presence of Elephant for consumptive & non-consumptive utilisation	Reduce the current population to 20, contracept females, and remove animals when population reaches between 20 and 30 for consumptive utilisation purposes (hunt) as per legislative prescripts.	<ul style="list-style-type: none"> ▪ The disposal (removal) of excess Elephant. Properties cannot be found to take Elephant as all populations are already overpopulated. ▪ Current restrictive legislation on the management of Elephant due to international pressure.
Giraffe	Economic Carrying Capacity	Optimise Production & Economic Return	Maintain populations at economic carrying capacity to allow for maximum recruitment rate to allow for sustainable consumptive utilisation through, hunting, live sales and culling.	<ul style="list-style-type: none"> ▪ Poaching (on PGR this threat is efficiently and effectively managed).
Waterbuck	Economic Carrying Capacity	Optimise Production & Economic Return	Maintain populations at economic carrying capacity to allow for maximum recruitment rate to allow for sustainable consumptive utilisation through, hunting, live sales and culling.	<ul style="list-style-type: none"> ▪ Poaching (on PGR this threat is efficiently and effectively managed).
Predators	Ecological Carrying Capacity	Allow for the presence of Predators for consumptive	Maintain populations as an important part of the ecological processes on the	<ul style="list-style-type: none"> ▪ Current restrictive legislation on the management of predators (Leopard in

Species	Target / Carrying Capacity	Rationale	Management Strategy	Key threats
		& non-consumptive utilisation	reserve but permit limited consumptive utilisation as per legislative quotas allocated.	<p>the case of the PGR) due to international pressure.</p> <ul style="list-style-type: none"> ▪ Unrestricted growth impacts negatively on the species on which they prey (Mountain Reedbuck as an example on the PGR) ▪ Lack of a formal and robust Leopard monitoring program
Vultures, namely: Lappet-Faced Vulture, African White-Backed Vulture, and White Headed Vulture	Unknown	Allow for the presence of and breeding of Vultures for Conservation purposes.	Maintain breeding populations as an important part of the ecological processes on the reserve, provincial and national biodiversity	<ul style="list-style-type: none"> ▪ Loss of large Trees (<i>Acacia nigrescens</i>) for nesting due to Elephant pressure ▪ Poisoning and Illegal use of Vulture parts

2.10 MONITORING AND REPORTING

Monitoring is critical in an adaptive management process, providing data for decision-making. The monitoring techniques and procedures applied must be based on:

- Adaptive management assumptions,
- Current ecological theory,
- Cost effectiveness and applicability,
- Appropriateness to management objectives, and
- Consistency over time, including climatic cycle fluctuations

The Management Authority (PGREA EXCO) is responsible to ensure the implementation of the PGR Management Plan, and that the objectives of the reserve are being achieved. The main monitoring requirements for the PGR to aid this are identified as follows:

- **Black Rhino** – The monitoring requirements in terms of the Black Rhino Range Expansion Project are described and implemented in terms of this Project and Black Rhino Management Plan, including CITIES Annual Report Form which is submitted to EKZNW

- **Elephant** – The monitoring requirements in terms of Elephant are described and implemented in terms of the Elephant Management Plan, including CITIES Annual Report Form which is submitted to EKZNW
- **Game Population Numbers** – An aerial helicopter game count is conducted every 3 years, with the average recruitment rate per species, less removals and mortalities, used between aerial counts to estimate numbers. The aerial helicopter census is used as a control to obtain more definitive numbers every 3 years.
- **Game Utilisation (Ordinary Game)** – Each landowner is allocated a quota on an annual basis for their use (hunt, cull or live capture). Each landowner submits a game utilisation return at the end of each month and this data is entered into a master data sheet maintained, monitored and recorded by the Management Authority (PGREA EXCO), from which the total annual removals are then calculated and recorded.
- **Game Utilisation (Special Game)** – The Management Authority (PGREA EXCO) determine annual Special Game (described under 2.7) removals. The utilisation of these species as also monitored and recorded on a spreadsheet maintained by Management Authority (PGREA EXCO).
- **Leopard** - Leopard, which currently occur in densities higher than the ecological carrying capacity, are a concern regarding their impact on other species in the PGR. Implementation of an effective Leopard monitoring program is required to guide their management on the PGR.
- **Vegetation** – A vegetation monitoring program was in place from 2012-2017. Initially, this included 32 sites on the PGR East Section (PGR-E) and 4 sites on the Pongolapoort Section (PPNR) of the Phongolo Nature Reserve (EKZNW). The type of habitat, vegetation species, structure and damage were recorded, a detailed report of specifically Elephant impact based on these surveys (Thornley R., Spencer M., Zitzer HR., Parr CL., 2020).

