Protected Area Management Plan

Selati
GAME RESERVE

BUILDING A LOWVELD LEGACY.

SECTION 1: AUTHORISATION

This Management Plan for Selati Game Reserve is approved**:**

TITLE	NAME	SIGNATURE AND DATE
LEDET MEC:		

Recommended:

This Management Plan is hereby internally accepted and authorised as required for the management of the Selati Game Reserve in terms of Sections 39, 40 and 41 of the National Environmental Management Protected Areas Act (No. 57 of 2003)**:**

TITLE	NAME	SIGNATURE AND DATE
Chairman of Board: Selati Game Reserve	Johan Visagie	
General Manager Selati Game Reserve	Bryan Havemann	

Prepared by

Dr Mike Peel (Pr.Sci.Nat)

with

Greg Martindale (Pr.Sci.Nat)

Citation

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ABBREVIATIONS

APNR	Associated Private Nature Reserves
APO	Annual Plan of Operation
ARC	Agricultural Research Council
CARA	Conservation of Agricultural Resources Act
DCA	Damage Causing Animal
EXCO	Executive Committee
FPA	Fire Protection Association in terms of the National Veld and Forest Fire Act (No.1 of 1998)
GKEPF	Greater Kruger Environmental Protection Foundation
GLTFCA	Great Limpopo Transfrontier Conservation Area
GLTP	Great Limpopo Transfrontier Park
GPS	Global Positioning System
IUCN	International Union for the Conservation of Nature
KNP	Kruger National Park
LEDET	Limpopo Department of Economic Development, Environment and Tourism
LUMS	Land Use Management Schemes
MEC	Member of the Executive Council
METT	Management Effectiveness Tracking Tool
MTPA	Mpumalanga Tourism and Parks Agency
NEMA	National Environmental Management Act
NEMBA	National Environment Management: Biodiversity Act
NEMPAA	National Environmental Management: Protected Areas Act
NFEPA	National Freshwater Ecosystem Priority Area
NPAES	National Protected Area Expansion Strategy
NSBA	National Spatial Biodiversity Assessment
PA	Protected Area
SANParks	South African National Parks
SAPS	South African Police Service
SDF	Municipal Spatial Development Framework
SWOT analysis	Strengths, weaknesses, opportunities and threats analysis
TPC	Threshold of Potential Concern
SGR	Selati Game Reserve
WCPA	World Commission on Protected Areas

INTRODUCTION

This management plan provides the strategic and operational framework for the management of Selati Game Reserve thereby ensuring the protection of its values and the achievement of its vision and objectives. It provides the primary tool for the management of the reserve, informing specific management programmes and the operational requirements, necessary to implement them. It provides a context for Selati Game Reserve, as a key component of the Lowveld savanna system of the Greater Kruger Area, and for the collaborative and cooperative management of joint issues with neighbouring protected areas. The management plan consists of the following sections:

Section1: provides for the formal authorisation of the management plan, as required in terms of Section 39 of the National Environmental Management: Protected Areas Act.

Section 2: describes the context of Selati Game Reserve, setting out its history, legal status, its ecological and socio-economic context, which provides for the strategic and implementation frameworks that follow.

Section 3: sets out the governance and policy framework through which Selati Game Reserve is managed.

Section 4: describes the consultation process followed in preparing the management plan. It also sets out the mechanisms, put in place, which ensure ongoing engagement with other protected areas that form part of the Lowveld savanna system of the Greater Kruger Area.

Section 5: sets out the purpose of Selati Game Reserve, the reserve's vision and the high-level objectives required to achieve the vision.

Section 6: sets out the zonation plan for Selati Game Reserve, describing those activities that are permissible and those that are not within the different zones of the reserve.

Section 7: describes the access points into the reserve and its facilities and infrastructure.

Section 8: sets out the requirements for the expansion of Selati Game Reserve and identifies those areas in which expansion may occur in the future.

Section 9: provides a concept development plan for the reserve, which identifies planned and potential developments that may take place within it.

Section 10: provides the implementation framework, identifying the key management interventions and their implementation requirements, to achieve the reserve's objectives and vision. It also addresses monitoring and evaluation requirements that ensure that the actions identified are being implemented.

Section 11: Identifies Selati Game Reserve's existing operational budget and highlights resource priorities within the reserve.

SECTION 2: CONTEXT

2.1 Location of Selati Game Reserve

Selati Game Reserve is in the eastern Lowveld of South Africa to the east of the Drakensberg escarpment to the west of the Kruger National Park, west of the R40. The reserve covers an area of 26,907.27 hectares (Figure 2.1).

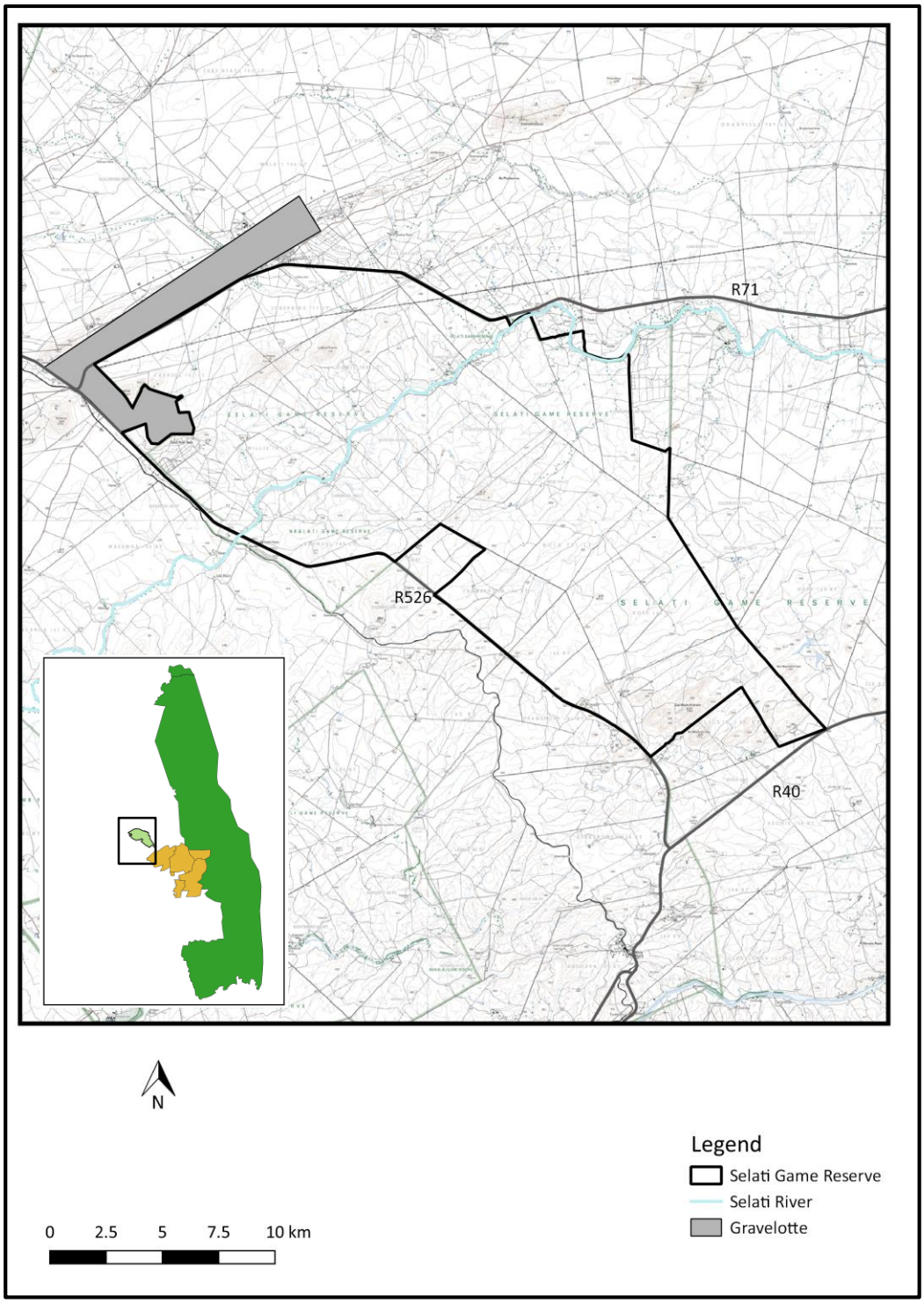


Figure 2.1: The location of Selati Game Reserve

Selati Game Reserve is bordered in the west by the town of Gravelotte, in the north by livestock and communal ranching areas and the Murchison Mine, in the east by protected areas, Abelana and Balule Private Nature Reserve and to the south by protected areas Makalali-Pidwa and Karongwe Reserves. The entire reserve falls within the Ba-Phalaborwa Local Municipality, which forms part of the Mopani District Municipality, within Limpopo Province.

2.2 Properties within Selati Game Reserve

The land that constitutes the Selati Game Reserve is presented in Appendix 2 and depicted in Figure 2.2.

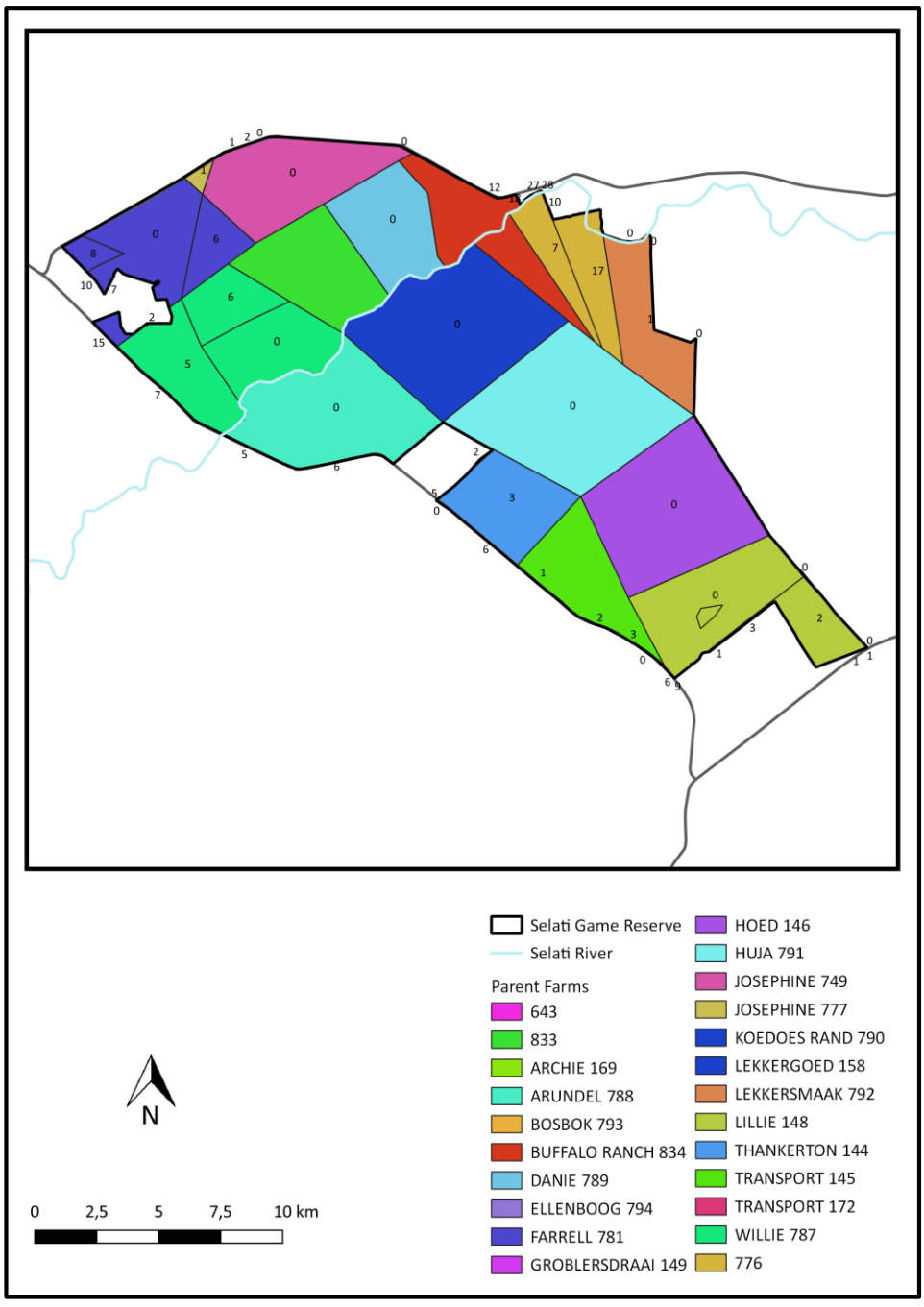


Figure 2.2: The properties within Selati Game Reserve

2.3 Legal context

2.3.1 Declaration status of the protected area

Selati Game Reserve is to be declared as a nature reserve in terms of Section 23 of the National Environmental Management: Protected Areas Act (No. 57 of 2003).

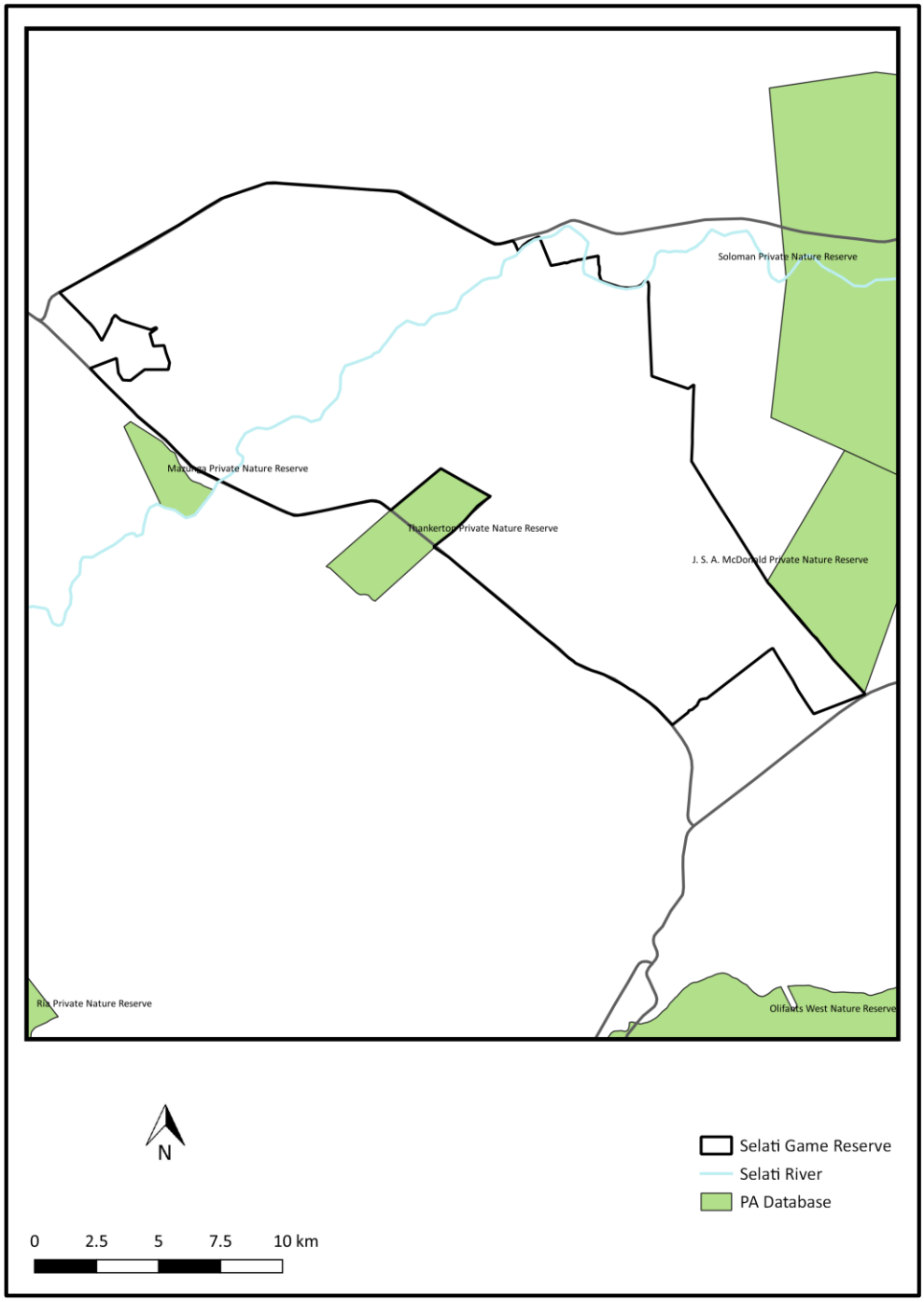


Figure 2.3: The protected area status of Selati Game Reserve

Selati Game Reserve is surrounded by several small private nature reserves, which were historically declared as protected areas in terms of various provincial conservation legislation.

2.3.2 Management of the protected area

Selati Game Reserve is managed through a constituted association, the Selati Game Reserve Association, in which all participating landowners are signatories. Operational management of the reserve is undertaken by the Big Five Game Company (Pty) Ltd. (Registration number: 1993/007876/07), which trades as Selati Game Reserve. The Selati Game Reserve Association is the management authority, assigned in terms of Section 38(2)(a) of the National Environmental Management: Protected Areas Act (No. 57 of 2003 - NEMPAA).

2.3.3 The GLTFCA Cooperative Agreement

Currently Selati Game Reserve is not a signatory to the Great Limpopo Transfrontier Conservation Area (GLTFCA) Cooperative Agreement, but the reserve aligns itself with the principles contained therein. The agreement, which has been formulated and adopted by all protected areas within the open system of the Greater Kruger Area and provides a framework for the protection, management and socio-economic beneficiation of the system. It has been established as the basis for cooperation and collaboration within the system, based on five management pillars, and addresses key risks, opportunities and benefits for protected area management authorities and landowners within the system.

2.3.4 Compliance with the requirements of the Biodiversity Act

In terms of Section 76 of the National Environmental Management: Biodiversity Act (No.10 of 2004 - NEMBA), the management authority of a protected area must incorporate an invasive species control plan in the protected area management plan. This is addressed in Sections 5 and 10 below.

Section 41(2) of NEMPAA requires that the terms and conditions of any applicable biodiversity management plan, which are prepared in terms of Section 43 of NEMBAA, must be considered in a management plan. In this case, there are two relevant biodiversity management plans – that for the African Lion and for the Black Rhino. These are addressed in Sections 5 and 10 below.

The National Norms and Standards for the Management of Elephants in South Africa were published in terms of Section 9 of NEMBAA. They provide the basis for elephant management in the country and must be considered in this management plan within the context of the Selati Game Reserve Elephant Management Plan.

2.3.5 Boundary demarcation and deviations

Selati Game Reserve is fenced, and the boundary of the reserve is well known. The reserve has a 2.4m high electric fence running for some 94km in the south, west and northern part of the reserve. The southern and northern boundaries are marked by the R526 Gravelotte – Mica and the R71 Gravelotte – Phalaborwa Provincial Roads respectively. The eastern boundary is formed by

portions of the farms Bosbok, Lekkersmaak, Ellenboog and Hope. As such, the boundary of the reserve is well known.

If any boundary deviations exist, in which the boundary deviates from the cadastral boundary of one or more of the properties, they should be addressed through an agreement between the two parties in which the deviation occurs.

2.3.6 Servitude register

There are Eskom servitudes in the Selati Game Reserve. In addition, there may be servitudes for rights-of-way, other access roads and infrastructure such as pipelines. It is important that any servitudes within the reserve are known and documented in an appropriate register in order to understand what the access and management implications of them are. The following known servitudes are available for Selati Game Reserve:

- Notarial Deed K760/1969S - ESKOM powerline (Map LG5459/1997); Notarial Deed K606/1968S (13 May 1968) - ESKOM powerline (Map LG 5459/1997).
- Notarial Deed K1147/69S (26 June 1969) - ESKOM powerline - (Map LG A 1083/88), Notarial Deed 439/64S (11 December 1963) - servitude of water storage over Koedoesrand 790.
- Notarial Deed No 276/1968S - ESKOM powerline - Portion 1 of BVB 776LT, Beryl Mining Company Limited has right to access water from Selati River.
- Notarial Deed No K439/1964-S (11 December 1963) – servitude of water storage in favour of the Remaining Extent of Portion 2 (a portion of portion A) of the farm B.V.B Ranch no 776 LT.

2.4 Management effectiveness

Management effectiveness is defined by the IUCN's World Commission on Protected Areas (WCPAs) as the assessment of how well a protected area is being managed – primarily the extent to which it is protecting values and achieving goals and objectives (Hockings, Stolton & Dudley 2000; Hockings *et al.* 2006). The assessment of management effectiveness using the Management Effectiveness Tracking Tool (METT-SA Version 3a, 2018) is not a management performance assessment but is intended to identify areas in which management effectiveness can be improved within a protected area and within the organisation managing the protected area.

Selati Game Reserve is yet to do the management effectiveness assessment, (using METT-SA Version 3a). Given the background information received, the following key issues could well need attention in order to further improve management effectiveness:

- Legal status – is the whole reserve declared as a protected area. If not, the remainder must be declared in terms of NEMPAA.
- A servitude register is in place and should be completed if necessary.
- A zone of influence around the reserve needs to be developed.

- The formally approved management plan should be in place.
- Need to identify cultural heritage sites, although this may not be a priority for the reserve.
- The annual plan of operation must be linked to the management plan and its objectives and targets.
- Although environmentally responsible practices are in place in the reserve, they may be improved.
- The management plan must be linked to the key performance areas of the general manager and other management staff.
- Water use planning outside of the reserve is a concern.

2.5 History of the reserve

In examining the ecological context of Selati Game Reserve, it is useful to investigate the factors that have shaped these savannas over the past two centuries (Peel *et al*. 2009, Peel 2014).

Selati Game Reserve takes its name from the Great Selati River which traverses the northern sector of the reserve from west to east (http://selatigamereserve.co.za). The river was named after the Selati Gold Fields and was the scene of a minor gold rush in 1865. The gold fields were named after Shalati, the female chief of the small Tebula tribe who lived in the bush around the Murchison Range to the north of the area (http://selatigamereserve.co.za).

Historically, the land within what is now Selati Game Reserve, and its surrounds, was purchased for cattle ranching and some hunting, with the land costs in the early 1900s of approximately £1.27 per ha.

In the early 1960s, protected areas were separated from the Kruger National Park by the erection of a veterinary fence designed to combat Foot and Mouth disease. The erection of this fence had far-reaching effects on the ecology of the area.

Cattle farming continued to dominate in the region to the west of the Kruger National Park and large private nature reserves until the late-1970s. There followed a large-scale switch of land-use, with cattle being replaced by wildlife throughout most of the region between the Orpen road and the Olifants and Selati Rivers. The cost of land at this time was approximately R70 per ha. At about this time, the first of the small-scale (200–5,000 ha) operations became involved in the ecotourism industry. In 1992, a new era was heralded with the start of the removal of the fence between the Kruger National Park and the large private nature reserves around 1993. The latter includes the Sabi Sand Wildtuin and the Associated Private Nature Reserves (APNR). At the same time there was ongoing consolidation of areas adjacent to the APNR, with properties ranging in size from 8 000 ha to 34 000 ha. The current price of land in the area varies from between R30 000 per ha to R70 000 per ha. At about the same time that this process was underway the landowners within the

Selati Game Reserve began to collaborate, under a common vision, and Selati Game Reserve was consolidated and established in 1993.

2.6 Biophysical environment

2.6.1 Climate

Precipitation in Selati Game Reserve is low and erratic, characteristic of semi-arid savannas: a hot, wet season of five to seven months (October to April) and the remainder of the year being dry. The vegetation is under moisture stress, which may be generally severe and of long duration. Rainfall characteristics, including the total amount of rainfall, distribution over a season, runoff, infiltration, storage in the soil profile, evaporation from the soil surface, uptake and transpiration, are important in determining the nature of the vegetation of an area.

The mean annual rainfall for Selati Game Reserve is xx 490mm (22y) (Peel, 2018) obtained from stations spread throughout the reserve (Figure 2.4). The following are the means at several weather stations within the Selati Game reserve: (Table 2.1).

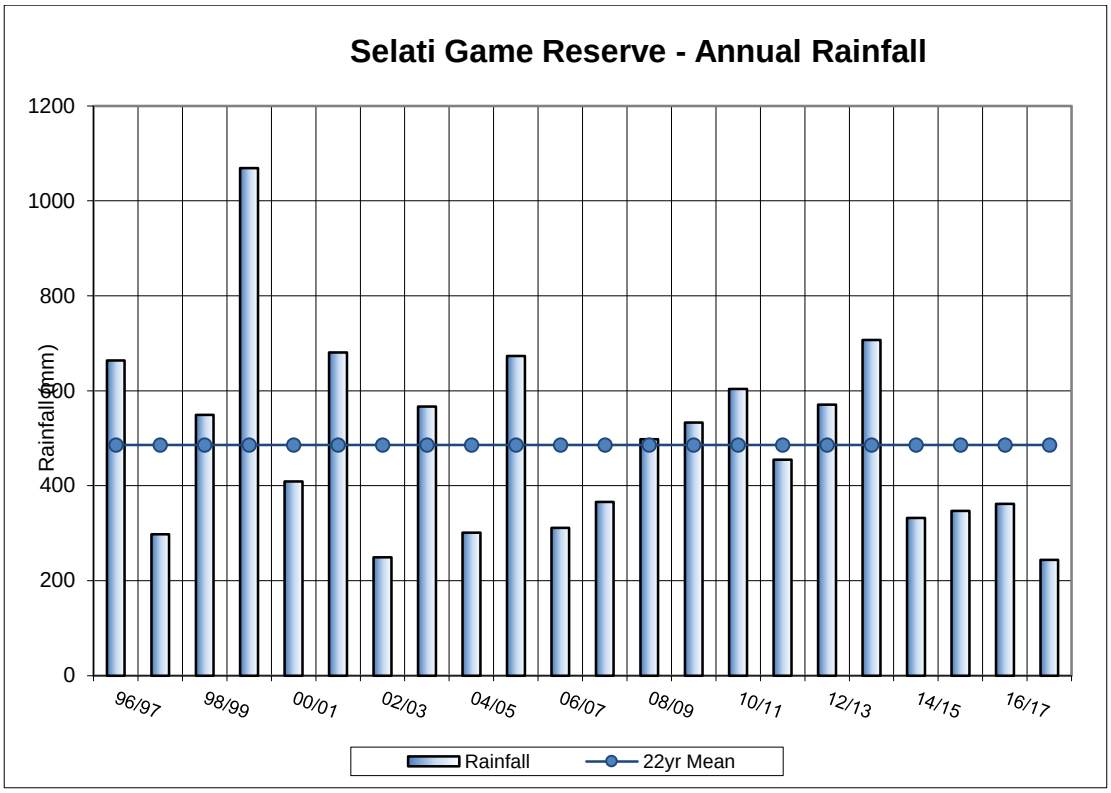
Table 2.1 Mean annual rainfall recorded within Selati Game Reserve (according to the sector weather stations) xx

Location	Sector	Mean Rainfall (mm)	Record Period (years)
Josephine	North	504.7	63
Farrel/Klipspringer	North/west	316.6	4
La Belle/Danie/Willie	North/central	323.6	4
BVB	North/East	340	4
Paw-paws, Huja	Central	316.3	4
Arundel, Main Office	South Central	483	23
Lillie, Lillie II	South	350.2	4

Selati Game Reserve has hot summers and mild to cold winters. Summer temperatures range between 18^{o}C and 45^{o}C while winter temperatures range between 8^{o}C and 23^{o}C. The mean highest monthly temperature is around 40^{o}C while the lowest mean minimum temperature is around 0^{o}C (Schulze 1975).

2.6.2 Topography

Selati Game Reserve is in a topographic position which can be described as lying between the Lowveld and the foothills of the Drakensberg (Peel & Stalmans, 2010). Altitude varies from around 460 metres above sea level (m.a.s.l.) near the rivers to around 780 (m.a.s.l.) (kopjes in the far east and west of the reserve).



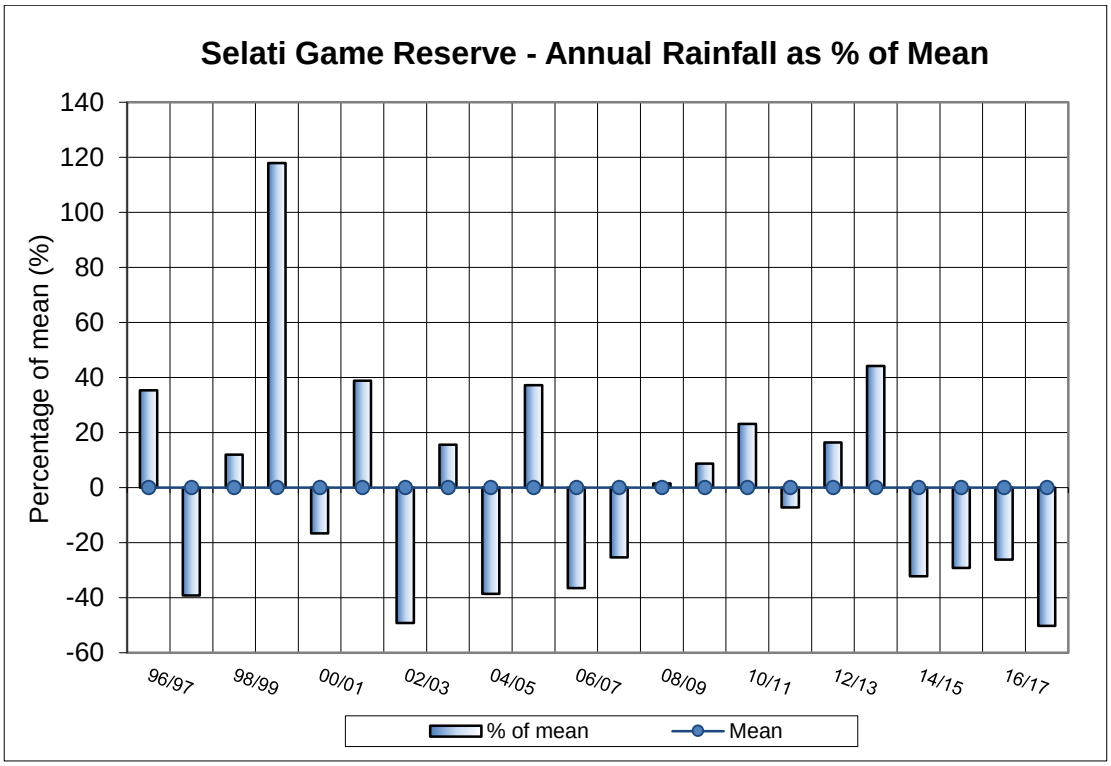


Figure 2.4: Annual rainfall for Selati Game Reserve and mean (top) and annual rainfall as a percentage of the long-term mean for the reserve (bottom)

2.6.3 Geology

The Lowveld is underlain by the basement gneisses and granites (Geological Series: Pilgrims Rest, 1986). Geologically, the study area is dominated by ancient granitoid rocks of Swazian and Randian age, which are grouped together as Basement complex. The predominant geology in the Basement complex can be classified as gneiss, granite or migmatite (Venter 1990). The Selati Game Reserve is dominated by granite (Lekkersmaak, Transport, Lillie, Willie and Hoed granite), Makhutswi gneiss, and localised areas of syenite, ultramafic schist, lamprophyre, chlorytic schist, chlorite-talc schist, quartzitic schist, quartzite, greywacke, chert, iron formation, and metaquartzite (Figure 2.5).

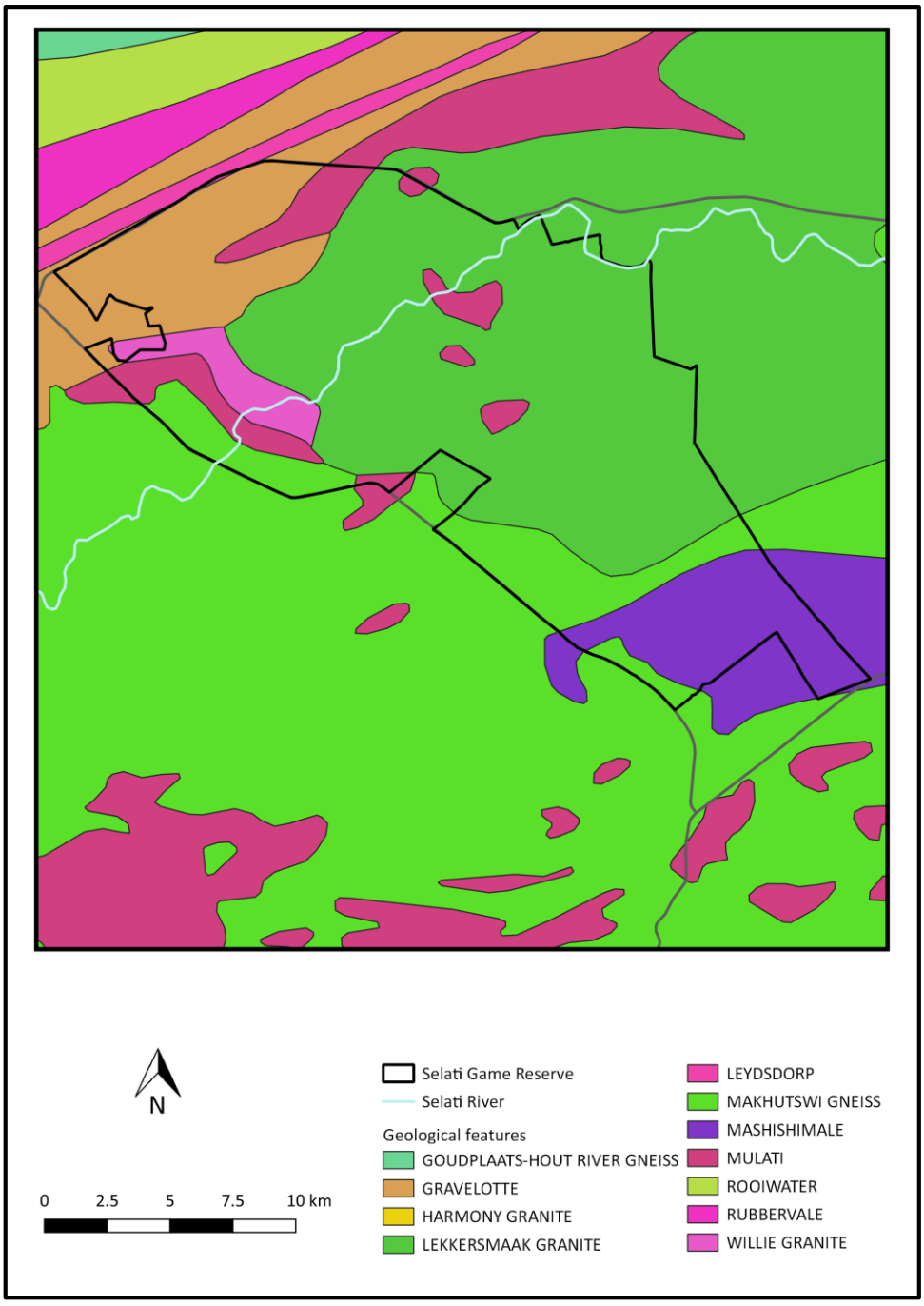


Figure 2.5: The geological composition of Selati Game Reserve.

2.6.4 Soils

In semi-arid regions, there is usually a good correlation between geological formation, soil type and vegetation type. This implies that the soil and parent rock from which the soil is formed exercise a strong influence on grazing management.

Soil affects the supply of water and nutrients to the plant. The soil moisture regime, a primary determinant of savanna dynamics and by extension vegetation composition, is influenced by four factors other than the pattern and amount of rainfall namely, infiltration, percolation, root extraction and evaporation (O'Connor 1985).

The role that soils play in determining vegetation patterns is vital. The Land Type Series map for Pilgrims Rest (1986) gives a broad outline of the dominant soil types on SeGR. Land type Fb 179a dominates the Lekkersmaak, BVB, Arundel, Koedeosrand, Hoed, Huja, and Thankerton properties. Land type Fb is dominated by Glenrosa and/or Mispah soil forms (other soils may occur). This group includes pedologically young landscapes that are not principally rock, alluvial or aeolian and where the dominant soil forming processes have been rock weathering, the formation of orthic topsoil horizons and clay illuviation giving rise to lithocutanic horizons. Lime is rare or absent in the upland soils but is widespread in the bottomland soils. Lime has been used to indicate the extent to which the landscapes have been leached. Some landscapes have no lime, but soluble salt accumulations occur. Land Type Ae 128 occurs on Farrell (north-west), Willie, and Danie (south). This Land Type is dominated by yellow and red soils without water tables and belonging in one or more of the following soil forms: Inanda, Kranskop, Magwa, Hutton, Griffin, and Clovelly. In Land Type Ae one or more soil forms occupy at least 40% of the area, contain red soils with a high base status and are greater than 300mm deep. Land Type Ea 165 occurs on Farrell (north-east), Josephine, and Danie (north). This unit indicates land with high base status, dark coloured and/or red soils, usually clayey, associated with basic parent materials. Land Type Ib 196 covers small areas associated with kopjes on Willie, Farrell, Danie, and Arundel. Ib indicates land types with exposed rock covering 60-80% of the area. The rocky portions may be underlain by soil which would have qualified the unit for inclusion in another broad soil pattern were it not for the surface rockiness.

