Public summary of environmental report and monitoring results for the period 01 April 2022 to 31 March 2024

Table of contents.

1. Chief Executive's message
2. Environmental Manager's report.
3. Scope of report
4. Core values
5. Overview of operations
6. Environmental management programme.
6.1. KLF Environmental Policy
6.2. Integrated Management System
7. Management of Environmental impacts
8. Land use and conservation management
8.1. Monitoring of environmental attributes
8.1.1. Monitoring of rare, threatened and endangered (RTE) species.
8.1.1.1. Floral component.
8.1.1.1.1. *Ledebouria rupestris (February 2022)*
8.1.1.1.2. *Aloe vossii (March 2023)*
8.1.1.1.3. *Aloe vossii (March 2024)*
8.1.1.1.4. *Aloe simii (March 2024)*
8.1.1.1.5. *Chlorophytum radula (March 2024)*
8.1.1.1.6. *Brachystelma ngomense (2022 and 2023)*
8.1.1.1.7. *Helichrysum lesliei (2023/24)*
8.1.1.2. Faunal component.
8.1.1.2.1. Herpetological surveys.
8.1.1.2.1.a. 2023 Assessments (Bergvleit, Belfast and Morgenzon)
8.1.1.2.1.b. . 2024 Assessments (Jesseivale, Ngome and Roburnia)
8.1.1.2.2. Bird Monitoring
8.1.1.2.2.a. 2023 Avifaunal Assessments (Woodbush, Thathe Vondo and Roodeval)
8.1.1.2.3. Crowned Eagle Monitoring.
8.1.2. Water Quality Monitoring.(Environmental Biomonitoring Services)
8.1.2.1. Belfast Plantation - Olifants Catchment 2022/23.
8.1.2.2. Morgenzon Plantation - Sabie Catchment 2022/23.
8.1.2.3. Bergvliet Plantation - Sabie Catchment 2022/23.
8.1.2.4. Tweefontein Plantation - Sabie Catchment 2022/23
8.1.2.5. Wilgeboom Plantation - Sabie Catchment 2022/23.
8.1.2.6. Entabeni Plantation - Limpopo Catchment 2023/24
8.1.2.7. Nelshoogte Plantation – Crocodile Catchment 2023/24
8.1.2.8. Jessievale Plantation - Usuthu Catchment 2023/24.
8.1.2.9. Roburnia Plantation – Usutu Catchment 2023/24.
8.1.2.10. Witklip Plantation – Crocodile Catchment 2023/24
8.1.2.11. Blyde Plantation - Olifants Catchment 2023/24
8.1.2.12. Ngome Plantation – Mfolozi Catchment 2023/24.
8.1.3. Grassland monitoring.

8.1.3.1. Grassland monitoring results – The Biodiversity Company 2022/23.

8.1.3.1.a. Belfast Plantation

8.1.3.1.b. Berlin Plantation

8.1.3.1.c. Blyde Plantation

8.1.3.1.d. Blyde Plantation (Lisbon Ridge)

8.1.3.1.e. Entabeni Plantation

8.1.3.1.f. Jessievale Plantation

8.1.3.1.g. Jessievale Plantation (Grootvlei)

8.1.3.1.h. Spitskop Plantation

8.1.3.1.i. Tweefontein Plantation (Maliedyke)

8.1.3.1.j. Uitsoek Plantation

8.1.3.1.k. Wilgeboom Plantation

8.1.3.1.l. Woodbush Plantation

8.1.3.2. Grassland monitoring results – Ecoleges Environmental Consultants 2023/24

8.1.3.2.a. Belfast Plantation.

8.1.3.2.b, Berlin Plantation.

8.1.3.2.c. Blyde Plantation

8.1.3.2.d. Blyde Plantation (Lisbon Ridge)

8.1.3.2.e. Entabeni Plantation

8.1.3.2.f. Jessievale Plantation

8.1.3.2.g. Jessievale Plantation (Grootvlei)

8.1.3.2.h. Spitskop Plantation

8.1.3.2.i. Tweefontein Plantation (Maliedyke)

8.1.3.2.j. Uitsoek Plantation

8.1.3.2.k. Roburnia Plantation

8.1.3.2.l. Wilgeboom Plantation

8.1.3.2.m. Woodbush Plantation

8.1.3.2.n. Witklip Plantation

8.1.3.3. Grazing capacity figures

8.1.4. High Conservation Values.

8.1.4.1. Indigenous Forest Monitoring.

8.1.4.1.a. Vigilance monitoring of Entabeni High Conservation Value Forest Complex on SAFCOL / Komatiland Forests Entabeni Plantation Forestry Estate in Levubu area, Limpopo Province - Report Number FW-03/23, dated February 2023.

8.1.4.1.b. Vigilance monitoring of New Agatha High Conservation Value Forest on SAFCOL / Komatiland Forests New Agatha Plantation Forestry Estate near Tzaneen, Limpopo Province - Report Number FW-01/23, dated February 2023.

8.1.4.1.c. Vigilance monitoring of Woodbush High Conservation Value Forest on SAFCOL / Komatiland Forests Woodbush Plantation Forestry Estate near Tzaneen, Limpopo Province – Report number FW 02/23, dated February 2023.

8.1.4.1.d. Vigilance monitoring of Frankfort High Conservation Value Forest on SAFCOL / Komatiland Forests Bergvliet Plantation Forestry Estate at Sabie, Mpumalanga – Report number FW-03/24, dated February 2024.

8.1.4.1.e. Vigilance monitoring of Geelhoutboom High Conservation Value Forest on SAFCOL / Komatiland Forests Tweefontein Plantation Forestry Estate at Sabie, Mpumalanga - Report Number FW-02/24, dated February 2024.

8.1.4.1.f. Vigilance monitoring of Wooden Pear High Conservation Value Forest on SAFCOL / Komatiland Forests Tweefontein Plantation Forestry Estate at Sabie, Mpumalanga - Report Number FW-04/24, dated February 2024.

8.1.4.2. Heritage sites (Rock / San art) Monitoring.

8.1.4.2.a. Routine Heritage Inspection and Evaluation report for Rock Art sites: Lochiel 1 and Lochiel 2 (Redhill Plantation), Syde 1 and Syde 2 (Roburnia Plantation), Blairmore, Ringkink 1a and 1b (Jessievale Plantation) and Northdene A and B (Roburnia Plantation), Lochiel, Warburton and Amsterdam areas – dated January 2024.

8.1.4.2.b. Routine Heritage Inspection and Evaluation report for the following Rock Art sites: Spitskop 1 (“Baboon Rock”), Ophir 1 (“Vlei Rock Paintings); Malieveld Vallei 1 (Bakenkop), Sabie area, January 2024.

8.1.4.2.c. Routine Heritage Inspection and Evaluation report for the following Rock Art site: Majuba 1, Berlin Plantation, Kaapschehoop, Mpumalanga, February 2024.

8.1.4.2.d. Phase 1 Archaeological Impact Assessment, Survey and Management Guidelines for a Rock Art Site, 802055, OPHIR 2, on the farm Ophir 191JT, portion REM, Spitskop Plantation, dated January 2024.

8.1.4.2.e. Phase 1 Archaeological Impact Assessment, Survey and Management Guidelines for a Rock Art Site, 736033, SCHOONGELEGEN1, on the farm Schoongelegen 231JT, Witklip Plantation, dated March 2024.

8.1.4.3. Non-Timber Forest Products (NTFP)

8.1.4.3.a. A management guideline towards sustainable bark harvesting to assist SAFCOL Plantation Forestry Managers when dealing with traditional healers or unauthorized bark harvesting.

8.2. Management of areas of special interest (ASI) and Natural Heritage Sites.

8.2.1. Relocation of desecrated Maria Shires and William Bowman Historical graves – Report on the Rescue excavation of the maria Shires and William Bowman Historical graves close to the Maria Shires Waterfall at SAFCOL Tweefontein Plantation on the Farm Geelhoutboom 565KT, Sabie District, Mpumalanga – April 2023.

8.3. Rehabilitation and restoration of degraded sites.

8.4. Wetlands

6.4.1 Wetland delineation

8.5. Weed control

8.6. Erosion Risk Programme

9. Safeguarding and control of pesticide usage.

10. Waste management.

11. Environmental auditing.

11.1. Internal auditing.

11.2. Third party auditing.

11.2.1. FSC® certification
11.2.2. NOSA certification
12. Stakeholder involvement.
12.1. Stakeholder communication and complaint resolution.
12.2. Stakeholder consultation forums and working groups.
13. Conclusion.

1. Chief Executive's message

This twelth Environmental report for SAFCOL's Komatiland Forests (SOC) Ltd (KLF) covers the reporting period of 1 April 2022 – 31 March 2024.

As a leading supplier of sawlogs to the South African market, the main objective of the company remains the sustainable and responsible development and optimization of its assets and land value in accordance with accepted environmental and commercial management principles and standards.

In line with our continual commitment to responsible forest management, we voluntarily subscribe to the Principles and Criteria of the Forest Stewardship Council® (FSC®) (FSC® – C013832 – Forest Management and FSC® – C007806 – Chain of Custody) against which we are annually audited by an independent third party. For details and results of these audits visit (https://info.fsc.org/details.php?id=a0240000005sRaXAAU&type=certificate&return=certificate.php).

Komatiland will continue to practice responsible forest management in accordance with FSC® Principles and Criteria and is dedicated to *Growing the Future* for the benefit of the South African nation.

2. Environmental Manager's Report

KLF continues to make good progress in the implementation and entrenchment of sound environmental management practices in its operations through the dedicated efforts of our Environmental Practitioners in support of and in co-operation with Operations management.

We remain committed to responsible, sustainable management of the forests and natural areas under our stewardship and continue to seek better and more effective ways to achieve our objectives and honour our commitments in this regard.

Stakeholders who wish to engage with KLF regarding environmental and related matters are invited to contact the General Manager: SHEQ at paul.wainwright@safcol.co.za or alternatively telephone +27 13 754 2700

3. Scope of report

This document provides the reader with a fairly detailed overview of corporate governance with regards to environmental management, assessment of environmental impacts, environmental monitoring, results of second and third party operational audits and stakeholder involvement and communication.