Since 2017, no further vegetation monitoring program has taken place for various reasons. Therefore, the PGR is to investigate and implement an effective vegetation monitoring program targeted at determining Elephant and other species vegetation impact over time. This Monitoring program will include:

- Measurements of Elephant and large herbivores impact on the Zululand Lowveld veld type, the dominant veld type on the reserve (SANBI Vegetation Type Code: SVI23 – classified as Vulnerable)
- Measurement of Elephant impact on the Lappet-faced Vulture and African and White-backed Vulture nesting success by their impact on large nesting trees (Mainly *Acacia nigrescens*)
- Comparison of current vegetation conditions with the existing 2012-2017 baseline vegetation data to determine vegetation change over time

- Sampling sites to be extended into the Dubula and Leeukop sections of the reserve

To able effective comparison of new data with existing baseline information, where possible, the same sites should be resampled.

- **Rainfall** – The PGR maintains and records rainfall data (shown under 1.5.1 – Data from 1996 - 2023) and will continue maintaining these records. The monitoring of this data assists with adaptive management decisions; such as during extended drought periods, etc.
- **Security** – All security incidences, actions, etc. are monitored and recorded and managed as per the PGR Security Management Plan (Note: This is a Confidential Document).
- **Finance** – As the PGR is made up of a number of landowners and the properties, each landowner responsible for their own financial management regarding their operations and maintenance of their respective facilities and properties.

There are joint management aspects that are jointly financed and managed by the landowners, under the leadership of the Management Authority (PGREA EXCO). These aspects are maintained, monitored and recorded by the Management Authority.

2.11 GUIDING PRINCIPLES

The guiding principles set out in this section will be employed in managing the PGR. The PGR strives to be a world-renowned leader in private wildlife ranching, ecotourism, biodiversity conservation, demonstrating that a financially sound and sustainable business can be based on the principles underlying conservation and ecotourism, and to achieve this apply best practices to achieve the highest quality and standards at all times. The principles are based on scientific knowledge, best practice, internal rules and relevant legislation and norms and standards.

2.11.1 General

Management decisions must have firm business and scientific basis or be supported by relevant experience and best practice. The PGR will strive to maintain and strengthen their capacity to learn from experience, to value and build staff expertise and draw on input from other experts in the industry to ensure effective management, sustainability and persistence of the reserve for the benefit of future generations. Management of PGR should be directed to:

- Maintain the protected area values and purpose for which it was assigned, the purpose and values refer to both historical and updated purpose and values as per the management plan
- Proving that a financially sound and sustainable business can be based on the principles underlying conservation (sustainable utilisation of natural resources) and ecotourism

- Maintain the diversity of landscapes, habitats, ecosystems and associated species in the reserve
- Operate under the guidance of the management plan and monitoring and evaluation program that supports adaptive management
- Provide nature- and culture-based tourism and recreational benefits consistent with the reserve's objectives
- Facilitate scientific research and ecological monitoring related to and consistent with the objectives of the reserve
- Use adaptive management strategies to improve the management effectiveness of the reserve
- Protect natural and cultural heritage by taking appropriate actions to avert and actively manage emerging threats and risks
- Implement the protected area management plan and direct management to achieve the long-term vision

2.11.2 Legal Context and Compliance

There is a large body of legislation relevant to the management of protected areas in South Africa. However, the primary legislation guiding the management of protected areas is the NEMPAA. NEMPAA establishes the legal basis for the creation and administration of protected areas in South Africa. In fulfilling this role, the following will apply regarding the PGR:

