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29 July 2024

Kathu Forest Nature Reserve Management Plan

Prepared for
Kathu Solar Park (Pty) Ltd
by
EndemicVision Environmental Services (Pty) Ltd

Directive

Project: Kathu Solar Park Biodiversity Management Plan
Project Number: EVP555
Client: Kathu Solar Park (Pty) Ltd
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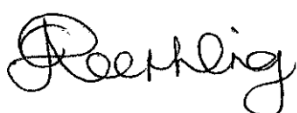
Declaration of Consultant Independence

This report has been prepared by EndemicVision Environmental Services (Pty) Limited (EVison) with all reasonable skill, care, and diligence within the terms of the contract with the client.

EndemicVision is a multidisciplinary environmental management and consulting company with more than 20 years of experience in field.

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The author of this report, Chrizette Neethling, does hereby declare that she is an independent consultant on behalf of EV and has no business, financial, personal, or other interest in the activity, application, or appeal in respect of which she was appointed other than fair remuneration for work performed in connection with the activity, application, or appeal. There are no circumstances that compromise the objectivity of the specialist performing such work. All opinions expressed in this report are her own.



Signed: **C.D. Neethling**

Dated: **29 July 2024**

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Definitions and Acronyms

Term	Definitions
Biological diversity:	The variables among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes they belong to.
Concentrated Solar Power	Solar generating facilities use the energy from the sun to generate electricity. Concentrating Solar Power facilities collect the incoming solar radiation and concentrate it (by focusing or combining it) onto a single point, thereby increasing the potential electricity generation capacity.
Wetland	Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which under normal circumstances supports or would support vegetation typically adapted to life in saturated soil (Water Act 36 of 1998)

Abbreviation	Act	No	Year
NEMA	National Environmental Management Act	107	1998
NEM-BA	National Environmental Management Biodiversity Act	10	2004
NEMPAA	National Environmental Management: Protected Areas Act	57	2003
NFA	National Forest Act	84	1998
NWA	National Water Act	36	1998

Acronyms	Description
APO	Annual Plan of Operations
CBA	Critical Biodiversity Area
EMP	Environmental Management Plan
GWC	Griqua West Centre of Endemism
IUCN	International Union for Conservation of Nature
NFEPA	National Freshwater Ecosystem Priority Area
NRMP	Nature Reserve Management Plan
SANBI	South African National Biodiversity Institute
SCC	Species of Conservation Concern
WMA	Water management Area

NRMP Approval Process



Figure 1: BMP approval process

The Nature Reserve Management Plan (NRMP) is **drafted** by an independent consultant with reference to the National Biodiversity Offset Policy, the NEMPAA and other legal requirements (terms of reference).

Independent consultant: EndemicVision Environmental Services (Pty) Ltd

The NRMP is **verified** through a consultation process with the relevant department and corporate entity and the proponent.

Department: Department of Forestry, Fisheries and the Environment (DFFE)

Corporate entity: Kathu Solar Park (KSP)

Proponent: Kathu Solar Park (KSP)

Stakeholder information sharing is a requirement in terms of NEMPAA and where no fatal flaws are identified by stakeholders, stakeholder adoption is desired. The aim is to have the NRMP **adopted** specifically by directly affected landowners and community forums where KSP is involved. The stakeholder engagement process includes the distribution of the draft NRMP and an invitation to converse about the contents of the NRMP.

Landowner: Sishen Iron Ore Mine (Pty) Ltd (SIOM);

Direct neighbors: Farm Selsden; Oupos Quarry; Burgersbos; Kalahari Country Club (KCC); Sishen Airport FASS; Vaal Central Water; Farm Marsh; Erf 8141;

Local Government: Gamagara Local Municipality (Department); John Taolo Gaetsewe District Municipality;

The NRMP will be **implemented** by the proponent to whom the offset declaration was issued, and any implementation agent or sub-contractor appointed for the purposes of ensuring that the NRMP vision and objectives are achieved.

Proponent: Kathu Solar Park

Implementing Agent: Kathu Solar Park

Table 1: Stakeholder engagement process

Item	Duration	Start Date	End Date
Draft NRMP for Client Approval	14	19-Mar	11-Apr
NRMP Distribution to Stakeholders (email and WhatsApp)	0	12-Apr	12-Apr
60 Day Commenting Period	60	12-Apr	12-Jun
Stakeholder Meetings (if requested)	60	12-Apr	12-Jun
Integrate Stakeholder Inputs	4	12-Jun	19-Jul
Final NRMP Approval by Client	4	22-Jul	25-Jul
Submission to Regulator	0	26-Jul	26-Jul

Signatories to the BMP

We, the undersigned parties and responsible persons, declare our commitment to this Nature Reserve Management Plan in our capacity as set out below.

I declare:

That I have read and understand the obligations, set out in this document, on the natural environment in as far as it may affect my decision making.

That I will make no decision that will be in contradiction to the agreements, legal requirements and obligations set on KSP.

Capacity	Name and Surname	Signature	Date

Approved by:

Capacity	Name and Surname	Signature	Date
Minister/MEC: Department of Agriculture, Environmental Affairs, Rural Development and Land Reform			

1. Executive Summary

EndemicVision was appointed to compile a Nature Reserve Management Plan (NRMP) for the Kathu Solar Park offset area (Kathu Forest Nature Reserve).

Kathu Solar Plant (KSP) is a large-scale Concentrated Solar-thermal Power (CSP) plant located approximately ten kilometers north-west from the town of Kathu (Gamagara local municipality, John Taolo Gaetsewe district municipality, Northern Cape Province).

The Department of Forestry required the proclamation of a biodiversity offset to compensate for the impacts from the CSP plant. An area of 644 hectares were proclaimed as a forest reserve in 2018. KSP is the proponent and the management agent of the biodiversity offset.

The NRMP area includes the extended area of 1 928 hectares consisting of the industrial area, agricultural area, buffer area, corridor area and protected areas, namely the proclaimed offset area and the planned offset area.

The fine scale mapping applied in the NRMP delineate five different biodiversity features of the Savanna biome in the Southern Kalahari (Mucina & Rutherford, 2011). The most important biodiversity features, in order of priority is the woodlands (200 ha, 10%); wetlands (18 ha, 1%); bushveld (1 019 ha, 53%); open woodland (110 ha, 6%) and thicket (133 ha, 7%). Since the nature of the proclamation of the offset area is mainly for the purpose of protecting the woodlands, priority is given to this habitat type. Conservation of wetlands were further required in the Environmental Management Programme (EMP) due to the loss of these sensitive habitats during the CSP development. Priority is further assigned according to the importance of ecological services provided by the habitat (Madzwamuse *et al.* 2007).

The KSP vision is to manage the KSP biodiversity features in such a way that the net biodiversity value of the area is maintained and improved for current and future generations.

This vision is implemented through strategic, operational and annual objectives and targets prioritized using the results of the KSP BMP gap analysis (2023), the baseline information and fine scale planning.

2. Introduction

The KSP NRMP area **location** is within the Gamagara Local Municipality and the John Taolo Gaetsewe District Municipality. The nearest towns to the proposed site are Kathu, located 8km to the south and Dibeng, located 13km to the west of the site.

The farms and **surrounding land uses** of the NRMP area is farm Selsden 464 on which Oupos (quarry) is situated to the north of KSP and used for livestock farming. Farm Uitkoms 463 is situated to the east of KSP and used for livestock farming. The farm Kalahari Gholf en Jag Landgoed 775 is situated to the south of KSP and used for game farming. The KSP CSP facility and the Vaal Central Water (former Sedibeng) pipeline servitude is situated on the western side, with the Sishen airfield directly southwest of the servitude on the farm Marsh 467. The T25 district public dirt road (Oupos road) is directly adjacent to the NRMP area and lies between the KSP property and the Oupos farm to the north.

KSP obtained an environmental authorisation (DEA ref 12/12/20/1994) to construct the CSP plant. A licence (NCU 6171115) was obtained in 2015 to destroy habitats containing approximately 1550 *Boscia albitrunca* and *Vachelia erioloba* nationally protected trees during the construction period (2015 – 2017). In accordance with this licence, KSP was required to secure and conserve woodland habitats on the east (644 ha) and south (29 ha) of the CSP plant. KSP was further required to conserve the wetland habitats to compensate for the destruction of four National Freshwater Ecosystem Priority Area (NFEPA) wetlands (two valley floor, one slope and one bench ephemeral pan).

A biodiversity offset was secured and proclaimed by the (then) Department of Forestry in 2018. The biodiversity offset area of 644 hectares includes approximately 170 hectares of woodland habitat towards the east that is also part of the nationally proclaimed Kathu Forest Protected Woodland. The proclaimed area further contains eleven wetlands of which five are NFEPA valley bottom ephemeral pans. KSP also constructed an artificial wetland to the north of approximately 6.3 hectares in accordance with the conditions set out in the WUL.

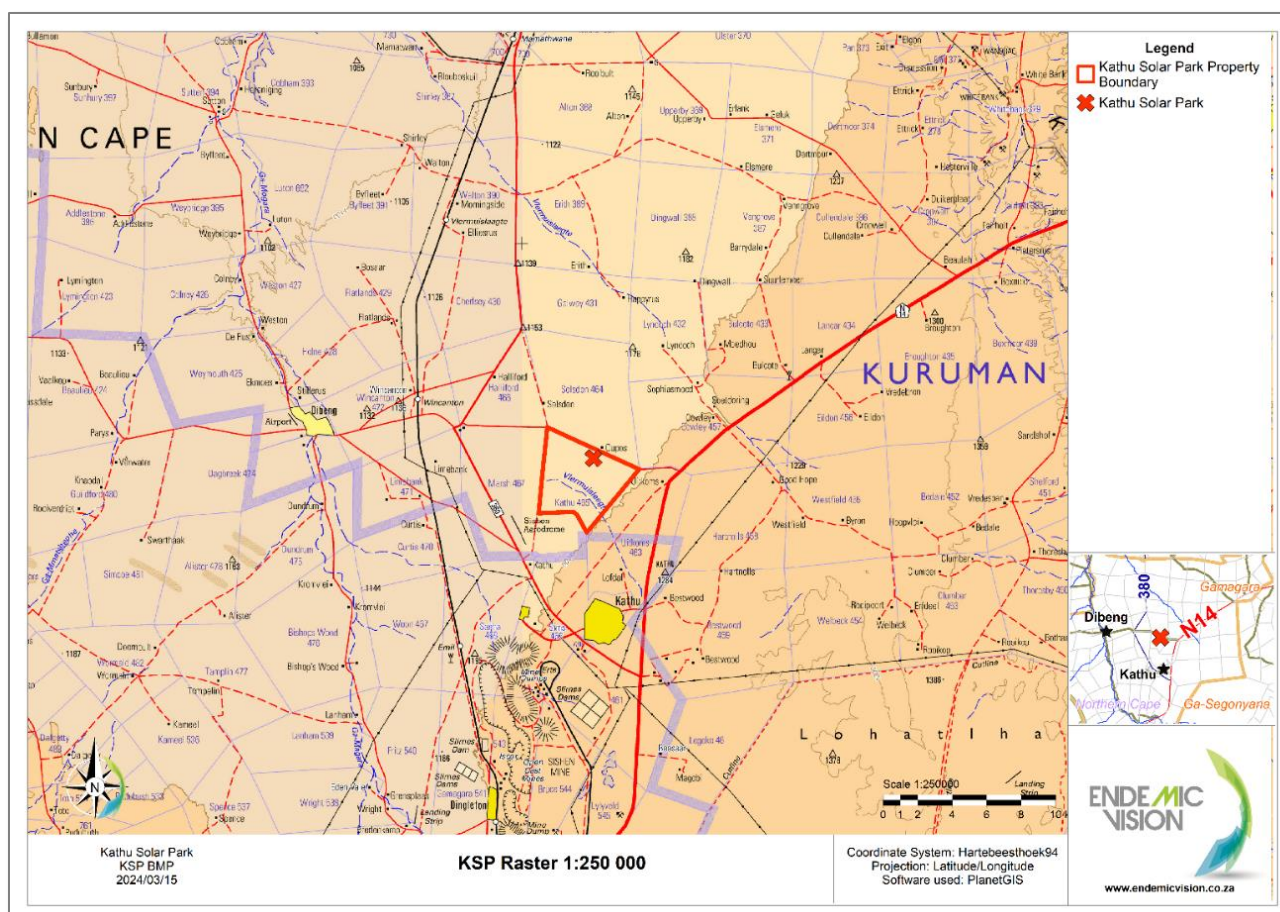


Figure 2: Regional context (1:250 000)

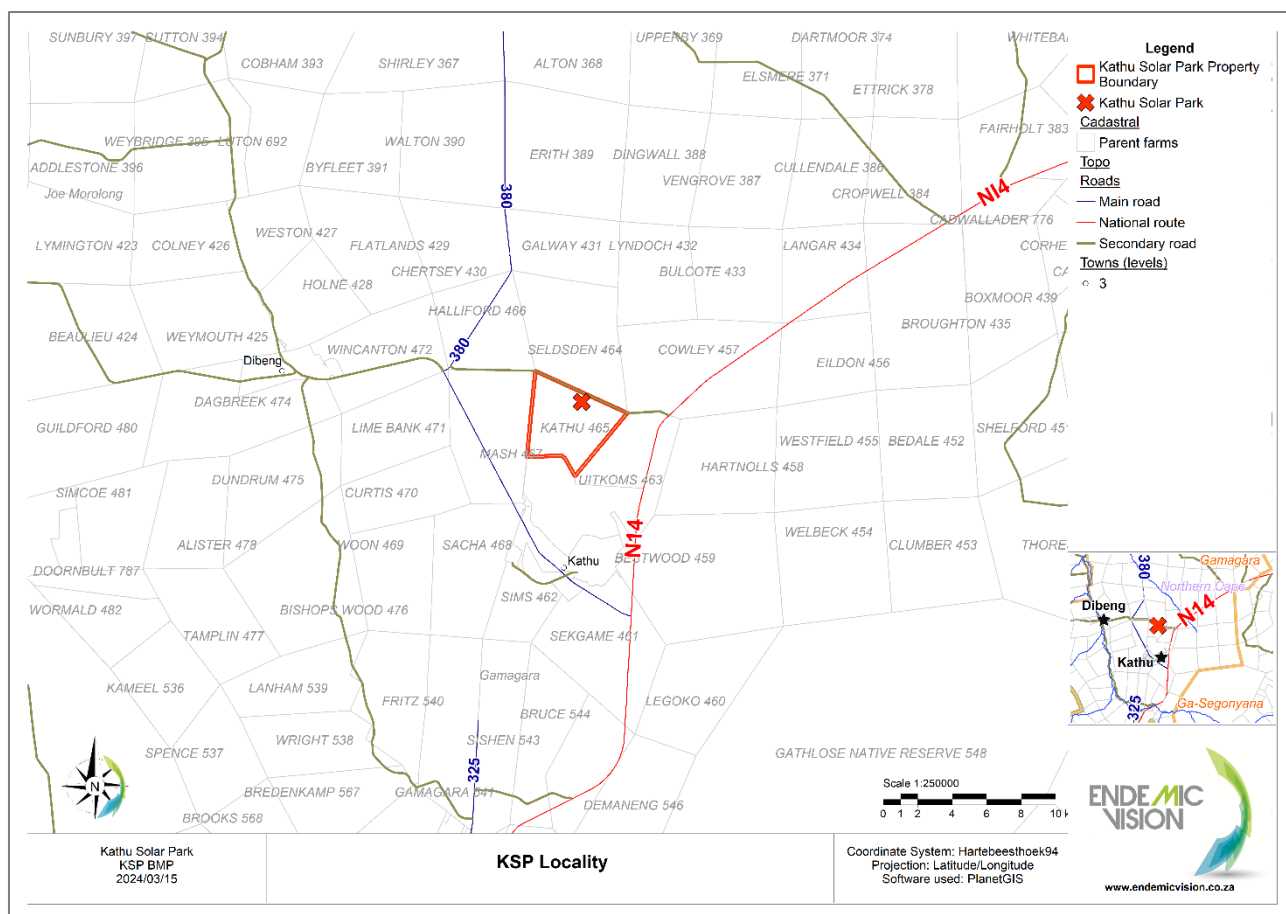


Figure 3: Surrounding properties and KSP locality

The NRMP is a legal requirement which aims to ensure the protection, conservation and management of the biodiversity offset in accordance with the objectives of the National Environmental Management: Protected Areas Act (No.57 of 2003) (NEMPAA).

CHAPTER 01 - ORGANIZATION

3. Rationale

What is Biodiversity?

Biodiversity refers to all living things as well as their interactions at various levels. The levels of biodiversity as described in the Convention on Biological Diversity (CBD) are ecosystems, habitats, species, communities and described genomes and genes. Biodiversity condition is directly correlated with human well-being and long-term sustainability of natural resources, ecosystem services and species survival that we depend on.

The Department of Forestry required the proclamation of a biodiversity offset to compensate for the impacts from the CSP plant. The requirement for an offset is linked to the environmental authorisation to construct, operate, decommission and finally rehabilitate the CSP. The biodiversity offset and its management requirements are therefore linked to the KSP's right to operate. Legal obligations that need to be met by KSP with regards to the protection of biodiversity, includes requirements set out in the NEMPAA; their Environmental Management Programme (EMP), specific species permits, licenses and water use license.