For further information or clarification,please contact the General Manager: SHEQ, Paul Wainwright at paul.wainwright@safcol.co.za

4. Core values of the company

Vision

A leader in sustainable forests and commercial forest products.

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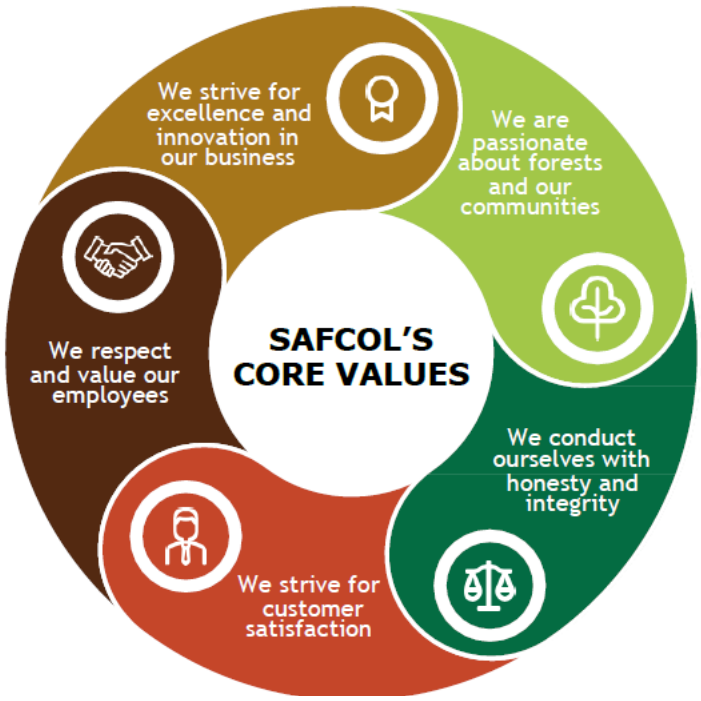
Mission

In delivering its vision, SAFCOL's mission is to :

- Grow in the forestry value chain.
- build commercial value through strategic partnerships.
- Facilitate sustainable and inclusive economic development.

Core Values

We strive to perform our functions in a transparent and professional manner that is guided by the highest levels of integrity and ethical business practices, while delivering high quality products and services as well as being accountable to our stakeholders. The following core values are central to the operations of SAFCOL:



SAFCOL / KLF, including its employees, does not request, demand, solicit, receive, accept, offer, pay or in any other way receive or disburse bribes or engage in any other illegal, fraudulent, or corrupt exchanges whether in cash or kind.

5. Overview of operations.

Komatiland Forests (KLF) manages sixteen (16) forestry plantations. Most of these plantations are consolidated units, whilst others are fairly fragmented, with portions lying over a wide area. These plantations have been restructured and grouped into two regions, reporting to a Regional Manager. The regions are:

1) **North:** This region covers a large area, and spans two provinces namely Limpopo and Mpumalanga. The regional office is located at the JDM Keet section of Woodbush plantation,

just outside Tzaneen. Bergvliet, Blyde, Entabeni, Tweefontein, Wilgeboom, Witklip and Woodbush make up the management unit.

2) **South:** This region is characterized by plantations over a wide area stretching from Brooklands near Sabie in Mpumalanga to Vryheid in Kwazulu-Natal. The regional office is located in the town of Belfast. Belfast, Berlin, Brooklands, Jessievale, Nelshoogte, Ngome, Roburnia and Uitsoek, fall into this region.

Table 1 indicates the total area managed.

Description	Area (ha)	Longitude E/W	Latitude N/S
Belfast – South / Belfast	6 425.45	30 02 11	-25 35 38
Berlin – South / Kaapschehoop	13 583.35	30 44 46	-25 34 01
Jessievale - South / Ermelo	18 646.54	30 32 35	-26 17 04
Ngome – South / Vryheid	3 700.51	31 27 38	-27 49 20
Uitsoek – South / Nelspruit – Sudwala	9 911.62	30 34 12	-25 16 51
Nelshoogte – South / Barberton	11 704.34	30 48 59	-25 49 26
Roburnia – South / Amsterdam	15 021.16	30 44 47	-26 40 33
Brooklands – South / Sabie	12 779.93	30 47 16	-25 16 14
Witklip – North / White River	9 883.68	30 55 04	-25 13 20
Bergvliet (incl Spitskop) – North / Sabie	17 908.33	30 51 60	-25 04 58
Tweefontein – North / Sabie	18 967.77	30 44 42	-25 03 13
Blyde (incl Morgenzon) – North / Graskop/Pilgrims Rest	12 923.54	30 51 09	-24 50 38
Wilgeboom – North / Hazyview	9 339.16	30 56 29	-24 55 57
Woodbush – North (incl New Agatha)	9 445.47	30 00 12	-23 47 36
Entabeni – North / Louis Trichardt	16 997.80	30 14 50	-23 00 33
Palm Ridge – Research / Mtubatuba	127.10	32 13 48	-28 19 12
Total	**187 228.62**		

The Palm Ridge research farm is primarily for the establishment of seed orchards.

A total of 187 228 ha is managed. This area includes 119 713 ha that is planted and 67 515 ha classified as open areas. This open area consists of infrastructure, maintenance areas, firebreaks and conservation areas. Approximately 49 741 ha is classified as conservation areas. The forestry land is leased from government with an effective minimum lease period of seventy years.
The plantations are mainly managed for the production of softwood sawlogs. Pine constitutes 92% of the planted species followed by Eucalyptus at 5 % and other species at 3 %.

Timbadola Sawmill (Entabeni Forestry Estate) is the only processing plant operated by KLF. Other processing is conducted at various private processing plants varying from large processers to smaller processors located in and around the plantations. Timbadola produces mainly graded structural and industrial lumber.

The Platorand Training Centre on the Tweefontein Estate is the in-house training facility for KLF and offers a full range of forestry related training courses.

KLF has an in-house research unit, based in Sabie, with its primary focus on 'tree improvement' projects for the pine species grown on the estates. This unit is also involved in international co-operative research programs. Currently the centre is managing a number of trials in several plantations across the Limpopo, Mpumalanga and Kwazulu-Natal provinces. Palm Ridge, located near Mtubatuba, is a research farm, with prime focus on establishing Pine seed orchards.

Also located in Sabie is the KLF nursery which produces quality seedlings for the estates. The nursery is able to produce ten million seedlings annually.

Numerous eco-tourism facilities are accessible to the general public and Komatiland recognizes eco-tourism as the vehicle to effectively facilitate alternative land use forms on Komatiland managed land in accordance with the National Forests Act. Facilities include various day visitor areas and picnic sites and include Green Heritage picnic site, Mac Mac pools, Mac Mac Falls, Lone Creek Falls, Bridal veil Falls, Forest Falls, Lisbon Falls, Berlyn Falls and Debegeni Falls. There are also numerous overnight hiking trails, horse trails, mountain bike and trail run routes. Lakenvlei Forest Lodge, situated on the Belfast forestry estate is a lodge with a full suite of activities and conference facilities. The Sabie Forestry Museum, the only one in South Africa, is also operated by KLF and plays an important educational role. KLF also actively supports the use of its land for various organized sport events which includes mountain biking, trail running and orientation events.

Non-timber forest products include mushrooms, honey and livestock grazing. Controlled firewood collection (plantation waste wood) by neighbouring communities is permitted.

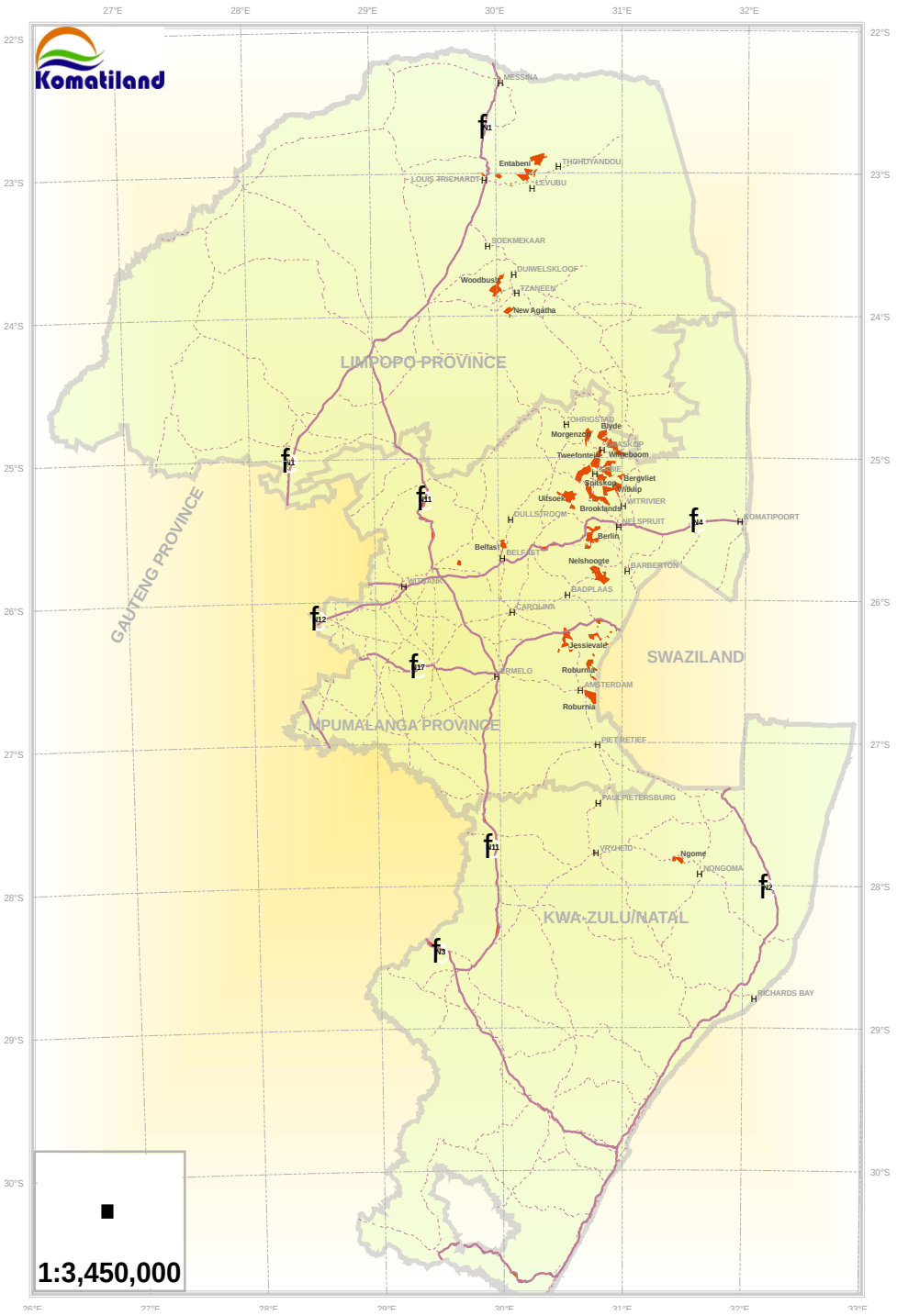


Figure 1: Distribution of Komatiland forestry estates.