- The PGR must familiarise themselves with all relevant legislation, regulations and any subsequent amendments and legal agreements, and apply them to their management actions
- A security strategy must be developed and implemented to ensure efficient law enforcement and protection of natural and cultural heritage. This strategy must address the following:
 - Co-operative structures to enable participation by key security stakeholders such as local communities and the South African Police Service (SAPS) to address offences and breaches of the law and other relevant co-operatives, relevant government departments such as Ezemvelo KZN Wildlife, Department of Water Affairs and Sanitation, Department of Forestry Fisheries and the Environment, etc.
 - Safety and security of the reserve's visitors, staff, and public and private property
 - Regular patrols covering the full extent of the reserve
 - Law enforcement within the protected area must be undertaken through surveillance, monitoring and appropriate reaction in the event of an offence, and be focussed on:

- Prevention of criminal activities through awareness programs, co-operative efforts with security stakeholders, such as the SAPS and Ezemvelo KZN Wildlife, and deterrents such as the successful prosecution of crimes
- Detection, investigation and prosecution of criminal activities through the SAPS
- Access management to provide for legal access to the reserve according to the operating procedures of the reserve

2.11.3 Conservation Beyond Boundaries

It is understood that the PGR does not operate in isolation and forms part of the greater area with a similar vision and needs to engage with and support conservation initiatives in the broader context.

2.11.3.1 Protected Area Expansion

Expansion, through the purchase of additional property or through formal agreements with neighbours, will be considered if:

- It supports and enhances the management objectives of the PGR
- It supports and enhances the business objectives of the PGR
- It significantly enhances the ecotourism experience available on the PGR
- It does not negatively impact on the financial and ecological sustainability of the PGR
- It supports and enhances the survival and well-being of species requiring extensive habitats

2.11.3.2 Buffer Zone and Zone of Influence

To safeguard the biodiversity within the reserve and to counter any threatening processes or edge effects, appropriate land uses in areas surrounding the reserve must be identified (these land uses are known). While there are significant areas of overlap between the Zone of Influence and Buffer Zone, the Zone of Influence has a more limited (narrower) definition than that of a 'Buffer Zone'.

Buffer Zone

A buffer zone can be defined as:

"an area, usually peripheral to a protected area, in which activities are implemented, or the area managed to enhance the positive and reducing the negative impacts of conservation on neighbouring communities and neighbouring communities on conservation" (modified from Wild & Mutebi 1997).

An additional impact buffer of 5 - 10 km around protected areas is provided through NEMA EIA regulations. The buffer is 5 km for Nature Reserves. In terms of these listed activities contained in NEMA, certain activities that may have negative impacts on a protected area, require assessments to be conducted and environmental authorisation to be obtained before being permitted to proceed.

Zone of Influence

The Zone of Influence comprises an area outside the boundary of a protected area where activities of people or other influences may negatively impact the purpose, values or objectives and/or efficient and effective management of the protected area and/or continued delivery of tourism and other societal benefits from the protected area.

2.11.3.3 Stakeholder Engagement

Constructive relationships with adjacent landowners and communities are an essential aspect of the effective management of the reserve. Stakeholder engagement should aim to develop a strong sense of partnership between the neighbours and communities around the reserve. The following guiding principles must be adhered to:

- Efforts should be made to ensure that the communities living around the reserve are aware of the role that it fulfils in sustainable utilisation management and biodiversity conservation, its value and purpose and the provision of ecosystem services to the region
- A shared understanding of the issues that affect both the reserve and the surrounding communities should be developed, and efforts to resolve them should be undertaken cooperatively
- Stakeholder engagement should form part of planning and management practices to ensure sound decision-making, public understanding, and to provide opportunities for stakeholders to contribute their knowledge, expertise and suggestions
- In order to mitigate the risk of conflict with neighbours regarding inappropriate developments in the surrounding areas that may negatively impact the reserve, the reserve must actively engage in commenting on such developments
- Consultation with stakeholders does not replace the decision-making mandate of Management Authority (PGREA EXCO). It will ensure that the reserve has access to a broad range of information about stakeholder needs, concerns, views and options to assist in the decision-making process

2.11.3.4 Co-Management

As the PGR includes a number of landowners who have come together to manage the PGR, all landowners participating need to give meaningful input into sustainable utilisation, conservation, ecotourism and business development, thus the management of the PGR is effectively co-management of the reserve. The following principles will ensure active and efficient co-management:

- Bring co-management partners together under one structure (PGREA EXCO)
- Clarify the responsibilities and rights of co-management partners
- Clarify expectations (vision) and understanding of co-management among co-management partners (i.e. the PGR Management Plan)