2.6.5 Hydrology and large dams

The following paragraph is drawn largely from Laporte-Bisquit *et. al*. (2014). The Selati River is a tributary of the Olifants River, rising in the Drakensberg escarpment in Legalameetse Nature Reserve (altitude between 1,400m to 1,600m). The Selati flows for 3-5 km in the mountainous area, then drops over the escarpment into the Lowveld, which consists of a relatively flat and low-lying mixed savanna vegetation (500-600 m above sea level) (Chapman, 2006). According to Palmer *et al*. (2004), the water quality in the upper Selati River, where it emerges from the escarpment, is very good. However, the water quality is affected downstream by agricultural activities and human settlements close to the escarpment (Chapman, 2006). Within the middle to

lower reaches, the Selati River flows through the Selati Game Reserve which covers an area of about 27,000ha. The reserve is typical of the savanna grassland biome with a great diversity of habitats. After exiting the Selati Game Reserve, the river flows through the town of Phalaborwa before it joins the Olifants River. At Phalaborwa, the Selati River is heavily polluted due to mining and industrial activities (Ashton *et al*.,2001; RESILIM internal report, 2014).

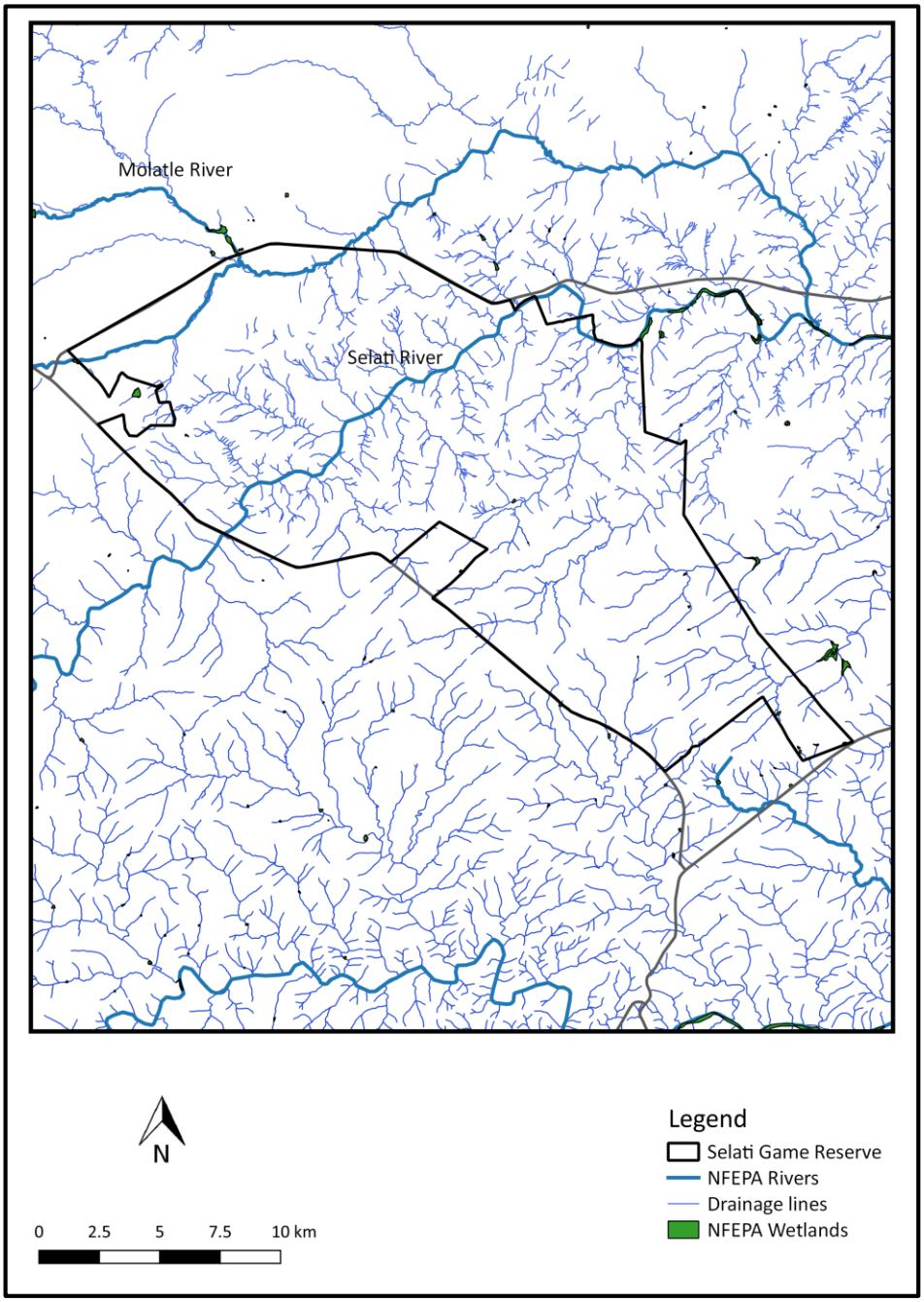


Figure 2.6: Drainage and hydrology of Selati Game Reserve.

The Selati River, which flows in an easterly direction through the north-west of the reserve, is classified as a Freshwater Ecosystem Priority Area (NFEPA) river (Figure 2.6). In addition, there is an unnamed tributary to the Molatle River, which flows through the northern section of the reserve, which is also

classified as an NFEPA river. There are also a small number of NFEPA wetlands within the reserve. The implication of this is that Selati Game Reserve contributes towards priority national targets for the protection of water resources. The protection of the reserve is thus important in maintaining the ecological integrity of the Selati River.

The sub-division of land and the fencing of conservation areas in the savannas of the north-eastern Lowveld of South Africa began in the late 1960's. This broke the natural east-west herbivore migration and, because many of the fenced off areas did not have perennial water, artificial water points had to be constructed. The result is a network of artificial water points in the Lowveld supplying 'excess' surface water in these semi-arid areas.

Given the above, Figure 2.6 illustrates the current (yet dynamic situation) as regards the provision of artificial water points in Selati Game Reserve. The current water density of open artificial water points is approximately 1,310 ha per open water point (6 earth dams and 15 artificial water points) (Joubert *pers. comm*.).

2.6.6 Habitat and vegetation

The Selati Game Reserve is situated entirely in the Savanna Biome. Acocks (1988) divides the study area into Lowveld and Arid Lowveld, while Low & Rebelo (1996) classify the area as Mixed Lowveld Bushveld. According to the latest South African classification (Mucina & Rutherford 2006), the larger part of the vegetation of the Selati Game Reserve contains elements of Arid Lowveld and Mopani Veld (Acocks Veld Type 11 and 15 respectively - 1988). Mucina & Rutherford (2006) (Figure 2.7; Table 2.2) describe the vegetation as follows:

- Dominated in the central parts of the reserve by:
    - Phalaborwa-Timbavati Mopane Veld (including Mopane on red soils, mixed Mopane-*Combretum apiculatum* and mixed Mopane-*Combretum apiculatum-Acacia* spp.).
- The northern and southern sections of the reserve are dominated by:
    - Granite Lowveld (including *Combretum apiculatum* veld, mixed *Combretum apiculatum-Sclerocarya birrea* veld, *Terminalia sericea* veld and sodic areas).
- Rocky outcrops mainly in the west and the east dominated by:
    - Gravelotte Rocky Bushveld.

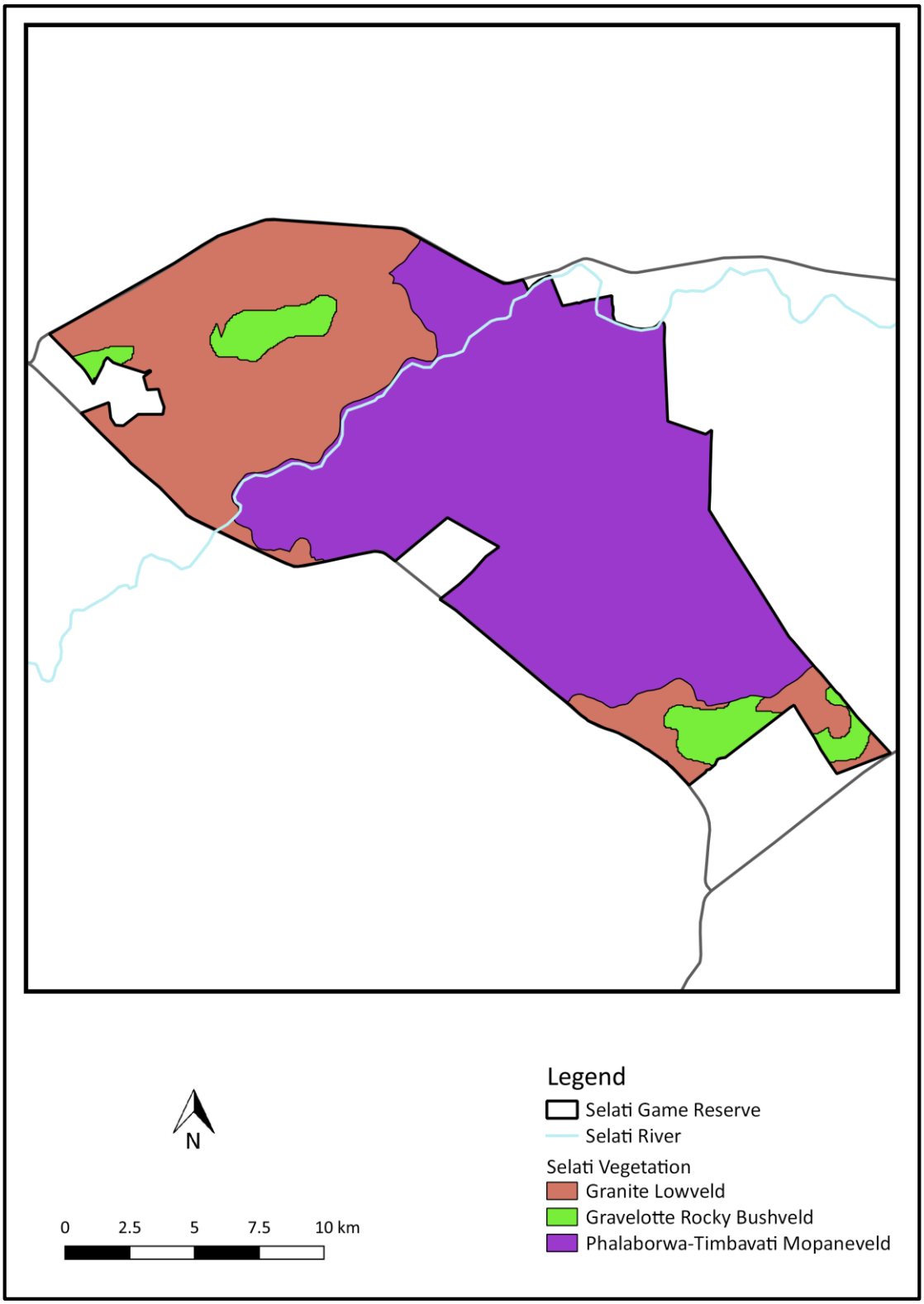


Figure 2.7 Vegetation of Selati Game Reserve (Mucina and Rutherford 2006).

Table 2.2 Important taxa and vegetation communities in Selati Game Reserve (Mucina and Rutherford 2006)

Taxa	Vegetation type		
	Phalaborwa-Timbavati Mopaneveld (SVmp7)	**Granite Lowveld (SVI3)**	**Gravelotte Rocky Bushveld (SVI7)**
Tall trees	*Acacia nigrescens* and *Sclerorya birrea* subsp. *caffra*	*Acacia nigrescens* and *Sclerorya birrea* subsp. *caffra*	*Pterocarpus angolensis*
Small trees	*Colophospermum mopane, Combretum apiculatum, Terminalia sericea, Acacia exuvialis, A. tortilis* subsp. *heterocantha, Albizia harveyi, Cassia abbreviata subsp. beareana, Combretum zeyheri, Dalbergia melanoxylon, Ozoroa engleri, Peltophorum africanum* and *Pseudolachnostylis maprounifolia*	*Acacia nilotica, Albizia harveyi, Combretum apiculatum, C. imberbe, C. zeyheri, Ficus stuhlmanii, Peltophorum africanum, Pterocarpus rotundifolius, Terminalia sericea, Acacia exuvialis, A. gerrandi, Bolusanthus speciosus, Cassia abbreviata* subsp. *beareana, Combretum collinum subsp. sulunse, Dalbergia melanoxylon, Gymnosporia glaucophylla, Lannea schweinfurthii var. stuhlmannii, Pavetta schumanniana, Plectroniella armata* and *Terminalia prunioides*	*Acacia caffra, Croton gratissimus, Cussonia natalensis, Ficus tettensis, Kirkia acuminate, Berchemia zeyheri, Bridelia mollis, Combertum apiculatum, C. molle, Dombeya rotundifolia, Englerophytum magalismontanum, Faurea saligna, Ficus abutilifolia, F. burkei, Heteropyxis natalensis, Ochna natalitia, Pavetta schumanniana, Rhus leptodictya, Schrebera alata, Sterculia rogersii* and *Vangueria infausta*
Succulent tree			*Euphorbia cooperi*
Tall shrubs	*Combretum hereoense, Euclea divinorum, Grewia bicolor, Maerua parvifolia, Strychnos madagascariensis* and *Tephrosia polystachya*	*Combretum hereoense, Dichrostachys cinerea, Euclea divinorum, Strychnos madagascariensis, Gardenia volkensii, Hibiscus micranthus* and *Tephrosia polystachya*	*Steganotaenia araliacea, Coptosperma supra-axillare, Hexalobus monopetalus, Mundulea sericea, Pouzolzia mixta* and *Psydrax livida,*
Low shrubs	*Clerodendrum ternatum, Commiphora africana, Hermannia glanduligera* and *Melhannia forbesii*	*Abutilon austro-africanum, Agathisanthemum bojeri, Aptosimum lineare, Barleria elegans, Clerodendrum ternatum, Commiphora africana, Grossypium herbaceum* subsp. *africanum* and *Panvonia burchelli*	*Barleria affinis, B. lancifolia, B. saxatilis* and *Psiadia punctulata*
Woody climbers	*Cissus cornifolia*	*Sphedamnocarpus pruriens* subsp. *pruriens*	*Cocculus hirsitus* and *Sphedamnocarpus pruriens* subsp. *pruriens*
Herbaceous climbers		*Rhynchosia totta*	

Taxa	Vegetation type		
	Phalaborwa-Timbavati Mopaneveld (SVmp7)	**Granite Lowveld (SVI3)**	**Gravelotte Rocky Bushveld (SVI7)**
Graminoids	*Brachiaria nigropedata, Digitaria eriantha subsp. eriantha, Eragrostis rigidior, Melinis repens, Panicum maximum, Pogonarthria squarrosa, Aristida congesta, Perotis patens, Schmidtia pappophoroides and Themeda triandra*	*Brachiaria nigropedata, Digitaria eriantha subsp. eriantha, Eragrostis rigidior, Melinis repens, Panicum maximum, Pogonarthria squarrosa, Aristida congesta, Bulbostylis hispidula, Chloris mossambicensis, Enneapogon cenchroides, Heteropogon contortus, Leptochloa eleusine, Perotis patens, Schmidtia pappophoroides, Sehima galpinii, Tricholaena monachne and Urochloa mosambicensis*	*Brachiaria serrata, Panicum maximum, Andropogon schirensis, Brachiaria nigropedata, Cymbopogon caesius, Eustachys paspaloides, Heteropogon contortus, Loudetia simplex* and *Setaria sphacelata,*
Herbs	*Evolvulus alsinoides, Heliotropium steudneri, Hemizygia elliottii, Ipomoea magnusiana and Kohautia virgata*	*Achyranthes aspera, Aspilia mossambicensis, Becium filamentosum, Chamaecrista absus, Commelina benghalensis, C. erecta, Cucumis africanus, Evolvulus alsinoides, Heliotropium strigosum, Hermbstaedtia ororata, Hibiscus praeteritus, Indigofera filipes, I. Sanguinea, Kohautia virgata, Kyphocarpa angustifolia, Leucas glabrata, Ocimum gratissimum, Phyllanthus maderaspatensis, Pupalia lappacea and Waltheria indica*	*Vernonia natalensis*
Succulent herbs		*Orbea rogersii and Stapelia leendertziae*	*Stapelia gigantea*

Because of the protection of these vegetation types, Selati Game Reserve make a significant contribution to the achievement of provincial and national biodiversity and protected area targets (Table 2.3).

Table 2.3 Vegetation types in Selati Game Reserve and their contribution towards protected area targets

Vegetation type	Threat status	Extent of veg type within the reserve (ha)	Proportion of extent of veg type within the reserve	Contribution to protected area targets
Phalaborwa-Timbavati Mopaneveld	Least threatened	17,543	7.78%	40.9%
Granite Lowveld	Vulnerable	9,523	0.48%	2.5%
Gravelotte Rocky Bushveld	Least threatened	1,554	4.81%	25.3%

We provide a description of vegetation patterns of the areas under conservation management to the west of the Kruger National Park at a spatial scale that allows for the meaningful examination and comparison of the structure, functioning, and ultimately effective management, of these savannas (Figure 2.8).

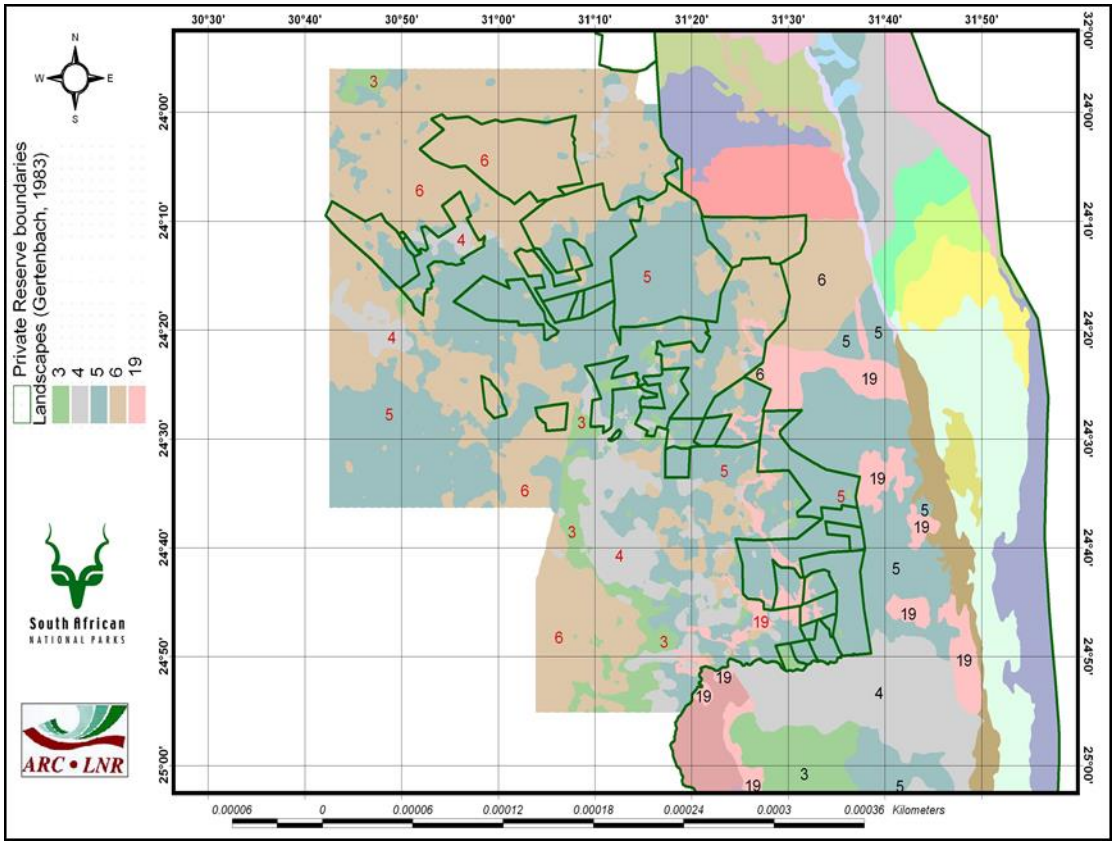


Figure 2.8: Landscape map of the area to the west of the Kruger National Park between the Sabie and Selati Rivers. Note that landscapes 6 (Peel *et al* 2007; Gertenbach 1983) predominates in the Selati Game Reserve

Seven plant communities were identified in the current study and satisfactorily accommodated within various topographical units of four extrapolated Landscapes of the Kruger National Park (Gertenbach 1983). While there have been more detailed mapping exercises within the Selati Game Reserve (e.g. van Rooyen *et al*. 2005), this contribution links to the co-ordinated effort extending into the Trans-Frontier National Park in Mozambique (Stalmans *et al.* 2004). Such an effort is essential for ecological monitoring purposes at a landscape scale across the private protected areas, Kruger National Park and Greater Limpopo National Park in Mozambique.

The plant communities and landscapes that are potentially represented in Selati Game Reserve include:

- Plant Community 5: ***Combretum apiculatum/Grewia bicolor*** **Low Closed Woodland.**
- Plant Community 6: ***Combretum apiculatum/Colophospermum mopane*** **Low Closed Woodland** (dominant)

Figure 2.9 presents a finer scale vegetation map for Selati game reserve (Joubert *pers. comm.*).

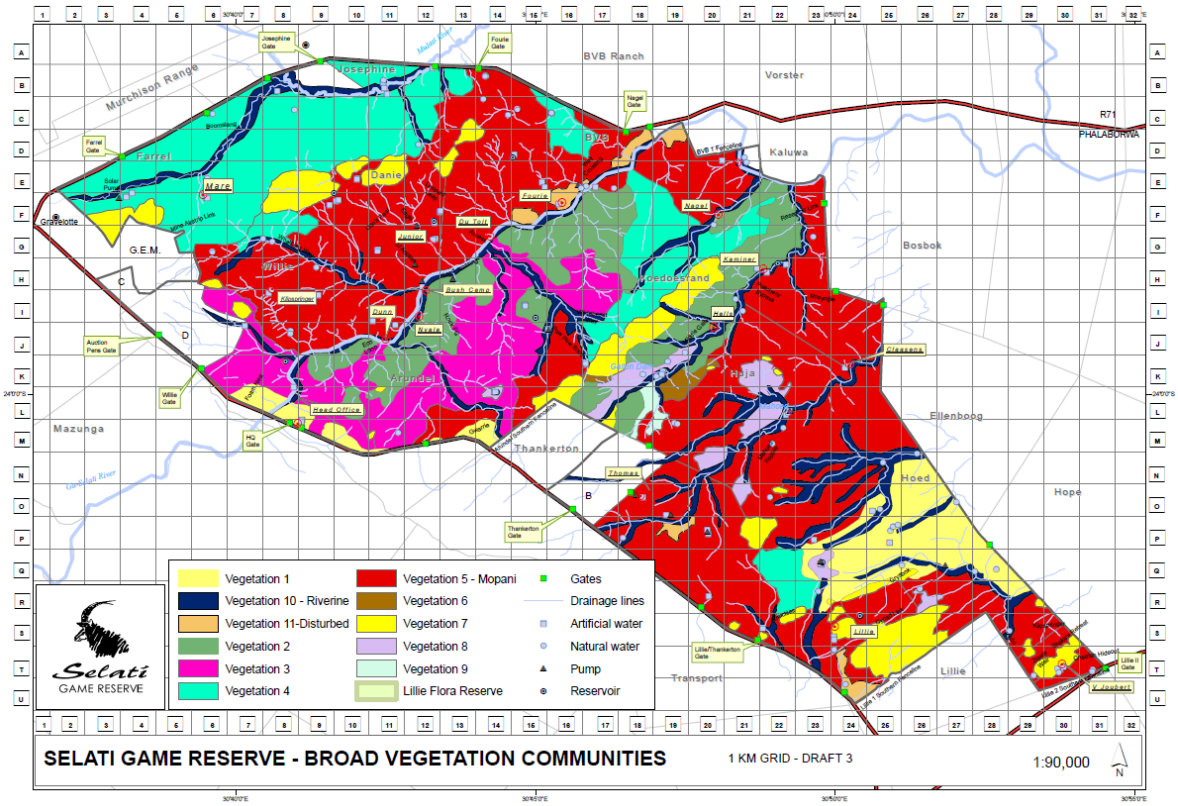


Figure 2.9: Vegetation of Selati Game Reserve (Joubert *pers. comm*)

2.6.7 Rare and threatened flora

There is one verified plant species occurring naturally within Selati Game Reserve that is classified as threatened, viz. *Encephalartos dyerianus,* which is Critically Endangered.

2.6.8 Vegetation component – current state

The ecological monitoring programme within Selati Game Reserve, which started in 1999/00 is aimed at furthering understanding of savanna functioning and providing sound guidelines for land users and policy makers to assist in contributing to the economic development, in harmony with social and environmental needs, of the region. The results indicate how rainfall, soil, herbivory, fire and grass/woody ratios influence the composition and cover of the herbaceous layer, an aspect that is often limiting in these grazer-dominated systems (Peel 2005). This analysis is used to propose broad guidelines for herbivore stocking density in areas of varying ecological potential and introduces the importance of controlling species mixes.

Herbaceous production varies as a function of the season, recent rainfall and defoliation in relation to the abundance value of species. In areas where a low erratic rainfall is experienced, a long run of data may be necessary to show anything other than the dependence of herbaceous production on precipitation. An estimate of herbaceous production as reflected in herbaceous standing crop is also important when making decisions regarding burning and fodder flow.

Belt transects are positioned to cover the major vegetation types throughout Selati Game Reserve. Transects are located within 20m of the roads edge, to negate time wasting when relocating, but are positioned far enough away to avoid any negative or positive effect as a result thereof. A Global Positioning System (GPS) is used to record the location of each transect. The following aspects are measured during the vegetation analysis of the ecological monitoring programme:

The herbaceous layer

Each transect is 100m in length and is clearly marked. The following parameters are measured on each transect:

- The herbaceous species nearest to each meter mark.
- The nearest perennial species to the meter mark.
- The distance to 1 and 2 above (if nearest is not a perennial as an index of basal cover).
- The tuft diameter of the recorded species (as an index of the maturity of the herbaceous species).
- The tuft diameter of 1 and 2 above (if nearest is not a perennial species).
- A vertical projection above each meter mark determined the percentage canopy cover at the site.

Measurement of the nearest annual and perennial species is done for the following reasons:

- The opportunistic life cycle of annuals often results in the annual colonising a bare patch between the transect line and a perennial. By

measuring only, the nearest plant, one may get the impression that the perennial has disappeared whereas what has happened is that an annual has just grown between it and the transect line. It is therefore apparent that the distance to annuals is less than to perennials. An increase to the nearest plants obviously indicates a decline in basal cover, whereas a decrease in the distance indicates an increase in cover.

- Because of their persistent nature, perennial grasses have greater diameters than annuals. This has important consequences especially in terms of erosion, with larger tufted plants binding the soil and halting water run-off more efficiently than smaller tufted plants.

The woody layer

Each transect is 100m in length and is clearly marked. The following parameters are measured at each transect:

- All woody species within the belt transect (100m x 2m).
- Number of stems per rootstock.
- Species per height class (0-1m, 1.1-2m, 2.1-5m, >5m).
- Canopy spread cover (vertical projection above the line and the species).
- Elephant impact per site (Dominant species; where possible 10 individuals/height class; 7-point scale of impact; impact classes (branches, uprooted, bark, stems, dead, no impact).

Trends in herbaceous layer parameters

Long-term data indicates that the herbaceous layer in Selati Game Reserve has been maintained in a favourable condition, concerning the measured parameters. The landscape has generally high proportions of perennial grass species, good cover and a mean standing crop of 970 kg/ha over the past 19 years.

Data from the annual ecological surveys in Selati Game Reserve presents the latest situation as follows:

- Herbaceous species composition - Figure 2.10.
- Herbaceous species cover (distance) – Figure 2.11.
- Herbaceous species cover (tuft) – Figure 2.12.
- Herbaceous standing crop – Figure 2.13.

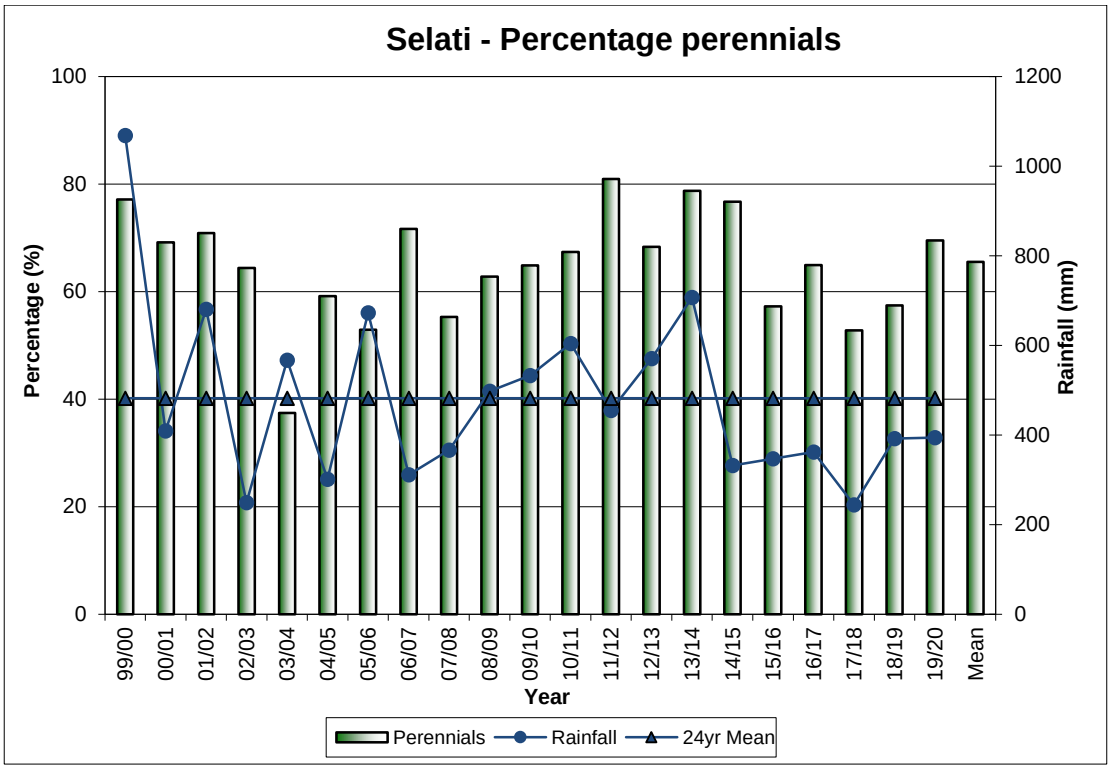


Figure 2.10: Proportion of perennial grasses recorded in Selati Game Reserve (1999/00 – 2019/20)

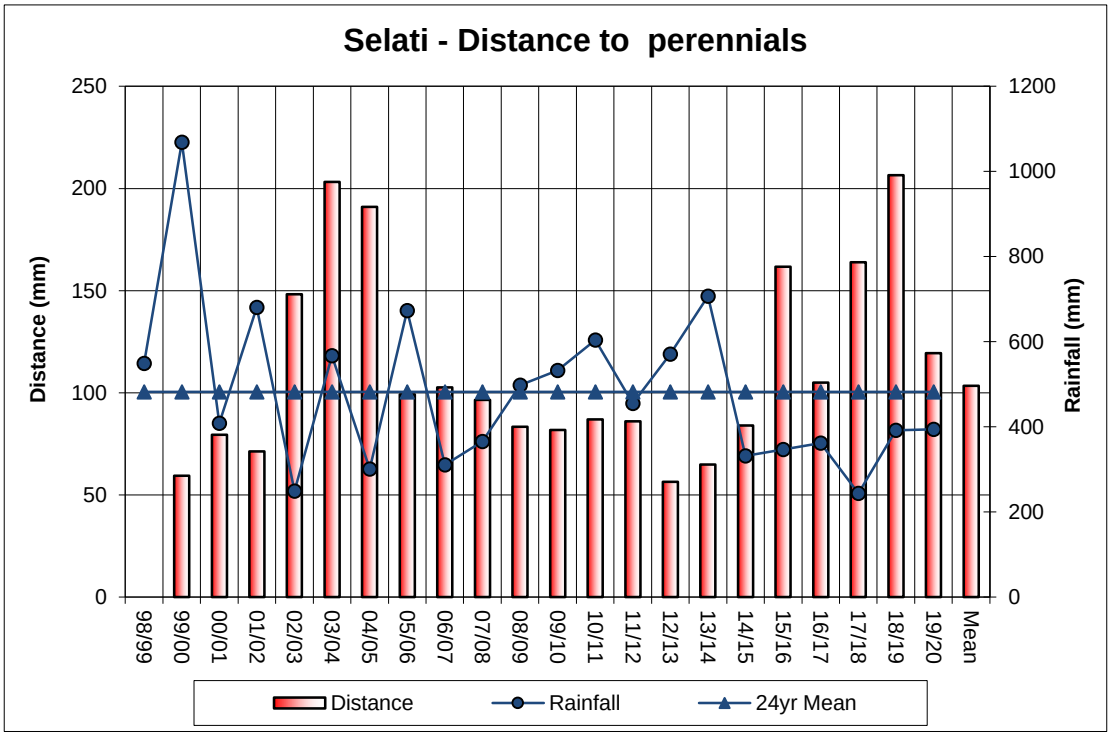


Figure 2.11: Perennial cover (distance measure) recorded in Selati Game Reserve (1999/00 – 2019/20)

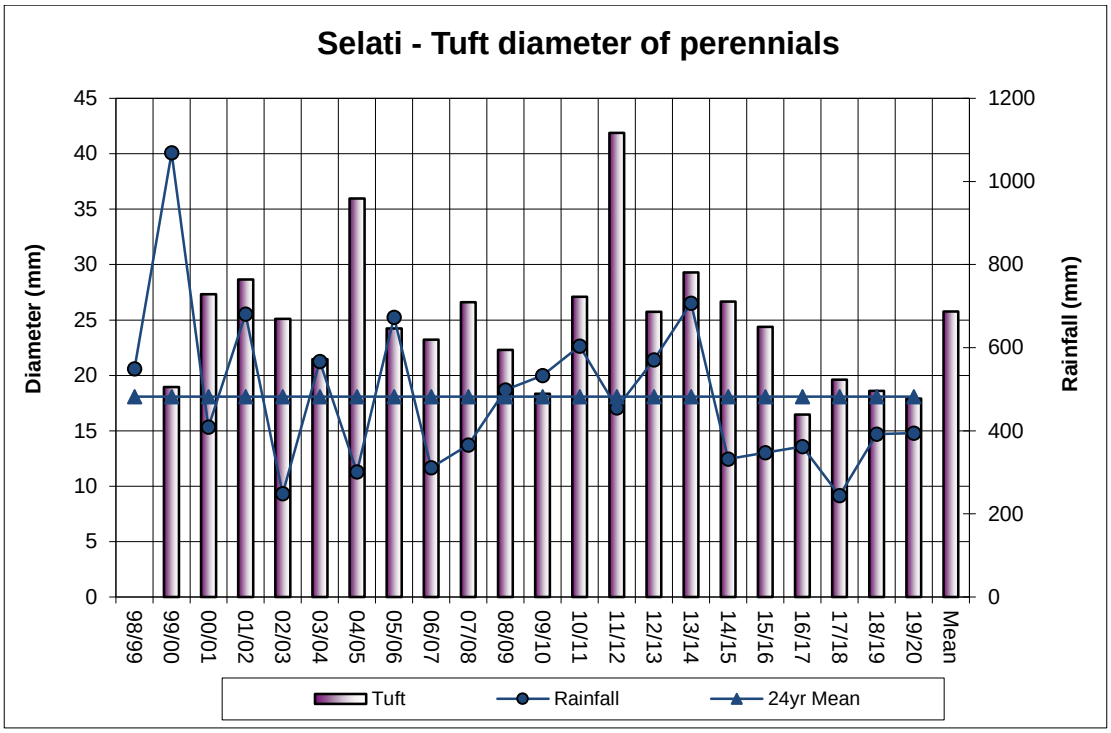


Figure 2.12: Perennial cover (tuft measure) recorded in Selati Game Reserve (1999/00 – 2019/20)

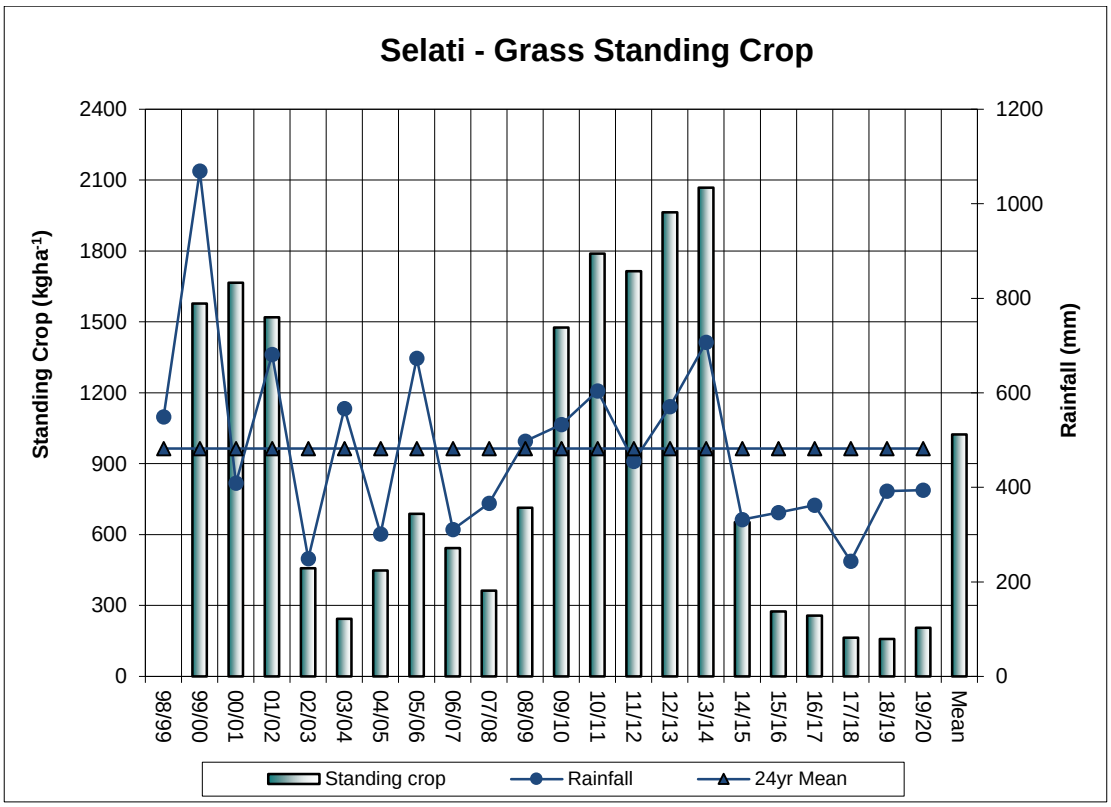


Figure 2.13: Grass standing crop recorded in Selati Game Reserve (1999/00 – 2019/20)

2.6.9 Fire regime

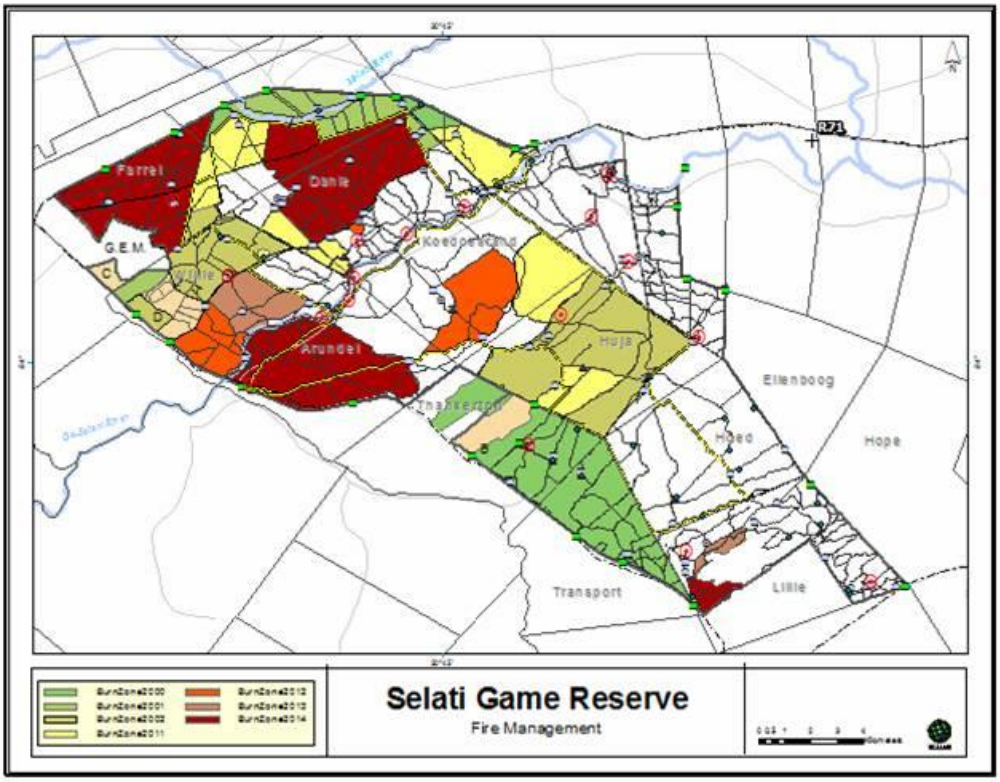
Contemporary ecological theory emphasises the importance of disturbance processes in maintaining the composition and structure of savanna ecosystems by continuously "resetting the clock", and fire is recognised as a critically important ecological disturbance process. The overarching fire management objective within Selati Game Reserve is to control the use of fire so that it can fulfil its role as a driving ecological force, maintaining grass layer vigour to promote diversity and to achieve the above within the constraints of legal provisions regarding the use of fire and the requirement of ensuring the safety of people, infrastructure and property. Fire plays a role as a management tool in rangelands, because it acts at a landscape level as a disturbance agent for creating diversity in time and space. There are three basic approaches to burning: avoiding burning, applying prescribed burning, and leaving fires to natural causes. In veld management, fire is mainly used as a tool for:

- Providing nutritious grazing by removing the moribund plant material that has accumulated from previous seasons.
- Managing undesirable woody or herbaceous invasive plants or weeds that reduce the productivity of the grass layer.
- Making firebreaks and burning portions of an area to stimulate grazing pressure in underutilised areas.