6. Environmental management programme

6.1. SAFCOL Environmental Policy

SAFCOL OUR FORESTS. OUR FUTURE.	Title	Environmental Policy – Display Summary		
	Document No.	SHE – POL - 002 – FT001	Version No.	08

ENVIRONMENTAL POLICY

As a responsible corporate citizen, SAFCOL is committed to responsible environmental stewardship within its operations and land holdings, in accordance with promulgated legislation, industry standards, and Best Operating Practices (BOP). SAFCOL recognises the environmental values inherent in our land holdings, promotes sound environmental practices, and strives for continual improvement of environmental performance across all our business activities.

We are committed to:

- As a minimum, compliance with all applicable environmental legislation, regulations, and international protocols and codes ratified by the Republic of South Africa.
- Alignment with applicable industry standards, and Best Operating Practices (BOP).
- Assess the environmental impacts of our operations, identify and implement measures to adapt and/or mitigate such impacts.
- Adopting the mitigation hierarchy in our operations by assessing, seeking to avoid, minimising, and then rehabilitating potential environmental impacts.
- Ensuring continual improvement of environmental performance across all business activities.
- Publishing a bi-annual Environmental Performance Report on environmental performance.
- Responsibly manage natural ecosystems in order to sustain and improve biodiversity.
- Protect threatened or protected species (TOPS) and habitats, as well as cultural heritage sites that occur on our land.
- Ensure a dedicated, professional, and informed Environmental team to provide specialist environmental guidance.
- Provide adequate training to employees and contractors to ensure sound environmental practices.
- Promote environmental awareness amongst all employees, contractors, and adjacent communities.
- Minimise waste and pollution through the efficient and sustainable use of all resources in all aspects of our business.
- Purchase environmentally sustainable products wherever feasible (e.g. recycled, FSC® certified, or low-environmental-impact products).
- Reduce risks emanating from environmental, health, and safety hazards.
- Assist and participate in finding solutions to challenges that may affect our environment, including climate change.
- Minimise Greenhouse Gas (GHG) emissions from operations and positively contribute to climate change adaption and mitigation.
- Ensure culturally appropriate engagement and consultation with relevant stakeholders regarding environmental and other practices.
- Perform Environmental, Occupational Health, Safety, and Risk management in an integrated manner.



O.T. Monaheng
Chief Executive Officer **September 2022**

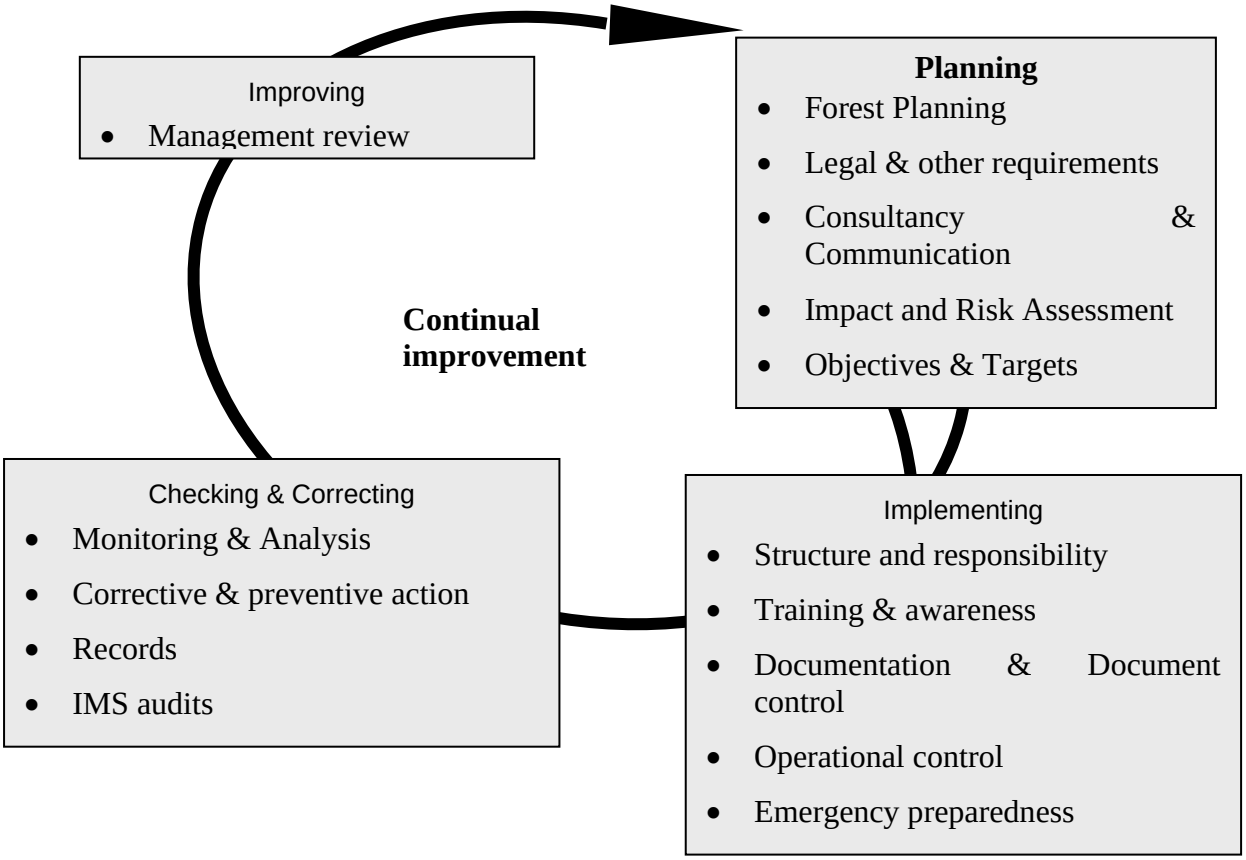
6.2. Integrated Management System

Since 2009, the Environmental Management System (EMS) was replaced with the Integrated Management System (IMS), a fully electronic system that effectively integrates operational compliance to the entire suite of national legislation, internal and industry norms and standards as well as NOSA and FSC® certification.

Since the first version of 1 June 2009, documents have been updated on a regular basis, to ensure that the most up to date and applicable information is available to staff.
The IMS has proven itself as a valuable compliance tool and has more than 800 associated documents linked from the various operational sections. It is fast becoming the "bible" for forestry operations and has served KLF well in terms of maintaining and enhancing performance and compliance.

The diagram below depicts the process flow and working of the Integrated Management System.

KLF'S INTEGRATED MANAGEMENT SYSTEM (IMS)



7. Management of Environmental Impacts.

An environmental impact is defined as an environmental change, caused by some human act. The impact is the outcome of this action and can be considered desirable or undesirable.
In accordance with national legislation and document FC 001 – "Change in Land use FMP" - of KLF's Integrated Management System (IMS), internal impact assessments, (Environmental Management

Plans -EMP), are compiled by the environmental section for site disturbing activities that may have an impact on the environment. These assessments involve the process of collecting, organizing, analysing, interpreting and communicating data that is relevant in order to make a well informed decision. For activities listed in the Environmental Impact Assessment Regulations, listing notices 1, 2 and 3 of 2014 in terms of section 24 and 24D of the **N**ational **E**nvironmental **M**anagement **A**ct (**NEMA**), Act 107 0f 1998, an independent environmental Assessment Practitioner will be consulted.
When appropriate, consultations with interested and affected parties are undertaken. The **E**nvironmental **M**anagement **P**lan (**EMP**) is a document that requires compilation prior to a site disturbing activity commencing. It requires that the proposed project be described, motivated, an investigation of alternatives, and requires a description of the natural features in and around the development site. Environmental impacts are rated prior and after mitigatory measures are implemented. The supply of services ie energy, water, accommodation, etc needs to be described. The disposal of waste that is generated with the activity is also addressed. Finally the plan will consider if stakeholder consultation is required or not and similarly if a legal requirement needs to be met. Should the activity be approved, environmental control measures are then compiled and responsibilities assigned.

8. Land use and Conservation Management.

A Conservation Management Plan (CMP) has been compiled to facilitate the management of the non-commercial areas on the plantations. They are dynamic plans and are updated on a regular basis as new information becomes available. This is particularly true when monitoring identifies new species, etc. A standard format is used, but each plan is adjusted in order to address the unique situation encountered on each estate, thus allowing proper management, implementation of recommendations and subsequent monitoring.
The CMP forms the basis of managing important environmental aspects of operations such as stakeholder communication, tracer belt preparation, burning regimes of fire breaks and blocks, weed control, wetland delineation and excisions, management of high conservation forests, identification and management of Areas of Special Interest (ASI), description and management of flora and fauna including Red Data species, waste generation and management, the identification and rehabilitation of degraded sites, and the operational planning of onsite Road Material Sources (RMS).
In addition, the CMP also provides a description of the land use as well as the physical and biotic environment for each plantation.