Where the PGR agrees to drop fences with neighbours to form a larger conservation area; such as the Nsubane-Pongola Transfrontier Area, or other such initiatives, the following principles will apply:

- Formal agreements with neighbours, will be considered if it benefits the objectives of the PGR, enhances the business opportunities of the PGR, significantly enhances the ecotourism experience available on the PGR and does not negatively impact on the financial and ecological sustainability of the PGR
- A Joint Management Agreement would form the basis of such co-management initiatives and incorporation with neighbouring properties to specifically guide and manage the relationship
- The Joint Management Agreement must be finalised and signed prior to fences being dropped between the properties involved

2.11.3.5 Public Education and Awareness

The PGR does and continues to work closely with the neighbouring communities, which is one of the success stories of the reserve. The PGR acknowledges that it cannot function in isolation from our neighbours and community. As an integral part of the conservation and ecotourism industry, we as the private sector must strive to form close working relationships with the public sector, as neighbours to the Phongolo Nature Reserve (EKZNW) and also as custodians of the nation's resources, as well as our private sector neighbours; such as the Gumbi communities' Somkhanda Game Reserve and the Mabevu Trust (Ntshangase community) who are the successful land claimants of the Phongolo Nature Reserve.

By forming close working relationships with the local and district municipalities, we can benefit from synergies such as increased awareness and support for the region and reduced

marketing costs. The underlying principle is that these relationships must be based on sound sustainable and business principles.

2.11.3.6 Ecotourism

The PGR aims to provide visitors to the PGR with a sustainable and highly marketable ecotourism experience based on a variety of accommodation facilities and activities (i.e. non-consumptive sustainable utilisation), while maintaining high standards of service, all within the context of conserving the reserves resource values, including biodiversity and cultural values.

The PGR will serve a wide range of markets, using a variety of accommodation facilities and activities; including catered and self-catered accommodation, game drives, game walks, game tracking experiences, boat cruises and fishing activities. This approach reduces the risks associated with single tourism markets.

Reserve management will remain flexible regarding visitor carrying capacities, utilising a variety of visitor management techniques aimed at increasing carrying capacities while reducing impacts, including:

- zoning areas to minimise impact
- utilising water-based activities where appropriate to reduce land based environmental impacts
- monitoring of visitor profiles, needs and expectations
- focusing on low volume, low impact activities and experiences
- using vehicle management techniques to reduce vehicle impact on the reserve

In order to achieve the above the following principles apply:

- Ensure that all infrastructure development enhances the sense of place, is cost effective, appropriate, does not negatively impact on the objectives of the reserve and complies with environmental and related legislation
- Ecotourism products should be designed to capitalise on the unique beauty, biodiversity and cultural features of the reserve
- Ecotourism products should be developed in response to tourism market demands and opportunities within the reserve, yet still support and enhance the objectives of the reserve
- Ecotourism should be used as a tool for the generation of economic activity as well as employment generation in the communities surrounding the reserve

- Ecotourism infrastructure should be maintained to high standards
- The reserve should, in line with the Occupational Health and Safety Act, make reasonable efforts to ensure visitor safety and to have an appropriate emergency response system in place
- Ecotourism facilities and activities should also take into account the consumptive sustainable utilisation objectives as well. The non-consumptive and consumptive sustainable utilisation activities should complement each other and not be in conflict with each other

2.11.3.7 Fire Management

The PGR has a Fire Management Plan in place (**Appendix 6**). Fire is regarded as an important physical disturbance that has a critical role in the structure and function of African savannas. The proper management of fire therefore is critical for the maintenance of biodiversity at the local and regional levels, as well for the enhancement of ecosystem productivity. The following principles apply on the PGR:

- Ensure an adequate quantity and quality of forage for both grazing and browsing large herbivores
- Ensure the maintenance of species and structural diversity, and spatial heterogeneity at the regional level:
 - a dynamic spatial and temporal balance between grassland and woodland habitats
 - ensure species richness at the regional level
 - ensure an appropriate intra seasonal distribution of burnt and unburnt patches/mosaics
- Manage fire in a manner that ensures that its negative impact on biologically important and fire sensitive habitats and species is minimised
- Manage fire to ensure adequate basal and aerial cover on erosion sensitive soils and slopes (addressing the threat of accelerated soil erosion in these areas)
- To reduce the risk of detrimental wild and arson fires from occurring