Other uses of fire are to manipulate plant populations; to maintain and create habitat for animals; to decrease the height of browsable material; to increase biotic and habitat diversity; to kill ectoparasites; to contribute to nutrient cycling; to protect property; and to reduce fire hazards.

Historical incidence of fire

Historically fires would have been a very important driving factor of ecosystem function in the region. It can probably also be assumed that in the past there was probably little impact by large mammals on the vegetation of the area, due to past management practices, and that fire was the main driver in determining the vegetation structure. The Kruger National Park is a prime example of a fire driven landscape within the greater landscape, with frequent fires. Large areas within the KNP burn annually due to the combination of frequent lightning strikes and few artificial barriers. Figure 2.14 presents the fire distribution data for the Selati Game Reserve since 2000 (Joubert *pers. comm*).



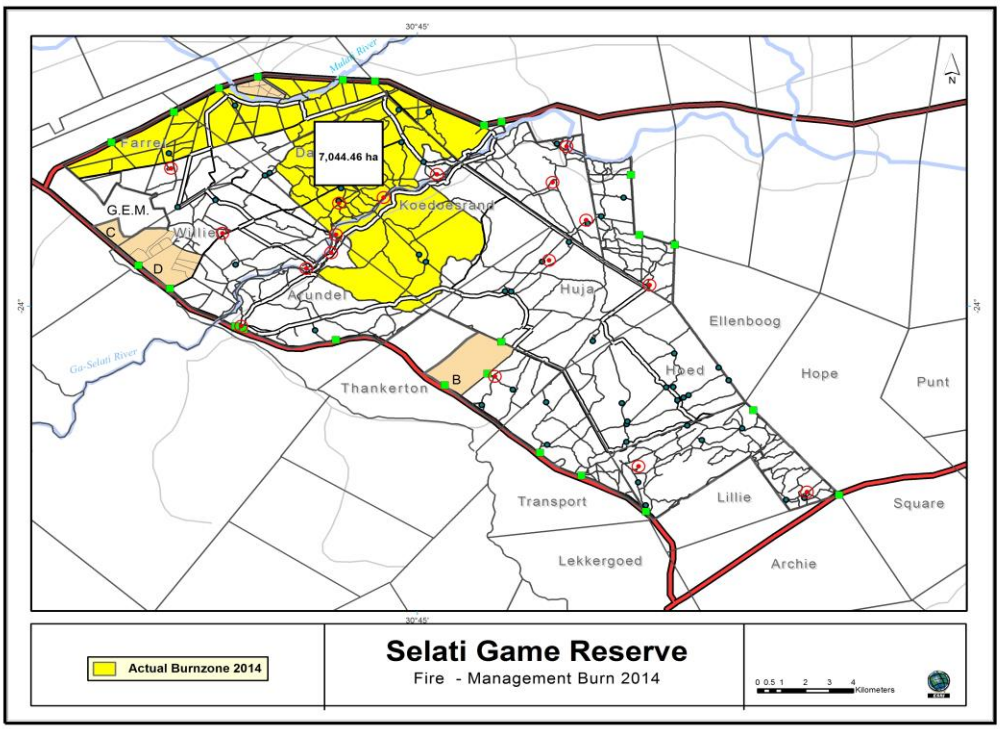


Figure 2.14: Distribution of fire in Selati Game Reserve (some areas have been burned more than once over the years – the shaded indicates the latest burn in 2014)

Prescribed burning

The effect of a fire varies with its frequency, intensity, the season of burning, and how many woody plants are killed.

- Fire Frequency. To maintain optimum productivity, field experience has shown that natural veld can be burned when a fuel load of around 4,000 $kgha^{-1}$ is reached. The frequency of fires may vary from annual burns on high-rainfall sour veld, to a burn every three to four years on mixed veld, to even longer or not at all on arid sweet veld.
- Fire intensity. Fire intensity is influenced by fuel load, fuel moisture content, relative humidity, ambient temperature and the wind regime. A headwind or downwind is required to remove accumulated organic material. It is therefore recommended that head fires be applied to the grass layer when the ambient temperature is below 20°C, the relative humidity of the air is below 50% and the soil surface is moist. These conditions keep the intensity of the fire low to the ground and cause the least damage to the grass layer. To control undesirable plants or encroaching bush (up to 3m in height), and to ensure a high fire intensity there should be a fuel load of more than 4 000 kg/ha, ambient temperature of 25°C or higher, relative humidity of 30% or less, and a wind speed of up to 20 km per hour. These conditions generally occur between 11:00 and 15:00 in late spring before the rainy season starts.
- Burn season. The timing of a burn should be such that the veld is able to recover quickly. The physiological condition and phenological state of the grass plants at the time of the burn rather than the season of burn determines the degree of the impact of the fire. Research has shown that there is no difference between the effect of a fire in the middle of winter and one immediately after the first spring rains. During winter, the growth of the grass plant slows, and therefore removing aboveground material at that stage causes less harm. It has been shown that a patch mosaic approach to burning may be beneficial to veld as cool fires remove moribund material but allow smaller trees to reach taller height classes. Burning from early winter reduces the chances of fires getting out of control under conditions of high winds, high temperatures and low relative humidity which may occur at the end of the dry season when fuel loads are high.

Firebreaks

Selati Game Reserve is a member of the Ba-Phalaborwa Fire Protection Association and as such takes every reasonable precaution to prevent fires spreading from the reserve onto neighbouring properties. This is done by means of perimeter firebreaks as well as strategically placed internal firebreaks. Perimeter firebreaks are maintained through grading between Selati Game Reserve and neighbouring areas (Figure 2.14). Agreement should be reached between neighbouring protected areas as to who is responsible for preparing the firebreaks between neighbouring areas. Selati Game Reserve

prepares strategic internal firebreaks along all the major property boundaries some of which are access roads, annually prior to the onset of the fire season (Figure 2.15). Strategic internal firebreaks that follow established roads are maintained by landowners. These firebreaks follow established roads and already have established inner strips, both of which enable firebreaks to be more easily and safely prepared. The sections of road for which the landowners are responsible are generally maintained as game drive roads for fire control purposes and the inner strips are cut and cleared rather than graded. However, the preparation of these firebreaks and the maintenance of the associated private roads and inner strips is at the sole discretion the relevant landowner or his designated agent.

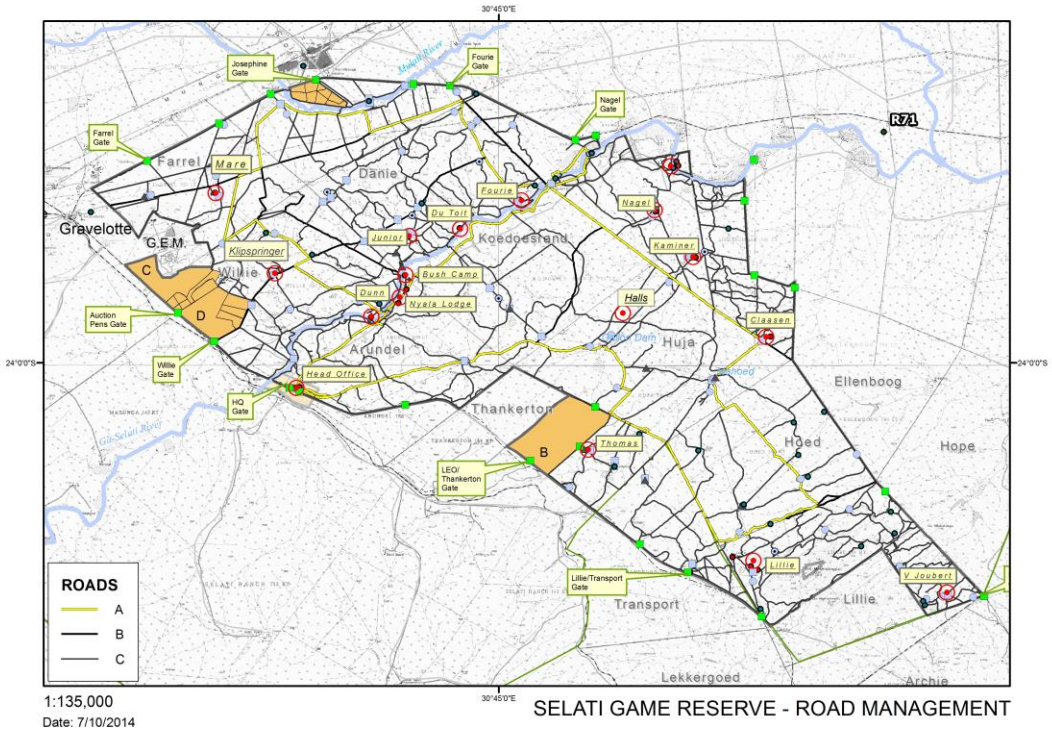


Figure 2.15: Location of perimeter and internal firebreaks within Selati Game Reserve (bold lines – B) and large internal roads (A) which act as the basis for fire management within the Selati Game Reserve

2.6.10 Invasive species

In terms of the National Environmental Management: Biodiversity Act (No.10 of 2004 – NEMBA) and the Conservation of Agricultural Resources Act (No.43 of 1983 – CARA), landowners are required to control and eradicate listed invasive alien species on their land. NEMBA categorises such plants on the following basis:

Category 1a: Prohibited - a person in control of a Category 1a Listed Invasive Species must comply with the provisions of section 73(2) of NEMBA; immediately take steps to combat or eradicate listed invasive species in compliance with sections 75(1), (2) and (3) of

NEMBA; and allow an authorised official from DEA to enter onto land to monitor, assist with or implement the combatting or eradication of the listed invasive species.

Category 1b: Prohibited/exempted if in possession or under control – a person in control of a Category 1b Listed Invasive Species must control the listed invasive species in compliance with sections 75(1), (2) and (3) of NEMBA. A person contemplated in sub-regulation (2) must allow an authorised official from DEA to enter onto the land to monitor, assist with or implement the control of the listed invasive species, or compliance with the Invasive Species Management Programme contemplated in section 75(4) of the Act.

Category 2: Permit required - Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the Act as species which require a permit to carry out a restricted activity within an area specified in the notice or an area specified in the permit. A landowner on whose land a Category 2 Listed Invasive Species occurs or person in possession of a permit, must ensure that the specimens of the species do not spread outside of the land or the area specified in the notice or permit. Unless otherwise specified in the notice, any species listed as a Category 2 Listed Invasive Species that occurs outside the specified area contemplated in sub-regulation (1), must, for purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to Regulation 3. Persons or organ of state must ensure that the specimens of such Listed Invasive Plant Species do not spread outside of the land over which they have control.

Category 3: Prohibited - Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of NEMBA, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of the Act, as specified in the notice. Any plant species identified as a Category 3 Listed Invasive Species that occurs in riparian areas, must, for the purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to regulation 3.

Table 2.4 Identified listed invasive alien plan species that must be controlled within the reserve in terms of NEMBA

Scientific name	Common name	NEMBA category	Status
Agave americana	American agave	Not listed	Rare, localised in limited numbers
Agave sisalana	Sisal	2	Rare, localised in limited numbers
Ageratum conyzoides	Invading ageratum	1b	Rare, localised in limited numbers
Argemone mexicana	Yellow flowered Mexican poppy	1b	Localised in average numbers
Argemone ochroleuca	White Flower Mexican Poppy	1b	
Aristolochia elegans	Dutchman's pipe	1b	
Bauhinia variegata	Orchid Tree	1b	
Bidens bipinnata	Spanish blackjack	Not listed	
Bryophyllum delagoense	Chandelier plant	1b	
Cardiospermum grandiflorum	Balloon vine	1b	
Catharanthus roseus	Madagascan periwinkle	1b	
Cereus jamacaru	Queen of the night	1b	
Cirsium vulgare	Spear thistle, Scotch thistle	1b	Localised in average numbers
Cryptostegia madagascariensis	Madagascar Rubber vine	1b	Rare, localised in limited numbers
Datura ferox	Large apple thorn	1b	Localised in average numbers
Datura stramonium	Common apple thorn	1b	Localised in average numbers
Duchesnea indica	Wild strawberry	1b	Rare, localised in limited numbers
Echinopsis schickendantzii	Torch cactus	1b	Rare, localised in limited numbers
Ipomoea indica	Morning glory	1b	Rare, localised in limited numbers
Jacaranda mimosifolia	Jacaranda Tree	1b	Rare, localised at some lodges
Lantana camara	Lantana	1b	Localised in average numbers
Melia azedarach	Syringa	1b	Rare, localised in limited numbers
Nymphaea mexicana	Yellow water-lilies	1b	Rare, localised in limited numbers
Opuntia ficus-indica	Sweet prickly-pear	1b	Rare, localised in limited numbers
Parthenium hysterphorus	Famine weed	1b	Localised in average numbers

Scientific name	Common name	NEMBA category	Status
Pennisetum clandestinum	Kikuyu grass	1b in PAs	Rare, localised in limited numbers
Phytolacca octandra	Ink berry	1b	Individuals, widely distributed
Ricinus communis	Caster-oil plant	2	Individuals, widely distributed
Rubus flagellaris	Bramble	1b	Rare, localised in limited numbers
Senna didymobotrya	Peanut butter cassia	1b	Individuals, widely distributed
Senna occidentalis	Stinkingweed	1b	Individuals, widely distributed
Senna obtusifolia	Sickle pod cassia	Not listed	Individuals, widely distributed
Sesbania punicea	Red sesbania	1b	Individuals, widely distributed
Sesbania spinosa	Spiny sesbania	Not listed	Individuals, widely distributed
Spathodea campanulata	African flame tree	3	Rare, localised at some lodges
Tecoma stans	Yellow bells	1b	Rare, localised at some lodges
Thevetia peruviana	Yellow oleander	1b	Rare, localised at some lodges
Tradescantia fluminensis	Wandering Jew	1b	Rare, localised at some lodges
Tradescantia zebrina	Wandering Jew	1b	Rare, localised at some lodges
Xanthium strumarium	Large cocklebur	1b	Localised in average numbers

2.6.11 Fauna

Selati Game Reserve has a high diversity of fauna and can therefore be described as a keystone reserve within the GLTFCA as well as the Limpopo Provinces. The large mammalian, small mammalian, avian, reptilian and amphibian fauna has been well documented, with work still needed to be undertaken on the invertebrate and freshwater fauna of Selati Game Reserve.

Avifauna

Selati Game Reserve contains a wide variety of habitats and provides an ideal environment for a large variety of bird species. 310 verified bird species have been observed within the reserve of which 11 are listed as threatened species (Table 2.5).

Table 2.5 Threatened bird species that occur at Selati Game Reserve

Bird species	Scientific name	Threatened status
Woollynecked Stork	*Ciconia episcopus*	Vulnerable
Saddle-billed Stork	*Ephippiorhynchus senegalensis*	Endangered
Marabou Stork	*Leptoptilos crumeniferous*	Near Threatened
Black Stork	*Ciconia nigra*	Near Threatened
Cape Vulture	*Gyps coprotheres*	Endangered
Hooded Vulture	*Necrosyrtes monachus*	Critically endangered
Kori Bustard	*Ardeotis kori*	Near Threatened
Lappetfaced Vulture	*Torgos tracheliotus*	Endangered
Martial Eagle	*Polemaetus bellicosus*	Vulnerable
Secretary Bird	*Sagittarius serpentarius*	Vulnerable
Southern Ground Hornbill	*Bucorvus leadbeateri*	Vulnerable
Whitebacked Vulture	*Gyps africanus*	Critically endangered
Whiteheaded Vulture	*Trigonoceps occipitalis*	Critically endangered
Western Red-footed falcon	*Falco vespertinus*	Near Threatened

Amphibians

11 verified amphibian species have been recorded within Selati Game Reserve with two species, the Lowveld bullfrog (*Pyxicephalus a. edulis*) and the Mottled shovel-nosed frog (*Hemisus marmoratum*), being listed as Near Threatened.

Mammals

Historically, Selati Game Reserve will have carried a full complement of the megafauna traditionally associated with savanna ecosystems. Some 50 mammal species have been documented in the reserve to-date from observation records and specimens (Table 2.6). Results of the annual game count of large mammals since 1997 when the area was largely consolidated are presented in Table 2.7.

Table 2.6 Threatened mammal species that occur at Selati Game Reserve

Mammal species	Scientific name	Threatened status
African Civet	*Civettictis civetta*	Least Concern
African Elephant	*Loxodonta africana*	Vulnerable
African Wild Dog	*Lycaon pictus*	Endangered
African yellow bat	*Scotophilus dinganii*	Least Concern

Mammal species	Scientific name	Threatened status
Aardvark/Ant bear	*Orycteropus afer*	Least Concern
Banded Mongoose	*Mungos mungo*	Least Concern
Black Rhino	*Diceros bicornis subsp. minor*	Critically Endangered
Black-backed Jackal	*Canis mesomelas*	Least Concern
Blue wildebeest	*Connochaetes taurinus*	Least Concern
Buffalo	*Syncerus caffer*	Least Concern
Burchell's Zebra	*Equus burchelli*	Least Concern
Bushbuck	*Tragelaphus scriptus*	Least Concern
Bushpig	*Potamochoerus larvatus*	Least Concern
Cane rat	*Thryonomys swinderianus*	Least Concern
Cape clawless otter	*Aonix capensis*	Near Threatened
Cape serotine bat	*Neoromicia capensis*	Least Concern
Caracal	*Felis caracal*	Least Concern
Chacma Baboon	*Papio ursinus*	Least Concern
Cheetah	*Acinonyx jubatus*	Vulnerable
Common Reedbuck	*Redunca arundinum*	Least Concern
Dwarf mongoose	*Helogale parvula*	Least Concern
Giraffe	*Giraffa camelopardalis*	Vulnerable
Greater bushbaby	*Otolemur crassicaudatus*	Least Concern
Grey Duiker	*Sylvicapra grimmia*	Least Concern
Hippopotamus	*Hippopotamus amphibius*	Vulnerable
Honey badger	*Melivora capensis*	Least Concern
Impala	*Aepyceros melampus*	Least Concern
Kudu	*Tragelaphus strepsiceros*	Least Concern
Leopard	*Panthera pardus*	Vulnerable
Lesser bushbaby	*Galago moholi*	Least Concern
Lion	*Panthera leo*	Vulnerable
Nyala	*Tragelaphus angasii*	Least Concern
Pangolin	*Smutsia temminckii*	Vulnerable
Porcupine	*Hystrix africaeaustralis*	Least Concern
Scrub Hare	*Lepus saxatilis*	Least Concern
Serval	*Leptailurus serval*	Least Concern
Sharpe's Grysbok	*Raphicerus sharpei*	Least Concern
Side-Striped Jackal	*Canis adustus*	Least Concern
Small spotted Genet	*Genetta genetta*	Least Concern
Southern White Rhino	*Ceratotherium simum*	Near Threatened

Mammal species	Scientific name	Threatened status
Spotted hyena	*Crocuta crocuta*	Least Concern
Spring Hare	*Pedetes capensis*	Least Concern
Steenbuck	*Raphicerus campestris*	Least Concern
Tree squirrel	*Paraxerus cepapi*	Least Concern
Tsessebe	*Damaliscus lunatus*	Endangered
Vervet Monkey	*Chlorocebus phygerythrus*	Least Concern
Wahlberg's epauletted fruit bat	*Epomophorus wahlbergi*	Least Concern
Warthog	*Phacochoerus africanus*	Least Concern
Water mongoose	*Atilax paludinosus*	Least Concern
Waterbuck	*Kobus ellipsiprymnus*	Least Concern
White-tailed mongoose	*Ichneunia albicauda*	Least Concern

Table 2.7 Aerial count results for Selati Game Reserve (1998-2020).

Species	Year																					
	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
Impala	3544			2340	2623	3394	2170	4013	3695	4531	4101	2922	2274	2691			3754	3785	4007	2675	3605	2191	3320
Wildebeest	435			679	618	623	603	776	460	456	633	531	497	586			675	813	717	809	592	430	446
Zebra	320			314	339	388	353	469	334	355	383	301	422	435			484	671	648	483	485	382	422
Kudu	946			973	1129	866	919	1140	1020	1206	557	477	506	624			775	1041	1006	678	765	693	695
Giraffe	143			195	177	207	197	255	251	265	226	315	244	267			329	303	354	253	312	321	441
Waterbuck	358			516	490	492	279	461	583	484	352	353	350	374			354	301	399	200	184	210	152
Warthog	175			364	405	869	617	442	426	661	222	139	195	228			273	327	335	201	129	106	213
Elephant	59			66	67	72	85	84	75	67	71	61	75	84			115	112	102	114	115	138	143
Buffalo																							36
White rhino*																							
Hippo																							
Nyala	33			41	48	91	71	119	119	106	68	33	40	41			51	61	61	53	22	40	18
Black rhino*																							
Bushbuck	40			44	52	38	35	47	47	45	15	9	1	17			19	9	13	9	1	5	0
Sable	86			42	35	27	17	16	16	14	8	9	2	4			6	14	31	49	39	50	70
Eland	96			168	195	188	207	222	226	219	213	131	92	84			58	41	70	52	64	62	93

*Note: this data has been omitted for security purposes.

Elephant management

A National Norms and Standards document for the management of elephants in South Africa was published in terms of the National Environmental Management: Biodiversity Act (NEMBA) (ACT NO. 10 OF 2004) in 2008. In terms of these norms and standards, Selati Game Reserve has an elephant management plan that was submitted to LEDET and approved on the 18th of September 2017. The Selati Game Reserve has extended the range of elephant in the region. In addition to this elephant are required to enhance the tourism potential of this 'Big Five' reserve. Further, elephant are essential role players in the ecological functioning of savanna ecosystems in that, among others, they have a large impact on vegetation by opening densely wooded areas which may have positive and negative spin-offs. Positive include improved tree:grass ratio thus improving conditions for grazers. A more competitive grass layer will also facilitate the use of fire (thus reducing the need for bush control programmes). Elephant may contribute to a reduced grass layer due to high utilisation of this resource. In this instance while rainfall drives the system, grazing pressure can ultimately compromise grass composition and vigour (distance and tuft) of the individual grass plants. The negative effect that this may have on the limiting (for grazers) grass layer may have catastrophic effects on the grazer component during periods of increased environmental and concomitant resource stress. Elephant may reduce the woody layer to a height class that is accessible to browsers feeding at lower levels. On the other hand, elephant may open areas (destroy trees) to such an extent that other browser species are placed at a disadvantage and where the continued existence in certain areas of uncommon species may also be threatened.

Large herbivores such as elephant therefore generally dominate in terms of biomass in savanna areas. Their nutritional requirements may result in a greater impact on vegetation than other species in the community (Owen-Smith, 1992). They have an additional impact through trampling and breakage. Within the constraints of time and money, it is therefore important to quantify the impact of elephant on the natural resource base.

The general trend with elephant is an upward one in the longer term but stable through management in recent years. The proportion of mixed feeders in the Selati Game Reserve remains high. Given concerns relating to the perceived/real impact of elephant, an in-depth analysis of factors such as elephant impact, tree density and cover is ongoing.

The Selati Game Reserve is part of a system that is large enough, and suitable for the management of self-sustaining elephant populations in a natural environment. The plan is aimed at ensuring the long-term survival of elephants within the Selati Game Reserve and wider system in which they occur while promoting biodiversity and socio-economic goals that are ecologically, socially and economically sustainable. While it is important to recognise the charismatic and iconic status of elephants and the strong local and international support for their protection, proper regard must be given to the impacts of elephants on ecosystems as they are recognised engineers of

habitat change and their presence or absence has a critical effect on the way in which ecosystems function. It is critical that the Selati Game Reserve be managed in such a way as not to disrupt the ecological integrity of the ecosystems in which elephants occur while enabling the achievement of the management objectives for the Selati Game Reserve. This may include the sustainable use of hair, skin, meat and ivory products in an ethical and humane way while recognising their sentient nature and highly organised social structure.

Conservation management has led to the significant growth of elephant populations and human intervention may be necessary to ensure that any future growth occurs in a manner that does not result in the loss of biodiversity, ecosystem function and resilience or human life, or the compromise of key management objectives for protected areas.

Measures to manage elephants must be informed by the best available scientific information. To this end and in order to inform management to the principles of adaptive management the following is measured in the woody layer on an annual basis in the Selati Game Reserve:

- All woody species within the 100m x 2m belt transect.
- Number of stems per rootstock.
- Species per height class (0-1m, 1.1-2m, 2.1-5m, >5m.
- Canopy spread cover (vertical projection above the line and the species).
- Elephant impact per site (dominant species; 10 individuals/height class.
- Degree of impact (0=0%, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=90-99%, and 7=100%).
- Types of impact (branch/es, uprooted, bark, stems, dead, no impact).
- A system of marking undamaged trees larger than 5m has been initiated at each site. 1-3 large trees of different species are marked, photographed and a GPS position of the actual tree taken. These trees are re-assessed during the annual ecological monitoring programme.

Crude elephant densities (based on population estimates) throughout their range vary between 0.3 and 2.5 elephant/km^2. Stocking rates for situations where you do not have impacts beyond acceptable limits of change vary between 0.3 and 0.57 elephant/km^2. This is based on semi-arid savanna situations and derived from estimates at Murchison Falls (Laws 1970; Van Wyk & Fairall 1969). It is contended that at densities greater than two elephant/km^2 there will be a detrimental effect on the habitat. Thus, the Selati Game Reserve's density of 0.40 elephant/km^2 falls within the preferred management density of between 0.3 and 0.57 elephants/km^2 and < 2 elephant/km^2.

There are several options to manage elephant (Peel & Anderson 2016):

- Do nothing - a laissez faire approach would constitute a conscious decision to do nothing.
- Translocation - the first choice in removing large numbers of elephant is obviously to capture and translocate animals to areas whose owners wish to stock animals and that can adequately support them.
- Contraception - immunocontraception is largely regarded as a viable choice for elephant management tool where practicable.
- Range manipulation - in the immediate term, the only option for the Selati Game Reserve to manipulate elephant habitat is to close water points.
- Feeding programme – this option is considered impractical in an extensive wildlife system.
- Culling – it has been recognised that under circumstances where all other options for reducing an elephant population have been evaluated and rejected as not being practical, culling of elephant numbers will be the only management option left.

As previously stated, the aim of the plan is to ensure the long-term survival of elephants within Selati Game Reserve and the wider system in which they occur while promoting biodiversity and socio-economic goals that are ecologically, socially and economically sustainable.

Lion management

A Biodiversity Management Plan for African Lion (*Panthera leo*) was published in terms of Section 43 of the National Environmental Management: Biodiversity Act (NEMBA) by the Minister of Environmental Affairs in 2015. In terms of the management plan, Selati Game Reserve's lion population falls within those classified as managed wild lions, as they occur within the fenced area of the reserve.

The Biodiversity Management Plan identifies that giraffe, impala, kudu, warthog, wildebeest and zebra constitute the most favoured prey species, while the selection of sable and waterbuck rises when severe drought increases their vulnerability. The Biodiversity Management Plan further identifies that without careful monitoring and regulation of large predators, ungulate populations can decline more rapidly than managers expect.

The Biodiversity Management Plan identifies that threats to wild and managed lions are relatively minimal with limited impacts of poaching and issues such as the lion bone trade. The Biodiversity Management Plan does however identify that lions are particularly sensitive to over-harvesting, as the removal of pride males through hunting often results in infanticide by incoming males that kill the cubs to stimulate the onset of oestrus in females. Lions have been trophy hunted in line with the most recent guidelines and recommends that national guidelines for the trophy hunting of wild and wild managed lions.

The Biodiversity Management Plan identifies that there are no systematic studies on the impact of trophy hunting of wild and managed wild lions in

South Africa but the low numbers of lions hunted would suggest that trophy hunting does not impact the viability of wild and managed wild lion populations. The Biodiversity Management Plan identifies that it is generally recommended that lion quotas should be set at about 3% of the total population or that offtakes should not exceed 0.5 lions 1,000/km^2. As such any quota should be allocated at the reserve scale.

The Biodiversity Management Plan highlights that although trophy hunting of wild and wild managed lions in South Africa does not affect populations in any significant way, the hunting of young male lions is not sustainable and it is now widely recognised that wild and wild managed lions should not be hunted if they are less than six years of age.

The Biodiversity Management Plan identifies that although very few wild and managed wild lions are hunted in South Africa, they may generate 5-17% of the gross trophy hunting income on national levels and are an important species for the trophy hunting industry. According to the norms and standards, it is estimated that the total revenue from hunting wild and managed wild lions in South Africa is approximately R3 million per year. This amount is based only on the species fee and not the substantial additional daily rates associated with hunts.

The primary objective of the Biodiversity Management Plan is to improve the conservation status of lions with a key sub-objective being to maintain the current degree of protection of wild lions. The secondary objective of the Biodiversity Management Plan is to encourage the development of opportunities for economic and social benefits from responsibly managed wild, wild managed and captive lion populations, which includes a sub-objective to promote sustainable legal trade in lions and lion products. Key actions related to these objectives and sub-objectives include:

- The development and implementation of guidelines to support permitting processes.
- Ensure alignment of permit decisions between national and provincial legislation.

These objectives, sub-objectives and actions have implications for trophy hunting of lions within Selati Game Reserve, which could continue to undertake such activities in accordance with all legal requirements.

The Biodiversity Management Plan includes a monitoring and evaluation plan, which includes targets for the persistence of wild lions, economic opportunities and social benefits from the utilisation of lions. Monitoring and evaluation of the utilisation of lions within the Selati Game Reserve should contribute towards the understanding of these issues and the economic and social value of lion trophy hunting within the reserve. It should be noted that Selati is a member of the Lion Management Forum of South Africa.

Rhino management

A Biodiversity Management Plan for Black Rhinoceros (*Diceros bicornis*) was published in terms of Section 43 of the National Environmental Management: Biodiversity Act (NEMBA) by the Minister of Environmental Affairs in 2013. Two of the now extant ecotypes of black rhinos occur in South Africa, of which the southern central *Diceros bicornis minor* occurs within Selati Game Reserve. South Africa conserves about 79% of this subspecies in the wild and South Africa conserves three of Africa's seven IUCN key black rhino populations of continental significance. Selati is a member of the Black Rhino Range Expansion Programme, administered by WWF-SA and has a custodianship agreement with Ezemvelo KZN Wildlife, who donated the black rhino to the reserve as part of the meta-population management approach that has been adopted for them.

The long-term vision for the black rhino population is to 'contribute to the recovery and long-term persistence of the indigenous subspecies in natural habitat throughout their former range within South Africa and managed as part of a regional meta-population'. The meta-population goal is to have at least 3,000 *D. b. minor* in South Africa, with at least four *D. b. minor* populations greater than 100. The short-term conservation goal is to achieve population targets of an average South African meta-population growth rate of at least 5% per annum and meta-population size of at least 2,800 for *D. b. minor* by the end of 2020.

The achievement of the meta-population and conservation goals are to be achieved through six key components, which include population monitoring to provide accurate and precise information on black rhino populations to allow management to make informed decision and protection in an effort to minimise losses from illegal activities. Selati Game Reserve contributes towards the meta-population and conservation goals and plays an active role through monitoring of its black rhino population numbers and through protection to avoid and minimise losses through illegal activities.

Two subspecies of white rhinoceros are distinguished, the southern white rhinoceros, *Ceratotherium simum simum* (which occurs in the Selati Game Reserve) and the northern white rhinoceros, *Ceratotherium simum cottonii* (now thought to be extinct) (Peel & Stalmans 2010).

The primary objective, regarding white rhinoceros' conservation in South Africa, is to increase overall rhinoceros numbers in the country, to minimise loss of the remaining genetic diversity and to provide a buffer against potential losses through poaching and natural mortalities. To maintain the growth of the national herd, all white rhinoceros and each habitat type they occupy must be managed so that, within the constraints that reserve objectives may place on them, their breeding performance is optimised, death rates are minimised, and the forage resources are not compromised (Pierce 2016; Peel & Stalmans 2010).

To safeguard and protect the rhino populations of the Selati Game Reserve from rhino poaching, a dehorning program has been implemented which was first initiated in 2012. This initial intervention requires further follow-up

treatments at various intervals during the following years. Selati is also contemplating applying for captive breeding status for its rhino in an effort to be able to further secure their protection.

Invertebrates

The recording of invertebrates within Selati Game Reserve is ongoing and it is well understood that invertebrate fauna, within the reserve, constitutes the greatest component of species diversity. In terms of biodiversity and the provision of ecosystem services however, it is important to acknowledge that invertebrates are fundamentally important. A wide variety of aquatic invertebrate species including a number of dragonfly, damselfly, mayfly and caddis fly species have been recorded within the major river systems of the reserve. A wide variety of terrestrial invertebrates have also been recorded, including beetles, wasps, dung beetles, bees, flies and butterflies. The complete species list is currently still being populated and updated.

Fish

A total of 13 verified fish species have been recorded within Selati Game Reserve and surrounds of which only one species, *Barbus brevipinnis*, is listed as Near Threatened and one is listed as protected*, Labeobarbus polylepis*. This list is however not yet complete and new species are being added. Surveys and continuous ad hoc observations still contribute to the understanding of the fish diversity within the reserve.

Reptiles

55 verified reptile species have been documented within Selati Game Reserve and its surrounds, but the list is not yet complete. Surveys and ongoing ad hoc observations still contribute to the understanding of the reptile diversity within the Selati Game Reserve. Two threatened species have been identified within the reserve (Table 2.8).