International standards (World Bank, IUCN, IFC) and NEMA requires that the **internalisation of development costs**. In this case, the KSP CSP project cost, and by implication its feasibility assessment, require that the biodiversity offset management costs are accounted for as part of the project costs. The challenge that KSP face is that this is being done retrospectively.

The **location** of KSP within the Savanna biome, part of the now more threatened Kathu Bushveld vegetation type and serving as part of and buffer to the national Kathu Forest Protected Woodland is a strong business case for KSP to manage its biodiversity. KSP, located in the Southern Kalahari forms part of the unique Green Kalahari landscape and the Grigqualand West Centre of Endemism. Being a mining and solar plant development hotspot with less than 2% of the natural habitat conserved underpins why KSP is required to operate in a biodiversity sensitive manner. The KSP CSP plant is located west of the nationally declared Kathu Forest Protected Woodland. All South Africa's Forest types (8) are threatened and in need of protection. The Kathu Forest Protected Woodland is protected in terms of Section 12(1)(c) of the National Forest Act (NFA) (Act 84 of 1998) and hosts a unique dense stand of *Vachellia erioloba* trees as well as a rich biodiversity with various species of conservation concern. A small area of the declared Kathu Forest Protected Woodland is situated within the proclaimed offset area. The KSP offset area is part of the nationally proclaimed forest and partially serve as buffer protection of the protected woodland.

KSP is the **custodian** of the biodiversity and an important community investor where they operate, and they are responsible for the condition in which they will hand over the biodiversity assets to the next generation. Biodiversity at KSP is represented according to habitats where specific sets of complex interactions take place. Some habitats or features are more important than others, in terms of ecosystem services provisioning, diversity or ecological functioning. Important biodiversity features located in the KSP NRMP area includes ephemeral wetland systems (internationally recognized), the woodlands (nationally recognized) supported by open woodland, bushveld and thicket habitats (provincially recognized) each with their own ecosystem services and diverse habitat features.

These habitats maintain **important species** to protect. The IUCN red data list indicates specific species of conservation concern at an international level. Some species are further protected at a national or provincial level and should be taken into consideration when conservation efforts are applied. KSP hosts IUCN red data species such as Devils' Claw and nationally protected trees; provincially protected geophytes, succulents as well as some Griqua west endemics.

At policy level, KSP through their Kathu Operations (Pty) Ltd strive to assess and understand the interactions between their activities and the environment as reflected in their Aspects and Impacts register. This commitment shows that KSP understands their impacts on the biodiversity and applies the mitigation hierarchy to reduce the impacts to the biodiversity.

The **broad implications of not managing the impacts on biodiversity** include irreversible environmental damage to endemic and threatened species by an ENGIE operation, damage to corporate reputation, poor stakeholder (specifically Non-Government Organizations (NGO's)) cooperation, reduced government benevolence, loss of license to expand operations, increased rehabilitation and closure costs, long term post closure liability due to reduced land capability for re-use, loss of shareholder and client confidence in KSP operation.

KSP can secure key biodiversity for conservation, serving as a custodian of the biodiversity asset endowed to KSP. **Biodiversity management** increases the legal standing, the sustainability and environmental profile of the operation while securing its license to operate and expand. KSP increases its key community profile by interacting at both the developing, restorative and enhancing sustainability and livelihoods through its biodiversity management.

3.1. Purpose of this plan

A nature reserve management plan is a legal requirement (Protected Areas Act – Act No. 57 of 2003) which aims to ensure the protection, conservation and management of protected areas in accordance with the objectives of this Act. A management plan for a biodiversity stewardship site is a strategic and practical document. It provides the framework for the development and operation of the site. It informs management at all levels. This includes landowners, management authority and environmental authorities across all spheres of government. (E.g. DFFE, DAERL and local government).

Specifically, the purpose of the management plan is to:

- Conserve biodiversity, protected trees and ecosystems on site;
- Provide clear management actions to fulfill set objectives and targets; and
- Enable the management authority to develop and manage the Reserve in a way that protects the purpose for which it was established.

3.2. Structure of the Plan

The **values** of the reserve as well as the legal requirements give rise to the **Vision** of this plan, which in turn lead to its **aim**, **purpose**, **objectives** and **targets**. The objectives and targets are fulfilled through the implementing the management actions.

Table 2: Structure and content of the two plans

Plan 1: KSP KFNR Management Plan	Strategic Plan	Values	The values of the KFNR are the woodland areas and the proximity (core and buffer) to the proclaimed Kathu Forest Protected Woodland. It is also valued for its NFEPA wetlands and protected trees, and species found on site.
		Vision	The KSP vision is to manage the KSP biodiversity features in such a way that the net biodiversity value of the area is maintained and improved for current and future generations.
		Aim	The KSP aim is to be legally compliant and have no net biodiversity loss.
		Purpose	The purposes of the KFNR are defined in the NEMPAA (Section 17). The KSP purpose relate closely to its objectives that fulfil the obligations of the NEMPAA section 17.
	Management Framework	Timeframe	The KFNR has a five-year timeframe, supported by an annual plan of operations that are updated annually.
		Objectives	Objectives are linked closely with, and fulfils the values, vision, aim and purpose of the KFNR.
		Targets	The targets are specific desired outcomes that support achievement of the objectives.
		Requirements	Where a legal requirement, norms and standards, procedures or best practice applies, these are listed to provide guidance in fulfilling the objective and target to a certain standard.
		Key Deliverables	The Key Deliverables are those practical outcomes and outputs that ensure the associated KPA Objectives are achieved.
Plan 2: Annual Plan of Operations	Annual Plan of Operation	Management Schedule	The Management Schedule is a working document that details the management actions, responsibilities, timeframes and budgets per target.
	Supporting plans and procedures	Plans	The following plans are appendices and implementation documents of the management plan in fulfilling its objectives. - Fire management plan. - Alien species control plan.
	Supporting plans and procedures	Procedures	The following procedures are appendices and implementation documents of the management plan in fulfilling its objectives. - Access control procedure

Plan 1 is presented with three chapters, Chapter 1, the organisation, Chapter 2, The baseline description, Chapter 3, the Management section.

- The **Organization** presents the justification and regional context that drives biodiversity management, the scope of the BMP, terms of reference and the roles and responsibilities to execute the BMP. The organization section the cut off points within which KSP will execute its biodiversity vision, objectives, and targets.
- The **Baseline** describe the natural resource base that is seen as the biodiversity capital held by KSP. It provides the environmental, biodiversity and land management assets of the BMP area. It also places the KSP BMP within the regional context.
- The **Management section** describes the Aim, Vision and Objectives of how KSP will firstly meet their legal obligations, secure the conservation of the biodiversity offset and ultimately enhance its biodiversity value.

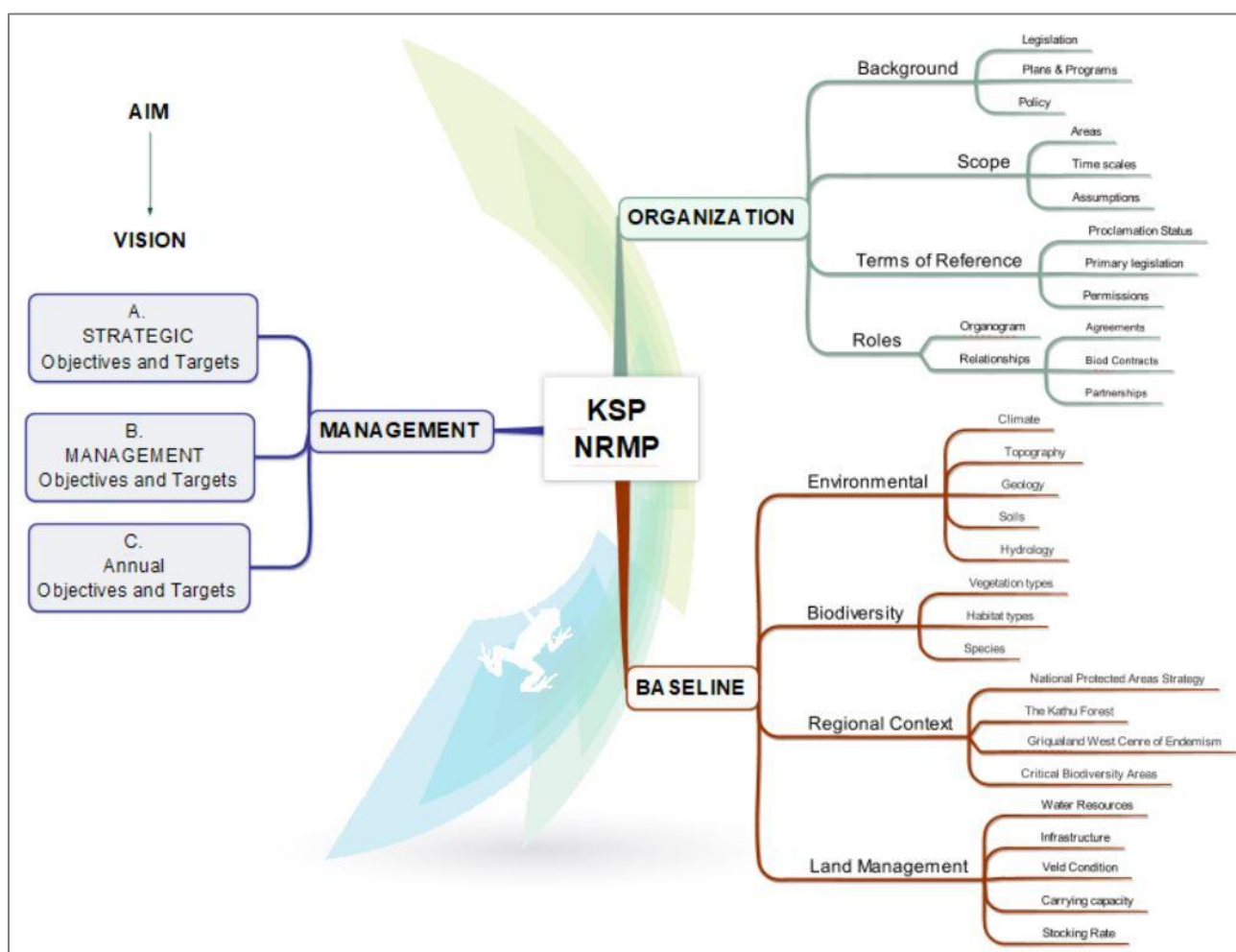


Figure 4: KSP BMP Structure

4. Scope of the NRMP

This NRMP is both a strategic and implementation document. It provides the framework for the long term; landscape level biodiversity interventions that will compensate for the loss of biodiversity from the KSP CSP plant, as well as ensuring operational effectiveness and legal compliance.

4.1. Areas

The NRMP area is 1 928 hectares divided into three management areas with four conservation zones. The five habitat types provide insight about the ecosystem functioning and services of the area.

4.1.1 Habitats

Habitats represent homogenous environments suitable for certain organisms to live together. A habitat or a group of related habitats can be considered an ecosystem. The habitat types identified for KSP are based on the homogenous vegetation community patterns found in a specific area. These habitats form patterns across the landscape that extend beyond the fixed anthropogenic restrictions of roads, fences and property boundaries. Each habitat type has its own vegetation community, diversity, ecological interactions and land capability. Habitats are seen as the basic unit of an area's biodiversity asset base and therefore influence management decisions. The management units should be interpreted with their underlying habitats in mind. A detailed description of each habitat type is provided in the biodiversity baseline section.

Table 3: Habitat types and extent on KSP property

Habitat	Priority	Hectares	% of lease area
Woodland	1	200	10%
Wetland	2	18	1%
Bushveld	3	1 019	53%
Open Woodland	4	110	6%
Thicket	5	133	7%
Disturbance	-	454	23%

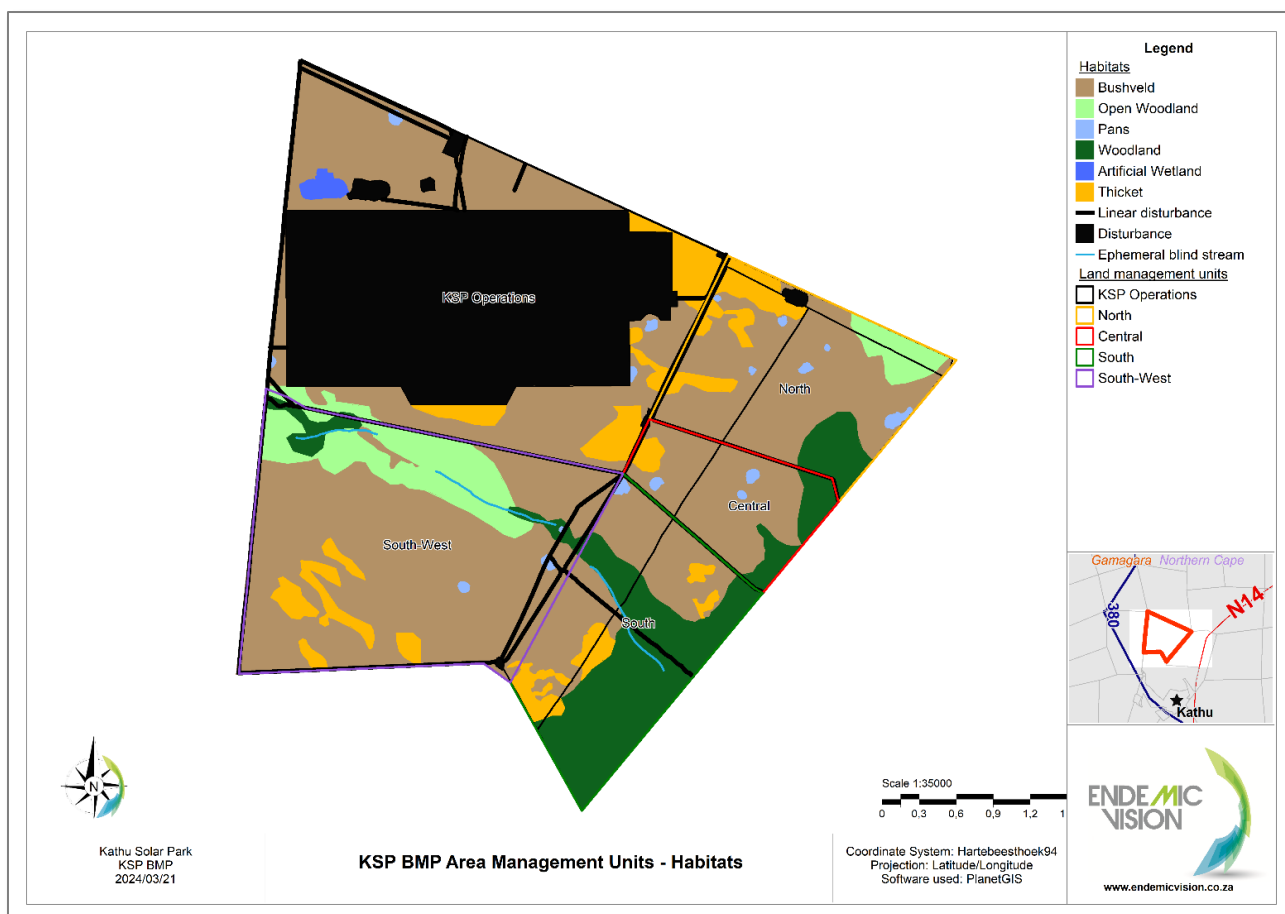


Figure 5: KSP management units and their underlying habitats

4.1.2 Zonation

In accordance with condition 41(2)(g) of the NEMPAA, the NRMP must contain: “a zoning of the area indicating what activities may take place in different sections of the area, and the conservation objectives of those sections.”

For management purposes, the KSP NRMP area is divided into six different zones:

- Industrial area (734 ha);
- Agricultural area (292 ha);
- Core zone (52 ha);
- Buffer zone (196 ha);
- Corridor (20 ha); and
- Protected (580 ha).

Different activities are permitted within the different zones and should be managed in accordance with the management approach of each zone, as tabled below. These zones were identified with the fine scale habitats of the lease area in mind, enhancing the conservation of sensitive features on the property. Areas for future developments are earmarked to ensure future conservation of the protected Kathu Forest Nature Reserve.

Table 4: Management zones

Zone	Description	Management approach
Industrial	The industrial area is the CSP operations area where none of the negative impacts from the operations may affect the conservation areas.	Allow and promote all industrial activities within the demarcated boundaries of the industrial area.
Agricultural	The agricultural area forms a continuous unit with the proclaimed protected areas but is earmarked for potential future development. The agricultural and protected areas will be managed as one unit. The aim is to ensure sustainable management of the agricultural area as part of the biodiversity asset base and to return this area to a similar condition after the planned development has been rehabilitated.	Promote sustainable land management, while retaining the option to expand the industrial activity into the agricultural area.
Protected	The protected area includes the formally declared Kathu Forest Nature Reserve	Protect, promote and enhance the biodiversity functionality of the protected area.
Core	Irreplaceable areas consisting of wetlands and dense Camelthorn woodlands within the formally protected Kathu Forest Nature Reserve. Additional 29 hectares on the south-western side of the property where large <i>V. erioloba</i> trees occur. The 29 hectares need to be formally conserved in compliance with Licence NCU 6171115.	Maintain in a natural or near-natural state with no further loss of habitat.
Corridor	Corridor linking the 29 hectares of dense woodland to the west of the lease area to the protected Kathu Forest Nature Reserve.	Maintain in a natural or near-natural state with no further loss of habitat.
Buffer	Supporting zone which must safeguard the core and corridor zones. 100m buffers apply to all core and corridor areas. An additional buffer of 175m (maximum possible between the existing development and the protected area) is placed to the west of the formally protected area.	Maintain ecological processes with no further loss of ecosystem functioning. Ensure integrity of the protected area.