2.11.3.8 Invasive Species 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 severe threat to the ecological functioning of natural systems and water production and must be strictly controlled. The invasive species

control in the PGR is now considered to be in a maintenance phase, due to effective programs implanted over many years. In undertaking invasive plant control, the following guiding principles will apply on the PGR:

- Methods will include physical, chemical, biological and fire control
- Biological control will be used where technology and knowledge have proven it to be effective, acceptable and even preferable
- Invasive plant control will require an ongoing programme that prioritises critical infestations along any watercourses, 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 prevent exacerbating the problem
- Monitoring and surveillance programmes must be implemented to facilitate adaptive management
- Strategic partnerships and poverty relief programmes such as the Herbicide Assistance program (Which the PGR has been doing) should be utilised in controlling invasive plants

Alien animal species can threaten the ecological, genetic or natural aesthetic integrity of the reserve and can be vectors for the spread of diseases (The PGR has no alien animal species on the reserve). Any Feral animal species are destroyed as per PGR policy.

2.11.3.9 Soil Resource Management

Soil erosion is a natural process, yet where it is accelerated due to unsustainable land use practices or activities, active measures to mitigate, rehabilitate and control will be implemented. In addressing any soil erosion, the following principles will apply on the PGR:

- 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 where there are early signs of soil erosion such as loss of vegetation cover should be managed to prevent soil erosion
- Soil erosion control and rehabilitation measures may include the need to re-vegetate disturbed areas
- Except at selected feature sites, plant only species indigenous to the site

2.11.3.10 Resource Utilisation

It is an accepted tenet of biodiversity conservation in South Africa and KZN 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, cultural heritage or biodiversity conservation imperatives. The PGR's main objective is the sustainable utilisation

of the natural resources (consumptive and non-consumptive) based on sound management principles and long-term viability, and to this end the guiding principles on the PGR are:

- Maintain populations on the reserve at economic carrying capacity to allow for maximum recruitment rate to allow for sustainable consumptive utilisation through, hunting, live sales and culling
- Maintain populations on the reserve for sustainable non-consumptive (ecotourism) utilisation to enhance the guest's experience on the reserve
- Ensure populations are maintained at required levels and not negatively impacted on through over utilisation, and so impacting on the reserve's main objective

2.11.3.11 Wildlife Management

Management interventions related to indigenous wildlife will be focussed the PGR's main objective of the sustainable utilisation of the natural resources (consumptive and non-consumptive) based on sound management principles and long-term viability, and on the safeguarding populations of rare and endangered species, such as Black Rhino. In addressing wildlife management, the following guiding principles apply on the PGR:

- Population management of wildlife species takes place to ensure that all species remain at or below carrying capacities to avoid causing ecological degradation of the reserve
- Animals that become a danger or excessive nuisance to persons and property due to either habituation or aberrant behaviour must be managed per the PGR rules
- Genetic diversity should be maintained, and genetic pollution of game populations avoided, such as the Black and White Rhino populations
- The keeping of closely related subspecies in protected areas must be avoided in order to prevent hybridisation between subspecies (e.g. Blue and Black Wildebeest)
- Key wildlife species, Elephants and Black Rhino, also require specific management interventions and these strategies needs to be recorded and monitored in order to facilitate adaptive management, preferably in separate subsidiary management plans. The PGR has both Elephant and Black Rhino Management Plans in place and these species are managed in terms of these plans.
- The PGR has very strict hunting and culling rules to specifically manage these activities, to which all the landowners and their clients must adhere to. These rule are:

Hunting

- Hunting is strictly "walk and stalk", with the exception of bow hunting where hunters are also permitted to hunt from hides; pit blinds, elevated blinds, box blinds and tree stands