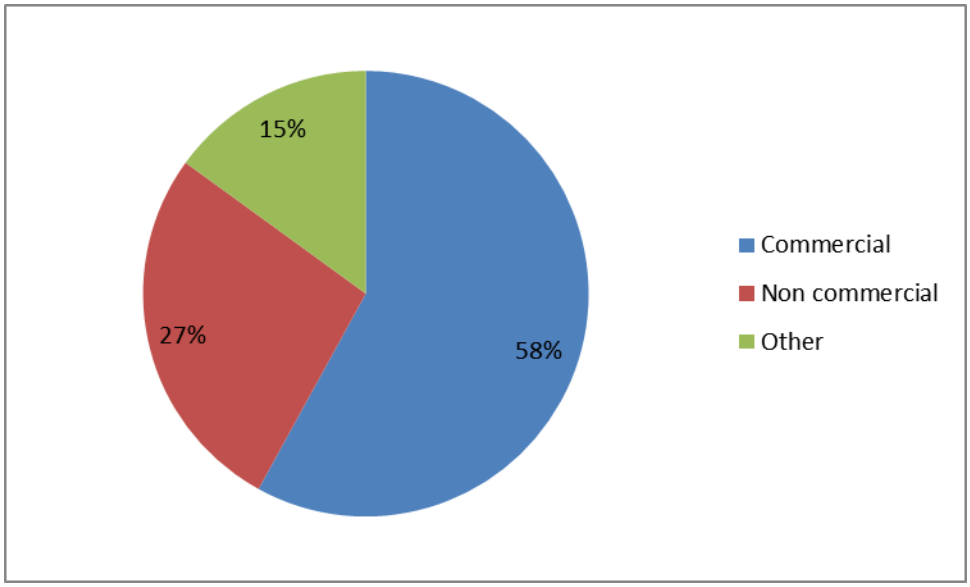


Figure 2: Breakdown of the land use areas in Komatiland Forests.

Commercial refers to the afforested land, non-commercial are the open conservation areas and other includes infrastructure such as roads and buildings and maintained areas such as sport fields.

Conservation Areas.

As can be seen from the above chart, approximately 27% of Komatiland Forests (Pty) Ltd land is classified as open or conservation areas. This equates to a total area of approximately 58925ha. This area is further broken down into the different vegetation types. The chart below provides the vegetation breakdown.

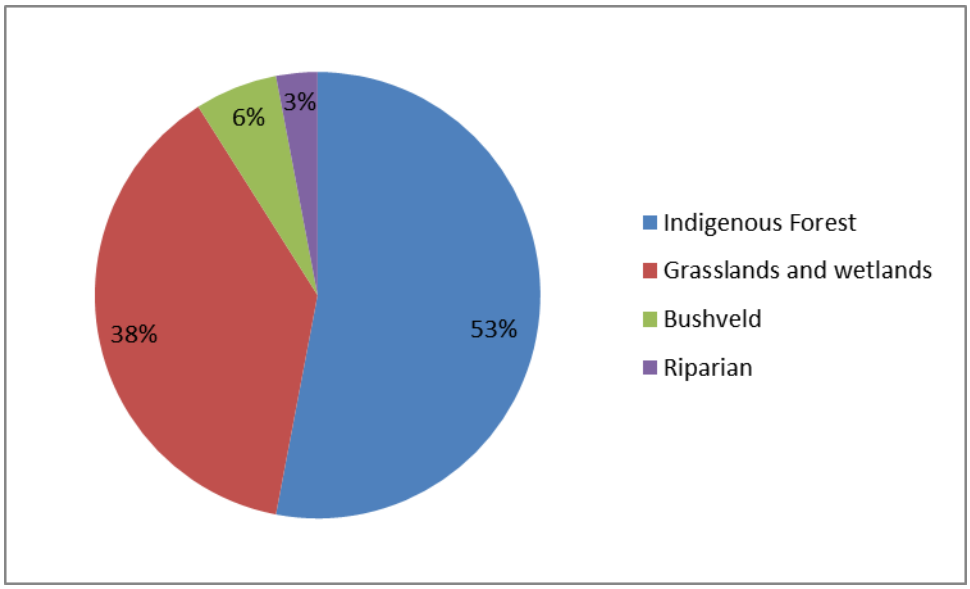


Figure 3: Vegetation breakdown

The 53% indigenous forests equate to an area of 31320ha, 38% grassland and wetland to 22391ha, 6% bushveld to 3535ha and the 3% riparian zones to 1769ha

8.1. Monitoring of environmental attributes

8.1.1. Monitoring of rare, threatened and endangered (RTE) species.

A red data species is one whose future survival hangs in the balance. Species that are rare or those that are threatened with extinction act as indicators on the functioning of the ecosystem and may signal the impending degeneration of biodiversity.

Over the past three decades, the decline and extinction of species has emerged as a major global environmental issue. According to Global Biodiversity Outlook Report 5: “Humanity stands at a crossroads with regard to the legacy it leaves to future generations. Biodiversity is declining at an unprecedented rate, and the pressures driving this decline are intensifying. None of the Aichi Biodiversity Targets will be fully met, in turn threatening the achievement of the Sustainable Development Goals and undermining efforts to address climate change. The COVID 19 pandemic has further highlighted the importance of the relationship between people and nature, and it reminds us of all of the profound consequences to our own well being and survival that can result from continued biodiversity loss and the degradation of ecosystems.”

Species are categorized as red data species so as to provide a guideline for why and where conservation efforts should be concentrated and operate as an early warning system of the level of the species and the condition of the ecosystem.
TOPS is another term that refers to Threatened or Protected Species and as such identifies priority species for protection.
A number of red data species have been identified on KLF property. Initial monitoring may be conducted by specialists, in order to obtain baseline information, on the current population and to identify potential threats to the survival of the species on the forestry estates. Subsequent monitoring, done by the KLF environmental section, will provide information regarding the dynamics of the population and will also identify the need for specific management practices. At any time, the specialist may be brought in to provide a review.

8.1.1.1. Floral component

According to the report “Assessing the biodiversity status of open land and the occurrence of threatened or rare plants on Komatiland Forests Plantations”, dated 8 August 2006, it was identified that of the Mpumalanga plantations, only 21% of the land remains in a natural state. The remaining natural areas have a high biodiversity value and 13.1% of KLF plantation land needs to be protected and maintained in a healthy natural state in order for the Mpumalanga province to meet its biodiversity targets. The distribution of biodiversity is not homogenous throughout all plantations, and some plantations, or parts of plantations are more important than others.
Tweefontein plantation was identified in the assessment, as the most important plantation in providing habitat for threatened plant species, as it supports 45 threatened or rare species. The most critical areas in this plantation are the high-altitude grasslands. Other plantations making significant contributions towards providing habitat for threatened plants include Berlin, Blyde and Uitsoek plantations, supporting 9, 12 and 11 species respectively.

Biodiversity status and threatened species are very effective indicators for assessing the biodiversity status of land under the control and management of Komatiland Forests. This information not only assists in spatially identifying the important areas that need stricter management for ensuring the persistence of biodiversity, but it also allows Komatiland Forests with enough information to begin to engage with authorities to establish protected area status (Biodiversity stewardship and protected areas expansion). The five Komatiland Forest declared Forest Nature Reserves (FNR) are identified within the Mpumalanga Protected Area Expansion Strategy (MPAES) (MTPA, 2009) as important for protected area expansion and particularly for the protection of grasslands and irreplaceable biodiversity features in terms of the Mpumalanga Biodiversity Sector Plan (MBSP) (MTPA, 2014).

On 19 October 2021, the Minister of the Department of Forestry, Fisheries and the Environment (DFFE), published in the Government Gazette 45435, the declaration of Forest Nature Reserves, under section 8(1) and 9 Of the National Forest Act 1998 (Act 98 of 1998)

SCHEDULE

PROPERTIES DECLARED AS FOREST NATURE RESERVES

Name of forest nature reserve	Property description	Size of property (ha)	Locality
Tweefontein	A part of ptn 1 of the farm Hartebeestvlakte 183 JT; A part of the Remainder of the farm Geelhoutboom 585 KT; A part of the Remainder of the farm Tweefontein 167 JT; A part of the Remainder of the farm Ceylon 197 JT; A part of the Remainder of the farm Mountain Top 161 JT; A part of the farm Lot E 201 JT; A part of the farm Lot D 202 JT; A part of the Remainder of the farm Lot C 204 JT; Ptn 1 of the farm Lot C 204 JT	1116,86	Thaba Chweu, Registration Division KT
Berlin	A part of the Remainder of the farm The Narrows 482 JT; A part of the farm Coetzeestroom 479 JT; A part of the farm Uitkyk 502 JT; A part of the Remainder of the farm Bridle 511 JT; A part of the Remainder of the farm KaapscheHoop 483 JT; A part of the Remainder of the farm Berlin 446 JT; A part of the farm The Wattles 509 JT; A part of the Remainder of the farm Majuba 508 JT	1288,29	Mbombela, Registration Division JT
Blyde	A part of the Remainder of the farm Berlyn 506 KT; A part of the Remainder of the farm Lisbon 531 KT; A part of the Remainder of the farm New York 530 KT; A part of ptn 1 of the farm Lisbon 531 KT	1482.73	Thaba Chweu, Registration Division KT
Uitsoek	A part of the Remainder of the farm Lisabon 262 JT; A part of the Remainder of the farm Kantoorboe 263 JT; A part of ptn 1 of the farm Uitkyk 264 JT	352,91	Thaba Chweu, Registration Division KT
Morgenzon	A part of ptn 3 of the farm Morgenzon 525 KT; Ptn 1 of the farm Peach Tree No 544 KT; A part of the Remainder of the farm Peach Tree No 544 KT	607,11	Thaba Chweu, Registration Division KT
TOTAL		4847,99	

The table below indicates the identified Red Data Flora species occurring on the KLF landholdings and / or adjacent DFFE Forest Nature Reserves.