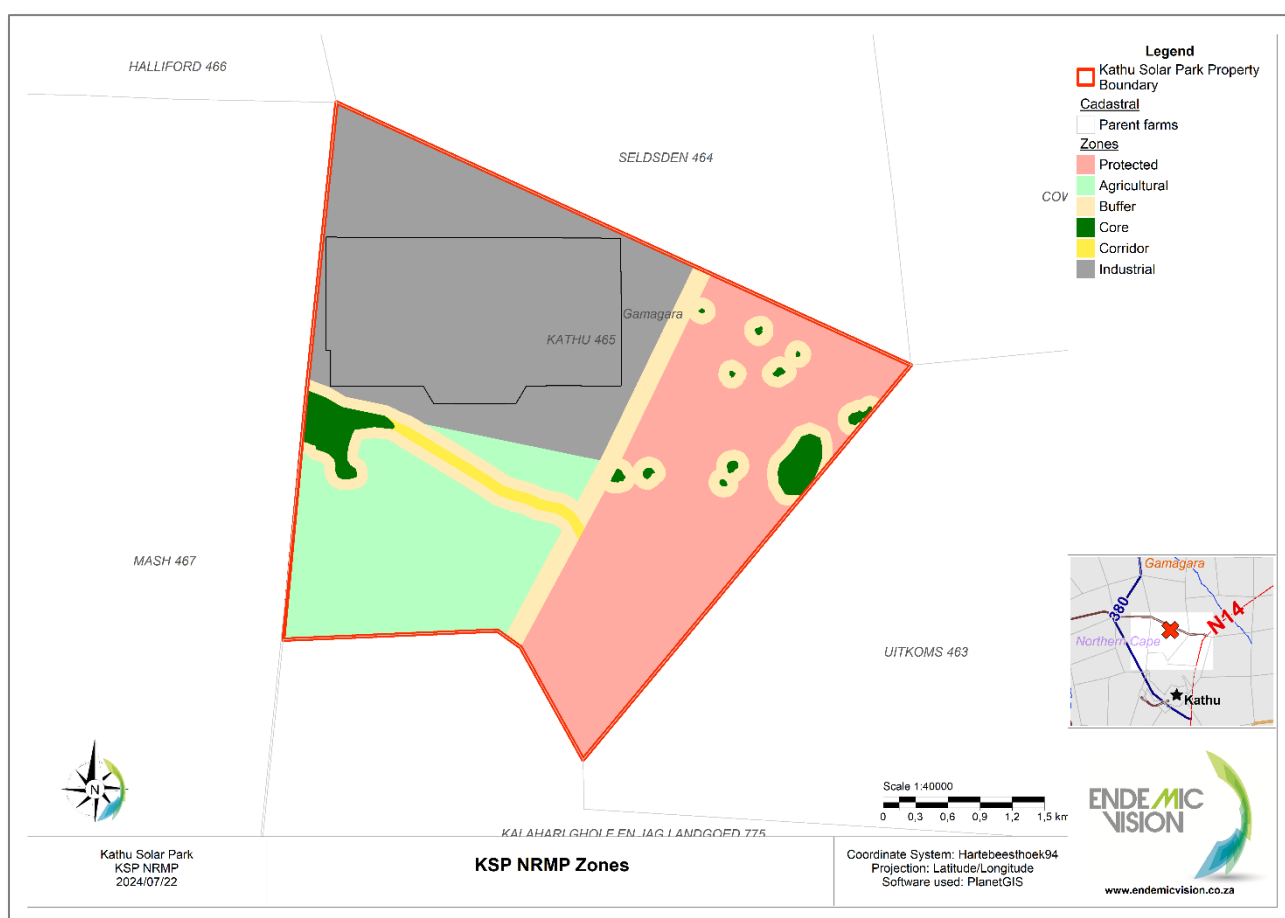


Figure 6: KSP NR Zonation

4.1.3 Expansion

The norms and standards published for the management of protected areas in South Africa provides the following indicators to be included in a NRMP:

- 5.1.a (vii) – “There is an expansion plan to improve the size and shape of the area”
- 9.1.a (i) – “The protected area has identified a buffer zone in its management plan”

Potential expansion areas have been identified for the Kathu Forest Nature Reserve. These areas include neighboring farm portions: Marsh RE/467 and Kalahari Gholf en Jag Landgoed RE/775. The Remainder of farm Marsh 467 have been chosen since this farm is owned by the same landowner as the Kathu Forest Nature Reserve. The only developments currently on this property is a hydroponics system and an airfield to the south with no farming taking place. There are various NFEPA listed pans on the property and the property connects with the 29 hectares of tall trees earmarked for conservation on the western side of the Kathu Solar Park lease area. The Remainder of farm Kalahari Gholf en Jag Landgoed 775 was chosen since this farm is utilized primarily as a game farm. This property further hosts a few NFEPA listed wetlands, a large portion of the proclaimed Kathu Forest Woodland and an extended section of the blind stream flowing through the Kathu Forest Nature Reserve.

An external buffer area is further proposed on the farm Uitkoms 463 and the Remainder of Kalahari Gholf en Jag Landgoed 775, directly adjacent to the Kathu Forest Nature Reserve to ensure the integrity of the protected area. Only internal buffers, where the landowner can determine the land use of that area, was included in the zonation map. No buffer is proposed to the north of the Kathu Forest Nature Reserve since there is already a secondary gravel route running alongside this property boundary and quarrying in the neighboring farm. The proposed expansion areas and external buffers are indicated below.

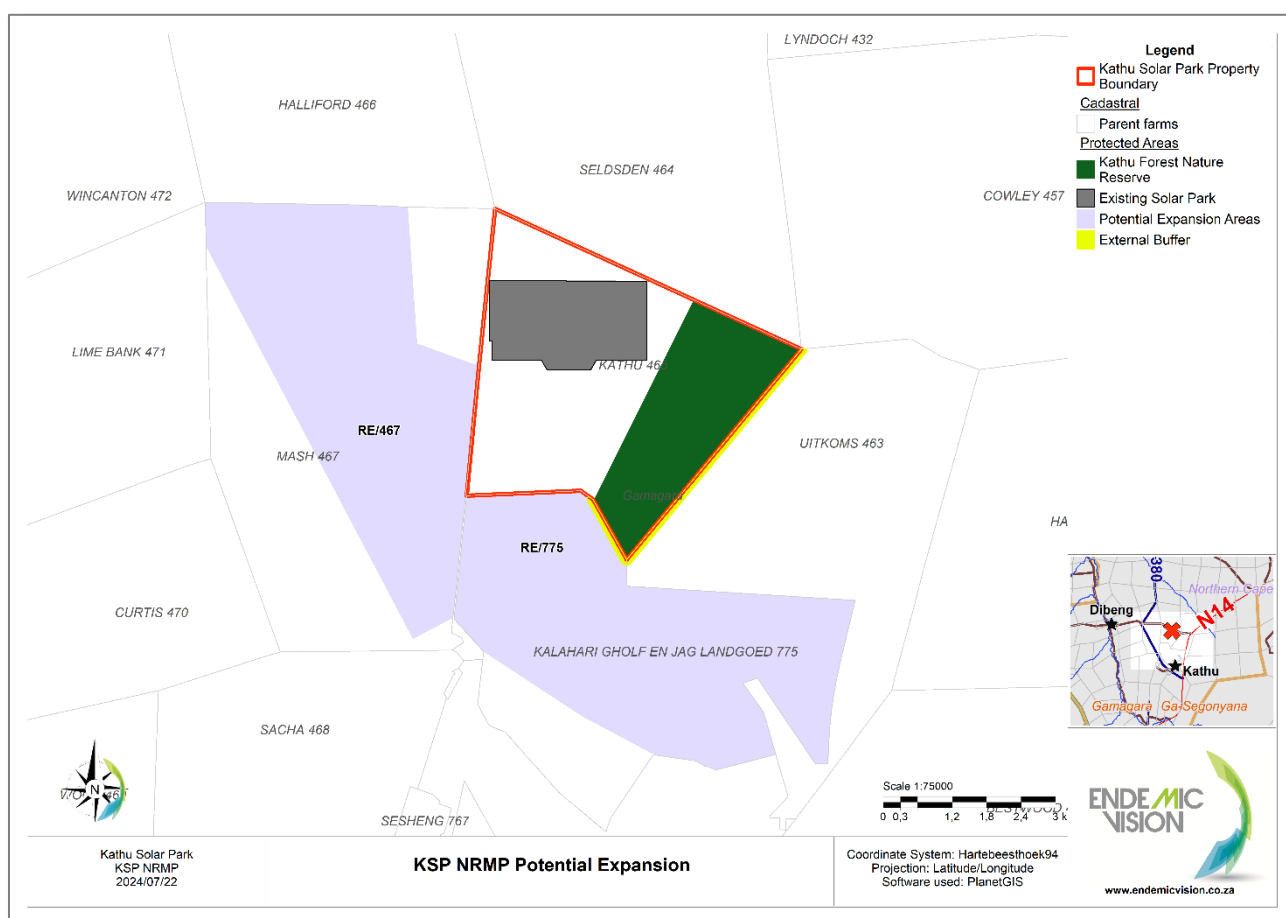


Figure 7: Kathu Forest Nature Reserve potential expansion

4.2. Timescales

The objectives of this NRMP will be implemented over a **five-year period**. The Annual Plan of Operations (APO) will be reviewed and updated annually, and the NRMP will be revised every three years.

The NRMP is based on the concept and guiding principles of **continuous adaptive management**. This means the structured and iterative process of reviewing available information and performance, learning and adjusting to maintain relevance and effectiveness and implementing the adjusted plan takes place on an annual basis during each review.

4.3. Limitations and Assumptions

- This biodiversity offset is an old generation offset with data sparsity about its original process. The biodiversity offset was proclaimed before the South African biodiversity policy was in place.
- This NRMP version is limited to land status and information data as accessed during quarter 01, 2024.
- Slight discrepancies exist between different layers of the landholding depending on projection, source, mapping method. Specifically, a discrepancy was found with regards to the NRMP offset area and the documented NRMP offset coordinates. The offset map, existing boundaries and fencelines of the same area were used as basis for delineating the offset area.
- Lists of protected species are sourced from available databases and specialist studies. Most plant species and some invertebrates are only visible for a few weeks during productive periods. It is assumed that the species lists are preliminary and that additional species will be added in the future as monitoring efforts expands.
- The carrying capacity values and the stocking rates declared in this report is a direct extrapolation of the habitat assessment report by Birch 2018. The values presented may not be completely accurate and may not reflect the current capacities of the veld. It is however accepted that it provides some guideline for decision making and is relatively conservative in that it represents the economic carrying capacity (75% of total carrying capacity).

5. Terms of Reference

5.1. Proclamation status

Sequentially, the current proclamation status is set out as follows.

- The property was registered to Sishen Iron Ore Company (Pty) Ltd on 17 October **2011** and is held by title deed number T2765/2011.
- Environmental authorisation ((DEA reference: 12/12/20/1994) for the development of the KSP CSP was issued on 03 November **2011**.
- KSP obtained the right to develop and manage the remaining extent of the farm Kathu 465 by means of a lease agreement. The Notarial Deed of Lease (Re-execution) between SIOM and KSP was signed on 09 November **2015** for a period of 20 years, up to and including 2034.
- The Department of Forestry required the proclamation of a biodiversity offset to compensate for the impacts from the CSP plant in December **2015** (Licence NCU 6171115).
- The final environmental management plan (V02) was effected in October **2016**.
- The Department of Environment and Nature Conservation required conservation measures to be implemented for species of conservation concern and set conditions on future developments by the proponent (FLORA 0056/**2016**).
- An area of 644 hectares were proclaimed by the Department of Forestry as a forest reserve on 01 June **2018**. The KSP biodiversity offset area is proclaimed in terms of section 8 (1) of the National Forests Act (Act No. 84 of 1998).

5.2. Primary legislation

The proclamation of an area as a Forest Nature Reserve gives effect to the proper conservation and management requirements of such area. The primary legislation driving conservation management of proclaimed areas is the National Environmental Management: Protected Areas Act (No.57 of 2003). This will be referred to as “the Act”. The Act establishes the legal basis for the creation, administration and management of protected areas. Primarily, it provides for the protection and conservation of areas representative of South Africa’s biological diversity and its natural landscapes.

The Act stipulates the purpose of a declared area (section 17), which serves as the basis for setting management objectives and targets:

Table 5: NEMPAA section 17 – Primary purpose of conservation areas

#	Primary purpose of conservation areas
1	To protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes in a system of protected areas
2	To preserve the ecological integrity of those areas
3	To conserve biodiversity in those areas
4	To protect areas representative of all ecosystems, habitats and species naturally occurring in South Africa
5	To protect South Africa's threatened or rare species
6	To protect an area which is vulnerable or ecologically sensitive
7	To assist in ensuring the sustained supply of environmental goods and services
8	To provide for the sustainable use of natural and biological resources
9	To create or augment destinations for nature-based tourism
10	To manage the interrelationship between natural environmental biodiversity, human settlement, and economic development
11	Generally, to contribute to human, social, cultural, spiritual and economic development
12	To rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species

The Act details the requirements for a management plan and the monitoring of its implementation as set out in sections 39 and 40 of the Act.

Table 6: NEMPAA section 39 to 48 - management plan requirements

Section	Description
39(2)	The management authority assigned in terms of section 38(1) or (2) must, within 12 months of the assignment, submit a management plan for the protected area to the Minister or the MEC for approval.
39(4)	A management plan must take into account any applicable aspects of the integrated development plan of the municipality in which the protected area is situated.
41(1)	The object of a management plan is to ensure the protection, conservation and management of the protected area concerned in a manner which is consistent with the objectives of this Act and for the purpose it was declared.
41(2)(a)	A management plan must contain at least - the terms and conditions of any applicable biodiversity management plan.
41(2)(b)	A management plan must contain at least - a co-ordinated policy framework.
41(2)(c)	A management plan must contain at least - such planning measures, controls and performance criteria as may be prescribed.
41(2)(d)	A management plan must contain at least - a programme for the implementation of the plan and its costing.
41(2)(e)	A management plan must contain at least - procedures for public participation, including participation by the owner (if applicable), any local community or other interested party.
41(2)(f)	A management plan must contain at least - where appropriate, the implementation of community-based natural resource management
41(2)(g)	A management plan must contain at least - a zoning of the area indicating what activities may take place in different sections of the area, and the conservation objectives of those sections.
39(2)	The management authority assigned in terms of section 38(1) or (2) must, within 12 months of the assignment, submit a management plan for the protected area to the Minister or the MEC for approval.
39(3)	When preparing a management plan for a protected area, the management authority concerned must consult municipalities, other organs of state, local communities and other affected parties which have an interest in the area.
43.3	The management authority of a protected area must (a) monitor the area against the indicators set in terms of subsection (1) or (2); and (b) annually report its findings to the Minister or MEC, as the case may be, or a person designated by the Minister or MEC.
48(1)(a)	Despite other legislation, no person may conduct commercial prospecting or mining activities in a special nature reserve or nature reserve.

Besides NEMPAA, certain pieces of legislation relate directly to the protection of natural resources and places an obligation on persons responsible for such resources.

National Environmental Management: Biodiversity Act (Act No. 10 of 2004) provides the lists of threatened and protected ecosystems and species as well as alien and invasive species directing management of such species.

The National Environmental Management Act (Act No. 107 of 1998) stipulates that disturbance of ecosystems and loss of biodiversity are avoided and limits the change of natural areas to any other use through the NEMA regulations and list of activities that would trigger an environmental impact assessment.

The National Water Act (Act No. 36 of 1998) regulates water resources (such as rivers, wetlands, pans, ground water) and all human interactions with these resources towards the long-term protection and sustainable use of these resources.

The National Heritage Resources Act (Act No. 25 of 1999) talks to the conservation of cultural, heritage, archaeological and palaeontology features that must be identified, assessed and protected.

The National Forests Act (Act No. 84 of 1998) protects nationally important tree species, trees, groups of trees, woodlands and forests and gives guidance on which activities are allowed in these areas.

The National Veld and Forest Fire Act (Act 101 of 1998) Provides requirements for veld fire prevention through firebreaks and required measures for firefighting.

5.3. Permissions

The following permissions (environmental authorisations, water-use licenses, flora licences and permits) and their obligations are integrated into the NRMP.

Protected Tree Licence NCU 6171115

Legal requirements are set out in Licence NCU 6171115, permitted to KSP for the removal of numerous protected trees from 2015 to 2017. Although this permit has expired, the need for an offset area arose as a condition to this licence and thus mainly focus on the protection of woodland habitat.