- No hunting is permitted without the presence of a PH (foreign clients) or Hunting Guide (local clients)
- The same group of animals may not be further pursued after two (2) unsuccessful stalks
- Shoot preferably one (1) animal from a herd, even if the rest of the herd remains standing after the shot is taken
- Once the hunter has fired a shot, remain hidden for some time until the rest of the herd has moved away. This will ensure that the animals do not associate people on foot with danger
- To comply with legal requirements, written permission from the landowner needs to be obtained before the hunt commences
- Strictly no shooting is permitted from or within 200m of a vehicle. The only exception to this rule is when reserve staff are conducting an official culling operation
- No hunting is permitted within the proximity (within 300m) of any lodge, camp, private homestead or tourism facility
- Hunting may only be conducted in daylight hours as prescribed in the KZN legislation. The only exception to this rule is when reserve staff are conducting an official culling operation at night
- Hunting rifles must be checked before a hunt commences to ensure that the client's rifles/firearms are correctly sighted in. Bow hunter's bows must also be checked on the bow range to ensure that the bows are correctly sighted and tuned. This is to minimize wounding of game
- The sighting in of rifles/firearms (zeroing) may only be done at designated areas
- Clients under the influence of alcohol may not be permitted to hunt, this for ethical and safety reasons
- Wounded game will be paid for in full by the client
- A tariff will be set for missed and repeat shots (rifle/firearms), which the client will pay for, as a means to minimize the disturbance factor as a result of unnecessary shots taken by a client
- Hunting vehicles traveling on main tourist roads must ensure that rifles and bows are not openly displayed and that any animals shot and being transported in the vehicle must be covered with a tarpaulin to minimize the visual impact for other guests traveling on the same roads
- Landowners are encouraged to promote the use of rifles fitted with sound suppressors in the PGR to minimise the disturbance factor

Culling

- Any shooting after dark, utilising a spotlight and vehicle, for the purpose of obtaining venison products, such as supplying venison products to butcheries or lodges, is defined as culling.
- All landowners must be notified before any culling operation is going to take place
- Only rifles fitted with sound suppressors may be used for culling operations to minimise the disturbance factor
- Culling may only be conducted by competent and experienced staff or landowners, or other competent and experienced persons
- Culling should only take place over a maximum period of 2 nights in one area, after which no culling is permitted in the same area for at least 2 months

2.11.3.12 Sense of Place

Sense of place is a complex ecosystem service that promotes and may be complemented by the character of tourism facilities, an appreciation of the reserve through the rejuvenation of physical, mental and psychological well-being of visitors. This, in turn, has a positive influence on the country's economy, social capital and enhancing pro-environmental behaviour, responsible use of natural resources and waste reduction. Sense of place generated by protected areas is a critical asset that needs to be conserved and protected (Wilson 1997).

Sense of place is a combination of managing 3 aspects; viewsapes, soundscapes and lightsapes. The guiding principles in the PGR in this regard are:

- Undeveloped viewsapes are fundamental to the sense of place and enjoyment of the wild character of the reserve by visitors, in particular water, high-lying and ridgetop areas. Landowners should collaborate with each other in protecting important viewsapes within and along access routes to the reserve
- Where essential infrastructure is required, it should be installed and maintained in a manner that does not degrade the viewscape and the associated sense of place
- Monitor human activities that generate noise that adversely affects the reserve soundscapes
- Take action to prevent or minimise all noise that, through frequency, magnitude, or duration, adversely affects the natural soundscape or other reserve resources or values, or that exceed levels that have been identified as being acceptable or appropriate
- Where possible restrict the use of artificial lighting in the reserve to those areas where security and basic human safety requirements must be met

- Use minimal-impact lighting techniques where possible

2.11.3.13 Water Management

The pollution of surface water and groundwater sources can impair biodiversity, ecosystems, the natural functioning of aquatic and terrestrial ecosystems and secondarily diminish the utility of the reserves waters for visitor use and enjoyment. The PGR should determine the quality of the reserves surface and groundwater resources and avoid the pollution of these waters by human activities occurring within and outside the reserve. The guiding principles for the PGR are:

- Work with appropriate governmental bodies and other partners to obtain the highest possible standards
- Ensure that all visitor and staff infrastructure that may potentially pollute water bodies (including groundwater) are properly maintained and operating to required standards
- Take all necessary actions to monitor, maintain or restore the quality of surface and ground water within the reserve
- Measures may be instituted by the management authority at both management and tourism infrastructure to deal with water availability and use during times of drought or water scarcity
- Water saving devices should be installed where possible, and staff and visitors should be made aware of the scarcity of water as a resource