RTE FLORA (2020)	
SCIENTIFIC NAME	**COMMON NAME**
CRITICALLY ENDANGERED	
Encephalartos laevifolius	Kaapsehoop Cycad
Protea roupelliae spp. Hamiltonii	Hamilton's' Silver Sugar bush
Ledebouria rupestris	
Aloe simii	
Chlorophytum radula	
Oberonia disticha	Orchid
ENDANGERED	
Ledebouria galpinii	
Brachystelma ngomense	Ngome Brachystelma
Dierama erectum	
Schizochilus gerrardii	Orchid
Helichrysum leslei	Everlasting
Mondia Whitei	White's ginger
Ocotea bullata	Stinkwood
Erica rivularis	
Adenia wilmsii	
VULNERABLE	
Eucomis vandermerwei	Pineapple plant
Streptocarpus denticulatus	
Streptocarpus occultus	
Ocotea kenyensis	Bastard Stinkwood
Prunus africana	Red Stinkwood
Encelphelartus humilis	Dwarf cycad
Aloe integra	
Aloe kniphofioides	
Clivia gardenia	
Clivia miniata var minata	
Clivia nobilis	Bush lily
Crinum moorei	Natal lily
Eulophia platypetala	Orchid
Cassipourea gummiflua var. verticillata	Onion wood
Cryptocarya myrtifolia	Myrtle Quince
Schizochilus crenulatus	Orchid
Hypodematium crenatum	Fern
Disa alticola	
Disa amoena	
Hesperantha saxicola	
Dioscorea sylvatica	Forest Elephant Foot

During this report period, the following RTE flora monitoring was conducted:

8.1.1.1.1. Ledebouria rupestris (February 2022)

Enviro-Leadership Consultants / Afrika Enviro and Biology was tasked with the 2022 monitoring of the population trend by undertaking a follow up survey on previously transects and niches, by using existing methods used for the previous monitoring. Below is an extract from the report:

7.1 Conclusion

The numbers counted on the transects remain relatively stable since the initial monitoring report (Considering the assumptions and limitations discussed in the report). The numbers counted on the niche areas varies more considerably. Decreased or increased numbers recorded in the niches can be contributed to surveying variables, and do not necessarily indicate a negative impact on the population). This deduction suggests that the monitoring of the transects is more accurate and more important than the niche areas. The overall numbers in the high impact zone remain lower than that of the low impact zone. Furthermore, the results indicate that the population is stable and not under direct threat.

7.2 Management recommendations

The following management recommendations (including measures recommended by Dimela, 2021) must be implemented to ensure that the population is maintained:

Consistency and accuracy of the data

- The start and end point of the transects must be permanently fixed with unobtrusive, but recognisable stakes/ pegs.
- SAFCOL must ensure that the next monitoring RFQ include the establishment of such permanent markers.
- SAFCOL must ensure that the follow-up surveyors are supplied with the historic survey reports and data sheets to ensure consistency in the data.

Record keeping and regular monitoring.

- SAFCOL must keep a record of the locality and dates of fires within this species' habitat.
- Monitoring should ideally be carried out at the same time each year and preferably in the latter part of the summer (February).
- Niche 13 is large, and many individuals of *Ledebouria rupestris* were recorded in this niche. However, the accuracy of the count likely diminishes with increased size of the niche. It is therefore recommended that Niche 13 be made smaller or be replaced entirely by Transect 5.

Infrastructure and maintenance.

- Barriers around pathways must be maintained.
- No additional pathways or trails may be cleared in any manner and no further development may be considered on the site.

Fire

- *Ledebouria rupestris* habitat north of the footpaths and hiking trail, towards the cliff, remain moribund as has been reported in the previous surveys. If this area for some reason cannot be burnt, the individuals occurring north of the trail should be relocated with the permission and assistance of the SANBI and MTPA.
- A cool fire is preferred, sufficient to clear moribund grass.
- Burning and relocation should follow the recommendations as set out by Lotter (1999).

Alien invasive plant species

The habitat of this species may benefit from some active management in the form of alien plant control. Care must be taken that no indigenous species or habitat are harmed.

Vendors

- Vendors must be educated to understand that the area includes sensitive plant assemblages in general and that it should not be disturbed.

8.1.1.1.2. Aloe vossii (March 2023)

A threatened plant species at Entabeni Plantation, that was monitored in-house.

Below is an extract from the report

A survey was undertaken by SAFCOL on a population of *Aloe Vossii* that is near threatened at Entabeni, in the Soutpansberg area, Limpopo Province. Baseline survey were undertaken in March and April 2003. Follow up surveys were conducted in February 2004, 2008, and 2012. In-house monitoring was conducted in 2020, 2021, and 2022 respectively to monitor this population. Under the IUCN (1994) categories, *Aloe Vossii* was assessed and assigned the Data Deficient category (Raimondo et al, 2009), however, the 2020 assessment undertaken placed the species at Near Threatened on the SANBI Red List of South African Plants.

This report is a snapshot of monitoring that was undertaken in March 2023, building on the follow up survey that was conducted in March 2022. The 2012 transect were used as reference monitoring sites in order to assess and determine trends from the previous monitoring findings. It is important to note that monitoring of this population should ideally take place between February and March every year.

Conclusions:

4. MANAGEMENT CONSIDERATION

Potential threats to the population include overgrazing and colonization of the site by alien invasive species and other woody species. Cattle are exacerbating streambank collapse as they cross, streambank stabilization should be considered. Alien invasive plant species observed in the grassland should be controlled as they may colonise the grassland completely.

5. CONCLUSION AND RECOMMENDATIONS

- There has been a **significant increase** in the number of plant population for Aloe population at Entabeni.
- Regular weeding should be undertaken for the area. Pine regeneration observed on site.
- The effects and frequency of fire on site should be monitored to assess influence on the population.
- Monitoring should be conducted between February and March every year so that data that are more accurate can be collected regarding the plants.

8.1.1.1.3. Aloe vossii (March 2024)

A threatened plant species at Entabeni Plantation, that was monitored in-house.

Below is an extract from the report:

Results from the monitoring suggest that the *Aloe Vossii* population at Entabeni is increasing and producing a higher number of juveniles every year. In comparing the 2023 counts, there is a significant **decrease** in the number of juveniles and adults observed within the transects. This can be attributed to the site being overgrown, and making it difficult to see the species.

5. CONCLUSION AND RECOMMENDATIONS

- Results from 2024 March monitoring are inconclusive due to limitations in the ability to count the plants. The site is overgrown and difficult to do the monitoring.
- The 2024 results showed a slight decrease in the overall population of Aloe Vossii on site.
- Implement recommendations from the 2022 and 2023 monitoring results.
- Monitoring should be conducted between February and March every year so that more accurate data can be collected regarding the plants.

8.1.1.1.4. Aloe simii (March 2024)

A Critically Endangered plant species that faces a high risk of extinction in the near future. The monitoring was conducted at Tweefontein by Indalo Agriconsulting (Pty) Ltd.

Below is an extract from the report:

SAFCOL, posing as Komatiland Forests, has contracted Indalo Agri-Consulting (Pty) Ltd, to conduct an assessment focusing on selected threatened flora species across several properties. The objective was to establish robust monitoring procedures and develop species-specific management plans to ensure the conservation and sustainable utilization of these valuable plant species. The Aloe *simii* plant species in Tweefontein first underwent a monitoring assessment in March 2009, conducted by ECOREX Consulting Ecologists. An in-house follow-up assessment was carried out later in the year 2019.

In terms of the IUCN Red Data list categories; *Aloe simii* has been assessed as **Critically Endangered**, and faces a very high risk of extinction in the wild in the near future. Moreover, it has a small distribution (< 5 000 km2), occurs in severely fragmented populations, and is continuing to decline in its area of occupancy (www.sanbi.org/biodiversity/reddata), probably due to of habitat loss.

Table 4-1 below presents data on the numbers of juvenile (non-flowering) and mature (flowering) *Aloe simii* plants found on site as recorded in each of the colonies for 2009, 2020 and 2024. Overall, findings show that the number of plants has been increasing over the years in each of the colonies with a total of 165 and 178 recorded in both 2020 and 2024, respectively. On average, there are about at least two new plants growing each year on the site.

Figure 4-1 below shows a graphical representation of the results per colony and per maturity of the aloe *simii* plant on the Tweefontein farm.

Table 4-1: Age-structure of Aloe simii colonies on Tweefontein.

	2009		2020		2024	
	Mature Flowering Plants	Juvenile (non-Flowering Plants)	Mature Flowering Plants	Juvenile (non-Flowering Plants)	Mature Flowering Plants	Juvenile (non-Flowering Plants)
Colony 1	64	18	72	23	76	26
Colony 2	39	21	44	26	46	30
TOTAL	103	39	116	49	122	56

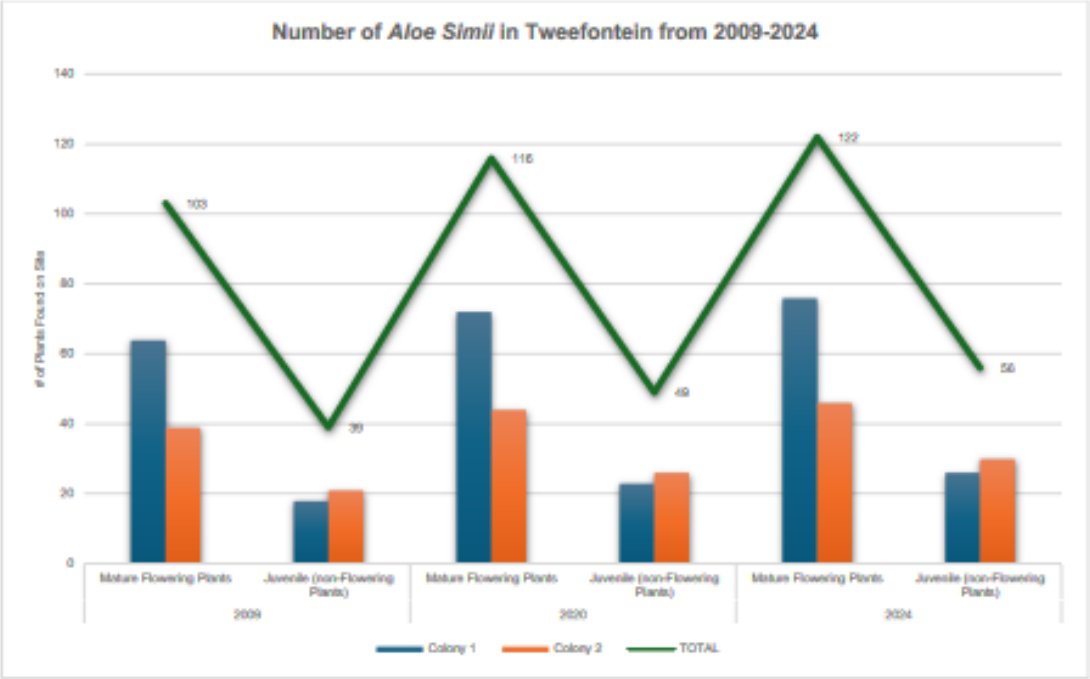


Figure 4-1: Number of Aloe Simii found in the Tweefontein Farm in 2009, 2020, and 2024.