Notice 294 of 2018: Nature Reserve Declaration

The declaration of the offset area was formally announced in General Notice 294 in 2018 and list the exact area to be conserved.

Notice 727 of 2009: Kathu Forest Declaration

A small portion of the declared Kathu Forest Protected Woodland is located within the KSP offset area. General Notice 727 of 2009 lists the allowed activities within each declared zone of the Kathu Forest Protected Woodland.

FLORA 0056/2016

Requirements set out in permit FLORA 0056/2016 received for the removal of protected flora for the development of the powerline from 2016 to 2017, will become applicable during any future developments planned for KSP and are thus incorporated into the NRMP.

Environmental Authorisation (DEA reference: 12/12/20/1994) and Environmental Management Programme (V 2)

Various biodiversity related requirements are listed in the EMP and will be integrated into the NRMP.

Notarial Deed of Lease (Re-execution)

Since the property is a lease property, conditions set out in the deed of lease needs to be adhered to during any decisions made regarding the management and usage of the KSP property.

6. Roles and responsibilities

This section provides the framework and rules of engagement, specifically in terms of:

- Enhancing alignment within KSP between KSP (the Project Company) and Kathu Operations (Pty) Ltd (the Operational and Maintenance Company);
- Potential conflict resolution pertaining to contrasting operational, management and biodiversity decisions;
- Resourcing the NRMP to achieve objectives;
- Responsible decision making through applying the hierarchy of control, correct levels of interaction as required internally, externally, locally and regionally.

6.1. Corporate Organogram

Corporately, biodiversity falls under the responsibility of the KSP. The accountable person for this NRMP is ultimately the CEO. The NRMP is executed by the KSP Environmental Manager and implemented by HSE employees and/or contractors.

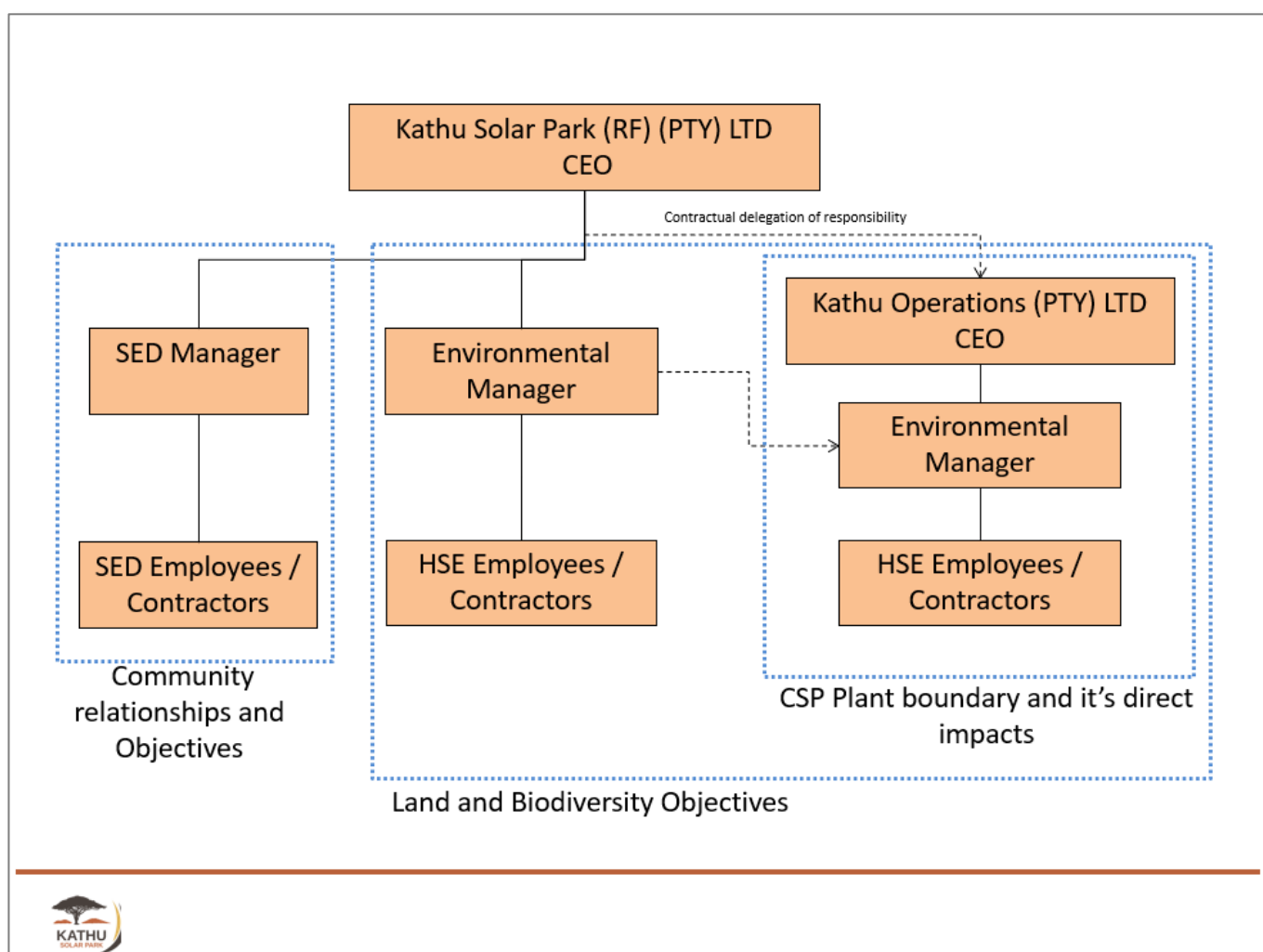


Figure 8: Corporate organogram of land and biodiversity related responsibilities

The main engagements that affect biodiversity management success are listed below for peer -, external -, community - and implementation agents.

Table 7: List of relationships and roles to consider in Biodiversity management and decision making.

Relations	Responsible Manager
Key peer relations Consultation among peer roles of different fields enhance land management synergies and success and reduce conflicting or fragmentation of landscapes. Peer managers that should have the same information base of the NRMP.	KSP Environmental Manager
External relations External relations that require accountability for and reporting of biodiversity related activities	KSP Environmental Manager
Community relationships An engagement platform and reiterative process is required to account for third party biodiversity related dependencies and contributions. Community involvement and enhancement.	KSP SED Manager
Implementation agents Implementation agents should all have the same biodiversity vision underpinning their activities. Where required, orientation and training to ensure all parties function from the same reference base may be required.	KSP Environmental Manager

6.2. Relationships

The relationships that affect the implementation success of the NRMP is formal and corporate agreements, partnerships, proclaimed servitudes and implementation agents.

6.2.1 Agreements

The signatories of the NRMP confirm that this NRMP serve as the management agreement between these signatories.

Service providers sign off and accept the KSP procedures as part of the awarded contract for all contractors working on KSP projects. These procedures are also signed off by the non-environmental sections of the CSP as an agreement between different sections of the same organization.

The Notarial Deed of Lease (Re-execution) between SIOM and KSP for the remaining extend of Kathu 465 was signed on 09 November **2015**.

The responsible positions that execute this agreement is:

KSP: KSP Chief Executive Officer

SIOM: Executive Head: Technical Services and Projects

The following lease agreement conditions that directly relate to biodiversity management is included.

Section	Lease agreement
21.1	The Lessee undertakes to comply at its own expense with all South African legislation, regulations, by-laws and any guidelines, as applicable to it, including (which is not necessarily a comprehensive list) MHSA, OHSA, Hazardous Substances, 1973, Compensation for Occupational Injuries and Diseases Act 1993, MPRDA, Broad-Based Black Economic Empowerment Act, 2002 and any codes promulgated under these Acts, the Charter and any other relevant charter promoting Broad-Based Black Economic Empowerment, Basic Conditions of Employment Act, 1997, Labour Relations Act, 1995 and all Environmental Laws including the governing water and air quality.
15.1	The Lessee and Lessor must each notify the other as soon as they become aware, subject to paragraph 15.2 of - any significant contamination or degradation of the Environment.
12.3	It is recorded that any applications for additional zoning approval or special consent or for any Environmental Approval that may be required for the use of the Leased Premises for the above purposes, including all costs incurred in that regard, shall be for the account of the Lessee, provided that applicable Authority has granted prior written consent.
16.2	Notwithstanding the provisions of clause 16.1 above and subject to compliance with Environmental Law, the Lessee shall take such measures to rehabilitate the Leased Premise as the Lessor directs, in writing, for the purpose of restoring the Leased Premises to the condition in which it was before the commencement of any Works, including amongst others, decommissioning the Energy Facility. The Lessee undertakes to complete any such rehabilitation or decommissioning within 6 (six) months after the Termination Date.
13.4	For the duration of this Agreement the Lessee shall take or procure that such measures are taken to ensure that its activities as a result of the Works and/or the Energy Facility and/or the Energy Business are conducted in accordance with Environmental Law, including, inter alia, the duties of care contemplated in NEMA and the National Water Act No. 36 of 1998, or alternatively where the same cannot altogether be avoided, are minimised and remedied, subject to any Environmental Approval.

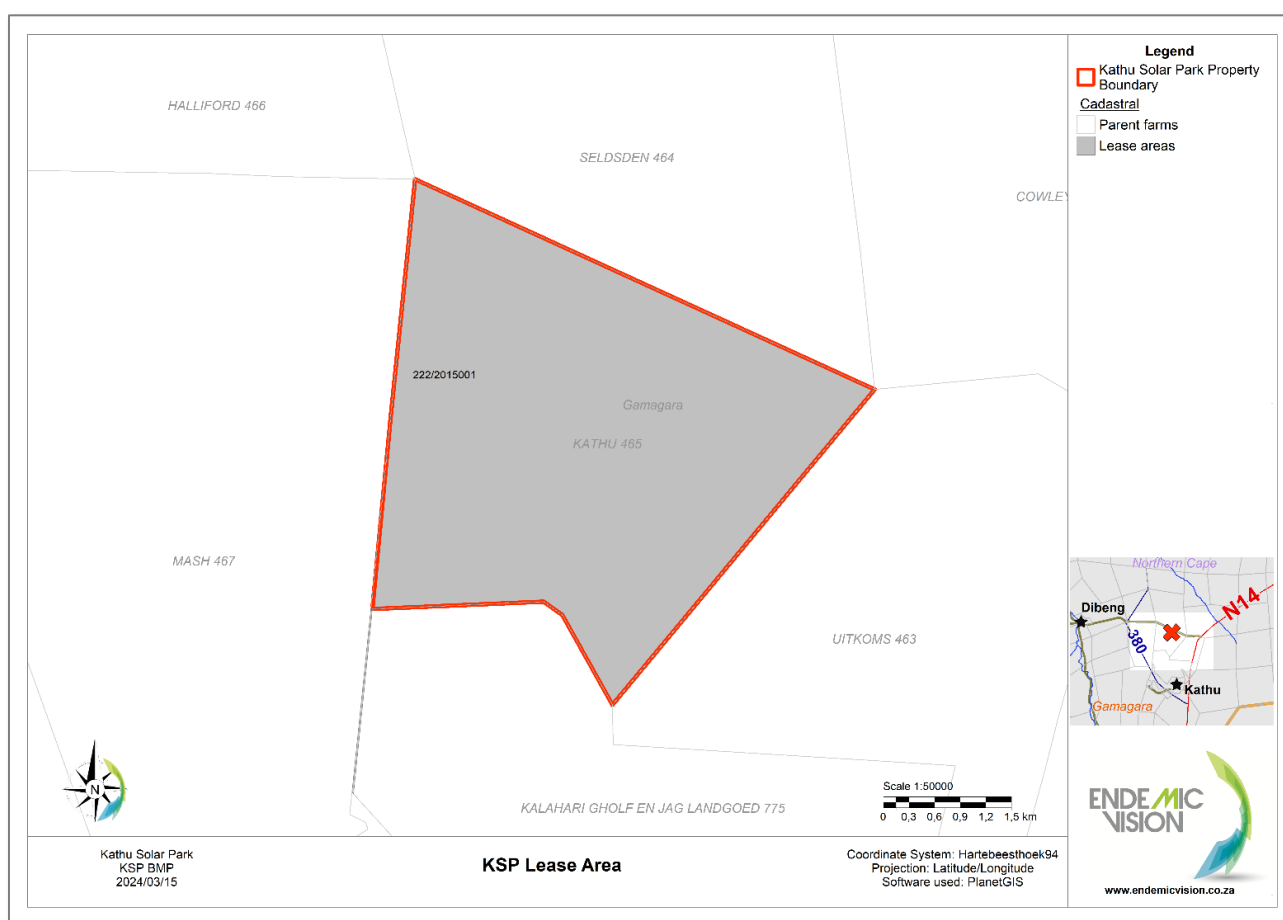


Figure 9: Lease property, Kathu 465

CHAPTER 02 - BASELINE

7. Environmental Baseline

The biodiversity baseline provides background information on the abiotic features, such as the climate and hydrology as well as the biotic features, such as the floral and faunal diversity within the property. National, regional and local biodiversity context is presented to show how KSP fit into the biodiversity landscape.

7.1. Climate

The Kathu Solar Park is situated in a summer rainfall region, where precipitation mainly occurs from December to March, with very dry winters. The mean annual rainfall ranges from 220 mm to 380 mm, whereas the mean annual evaporation rate is 2276 mm (Mucina and Rutherford, 2006). Maximum temperatures reach 42°C and minimum temperatures reaches -9°C.

7.2. Topography, geology and soils

The **topography** of the Kathu Solar Park is relatively flat (<2% slopes), ranging from 1167 meters above sea level to the west and 1196 meters above sea level to the east. The area slopes subtly towards the ephemeral pans and serves as the catchment area around these features.

The area occurs on the Ag **land type** (ARC – Institute for Soil Climate & Water), a land-type being an area that is uniform with respect to terrain form, soil patterns and climate that is non-arable and low to moderate grazing potential.

The upper **geology** consists of the Kalahari Group which comprises of windblown aeolian sands overlaying calcrete, limestone, clays and boulder beds (Thomas & Shaw, 991). Aeolian surface sands are of the Gordonia formation and consist of fine to medium loose sand with coarse silt particles, often called “Kalahari sands”. These soils are mainly Hutton or Mispah soil forms and varies in depth, mostly overlaying calcrete beds. These calcrete or limestone beds can be seen in the majority of the landscape, with deeper overlain sandy soils to the east of the property. The limestone is underlain by Diabase as a part of the Ongeluk formation.

The **soil types** include Eb soils, between 450 -750mm deep with less than 15% clay in its soil texture class distribution. These are soils have minimum development, especially if not under vegetation clusters and therefore usually shallow on hard or weathering rock. Lime is generally present in part or in most of the landscape.

7.3. Hydrology

The Kathu Solar Park is located in the Lower Vaal Water Management Area (WMA). The Lower Vaal WMA is one of three WMAs in the Vaal River System, which is the drainage area of the Vaal River from its headwaters to the confluence of the Vaal and Orange Rivers. The northern part of the Kathu Solar Park property is situated in quaternary catchment D41K and the southern part in D41J. The closest NFEPA listed river is located 6km to the northeast of the property (CSIR, 2011). A non-perennial stream is situated close to the center of the property stretching from west to east. There are various NFEPA listed wetlands located on the property, including six valley floor wetlands and one bench. One slope, one bench and one valley floor wetland were further situated within the current disturbed area and thus completely destroyed. One artificial pan is located directly north of the Kathu Solar Park development. A further 11 non-NFEPA listed ephemeral pans can be found on the property. The Kathu Solar Park is situated within the Sishen/Kathu groundwater Strategic Water Source Area (Water Research Commission, 2017). Groundwater in this area forms a nationally important resource.