Table 2.8 Threatened reptile species that occur at Selati Game Reserve

Reptile species	Scientific name	Threatened status
Aparallactus l. lunulatus	Blotched Centipede Eater	Near threatened
Nucras taeniolata ornata	Ornate Scrub Lizard	Near threatened

2.7 Cultural heritage

To date no cultural or historical sites have been recorded in the Selati Game Reserve.

2.8 Socio-economic context

The Selati Game Reserve is located within Ba-Phalaborwa Local Municipality. This municipality is a Category B Local Municipalities (Rural) which means that

it is a priority for the focus of state economic development projects. The Ba-Phalaborwa Local Municipality Integrated Development Plan (IDP) identifies the following challenges – poverty, inequality and unemployment.

The Ba-Phalaborwa municipality indicates tourism as one of the primary drivers for economic growth. The slogan for the municipality is 'The home of Marula and wildlife tourism' and with one of the strategic values stated as 'Conservation consciousness' which encompasses the 'deliberate and purposeful protection, preservation, management or restoration of wildlife and natural resources'

The 2016 STATS SA census indicates that there is a population of 168,937 people within the Ba-Phalaborwa Local Municipality. The Stats SA Census (2011) shows that the population was 150,495 of which approximately 33% of the population is below the age of 15 and 70% of the population below the age of 34 which represents a very young population distribution. The IDP puts the unemployment rate at 37.5%. The age dependency ratio is the ratio of dependents (people younger than 15 or older than 64) to the working-age population, those ages 15-64. Data are shown as the proportion of dependents per 100 working-age population. The dependency ratio within Ba-Phalaborwa Local Municipality is 53.3 (2016 – South African mean 52.41). The IDP highlights the role that tourism and conservation may play as a driver of economic development within the municipality.

Given the high levels of unemployment and poverty in many of the communities located within the Ba-Phalaborwa Local Municipality and other areas around Selati Game Reserve and the Greater Kruger Area, the employment opportunities offered by the Greater Kruger Area are one of the most important sources of local economic development. Most of the employees in Selati Game Reserve and the Greater Kruger Area, more broadly, originate from the surrounding communities and the salaries paid to them is channelled back to households within these surrounding areas. The Kruger National Park, surrounding privately-owned protected areas, including Selati Game Reserve, and numerous hotels, lodges, guesthouses and bed and breakfasts in the Lowveld are indicative of the attraction force of the region for tourism and its role as a major driver of socio-economic development both regionally and nationally. A study by Saaiman et al (2010) showed at that time that the multiplier value of the Kruger National Park is approximately R2 billion per annum, which further supports this rationale.

2.8.1 Community outreach and conservation projects

Being a privately-owned reserve and with no direct boundary contact with any communities, Selati Game Reserve may have few legal obligations towards any such neighbouring or nearby community. However, one cannot ignore the socio-economic setting in terms of its long-term impact on the integrity of Selati Game Reserve and the positive or negative relationship with neighbouring areas.

In common with many rural and former homeland areas, unemployment levels in the surrounding areas and the pressure on available land is high. It is quite logical that people living close to Selati Game Reserve should look at it as a source of potential benefits either directly (through resource utilisation) or indirectly (through employment and the provision of services).

The policy of Selati Game Reserve with regard to its neighbouring and nearby communities is to:

- Assist, through the development and management of the Reserve, in improving the quality of life of the disadvantaged communities living nearby (e.g. through controlled resource utilisation).
- Give preference to indirect rather than direct interventions (facilitation and provision of opportunities rather than outright financial support).
- Transfer of knowledge, skills and opportunities towards strengthening SMME development will be favoured.

The Selati Wilderness Foundation NPC (registration number 2018/090330/08) was established in 2018. The NPC is also registered as an NPO with the Department of Social Welfare (250-958 NPO) and with SARS as a Public Benefit Organisation. The primary objectives of the NPC are as follows:

1. Provide environmental awareness training programmes for pupils at schools from disparate communities and students at tertiary institutions with the aim of discovering the principles of conservation and sustainability and promoting the wellbeing of the ecosystem.
2. Offer support to rural schools, primarily in Limpopo, in the form of feeding schemes and infrastructural assistance.
3. Provide scholarships to students to pursue environmental studies in collaboration with similar organisations.
4. Advance protection of endangered species and other vulnerable ecological aspects through educational awareness and ongoing research projects pertaining to the natural environment.
5. Promote and support anti-poaching initiatives, particularly for the protection of the rhino population on the Selati Game Reserve and surrounding areas and protection of other threatened species of wildlife in general.

Currently all the Corporate Social Investment (CSI) projects (Bush Buddies, Gravelotte Primary school assistance) is carried out through the NPC. The NPC has also funded and supported the introduction of cheetah onto the reserve.

Education

Education, in particular environmental education, should be one of the reserve's focus areas as it is key to achieving long-term change. For the reserve, education remains an all-important aspect of the environmental education. In a competing world education from a very young age is becoming more and more relevant. The Selati Wilderness Foundation is currently

sponsoring the building and rehabilitation of a pre-school facility. In addition, the foundation is involved in upgrading the kitchen which will enable the feeding of the poorest of poor children attending the school. These projects will assist in the broad sense whilst targeted sponsorships assist to identify and develop opportunity for the poorest of poor children. The Selati Game Reserve Bush Buddies Programme is a unique concept developed to bring teenaged children from different backgrounds together. The aim of "Bush Buddies" is to establish lasting friendships using the natural environment

Environment

Selati Game Reserve aims to facilitate community engagement on conservation issues, increasing their involvement in wildlife, and encouraging youth participation in conservation through the "Bush Buddies" programme. On intervention weekends learners are subjected to various environmental and tourism topics. These intervention weekends are aimed at increasing environment awareness, responsible natural resource use and overall improved land management.

SECTION 3: POLICY FRAMEWORK

Section 41 of the National Environmental Management: Protected Areas Act (NEMPAA) requires the inclusion of a coordinated policy framework in a protected area's management plan. The policy framework that guides the development and management of Selati Game Reserve is nested within international and national legislation, as well as the internal governance of the reserve itself.

3.1 National legislation

As the management authority for Selati Game Reserve, the Selati Game Reserve Association is subject to the framework of the Constitution, national legislation and relevant policies such as the Policy for the Conservation and Sustainable use of South Africa's Biological Diversity, the National Biodiversity Strategy and Action Plan, and the National Protected Areas Expansion Strategy. This legislation and the associated policies provide the statutory basis for the protection, development and management of the reserve, including the ability to obtain permits and authorisations to undertake restricted or controlled activities within it.

3.3 Internal governance and policy framework within Selati Game Reserve

3.3.1 The Selati Game Reserve Constitution

The management structure of Selati Game Reserve is based on the Selati Game Reserve Constitution (amended 2018) (Appendix 4). There are several key aspects to the constitution:

- The objectives of the association are consistent with it being protected and managed as a nature reserve, based on sustainable utilisation principles.
- To promote, conserve and manage the abiotic and biotic components in a manner which promotes ecosystem functioning.
- The constitution establishes the Board, which is vested with and may exercise all such powers, functions and duties as may be required to carry out and enforce the objects of the association.
- The constitution allows for the appointment of a general manager, who reports to the Board, whose general duties are to promote the objectives of the association.
- The constitution is aligned with the National Environmental Management: Protected Areas Act in terms of its objectives, laws, rules and regulations.
- The erection and maintenance of game fencing around the extreme boarder of the properties comprising the Reserve.
- Support for local community development.

The constitution forms the overall basis for the management of Selati Game Reserve, as it sets the objectives for the reserve, establishes the Board and the position of the general manager. It establishes obligations of members in relation to the development and use of their land.

The memorandum of incorporation, various policies, protocols and codes of conduct address issues relating to various aspects and management of activities within the reserve. These include:

- Corporate status.
- Objectives.
- Powers.
- Membership.
- Representation of members.
- Member obligations.
- Termination of membership.
- Fencing and fencing out.
- Annual General Meeting.
- Special General Meeting.
- Quorum.
- Voting rights.
- Proxies.
- Amendments to the constitution.
- Election of executive committee and chairman.
- Resolutions.
- Reservations of rights of privacy and ownership.
- Annual subscription.
- Expenditure and special levies.
- Accounts.
- Conservation activities.
- Servitudes.
- Liability.
- Dissolution.
- Arbitration.
- Commercialisation.
- Building regulations and guidelines.
- A policy on commercialisation for eco-tourism.
- Conditions of entry into the reserve.
- A contractor's code of conduct agreement.
- Gate entry and exit procedures.
- A human resources policy.

- Traversing rights.
- A safety and security policy and procedure.
- Access road policy.
- Financial

3.3.2 Administrative structure for Selati Game Reserve

The organisational structure for Selati Game Reserve is set out in Table 3.1 and Figure 3.1. The figure depicts an organogram of the staff complement and positions required to enable the effective operation, management and protection of the reserve.

Table 3.1 The human resource requirements of Selati Game Reserve

Designated position	Quantity
General Manager	1
Research & Volunteer Manager	1
Maintenance Manager	1
Ranger Services & Security	1
Operations & Marketing	1
Lodge Services & Receptionist	1
Field Rangers	9
Boundary Patrol Scouts	0
Gate Guards	0
Fence Maintenance	3
Labourers	7
Cleaner	3
Gardeners	1
TOTAL	**29**

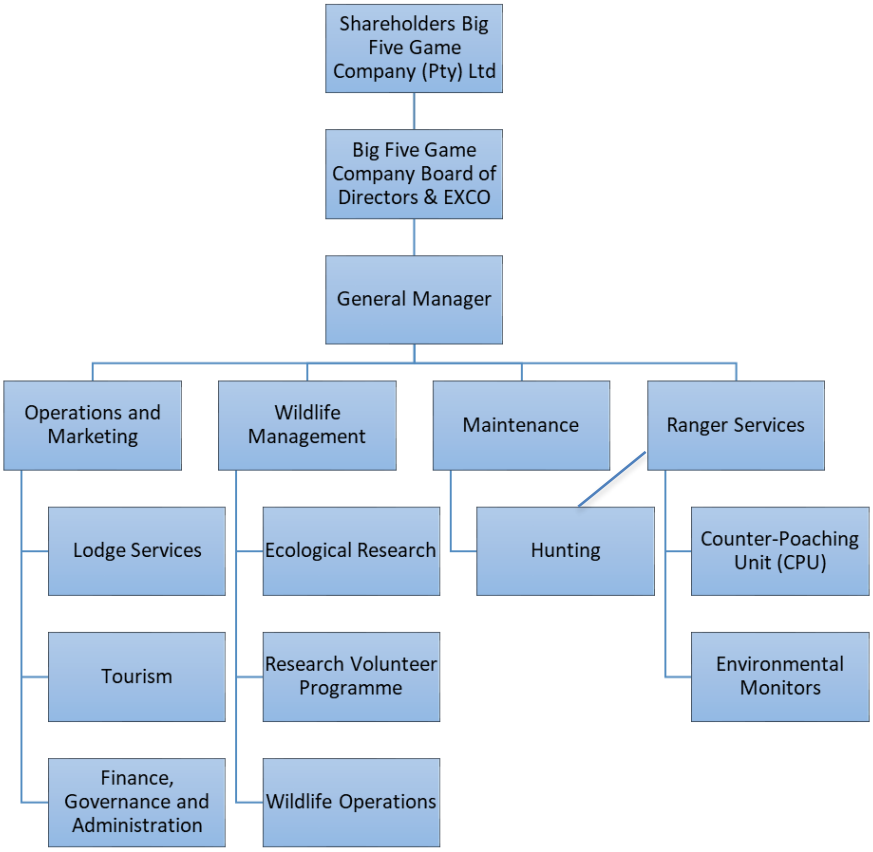


Figure 3.1: Organisational structure of Selati Game Reserve

SECTION 4: CONSULTATION

4.1 Stakeholder consultation process and mechanisms

Stakeholder involvement and support is an important aspect of effective protected area management. It is also a requirement in terms of Sections 39(3) and 41(2)(e) of the National Environmental Management: Protected Areas Act (NEMPAA). Accordingly, the development of this management plan has been undertaken through a collaborative process, involving the landowners of Selati Game Reserve and other key stakeholders.

The involvement of the reserve's landowners in this process is considered fundamentally important, as the management plan sets out their obligations and the obligations of the Selati Game Reserve Association and Big Five Game Company (Pty) Ltd, as the reserve's management authority and operational managers respectively, in protecting and managing the reserve. It details the legal obligations that they must meet in terms of NEMPAA and other legislation such as the National Environmental Management: Biodiversity Act (NEMBA). It sets the strategic direction and defines the primary activities and uses within the reserve. As such, it is critical that there is a proper understanding and a strong sense of ownership of the management plan amongst the reserve's landowners.

Consultation of key external stakeholders, in particular municipalities, LEDET, and other government departments, during the development of the management plan, has been undertaken in accordance with the requirements of NEMPAA.

4.2 Stakeholder expectations

Selati Game Reserve has many stakeholders who have a direct or indirect interest in its management and the consequences thereof. The reserve is comprised of many different properties, owned by different stakeholders who have a direct or indirect interest in its management and the consequences thereof, as a result, the stakeholders are both internal and external to the reserve.

It is important for the Selati Game Reserve management teams to duly consider the different expectations by the different stakeholders. It must however be realised that some of these expectations are in conflict with other expectations. It is also not possible to fully realise all expectations within the available natural and financial resources and without endangering some of the core attributes of the reserve. Neighbouring stakeholders include:

- East: protected areas (Abelana).
- West: Gravelotte and G.E.M mine.
- South: protected area and private wildife areas (Makalali-Pidwa, Balule Nature Reserve, which is part of the APNR, Karongwe, Mazunga and Skala).

- North: private wildlife and mines (P Mare, Warren Boerdery and JCI mines).

4.2.1 National and provincial government

The provincial governments of the Limpopo Province have identified the development of tourism as being one of their priorities in generating revenue and employment, which will:

- Contribute to the national and regional economy.
- Create meaningful job opportunities and skills development programmes for members of local communities.
- Stimulate the development of local communities by assisting in the development of SMMEs that can provide employment and generate income.
- Encourage the private sector to engage previously disadvantaged communities with a view to developing joint venture businesses.

4.2.2 Local government

Selati Game Reserve should strive to align its development and activities within the spatial development frameworks and local economic growth strategies of the district and local municipalities in the region.

4.2.3 Landowners

The expectations of the owners of Selati Game Reserve are expressed generally in the vision and objectives for the reserve. Their expectations can be summarised as follows:

- Owners expect a well-managed, well-protected natural area that satisfies them, their families and guests' desire to have a rich wildlife experience.
- Owners expect their property value to be maintained through sound management and protection.

4.2.4 Neighbours – private landowners

Neighbouring land users to the north, east and west all exercise the same type of land use, namely conservation, ecotourism, recreation and hunting and their interests and concerns mostly coincide with those of Selati Game Reserve.

4.2.5 Neighbours – local communities

Local communities are expected to have the following main interests and concerns:

- Selati Game Reserve is seen as a potential source of employment.
- The reserve harbours a range of natural resources of interest to local communities (thatching grass, firewood, medicinal plants etc.).

To date Selati game reserve's community-based CSI activities are limited to initiatives in and around Gravelotte and Letsitele as there is no significant community within close proximity to the Selati Game Reserve. With the exception of the Consolidated Murchison Mine located to the north of the Reserve; the district comprises mainly game related enterprises.

However, the future strategy should enable Selati to develop ongoing programmes further afield, aligned to nurturing a better understanding and appreciation of the environment.

Enterprise and Skills Development

The Selati Game Reserve plays a leading role in the Gravelotte Wild Life Producers Association.

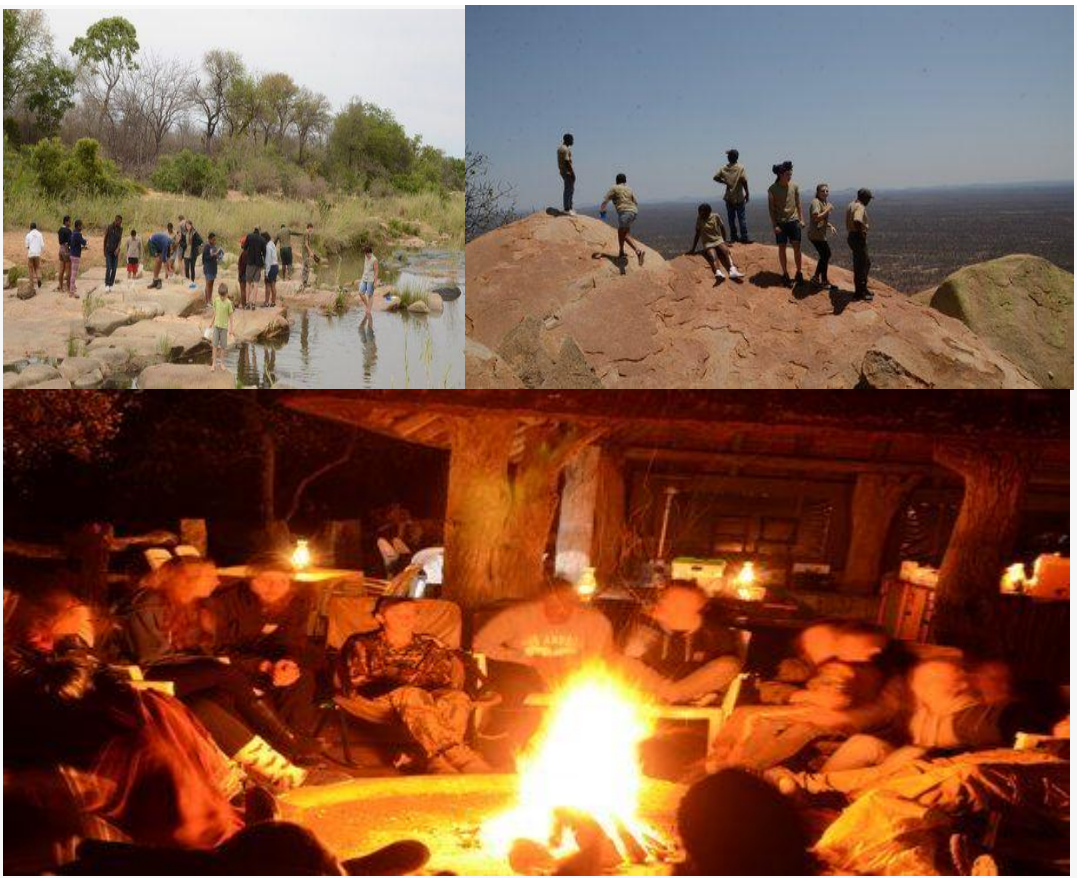
The Association is currently developing a model to assist communities set up game breeding programmes in an effort to advance the members' interests in the area of BEE oriented enterprise and skills development. These projects will be aimed at communities who have access to land, such as the beneficiaries of restitution claims.

Scholarships for Grade 7 Students

We annually award scholarships to two promising students from the Gravelotte community to attend Grade 7 at the Gravelotte Primary School.

Bush Buddies

Selati Game Reserve is dedicated to a conservation philosophy that embraces the human communities with whom we share this environment. Bush Buddies, the Reserve's own youth development programme, is our answer to the challenges posed by our unique context: a context in which young South Africans still struggle to connect across entrenched divides, and preserving the environment frequently falls to the bottom of a long national priority list. Founded in 2016, the Bush Buddies initiative brings secondary school learners from disparate communities together for a year-long programme of learning and interaction, coalescing around a series of wilderness weekends on the Reserve. Under the guidance of the reserve's managers, the learners came to grips with bush-craft basics: from identifying and tracking animals, to assessing river health, to stargazing, even dissecting an impala. These intensive, fun and inspiring excursions are supported by continued learning and interaction online throughout the year. The inaugural programme involved six learners from a leading Nelspruit independent school Penryn College – also the home of Penreach, one of Africa's largest education outreach initiatives – and six learners from Zivuko Secondary School in rural Nkowankowa, Limpopo. During the course of the year, the learners discover the principles of conservation and sustainability, with the aim of triggering a sense of personal investment and ownership in the wellbeing of the ecosystem. Just as importantly, they break down barriers and make friends that they would otherwise never have met – an experience that is hoped will colour their view of themselves and their fellow South Africans for the rest of their lives.



We are actively involved with a number of ongoing initiatives at the Gravelotte Primary School, the most recent being:

- Soil preparation for a piece of land ear-marked for a vegetable garden.
- Repair and extension of the jungle gyms for the pre-primary phase.
- Repair of the school entrance gate to increase school security (in partnership with Break Even company).
- Ongoing feeding scheme for the children to ensure they have at least one nutritious meal every day.
- Upgrade of a facility to function as Grade RR classroom.

The Selati Game Reserve Employee Scheme

Various initiatives are running:

- Staff members are supplied with seedlings and pesticides and have established their own vegetable garden.

4.2.6 Tourists

Guests visiting lodges in Selati Game Reserve expect to observe the maximum number and wide diversity of indigenous wildlife. A relatively stable situation with minimal seasonal movement and the Big Five in the area of operation is critical.

4.2.7 The general public and environmental groups

The extended media coverage and the legal processes surrounding the hunting in the protected areas are ample evidence of the degree of interest by the general public and environmental groups in South Africa. This group of stakeholders is by no means homogeneous. Pro- and anti-hunting sentiments as well as pro- and anti-development views can be found.

SECTION 5: STRATEGIC FRAMEWORK

5.1 Purpose of Selati Game Reserve

Section 41 of the National Environmental: Protected Areas Act (NEMPAA) requires that a protected area be managed in accordance with the purpose for which it was declared. The reserve's constitution identifies the objectives of the Selati Game Reserve Association, which is that it shall be to:

- Manage and conserve a wide diversity of indigenous species and their associated habitats using sustainable utilisation principles.
- Or provide for ecologically and aesthetically sustainable (non-consumptive and consumptive) use of the area for its owners, based on wildlife focused recreation and tourism.
- Or the following:
    - Conserve a diversity of indigenous species as a base for providing a high-quality African bush experience without causing a deterioration to sustainability and biodiversity of the Selati Game Reserve.
    - Optimise profitability through the sustainable use of natural resources (e.g. hunting, game sales, tourism, bush thinning, collection of thatching grass).
    - Ensure that the objectives of the association are consistent with it being protected and managed as a nature reserve, based on sustainable utilisation principles.
    - Promote, conserve and control wild game, flora and fauna, the soil and general environment within the reserve.
    - Establish a Board, which is vested with and may exercise all such powers, functions and duties as may be required to carry out and enforce the objects of the association.
    - Allow for the appointment of a general manager, who reports to the Board, whose general duties are to promote the objects of the association.
    - Ensure that animal offtake quotas and conservation of flora and fauna on a member's land shall be carried out strictly in accordance with the laws, rules and regulations laid down from time to time by the Department of Nature Conservation or any relevant statutory or regional authority and/or by the Board.

In being declared as a nature reserve, Selati Game Reserve has defined the purpose of the nature reserve in accordance with Section 17 of NEMPAA. The purpose of Selati Game Reserve is to:

- Protect representative areas of Phalaborwa-Timbavati Mopaneveld, Granite Lowveld and Gravelotte Rocky Bushveld.
- Provide landscape level biodiversity conservation, as part of protected area system of the Lowveld and the Great Limpopo Transfrontier

Conservation Area (GLTFCA) and contribute to the protection of the ecological integrity and biodiversity of the region.

- Protect part of the catchment of the Selati River and its tributaries, which include National Freshwater Priority Areas.
- Protect threatened, rare and endemic species found in the Lowveld region of southern Africa.
- Assist in the supply of sustained environmental goods and services.
- Provide for the consumptive and non-consumptive sustainable use of natural and biological resources, which includes broader animal offtakes.
- Contribute towards the tourism role of the Lowveld and GLTFCA, which is a flagship wildlife tourism destination that is a primary economic driver and generator of foreign exchange earnings in the region.
- Contribute towards socio-economic development as part of the GLTFCA.
- Manage, rehabilitate and restore degraded ecosystems and promote the recovery of threatened species.

5.2 Desired state for Selati Game Reserve

The ecological and socio-economic value of Selati Game Reserve extends beyond its immediate surrounds, where it forms a fundamental component of the protected area system within the GLTFCA. The reserve was created with the intention of setting aside a natural area for the enjoyment and benefit of its owners and future generations. This intention remains compatible with the biodiversity conservation imperatives that exist within the reserve and the role that it plays in contributing to and driving socio-economic development in the region.

Selati Game Reserve would not be a functional protected area if it were not for the dedicated members and staff. Ecotourism, hunting and the conservation of biodiversity go together, and it is essential that this is understood and accepted, as part of the southern African conservation philosophy of sustainable utilisation, which is enshrined in legislation, including NEMPAA.

Within this context, where the reserve is managed mainly for the sustainable use of natural ecosystems, the broad desired state may be defined as follows:

- To protect and maintain the biological diversity and other natural values of the reserve in the long-term.
- To protect the natural resource base and the land-use within the reserve and ensure the provision of ongoing benefits from this.
- To promote sound management practices for sustainability.
- To contribute to regional and national development.

5.2.1 Vision and mission

The vision for Selati Game Reserve is an aspirational statement that provides a long-term depiction of the reserve's future desired state.

VISION

The vision for the Selati Game Reserve is:

> *To create an enduring legacy by conserving and enhancing the biodiversity of the ecosystem through the astute and sustainable management of resources.*

MISSION

Achieving the vision for the Selati Game Reserve, its mission is:

> *To manage its natural resources that will allow for biodiversity development through a functioning ecosystem and in doing so create revenue generating opportunities for funding its operational needs and enhancing asset its value.*

The vision and mission statements speak to two primary goals. These goals are

1. Managing the natural resources of the reserve in a manner which preserves and enhances the resilience of the ecosystem.
2. Creating revenue generating opportunities funding the operational needs to maintain the natural assets and to enhance the value of thereof.

5.2.2 Values

The values of a place are those remarkable attributes that exemplify it, making it unique and worthy of its status as a protected area. The values are important in planning and management, as they are the aspects of the place that must be protected. The values of Selati Game Reserve include:

Natural values	▪ Selati Game Reserve demonstrates a high biodiversity of habitats due to the underlying geology, vegetation types, river systems and rainfall gradient. ▪ The reserve has a very high diversity of species including in the region of 50 large to medium sized mammal species, 310 bird species, a representative portion of species found in the South African Lowveld many of which are described for the KNP with 336 trees and shrub species; 75 grasses; 118 reptilian species and 35 amphibian species. ▪ The aesthetic attraction and sense of place associated with the reserve.
Ecosystem service values	▪ Selati Game Reserve is an important catchment area for the Selati River and provides an essential link in the protected areas system of the Lowveld.

	▪ Selati Game Reserve also falls in an ecotonal zone between the sour bushveld and sweet bushveld zones giving rise to a high diversity of species ▪ Selati Game Reserve also preserves partly the oldest Greenstone belt rock formations found in the Murchison Range.
Socio-economic values	▪ Selati Game Reserve contributes towards socio-economic development and community upliftment in the region through its biodiversity conservation and tourism activities. ▪ Selati Game Reserve provides for unique scientific research opportunities. ▪ Selati Game Reserve provides benefits to its landowners flowing from tourism and sustainable resource use.
Cultural and historical values	▪ Selati Game Reserve was one of the early privately-owned game reserves established within South Africa and forms part of an important historical landscape in the region.
Ecotourism values	▪ Selati Game Reserve is a high-quality tourism destination within Southern Africa, boasting outstanding landscapes and game viewing. ▪ Selati Game Reserve supports a wide variety of animal species including Big-Five game species, cheetah, wild dog and Black Rhinoceros. ▪ The reserve is a destination for high quality bird watching and guided walks.
Responsible resource use values	▪ Selati Game Reserve supports a wide variety of animal species including Big-Five game species. ▪ Selati Game Reserve is a model for ethical and sustainable wildlife offtakes that generates income for vital conservation management practices.

5.3 SWOT analysis

A strengths, weaknesses, opportunities and threats (SWOT) analysis has been undertaken of Selati Game Reserve (see Appendix 4). This is a strategic planning method used to identify the attributes of a reserve, which involves evaluating the internal and external factors that are favourable and adverse to achieving the reserve's objectives. The attributes, which provide a context for the objectives that have been identified for the reserve, are:

- Selati Game Reserve has the potential to be a premier wildlife tourism destination.
- The reserve is large, with diverse areas that are mostly natural.
- The reserve is located within a semi-arid climate with large, mostly unpredictable and certainly unavoidable, variations that have major impacts on vegetation dynamics, carrying capacity of wildlife and on management requirements.

- Ecological functioning for certain attributes is at a spatial scale that is smaller than that of the Kruger National Park.
- There is a diversity of owners and diversity of opinions.
- There is pressure by external stakeholders on decision-making.

5.4 Key performance areas

The management of Selati Game Reserve has been grouped into six key performance areas. These key performance areas and the reserve's high-level objectives have been translated into key deliverables, which form the basis for achieving the reserve's management goals. The key performance areas are:

- Governance – this relates to the administrative structures and oversight that is in place for the management of the reserve.
- Land use – this relates to the reserve's status as a protected area.
- Ecological management – which addresses a wide range of ecological and conservation management issues that support the reserve's species and natural resource base.
- Socio-economic benefits – which addresses the economic activities that ensure the financial viability of the reserve, as well as the role of the reserve within the broader socio-economic framework of the region.
- Safety and security – which addresses the need to ensure security of assets, the combatting of environmental crime, and issues such as disaster risk management.
- Land inclusion – which sets the requirements for the expansion of Selati Game Reserve.

Table 5.1 High-level objectives and key deliverable for Selati Game Reserve

Key performance area	High-level objective	Key deliverable
Governance	To ensure that appropriate administrative structures are in place to ensure that Selati Game Reserve is effectively managed. To ensure that cooperation and collaboration of Selati Game Reserve as part of the system of the Greater Kruger Area.	• Annual plans of operation include detailed budgetary requirements. • There are sufficient facilities, infrastructure and equipment to enable staff to effectively manage the reserve. • Infrastructure and equipment in the reserve are adequately maintained. • Infrastructure in the reserve does not cause environmental harm. • Activities that may lead to ecological degradation or pose threats to species and habitats of Selati Game Reserve and carefully controlled and managed. • Selati Game Reserve actively engages as a protected area within the GLTFCA.
Land use	To ensure that Selati Game Reserve is appropriately legally protected for biodiversity conservation purposes so that its landowners may continue to enjoy and benefit from the existing land use of the reserve.	• Selati Game Reserve is fully declared in terms of NEMPAA. • Selati Game Reserve is integrated within regional land-use planning frameworks. • The boundaries of Selati Game Reserve are accurately known and any deviations from cadastral boundaries are addressed through formal agreements. • A servitude register is developed for the reserve.
Ecological management	To manage the ecosystem, landscapes and species populations of Selati Game Reserve so that a meaningful contribution will be made towards their conservation. To cost-effectively restore and conserve the reserve's landscapes, ecosystems and biodiversity in a productive and aesthetic state that will contribute towards the reserve's vision and be sustainable within the climatic and geological constraints of the area.	• Critical ecological processes and functions are maintained within Selati Game Reserve. • Wildlife management and offtakes are undertaken based on ecological principles and the recommendations of appropriate monitoring processes and studies. • Elephant management is undertaken in accordance with the recommendations of an Elephant Management Plan. • An integrated approach to rhino management is adopted to address issues of illegal poaching. • Water resource management is undertaken in a pragmatic manner that considers implications at a landscape-level. • Fire management is undertaken based on ecological principles, the recommendations of studies undertaken for the site and the consideration of landscape-level issues. • Invasive alien plant species control measures are implemented in the nature reserve in a planned and systematic manner. • Areas that are impacted by soil erosion are identified, managed and, if necessary, rehabilitated.

Table 5.1 (continued)

Key performance area	High-level objective	Key deliverable
Socio-economic benefits	To manage Selati Game Reserve so that, without compromising the ecological and aesthetic objectives, the economic viability and investment value of the properties are maintained. To make investment opportunities available that are compatible with the reserve's visions and mission and involve the participation of members of the local community, wherever appropriate.	• Income generation for the conservation management of Selati Game Reserve is optimised through sustainable consumptive and non-consumptive utilisation of natural resources, including tourism. • Best-practice approaches to activities such as tourism and hunting are adopted in a spirit of cooperation and transparency with partners and stakeholders. • Support, cooperate and collaborate with protected areas within the GLTFCA in maximising socio-economic benefits to the region. • Implementation of an education, awareness and interpretation programme for Selati Game Reserve.
Safety and security	To comply with and enforce legislation pertaining to the protection, development and management of Selati Game Reserve.	• There is appropriate security and law enforcement within Selati Game Reserve. • Wildlife risks to neighbours, visitors, staff, infrastructure and livelihoods are minimised.
Land inclusion	To undertake any expansion of Selati Game Reserve in accordance with the requirements of the reserve's constitution.	• The potential value and risks of any land that is to be incorporated into Selati Game Reserve are carefully evaluated before a decision is made whether to include the land or not.

SECTION 6: ZONING

The purpose of the zonation of Selati Game Reserve is to identify types and levels of usage that are acceptable based on an area's sensitivity and resilience, and to manage visitor experience and inter-user conflict. Zonation may be used to identify areas in which appropriate uses and infrastructure may be located and developed.

6.1 Guiding principles for zonation

The zonation plan that has been developed for Selati Game Reserve utilises the same zonation categories as the Kruger National Park zonation and is aligned with the zonation of protected areas in the region. The guiding principles for zonation are that zonation:

- Is the foundation of all planning and development within a protected area, with the aim of ensuring its long-term sustainability.
- Ensures the integrity of the Selati Game Reserve's scenic quality by limiting human intrusions into the landscape.
- Accommodates a wide range of unique opportunities for experiences of solitude and nature-based recreation which do not conflict with the desired social and environmental states.
- Confines development within the reserve to areas that are robust enough to tolerate development and without detracting from the "sense of place".
- Rationalises and channels access into the reserve and internal movement through it.
- Sets the limits of acceptable change to minimise the loss of biodiversity and to reduce conflict between reserve uses.

6.2 The zoning system

In applying zonation to Selati Game Reserve, not all the zonation categories utilised in the Kruger National Park are relevant, as the reserve is much smaller than the Kruger National Park and does not have the same wilderness values. Accordingly, the wilderness and remote zones do not apply to Selati Game Reserve, but the focus is rather on the following zones:

Primitive zone	Areas in which most built infrastructure is excluded, with a primary focus on wildlife viewing on 4x4 roads and walking.
Low-intensity leisure zone	Areas in which lodges or camps and associated built infrastructure have been developed.
High-intensity leisure/ operational	This zone incorporates areas in which there are relatively high levels of development, including the reserve's management and operational areas, primary entrance and access areas. Interaction between groups of users in the zone is high.

Wildlife bomas/camps	This zone incorporates a double-fence boma for buffalo that are intended for release onto the reserve and a sable breeding camp that is used for limited breeding of sable antelope.

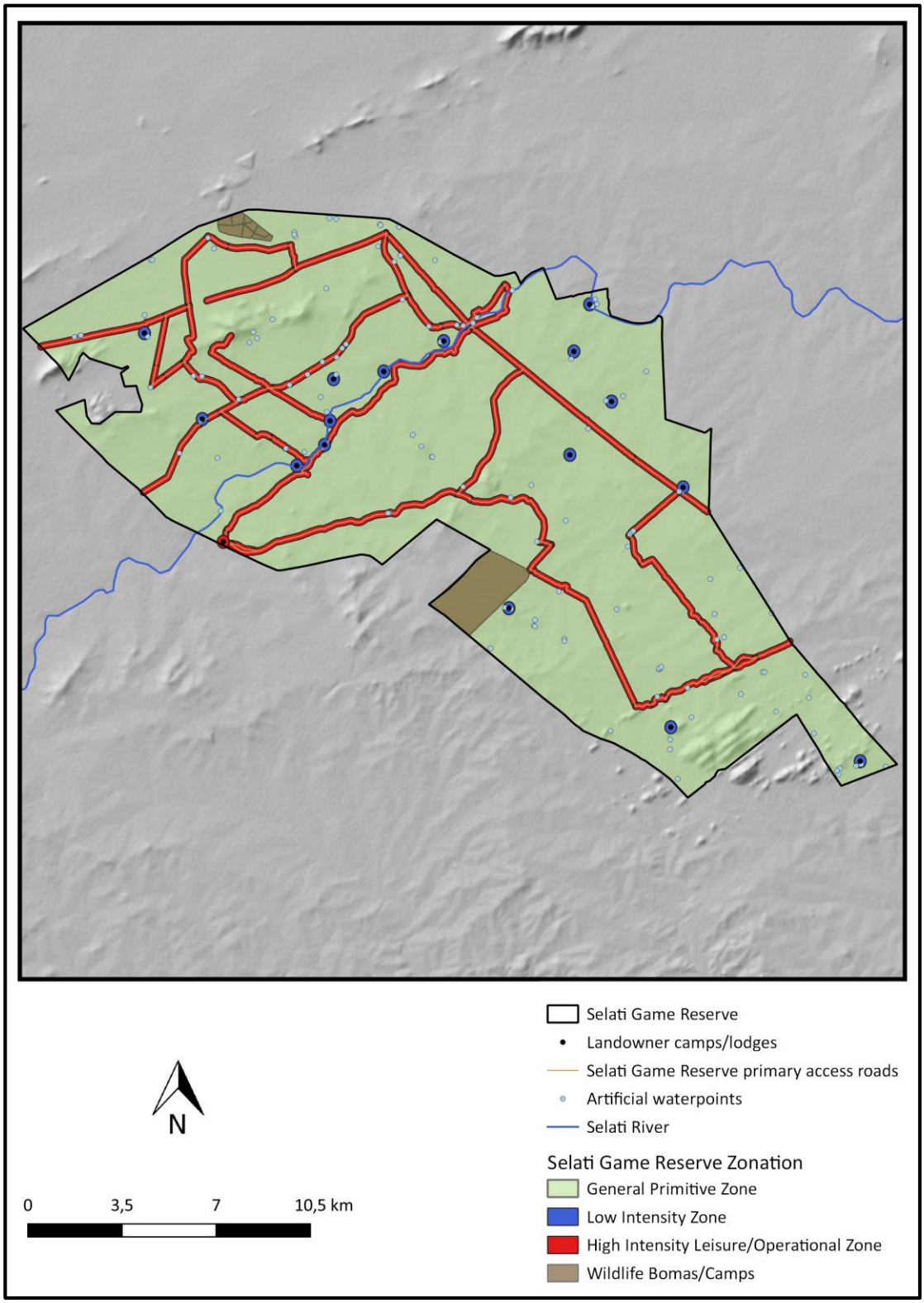


Figure 6.1: Zonation map of Selati Game Reserve

Primary Zone	Primitive	Low-intensity Leisure	High-intensity Leisure/ Operational	Wildlife bomas/ breeding camps
General Characteristics	Self-drive and guided access and walking are allowed in this zone on low maintenance, predominantly 4x4 game viewing tracks. Access in this zone is limited primarily to landowners, commercial lodge operators and reserve management. There may also be traversing agreements in place for this zone.	This zone incorporates areas in which built infrastructure for private or commercial tourism uses has been built. It includes lodges, house and associated buildings.	This zone incorporates the reserve's main entrances and access routes and built infrastructure to support the management and operation of the reserve. As such it consists of well-maintained graded roads and access areas and areas that incorporate built infrastructure and associated landscaping.	This zone is used as a temporary holding area for buffalo, which are to be released onto the reserve and for the breeding of sable antelope. As such it consists of fenced camps, some habitat manipulation for the buffalo and sable and supplementary feeding takes place within it.
Objectives	The main objective of this conservation-orientated zone is to provide a relative sense of solitude and relaxation in an environment that may be exposed to some sights and sounds of human activities. Although it is a place of quietness and naturalness, there may be some interaction between users. The zone is accessible on access-controlled roads. Development within this zone is limited and reflects and respects the natural environment.	The main objective of this visitor-orientated zone is to provide infrastructure for landowners and their guests in a natural environment. Development within this zone is for the private use of landowners or for commercial lodges. Development within this zone must be undertaken in accordance with the reserve's constitution policies that limit development to certain sizes and areas and should reflect and respect the natural environment.	The main objective of this visitor and management-orientated zone is to provide for primary access for visitors to properties, and for managerial and operational reserve activities in restricted and designated areas that are robust enough to tolerate development. This zone allows for a concentration of managerial and operational facilities.	The main objective of this zone is to provide a temporary holding area for species that are to be introduced onto the reserve and fenced camps for the breeding of sable. As such the zone allows for habitat manipulation and a degree of intensive management of sable antelope.