This first (2009) survey of the *Aloe simii* population at Tweefontein suggests that the population was in a healthy reproductive state. Plant density was high and a recruitment rate of 27% is evident. During this (2024) survey, the plant population was found to have increased by 7 more juvenile (non-flowering) and 6 more mature (flowering) plants.

On average, the *Aloe simii* plants has about 2,4 more new plants each year since 2009. While bush encroachment was observed on site during this survey, satellite images from 2017 show that the area has been constantly cleared. Please refer to the images below.



Because the *Aloe Simii* plants prefers and thrives more on grassy areas, it is therefore recommended that more frequent clearance of the site through burning must be implemented in order to ensure maximum potential for both the germination of the seeds in the soil, and the spreading potential of the plant.

Until more quantitative trends in the dynamics of the *Aloe*, Suitable burning techniques must be ensured to prevent the encroachment of native shrubs over the *Aloe simii* plants. Continuous assessment should continue to determine whether or not the burning has been successful regime.

8.1.1.1.5. Chlorophytum radula (March 2024)

A Critically Endangered species of *Chlorophytum radula*, at the Woodbush Plantation was monitored inhouse in 2024 to assess the health of the population.

Below is an extract from the report:
Results:

6. Conclusion and Recommendation

Results from *Chlorophythum radula* populations suggest that the overall population is in a healthy state. However, populations seems to be slightly decreasing in the sites surveyed. Site 1, 2 and 4 have relatively healthy populations, whilst site 3 and 5 populations seems slightly under pressure.

- Monitor access routes in site 1 and 5, where maintenance activities are likely to be required from time to time.
- Develop and maintain a burning database for all *C. radula* sites to monitor effects of fire regime on the population.
- Create and maintain buffers around *C. radula* sites to ensure forestry activities does not affect the population.
- Carry out weeding activities at C. radula sites.
- Revisit all recommendations contained in the 2022 survey report.

8.1.1.1.6. Brachystelma ngomense (2022 and 2023)



Photo: Chris Foster (2023)

An endangered, endemic perennial herb found in the Northern Zululand Mistbelt Grasslands located on a section of Ngome plantation in Kwazulu-Natal. It is not found in open grasslands being restricted to seepage aprons at the edges of dolerite rock sheets, at an altitude of 1100-1200 m. In-house monitoring is conducted on an annual basis.

Information that is collected included:

- Evidence of plant disease.
- Evidence of fire damage
- Drought impacts
- Evidence of animal damage (cattle / donkeys)
- Rock gathering activities.
- Presence of insects
- Rainfall figures

A total of 90 plants were counted in 2022 in plot 1. In 2023 119 were counted.
A total of 29 plants were counted in 2022 in plot 2. In 2023 23 were counted.
A total of 11 plants were counted in 2022 in plot 3. In 2023 12 plants were counted.

NEW: A new site was identified. This site occurs on a rock outcrop and is noted as site 4. The approximate size is 6m x 8m. A population of 35 plants was counted on this site.

"There was evidence of flowering. The flowering period is from November through to March. There were no cattle herds visible in the vicinity of the plots; however, evidence of grazing pressure was evident in all plots but specifically plots 2 and 3 that had been subjected to a burn in 2023. Horses were observed and this could be problematic due to the way that horses graze – to soil level. There appeared to be less grazing pressure due to the moribund / older grasses in Plot 1. In fewer plots compared to previous years, disturbance of the rocks was noticeable as a result of cattle trampling and perhaps removal by people.
Plot 4 was burnt in 2023".

.

"The habitats appear to be impacted on. All plots are still subjected to grazing and trampling from the adjoining communities' livestock. No cattle were found in the vicinity of the three plots. (Numerous cattle herds have been seen grazing in the vicinity in the past). Of concern was the herd of horses.
The next review should be conducted from Nov 2024 - Jan 2025".

8.1.1.1.7. Helichrysum lesliei (2023/24)



Photo: Chris Foster (2024)

"Helichrysum lesiei is a dwarf shrub of the daisy family (Asteraceae). It is characterised by pale grey-green leaves, covered in a dense layer of very fine woolly hairs. It can grow up to 60cm in height and flowers from January to March. The flowers are bright yellow in colour.

In terms of the SANBI Red List of South African Plants, *Helichrysum lesliei* was assessed as Endangered (2013/01/28)

The species is a range-restricted habitat specialist and is thought to remain at only two locations, after extensive habitat loss due to the establishment of timber plantations. (SANBI Red List of South African Plants). It faces a high risk of extinction in the wild due to the loss of habitat through afforestation of the mist belt grasslands, and degradation of the grassland habitat through the invasion of alien and invasive plants and the implementation of poor fire regimes.

The Uitsoek population occurs at an elevation of 1850 – 1920 metres and is associated with wooded quartzite outcrops and ridges in short, closed grassland. It is accompanied by scattered shrubs and forbs and scattered trees. Most plants grow within half a metre of a rock outcrop, which presumably protects the plants from fire and trampling.

"*As mentioned, this survey was merely a visual assessment and not a scientific study. The ECOREX July 2011 report was used to identify the areas. The plants that were evident appeared to be in good health, as most were in flower. There were numerous juvenile plants, and this will need to be investigated further to determine recruitment rate. There was no evidence of diseased plants or excessive trampling by wildlife or livestock. There was evidence of horse faeces and disturbance (digging up of forbs) by a troop of baboons that were moving through the area.*

Fire is most likely the greatest threat to this population, and as this species has a close association to rock outcrops and ridges, it would suggest that it is moderately fire sensitive. Hot fires may well lead to a decline in the population numbers. Excluding fire on the other hand, may also be detrimental, as this allows for invasive weeds to establish, especially as was observed under the scattered tree canopies. This then also increases fuel load that could result in a hot fire. In the ECOREX July 2011 report, it was mentioned that by excluding fire, a risk is created that will also threaten the Helichrysum population, as this would allow the establishment of dense thickets in the areas where the plant is growing, creating a shading effect. Helichrysum lesliei appears to require at least partial sunlight, so the establishment of such thickets could potentially lead to a decrease in population numbers as a result of a denser canopy over the plants.

RECOMMENDATIONS.

The following recommendations are provided:

1. ***AWARENESS:*** *Ensure that staff who are assigned to work in the area (weed control, fire protection, are aware of the status of this plant species.2*

2. ***CHANGE IN FOREST MANAGEMENT:*** *Ensure that when there is a change in managers responsible for this area, they are informed about the unique characteristics and requirements for the management of this area (Kempshoogte).*

3. ***WEED CONTROL:*** *Weed control is required to eradicate / control invasive weed encroachment. Particular attention is required to remove the establishment of the identified weeds in this report, from beneath the scattered tree canopy. As Helichrysum appears to be moderately fire-sensitive, slashed weeds must be removed from the populated areas to prevent a fuel build up and a hotter fire. Where herbicides are used, caution must be exercised to avoid herbicide drift onto non-target plant species. Encroachment of pine species was particularly noticeable along the grassland areas adjacent to the commercial pine plantations.*

4. ***TRACER BELTS**: The preparation of tracer belts must be done in such a way to reduce the impact of the activity. Tracer belts must be monitored for erosion and rehabilitated where such occurs. In addition tracer belts must avoid traversing the Helichrysum lesliei colonies.*

5. ***BURNING:** The burning of Kempshoogte must always be considered as a conservation burn and not a firebreak. Hence the continuation of rotational burns and the possibility of patch mosaic burning must continue. Hot fires must be avoided at all costs.*

6. ***SPECIALIST ASSESSMENTS:** Appoint timeously in 2024/25; a registered ecologist to conduct a reassessment, using the same methodology as used in the ECOREX July 2011 report. The assessment must be conducted from January to March.*

7. ***IN-HOUSE MONITORING:** After the specialist ecologist has conducted the reassessment, monitor the population in sub group 1, according to the prescribed methodology on an in-house basis. A specialist review can be done once every three to four years or if a dramatic change is noted. Visit the sub groups 2 and 3(a) and 3(b), to check on the presence of species and to identify issues such as weed infestation, fires, presence of livestock, etc"*

8.1.1.2. Faunal component.

The status of mammals and birds refer to the Red Data Status according to the Red Data Books. The mammal status is based on the Red Data Book of the Mammals of South Africa: A conservation Assessment (2012).The categories used in this book include: Extinct in the wild (EW), Critically endangered (CR), Endangered (E), Vulnerable (VUL), Near threatened (NT), Least concern (LC), Data deficient (DD) and Not evaluated (NE).
Due to the fact that unlike the floral component that are static in nature, animals move around and even those that are territorial do move around within their territory. This complicates the monitoring process and to assist the people on the ground, Komatiland Forests (SOC) Ltd compiled a field book containing pictures and a detailed description of the Red Data species occurring on its land. This booklet was updated during January 2018. Staff are also provided with information in the IMS on how to record sightings. The recording of all animal sightings is encouraged where a sighting record is used.
Each plantation also has a list of Red Data mammals and birds found on their property as well as a general mammal and bird list. These lists form part of the Conservation Management Plan (CMP), and are updated on a continual basis when new sightings are made either by the forestry personal, outside groups, specialists and birding clubs.

Raptor nesting sites are reported and protected. If a nest is found within a commercial area, the area must be demarcated and a few trees will remain standing around the nest. These sites are also captured as Areas of Special Interest (ASI). Dr Garth Batchelor is involved in annually visiting these sites as well as identifying new localities of nesting sites. The focus of his research is on monitoring the breeding activity of the Crowned Eagles on known nests. Considerable time and effort were spent during the 2022/23 and 2023/24 breeding season, to locate new Crowned Eagle nests on plantations where they had been previously recorded. Prey items below nests were searched, documented, and analysed.