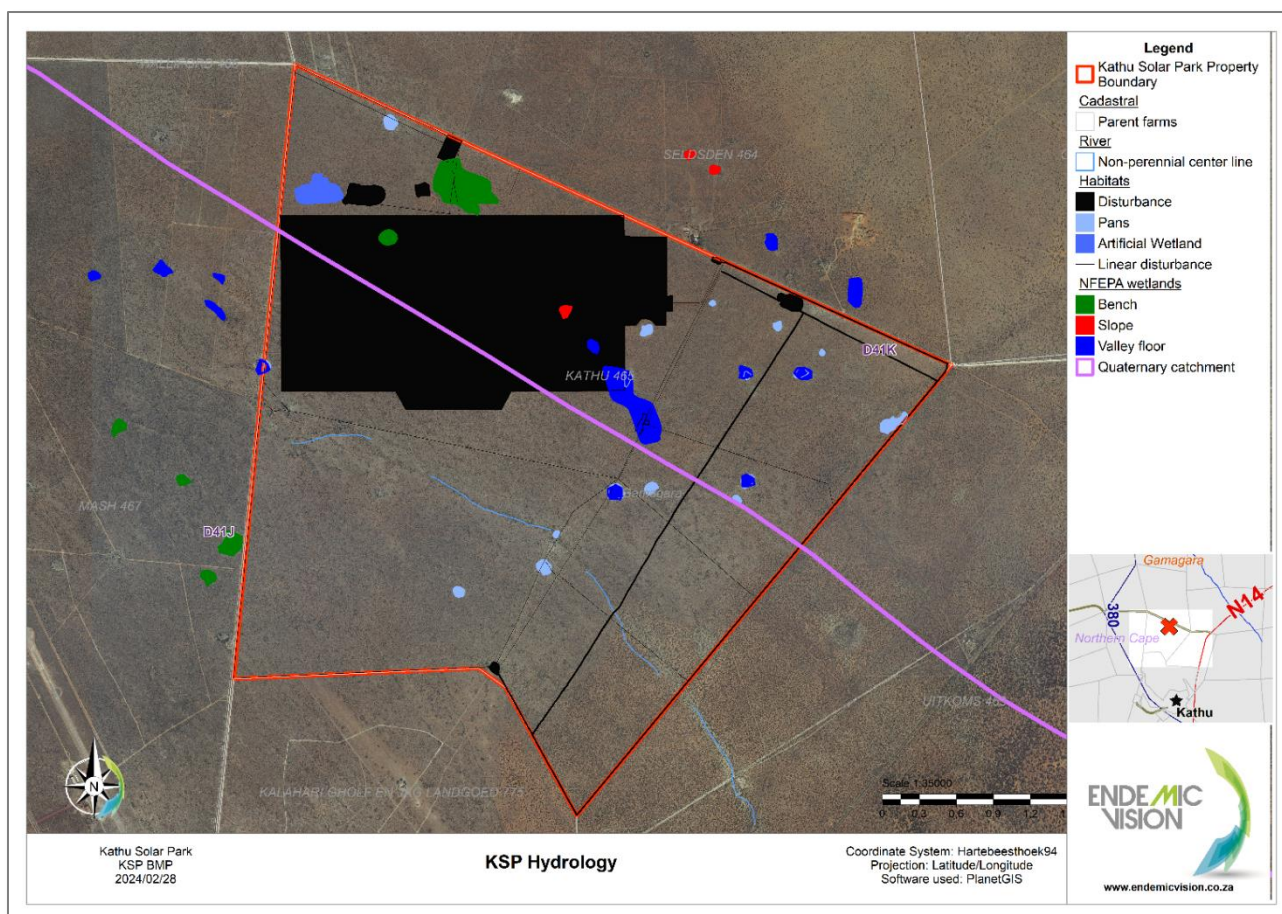


Figure 10: Hydrology of KSP

8. Biodiversity Baseline

8.1. Vegetation types

The Kathu Solar Park is situated within the Kathu Bushveld (SVk 12) vegetation type (Mucina and Rutherford, 2006). Kathu Bushveld is distributed along the plains from Kathu and Deben in the south, through Hotazel to the Botswana border between VanZylsrus and McCarthys Rest in the Northern Cape province with an altitude range of 960 to 1300 meters.

This vegetation type consists primarily of an open medium to tall tree layer of *Boscia albitrunca* (Witgat / Shepherd's Tree) and/or *Vachellia erioloba* (Kameeldoring / Camelthorn) species. The shrub layer is most important and usually consists of *Senegalia mellifera* (Swarthaak / Blackthorn), *Diospyros lycioides* (Bloubos / Monkey-plum) and *Lycium hirsutum* (Kriedoring / Wolwedoring/ River Honey-thorn). Grass cover is variable.

Soils are red aeolian sands and surface calcretes which include deep sands that exceed depths of 1,2 meters such as those of the Hutton and Clovelly soil forms. This vegetation type has summer and autumn rainfall (MAP between 220 and 380mm) with dry winters and frequent frost events.

Kalahari endemic species or biogeographically important taxa that occur in this vegetation type include small tree, *Acacia luederitzii* var. *luederitzii*, graminoids *Antheophora argentea*, *Megaloprotachne albescens*, *Panicum kalaharensense* and herb, *Neuradopsis bechuanensis*.

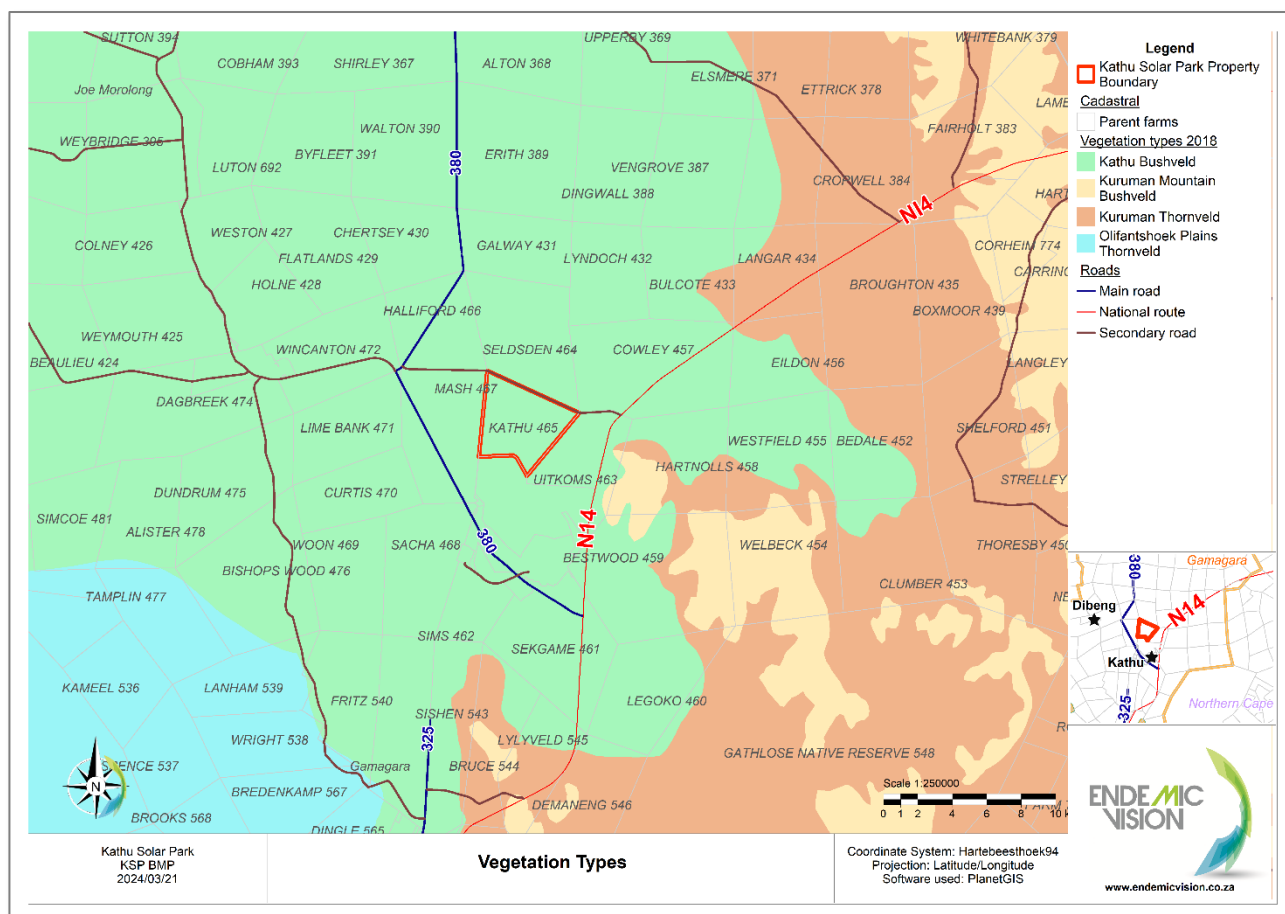


Figure 11: Vegetation types

8.2. Habitat types

The fine scale mapping applied in the NRMP delineate five different biodiversity features of the Savanna biome in the Southern Kalahari (Mucina & Rutherford, 2011). The most important biodiversity features, in order of priority is the woodlands (200 ha, 10%); wetlands (18 ha, 1%); bushveld (1 019 ha, 53%); open woodland (110 ha, 6%) and thicket (133 ha, 7%). Since the nature of the proclamation of the offset area is mainly for the purpose of protecting the woodlands, priority is given to this habitat type. Conservation of wetlands were further required in the Environmental Management Programme (EMP) due to the loss of these sensitive habitats during the CSP development. Priority is further assigned according to the importance of ecological services provided by the habitat (Madzwamuse *et al.* 2007).

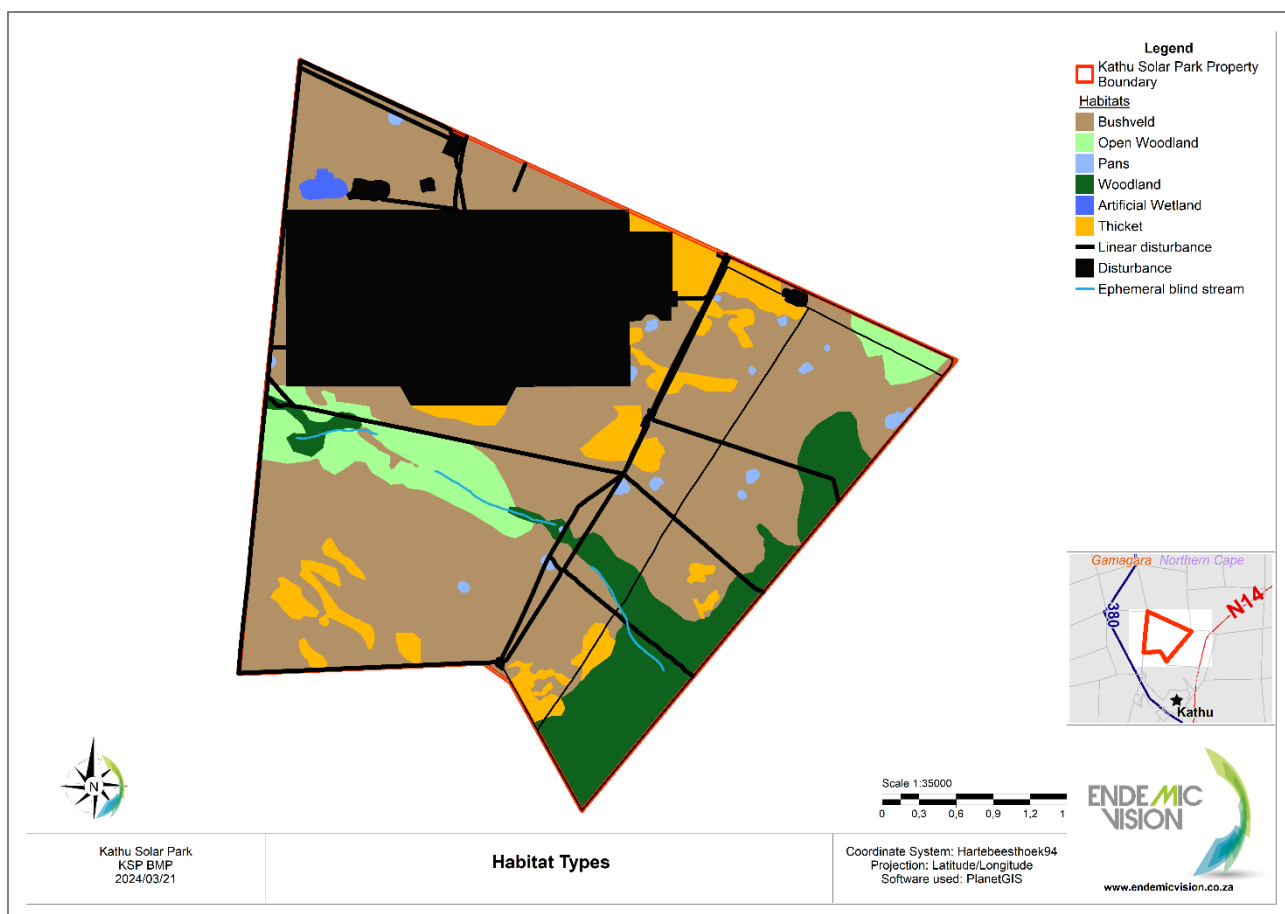


Figure 12: Habitat types found at KSP

8.2.1 Pans and Streams

Various ephemeral wetlands were identified, generally dominated by grasses in the center and surrounded by a vigorous tree line, creating a unique habitat. An ephemeral blind stream is situated in the center of the property. Although the stream cannot be seen, a definite change in habitat can be seen, where open woodland and woodland habitat can be found along the stream.

8.2.2 Woodlands and Open Woodlands

Other habitats identified on the property includes woodland, where woody vegetation covers 35% - 75%, dominated by tree elements and open woodland, where the woody vegetation covers 10% - 35%. Woodland habitat on the property is situated to the east and south-east and includes a small area of the proclaimed Kathu Forest Protected Woodland. The woodland is dominated by *Vachellia erioloba*, *Boscia albitrunca*, *Senegalia melifera*, *Tarchonanthus camphoratus* and *Ziziphus mucronata*. In the open woodland, single specimens of *Vachellia erioloba*, *Vachellia haematoxylon*, *Boscia albitrunca*, *Terminalia sericea*, *Senegalia melifera*, *Tarchonanthus camphoratus*, and *Ziziphus mucronata* are present within a dominant grass and forb layer. This habitat is associated with soil type or fire regime practices that favor grass dominance with isolated woody elements. Most of the open woodland on this property is mainly situated along remnants of a non-perennial stream.

8.2.3 Bushveld and Thickets

Most of the Kathu Solar Park property is dominated by a shrub layer and can either be categorized as thicket, where the woody vegetation covers 75% - 100%, or bushveld habitat, where the woody vegetation covers 35% - 75%. The thicket habitat is dominated by either *Tarchonanthus camphoratus*, *Senegalia melifera* or a combination of both with scattered *Vachellia erioloba* trees and some *Boscia albitrunca* trees. The bushveld habitat has a well-developed grass layer between the dominant shrub layer, with a scattered tree layer. A higher diversity is seen in the bushveld habitat where the woody layer mostly consists of *Grewia*, *Tarchonanthus*, *Ziziphus*, *Boscia albitrunca*, *Vachellia haematoxylon*, *Vachellia erioloba*, *Searsia*, *Senegalia*, *Diospyros*, *Terminalia*, *Gymnosporia*, *Rhigozum* and lower shrubs such as *Eriocephalus*, *Asparagus*, *Lycium*, *Lantana* and *Felicia*.

Encroaching thicket was identified as a concern during the initial assessment of the biodiversity offset. The baseline thicket areas of 2016 are compared with the current thicket delineation to indicate changes over time. The comparison shows that the northern and south-eastern sections had thicket habitats, but that this has expanded to more than double over the last 18 years.

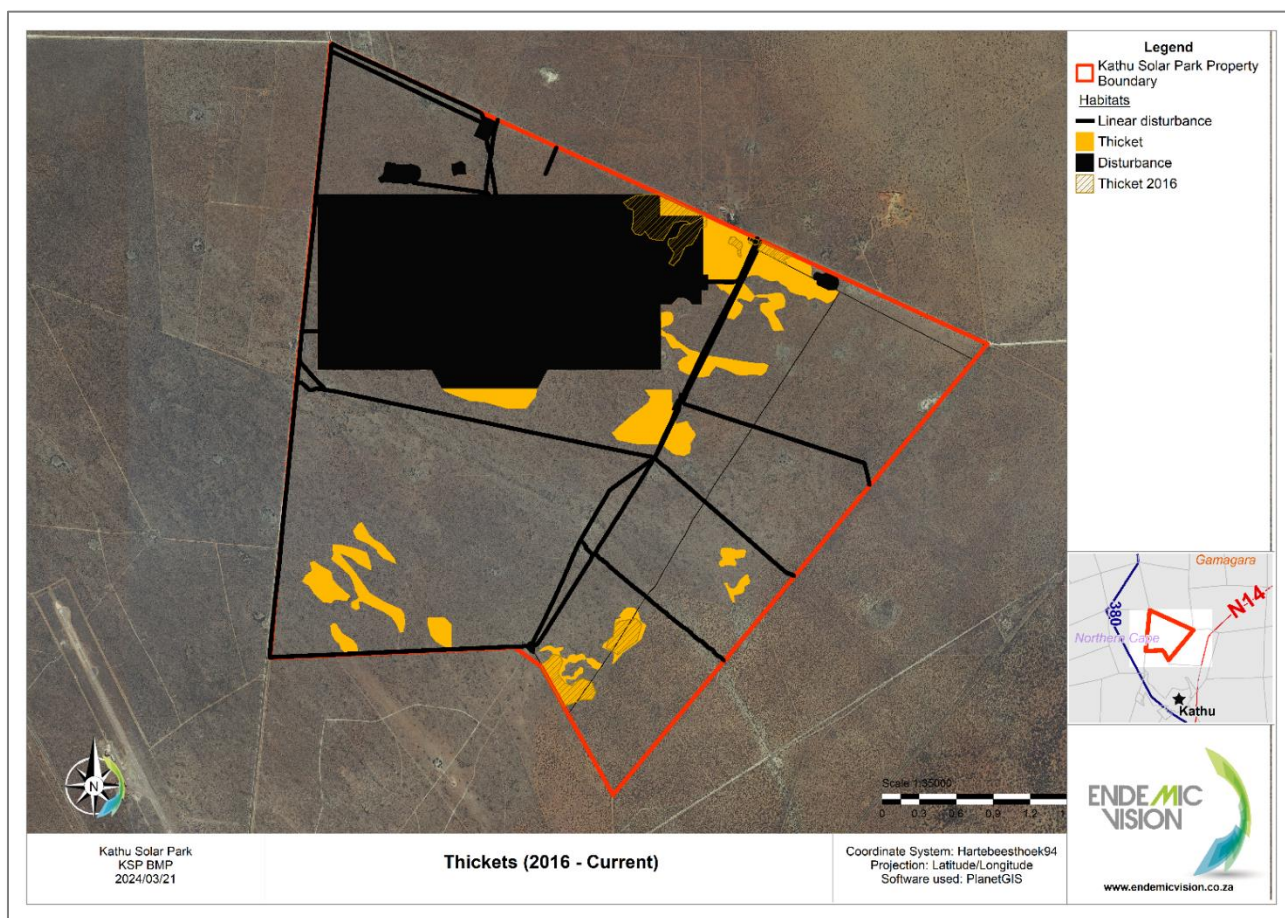


Figure 13: Thicket encroachment from 2016 to 2024

8.3. Species diversity

All species are assessed in terms of their conservation status, where significant species or species of conservation concern (SCC) are specifically listed below. The following conservation listings were considered:

Internationally listed.