Limits of Acceptable Change: Biophysical	Some deviation from a natural/pristine state through the creation of game viewing roads and tracks is allowed, as well as limited infrastructure associated with picnic sites and hides, but care should be taken to restrict the extent of these.	Some deviation from a natural/pristine state through development is allowed but care should be taken to restrict the development footprints in accordance with the Selati Game Reserve Constitution and relevant regulatory framework.	The greatest level of deviation from a natural/pristine state is allowed in this zone, and it is accepted that damage to the biophysical environment associated with operational activities and facilities will be inevitable. However, care must be taken to ensure that the zone still retains a level of ecological integrity consistent with a protected area.	Some deviation from a natural/pristine state is allowed in maintaining the camps for the sable antelope and to allow for supplementary feeding and a degree of intensive management of the animals.
Limits of Acceptable Change: Aesthetic and Recreational	Activities which impact on the relatively natural appearance and character of the area should be restricted. Roads and tracks should be carefully designed with due consideration to issues such as sensitive vegetation, drainage and hydrology. Noise and light pollution should be kept to a minimum.	Activities which impact on the relatively natural appearance and character of the area should be restricted although the presence of landowners and their guests, and the facilities they require may impact on the feeling of wildness experienced in this zone. Infrastructure and facilities should be designed to fit in with the environment within which they are located to avoid aesthetic impacts. Noise and light pollution should be kept to a minimum and green technologies such as solar power should be encouraged.	Although it is inevitable that the relatively high levels of usage in these areas will impact on the wild appearance and reduce the wilderness characteristics of the area (solitude, remoteness, wildness, etc.), these should be managed and limited to ensure that the area generally still provides a relatively natural outdoor experience	This zone should largely maintain a relatively natural appearance although this is somewhat altered by the presence of fences used for the bomas.

Access and Roads	Access is for a low number of vehicles at a time to allow for operational activities or for guided and self-drive activities. Low volume access 4x4 routes can be accommodated. Heavy machinery such as trucks or large numbers of vehicles are only allowed along designated routes for limited periods of time.	Access is for a low number of vehicles at a time to allow for operational activities or for guided and self-drive activities. Low volume access 4x4 routes can be accommodated. Heavy machinery such as trucks or large numbers of vehicles are only allowed along designated routes for limited periods of time.	The zone is relatively motorised, including visitor, operational and delivery vehicles on designated routes. Care must be taken to distinguish between roads that serve as delivery routes within the reserve, link roads between camps, and game viewing roads, to minimise conflict between users.	Access into this zone if restricted to a low number of vehicles at a time to allow for operational activities and for limited guided and self-drive activities.

6.3 Implication of zonation

The zonation scheme serves as a broad guideline for the planning and management of Selati Game Reserve. Regardless of the zonation adopted, due process must be followed for development proposals even in the High-intensity Leisure Zone. The setting of houses, camps and lodges has historically been and will in future probably continue to concentrate on the riverine fringe. This habitat plays a vital ecological role in the wider landscape in terms of its forage reserves in winter and its functional linkage as a corridor for many species. It will therefore be important to carefully assess the requirements for privacy (developments sheltered by dense riverine vegetation), suitable microclimate (large shade trees in riverine areas) and aesthetics in terms of their potential impact on the carrying capacity and functioning of these corridors. This fine-scale planning must be addressed on a case-by-case basis.

6.4 Buffer protection and regional planning

6.4.1 The Kruger National Park buffer zone

The Kruger National Park (KNP) management plan address its buffer zone, which extends beyond the Greater Kruger Area and thus includes Selati Game Reserve. It is logical that consideration of buffer zone issues and regional planning be aligned amongst all the protected areas that form part of the system of the Greater Kruger Area and the GLTFCA. In this regard, the KNP management plan identifies that its buffer zone will serve as a basis for:

- Helping to identify the external impacts that would adversely affect the reserve.
- Integrating long term protection of the park into the Spatial Development Frameworks (SDFs) of municipalities and other local authorities, as per the Land use management scheme (LUMS).

- Identifying the focus areas in which park management need to consolidate or expand within compatible land uses through a range of contractual and cooperative agreements.
- Guide management interventions to address risks and threats such as invasive alien species management, restoration programmes, safety and security management.
- Support catchment and rangeland management programmes through cooperative partnerships.
- Identify the focus areas for community beneficiation projects and sustainable economic development opportunities such as the wild activity developments at entry gates.

The KNP management plan identifies three categories within its buffer zone – priority natural areas, catchment protection and viewshed protection.

Priority natural areas

The buffer zone comprises both the KNP's conservation expansion and land consolidation footprint, which further serves as a defensive buffer to the park. The land use buffer zone is inclusive of the priority natural areas required for the long-term persistence of biodiversity in and around the park through the protection of patterns and processes. Additionally, priority natural areas typically include areas identified for future park consolidation, ecological and climate change corridors and linkages as well as reasonably natural areas of high biodiversity value. The integrated land use zone allows for protection to core biodiversity areas. Inappropriate development and land use not compatible with conservation should be opposed in this area. Selati Game Reserve falls within this category, enabling connectivity and the continued movement of species across the landscape.

Catchment protection

Catchment protection areas are landscape level areas important for maintaining key hydrological processes within the KNP and the Greater Kruger Area. Inappropriate development (dam construction, loss of riparian vegetation etc.) that will negatively affect the hydrological processes should be opposed. Control of alien vegetation and soil erosion as well as appropriate land care should be promoted.

Viewshed protection

Viewshed protection areas aim to preserve the aesthetic quality of the visitor's experience in a protected area. Within these areas, any development proposals should be carefully screened to ensure that they do not impact excessively on the aesthetics of the KNP, the Greater Kruger Area and the GLTFCA. The areas identified are only broadly indicative of sensitive areas, at a fine scale many areas within this zone would be perfectly suited for development. In addition, major projects with large-scale regional impacts need to be addressed even if they are outside the viewshed protection zone.

6.4.2 Municipal planning

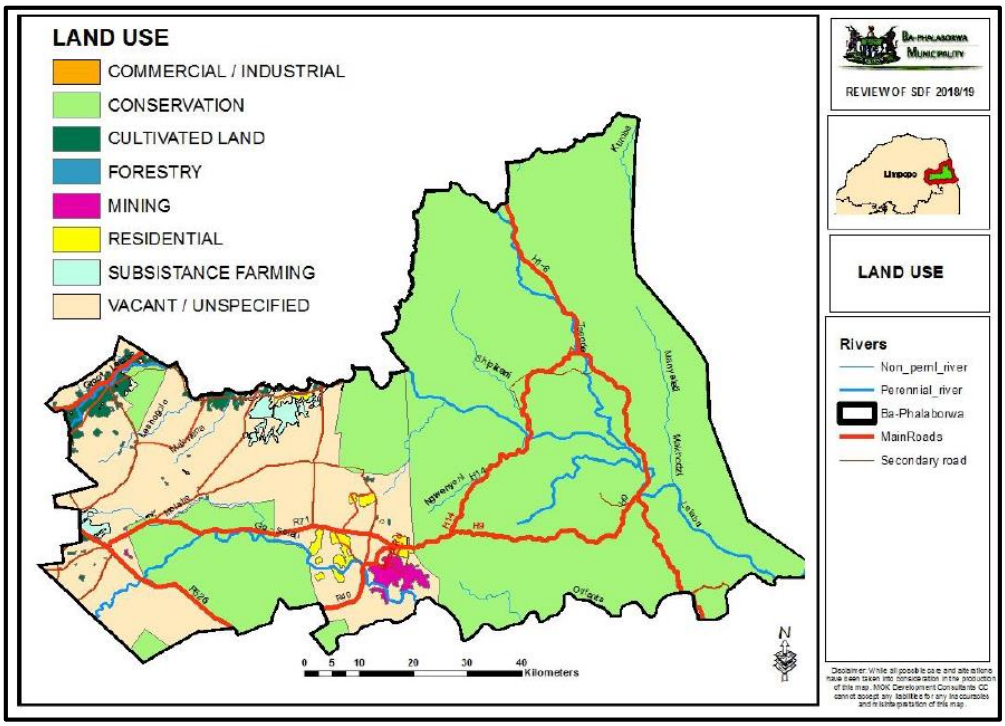


Figure 6.2: Ba-phalaborwa Spatial Development Framework (2019-2024)

The Ba-Phalaborwa Local Municipality Spatial Development Framework correctly identifies the land-use at Selati Game Reserve as "Conservation" (Figure 6.2). It is important that Selati Game Reserve be accurately reflected as a protected area in municipal planning documents and that the land be zoned in the municipality's Land Use Management Scheme for conservation, as it has implications for the types of land-use that may be allowed in proximity of the reserve and the types of development that may take place around it.

6.4.3 Zone of influence

The Management Effectiveness Tracking Tool (METT) describes a zone of influence as "an external planning domain" or a "non-legislated area drawn on a map to inform the site manager as to where he/she should be involved in land and water use planning. It differs from the legislated EIA Buffer Zone, which is an arbitrary 5 km line drawn around a protected area." This differs from the buffer zone around the Greater Kruger Area in that it is the area that land, and water use planning will directly impact on Selati Game Reserve. Accordingly, a zone of influence has been delineated for the reserve (Figure 6.3).

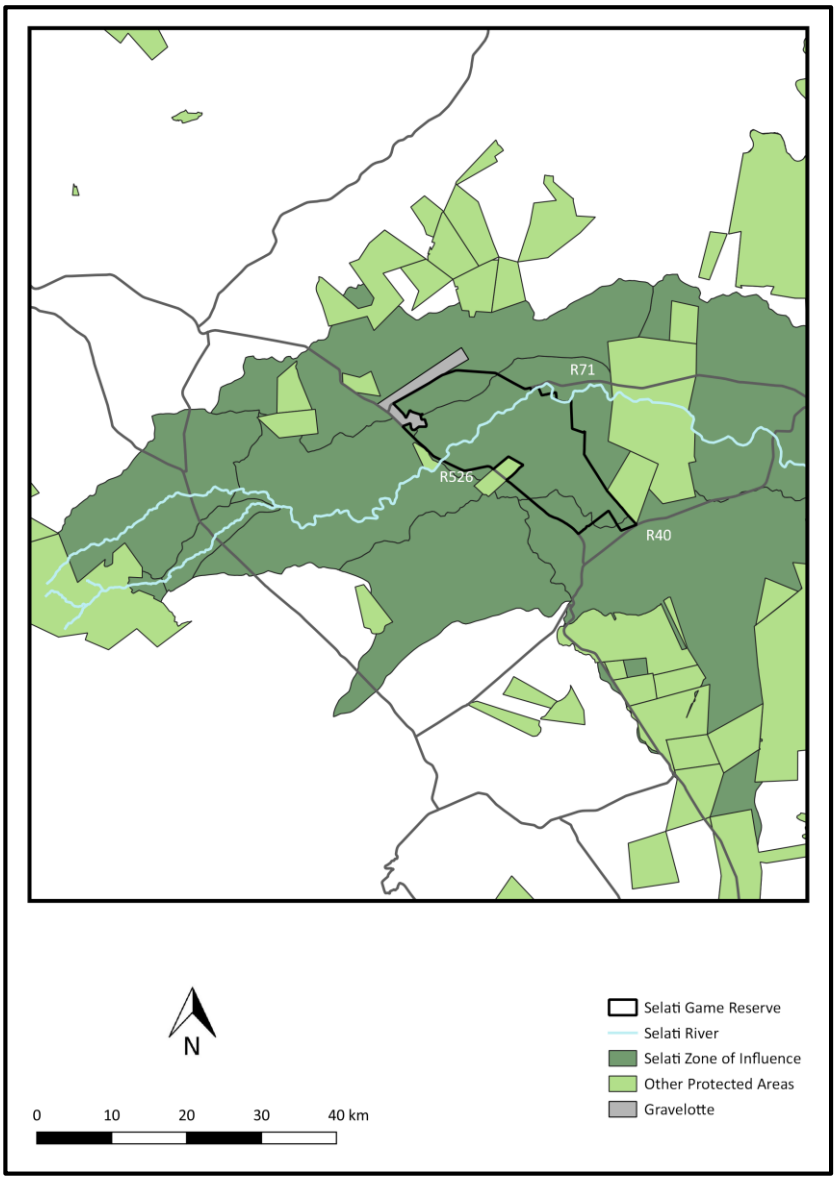


Figure 6.3: The zone of influence of Selati Game Reserve

The zone of influence is based on the following:

- The quaternary catchments of the Selati River from source to the reserve.
- Quaternary catchments in the region around the reserve, which may impact on it.
- Nearby towns, mines and neighbouring settlements that have the potential to impact on the reserve.
- Surrounding protected areas that provide compatible land uses with the reserve.

SECTION 7: ACCESS AND FACILITIES

Management policies and procedures must ensure that Selati Game Reserve's infrastructure is maintained, renovated, upgraded and replaced at the required intervals according to specific design norms and standards, including national construction regulations, green building and 'touch the earth lightly' principles. Water saving measures should be incorporated and waste generation minimised. The infrastructural features of the reserve can be classed into four main categories (Figure 7.1):

- Buildings.
- Fences and Gates.
- Roads and bridges.
- Artificial watering points.

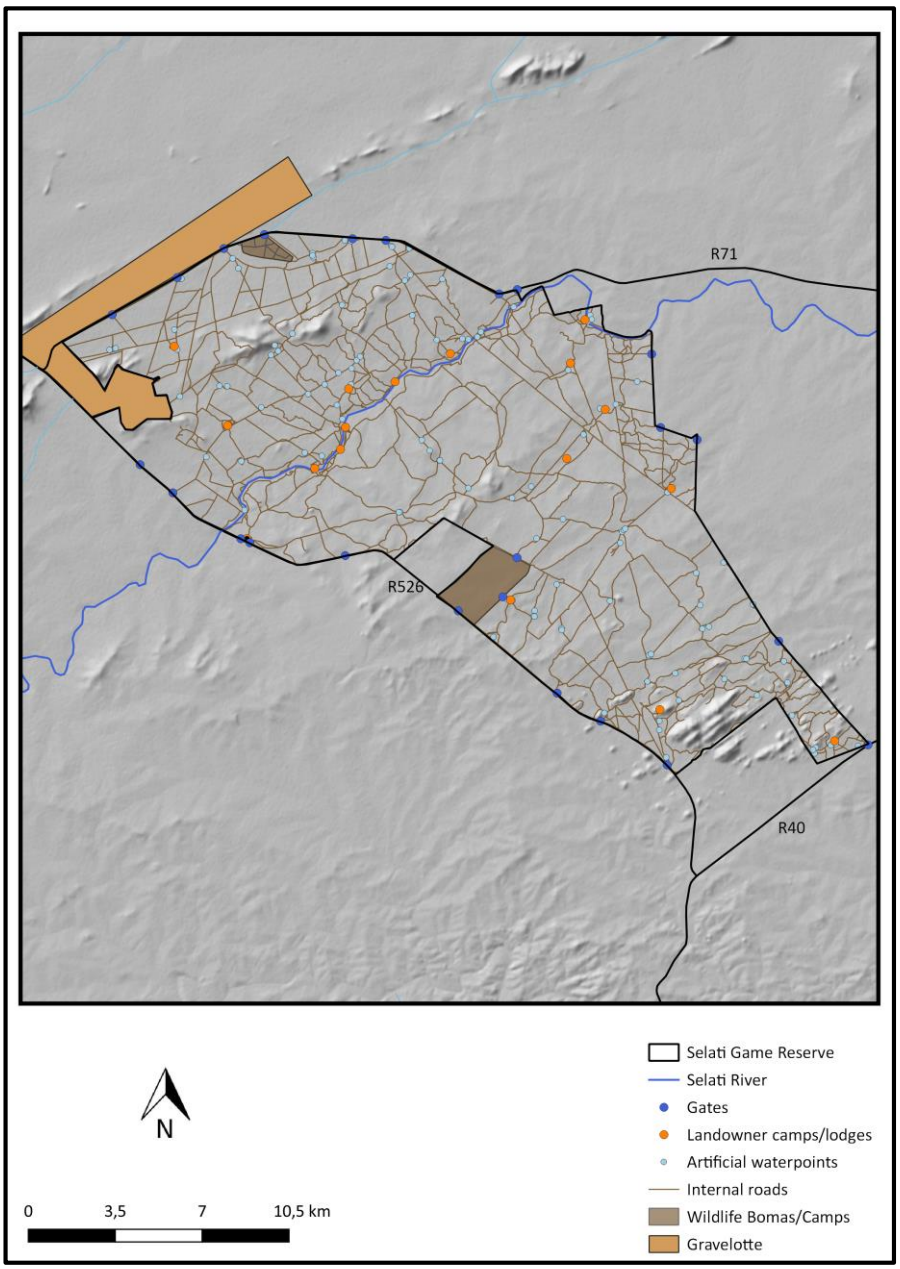


Figure 7.1: Infrastructure within Selati Game Reserve

7.1 Fences

Approximately 94 kilometres of Selati Game Reserve is fenced with a 2.4m game proof fence consisting of 18 wire strands, 1.2m pig mesh fence and 4 paired, evenly spaced internal electrified strands (Figure 7.2). Power is generated through a system of solar powered energizers with a battery backup system. The electrical charge on the fence is between 7000 and 9000 volts producing 4000 milli-amps. This fence exceeds the minimum standards for enclosing large game species, particularly lion, elephant and rhinoceros. The perimeter fence is patrolled continuously. A designated motorized fence monitoring team and maintenance team is also employed to ensure that the fence always remains functional. There is an additional 13km of internal fencing.

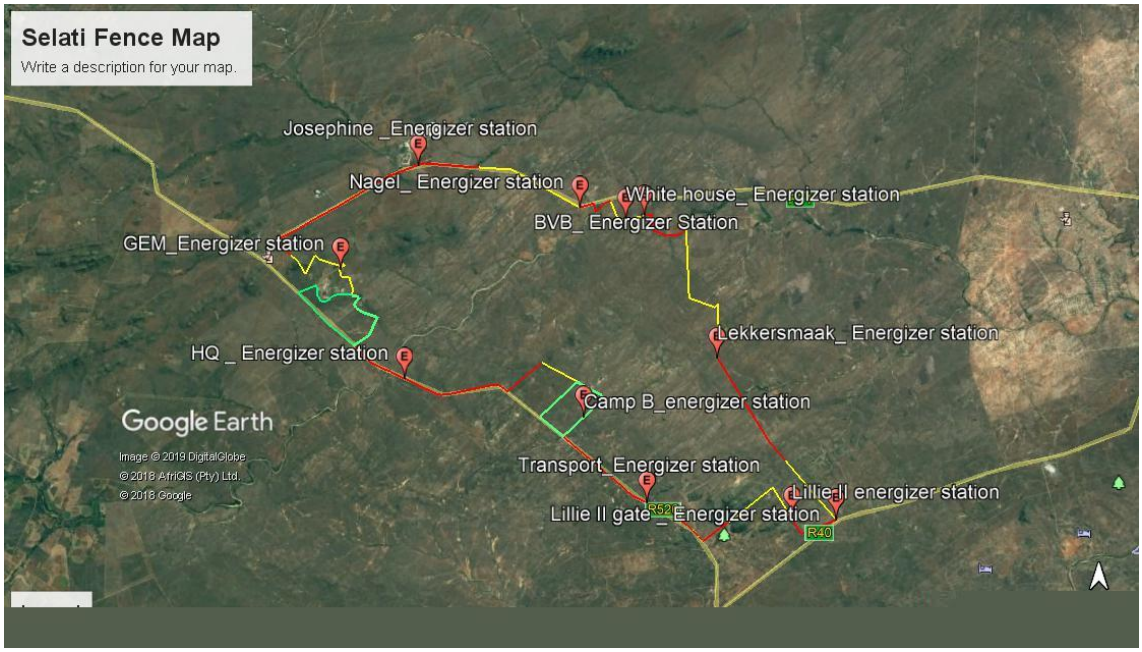


Figure 7.2: Selati Game Reserve fences

7.2 Roads

Selati Game Reserve has an extensive road network of approximately 730 km of gravel roads of which only the primary and secondary roads and some firebreaks (winter) are maintained by reserve management (Figure 7.1).

The internal road network is subdivided into three road classes, Class A roads includes all access roads to private camps and houses, class B all roads for game viewing and class C roads include all private roads. Internal roads are maintained as two-tracks used by game drive vehicles. Several drainage line crossings on Selati Game Reserve maintained roads are lined with concrete to facilitate drainage and prevent the road surfaces from washing away. Most of the less strategic stream crossings are natural, rock packed or occur at a natural crossing point over bedrock. A single suspension bridge spans across the Selati River which gives access to the north eastern parts during the rainy season. A low-level concrete bridge provides alternate access.

7.3 Access points

Selati Game Reserve can be accessed through nine entrance gates situated in the southern and northern sections of the reserve (Figure 7.1). The roads to these access gates are well signposted. The entrances are easily accessed from the R526, R71, R40 Roads.

7.4 Electricity

The provision of electricity is vital for the smooth functioning of management (in particular administrative facilities), for the living comfort of staff and owners and for the efficient operation of tourism facilities at a standard commensurate with the expectations of owners and visitors.

Although much progress is being made with alternative sources of energy (such as solar power), Eskom remains the most effective supplier. Due to environmental concerns, and to retain the aesthetic appeal of the reserve, landowners are encouraged to provide Eskom power via underground cables. Figure 7.3 presents the distribution of energizer station on Selati Game Reserve. The policy around energy is as follows:

- As far as possible, electricity should be provided to management and tourism development nodes.
- The provision of power must be done in an environmentally sensitive manner that does not impact negatively on the conservation objectives of the reserve, including the preservation of its wilderness character (where applicable, underground cables are preferable).
- Renewable sources of energy and energy-saving designs should be considered.

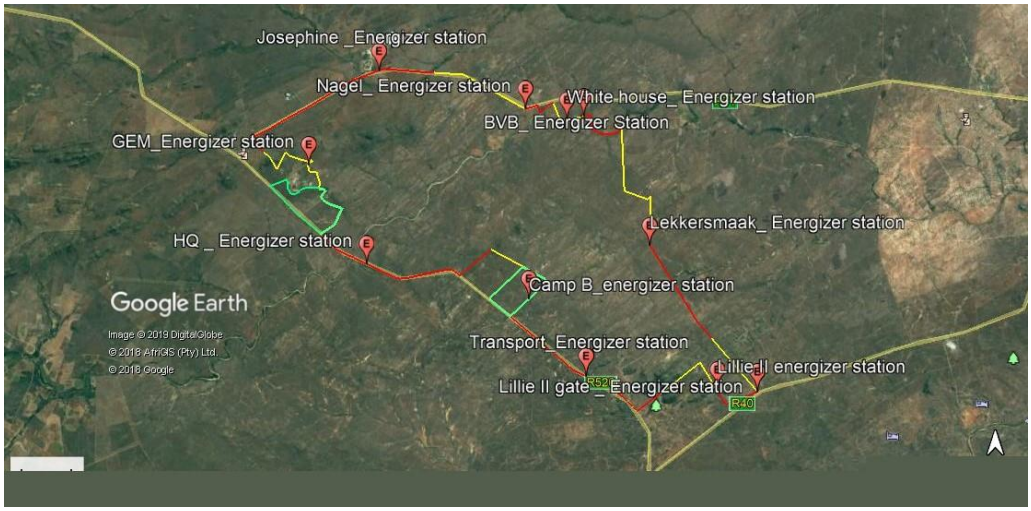


Figure 7.3: Energizer stations on Selati Game Reserve

7.5 Buildings

The Selati Game Reserve Constitution restricts development as follows:

- Only one camp (maximum of 20 beds) per 1,000 hectares of land owned by any shareholder.
- The area in which the camp may be built may not exceed two hectares.
- Only one game drive vehicle per 1,000 hectares of land owned by any landowner.
- Landowners may traverse on the entire reserve.
- Each landowner shall provide 10 km of road per 1,000 hectares available for traversing by other members.

The following principles must be used with the planning and the construction of new buildings on Selati Game Reserve:

- Buildings must blend in with the local landscape. They should be against a natural backdrop and exterior colours should be natural and earthy to blend with the site.
- Buildings must not be higher than the surrounding treeline.
- The structures must be planned around large trees and must minimise the need for the removal of trees or large boulders.
- Light and sound pollution must be minimised in the location, design, structure and management of all buildings and infrastructure.
- New infrastructure must not be located where it may have a potentially negative effect on neighbours or important existing infrastructure, or on the possible future tourism experience of an area.
- Emphasis must be placed on water and energy saving devices and processes.

The office complex consists of two office blocks, a workshop, a shed, three storage facilities, staff housing, garages for vehicles and a tented guest facility. The administrative centre, workshops and most of the staff accommodation of Selati Game Reserve is located at Arundel farm (Figure 7.2). The main office block includes 4 offices, 1 boardroom, 1 kitchen, 1 entertainment area, 4 storerooms and 2 ablution facilities. The reserve control room is located at the Selati Game Reserve Headquarters. The Reserve Headquarters also accommodates an extensive workshop area and associated storerooms. The workshop provides a support service for the Reserve's vehicle and equipment fleet. Water is supplied to the office complex via two boreholes into a single overhead water tank.

An extensive garage complex is situated at the workshop. This provides for undercover storage and parking of the reserve's tractors and earthmoving equipment. Various trailers and tractor implements are also housed here. A separate area houses all the reserve's firefighting equipment. The facility also includes a fodder store and fuel storage tanks.

Staff employed by Selati Game Reserve necessitate the provision of housing and other infrastructure, yet it is still desirable to keep infrastructure on the reserve to a minimum. Therefore, where it is cost-effective to do so, Selati

Game Reserve will outsource certain work in order to keep its own staff levels and associated infrastructure within realistic bounds.

The staff accommodation facilities at the headquarters complex includes a staff village consisting of 15, two-roomed accommodation blocks each with its own ablutions and kitchen area. Also, within the headquarters complex are three management staff houses, with varying numbers of bedrooms. There is a research flat, which accommodates two people in one room.

Selati Game Reserve has approved three owner camps as commercial enterprises and there is an Eco Training Camp on the reserve. The volunteer program currently consists of three two-man tents, located at head office and it is intended that this facility will be increased up to eight tents in the near future. It may also be relocated to the Selati River at its closest location to the reserve head office. The reserve's commercial policy provides governance and control over all commercial tourism enterprises. There are 15 private landowner camps (Figure 7.1). These lodges/private camps are distributed throughout the reserve and all obtain their potable water supply from subterranean water via boreholes. Each lodge/private camp is responsible for the management of water and there are no abstraction points on the Selati River. There are 18 boreholes distributed throughout the reserve for management purposes, of which six are currently in use (see also 'Artificial water points' below).

7.6 Waste

A temporary holding facility for recycled waste is located at Selati headquarters. Solid waste policy is partially implemented where solid waste generated within Selati Game Reserve is collected, sorted for recycling and removed from the reserve. Sewage is processed through conventional septic tanks and soakaways at the commercial lodges and private camps.

7.1 Artificial water points

There are 27 artificial watering points on the reserve supplied by 14 boreholes (Figure 7.1). Water is pumped to the surface by mechanical diesel engines attached to mono pumps from five boreholes, electrical pumps from four boreholes and solar pumps from five boreholes.

SECTION 8: EXPANSION STRATEGY

8.1 Expansion of the GLTFCA

As part of the system of the Greater Kruger Area, efforts to expand Selati Game Reserve should be guided by the reserve's constitution. As part of the Greater Kruger Area and the Great Limpopo Transfrontier Conservation Area GLTFCA, Selati Game Reserve forms part of a greater international transfrontier conservation effort that involves South Africa, Mozambique and Zimbabwe (Figure 8.1). Protected area expansion may thus focus on areas on the boundary of the reserve or may be supported as strategic expansion of the GLTFCA.

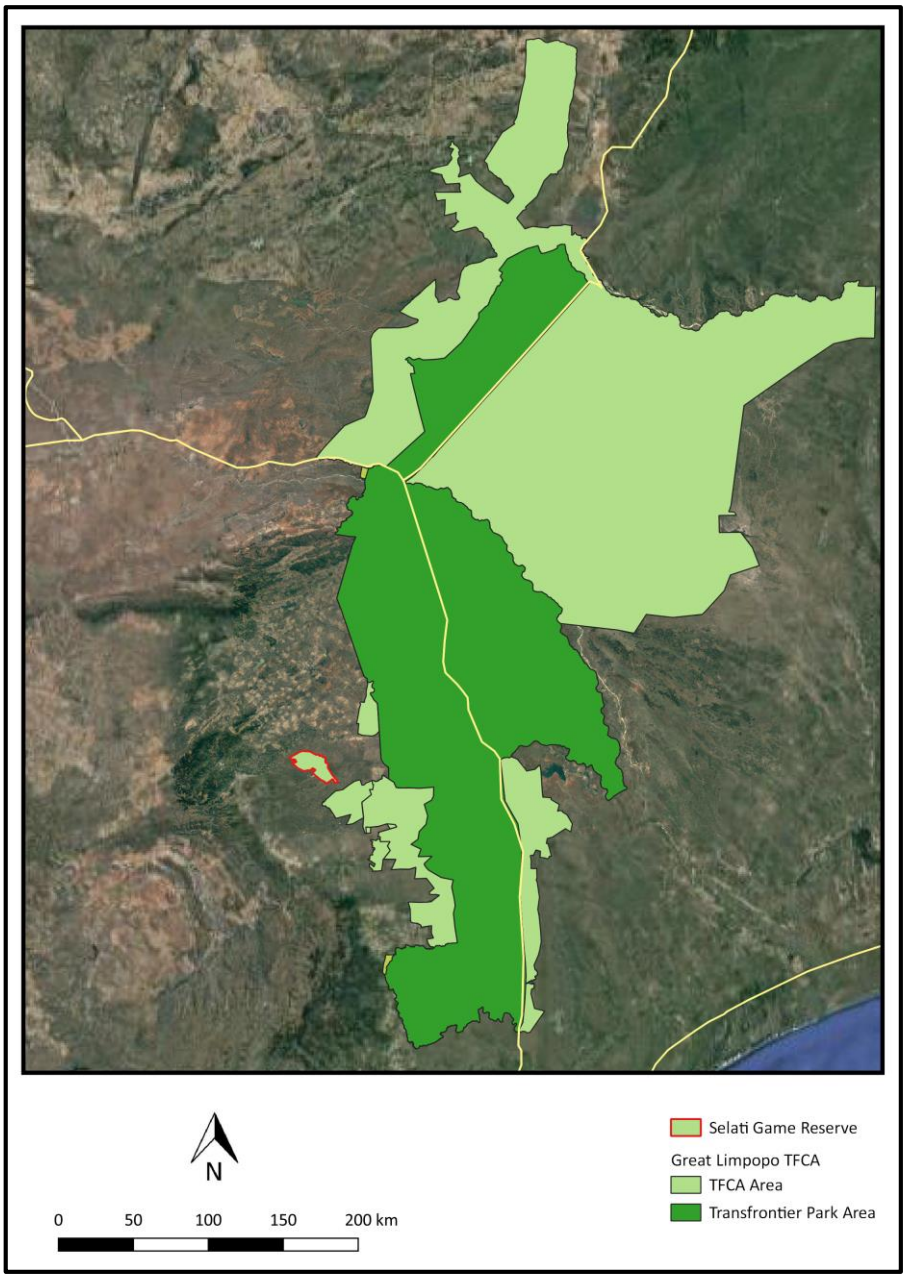


Figure 8.1: The Great Limpopo Transfrontier Park and the Great Limpopo Transfrontier Conservation Area

8.2 PA Expansion around Selati Game Reserve

Three expansion opportunities exist for Selati Game Reserve, which is largely guided by veterinary regulations. An expansion opportunity exists towards the east which will add an approximate 15,000ha to the existing reserve. This land is a proclaimed protected nature area and falls within the veterinary protected zone without vaccination which is similar to Selati Game Reserve.

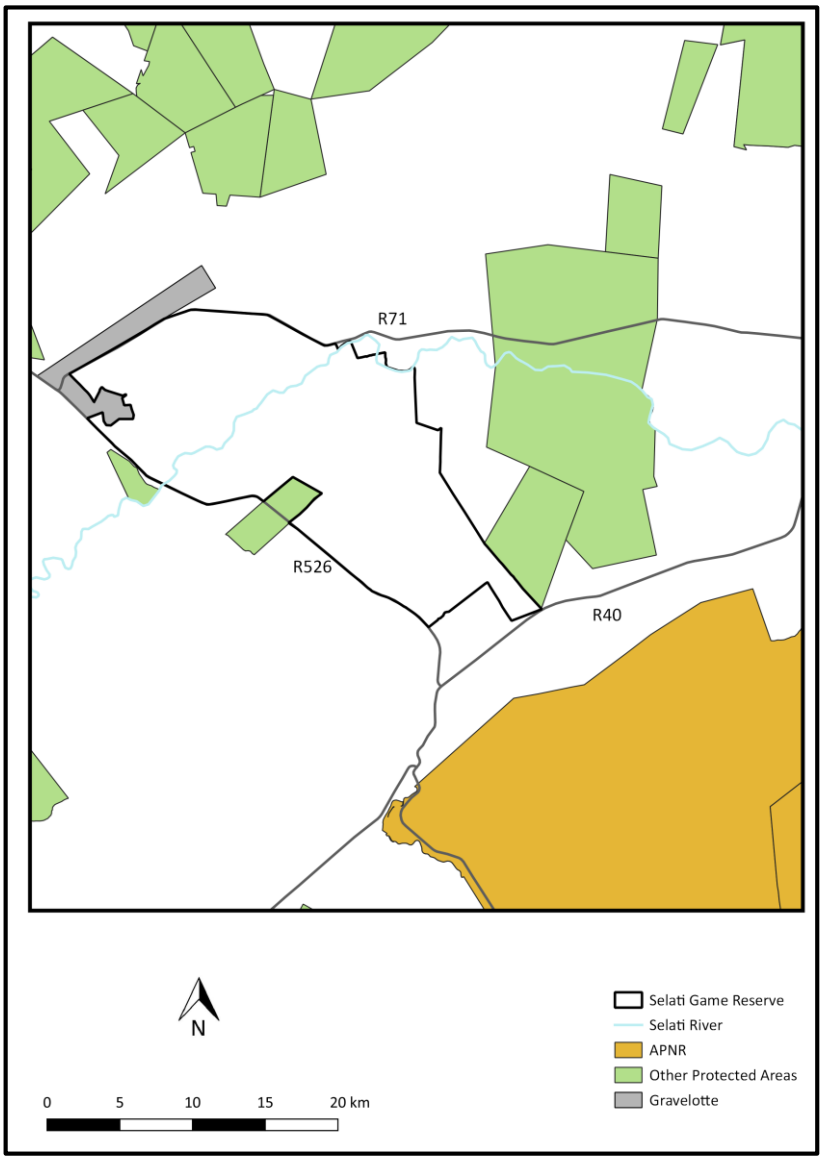


Figure 8.2: Opportunities for protected area expansion around Selati Game Reserve

Expansion possibilities also exist towards the south to form part of the open system of the Greater Kruger Area and inclusion into the APNR. This expansion will cross veterinary regulatory zones from a veterinary protected zone without vaccination to an infected zone. Joining the Selati Game Reserve onto the open system of the Greater Kruger Area will be the ultimate conservation achievement for the reserve. The two major challenges are the current veterinary regulations and the R40 provincial road which separates the reserve with the APNR.