When possible, input into the National Censuses (Oribi, cranes and Blue swallow) is done on certain plantations. EWT who co-ordinates these censuses have not held recent surveys. The table below indicates the identified Red Data Faunal species occurring on the KLF landholdings.

RTE FAUNA (2018)	
SCIENTIFIC NAME	**COMMON NAME**
CRITICALLY ENDANGERED	
Hirundo atrocaerula	Blue Swallow
Sorothraru ayeresi	White winged Flufftail
Bugeranus caranculatus	Wattled Crane
Chiloglanis bifurcus	Incomati sucker-mouth
ENDANGERED	
Mycteria ibis	Yellow-billed Stork
Ephippiorhynchus senegalensis	Saddle-billed Stork
Polemaetus bellicosus	Martial Eagle
Balearica regulorum	Grey Crowned Crane
Gyps coprotheres	Cape Vulture
Gyps africanus	White-backed Vulture
Macheiramohus alcinus	Bat Hawk
Poicephalus robustus	Grey-headed Cape Parrot
Circus ranivorus	African Marsh Harrier
Ourebia ourebi	Oribi
Amblysomus marleyi	Marley's Golden Mole
Neamblysomus gunningi	Gunning's Golden Mole
Neamblysomus julianae	Juliana's Golden Mole
Redunca fulvorufula	Mountain Reedbuck
Acontias rieppeli	Woodbush Legless Skink
VULNERABLE	
Ciconia nigra	Black Stork
Eupodotis cafra	White-bellied Korhaan
Sarothrura affinis	Striped Flufftail
Tyto capensis	African Grass owl
Stephanoaetus coronatus	African Crowned Eagle
Aquila verreauxii	Verreauxs' Eagle
Neotis dehami	Denham's Bustard
Lioptilus Nigricaapillus	Bush Blackcap
Smithornis capensis	African Broadbill
Geronticus calvus	Southern Bald Ibis
Sagittarius serpentarius	Secretary Bird
Falco biamicus	Lanner Falcon
Falco peregrinus	Peregrine Falcon
Podica senegalensis	African Finfoot
Cercopithcus mitis	Samango Monkey
Panthera pardus	Leopard
Philantomba monticola	Blue duiker
Chrysospalax villosus	Rough-haired Golden Mole
Myodorex sclateri	Sclater's Forest Shrew
Paraxerus palliates ornatus	Ngoye Red Squirrel
Rhinolopus swinnyi	Swinny's Horseshoe Bat
Amblysomus robusta	Robust Golden mole
Mystromys albicaudatus	White-tailed Rat
Hydrictis maculicollis	Spotted-necked Otter
Myosorex cafer	Dark-Footed Forest Shrew
Smutsia temminckii	Temminck's Ground Pangolin

Lygodactylus methueni	Methuen's Dwarf Gecko
Tetradactylus breyeri	Breyer's Long-tailed seps
Chirindia langi	Soutpansberg Worm Lizard.

8.1.1.2.1. Herpetological surveys.

Since 2008, Komatiland Forests began commissioning herpetological surveys on the amphibian and reptile fauna on its plantations. Table 5 below indicates which plantations have been surveyed since the inception of these surveys. During this report period, the assessments of Bergvliet, Morgezon, Belfast, Jessievale, Ngome and Roburnia Plantations took place.

Table 5: Plantations surveyed for amphibians and reptiles.

Plantation	Report title	Reporting period
Ngome	SAFCOL Ngome Plantation, Reptile and Amphibian Baseline Survey.	2023- 2024
Roburnia	SAFCOL Roburnia Plantation, Reptile and Amphibian Baseline Survey.	2023 - 2024
Jessievale	SAFCOL Jessievale Plantation, Reptile and Amphibian Baseline Survey.	2023 - 2024
Bergvliet	Findings of the Herpetological Survey for Komatiland Forests Bergvliet Plantation.	2022 - 2023
Belfast	Findings of the Herpetological Survey for Komatiland Forests Belfast Plantation.	2022- 2023
Morgenzon	"The Reptiles and Amphibians of Morgenzon Plantation."	2022 - 2023

8.1.1.2.1.a The 2023 Assessments.

Enviro-Leadership Consultants were appointed in 2022 and 2023 respectively to conduct Herpetology survey monitoring in the plantations listed below.

- **Bergvliet (16- 20 January 2023)**

4. Results

Less species were found during this survey but one snake was seen (Slug eater) and one new record was added (Velvety Gecko). No Toads were seen as opposed to the previous survey and interestingly this was the same for the Morgenzon plantation surveyed at the beginning of December a month earlier.

4.1. Totals

Frogs: Out of a total of 15 possible frog species 6 were recorded which equates to 40% as apposed to 47% on previous visit

Lizards: Out of a total of 20 possible lizard species 8 were recorded which equates to 40% as opposed to 58% on previous visit.

Snakes: Out of a total of 25 possible species 1 was recorded and which equates to 4%.

6. Concerns and Recommendations

6.1. Forest

Afromontane forests are the second richest biomes in species diversity (Emery 2002) and therefore important to conserve. These areas are now being threatened by global warming and every effort should be made to keep them pristine.

Concerns affecting fauna:

a. Alien vegetation in the forest and on the forest margin.
b. Intensity and Frequency of fires on margins.
c. Fragmentation.

Recommendations:

a. Keep margins and forest free of alien vegetation which will decrease fire risk. Create a free margin of grass to act as a barrier between the plantation and the forest to minimize disturbance when felling in the area.
b. Natural vegetation will not burn with the same intensity as alien vegetation. No fires during droughts. A natural burning regime on margins and not every year.
c. Allow existing corridors to function naturally and create corridors if necessary.

6.2. Wetlands including Riparian Zone

Wetlands are considered to be one of the most valuable ecosystems in the world and according to the International Union for Conservation of Nature the 3rd most vital life support system (Ferrar 2007). Apart from the obvious need to conserve these areas for water they provide habitat for a number of species.

Concerns affecting fauna:

a. Afforestation
b. Sedimentation
c. Construction of dams
d. Fire intensity and frequency. Natural fires are important but only surface fires. Subsurface fires are detrimental to the vigor of a wetland.

Recommendations:

a. Remove any alien vegetation (Fig 6) from wetland and riverine areas and not to plant any new areas near water or catchments.
b. Restrict the runoff from roads and clear-felled areas from entering directly into streams. For example, using vetiver grass which is noninvasive, has a deep root system directly under the plant and can be harvested. This reduces the speed of runoff water and catches the sediment which in turn helps with erosion control.
c. Do not build any dams and remove existing dams where possible from streams to allow the natural flow of water.
d. Restrict the frequency of fires and lower the intensity of the burn.

6.3. Grassland

In the study area there are the grasslands around the granite outcrops, grasslands in the riparian zones and the grasslands on the slopes and a small section the isolated escarpment. The Grassland biome of South Africa has been identified as critically endangered and the biome in South Africa most requiring conservation attention through the implementation of efficient, sustainable systematic conservation plans (Matsika, Ruwadzano. 2007). From the land cover of exotic plantations on the escarpment and surrounds large tracts of what would have been natural grasslands, which are known to be very high in biodiversity have been negatively affected.

Concerns affecting fauna

a) Afforestation
b) Fire intensity and frequency of fires. Fig 6 illustrates how hot fires can harm species hiding under rocks. Fig 7 shows how frequent fires cause grass to form a stalk and reduce ground cover increasing runoff.
c) Fragmentation
d) Alien vegetation
e) Neglect
f) Under grazing and overgrazing.

Recommendations

a) Do not plant in any of the grassland areas.

b) Restrict the frequency of fires. Burning too often will have a detrimental effect on the small fauna in that area. Being fragmented it will not allow for migration of fauna from other areas. Where possible strip burn so that the whole area is not burnt at the same time. Try to allow a 3-year rest period before another burn to allow for the migration from non-burnt sections.
c) Fragmentation causes problems by not allowing migration of fauna from other areas. Maintain existing corridors and where possible create corridors. Some species are habitat specific and will not use a forest thicket and need a grassland area to move through.

d) Remove alien vegetation and keep the area clear. Often alien vegetation increases the intensity of the fires.
e) Monitor the areas and use the correct burning practices to maintain the areas.
f) Grasslands have evolved with grazers and allowing some managed grazing by cattle or wildlife will help maintain it.



Fig 6. Burnt leaves under a rock

Discussion

Frog diversity in the areas surveyed was less than the previous visit. A hot and dry spell climate wise will have influenced this and a visit in the early summer during rains will no doubt produce more variety.

Lizard numbers were good but most of the recorded species are rupicolous (rock dwelling) which again is less disturbed by fires. The grass areas however did not reveal much when traversing them.

- **Belfast Plantation (23- 27 January 2023)**

4. Results

Speaking to the maintenance manager of Lakenvlei lodge, who has been on the plantation for 15 years he has never come across Puff Adder or Chameleons although showing to occur in this grid square.

4.1. Totals

Frogs: Out of a total of 18 possible frog species 5 were recorded which equates to 28%.

Lizards: Out of a total of 12 possible lizard species 4 were recorded which equates to 33%.

Snakes: Out of a total of 14 possible species 1 was recorded and 4 seen by Pieter working on plantation which equates to 36%.

6. Concerns and Recommendations

6.1. Wetlands

Wetlands are considered to be one of the most valuable ecosystems in the world and according to the International Union for Conservation of Nature the 3rd most vital life support system (Ferrar 2007). Apart from the obvious need to conserve these areas for water they provide habitat for a number of species.

Concerns affecting fauna:

a. Afforestation
b. Sedimentation
c. Construction of dams
d. Fire intensity and frequency. Natural fires are important but only surface fires. Subsurface fires are detrimental to the vigor of a wetland.