- **CITES** (the Convention on International Trade in Endangered Species of Wild Fauna and Flora)
Appendices I, II and III to the Convention are lists of species with different levels or types of protection from over-exploitation, where Appendix I affords the highest protection status.
- **IUCN** (International Union for Conservation of Nature) Red List of Threatened Species
Species are categorized as NE (Not Evaluated), DD (Data Deficient), LC (Least Concern), NT (Near Threatened), VU (Vulnerable), EN (Endangered), CR (Critically Endangered), EW (Extinct in the Wild) or EX (Extinct).

Nationally listed

- **TOPS** (Threatened or Protected Species)
This list of species is protected under the National Environmental Management: Biodiversity Act (Act 10 of 2004) and categorizes the species into critically endangered, endangered, vulnerable or protected species.

Provincially listed.

- **NCNCA** (Northern Cape Nature Conservation Act (Act 9 of 2009)
Schedule 1 lists species which are specially protected, schedule 2 lists species which are protected, schedule 3 lists other indigenous species, schedule 4 lists damage causing species, schedule 5 lists pets and schedule 6 lists invasive species.
- **DFFE** (Department of Forestry, Fisheries and the Environment)
Tree species are listed as protected in the protected tree list under the National Forest Act (Act 30 of 1998).

8.3.1 Significant Flora Species

Very few flora species have been assessed by IUCN for incorporation into the international red list for international protection. Nationally protected species found on the property, includes *Vachellia erioloba* and *Boscia albitrunca*, protected under the National Forest Act (Act 30 of 1998).

Provincially protected species are listed in the Northern Cape Nature Conservation Act (9 of 2009) and either listed as indigenous, protected or specially protected. One specially protected flora species are found on site, namely *Lessertia frutescens* and at least fifteen protected species, namely *Aloe grandidentata*, *Ammocharis coranica*, *Boscia albitrunca*, *Boophone disticha*, *Brachystelma sp.*, *Crinum spp.*, *Fockea angustifolia*, *Jamesbrittenia atropurpurea*, *Lampranthus stipulaceus*, *Nerine laticoma*, *Ornithogalum seineri*, *Orphanthera jasminiflora*, *Oxalis commutate*, *Oxalis semiloba* and *Ruschia hamata*. Various other unconfirmed geophytes are found on the property, which could be listed as protected or specially protected.

Regionally, the Griqualand West bioregion is recognized as a centre of endemism. *Tarchonanthus obovatus* is one Griqualand West endemic identified on the Kathu Solar Park property. Kalahari endemic species often found within the Kathu Bushveld vegetation type includes *Acacia luederitzii var luederitzii*, *Antheophora argentea*, *Megaloprotachne albescens*, *Panicum kalaharens* and *Neuradopsis bechuanensis*.

8.3.2 Significant Fauna Species

8.3.2.1 Fauna

Significant fauna species found on site includes the Temminck's pangolin (*Smutsia temminckii*), which is protected internationally (listed as vulnerable in the red data list), nationally (listed as vulnerable under TOPS) and provincially (listed as specially protected under NCNCA). The Aardvark (*Orycteropus afer*) are further commonly found on the property, which is specially protected (schedule 1) and the Porcupine (*Hystrix africae australis*), which is protected (schedule 2) under NCNCA.

The Black-footed cat (*Felis nigripes*) (Vulnerable), Brown Hyaena (*Hyaena brunnea*) (Near threatened) and Leopard (*Panthera pardus*) (Vulnerable), listed in IUCN red data lists are expected to occur in the broader area but unlikely to occur due to the level of anthropogenic disturbance in the area.

No livestock or wild are kept on the property but various other fauna can be found, which includes kudu, steenbok, duikers, hare, gerbils and other rodents.

8.3.2.2 Avifauna

The Kori bustard (*Ardeotis kori*), listed as near threatened in IUCN red data list, listed as vulnerable in TOPS and listed in appendix II of CITES, is expected to occur on site. *V. erioloba* trees, present within the open woodland and woodland habitats further serves as suitable habitat for predatory birds for perching sites (majority listed as specially protected in NCNCA), of which Spotted eagle owls (*Bubo africanus*) were confirmed. Spotted eagle owls are further listed in appendix II of CITES.

Various migratory waterfowl visit the ephemeral pans during the rainy season, all of which are listed as specially protected under NCNCA. The Black stork (*Ciconia nigra*), also specially protected under NCNCA, is another confirmed visitor to the pans on KSP. The Black stork is further listed as moderately depleted under IUCN, vulnerable in TOPS and listed in appendix II of CITES.

Various other indigenous bird species are present within the property, where most of our indigenous species are listed as protected in NCNCA).

8.3.2.3 Herpetofauna

All herpetofauna expected to occur on site is listed as protected schedule 2 under NCNCA. The rock monitor (*Varanus albigularis*), listed in CITES Appendix II, were found on site. Suitable habitat also occurs for chameleons (listed as specially protected in NCNCA), which are often found on *Grewia flava* shrubs.

8.3.2.4 Invertebrates

Various flowering shrubs and bulbs found within the bushveld and thicket habitats are important to pollinators. The *B. albitrunca* tree found on the property further serves as the host species for the Brown-veined White migratory butterfly species. Scorpions are often found within the bark of the *V. erioloba* trees with further evidence of burrowing scorpions (*Opisthophthalmus spp.*).

Except for terrestrial invertebrates, sensitive aquatic invertebrates can be found within the ephemeral pans on the property. These sensitive species are only present within seasonally inundated wetlands like these, which dry out completely on occasion. Due to the scarcity of these habitats, these species are seen as sensitive (Day *et al.*, 2010). These species include Branchiopoda, such as Anostraca (fairy or brine shrimps); Notostraca (shield/ tadpole shrimps); and Conchostraca (clam shrimps) as well as Cladocera (water fleas), or Ostracoda (seed shrimps) and Copepoda.

8.4. Regional Context

8.4.1 National protected areas strategy

The National Protected Area Expansion Strategy (2008) was updated in 2016. The NPAES calls on provinces to develop implementation plans in support of (i) the NPAES and (ii) provincial conservation efforts and priorities. The NPAES provides a broad national framework for Protected Area expansion in South Africa. It also identifies (i) areas of importance to be targeted for Protected Area expansion and (ii) mechanisms to achieve this.

The Northern Cape Department of Environment and Nature Conservation has developed (2017) the Northern Cape Protected Area Expansion Strategy to inform the national strategy. The Critical Biodiversity Areas (CBA) as identified in the Northern Cape Bioregional plan (2016) is used as basis for prioritising areas. The Kalahari pans (ephemeral wetlands), Kathu Forest Protected Woodland as well as Kuruman mountain bushveld and all ephemeral river systems are prioritised where possible.

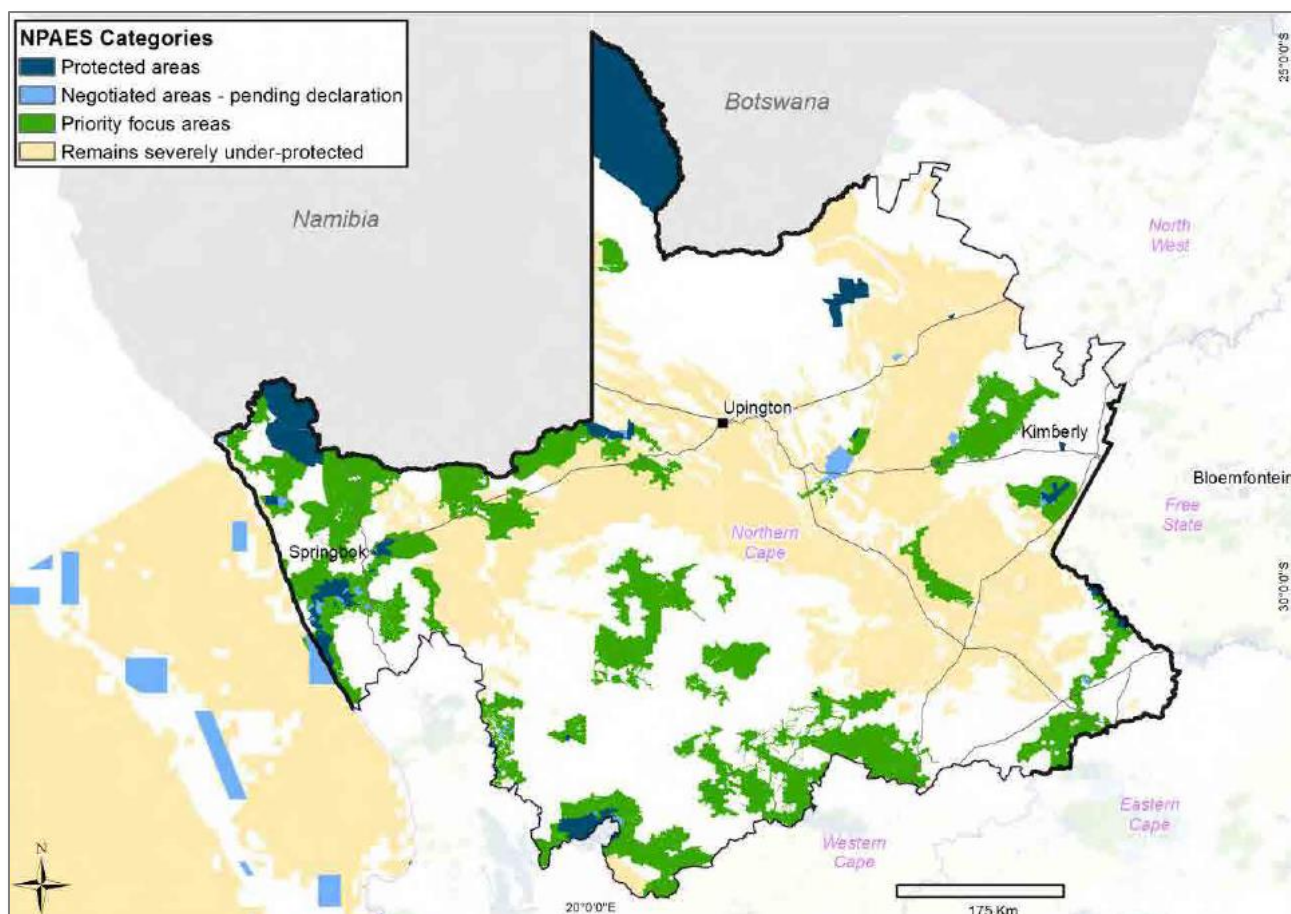


Figure 14: Protected area expansion strategy indicating KSP as a negotiated area (now proclaimed) and the surrounding area as severely under-protected

8.4.2 Griqualand west centre of endemism

South Africa hosts 14 centres of endemism, where an unusually high occurrence of species with very restricted distributions occurs (Anderson, 2003). The Kathu Solar Park is situated in the Griqualand West Centre of Endemism (GWC), which indicates a global conservation significance. These range-restricted plant species are however mainly associated with rocky outcrops, which does not occur on the Kathu Solar Park property. *Tarchonanthus obovatus* is one endemic identified on the property.

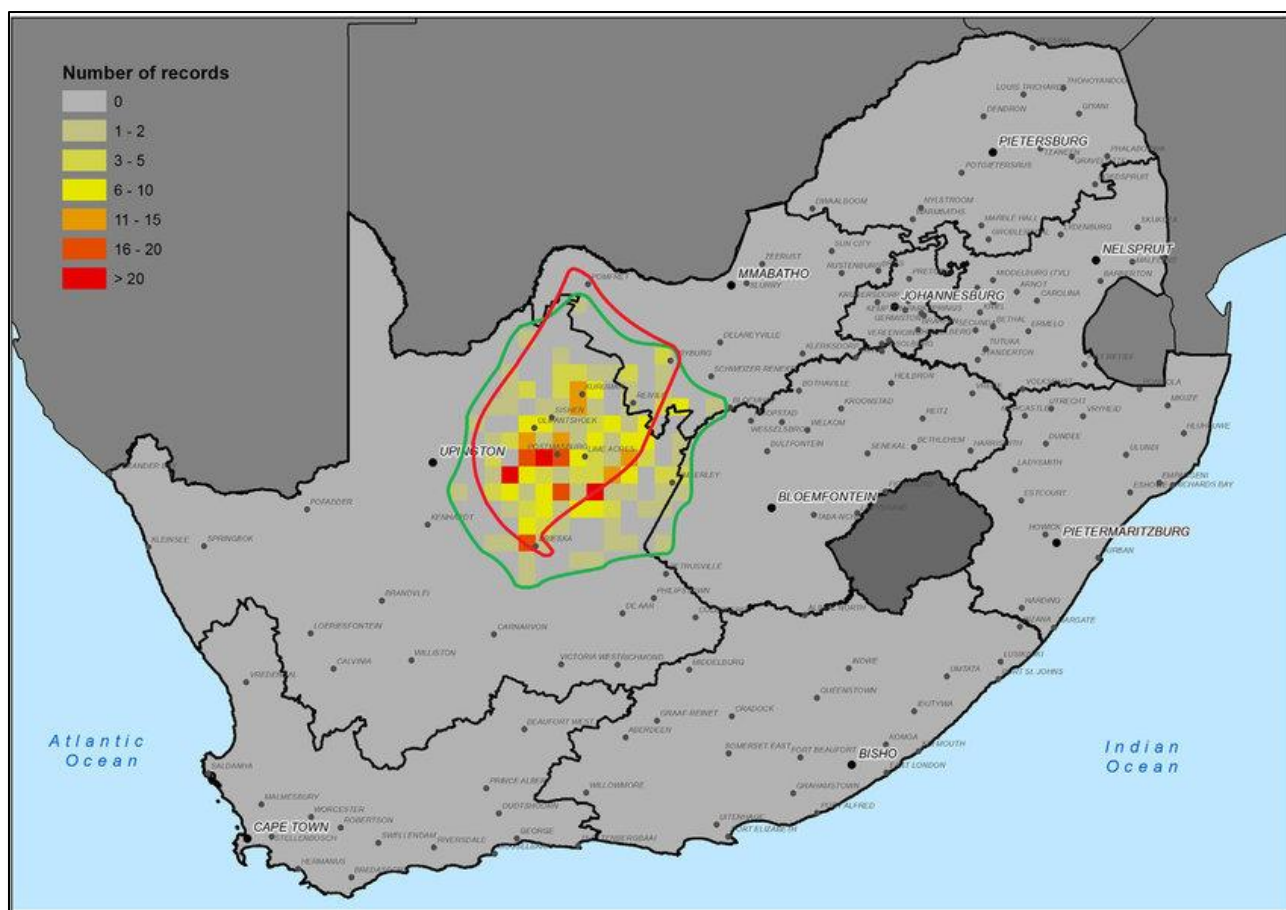


Figure 15: Griqua West Centre of Endemism - darker colors highlight number of records for endemic species

8.4.3 Critical biodiversity areas

Critical Biodiversity Areas (CBA 1, 2), ecological support areas and other natural areas are all present within the Kathu Solar Park property (DENC, 2016). This CBA1 area consists of the declared protected woodland in terms of Section 12(1)(c) of the National Forest Act (NFA) (Act 84 of 1998), namely the Kathu Forest Protected Woodland, where CBA 2 act as a buffer area for this woodland.