Expansion potential also exists towards the west of the reserve into the veterinary free zone without vaccination onto neighbouring wildlife farms and reserves. The major challenge again would be the veterinary regulations and the presence of provincial roads.

SECTION 9: CONCEPT DEVELOPMENT PLAN

According to the Guidelines for the Development of a Management Plan for a Protected Area in terms of NEMPAA (DEA 2011), a concept plan is required to set out the long-term plan for the development of a protected area. Accordingly, the Selati landowners and the Board have identified a range of potential sites that may be developed in the future (Figure 9.1).

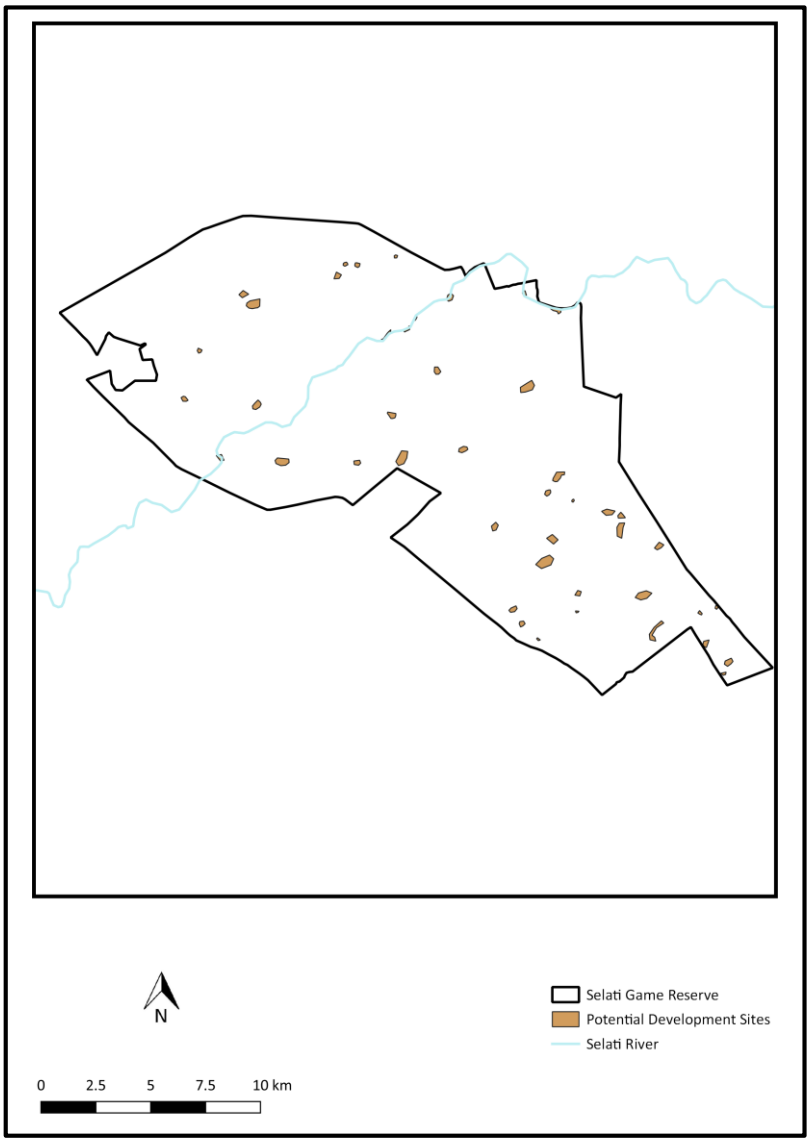


Figure 9.1: Potential development sites within Selati Game Reserve

The sites identified include areas that may be developed as:

- Small overnight facilities.
- Picnic sites.
- Viewpoints.

If these areas are developed, the following must be considered, prior to proceeding with the development:

- Whether any envisaged development will be undertaken in accordance with the reserve's zonation plan, i.e. if it involves the development of infrastructure for landowners' private use or for tourism, is it within the low intensity leisure zone? If development is proposed to support operational management, is it within the high intensity operational zone? If development that is not permissible in a particular zone is envisaged, an assessment of the development must be made by an appointed member of the reserve management team and/or a specialist, appointed by the reserve Board at the developer's cost. A recommendation may then be made to the Board, after which if the development is to proceed, the reserve's zonation plan may need to be amended.

9.1 Requirements for environmental authorisation

Any envisaged activity that requires environmental authorisation in terms of the National Environmental Management Act (No.107 of 1998) must complete the required processes before an activity or development may proceed. Depending on the nature of the activity, either a basic assessment or full scoping and environmental impact assessment process may need to be followed.

It must be noted that Listing Notice No.3 applies to activities where environmental authorisation is required prior to commencement of that activity in specific identified geographical areas. The types of activities and geographical areas set out in Listing Notice No.3 that are relevant to Selati Game Reserve, as it is a protected area, as defined in terms of NEMPAA, include:

- The development of masts or towers used for telecommunication broadcasting or radio transmission purposes (where the mast is on a site not previously used for such and is 15 metres or higher).
- The development of a road wider than four metres.
- The development of resorts, lodges, hotels and tourism or hospitality facilities that sleep less than 15 people.
- The development of resorts, lodges, hotels and tourism or hospitality facilities that sleep more than 15 people.
- The development of aircraft landing strips and runways 1.4 kilometres and shorter.
- The development of dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 m^2 in size.
- The expansion of a resort, lodge, hotel, tourism or hospitality facilities where the development footprint will be expanded, and the expanded facility can accommodate an additional 15 people or more.
- The expansion of runways or aircraft landing strips where the expanded runways or aircraft landing strips will be longer than 1.4 kilometres in length.

SECTION 10: IMPLEMENTATION FRAMEWORK

10.1 Introduction

In this section, the high-level objectives and associated deliverable, identified in Section 5 above are translated into an implementation framework based on management goals and actions. This is intended to provide a clear flow from the actions implemented to manage Selati Game Reserve to the high-level objectives and the vision and mission for the reserve. The implementation framework is arranged within the key performance areas, identified in Section 5. The implementation framework is structured as follows:

- Key performance area.
- Background: overview of intent, guiding principles, description and intended outcome of implementation efforts.
- Tables: outline of objectives and actions, structured in the following way:
    - Deliverables: these are the same deliverables identified in Section 5.
    - Management goals: the goals required to achieve the deliverable.
    - Actions: the actions necessary to achieve the goal and the deliverable.
    - Responsibility: the entity or individual responsible for implementing the action.
    - Portfolio of evidence: the proof that demonstrates the achievement of the objective.
    - Timeframe: an indication of when the action is likely to be completed.

10.2 Governance

It is essential that there are appropriate institutional structures in place that enable the effective management of Selati Game Reserve. This includes ensuring that the requirements of the National Environmental Management: Protected Areas Act (NEMPAA) are met, that there are adequate staff and resources to manage the reserve and that there is adequate oversight in its management.

10.2.1 Financial and human resources

Selati Game Reserve cannot be effectively managed without adequate sustained funding and sufficient human resources. The following guiding principles should be adhered to:

- Adequate funding must be provided for the management of the reserve to ensure its sustained functioning.

- Adequate, properly trained and experienced staff must be employed at the reserve to undertake the operations required for its effective management.

10.2.2 Infrastructure and equipment

For Selati Game Reserve to operate appropriately, adequate infrastructure and equipment need to be provided and maintained both for management and tourism purposes. In addressing infrastructure and equipment needs in the reserve, the following guiding principles will be adhered to:

- Infrastructure and equipment must be maintained to avoid any damage to the environment and ensure the safety of staff and visitors to the reserve.
- Infrastructure and equipment must be provided to ensure the effective management and operation of the reserve.

10.2.3 Management systems

Management systems are required to ensure the health and safety of visitors, staff and contractors working within the Selati Game Reserve. Furthermore, standard approaches to addressing specific operational interventions are required. The following guiding principles should be adhered to:

- Risks and legal liabilities related to visitor, staff and contractor health and safety must be identified and appropriately addressed.
- Standard operating procedures that ensure consistency in management must be developed and implemented.

The operational requirements and actions necessary to achieve the high-level objectives and deliverables for governance are set out in Table 10.1.

Table 10.1 The governance requirements for Selati Game Reserve

High-level objective: To ensure that appropriate administrative structures are in place to ensure that Selati Game Reserve is effectively managed.

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Deliverable: Annual plans of operation include detailed budgetary requirements.				
Prior to the completion of the Annual Plan of Operation, a costing of its activities must be developed and approved by the Selati Game Reserve Board.	Management costs must be identified and factored in as part of the reserve's annual management meeting.	Selati Game Reserve General Manager and Board	APO	Annually
	A cost estimate must be included in the reserve's Annual Plan of Operation (APO).	Selati Game Reserve General Manager and Board	APO	Annually

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Deliverable: There are sufficient facilities, infrastructure and equipment to enable staff to effectively manage the reserve.				
Facilities, infrastructure and equipment necessary to support the effective management of the reserve are identified and provided.	Sufficient facilities, infrastructure and equipment are provided to staff to enable them to undertake their assigned activities.	Selati Game Reserve General Manager and Board	Asset register	As required
Deliverable: Infrastructure and equipment in the reserve are adequately maintained.				
A scheduled maintenance programme is implemented to maintain infrastructure and equipment.	Regular scheduled maintenance of all infrastructure and equipment must be undertaken.	Selati Game Reserve General Manager	Maintenance schedule	Annually
Deliverable: Infrastructure in the reserve does not cause environmental harm.				
Infrastructure and management systems are managed within the reserve to ensure that they do not cause unacceptable harm to the environment.	Service infrastructure, including that for water supply, electricity and sewerage, must be monitored to ensure that it is not causing environmental harm and appropriate action must be taken if it is.	Selati Game Reserve General Manager	Reports	Annually
	Appropriate strategies must be implemented for the management and recycling of waste in the reserve.	Selati Game Reserve General Manager	Waste management policy	Annually
Deliverable: Activities that may lead to ecological degradation or pose threats to species and habitats of Selati Game Reserve and carefully controlled and managed.				
Existing and proposed commercial and non-commercial activities must be carefully evaluated to ensure that unnecessary environmental harm, habitat loss or ecological degradation does not take place.	Any activities or developments that require environmental authorisation, such as basic assessments, environmental impact assessments and the granting of water use licences, must be properly evaluated and appropriate environmental authorisations must be granted prior to development.	Selati Game Reserve General Manager and Board	Environmental authorisations and water use licences	As required
	Activities that take place outside of lodge environments (e.g. bush meals, weddings, etc.) must be carefully planned, considered, located and controlled to avoid unnecessary deleterious impacts.	Selati Game Reserve General Manager and Board	Reports	As required

High-level objective: To cooperate and collaborate as part of the Lowveld protected area system and the GLTFCA.

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Deliverable: Selati Game Reserve actively engages as a protected area within the GLTFCA.				
Selati Game Reserve seeks opportunities to engage and participate collaboratively with other protected areas within the GLTFCA	Selati Game Reserve participates in joint fora and events of the Lowveld PA Group. Opportunities to collaborate in relation to issues such as research, conservation management, socio-economic beneficiation and safety and security are actively pursued.	Selati Game Reserve General Manager	Reports	As required

10.3 Land use

Selati Game Reserve is an integral component of a landscape-level conservation initiative that encompasses the Great Limpopo Transfrontier Conservation Area (GLTFCA). It is essential that the reserve receives proper legal protection that ensures that its biodiversity value is secured and it is also essential that regional planning considers both the reserve and the broader Greater Kruger Area in an effort to ensure the protection of its ecological and economic value and its sense of place.

10.3.1 Regularisation of the reserve

Ensuring the proper legal protection of Selati Game Reserve requires that the entire reserve be declared as a protected area in terms of NEMPAA. This requires that a written agreement be formulated between the landowners and the Limpopo MEC and that this agreement be endorsed on the title deeds of the properties, making it binding on successors in title. The guiding principles for protection of the reserve will be to:

- Secure the existing land use of Selati Game Reserve for the benefit of its landowners and future generations, thus creating a legacy for biodiversity conservation in South Africa.
- Address key risks and unlock significant opportunities and benefits for the reserve's landowners through appropriate legal protection.

10.3.2 Regional land use planning

The viability of the Greater Kruger Area and the edge effects in its buffer zone and on its boundaries are dependent upon the extent to which such areas are socially, economically, and ecologically integrated. The pressures facing the Greater Kruger Area i.e. housing and estate developments, invasive alien species, mining, pollution and poaching demands both reactive and proactive involvement in the adjacent land use zones. The main integrated land use mechanisms to achieve positive outcomes to date have been: planning alignment; commenting on development applications; facilitating private or community protected area / environment establishment; low cost protected

area expansion through offset negotiations; conservation management support; human-wildlife conflict management; legal and regulatory compliance monitoring; alien clearing; fire management; research; eco-tourism promotion; and support to the wildlife economy. Selati Game Reserve needs to participate in efforts to reach out influentially, in an organised and practical way, to a host of outside partners in the landscape.

This requires engagement, planning and implementation into relevant planning processes such as municipal and bioregional planning, to encourage the adoption of the integrated land use zone of the Greater Kruger Area as a special management area to discourage or mitigate negative land use development and economies. The Kruger National Park's management plan identifies that SANParks management will engage with local municipalities and three district municipalities and will be involved in the revision of their SDFs, Integrated Development Plans (IDPs) and Environmental Management Frameworks (EMFs). Furthermore, park management will develop robust and innovative approaches towards regional stewardship support, park incorporation and land consolidation, utilising different models to forge partnerships with the provincial conservation agencies, communities and the private sector. It is important that Selati Game Reserve and all other reserves within the GLTFCA support and participate in these processes. The guiding principles for regional land use planning will be to:

- Collaborate and take appropriate actions collectively with protected areas in the system of the Greater Kruger Area, through the GLTFCA Cooperative Agreement, to manage threatening processes and edge effects on the reserve's boundaries and that of the system.
- Endeavour to assist the local and district municipalities in determining appropriate land uses and development strategies in the areas surrounding the reserve and the system of the Greater Kruger Area.
- Endeavour to align the reserve's plans and strategies with the strategies of the local and district municipality, where appropriate.

The operational requirements and actions necessary to achieve the high-level objectives and deliverables for land-use are set out in Table 10.2.

Table 10.2 The land-use requirements for Selati Game Reserve

High-level objective: To ensure that Selati Game Reserve is appropriately legally protected for biodiversity conservation purposes so that its landowners may continue to enjoy and benefit from the existing land use of the reserve.				
Management goal	**Actions**	**Responsibility**	**Portfolio of evidence**	**Timeframe**
Deliverable: Selati Game Reserve is fully declared and regularised in terms of NEMPAA.				
All properties that constitute the reserve are declared in terms of NEMPAA	Any un-proclaimed properties must be declared in accordance with the requirements of NEMPAA.	Selati Game Reserve Board	Declaration notice in the government gazette	Year 3

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Selati Game Reserve is fully compliant with NEMPAA and its norms and standards.	The terms of the written agreement between the landowners and the Limpopo MEC must be recorded in a notarial deed agreement and registered against the title deeds of the properties in accordance with Section 35(3)(b) of NEMPAA.	Selati Game Reserve Board	Notarial deed agreements	Year 1
	Opportunities to capitalise on benefits in terms of Section 17 of the Municipal Property Rates Act and Section 37D of the Income Tax Act should be explored and implemented.	Selati Game Reserve Board and individual landowners	Not applicable	Year 1
Deliverable: Selati Game Reserve is integrated within regional land-use planning frameworks.				
Buffer zone consideration for the reserve and the GLTFCA must be captured in local and regional plans.	Inputs must be made into the development of local and district municipality IDPs, SDFs and LUMS to ensure compatible land uses in the areas around the reserve and the GLTFCA.	Selati Game Reserve General Manager and Board	IDPs, SDFs and LUMS	As required
Efforts to secure the reserve's river catchments should be made through engagements with relevant authorities and partners.	Partners and authorities should be engaged to engender better cooperation in the management of water resources and enforcement of applicable legislation within upper catchment areas above the reserve.	Selati Game Reserve General Manager	Improved water resource quality and quantity.	Ongoing
Deliverable: The boundaries of Selati Game Reserve are accurately known and any deviations from cadastral boundaries are addressed through formal agreements.				
Any boundary deviations must be addressed through formal agreements.	A process to determine the exact boundaries and to identify any deviations from them must be undertaken and if any deviations are identified, these must be addressed through formal agreements between the Selati Game Reserve Board and the neighbouring landowners/ protected area management authorities.	Selati Game Reserve General Manager and Board	Accurate delineation of the reserve boundaries.	Year 1
Deliverable: A servitude register is developed for the reserve.				
A servitude register must be developed for the reserve.	A detailed register of all servitudes and rights of way, registered against the title deeds of properties within the reserve must be prepared.	Selati Game Reserve General Manager and Board	Servitude Register and map	Year 1

10.4 Ecological management

This section outlines the ecological management measures that should be implemented across the reserve and provides guidance as to what is necessary and how ecological management should be undertaken.

10.4.1 Maintenance of ecological processes

Vegetation

Vegetation, comprising the woody and herbaceous layers as influenced by soil physical and chemical properties including soil moisture (rainfall is an indirect measure of soil moisture) should be conserved to maintain plant populations and a representative variety of habitats within Selati Game Reserve. The response of the vegetation to the additional effects of management actions such as herbivory and/or fire needs to be assessed in relation to rainfall and soil type and, if necessary, management actions need to be adapted if they are having a deleterious effect.

Bush encroachment control

An important aspect of vegetation management is the control of bush encroachment through the increase in abundance and density of invasive woody species. The guiding principles in managing bush encroachment are to:

- Maintain woody plant densities at levels which maximise grass production, by minimising woody/grass competition.
- Reverse bush encroachment on areas which were previously open woodlands.
- Create preferred habitat for grazers.
- Increase the visibility of large herbivores to enhance game viewing.
- Target those woody plant species and age classes responsible for man-induced encroachment.

10.4.2 Wildlife management and offtakes

Wildlife management will focus on conserving a wide diversity of indigenous animal species in the reserve without causing a long-term deterioration in the veld condition resulting from accelerated soil loss, bush encroachment or an unfavourable shift in the grass species composition and/or cover.

The guiding principles for wildlife management within Selati Game Reserve will be:

- The management of wildlife populations in the reserve will be undertaken to conserve, where possible, viable populations of those species that are indigenous to the Lowveld in such a way that visitors will be able to enjoy a high-quality wildlife experience.
- Thresholds of Potential Concern (TPC) will be established, on a general level for all species and a species-specific level for those that can be

cost-effectively monitored and those that are considered important in the reserve's hierarchy of objectives.

- Sustainable utilisation of wildlife, primarily through culling, will be undertaken based on 'best practice' approaches, which ensure that the utilisation of wildlife is undertaken without detracting from the experience of other users of the Greater Kruger Area.
- An important consideration in undertaking sustainable utilisation will be to assist in the attainment of the dynamic equilibrium between the vegetation and large herbivores and to maintain populations at a level that prevents the loss of a competing species from the reserve.
- Genetic diversity - In small populations, there is concern that a small gene pool can result in inbreeding and loss of vigour. Amongst the present species populations within the reserve, it is only cheetah that could give cause for concern. The latter populations should be managed to at least maintain or improve genetic diversity.
- In all matters relating to wildlife, the relevant veterinary legislation must be considered. In this regard, consideration must be given to the Animal Diseases Act 35 of 1984 and its amendments (Government Gazette 1986).

Species management

Specific management interventions related to animal species will be limited to those that are for the purposes of safeguarding populations of rare and threatened species, or enhancing the ecological functioning of Selati Game Reserve, to meet set conservation targets. In addition, interventions may be required for problem animal management. In addressing species management, the following guiding principles should be adhered to:

- Species management must be focused primarily on protecting the ecological functioning of the nature reserve and meeting set conservation targets for species and vegetation types.
- Population management of wildlife species may be required to ensure that such species are not causing ecological degradation of the nature reserve.
- Animals that become a danger or excessive nuisance to persons and property due to either habituation or aberrant behaviour must be managed in accordance with relevant policies and standard operating procedures.

In relation to damage causing animals (DCAs), the following will apply:

- Human safety and lives shall enjoy priority in the reserve. Any potentially dangerous animal that may pose a problem and endanger the lives of people must be destroyed as humanely and swiftly as possible. This is likely to arise through old age, injury, disease or aberrant behaviour the cause of which may be unknown. Lodges that irrigate their gardens must accept that animals, that otherwise would

not be considered problematic, will be attracted to the lodge and may pose a threat to people and property.

- Reserve Management will make an application to LEDET for a permit that will enable reserve management to take immediate action.

Selati Game Reserve has identified specific interventions for particular species. Accordingly, the approach will be to prepare species specific management interventions for keystone species and groups including:

- African Elephant.
- Black Rhinoceros.
- White Rhinoceros.
- Predators.

Setting Thresholds of Potential Concern

The importance of setting the limits of acceptable change has been emphasised by marked trends of selective grazers on the one hand (e.g. wildebeest declining) and mixed feeders (elephant and impala increasing) on the other hand in Selati Game Reserve. There must be pre-agreed Thresholds of Potential Concern (TPCs) or 'amber lights' that will trigger management actions to remedy the situation (see Figures 10.1 and 10.2).

It is recommended that preliminary TPCs for herbivores within the reserve be set based on measurable criteria such as population size, estimated rates of increase and survival as well as an element of predator impact, calving percentage and survival and calving interval. Should a population move outside the numerical limits of the TPC, the situation must be investigated in terms of their impact on both the natural resources and other species and remedial action taken where necessary.

Preliminary TPCs for the numbers of individual herbivore prey species have been determined and are influenced by interplay of the following requirements:

- Minimum population size that can fulfil predator demand and that can withstand predator pressure.
- Minimum numbers of 'common' species that make up the 'filler' for a generally 'good' game experience.
- Minimum number of pachyderms (rhino and elephant) to make up the Big Game experience.
- Maximum number as dictated by available vegetation resources.
- Balance between different feeding groups in terms of respective feeding requirements (bulk grazers, browsers, etc.) and respective role of each feeding group in facilitating/denying the access to vegetation resources by another feeding group.

- Where populations are of high conservation value, (e.g. rhino species) determine what the minimum population size should be in order to maintain a genetically viable population.

These requirements, balanced against the low success rate of certain species, may lead to specific species becoming marginal. A decision may then be required as to whether a specific species is allowed to disappear or somehow survive or whether it should be pro-actively removed.

The provisional limits of acceptable change for the larger wildlife species are derived from information provided in Table 10.3 and presented in Table 10.4. A rate of increase of 0% for a species indicates that, at best the population numbers remain stable. It must be emphasised that these TPCs are only provisional and that they must be investigated so that they can be more reliably determined.

A first approximation of TPCs is presented for the main prey species in the reserve. The calculations were based on the following:

- Estimated population numbers of the various predator species.
- Estimated food requirements of each predator species.
- Relative percentage of the different prey species in the diet (hypothesised in the absence of data). It is acknowledged that prey selection will vary as the number and type of prey species available varies but it is felt that the data set would serve as a good basis for setting preliminary numbers for the different species.
- Prey species totals taken from the 2020 game counts.
- A projected increase in each of the major prey species.

The final figure is the minimum that would be required for the population to remain stable. A further calculation is done to determine whether the minimum number of animals required per species would in any way compromise the condition of the veld (Table 10.3 and Figures 10.1 and 10.2). The situation regarding predators should be addressed similarly, i.e. what density of predators would facilitate stable or growing prey populations.

Table 10.3 Predator numbers and the relative percentage prey in their diets (Joubert *pers. comm.* from recorded kills only)xx

Parameter	Lion			Cheetah	Leopard	Hyena	Wild dog
Count	♂	♀	Sub Ad./Cub	1	10♂ 15♀	35	0
% in diet	2	3	2				
Impala	13.8			75	38.9	37.8	0
Wildebeest	12.1			0	1.3	4.4	0
Zebra	6			0	0	3.3	0
Buffalo	0			0	0	0	0
Waterbuck	23.3			0	0	6.7	0
Giraffe	2			0	0	0	0
Kudu	24.1			0	6.5	10	0
Eland	2.6			0	0	2.2	0

Table 10.4 Preliminary TPCs for prey animals within Selati Game Reserve based on census figures and predator numbers within the reserve, and on recorded fecundity and mortalities, 2020xx

Species	[1]Estimated fecundity per annum (%)	[2]Trends with R^2 10y (top and 3 y (bottom)	[3]Increment vs projected predation	[4]Current total	Total required for 0% increase	Shortfall or surplus
Impala	40	Up – 0.33 Down – 0.1	1 442 – 862	3 605	2 155	2 904
Wildebeest	27	Up – 0.46 Down – 0.33	160 - 105	592	390	362
Zebra	20	Up – 0.42 Down - 0.74	97 - 29	485	421	161
Waterbuck	27	Up – 0.42 Down 0.81	50 - 15	184	157	27
Giraffe	12	Up – 0.08 Down – 0.17	37 - 1	312	280	32
Kudu	40	Up – 0.46 Down – 0.5	306 - 78	765	602	163
Eland	40	Down – 0.64 Up – 0.11	26 - 3	64	30	60

1 This relates to the percentage of females that are likely to give birth in that season.
2 The linear trends of the species over 10 and three years respectively – providing an indication of population stability/variation in the longer and shorter term.
3 The increment is based on the actual population count (Current total) for the year plus the anticipated increase (estimated fecundity) compared with the number that will be predated, based on kill data obtained for the reserve.
4 Population count for the year.

Some critical questions:

- Is the number of animals required to ensure that the various prey populations maintain themselves, i.e. not increase, sustainable in terms of the current veld condition?
- The number and population structure of the predator population.
- The necessity for the target species of the various predators.

The stocking rate situation should be considered as follows:

- Using the 2020 figures.
- Using game numbers required to maintain populations under current predator numbers plus the current numbers of the remaining species.

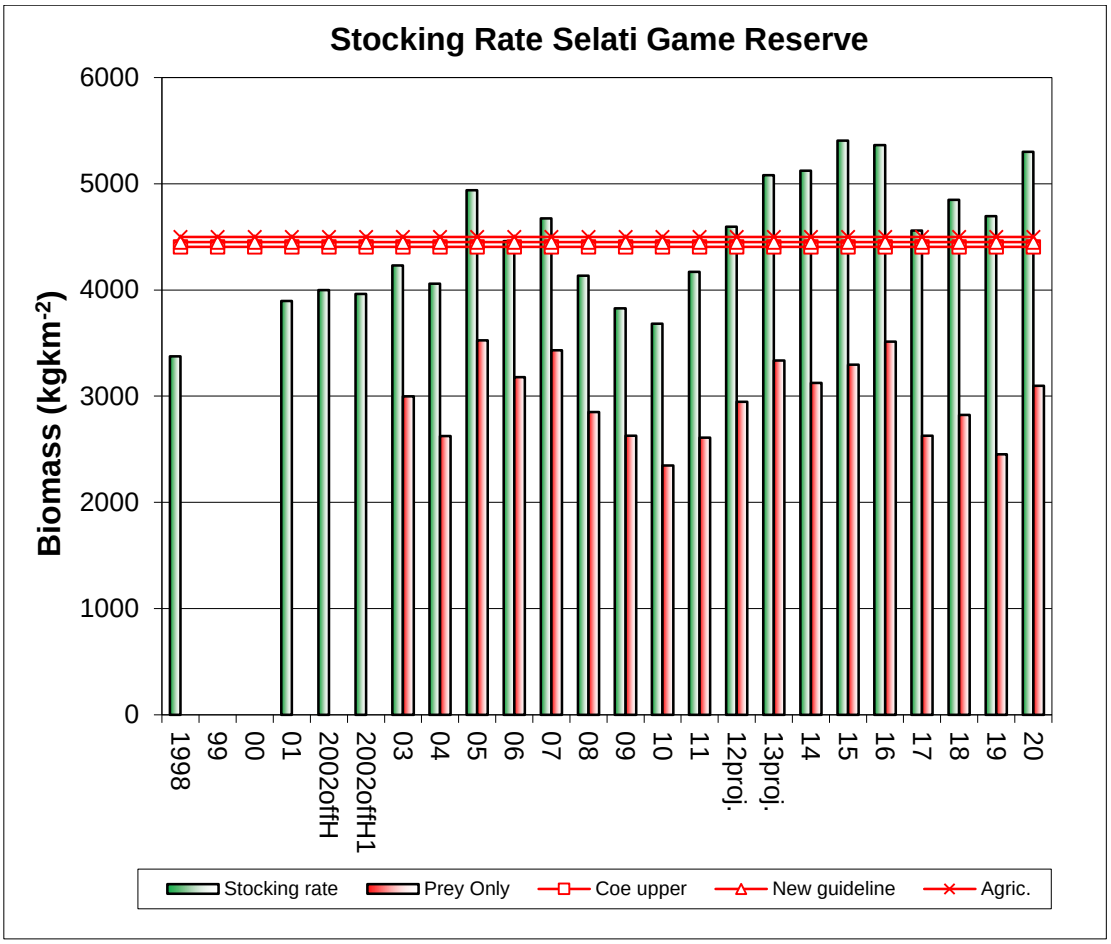


Figure 10.1: Graph illustrating the herbivore biomass in the Selati Game Reserve: 1998 – 2020

Figures 10.1 and 10.2, indicate the following:

- The overall biomass has been generally above the guideline since 2013 and rose sharply in 2020 again.
- The feeding class ratios are skewed – bulk grazers, recommended 45%, actual 16% (despite insertion of buffalo); selective grazers, recommended 20%, actual 6%, mixed feeders, recommended 20%,

actual 47% (elephant and impala dominate the system) and browsers, recommended 15%, actual 31%.

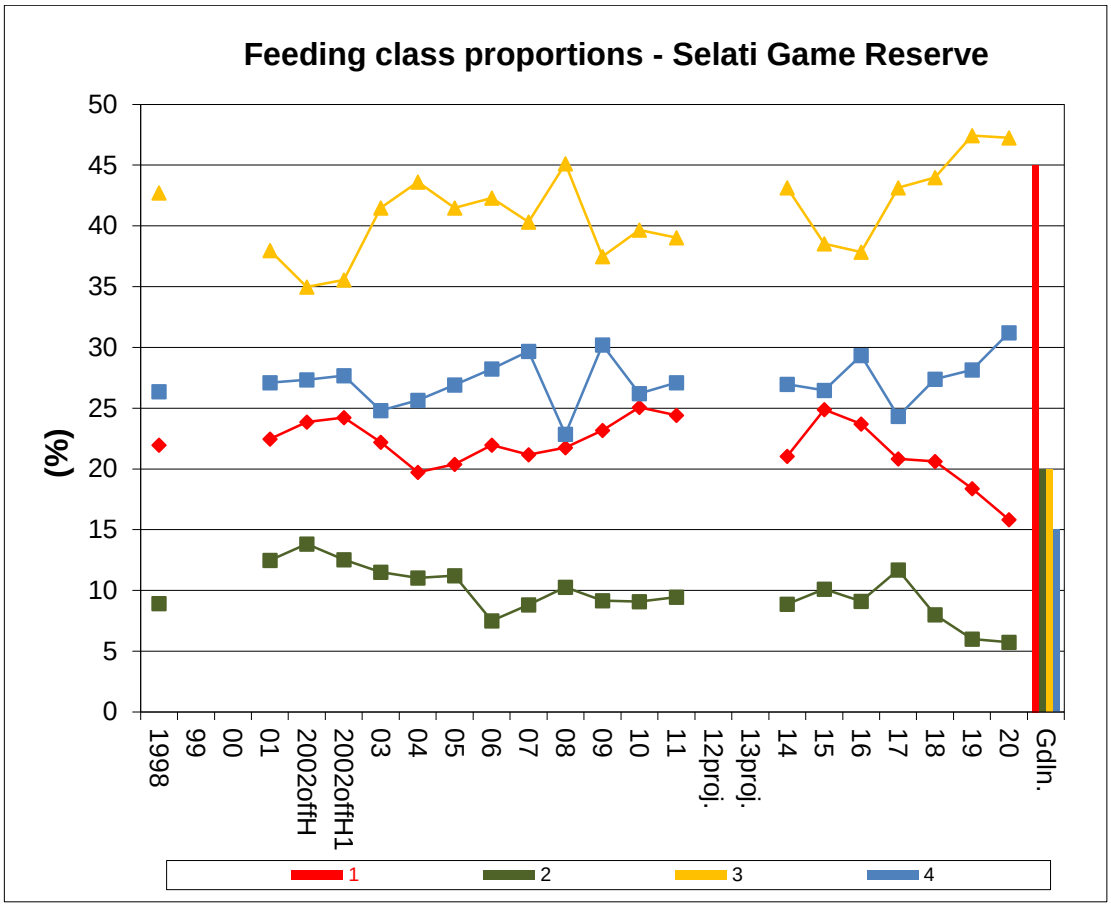


Figure 10.2: Graph illustrating the feeding class proportions within Selati Game Reserve: 1998 – 2020

The following could be deduced from the above:

- Under the modelled predator levels, the mega-herbivore population (elephant) still causes the guidelines to be exceeded. Does this mean that the guidelines are not appropriate? ALTERNATIVELY, do we need to reduce certain species due to their impact on the vegetation/other herbivore species? (Feeding Class 3).
- Further modelling is suggested whereby the predator numbers (lion) may be manipulated and the resulting prey biomass examined. This exercise would also affect the possible manipulation required in the non-prey species in particular. Fecundity estimates also require in-depth examination.

The above represents an approximation of the predator-prey relations in Selati Game Reserve. This model has ignored the fact that the reserve does not represent a closed system. A more detailed examination of the situation considering possible source-sink dynamics and density dependent feedback is required.

Sustainable utilisation

Wildlife removals may be in the form of live removal, hunting or harvesting for meat. Once the predator populations have reached carrying capacity, the sustainable utilisation of some of their prey species may no longer be possible.

Animals will be removed in the interests of habitat management and because 'Best Practice' may indicate that a harvestable surplus can be removed. Management staff need to consider any removal quotas after the annual game counts (September/October) so that these can be marketed to best advantage. Removals may take the form of live capture and culling, which is likely to be determined based on optimising income generation for the reserve.

The live capture quota should be decided as soon as the effectiveness of the rainy season and its impact on the vegetation can be judged. This will probably be by the end of March. The criteria that will be specified for live removals will be as follows:

- Species, number, sexes, age class.
- Areas targeted for removal of each species.
- Any restrictions on the capture season such as a cut-off date when increasing temperatures and late pregnancies increase the risk of capture related losses.
- Appropriate capture method.

Any proposal as to game removal should be taken after the annual game count at a meeting that includes the management and research staff, general manager, the ecologists doing the ecological monitoring on Selati Game Reserve and the ecologists and officials of LEDET and SANParks. The final decision would then be taken.

If a situation does arise when large-scale removals become necessary through culling, the following criteria should be observed:

- Numbers, sex and age composition of animals to be removed.
- Area in which animals are to be removed.
- Constraints as to the method and time of removal.
- Restrictions as to who may be present at the culling operation.
- Recommendations as to processing and disposal of carcasses.
- Record keeping, processing and interpretation of data.
- Media statements if required.
- Adherence to all relevant veterinary regulations is mandatory.

When culling is implemented, this will be undertaken by the most experienced Selati Game Reserve staff or be contracted to an organisation with proven expertise to implement the task. The management of any culling done by an outside contractor will be always be monitored by a senior member of the reserve's management staff. The monitoring officer or his/her deputy will be present at each operation.

10.4.3 Elephant management

In managing the elephant population within the reserve, the following guiding principles will be adhered to:

- Elephant management must be undertaken in accordance with the National Norms and Standards for the Management of Elephants in South Africa.

10.4.4 Integrated rhino management

In managing white and black rhino within the reserve, the following guiding principles will be adhered to:

- Innovative approaches to deter illegal activities, including poaching should be explored and implemented.
- Rhino management and security must be undertaken in collaboration with all other protected areas in the system of the Greater Kruger Area and the GLTFCA.

10.4.4 Water resource management

The sub-division of land and fencing of land for commercial cattle ranching, and over the past few decades' various forms of wildlife utilisation, meant that animals were restricted to areas that were seasonally waterless. With fencing, it became necessary to provide water artificially year-round in areas where water was only seasonally available in the past. This resulted in an eruption of water dependent animal species such as impala and wildebeest, increased concentrations of animals and grazing, trampling, dunging and urination which affects water infiltration, run-off, grass cover, species composition, the tree: grass ratio, and ultimately biodiversity and carrying capacity (depending on the set objectives) particularly on units much reduced in size.

Whilst the provision of water is essential for most game species, it has been shown that species that require medium to tall grasses (common reedbuck, roan, sable, tsessebe) decline under conditions of high artificial water point density. The ideal primary water objective would be to provide water for animals in places and for periods which approximate as closely as possible the natural past distribution of water without affecting adversely the hydrology and consequent ecology of the reserve and to maintain natural water bodies in such a condition so as to support the naturally occurring species linked to such bodies.

10.4.5 Fire management

Fire and herbivore management are heavily inter-related, which requires that:

- Herbivore management allow for the recovery of desirable plant species, which requires periodic rest or alleviated herbivore pressure during the growing season.

- Fire should be used as a management tool to encourage herbivore utilisation on areas that have received a level of rest or reduced usage in the previous season/s.
- Overall long-term wildlife numbers and animal species composition for the reserve should not exceed its carrying capacity.