2.11.3.14 Ecological Integrity

Protecting and conserving the ecological integrity of the reserve is crucial, as this forms the bases on which the PGR's objectives are based to ensure the long term sustainability and financial viability of the reserve. The integrity of the natural heritage is maintained by ensuring that management decisions are made on sound resource management and ecosystem-based management practices. The following principles will apply in the PGR:

- It is recognised that the reserve is not an island but is part of larger ecosystems and cultural landscapes, and decision-making should, therefore; be based on an understanding of surrounding environments
- The various internal and external factors that threaten the reserve, its value, its success and purpose must be carefully analysed. Protection must be appropriate to the type, significance and sensitivity of the ecosystems involved
- Because the reserve is influenced by surrounding, and adjacent, land uses and, in turn, the management of the reserve influences those surrounding areas, co-operative

relationships should be sought with relevant stakeholders. The priority in decision making should be to ensure the long-term ecological integrity of these areas

- Concerted effort should be made to encourage compatible external activities and to discourage incompatible ones within the greater ecosystem setting of the reserve

2.11.3.15 Use of Airspace

Non-human disturbed airspace above the reserve is fundamental to the health and well-being of wildlife and the enjoyment and benefit of the protected area by people and for security purposes. Except where explicit permission is granted, the management authority should actively safeguard the airspace above the reserve from low-flying manned and unmanned aircraft and any other unnatural aerial disturbance. The following principle applies within the PGR:

- The use of aircraft inside the reserve is prohibited, unless these are used for authorised research or official purposes

2.11.3.16 Memorials and Plaques

The PGR recognises that people often form a spiritual bond with the beauty and tranquillity of the reserve or a particular place therein. This appreciation may lead to an occasional request for a memorial in remembrance of the person and their special bond, to be placed in the reserve. The PGR will only consider a small sensitively and unobtrusively placed plaque of commemoration.

2.11.3.17 Development and Maintenance of Infrastructure

In order for the reserve to operate effectively, infrastructure within the reserve should be appropriate and maintained, removed, expanded or developed for conservation management and ecotourism purposes. All developments must be undertaken cognisant of and as per legal requirements and procedures regarding environmental impacts. The basic guiding principles for the PGR are:

- Where possible tourist accommodation and other facilities should at all times be maintained to appropriate standards regarding safety, appearance, cleanliness and serviceability
- All structures should as far as possible be harmonised with the surrounding environment and landscape character through appropriate siting, use of colour, building materials, landscaping and screening

- All protected area infrastructure should be maintained to a safe and operational standard through the use of regular scheduled maintenance programs
- All future electricity supplies should be underground where possible and other services provided in an aesthetically pleasing manner
- Staff and guests should be conscious of water and energy use and minimise wastage
- All lodges, camps and overall reserve management will adopt a responsible and environmentally friendly waste management process which will address liquid as well as solid waste. Liquid waste will be treated on site according to site development plans, and the impact of waste treatment closely monitored
- Solid waste should be separated and sorted, with biodegradable waste being composted, recyclables stockpiled, and combustibles disposed of in a responsible manner
- Research will be undertaken to identify the Best Practicable Environmental Option (BPEO) regarding each type of waste stream
- Although each individual landowners is responsible for the maintenance of the roads on their respective properties, the PGR's basic principles are that the road network is developed appropriately to attain the objectives of the reserve and according to local conditions
- No roads will be developed in sensitive areas
- Wherever possible roads will be contoured and provided with drainage
- Where possible a management road will be developed along the boundary fence to facilitate maintenance and security of the fence

2.11.3.18 Research, Monitoring and Reporting

Research and monitoring is critical in an adaptive management process, providing data for decision-making. The following guiding principles apply on the PGR:

- The results of any research must benefit and support the objectives of the PGR and all research projects must be approved by the Management Authority (PGREA EXCO)
- Management decisions should be based on the best available knowledge, supported by a wide range of research
- Priority should be given to research that provides information and understanding that is of direct benefit to the reserve and will guide the management interventions required to achieve its objectives in the most cost-effective manner
- Partnerships and agreements with relevant academic and research institutions should be promoted to stimulate and encourage the desired research in the reserve
- Monitoring techniques and procedures applied must be based on:

- Adaptive management assumptions,
- Current ecological theory,
- Cost effectiveness and applicability,
- Appropriateness to management objectives, and
- Consistency over time, including climatic cycle fluctuations
- Monitoring programs should facilitate adaptive management through the assessment of management interventions and the provision of information for achieving the objectives of the reserve
- Biological reporting on the PGR includes:
 - Internal PGR Reports – Submitted to PGREA EXCO
 - Monthly Game Utilisation
 - Monthly Loan Account Status (Financial)
 - Management Report (Boundary fences, boundary roads, fires)
 - Security
 - Provincial Reports
 - Black Rhino 1st Interim Report (BRREP Program)
 - Black Rhino 2nd Interim Report (BRREP Program)
 - Black Rhino Annual Status Report (BRREP Program)
 - KZN Elephant Annual Status Report (EKZNW)
 - KZN CITIES and Important Large Vertebrate Population Estimate Survey (EKZNW)
 - KZN CITIES Species Survey Report (EKZNW)

2.11.3.19 Financial and Human Resources

As per 1.8.2 above, the PGR is made up of a number of landowners and the properties, each landowner responsible for their own financial management regarding their operations and maintenance of their respective facilities and properties.

There are joint management aspects that are jointly financed and managed by the landowners, under the leadership of the Management Authority (PGREA EXCO). These being:

- Security
- Boundary fence maintenance
- Boundary road and common road maintenance
- Game management
- Veld management

Protected areas cannot be effectively managed without adequate sustained funding and sufficient human resources. In addressing the financial and human resource needs of the protected area, the following guiding principles should be adhered to:

- Adequate funding is required for the management of the reserve to ensure the protection of its biodiversity and the achievement of its objectives
- Prioritisation of management actions based on available funding should be aligned with priorities as determined by the Management Authority (PGREA EXCO)
- Adequate, trained, and experienced staff should be employed by the landowners in the reserve to undertake operations required for effective management

3. REFERENCES

- Champion, G., 2010: The Ecology of Nile Crocodile (*Crocodylus niloticus*) in Pongolapoort Dam, Northern KwaZulu-Natal, South Africa.
- Jewitt, D., 2011: Conservation Targets and Status for Vegetation Types in KZN. Report, Ecosystem Ecologist, Ezemvelo KZN Wildlife.
- Margules, C. and Pressey, R., 2000: Systematic conservation planning. *Nature* 405:243-253.
- Mucina, L. and Rutherford, M.C. (eds.), 2006: The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19, South African National Biodiversity Institute, Pretoria.
- Pringle, J. 1982. *The Conservationists and the Killers*. Cape Town; Books of Africa.
- Shannon, G., Page, B., Slotow, R. & Duffy, K., 2006: African elephant home range and habitat selection in Pongola Game Reserve, South Africa. *African Zoology*, 41(1): 37–44, April 2006.
- Strathie, L., 2008: Agricultural Research Council - Plant Protection Research Institute, Weeds Division.
- Summers, M., 2015: Aspects of Nile Crocodile (*Crocodylus niloticus*) Population Ecology and Behaviour in Pongolapoort Dam, KwaZulu-Natal.
- Thornley R., Spencer M., Zitzer HR., Parr CL. 2020. Woody vegetation damage by the African elephant during severe drought at Pongola Game Reserve, South Africa. *Afr. J. Ecol.* **58**:658–673.
- Van Rooyen, N. & van Rooyen MW., 2008: Vegetation of Pongola Game Reserve. Survey Report.
- Van Wyk, J.J., 1983: Ingwavuma – ‘n Etno-historiese oorsig. *Journal of Racial Affairs*, 34 (2), 54-64.
- Wild, R.G. & Mutebi, J., 1997, Bwindi impenetrable forest, Uganda: Conservation through collaborative management, *Nature and Resources* (United Kingdom).
- Wilson, R., 1997, A sense of place, *Early Childhood Education Journal*, 24(3), 191–194.
- Wright, J. & Hamilton, C. 1989: Tradition and transformations. The Phongolo-Mzimkhulu region in the late eighteenth and early nineteenth centuries. In A. Duminy and B Guest (eds.) *Natal and Zululand from Earliest Times to 1910. A New History*. Pietermaritzburg: University of Natal, 49-82.

4. APPENDICES