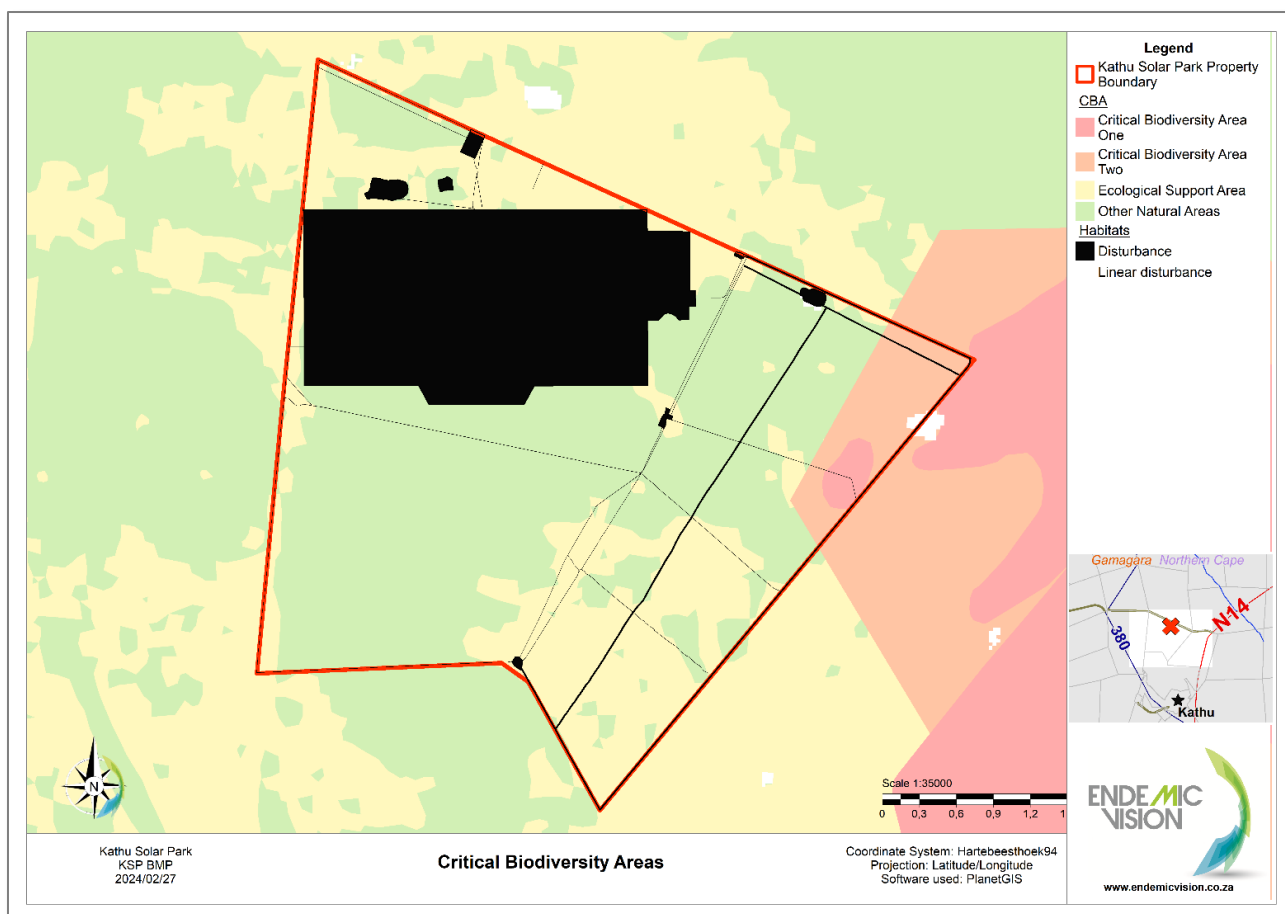


Figure 16: Critical Biodiversity Areas (CBA) within the Kathu Solar Park property

8.4.4 The Kathu Forest Protected Woodland

Originally this area was identified as a priority area in 1919 and proclaimed as a state forest. At that time this area was known to trade in camel thorn pods as a concentrate fodder for livestock. The state forest was de-proclaimed and registered as a national heritage site in 1995. The Kathu Forest was declared a protected woodland in South Africa in terms of Section 12(1)(c) of the National Forest Act (Act No. 84 of 1998) in 2009. This was the first woodland to be declared as a protected woodland within South Africa. The declaration of the Kathu Forest Protected Woodland does not only protect *Vachellia erioloba* tree species but also an area high in biodiversity with various IUCN red listed species as well as various nationally and provincially protected species and endemic or near endemic species. The woodland is approximately 4000 hectares in size and is one of two such woodlands in the world, the other being between Mariental and Rehoboth in Namibia.

After the 2009 declaration, the woodland was re-declared in 2013 to ensure the expanded area is protected and includes zones of conservation. Three different zones are demarcated within the Kathu Forest Protected Woodland with different activities allowed within each zone:

Table 8: Kathu Forest Protected Woodland zone descriptions

Zone #	Name	Zone description	Allowable activities apart from existing agricultural land use rights
1	Primary conservation zone	Dense closed canopy woodlands on deep Kalahari sands.	Hiking trails and limited vehicle tracks
2	Low impact ecotourism zone	Moderately dense woodlands	Low-impact eco-tourist development (trails, tracks, picnic sites etc.)
3	Eco estate buffer zone	Open woodland with well-established shrub and grass sward. Some up-land lowland interfaces (outcrops) feeding into woodlands.	Low density housing development that retains the natural character of the area, with no introduction of alien plant species and subject to an agreed off-set agreement for the conservation and management of the Kathu Protected Woodland and adjoining areas

A portion of the farm Kathu 465 (644 ha) have been demarcated as an offset area for the loss of important tree species (*Vachellia erioloba* and *Boscia albitrunca*) during the development of the Kathu Solar Park. The offset area was proclaimed as a Forest Nature Reserve in 2018 under section 8(1) of the National Forests Act (Act No. 84 of 1998). A small area of the declared Kathu Forest Protected Woodland is situated within this protected area.

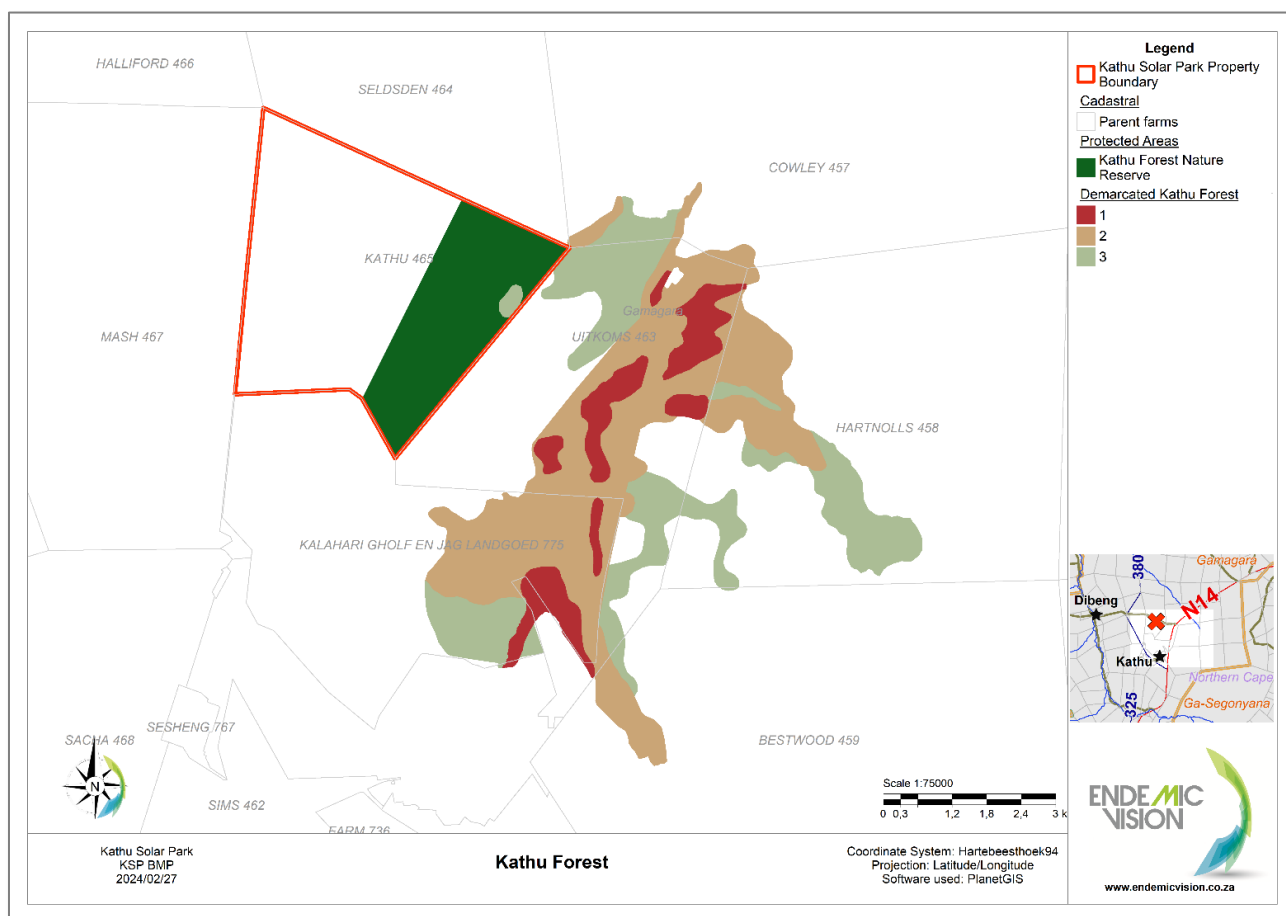


Figure 17: Declared Kathu Forest Protected Woodland and Kathu Forest Nature Reserve

8.5. Land management baseline

8.5.1 Water resources

Various water resources are present on the property including natural resources such as ephemeral pans and one non-perennial stream. The majority of these pans are situated in the offset area to the east of the property. One artificial pan is located to the north of the current solar plant. This wetland was created during the construction of the solar plant, where some natural ephemeral pans were destroyed, as an effort to create similar habitat. Stormwater is redirected from the plant to this artificial wetland through a narrow channel.

Historic watering points are present on all four sides of the property, close to the boundary fence. Currently only one of these watering points (south) is in working condition. These watering points consists of boreholes, dams/ reservoirs and windpumps. Additionally, two dams (not in working condition) are situated along the centre road of the farm. Boreholes can further be found close to the entrance of the farm as well as to the west of the current Kathu Solar Park.

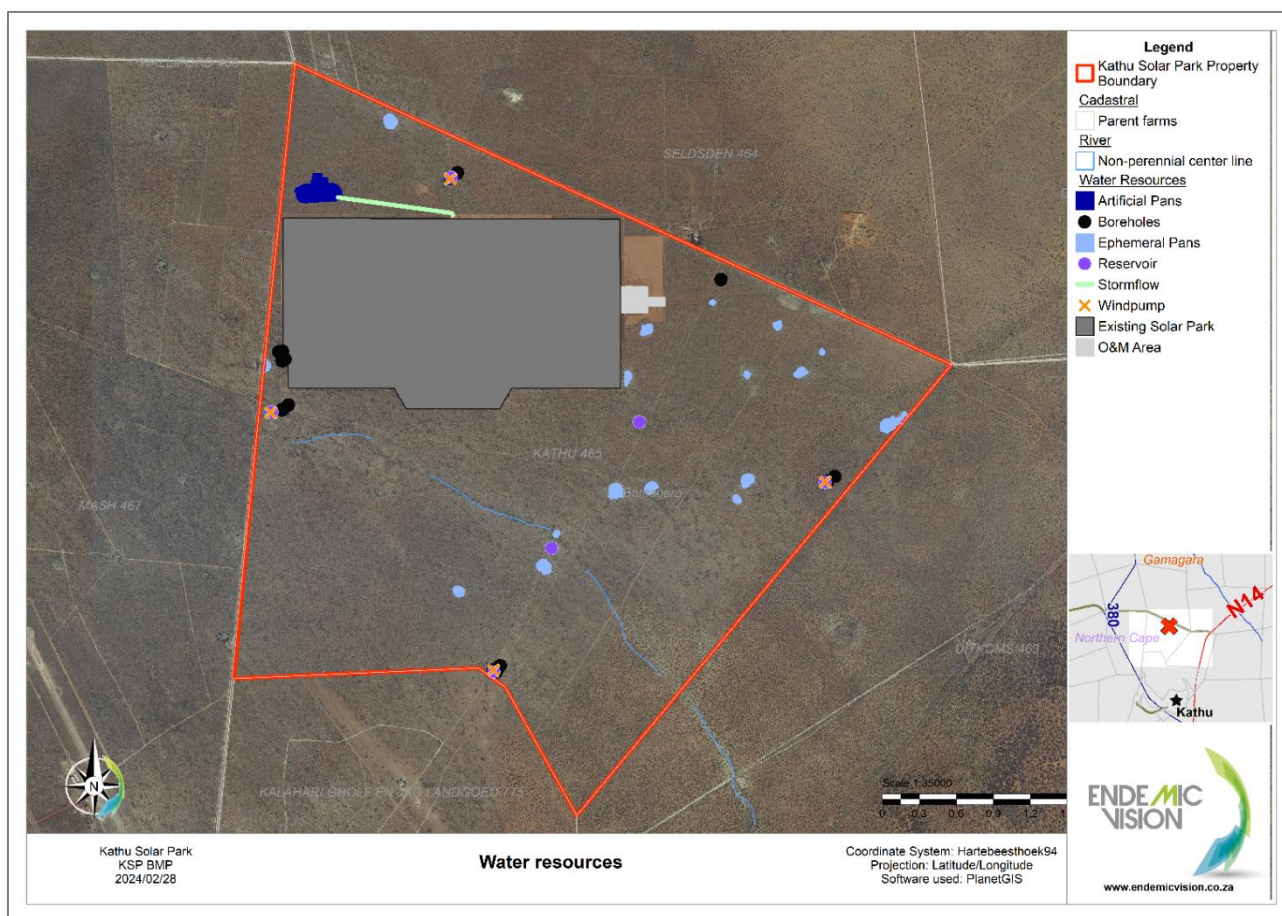


Figure 18: Water resources present on KSP, including boreholes, and historic watering points

8.5.2 Infrastructure

The entire property is fenced off, although maintenance is required on portions of these fencing. The fences consist of 1.2m fences, suitable for livestock, except the fence to the south, bordering a game farm, where a 1.8m fence is present. Old fences are also present within the property, dividing the property into six units. Roads are present along all fences, powerlines and telephone lines. Only a few of these roads are currently in a drivable condition due to vegetation growth within these roads.

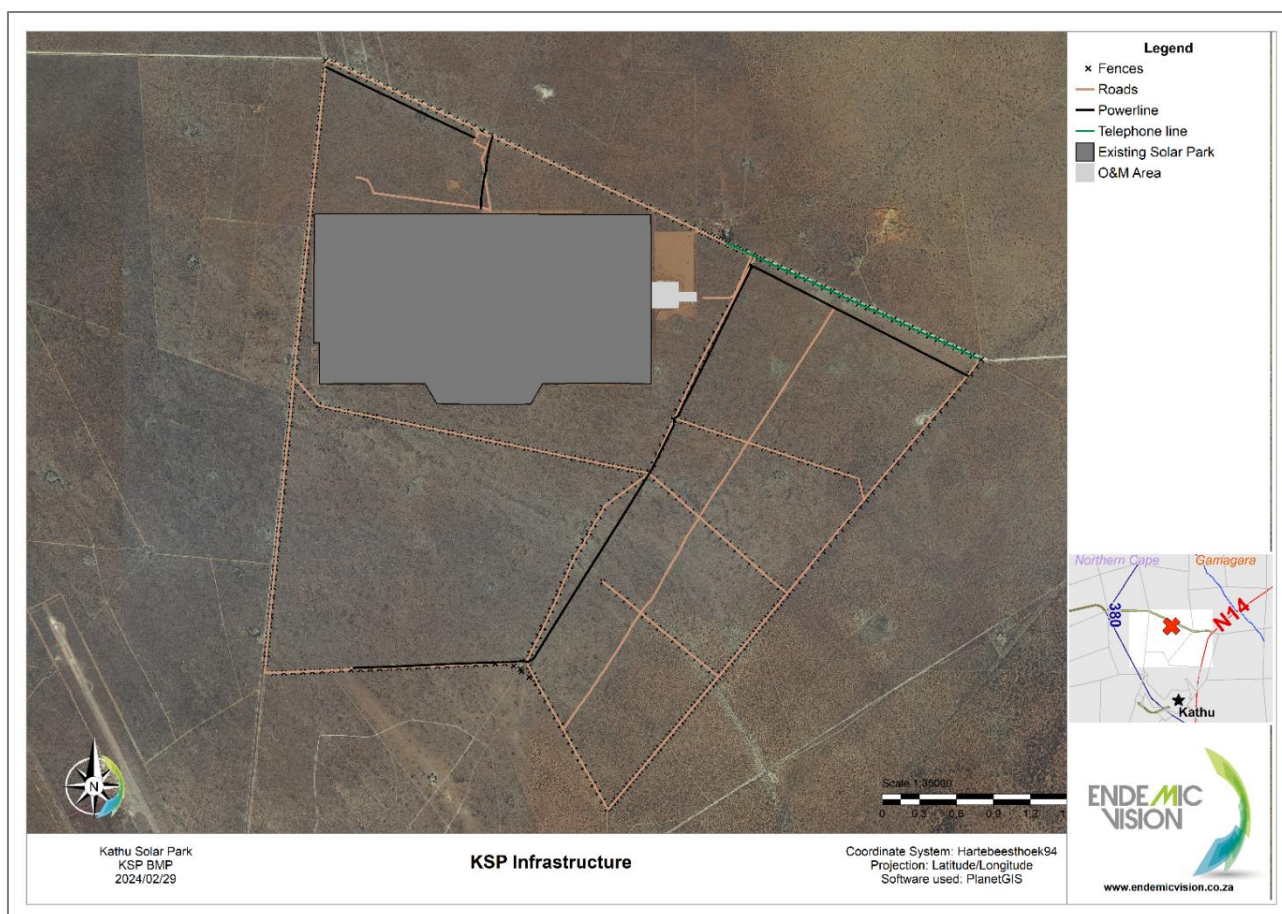


Figure 19: Map indicating roads, fences and other linear disturbances on KSP.