Fire plays an important role in southern African ecology, and has important effects on vegetation composition, primary productivity and nutrient cycling. The following guiding principles should be adhered to:

- Burning must be undertaken with consideration of the biodiversity conservation requirements of the reserve and the need to protect rare and threatened species.
- Heterogeneity should be maximised by spreading the use of fire across the year and by varying ignition points and extent of fires away from fixed blocks.
- A degree of laissez faire should be introduced that will benefit diversity but that may also reduce management input costs and manpower requirements.
- Excessive litter and old growth should be removed in order to maintain a diverse and vigorous herbaceous sward.
- Fire should be used to retard woody plant growth.
- Fire management should be undertaken to reduce the risk of detrimental wild and/or arson fires.
- Burning and fire management must be undertaken in a safe manner that is legally compliant with the National Veld and Forest Fire Act.

10.4.6 Invasive species control

A listed invasive species means any species, which is listed in terms of the Conservation of Agricultural Resources Act and section 70 of the National Environmental Management: Biodiversity Act and its regulations, whose establishment and spread occurs outside of its natural distribution range. In undertaking invasive plant control, the following guiding principles will be adhered to:

- Invasive plant control will require an ongoing programme that prioritises key infestations along watercourses, drainage lines and upper catchment areas.
- Innovative methods for clearing of indigenous problem plants must be sought.
- Initial clearing efforts should focus on containing infestations that are most likely to spread into new areas.
- All follow-up requirements must be strictly adhered to otherwise the problem will be exacerbated.

10.4.7 Soil erosion management

The loss of topsoil is chronic and irreversible. Every patch of bare exposed soil surface, or network of erosion gullies, represents lost productivity, in terms of both forage and habitat. The environmental inhospitality of the exposed earth prevents the establishment of the protective plants that are food, cover and shade for many organisms.

The capability of the soil to resist water erosion is dependent on soil particle size, chemistry and organic content, as well as the nature and extent of the vegetation cover. Sandy soils have a relatively large pore space, which gives them a greater capacity for water infiltration than silty or clay soils. With their smaller pore spaces, silty and clay soils are prone to rapid run-off flow with lower rainfall infiltration. This rate of overland flow is likely to increase as the slope angle increases. Rainfall events in arid areas are often intense and usually exceed the infiltration rate. This results in overland run-off flows, which attain much higher velocities than non-arid areas. Erodibility of the soil by wind is determined by the speed, turbulence, frequency, duration and direction of the prevailing winds. Soil surface erodibility by wind is also influenced by physical soil attributes like particle size, cohesiveness, moisture content, organic matter, the presence of stones and rocks and the nature and type of vegetation cover (highlighting the importance of healthy grass cover as measured in the vegetation monitoring).

Soil removal by wind and water is a part of a natural geomorphological process, the inevitable and universal process of landmass erosion. The erosion of the ancient parent rock is slow and results in the formation of the soils that support and maintain the plants that protect it. Under natural conditions, a fragile balance exists between the rate of soil formation and the rate at which it is degraded or eroded. In contrast to this natural process, the rate of soil erosion can be enormously sped up or accelerated through the activities of man. Under these conditions, soil is removed much faster than it can be formed, most often resulting in the loss of valuable life-giving topsoil. Accelerated soil erosion usually occurs when there is a change in plant cover, which changes the rate of rainfall infiltration and run-off.

Human activities that most commonly lead to wind erosion are those that change or remove the protective vegetation cover and those that destabilise the natural soil surfaces, such as earth moving, land clearing, ploughing, burning, overgrazing, mining, trampling by domestic stock and even off-road vehicle use. The compaction, crusting and sealing of soil surfaces diminish water infiltration capacity and increase surface run-off, which often leads to soil erosion.

Compaction, crusting and sealing impede seedling growth and root penetration and retard oxygen and carbon dioxide interchange with plant roots. The sealing of surfaces can be caused by physical trampling but is most commonly caused by the clogging of soil pores by fine-grained silt and clay particles dispersed by raindrop impacts.

The effects of trampling and compaction often accompany overgrazing of vegetation by wildlife. The most common consequence of overgrazing, however, is a dramatic decrease in vegetation cover that leads to accelerated erosion of the soil surface by water and wind (Coetzee, 2010). Selati Game Reserve is in a semi-arid savanna ecosystem. A semi-arid savanna is dry wooded grassland where the rainfall is usually restricted to five or six months of the year and which ranges typically from 250 mm to 650 mm per annum. Rainfall in these areas exhibits increasing signs of variability. Moisture, or lack thereof, limits the production of grazing and browse for game, and an integrated land management plan should be aimed at conserving soil moisture by minimising rainfall runoff into drainage lines and maximising rainfall penetration into the soil. The guiding principles for soil management will be to:

- Manage areas susceptible to soil erosion, or showing early signs of soil erosion, such as loss of vegetation cover, to prevent accelerated soil erosion.

The operational requirements and actions necessary to achieve the high-level objectives and deliverables for ecological management are set out in Table 10.5.

Table 10.5 Ecological management requirements for Selati Game Reserve

High-level objective: To manage the ecosystem, landscapes and species populations of Selati Game Reserve so that a meaningful contribution will be made towards their conservation.				
Management goal	**Actions**	**Responsibility**	**Portfolio of evidence**	**Timeframe**
Deliverable: Critical ecological processes and functions are maintained within Selati Game Reserve.				
The habitat types within the reserve should be managed optimally to maintain a representative species composition.	An integrated habitat management programme, which considers the effects of herbivory, fire, water resource management and impacts such as bush encroachment and soil erosion must be developed.	Selati Game Reserve General Manager/ ecological specialists	Report	Year 1
	A predictive understanding of the dynamics of specific plant species and the vegetation as a whole in particular in its relation to climate, soils, herbivory, bush control and fire should be enabled through the implementation of monitoring that examines the effects of management and environment on vegetation composition and structure.	Selati Game Reserve General Manager/ ecological specialists	Monitoring reports	Annually

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
The habitat types within the reserve should be managed optimally to maintain a representative species composition.	The extent and effects of habitat rehabilitation should be monitored.	Selati Game Reserve General Manager/ ecological specialists	Monitoring reports	Annually
	The status and relative trend of rare and threatened plant species within the reserve should be quantified.	Selati Game Reserve General Manager/ ecological specialists	Monitoring reports	Annually
	Vegetation management should be adapted if negative trends in composition and structure, and the status of species are detected.	Selati Game Reserve General Manager/ ecological specialists	Monitoring reports	Annually
Measures should be implemented to control human induced bush encroachment within the reserve.	The effect of management and environmental aspects on vegetation composition and structure must be monitored.	Selati Game Reserve General Manager/ ecological specialists	Monitoring reports	Annually
	Vegetation condition and trends in the areas where bush thinning is done must be monitored and the success of previous coppice control efforts should be reviewed.	Selati Game Reserve General Manager/ ecological specialists	Monitoring reports	Annually
	The following data should be recorded: • Location and GPS reference. • Species and approximate number or area of plants. • Treatment details (chemical application information). • Costs (transport, person-hours, chemicals etc.). • Dates and weather. • Rainfall details as this can impact on the efficacy of chemical applications. • Follow-up observations and treatments.	Selati Game Reserve General Manager	Monitoring reports	Annually

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Human use of indigenous vegetation should be allowed within limits in which it has no appreciable effects on the ecological dynamics, species and habitats of the reserve.	The amount of firewood available for use (internal and external) should be determined as part of the integrated habitat management programme.	Selati Game Reserve General Manager/ ecological specialists	Report	Year 3
	Ethno-botanical assessment should be undertaken of key species, their conservation status and the extent to which they can be harvested sustainably If certain situations trigger the need	Selati Game Reserve General Manager/ ecological specialists	Report	Year 3
	Zones that may be out of bounds for harvesting because of negative impacts should be defined.	Selati Game Reserve General Manager	Report	Year 3
	Medicinal plants/other plant products (e.g. thatching grass) that can be utilised on a sustainable basis, should be made available.	Selati Game Reserve General Manager/ ecological specialists	Report	Annually
Deliverable: Wildlife management and offtakes are undertaken based on ecological principles and the recommendations of appropriate monitoring processes and studies.				
On an annual basis, the absolute or relative trends of selected species other population parameters (such as sex and age structure), which will help in understanding the population dynamics of key species, should be quantified.	An aerial game count should be undertaken on an annual basis.	Selati Game Reserve General Manager/ ecological specialists	Report	Annually
	Reports on animal numbers, stocking rates, and species mix proportions, must be developed together with guidelines for management.	Selati Game Reserve General Manager/ ecological specialists	Report	Annually
	The following parameters should be monitored: • Sex and age structures. • Physical condition of animals through observation or using faecal analysis techniques. • Disease and parasites when necessary. • Behaviour when necessary.	Selati Game Reserve General Manager/ ecological specialists	Report	Annually

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Sustainable utilisation of wildlife through culling must be based on ecological considerations and the prevention or minimisation of resource related die-offs during drought periods.	Species which can be utilised on a sustainable basis, using cost effective methods should be identified.	Selati Game Reserve General Manager/ ecological specialists	Report	Annually
	The removal of key species such as warthog, during periods of drought, to minimise resource related die-offs should be considered.	Selati Game Reserve General Manager/ ecological specialists	Report	As required
	Ways of marketing and utilising game meat and associated products should be determined within the constraints of veterinary restrictions.	Selati Game Reserve General Manager	Report	Year 3
	Steps should be taken to prevent notifiable disease outbreaks, in particular Foot-and-Mouth Disease, African Swine Fever, Tuberculosis and Anthrax.	Selati Game Reserve General Manager/ disease specialists	Report	As required
Appropriate action must be taken to control damage causing animals (DCA).	Individual animals that could be considered a problem and a threat to human lives or infrastructure should be identified and appropriate action undertaken to control them.	Selati Game Reserve General Manager	Reports and DCA permits	As required
The impact of keystone species and groups on the habitat and ecology of the reserve should be determined.	Thresholds of Potential Concern for selected species/components on habitats and the reserve's ecology should be determined.	Selati Game Reserve General Manager/ ecological specialists	Report	Year 1
	Management actions in relation to the Thresholds of Potential Concern should be implemented, where necessary.	Selati Game Reserve General Manager/ ecological specialists	Report	As required
Deliverable: Elephant management is undertaken in accordance with the recommendations of the approved Elephant Management Plan.				
Elephants within the reserve should be managed in to maintain an optimal population size, demographic structure and to avoid ecological degradation.	A formally approved Elephant Management Plan, covering the reserve, must be in place and be implemented.	Selati Game Reserve General Manager and Board	Elephant Management Plan	Year 1
	Elephant population numbers within the reserve should not exceed carrying capacity levels identified in the elephant management plan.	LEDET Agreement Partners	Elephant Management Plan	Year 10
	A perimeter fence must be maintained to contain the elephant within the reserve in accordance with the national norms and standards.	Selati Game Reserve General Manager and Board	Fencing specifications	Ongoing

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Deliverable: An integrated approach to rhino management is adopted to address issues of illegal poaching.				
Rhino within the reserve should be managed in cooperation with other protected areas to coordinate law enforcement efforts and deter illegal activities.	Innovative approaches to deter illegal activities, including de-horning, should be considered in consultation with neighbouring protected areas.	Selati Game Reserve General Manager and Board	Report on de-horning	Ongoing
Deliverable: Water resource management is undertaken in a pragmatic manner that considers implications at a landscape-level.				
Water should be provided for animals in places and for periods which approximate as closely as possible the natural past distribution of water without affecting adversely the hydrology and consequent ecology of the reserve.	An inventory and map of natural perennial and non-perennial water sources, and existing artificial points including the current status of each water point, should be prepared.	Selati Game Reserve General Manager/ ecological specialists	Maps and report	Year 1
Water should be provided for animals in places and for periods which are to approximate as closely as possible the natural past distribution of water without affecting adversely the hydrology and consequent ecology of the reserve.	A policy prohibiting the reconstruction of breached catchment dams unless such dams are deemed to be integral in the implementation of the water distribution policy, should be implemented.	Selati Game Reserve Board	Selati Game Reserve AGM resolution	Year 1
	The longer-term effects of artificial water provision on habitats in the reserve should be assessed.	Selati Game Reserve General Manager/ ecological specialists	Maps and report	Year 2
	Agreement should be reached amongst landowners and the reserve's management authority for a water supply management programme for animals.	Selati Game Reserve Board	Selati Game Reserve AGM resolution	Year 3
	Management actions to close over-utilised water points should be undertaken.	Selati Game Reserve Board	Selati Game Reserve AGM resolution	Year 3

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Deliverable: Fire management is undertaken based on ecological principles, the recommendations of studies undertaken for the site and the consideration of landscape-level issues.				
Fire should be used in a controlled manner to fulfil its role as a system driver in the reserve and to maintain grass layer vigour and promote diversity.	Fuel loads and the proportion of moribund grass should be evaluated during a pre-burn survey for early season fires (March to May) and late season fires (July to September).	Selati Game Reserve General Manager/ ecological specialists	Maps and reports	Annually
	In conjunction with neighbouring protected areas, a burning programme should be implemented if the objectives for the proposed fire will be achieved.	Selati Game Reserve General Manager	Maps and reports	As required
	The effect of controlled burns should be evaluated during a post-burn survey that ensures adequate data recording. Date that should be recorded includes: • Location of the fire with an accurate GPS map of the burnt area. • Date and time of the fire. • Weather conditions including temperature, wind speed and humidity. • Veld conditions. • Cause of the fire. • Nature of the fire. • Fire danger index.	Selati Game Reserve General Manager	Maps and reports	As required
	Burns must be annually recorded and mapped and integrated with past information on burning.	Selati Game Reserve General Manager	Maps and reports	Annually
Fire should be used in a controlled manner to fulfil its role as a system driver in the reserve and to maintain grass layer vigour and promote diversity.	Peripheral and strategic internal firebreaks should be cleared as a high priority.	Selati Game Reserve General Manager	Maps and reports	Annually
	Staff should receive adequate training in fire management and there must be adequate firefighting equipment available in the reserve.	Selati Game Reserve General Manager	Training and asset registers	As required
	An emergency fire plan must be in place to handle any unplanned fires.	Selati Game Reserve General Manager	Emergency plan	Ongoing
	Membership must be maintained of the Ba-Phalaborwa Fire Protection Association.	Selati Game Reserve General Manager and Board	Membership	Annually

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
High-level objective: To cost-effectively, where practicable restore and conserve the reserve's landscapes, ecosystems and biodiversity in a productive and aesthetic state that will contribute towards the reserve's vision and be sustainable within the climatic and geological constraints of the area.				
Deliverable: Invasive alien plant species control measures are implemented in the nature reserve in a planned and systematic manner.				
Concerted, sustained control efforts in identified areas of invasive plant infestation must be implemented.	Heavy infestations of particular invasive alien plant species must be mapped, and suitable management strategies identified.	Selati Game Reserve General Manager	Maps and reports	Annually
	Invasive alien plant control must be undertaken in a systematic planned manner within the reserve.	Selati Game Reserve General Manager	Maps and reports	Annually
Management of low-level infestations of invasive alien plant species must be undertaken on a continual basis.	Ongoing control and eradication of listed invasive species must be undertaken to a point where maintenance control is all that is required.	Selati Game Reserve General Manager	Maps and reports	Annually
Deliverable: Areas that are impacted by soil erosion are identified, managed and, if necessary, rehabilitated.				
Erosion that is threatening unique, valuable or sensitive habitat must be identified and attended to.	Gully erosion in bottomlands must be identified and mapped.	Selati Game Reserve General Manager	Maps	Year 1
	Extensive sheet eroded areas and erosion from sodic patches must be identified and mapped.	Selati Game Reserve General Manager	Maps	Year 1
	A priority programme for erosion reclamation, as part of an integrated habitat rehabilitation programme must be developed.	Selati Game Reserve General Manager	Report	Year 1
	Headward gully erosion into bottomlands should be stabilised.	Selati Game Reserve General Manager	Fixed point photography	As required
	Water run-off must be reduced, and infiltration increased on sodic patches and sheet eroded areas.	Selati Game Reserve General Manager	Fixed point photography	As required

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Areas of active erosion resulting from the road and track network should be identified and erosion minimised through the correct alignment, drainage and, if required, closure and reclamation of roads and tracks.	A detailed and systematic assessment of roads and tracks must be conducted.	Selati Game Reserve General Manager	Maps and report	Year 1
	Areas of active erosion must be mapped and appropriate measures to minimise these should be recommended.	Selati Game Reserve General Manager	Maps and report	Year 1
	Roads and tracks for erosion reclamation measures must be prioritised.	Selati Game Reserve General Manager	Maps and report	Ongoing
	Roads and tracks that are placed on sodic areas, other erodible soils and on active seep lines must be re-routed.	Selati Game Reserve General Manager	Fixed point photography	As required
	Roads and tracks must be maintained in a state which minimises their impact on surrounding hydrology, soil erosion, and biologically sensitive areas	Selati Game Reserve General Manager	Fixed point photography	Ongoing
Quarry material for the surfacing of key road and tracks must be utilised with the minimum of disturbance to the environment and to the aesthetics of the reserve.	Sources of quarry outside of the reserve, which can be utilised, thus employing contractors to bring in suitable quarry material for key roads and tracks should be identified.	Selati Game Reserve General Manager	Report	As required
	Where possible, the use of the surplus gravel from dam walls that have breached and that are not to be reinstated should be investigated.	Selati Game Reserve General Manager	Report	As required
	Where applicable, the use of the surplus gravel from the pits dug to dispose of rubble, litter and refuse should be investigated.	Selati Game Reserve General Manager	Report	As required
	If no alternative can be found, then suitable quarry site/s within the reserve should be identified and the quality of the available quarry material should be assessed.	Selati Game Reserve General Manager	Report	As required

10.5 Socio-economic benefits

10.5.1 Income generation

Tourism and hunting within Selati Game Reserve are a vital source of income that underpins the reserve's financial sustainability and viability and are integral to ensuring that the reserve is properly resourced and protected. It is thus vital that opportunities to optimise income, return on investment and

value for landowners are realised. It is also equally important, however, that the natural resource base that supports the commercial activities that operate within the reserve is protected to ensure the long-term sustainability of its nature-based commercial ventures. In managing and further developing commercial opportunities within Selati Game Reserve, the following guiding principles will apply:

- The development and operation of commercial ventures and opportunities within the reserve will be consistent with the values and purpose for which it was established.
- Opportunities to optimise income generation, return on investment and value to landowners and partners will be sought in developing and operating commercial ventures within the reserve.
- Innovation, excellence and best practice will be hallmarks of commercial ventures within the reserve.
- Commercial activities will be undertaken in an open and transparent manner that clearly shows how income generated and how it is spent within the reserve.
- Opportunities to develop partnerships and collaborate with role players within the system of the Greater Kruger Area will be sought, to add value to the reserve's operations and commercial ventures.
- Tourist and hunting activities must not threaten its biodiversity or ecological function or lead to unacceptable levels of habitat degradation.
- In developing tourist and hunting infrastructure, requirements for environmental authorisation must be considered and adhered to.

10.5.2 Collaboration and implementation of social projects

Constructive relationships with adjacent protected areas and neighbouring communities in the region are an important aspect of the effective conservation of protected areas. In striving to drive socio-economic development in the region, Selati Game Reserve should aim to develop a strong sense of partnership with protected areas that are within the GLTFCA, and communities in the region. The following guiding principles should be adhered to:

- Specific efforts should be developed in partnership with other protected areas in the region.
- Efforts should be made to ensure that the community members living in the region are aware of the role the reserve and the system of protected areas fulfils in regional economic development, biodiversity protection and the provision of ecosystem services.
- Stakeholder engagement should be undertaken to engender a sense support for the reserve and its biodiversity conservation objectives.
- A common understanding of the issues that affect both the reserve and communities in the region should be developed and efforts to resolve them should be undertaken cooperatively.

10.5.3 Environmental education, awareness and interpretation

Environmental education and interpretation of Selati Game Reserve's resources should be aimed at creating awareness, understanding and appreciation of the significance and importance of its biodiversity and ecological function. In implementing the environmental education, awareness and interpretation programme, the following guiding principles should be adhered to:

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

The operational requirements and actions necessary to achieve the high-level objectives and deliverables for socio-economic benefits are set out in Table 10.6.

Table 10.6 Socio-economic benefit requirements for Selati Game Reserve

High-level objective: To manage Selati Game Reserve so that, without compromising the ecological and aesthetic objectives, the economic viability and investment value of the properties are maintained.				
Management goal	**Actions**	**Responsibility**	**Portfolio of evidence**	**Timeframe**
Deliverable: Income generation for the conservation management of Selati Game Reserve is optimised through sustainable consumptive and non-consumptive utilisation of natural resources, including tourism.				
Income generation within the reserve should be optimised to ensure value for landowners and adequate resources to protect and operate the reserve.	Income generation within Selati Game Reserve contributes towards an adequate budget to protect and operate the reserve.	Selati Game Reserve General Manager and Board	Income statements in the reserve's annual finances	Annually
Deliverable: Best-practice approaches to activities such as tourism are adopted in a spirit of cooperation and transparency with partners and stakeholders.				
Selati Game Reserve should be at the forefront of innovation and best practice in nature-based tourism and conservation in South Africa.	New tourism ventures should strive to drive innovation and best practice in the wildlife tourism and conservation industries.	Selati Game Reserve General Manager, Board and landowners	Reports	As required

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Mechanisms should be instituted to clearly demonstrate how income derived from tourism activities is utilised in the management of the reserve.	Transparent reporting mechanisms, should be instituted, which demonstrate the nature of tourism activities within the reserve, show how much income these activities generate and how the income is spent in supporting the operation and management of the reserve.	Selati Game Reserve Board	Reports	Annually
Deliverable: Support, cooperate and collaborate with protected areas within the GLTFCA in maximising socio-economic benefits to the region.				
Opportunities to contribute towards cooperation and collaboration in maximising socio-benefits to the region should be explored and implemented.	Opportunities, based on economies of scale and the joint buying power of the collective protected areas within the GLTFCA should be explored and implemented, in an effort to drive significant and meaningful change and socio-economic benefits, associated with wildlife conservation, in the region.	Cooperative Agreement Partners	Socio-economic projects	Year 5
Deliverable: Implementation of an education, awareness and interpretation programme for Selati Game Reserve.				
Environmental education, awareness and interpretation should be undertaken to raise awareness of the reserve's ecological and conservation value.	Environmental interpretation and education should be focused on nearby communities and visitors to the reserve.	Selati Game Reserve General Manager	Education Programme	Ongoing
	Where possible, members of nearby communities should be employed and trained to assist in and implement environmental education programmes.	Selati Game Reserve General Manager	HR Records	Ongoing

10.6 Safety and security

The landowners and managers of Selati Game Reserve have a responsibility to ensure that laws related to the conservation of the reserve and efforts to combat illegal activities, in particular poaching, are enforced. On this basis, the following guiding principles apply:

- Law enforcement efforts should be coordinated with surrounding protected areas and the relevant authorities including SANParks, LEDET and the South African Police Service in addressing offences and breaches of the law.
- Law enforcement in the reserve will be undertaken through surveillance, monitoring and appropriate reaction in the event of an offence.

The operational requirements and actions necessary to achieve the high-level objectives and deliverables for safety and security are set out in Table 10.7.

Table 10.7 Safety and security requirements for Selati Game Reserve

High-level objective: To comply with and enforce legislation pertaining to the protection, development and management of Selati Game Reserve.

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Deliverable: There is appropriate security and law enforcement within Selati Game Reserve.				
Applicable legislation related to combatting illegal access and wildlife crime should be implemented.	Appropriate protocols and standard operating procedures, and coordinated with neighbours, should be established, and implemented.	Selati Game Reserve General Manager and Board	Security protocols and standard operating procedures.	Ongoing
	Regular proactive and reactive interventions should be conducted, i.e. patrols and surveillance operations to ensure that area integrity is maintained.	Selati Game Reserve General Manager and Board	Schedule of patrols and reports	Annually
	The boundary and facility fence line integrity must be ensured.	Selati Game Reserve General Manager and Board	Schedule of patrols and reports	Annually
	Implement deception testing technology as a tool to support security related investigation processes.	Selati Game Reserve General Manager and Board	Deception testing reports	Annually
	Cooperate with key partners, including SANParks, SAPS and provincial conservation authorities in the prosecution of offenders caught committing an offence.	Selati Game Reserve General Manager and Board	Court rulings	As required
Deliverable: Wildlife risks to neighbours, visitors, staff, infrastructure and livelihoods are minimised.				
Risks and liabilities associated with wildlife-related emergencies and breakouts that may lead to injury, death, damage to infrastructure or impacts on livelihoods are regularly assessed and measures are implemented to minimise them.	Standard operating procedures must be regularly reviewed and updated to address risks, procedures and compensation associated with wildlife breakouts and emergencies.	Selati Game Reserve General Manager and Board	Reports	As required

10.7 Land inclusion

In order to safeguard the integrity of Selati Game Reserve and the system of the Greater Kruger Area, opportunities to incorporate un-declared properties

around the reserve should be explored. The inclusion of any land into Selati Game Reserve should adhere to the following guiding principles:

- Any land to be included in Selati Game Reserve must contribute towards the ecological functioning and integrity of the reserve.
- The land to be included must contribute towards the protection of important habitat and the maintenance of viable populations of threatened, rare and endemic species.
- The land to be included should enhance the economic viability of Selati Game Reserve and should contribute towards socio-economic benefits to surrounding communities, including economic development, job creation and poverty alleviation.
- The land to be included should contribute towards improved management effectiveness of Selati Game Reserve, in particular through improved protected area design and enhanced security of the region.
- The land to be included may contribute towards the social, historical and cultural significance of Selati Game Reserve through the protection of important historical and cultural assets.

The operational requirements and actions necessary to achieve the high-level objectives and deliverables for land inclusion are set out in Table 10.8.

Table 10.8 Land inclusion requirements for Selati Game Reserve

High-level objective: To undertake any expansion of Selati Game Reserve in accordance with the requirements of the reserve's constitution.

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Deliverable: The potential value and risks of any land that is to be incorporated into Selati Game Reserve are carefully evaluated before a decision is made whether to include the land or not.				
Prior to initiating the process to incorporate land into Selati Game Reserve, an appropriate screening process must be implemented.	An ecological assessment should be undertaken to determine the contribution that the land will make towards: • The ecological viability of the reserve. • The protection of a representative sample of habitat or species. • The protection of threatened habitat and species. • The maintenance of viable populations of key species. • The maintenance of ecological processes. • The enhancement of ecological connectivity across the landscape.	Selati Game Reserve General Manager and Board/ ecological specialists	Report	As required

Management goal	Actions	Responsibility	Portfolio of evidence	Timeframe
Prior to initiating the process to incorporate land into Selati Game Reserve, an appropriate screening process must be implemented.	A risk assessment should be undertaken to determine: • The ownership and governance of the land and whether it will enhance, maintain or undermine the governance of the reserve. • The legal status of the land in terms of planning, zoning and other relevant issues such as land claims. • Commercial and non-commercial activities undertaken on the land, whether they are compatible with or whether they would pose a reputational risk to the reserve. • Relationships between the owners and managers of the land, surrounding neighbours and local communities, including the types of community beneficiation activities associated with the land. • Risks that the land will pose to the safety and security of the reserve, in particular in relation to wildlife crime.	Selati Game Reserve General Manager and Board	Report	As required

10.8 Monitoring, reporting and evaluation

10.8.1 Legislative requirements for monitoring and reporting

The National Environmental Management: Protected Areas Act (NEMPAA) and the Regulations for the Proper Administration of Nature Reserves, which were published in terms of Section 86(1) of NEMPAA in 2012, include the following:

- Section 43(4) of NEMPAA enables the Minister or MEC to appoint external auditors to monitor a management authority's compliance with the overall objectives of the management plan.
- Clause 15 of the Regulations requires the management authority of a nature reserve to monitor and report annually, before the end of June each year, on the status of the implementation of the management plan.

The Norms and Standards for the Management of Protected Areas in South Africa, which were published in terms of Section 11 of NEMPAA in 2016, include the following:

- Clause 24 requires management authorities responsible for protected areas on private land, which are not organs of state, to report annually

to the MEC, by the end of May each year on their progress towards maintaining the norms and standards.

The Norms and Standards for the Inclusion of Private Nature Reserves in the Register of Protected Areas of South Africa, which were published in terms of Section 11 of NEMPAA in 2018, include the following:

- Clause 13 requires the management authorities of private nature reserves to submit a report to the MEC on progress towards meeting the norms and standards, which address the requirements for regularisation of private nature reserves in terms of NEMPAA.

There is thus a need to meet the legislative and regulatory requirements for monitoring and reporting on management and the implementation of this Selati Game Reserve management plan. In monitoring, evaluating and reporting on protected area management and the implementation of management plans, the following must be considered:

- Monitoring, evaluation and reporting is a fundamental aspect of adaptive management, enabling the assessment of management interventions and, if necessary, their modification, to achieve the vision and objectives of a protected area.
- Monitoring should be designed and implemented to determine the effectiveness of the implementation of a protected area's management plan and as such should be designed to be straightforward and practical for implementation by on-site staff.
- Records should be maintained of key management interventions, as set out in the management plan, and of problem events or incidents such as poaching and uncontrolled/arson fires.
- Scientific monitoring programmes may be established to monitor specific management interventions such as those that relate to the need to maintain, where practicable vegetation composition and diversity, wildlife carrying capacities and specific measures required for individual species.
- The outcomes of the monitoring process must be captured in an annual report, which should then also used to inform the annual plan of operation that is developed for the protected area in the following year.
- A level of transparency must be instituted, as part of the monitoring, evaluation and reporting process to ensure that the protected areas maintain legitimacy in the activities and land uses undertaken within them.

10.8.2 Existing ecological monitoring within the reserve

Wildlife monitoring

The ongoing monitoring of the wildlife population numbers, and performance is essential to be able to determine whether a population is doing well or not,

and if not and whether it is likely to reach a TPC. The intensity of monitoring of species will be related to their ecological importance.

Monitoring of animal numbers

The aerial count is regarded as a total area count and a reflection of the minimum number of animals present. Selati Game Reserve has an animal number database and although there is a relatively high cost associated with helicopter counts, they provide probably the best tool currently available to reliably and relatively easily assess the status of wildlife populations on areas the size of the reserve. When one examines the cost of the ecological monitoring (game count and veld monitoring) against the value of the animals alone, it is clear that the costs of the monitoring is low (estimated 0.55% of the estimated value of the game alone – 2020 for the Selati Game Reserve).

The veld condition assessment programme in Selati Game Reserve has been going since 1999/00 and forms part of an extensive programme reaching as far south as the Sabi Sand Wildtuin and as far north as Selati Game Reserve in South Africa. Similar initiatives have been set up in Mozambique and Zimbabwe.

Sex and age classification

The most efficient non-consumptive way to evaluate the performance of a population is by monitoring its sex and age composition over time. These data will generally explain why population numbers have either declined, are performing badly or are increasing.

The information sought is that which will give the percentage of calves born in relation to the number of adult females and the percentage surviving after one year. Data on the ratio of males to females and the survival rate of yearlings would certainly enhance the results of modelling exercises such as that presented above.

Sex and age classification must, where possible be collected shortly after the annual birth pulse but importantly before the spring rains in October/November to obtain data on calf survival. This exercise is done as far as possible during the annual aerial game counts

Condition assessments

Visual assessment of physical condition of animals should be noted and the reason behind an unexpected drop in condition determined. For antelope and buffalo, the criteria described by Riney (1982) provides a useful field guide.

In the case of carcasses, a visual assessment of internal body fat surrounding the kidneys and mesenteric fat should be recorded and the colour and texture of the bone marrow from a leg bone noted.

Further, animal condition should be assessed using faecal nitrogen (Grant et al 2000). This technique is already being used in some of the large Lowveld private nature reserves. Faecal samples should be collected at least twice a

year, in April, when condition levels are likely to be at a peak and again at the end of winter (say October) when animals are nutritionally stressed. This exercise is a useful adjunct to the veld condition assessments as together they may provide an 'early warning' of nutritional stress in individuals or within the population. It is recommended that Selati Game Reserve become part of this programme.

Genetic analysis

A DNA profiling technique based on molecular genetics was developed by the Animal Improvement Institute of the Agricultural Research Council for white rhinoceros using material collected from Mpumalanga Tourism and Parks Agency (MTPA). Individual animals can now be unequivocally identified by means of unique bands of micro-satellites. The individual profile consists of a combination of the two parent's profiles, making it therefore possible to construct parental lineages. The next time an individual rhinoceros on the reserve is immobilised (for whatever reason) a blood and tissue sample should be collected to be added to a rhino database.

The information from the database should be accumulated to determine parentage, animal productivity, genetic variation, rate of inbreeding and genetic distances between populations. The DNA profiling technique provides a powerful tool for the prevention of deleterious genetic consequences of maintaining small, isolated sub-populations. Objective decisions can then be made as to which individual rhino should be exchanged amongst the different sub-populations in the region (Steyn & Stalmans 2004).

Game Deaths

The recording of all game deaths is necessary to complement the count data and to understand cause and effect relationship of habitats, weather, competition and predators. The following information must be recorded for game deaths: species, date, location, weather, sex, age class, condition, cause of death- including culling, scavengers. Skulls should be collected, and the age determined from the stage of tooth wear and eruption.

10.8.3 The development of a monitoring schedule for Selati Game Reserve

The development of an annual monitoring schedule for Selati Game Reserve, must consider and address the requirements set out in Table 10.9.

Table 10.9 The monitoring and reporting requirements for Selati Game Reserve

Key performance area	Monitoring and reporting requirements
Governance	The reserve's compliance in terms of NEMPAA must be monitored and reported on.
	An annual budget for the nature reserve, directly linked to its annual plan of operation, must be developed and reported on in the reserve's annual report.

Key performance area	Monitoring and reporting requirements
Governance	The human resource management systems of the reserve should be monitored to ensure that there are sufficient, trained and capable staff to manage the reserve.
	The facilities, infrastructure and equipment within the reserve should be monitored to ensure that there are sufficient resources to effectively manage the reserve.
	Areas in which potential environmental harm may arise from development or operations within the reserve should be actively monitored to ensure that issues such as pollution or habitat destruction do not arise.
	Compliance with environmental authorisation requirements must be monitored and reported on in accordance with the conditions of any environmental authorisations.
Land use	The declaration of un-proclaimed portions of the nature reserve should be reported on as part of the reserve's annual report.
	The endorsement of the nature reserve status of the reserve on property title deeds should be monitored and reported on.
	Inputs into municipal and regional plans should be recorded and reported on in the reserve's annual report.
Ecological management	The reserve's existing animal and vegetation monitoring programmes should be maintained, and their key findings included in the annual report.
	Efforts to control bush encroachment should be monitored and reported on in the annual report.
	The use of firewood and other natural resources in the reserve should be monitored and reported on in the annual report.
	Animal population control, either through live removal or culling must be monitored and the details, including species and numbers of animals should be monitored and reported on in the annual report.
	A programme for monitoring of elephants, undertaken in accordance with the Elephant Management Plan should be developed.
	A programme for the monitoring of water resources should be developed.
	Data on the reserve's burning regime should continue to be maintained, including maps of areas burnt, the date of the burns and the weather conditions at the time of the burn.
	A programme for monitoring the control of invasive alien plant species should be developed, implemented and the findings included in the reserve's annual report.
	Appropriate monitoring procedures should be implemented for areas susceptible to accelerated soil erosion.
Socio-economic benefits	Income generated within the reserve should be recorded and reported on in the reserve's annual report.
	In order to maintain complete transparency, detailed financial records should be maintained of income derived from hunting (no longer practised) and tourism activities, and the proportion of it that is spent in the management of the reserve.
	A programme for monitoring the socio-economic benefits and impact of Selati Game Reserve, at a landscape and regional scale, should be developed in collaboration with neighbouring protected areas.

Key performance area	Monitoring and reporting requirements
Socio-economic benefits	The implementation of the reserve's environmental education, awareness and interpretation programme should be monitored and reported on in the annual report.
Safety and security	Records should be maintained of illegal incidents, and the measures taken to address them, and these should be reported on in the reserve's annual report.
	Selati Game Reserve should support any programmes, developed with partners, for monitoring wildlife crime.
Land inclusion	Any land to be included into the reserve should be monitored and reported on the annual report.

10.8.4 Management plan implementation and reporting

In order to streamline processes, the annual reporting process should be aligned with the development of an annual plan of operation, the annual budgeting process and the integration of the findings of management effectiveness assessments for Selati Game Reserve (Figure 10.3).

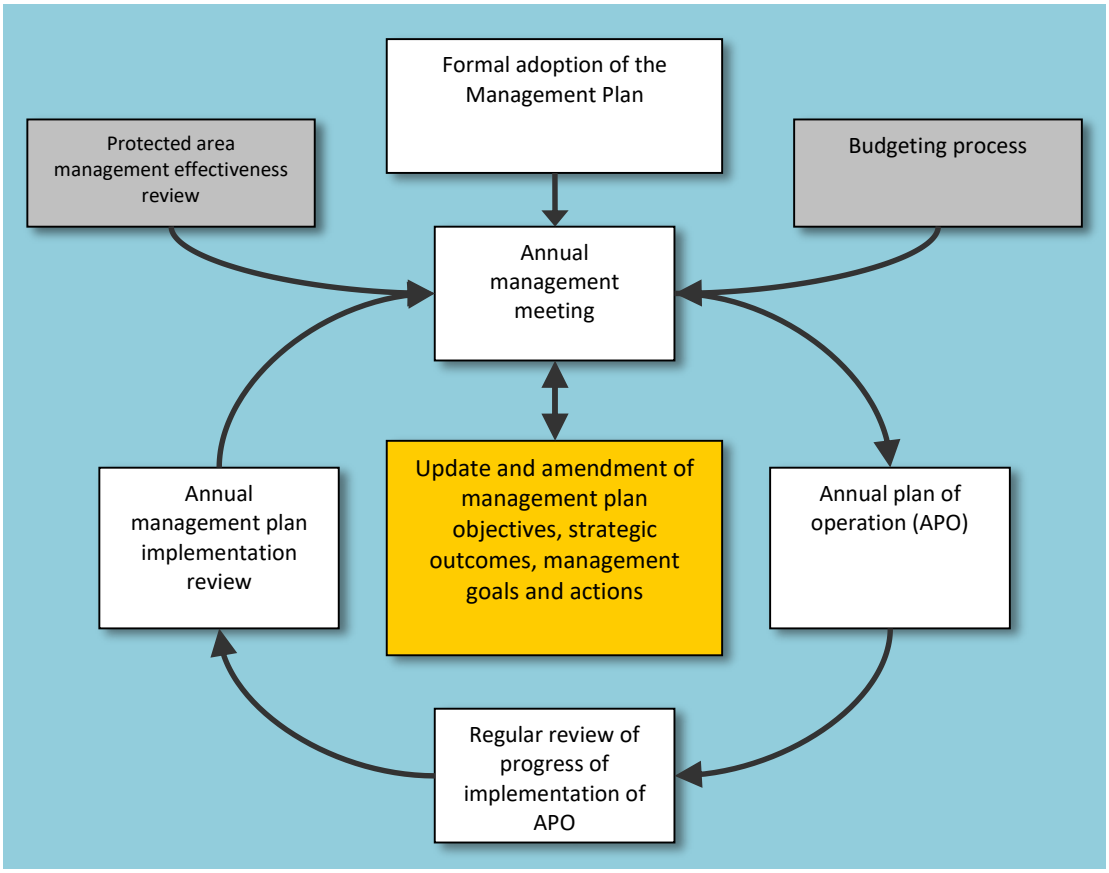


Figure 10.3: Process for reviewing the management plan and developing an annual plan of operation, integrated with the findings of a management effectiveness assessment and budgeting processes

The development of an annual report and an annual plan of operation, informed by the annual budgeting process, may be undertaken through an

annual management meeting in which Selati Game Reserve's managers and Board jointly develop the annual report and annual plan of operation. Key experts and stakeholders (e.g. ecologists, researchers, national or provincial conservation authorities, etc.) may also be included in the annual management meeting, if their input is required. The purpose of the meeting should be to review progress in the implementation of the management plan, compile the associated annual report and to then identify goals and intended outcomes for the coming year, and develop Selati Game Reserve's annual plan of operation (APO). As part of this process, the reserve's budget should be reviewed, and costs provisionally allocated for key management interventions. If a management effectiveness assessment has been undertaken in that year, its findings should also be incorporated into the reserve's annual plan of operation. The annual report generated from this meeting may then also form the basis for the management report presented to the Selati Game Reserve landowners at the annual general meeting. A pro formal annual plan of operation, in the form of the annual management meeting minutes is set out in Appendix 5.

In undertaking the review of the previous year, it is important that any supporting documentation, related to the management plan's monitoring section, be included. This may include brief reports, photographs, maps and any other relevant data and information. This will thus enable an effective review of the implementation of the management plan, allow the Selati Game Reserve's Board to identify any deficiencies in the management of the reserve and areas in which partners may play a role in supporting it. A further important aspect of this process will be to identify areas in which goals and actions may have been achieved and completed or may need to be modified, which may then inform a periodic formal review of the management plan.

Periodic completion of METT assessments

The Management Effectiveness Tracking Tool (METT-SA Version 3) has become the standardised tool for measuring protected area management effectiveness in South Africa. It is largely aligned with the Norms and Standards for the Management of Protected Areas in South Africa, which means that completion of a METT assessment and preparation of an accompanying report will meet its reporting requirements. It is important that the development of the Selati Game Reserve annual plan of operation (APO) consider the findings of METT assessments. This will allow key management issues and challenges to be identified and prioritised in the APO.

Reporting process

Following the completion of an annual review and the periodic completion of a METT assessment, an annual report should be prepared for each protected area. This report should be in a standard structure and format and should address the reporting requirements of NEMPAA, its regulations and norms and standards. An annual reporting template is contained in Appendix 6. An annual report for Selati Game Reserve should be prepared and submitted to the Selati Game Reserve's institutional structures each year.

SECTION 11: COSTING

In implementing this plan and developing associated annual plans of operation, the resource requirements for Selati Game Reserve must be considered and budgeted for.

11.1 Income

The 2019/20 operational costs for the management of Selati Game Reserve were R8.39 million and the budget for the operational costs for 2020/21 is R8.62 million. The primary sources of income within Selati Game Reserve are member's levies, the sale of wildlife, hunting, hospitality and the sale of sable from the reserve's breeding programme.

11.2 Operational costs

The budget for the 2020/21 financial year is presented below.

Table 11.1 2020/21 Operational Budget for Selati Game Reserve

Hospitality	**61 000.00**
Volunteers - Advertising & Promotion	31 500.00
Volunteers - Catering	20 000.00
Volunteers - Consumables	4 000.00
Volunteers - Repairs and Maintenance	5 500.00

Reserve Operating Expenses	**3 204 600.00**
ROC - Accounting fees	130 000.00
ROC - Audit fees	44 000.00
ROC - Bank charges	30 000.00
ROC - Cleaning Material	2 400.00
ROC - Computer expenses	20 000.00
ROC - Consulting fees	100 000.00
ROC - Depreciation	500 000.00
ROC - Electricity & water	350 000.00
ROC - Environment & Mapping - reserve	250 000.00
ROC - Entertainment Expenses	32 000.00
ROC - Finance charges	100 000.00
ROC - Fuel & Oil	500 000.00
ROC - Game Meat Equipment & Cons	2 000.00
ROC - Insurance	168 000.00
ROC - Insecticides & chemicals	10 000.00
ROC - Internet	12 000.00
ROC - Land tax	50 000.00

ROC - Legal fees	250 000.00
ROC - Ledet Permits	5 000.00
ROC - Marketing cost	145 500.00
ROC - Maintenance Big 5	50 000.00
ROC - Maintenance Fencing	100 000.00
ROC - Maintenance Building	378 000.00
ROC - Maintenance Gates	25 000.00
ROC - Maintenance Pump and Pipelines	25 000.00
ROC - Maintenance Vehicles	145 500.00
ROC - Membership fees	600.00
ROC - Medical expenses	60 000.00
ROC - Merchandise and clothes	20 000.00
ROC - Printing & stationeries	20 000.00
ROC - Rent Paid	120 600.00
ROC - Telephone	30 000.00
ROC - Travel & accommodation	5 000.00
ROC - Waste management	24 000.00

Security Expenses	**1 938 617.00**
Security - Vehicle Trackers	14 400.00
Security - Furniture & Fittings	60 000.00
Security – Knox, Fidelity	160 537.00
Security - CPU Contractors	1 498 680.00
Security - Rations	72 000.00
Security - Surveillance	30 000.00
Security - Picket upgrade	50 000.00
Security - GKEPF	25 000.00
Security - Kennels	2 000.00
Security - Polygraph testing	25 000.00
Security - Weaponry	1 000.00

Human Resources	**3 410 340.00**
HR - Salaries	2 951 500.00
HR - Wages	94 380.00
HR - Bonusses paid	100 000.00
HR - SDL	31 000.00
HR - Provident Fund	38 760.00
HR - UIF	18 600.00
HR - Protective Clothing	60 000.00
HR - Staff training	60 000.00
HR - Staff welfare	6 100.00
HR – Workmen's Compensation	50 000.00

Research	**167 950.00**
Research - field equipment	10 000.00
Research - furniture and fittings	3 000.00
Research - laboratory equipment and supplies	2 000.00
Research - printing and stationery	2 000.00
Research - lion veterinary	10 000.00
Research - cheetah helicopter / Transport	3 000.00
Research - Elephant helicopter / Transport	130 000.00
Research - Other animals veterinary	7 950.00
TOTAL	**8 782 507.00**

In implementing the management plan, the budget must consider the requirements of the annual plan of operation and be structured accordingly. Potential funding gaps should be identified, and appropriate strategies developed to address them. In the event of funding shortfalls in a particular year, management interventions must be prioritised, based on the most essential and urgent needs for the reserve.

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APPENDIX 1: DEFINITIONS OF TERMS

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

Ecosystem services	As defined in Section 1 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) as "environmental goods and services" meaning: a. Benefits obtained from ecosystems such as food, fuel and fibre and genetic resources. b. Benefits from the regulation of ecosystem processes such as climate regulation, disease and flood control and detoxification. c. Cultural non-material benefits obtained from ecosystems such as benefits of a spiritual, recreational, aesthetic, inspirational, educational, community and symbolic nature;" For the purposes of this IMP, sustainable water production is also specifically included under this definition.
Environmental degradation	The deterioration of the environment through depletion of resources such as air, water and soil; the destruction of ecosystems and the loss of species or undesirable reduction of species population numbers from a specific area from an environmental health perspective
Indigenous species	In relation to a specific protected area, means a species that occurs, or has historically occurred, naturally in a free state of nature within that specific protected area, but excludes a species introduced in that protected area as a result of human activity (as per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]).
Invasive species	Means any species whose establishment and spread outside of its natural distribution range – a. Threaten ecosystems, habitats or other species or have a demonstrable potential to threaten ecosystems, habitats or other species. b. May result in economic and environmental harm or harm to human health. (As per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]).
Joint management	The agreed co-ordination of management and/or management actions by landowners and/or mandated managers on their individual or combined properties in order to achieve common management objectives.
Local community	Any community of people living or having rights or interests in a distinct geographical area (as per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]).
Management	In relation to a protected area, includes control, protection, conservation, maintenance and rehabilitation of the protected area with due regard to the use and extraction of biological resources, community-based practices and benefit sharing activities in the area in a manner consistent with the Biodiversity Act (as per the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003).
Management authority	In relation to a protected area, means the organ of state or other institution or person in which the authority to manage the protected area is vested (as per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]).

Monitoring	The collection and analysis of repeated observations or measurements to evaluate change in status, distribution or integrity in order to track the impacts of directed management implemented to achieve a stated management objective.
Nature conservation	The conservation of naturally occurring ecological systems, the sustainable utilisation of indigenous plants and animals therein, and the promotion and maintenance of biological.
Neighbouring community	The communities and people permanently living in the local municipal area/s bordering onto the Nature Reserve.
Natural heritage	As defined in Article 2 of the World Heritage Convention (UNESCO) 1972 'natural heritage' is as: "natural features consisting of physical and biological formations or groups of such formations, which are of (…) value from the aesthetic or scientific point of view, geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of (…) value from the point of view of science or conservation, natural sites or precisely delineated natural areas of (…) value from the point of view of science, conservation or natural beauty." For the purposes of this IMP, this would include the required ecological integrity of the protected area for the production of ecosystem services.
Partnerships	A co-operative and / or collaborative arrangement between the Game Reserve management / LEDET/MTPA/SANParks and a third party that supports the achievement of the Game Reserve management objectives.
Protected areas	• Means any of the protected areas referred to in section 9 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003).
Ramsar Convention	Means: "The Convention on Wetlands of International Importance, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty, which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources." (There are presently 158 Contracting Parties to the Convention, the Convention has broadened its scope to cover all aspects of wetland conservation and wise use, recognising wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities.)

Stakeholders/ interested parties	These are interested individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public. According to the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), "stakeholder" means a person, an organ of state or a community contemplated in section 82 (1) (a), or an indigenous community contemplated in section 82(1) (b).
Surveillance	The collection and analysis of single or repeated measurements to establish status or distribution or integrity at a point in time in the absence of a specific management context or objective.
Sustainable	In relation to the use of a biological resource, means the use of such resource in a way and at a rate that would not lead to its long-term decline; would not disrupt the ecological integrity of the ecosystem in which it occurs; and would ensure its continued use to meet the needs and aspirations of present and future generations of people (as per National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).
Wilderness area	Means an area designated in terms of section 22 or 26 for the purpose of retaining an intrinsically wild appearance and character, or capable of being restored to such and which is undeveloped and roadless, without permanent improvements or human habitation (as defined by the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]).
World heritage site	Means a World Heritage Site as defined in the World Heritage Convention Act, No. 49 of 1999 under Chapter 1, section 1 subsection (xxiv).

APPENDIX 2: SELATI GAME RESERVE PROPERTIES

Table: Properties within Selati Game Reserve.

Owner/ Member	Property Name	Title Deed Description	Title Deed Number	Title Deed Owner	Area on Title Deed (ha)	Area in the Reserve (ha)
Moekie Nagel	B.V.B. Ranch	Portion 7 of the Farm B.V.B. Ranch 776 LT	T89771/1999	Ryk Nagel Selati Family Trust	471.0926	471.0926
Junior Joubert	La France	Farm La France 833 LT	T105213/1997	Plaas Danie Ga-Selati (Pty) Ltd	1,384.6966	1,384.6966
Alan Du Toit	Danie	Remaining portion of the Farm Danie 789 LT	T24795/2006	Pedal Trading 168 (Pty) Ltd	1,201.5604	1,201.5604
J & L Fourie	Buffalo Ranch	Buffalo Ranch 834 LT	T105216/1997	J & L Fourie Trust	1238.0719	1238.0719
Steve Kaminer	B.V.B.	Portion 17 of the Farm B.V.B. Ranch 776 LT	T72828/2002	S L Kaminer	631.0448	631.0448

Owner/ Member	Property Name	Title Deed Description	Title Deed Number	Title Deed Owner	Area on Title Deed (ha)	Area in the Reserve (ha)
Arnold Pistorius & Andries Oosthuisen	Lillie Ranch	Remaining extent of the Farm Lillie 148 KT	T1305/1996	Lillie Ranch (Pty) Ltd	1546.6206	1546.6206
Val Joubert & Johan Visagie	Lillie	Portion 2 of the Farm Lillie 148 KT	T12997/1997	Lmae Trust 505 and Val Joubert	529.7014	529.7014
Henry Dunn	Willie	Remaining extent of the Farm Willie 787 LT	T571/1989	HB Dunn	1971.1968	1971.1968
Klipspringer Lodge (Pty) Ltd	Willie	Portion 6 of the Farm Willie 787 LT	T091890/2011	Klipspringer Lodge (Pty) Ltd	600.0034	600.0034
Nyala Lodge	Nyala Lodge	Portion 4 of the Farm Arundel 788 LT	T26158/2006	Nyala Lodge Share Block (Pty) Ltd	999.8657	999.8657
Thomas Broers	Thankerton & Transport	Portion 3 of the Farm Thankerton 144 KT	T77293/2001	Overvaal Eiendomme (Pty) Ltd	1,112.5469	1,112.5469
		Remaining extent of the Farm Transport 145 KT	T64370/1989	Overvaal Eiendomme (Pty) Ltd	1,137.6125	1,137.6125

Owner/ Member	Property Name	Title Deed Description	Title Deed Number	Title Deed Owner	Area on Title Deed (ha)	Area in the Reserve (ha)
Hester Mare	Farrel & Josephine	Portion 6 of the Farm Farrel 781 LT		Piet Warren Plaase (Pty) Ltd	245.6881	58.2400
		Portion 1 of the Farm Josephine 777 LT	T35531/1984	PP Mare Boerdery (Pty) Ltd	2,126.7839	1,218.1100
		Remaining extent of the Farm Farrell 781 LT	T35531/1984	PP Mare Boerdery (Pty) Ltd	447.8524	447.8524
		Portion 8 of the Farm Farrell 781 LT	T35531/1984	PP Mare Boerdery (Pty) Ltd	151.9259	151.9259
Johan Claasens	Lekkersmaak	Lekkersmaak 792 LT Portion 1	T60721/2011	Vanggatfontein Bellegins (Edms) Beperk	1,856.9600	1,067.2300
Piet Warren	Josephine and BVB	Farm Josephine 777 LT	T30401/1984	Piet Warren Plaase (Pty) Ltd	2,270.4650	1,647.3189
		Portion 16 of the Farm BVB 776 LT	T30401/1984	Piet Warren Plaase (Pty) Ltd	27.8722	27.8722
Hall and Sons	Ermelo Ranch	Farm Koedoesrand 790 LT	T95164/1997	H L Hall and Sons Properties (Pty) Ltd	2,747.2964	2,747.2964
		Fam Huja 791 LT	T95164/1997	H L Hall and Sons Properties (Pty) Ltd	2,971.1867	2,971.1867
		Farm Hoed 146 KT	T95164/1997	H L Hall and Sons Properties (Pty) Ltd	2,504.5924	2,504.5924
		Remaining extent of the Farm Arundel 788 LT	T95164/1997	H L Hall and Sons Properties (Pty) Ltd	1,236.6318	1,236.6318

APPENDIX 3: SELATI GAME RESERVE PROCLAMATION NOTICE

APPENDIX 4: STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS ANALYSIS

A SWOT analysis is a strategic planning method used to evaluate the relevant strengths, weaknesses, opportunities, and threats. It involves specifying the objectives and identifying the internal and external factors that are favourable and averse to achieving those objectives.

Selati Game Reserve strengths

The 'Strengths' identified within Selati Game Reserve that are relevant to the reserve's management are as follows:

- Prevailing reputation as a private wildlife tourism destination.
- Leading eco-tourism operations.
- Low human footprint
- Low number of shareholders
- Proximity to the Kruger National Park and other established wildlife products.
- Quality of game.
- Relatively large untouched wilderness area.
- Diverse environment with varying geology, topography, soils and vegetation.
- Aesthetically pleasing.
- One large river.
- Limited alien plant infestation.
- Ecologically relatively heterogeneous.
- Production value of commercial operations.
- Historical returns on capital investment.
- Significant contribution to local economy.
- Significant job creation (local employment).
- Investments by landowners into neighbouring communities.
- Skills transfer to local community members.
- Easy accessibility via road and air.
- Highly competent management team with extensive local experience.
- A comprehensive ecological database extending over a period of some 20 years.

Selati Game Reserve weaknesses

The 'Weaknesses' identified within Selati Game Reserve that are relevant to the reserves management are as follows:

- Diverse ownership with sometimes divergent conservation philosophies, this may lead to differences in opinion and vision between different landowners and/or groups of landowners. Widely dispersed infrastructure of permanent water points, airstrips, camps and lodges, roads, power lines, buildings, waste pits, traffic etc.
- Semi-arid environment with great variability which has important implications as to the carrying capacity at any given time for wildlife.
- Legacy of past land use practices including animal species that are declining (e.g. eland) and have disappeared (roan and tsessebe), permanent water points (some of which are poorly located); accelerated erosion (from poorly aligned tracks that are corrugated, rutted and frequently below the level of the surrounding landscape), gravel quarries, and bush encroachment.
- Vulnerability to upstream exploitation of water resources.
- National and Provincial regulatory measures.
- Security threats both internal and external.
- Perception of wealth.
- Dependence on hunting, game sales and reserve resources to fund escalating security activities.
- Insufficient recovery of ordinary revenue to fund Selati Game Reserve operating activities.
- Treatment of waste across reserve.

Selati Game Reserve opportunities

The 'Opportunities' identified within Selati Game Reserve that are relevant to the reserves management are as follows:

- Further expansion of its borders by incorporation of land into the reserve.
- Opportunity to become a high-profile ecotourism brand.
- Long and well-established reputation within the wildlife fraternity.
- Reverse human induced disturbances – enhance 'wilderness' qualities.
- Reduce camp and lodge footprints (back of house operations).
- Move off the Eskom grid onto alternate power (remove power lines).
- Reduce volume and impact of traffic on reserve.
- Arrest and reverse erosion.

- Establish the Selati Game Reserve as a preferred employer by ensuring compliance with the BCEA and by providing staff with adequate living quarters.
- Address threat of criminal activity on reserve through appropriate security measures.
- Forging a good working relationship with Working on Fire and the Greater Kruger Fire Protection Association (GKFPA).
- Engage with communities on SMME opportunities.
- Improved relations with SANParks and DEA whilst becoming a key role player as partner in the Greater Limpopo Trans Frontier Conservation Area (GLTFCA).
- Inform conservation management decisions through focused research and monitoring initiatives.
- Maintain the riparian habitat.
- Engage with the relevant District Municipalities to use land taxes for community initiatives through Municipal IDP.
- Adopt a coordinated, regional landscape and bottom-up approach with respect to obtaining an understanding of prevailing habitat limitations for certain species (e.g. blue wildebeest, sable antelope, black and white rhinoceros, common reedbuck), i.e. focus on the fundamentals such as soils, habitat suitability and abundance of perennial water rather than on the species itself (understand & address the cause rather than treating the symptom).

Selati Game Reserve threats

The 'Threats' identified within Selati Game Reserve that are relevant to the reserves management are as follows:

- Increase in development pressure on neighbouring properties and communal land resulting in potential conflict with neighbours.
- Poaching and associated costs for counter-poaching measures, especially of rhinoceros.
- Financial impact of municipal rates.
- Haphazard habitat manipulation.
- Disease, in particular rabies, anthrax, foot and mouth and TB.
- Suspension or banning of trade in rhino – dependence on sales.
- Elephant impact on natural resources.
- Government imposed regulatory measures.
- Increased demands from external sources influencing the ability of the Selati Game Reserve regarding in terms of sustainable use of natural resources.

- Land claims. In the event of a successful claim the new owners may have different expectations, different objectives and could be inexperienced in terms of understanding the required level of ecological management to successfully sustain the Selati Game Reserve.
- Crime with special emphasis on violent crime.
- Social media.
- Decline in the economic value of species (e.g. sable antelope) important to the financial stability of Selati game reserve

APPENDIX 5: PRO FORMA ANNUAL PLAN OF OPERATION

Notes of a management meeting for Selati Game Reserve held at … on …

Present:

Apologies:

CC:

Table 1 Progress and goals set for Selati Game Reserve

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
GOVERNANCE					
Management costs must be identified and factored in as part of the reserve's annual management meeting.			Annually	Selati Game Reserve General Manager and Board	
A cost estimate must be included in the reserve's Annual Plan of Operation (APO).			Annually	Selati Game Reserve General Manager and Board	
Sufficient facilities, infrastructure and equipment are provided to staff to enable them to undertake their assigned activities.			As required	Selati Game Reserve General Manager and Board	
Regular scheduled maintenance of all infrastructure and equipment must be undertaken.			Annually	Selati Game Reserve General Manager	
Service infrastructure, including that for water supply, electricity and sewerage, must be monitored to ensure that it is not causing environmental harm and appropriate action must be taken if it is.			Annually	Selati Game Reserve General Manager	
Appropriate strategies must be implemented for the management and recycling of waste in the reserve.			As required	Selati Game Reserve General Manager and Board	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
GOVERNANCE					
Any activities or developments that require environmental authorisation, such as basic assessments, environmental impact assessments and the granting of water use licences, must be properly evaluated and appropriate environmental authorisations must be granted prior to development.			As required	Selati Game Reserve General Manager and Board	
Activities that take place outside of lodge environments (e.g. bush meals, weddings, etc.) must be carefully planned, considered, located and controlled to avoid unnecessary deleterious impacts.			As required	Selati Game Reserve General Manager and Board	
Selati Game Reserve participates in joint fora and events of the Lowveld PA Group.			As required	Selati Game Reserve General Manager	
Opportunities to collaborate in relation to issues such as research, conservation management, socio-economic beneficiation and safety and security are actively pursued.			As required	Selati Game Reserve General Manager and Board	
LAND USE					
Any un-proclaimed properties within Selati Game Reserve must be declared in accordance with NEMPAA.			Year 3	Selati Game Reserve Board	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
LAND USE					
The terms of the written agreement between the landowners and the Limpopo MEC must be recorded in a notarial deed agreement and registered against the title deeds of the properties in accordance with Section 35(3)(b) of NEMPAA.			Year 1	Selati Game Reserve Board	
Opportunities to capitalise on benefits in terms of Section 17 of the Municipal Property Rates Act and Section 37D of the Income Tax Act should be explored and implemented.			Year 1	Selati Game Reserve Board	
Inputs must be made into the development of local and district municipality IDPs, SDFs and LUMS to ensure compatible land uses in the areas around the reserve and the Greater Kruger Area.			As required	Selati Game Reserve General Manager	
Partners and authorities should be engaged to engender better cooperation in the management of water resources and enforcement of applicable legislation within upper catchment areas above the reserve.			Ongoing	Selati Game Reserve General Manager	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
LAND USE					
A process to determine the exact boundaries and to identify any deviations from them must be undertaken and if any deviations are identified, these must be addressed through formal agreements between the Selati Game Reserve Board and the neighbouring landowners/ protected area management authorities.			Year 1	Selati Game Reserve General Manager and Board	
A detailed register of all servitudes and rights of way, registered against the title deeds of properties within the reserve must be prepared.			Year 1	Selati Game Reserve General Manager and Board	
ECOLOGICAL MANAGEMENT					
An integrated habitat management programme, which considers the effects of herbivory, fire, water resource management and impacts such as bush encroachment and soil erosion must be developed.			Year 1	Selati Game Reserve General Manager/ ecological specialists	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
ECOLOGICAL MANAGEMENT					
A predictive understanding of the dynamics of specific plant species and the vegetation as a whole in particular in its relation to climate, soils, herbivory, bush control and fire should be enabled through the implementation of monitoring that examines the effects of management and environment on vegetation composition and structure.			Annually	Selati Game Reserve General Manager/ ecological specialists	
The extent and effects of habitat rehabilitation should be monitored.			Annually	Selati Game Reserve General Manager/ ecological specialists	
The status and relative trend of rare and threatened plant species within the reserve should be quantified.			Annually	Selati Game Reserve General Manager/ ecological specialists	
Vegetation management should be adapted if negative trends in composition and structure, and the status of species are detected.			Annually	Selati Game Reserve General Manager/ ecological specialists	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
ECOLOGICAL MANAGEMENT					
The effect of management and environmental aspects on vegetation composition and structure must be monitored.			Annually	Selati Game Reserve General Manager/ ecological specialists	
Vegetation condition and trends in the areas where bush thinning is done must be monitored and the success of previous coppice control efforts should be reviewed.			Annually	Selati Game Reserve General Manager/ ecological specialists	
The following data should be recorded: • Location and GPS reference. • Species and approximate number or area of plants. • Treatment details (including chemical application information). • Costs (transport, person-hours, chemicals etc.). • Dates and weather. • Rainfall details as this can impact on the efficacy of chemical applications. Follow-up observations and treatments.			Annually	Selati Game Reserve General Manager	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
ECOLOGICAL MANAGEMENT					
The amount of firewood available for use (internal and external) should be determined as part of the integrated habitat management programme.			Year 3	Selati Game Reserve General Manager/ ecological specialists	
Ethno-botanical assessment should be undertaken of key species, their conservation status and the extent to which they can be harvested sustainably.			Year 3	Selati Game Reserve General Manager/ ecological specialists	
Zones that may be out of bounds for harvesting because of negative impacts on tourism should be defined.			Year 3	Selati Game Reserve General Manager/ ecological specialists	
Medicinal plants/other plant products (e.g. thatching grass) that can be utilised on a sustainable basis, should be made available.			Annually	Selati Game Reserve General Manager/ ecological specialists	
An aerial game count must be undertaken on an annual basis.			Annually	Selati Game Reserve General Manager/ ecological specialists	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
ECOLOGICAL MANAGEMENT					
Reports on animal numbers, stocking rates, and species mix proportions, must be developed together with guidelines for management.			Annually	Selati Game Reserve General Manager/ ecological specialists	
The following parameters should be monitored: • Sex and age structures. • Physical condition of animals through observation or using faecal analysis techniques. • Disease and parasites when necessary. • Behaviour when necessary.			Bi-annually	Selati Game Reserve General Manager/ ecological specialists	
Species which can be utilised on a sustainable basis, using cost effective methods should be identified.			Annually	Selati Game Reserve General Manager/ ecological specialists	
The removal of key species such as warthog, during periods of drought, to minimise resource related die-offs should be considered.			As required	Selati Game Reserve General Manager/ ecological specialists	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
ECOLOGICAL MANAGEMENT					
Ways of marketing and utilising game meat and associated products should be determined within the constraints of veterinary restrictions.			Year 3	Selati Game Reserve General Manager/ ecological specialists	
Steps should be taken to prevent notifiable disease outbreaks, in particular Foot-and-Mouth Disease, African Swine Fever, Tuberculosis and Anthrax.			As required	Selati Game Reserve General Manager/ disease specialists	
Individual animals that could be considered a problem and a threat to human lives or infrastructure should be identified and appropriate action undertaken to control them.			As required	Selati Game Reserve General Manager	
Thresholds of Potential Concern for selected species/components on habitats and the reserve's ecology should be determined.			Year 1	Selati Game Reserve GM/ ecological specialists	
Management actions in relation to the Thresholds of Potential Concern should be implemented, where necessary.			As required	Selati Game Reserve General Manager/ ecological specialists	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
ECOLOGICAL MANAGEMENT					
A formally approved Elephant Management Plan, covering the reserve, must be in place and be implemented.			Year 1	Selati Game Reserve General Manager and Board	
Elephant population numbers within the reserve should not exceed carrying capacity levels identified in the elephant management plan, although this must be contextualised within the system of the Greater Kruger Area.			Year 10	GLTFCA Cooperative Agreement Partners	
A perimeter fence must be maintained to contain the elephant within the reserve in accordance with the national norms and standards.			Ongoing	Selati Game Reserve General Manager and Board	
Innovative approaches to deter illegal activities, including de-horning, should be considered in consultation with neighbouring protected areas.					
An inventory and map of natural perennial and non-perennial water sources, and existing artificial points including the current status of each water point, should be prepared.			Year 1	Selati Game Reserve General Manager/ ecological specialists	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
ECOLOGICAL MANAGEMENT					
A policy prohibiting the reconstruction of breached catchment dams unless such dams are deemed to be integral in the implementation of the water distribution policy, should be implemented.			Year 1	Selati Game Reserve Board	
The longer-term effects of artificial water provision on habitats in the reserve should be assessed.			Year 2	Selati Game Reserve General Manager/ ecological specialists	
Agreement should be reached amongst landowners and the reserve's management authority for a water supply management programme for animals.			Year 3	Selati Game Reserve Board	
Management actions to close over-utilised water points should be undertaken.			Year 3	Selati Game Reserve Board	
Fuel loads and the proportion of moribund grass should be evaluated during a pre-burn survey for late season fires (July to September).			Annually	Selati Game Reserve General Manager	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
ECOLOGICAL MANAGEMENT					
In conjunction with neighbouring protected areas, a burning programme should be implemented if the objectives for the proposed fire will be achieved.			As required	Selati Game Reserve General Manager	
The effect of controlled burns should be evaluated during a post-burn survey that ensures adequate data recording. Date that should be recorded includes: • Location of the fire with an accurate GPS map of the burnt area. • Date and time of the fire. • Weather conditions including temperature, wind speed and humidity. • Veld conditions. • Cause of the fire. • Nature of the fire. Fire danger index.			As required	Selati Game Reserve General Manager	
Burns must be annually recorded and mapped and integrated with past information on burning.			Annually	Selati Game Reserve General Manager	
Peripheral and strategic internal firebreaks should be cleared as a high priority.			Annually	Selati Game Reserve General Manager	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
ECOLOGICAL MANAGEMENT					
Staff should receive adequate training in fire management and there must be adequate firefighting equipment available in the reserve.			As required	Selati Game Reserve General Manager	
An emergency fire plan must be in place to handle any unplanned fires.			Year 1	Selati Game Reserve GM	
Membership must be maintained of the Ba-Phalaborwa Fire Protection Association.			Annually	Selati Game Reserve GM and Board	
Heavy infestations of particular invasive alien plant species must be mapped, and suitable management strategies identified.			Annually	Selati Game Reserve General Manager	
Invasive alien plant control in must be undertaken in a systematic planned manner within the reserve.			Annually	Selati Game Reserve General Manager	
Ongoing control and eradication of listed invasive species must be undertaken to a point where maintenance control is all that is required.			Annually	Selati Game Reserve General Manager	
Gully erosion in bottomlands must be identified and mapped.			Year 1	Selati Game Reserve General Manager	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
ECOLOGICAL MANAGEMENT					
Extensive sheet eroded areas and erosion from sodic patches must be identified and mapped.			Year 1	Selati Game Reserve General Manager	
A priority programme for erosion reclamation, as part of an integrated habitat rehabilitation programme must be developed.			Year 1	Selati Game Reserve General Manager	
Headward gully erosion into bottomlands should be stabilised.			As required	Selati Game Reserve General Manager	
Water run-off must be reduced, and infiltration increased on sodic patches and sheet eroded areas.			As required	Selati Game Reserve General Manager	
A detailed and systematic assessment of roads and tracks must be conducted.			Year 1	Selati Game Reserve GM	
Areas of active erosion must be mapped and appropriate measures to minimise these should be recommended.			Year 1	Selati Game Reserve General Manager	
Roads and tracks for erosion reclamation measures must be prioritised.			Year 1	Selati Game Reserve General Manager	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
ECOLOGICAL MANAGEMENT					
Roads and tracks that are placed on sodic areas, other erodible soils and on active seep lines must be re-routed.			As required	Selati Game Reserve General Manager	
Roads and tracks must be maintained in a state which minimises their impact on surrounding hydrology, soil erosion, and biologically sensitive areas			Ongoing	Selati Game Reserve General Manager	
Sources of quarry outside of the reserve, which can be utilised, thus employing contractors to bring in suitable quarry material for key roads and tracks should be identified.			As required	Selati Game Reserve General Manager	
Where possible, the use of the surplus gravel from dam walls that have breached and that are not to be reinstated should be investigated.			As required	Selati Game Reserve General Manager	
Where applicable, the use of the surplus gravel from the pits dug to dispose of rubble, litter and refuse should be investigated.			As required	Selati Game Reserve General Manager	

Appendix 5

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
ECOLOGICAL MANAGEMENT					
If no alternative can be found, then suitable quarry site/s within the reserve should be identified and the quality of the available quarry material should be assessed.			As required	Selati Game Reserve General Manager	
SOCIO-ECONOMIC BENEFITS					
Income generation within Selati Game Reserve contributes towards an adequate budget to protect and operate the reserve.			Annually	Selati Game Reserve General Manager and Board	
New tourism ventures should strive to drive innovation and best practice in the wildlife tourism and conservation industries.			As required	Selati Game Reserve General Manager, Board, and landowners	
Transparent reporting mechanisms, should be instituted, which demonstrate the nature tourism activities within the reserve, show how much income these activities generate and how the income is spent in supporting the operation and management of the reserve.			Annually	Selati Game Reserve Board	

Appendix 5

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
SOCIO-ECONOMIC BENEFITS					
Opportunities, based on economies of scale and the joint buying power of the collective protected areas within the GLTFCA should be explored and implemented, to drive significant and meaningful change and socio-economic benefits, associated with wildlife conservation, in the region.			Year 5	GLTFCA Cooperative Agreement Partners	
Environmental interpretation and education should be focused on nearby communities and visitors to the reserve.			Ongoing	Selati Game Reserve General Manager	
Where possible, members of nearby communities should be employed and trained to assist in and implement environmental education programmes.			Ongoing	Selati Game Reserve General Manager	
SAFETY AND SECURITY					
Appropriate protocols and standard operating procedures, aligned with GKEPF and coordinated with neighbours, should be established and implemented.			Ongoing	Selati Game Reserve General Manager and Board	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
SAFETY AND SECURITY					
Regular proactive and reactive interventions should be conducted, i.e. patrols and surveillance operations to ensure that area integrity is maintained.			Annually	Selati Game Reserve General Manager and Board	
The boundary and facility fence line integrity must be ensured.			Annually	Selati Game Reserve General Manager and Board	
Implement deception testing technology as a tool to support security related investigation processes.			Annually	Selati Game Reserve General Manager and Board	
Cooperate with key partners, including SANParks, SAPS and provincial conservation authorities in the prosecution of offenders caught committing an offence.			As required	Selati Game Reserve General Manager and Board	
Standard operating procedures must be regularly reviewed and updated to address risks, procedures and compensation associated with wildlife breakouts and emergencies.			As required	Selati Game Reserve General Manager and Board	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
LAND INCLUSION					
An ecological assessment should be undertaken to determine the contribution that the land will make towards: • The ecological viability of the reserve. • The protection of a representative sample of habitat or species. • The protection of threatened habitat and species. • The maintenance of viable populations of key species. • The maintenance of ecological processes. The enhancement of ecological connectivity across the landscape.			As required	Selati Game Reserve General Manager/ ecological specialists	

Management action	2021/22 Progress	2022/23 goals	Completion date	Responsibility	Notes
LAND INCLUSION					
A risk assessment should be undertaken to determine: • The ownership and governance of the land and whether it will enhance, maintain or undermine the governance of the reserve. • The legal status of the land in terms of planning, zoning and other relevant issues such as land claims. • Commercial and non-commercial activities undertaken on the land, whether they are compatible with or whether they would pose a reputational risk to the reserve. • Relationships between the owners and managers of the land, surrounding neighbours and local communities, including the types of community beneficiation activities associated with the land. • Risks that the land will pose to the safety and security of the reserve, in particular in relation to wildlife crime.			As required	Selati Game Reserve General Manager/ ecological specialists	

APPENDIX 6: ANNUAL REPORTING TEMPLATE

Name		
PA category		
PA purpose	•	
Size of PA		
Type of ownership / land tenure		
Item	**Status**	**Action required**
Declaration		
Property description		
Governance of protected area		
Appointment of management authority		
Title Deed endorsement		
Management Plan		
Target contribution to vegetation types		
Inclusion in PACA database		
Annual Plan of Operation		
METT assessment		
Meetings of the Joint Operations Committee		
Expansion and buffering of existing PA		
Annual PA monitoring measures		
Participation in landscape monitoring and research		
Links and funding by government programmes		
Links and funding from non-government and other sources		
Expenditure of income within the PA		
Illegal incidents / law enforcement issues		
Portfolio of evidence		
Declaration Agreement		
Declaration Notice/s		
Notarial deed agreement		
Management plan		
Elephant management plan		
Annual Report and Plan of Operation		
METT report		

Ecological reports	
Annual budget	
Permits	