8.5.3 Veld Condition

Plant diversity is related to veld resilience during stress such as grazing, fire, frost, soil protection, drought and changes in climatic conditions. The greater the plant diversity, the greater the resilience of the area to recover from stress.

Land management, such as different grazing types and pressures; land management changes, breeding cycles and stocking rates, watering holes, roads, construction, paddock layout and fire management directly correlated with the species richness and veld condition. All the above are seen as disturbances that can change climax veld to sub-climax and pioneer veld.

The 2019 assessment (Birch 2019) indicated that the proclaimed offset area had a veld condition score between 45% (poor) and 70% (good) depending on the area assessed. The poorer scores were attributed to *Senegalia melifera* thicket that increase browsing value instead of grazing value, historic over grazing and trampling, especially around watering points.

Veld condition is affected by droughts, fire, rain season and management and should be monitored continuously.

8.5.4 Carrying capacity

Carrying capacity includes both the grazing and browsing capacity of the veld that is used to guide which species and numbers of game or livestock can be economically productive in an area.

A detailed carrying capacity assessment of the offset area was undertaken during the wet season in March 2019 (Birch, N. 2019). The data from this assessment is extrapolated to include the extended areas for similar habitats to provide some indication of potential carrying capacity for KSP. It should be noted that these figures can only be used as broadly indicative and that a carrying capacity re-assessment is required to provide accurate data for future management.

The Department of agriculture published a general notice on the new long-term grazing capacity for south Africa (GG 41870; Notice No 898; 2018). Carrying capacity is delineated per province and indicates that KSP expected carrying capacity is 13

LSU/ha. Where no detailed assessment of actual carrying capacity is undertaken, the grazing capacity of the NRMP would amount to 102 Grazer Units.

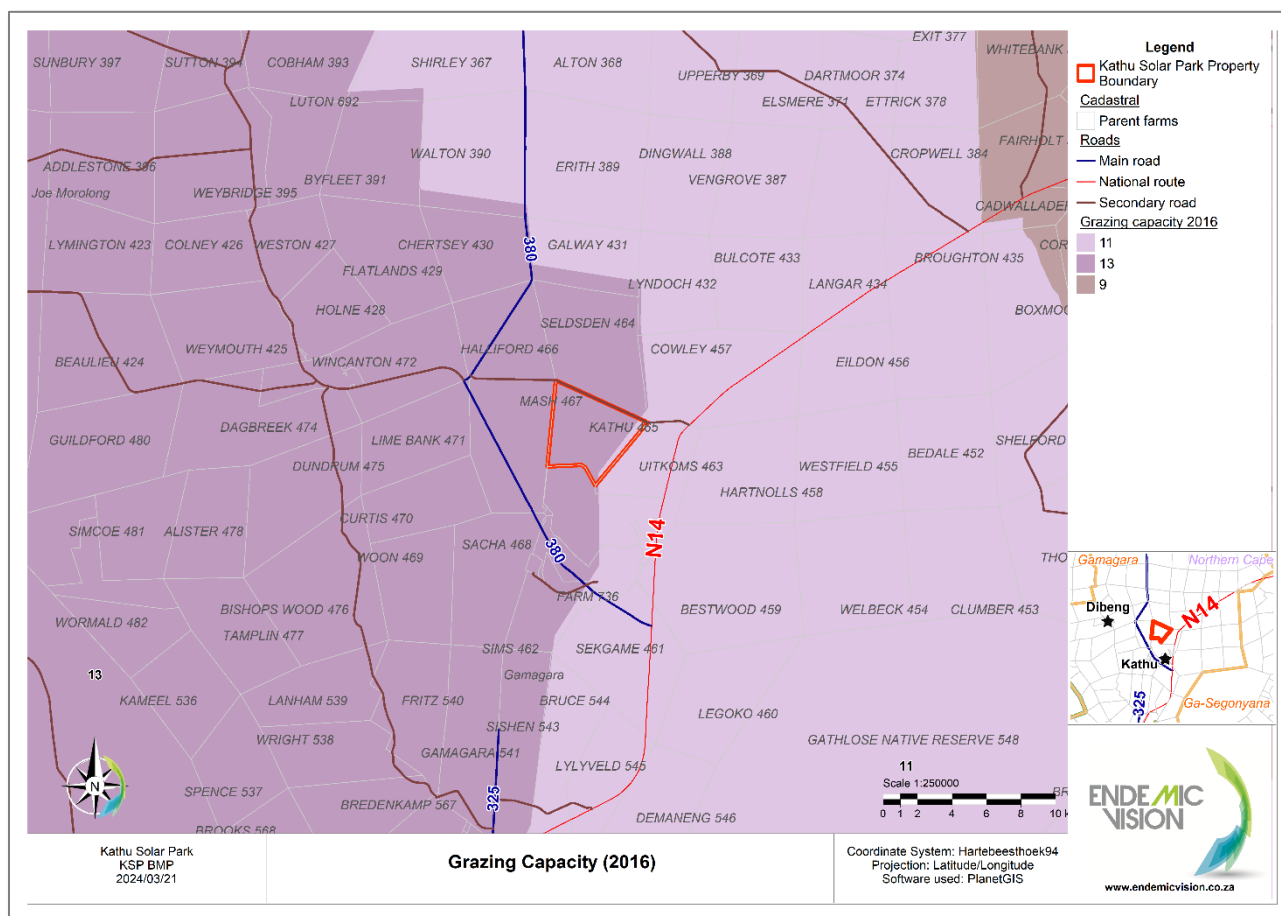


Figure 20: Grazing Capacity (LSU/ha)

8.5.4.1 Grazing capacity

Grazing capacity, according to (Bothma and du Toit, 2010) is calculated as the economic number of grazing units (GU/ha) per site. Economic grazing capacity is 75% of the ecological grazing capacity and allows for increase (breeding), maximum meat production and recovery from drought conditions. The basis of the potential grazing capacity is the veld condition scores that is converted to ecological index or percentage performance value where 0% is zero grazing capacity and 100% is 100% grazing capacity of the benchmark. The index value is benchmarked against the desired veld condition.

The Department of Agriculture refers to large stock units (LSU) values. LSU/ha is considered a linear trend instead of the semi-cumulative and refined GU/ha and BU/ha. The current best practice is to use Grazing Units and Browsing Units. LSU based calculations does not properly account for the metabolic mass, especially herbivore game species that are ecologically separate and specialized that allows for complementary resource use of habitats.

LSU/ha is not recommended for use in carrying capacity calculations, but direct gross conversion can be made from GU/ha to LSU/ha (Bothma and du Toit, 2010; Van Oudtshoorn, 2015).

The extrapolated carrying capacity for KSP amounts to a total of 142 grazer units with woodland and open woodland being able to maintain the largest number of animals.

Table 9: Grazing capacity per habitat type

Grazing Capacity	Bushveld	Open Woodland	Pans	Thicket	Woodland
Total Economic Grazer Units	130	8	1	3	33

8.5.4.2 Browsing capacity

Browsing capacity refers to browse which includes the woody plant material that is available (edible and within reach of the browser) and is expressed as browser units per hectare (BU/ha). Even though over-browsing does not really take place, the browse supply during late dry season in savannas limits the stocking capacity of an area.

When determining the browsing capacity, the leaf volume that is not within reach of the animals is excluded by using the Maximum Browsing Height (MBH), the maximum height at which a certain animal can browse. The browsing capacity for each animal species will be different because every species utilizes browse at a different height.

The extrapolated browsing capacity for KSP amounts to a total of 38 browser units with bushveld and woodland able to maintain the largest number of browsing animals.

Table 10: Browsing capacity per habitat type.

Browsing Capacity	Bushveld	Open Woodland	Pans	Thicket	Woodland
Total Economic Browser Units	23	6	1	9	18

8.5.5 Stocking rate

The **recommended species for introduction** is Gemsbok, Zebra, Springbok with the understanding that Kudu, Duiker, Steenbok and warthog occur naturally.

Stocking rate refers to the number of browser units and grazer units the area can support taking the species suitable to the habitats, the veld condition, carrying capacity and economic drivers (game or livestock increase) into account. Stocking rate is one of the most important factors affecting individual animal performance, farm profitability and veld condition.

It should be noted that stocking rates are dynamic and only provide a point in time estimation that require adaptive management and re-assessment over time. The recommended species and percentage distribution of the types of species were directly extrapolated from the 2018 habitat assessment. A total of 181 animals and seven (7) species could be stocked in the NRMP area.

Table 11: Stocking rates of potential feeders and species

Stocking Rate	Animals per type	Species	# of animals
Grazers	68	Gemsbok	34
		Zebra	34
Browsers	31	Duiker	12
		Kudu	19
Mixed Feeders	83	Springbok	36
		Steenbok	28
		Warthog	18
Total	181	7	181

CHAPTER 03 - MANAGEMENT

Five elements or processes were considered in compiling the objectives and targets.

- 1) Firstly, the KSP values and drivers that influence their commitment to biodiversity management as a whole.
- 2) Secondly, the NRMP gap analysis (EndemicVision 2024) where key issues were identified that needs to be addressed.
- 3) Thirdly, the detailed fine scale mapping provided an understanding of the specific significant biodiversity features and natural resource base.
- 4) The KSP NRMP vision, brainstormed during the compilation of the NRMP, provides direction to the objectives and targets. The vision is achieved through overarching objectives that is ordered as being either strategic, management or annual actions. Each objective is further detailed by SMART targets in the APO (Appendix 2). SMART targets are Specific, Measurable, Achievable, Relevant, and Time-bound. Details, requirements and measurable indices are added to ensure effective implementation.

Table 12: Types of objectives

Order	Description
Strategic management objectives	Strategic items requiring more than one management level; Capital Projects or longer-term items (3-5 years)
Management objectives	Management items; Operational budget; Medium term items (1-3 years)
Operational objectives	Implementation items; Foundational annual actions; short term items (annual)

- 5) Once the initial objectives (NRMP V01) have been addressed, a SWOT process is proposed to review and refine the objectives further.

9. Objective Determination

9.1. KSP values and drivers

The Health-Safety and Environmental Policy is a key driver. The highest level of commitment underpins and directs the NRMP.

KSP considers themselves to be a performance driven company aiming for the highest level of health, safety and environmental performance by demonstrating professional conduct and compliance with all applicable laws.

KSP has a strong focus on social engagement, encouraging communication, consultation and participation with relevant stakeholders about their performance.

9.2. NRMP compliance status

A rapid gap analysis was conducted of 77 biodiversity, land management and rehabilitation requirements set out in the legislation, proclamation and KSP authorizations to determine the KSP compliance status. The recommendations are included as specific NRMP objectives with targets. The current summary of compliance is tabled below and should be updated with every review of the NRMP to indicate the current compliance status.

Table 13: Summary of the rapid biodiversity gap analysis

Requirements	Number of Requirements	% Compliance
Offset edict	5	78%
Management Conditions	11	64%
Rehabilitation	16	59%
Management Responsibility	4	53%
Sensitive Habitats	8	51%
Monitoring & Reporting	13	35%
Management Plan	18	10%
Future considerations	2	0%
Total	77	
Average Compliance - all items		43%

9.3. NRMP fine scale mapping

To delineate biodiversity features, vegetation types were divided using recognized habitat units. The entire landholding is divided into longitude - latitude referenced cells of 3.06 ha. Each grid cell consists of four quadrants mapped at 3" (second) intervals. Each grid cell (4 quadrants) is classified as a habitat unit.

A baseline fine scale map was generated using Planet GIS (PGIS) and Google Earth software. Vegetation types were identified, and habitat types were further delineated at a five second interval scale. Linear disturbances, infrastructure and water resources were mapped to provide the georeferenced context to understand the baseline environment and make sound management decisions.

The baseline mapping is detailed as part of the Baseline section of the NRMP and specifically influence the management and infrastructure objectives. The fine scale mapping also provided the current impact statement and infrastructure that was used as a baseline upon which management interventions were identified.

9.4. NRMP SWOT analysis

A Strengths-Weakness-Opportunity and Threats analysis is proposed as a check-point to identify challenges and opportunities once the NRMP compliance items have been addressed. This process will take place upon the three-year review of the NRMP V01.

10. Aim and Vision of the NRMP

The **values** of the KFNR are the woodland areas and the proximity (core and buffer) to the proclaimed Kathu Forest Protected Woodland. It is also valued for its NFEPA wetlands and protected trees, and species found on site.

The KSP vision is to manage the KSP biodiversity features in such a way that the net biodiversity value of the area is maintained and improved for current and future generations.

The **purposes** of the KFNR are defined in the NEMPAA (Sect 17). The KSP purpose relate closely to its objectives that fulfill the obligations of the NEMPAA section 17.

The KSP aim is to be legally compliant and have no net biodiversity loss.

11. Objectives and Targets

The following objectives and targets are prioritized as being strategic, management or operational actions:

Strategic Objectives and Targets (High priority)
Advance community-based conservation
Promote career skills for semi-literate communities
Establish local tree nursery outside of Nature Reserve footprint to enhance the Nature Reserve
Provide effective conservation skills for sustainable community living on the land
Instil science competencies for future environmentalists
Complete the offset edict
Complete KFNR proclamation process
Initiate Process to Declare KFNR under NEMPAA
Amend title deed to ensure the long-term protection of the required offset areas by 2026
Develop, communicate and submit final NRMP in 2024
Secure the long term (LOP) management authority (succession) of the NRMP area
Implement rehabilitation
Rehabilitate the KSP impact footprint to mitigate the original development impacts at LOP
Management Objectives and Targets (Medium Priority)
Conserve important habitats
Introduce game species to promote habitat utilization
Improve wetland and riverine habitats of the NRMP
Improve infrastructure
Re-establish management roads
Reinstate watering points
Upgrade fences and firebreaks
Manage EAI species
Implement alien and thicket control program
Manage encroaching, alien and invasive species
Monitor, review and update management
Revise the NRMP every three years
Monitor veld condition to guide management decisions

Basic Objectives and Targets (Low Priority)
Manage site access and security
Prevent illegal access, wood collecting, snaring and potential wildfires caused by trespassers
Improve infrastructure
Maintenance of nature reserve infrastructure
Monitor, review and update management
Monitor environmental variables that affect ecological functioning
Review and update the APO annually
Submit annual NRMP area audit report to DAERL and Landowner
Monitor concurrent rehabilitated areas one year after establishment

12. Five-year Plan

The APO (Appendix 2) makes out part of the five-year nature reserve management plan

Five-year period	
Year start	2024
Year end	2028
Current year	2024 (year 1)

12.1. Five-year budget

Below is the estimated budget per objective for the five-year period.

	2024	2025	2026	2027	2028	Grand Total
Advance community-based conservation						
Complete the offset edict	R 170 000	R 50 000				R 220 000
Manage site access and security	R 70 000	R 120 000	R 120 000	R 126 000	R 132 300	R 568 300
Conserve important habitats			R 50 000	R 75 000	R 78 750	R 203 750
Implement rehabilitation						
Manage EAI species		R 25 000	R 52 500	R 60 000	R 63 000	R 200 500
Monitor, review and update management		R 60 000	R 50 000	R 60 000	R 63 000	R 233 000
Improve and maintain NR infrastructure	R 572 000	R 600 000	R 650 000	R 157 500	R 165 375	R 2 144 875
Grand Total	R 812 000	R 855 000	R 922 500	R 478 500	R 502 425	R 3 570 425

12.2. Five-year schedule

Objective	Number of management actions per year					Total
	2024	2025	2026	2027	2028	
Advance community-based conservation			1	3		4
Complete the offset edict	4	2				6
Manage site access and security	2	1	1	1	1	6
Conserve important habitats			1	1	1	3
Implement rehabilitation					1	1
Manage EAI species		1	1	1	1	4
Monitor, review and update management		6	6	8	6	26
Improve and maintain NR infrastructure	3	3	2	1	1	10
Grand Total	9	13	12	15	11	60

Recommendations

The following recommendations are noted for future NRMP updating.

- Review conceptual community enhancement plan as drafted below.

Target	Details	Requirements	Indices - measurable outputs
Provide effective conservation skills for sustainable community living on the land.	Rehabilitation; composting; trench gardening; values of trees; waste management	Identify developing farmers or rural families; identify skill needs; conduct training; evaluate changes in livelihoods after training.	Number of families reached. Number of training sessions presented.
Instil science competencies for future environmentalists	Set up ecological monitoring exposure program in line with BMP monitoring program. Teach skills: plant identification; monitoring methods (vegetation, animal, pans, etc).	Identify universities or partners (WESSA); Identify potential students; holiday pupils; provide experience and training in ecological monitoring.	Number of students trained.
Promote career skills for semi-literate communities	Employ and/or train local semi-literate persons for land management tasks: Fencing; Alien eradication; erosion control; bush encroachment control; cleaning fire breaks.	Identify service providers and/or persons for skills transfer. Implement management measures. Evaluate work completed and skills gain.	Number of local semi-literate communities.

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