Recommendations:

a. Remove any alien vegetation from wetland and riverine areas and not to plant any new areas near water or catchments.
b. Restrict the runoff from roads and clear-felled areas from entering directly into streams. For example, using vetiver grass which is noninvasive, has a deep root system directly under the plant and can be harvested. This reduces the speed of runoff water and catches the sediment which in turn helps with erosion control.
c. Do not build any dams and remove existing dams where possible from streams to allow the natural flow of water.
d. Restrict the frequency of fires and lower the intensity of the burn.

6.2. Grassland

In the study area grassland makes up a small portion of the conservation areas outside the wetland area and as mentioned before this is mainly where the plantations exists. The Grassland biome of South Africa has been identified as critically endangered and the biome in South Africa most requiring conservation attention through the implementation of efficient, sustainable systematic conservation plans (Matsika, Ruwadzano. 2007). From the land cover of exotic plantations on the escarpment and surrounds large tracts of what would have been natural grasslands, which are known to be very high in biodiversity have been negatively affected.

Concerns affecting fauna

a) Afforestation
b) Fire intensity and frequency of fires.
c) Fragmentation
d) Alien vegetation
e) Neglect
f) Under grazing and overgrazing.

Recommendations

a) Do not plant in any of the grassland areas.
b) Restrict the frequency of fires. Burning too often will have a detrimental effect on the small fauna in that area. Being fragmented it will not allow for migration of fauna from other areas. Where possible strip burn so that the whole area is not burnt at the same time. Try to allow a 3-year rest period before another burn to allow for the migration from non-burnt sections. **According to one of the foresters rotational burning is practiced with a 2 year cycle in place.**

c) Fragmentation causes problems by not allowing migration of fauna from other areas. Maintain existing corridors and where possible create corridors. Some species are habitat specific and will not use a forest thicket and need a grassland area to move through. **On Belfast plantation the grasslands that are there are connected to other sections via the wetland drainage areas.**
d) Remove alien vegetation and keep the area clear. Often alien vegetation increases the intensity of the fires.
e) Monitor the areas and use the correct burning practices to maintain the areas.
f) Grasslands have evolved with grazers and allowing some managed grazing by cattle or wildlife will help maintain it. **Some cattle and horses were seen on the property.**

Discussion:

Frog diversity in the areas surveyed was less than expected but this is probably due to the time of year and lack of rainfall during the visit. The vlei areas are plentiful and the habitat available to amphibians seems to be well looked after. A survey earlier in the summer season during rain will most definitely produce more variety.

Lizard numbers were fair but most of the recorded species are rupicolous (rock dwelling) which is less disturbed by fires. The grass areas however did not reveal much when traversing them.

As is the case with snakes they were very elusive and the only one recorded was a fossorial species under a rock. A couple of shed skins (Fig 5) were found, but not intact so identification wasn't possible but most likely that of a mole snake and Cross-marked Grass Snake. A snake vertebra (Fig 6) was also found between the rocks as well as a slide mark in the sand (Fig 7). This shows that they are around.

- **Morgenzon Plantation (12-16 December 2022)**

4. Results

As mentioned, there are quiet large sections of this plantation as conservation areas. Crag lizards (Psuedocordylus melanotus) and Common Girdled Lizards (Cordylus vittifer) were seen often and showed healthy populations in their habitats. Surprisingly no toads were seen but this may be due to the fewer man-made ponds. People at PATKAT horse trails say they have seen but not often and not able to give the species.

4.1. Totals

Frogs: Out of a total of 15 possible frog species 11 were recorded which equates to 87%.

Lizards: Out of a total of 16 possible lizard species 8 were recorded which equates to 50%.

Snakes: Out of a total of 20 possible species 7 were recorded and which equates to 35%.

6. Concerns and Recommendations

6.1. Forest

Afromontane forests are the second richest biomes in species diversity (Emery 2002) and therefore important to conserve. These areas are now being threatened by global warming and every effort should be made to keep them pristine.

Concerns affecting fauna:

a. Alien vegetation in the forest and on the forest margin.
b. Intensity and Frequency of fires on margins.
c. Fragmentation.

Recommendations:

a. Keep margins and forest free of alien vegetation which will decrease fire risk.
b. Natural vegetation will not burn with the same intensity as alien vegetation. No fires during droughts. A natural burning regime on margins and not every year.
c. Allow existing corridors to function naturally and create corridors if necessary.

6.2. Wetlands including Riparian Zone

Wetlands are considered to be one of the most valuable ecosystems in the world and according to the International Union for Conservation of Nature the 3rd most vital life support system (Ferrar 2007). Apart from the obvious need to conserve these areas for water they provide habitat for a number of species.

Concerns affecting fauna:

a. Afforestation
b. Sedimentation
c. Construction of dams
d. Fire intensity and frequency. Natural fires are important but only surface fires. Subsurface fires are detrimental to the vigor of a wetland.
e. Dumping of litter.

Recommendations:

a. Remove any alien vegetation from wetland and riverine areas and not to plant any new areas near water or catchments.
b. Restrict the runoff from roads and clear-felled areas from entering directly into streams.
c. Do not build any dams and remove existing dams where possible from streams to allow the natural flow of water.
d. Restrict the frequency of fires and lower the intensity of the burn.
e. Staff awareness talks on the detrimental environmental effects of pollution.

6.3. Grassland

In the study area there are large grasslands on the steep east facing slope and a large plateau facing west. Because there are very few roads on these areas there is less silt runoff and are in good condition.

The Grassland biome of South Africa has been identified as critically endangered and the biome in South Africa most requiring conservation attention through the implementation of efficient, sustainable systematic conservation plans (Matsika, Ruwadzano. 2007). From the land cover of exotic plantations on the escarpment and surrounds large tracts of what would have been natural grasslands, which are known to be very high in biodiversity have been negatively affected.

Concerns affectina fauna

a) Afforestation
b) Fire intensity and frequency of fires
c) Fragmentation
d) Alien vegetation
e) Neglect
f) Under grazing and overgrazing.

Recommendations

a) Do not plant in any of the grassland areas.
b) Restrict the frequency of fires. Burning too often will have a detrimental effect on the small fauna in that area. Being fragmented it will not allow for migration of fauna from other areas.
c) Fragmentation causes problems by not allowing migration of fauna from other areas. Maintain existing corridors and where possible create corridors. Some species are habitat specific and will not use a forest thicket and need a grassland area to move through.
d) Remove alien vegetation and keep the area clear.
e) Monitor the areas and use the correct burning practices to maintain the areas.
f) Grasslands have evolved with grazers and allowing some managed grazing by cattle or wildlife will help maintain it. (Cattle, horses and some wildlife are on this property) **(Fig 9)**

Discussion:

The frog records show a healthy population in the areas covered where suitable habitat is available as well as the lizard species. Snakes are always difficult to locate and by nature are very secretive. However a good representation was found and a highlight was the Berg Adder (Bitis Atropos) that although common is rarely seen. One method of finding snakes was to dig up old termitarium's in the winter to find hibernating snakes but it's very destructive and not recommended.

8.1.1.1.2.b. The 2024 Assessments.

- **Jesseivale Plantation (05- 09 February 2024)**

Below is an indication of the number of species recorded on site compared to the total number of species known to occur in the study area.

- Frogs: Out of a total of 18 possible frog species 11 were recorded which equates to 61%.
- Lizards: Out of a total of 29 possible lizard species 10 were recorded which equates to 34%.
- Snakes: Out of a total of 30 possible species 2 were recorded and which equates to 6%.

6. Concerns and Recommendations

6.1. Riparian zone and wetlands

Wetlands are considered to be one of the most valuable ecosystems in the world and according to the International Union for Conservation of Nature the 3rd most vital life support system (Ferrar 2007). Apart from the obvious need to conserve these areas for water they provide habitat for a number of species.

Concerns affecting fauna:

a. Afforestation
b. Sedimentation
c. Construction of dams
d. Fire intensity and frequency. Natural fires are important but only surface fires. Subsurface fires are detrimental to the vigor of a wetland.

Recommendations:

a. Keep up with the removal of any alien vegetation from wetland and riverine areas that is currently being done and not to plant any new areas near water or catchments.
b. Restrict the runoff from roads and clear-felled areas from entering directly into streams.
c. Do not build any dams and remove existing dams where possible from streams to allow the natural flow of water.
d. Restrict the frequency of fires and lower the intensity of the burn.

6.3. Grassland

In the study area the grasslands where biannual burning takes place seem to be in good condition.

The Grassland biome of South Africa has been identified as critically endangered and the biome in South Africa most requiring conservation attention through the implementation of efficient, sustainable systematic conservation plans (Matsika, Ruwadzano. 2007). From the land cover of exotic plantations on the escarpment and surrounds large tracts of what would have been natural grasslands, which are known to be very high in biodiversity have been negatively affected.

Concerns affecting fauna

a) Afforestation
b) Fire intensity and frequency of fires
c) Fragmentation
d) Alien vegetation
e) Neglect
f) Under grazing and overgrazing.

Recommendations

a) Do not plant in any of the grassland areas.
b) Speaking to the forester it was noted that burning in the larger areas not designated as fire breaks was burnt on a rotational basis. If possible then restrict the frequency of fires in fire breaks by allowing some areas to be

fire free for a period of time and rotate. Burning too often will have a detrimental effect on the small fauna in that area. Being fragmented it will not allow for migration of fauna from other areas. It is also important to not have fires during the summer months when the reptiles are most active.

c) In this plantation there are areas of natural vegetation bordering it. This allows for a greater immigration and migration of fauna. Fragmentation causes problems by not allowing migration of fauna from other areas. Maintain existing corridors and where possible create corridors. Some species are habitat specific and will not use a forest thicket and need a grassland area to move through.
d) Keep up the alien vegetation removal and keep the area clear.
e) Monitor the areas and use the correct burning practices to maintain the areas.

f) Grasslands have evolved with grazers and by allowing some managed grazing by cattle or wildlife will help maintain it which is in practice on Jessievale plantation in the form of cattle

Note: Where any runoff is noted Vetiver grass is a viable control method. It has good root systems that don't spread sideways and can stabalise loose ground as well

Discussion:

Some of the species which may possibly be found in the area may occur in this quarter degree grid if the habitat is suitable.
For the frogs a heavy rain shower during the survey would have been beneficial in causing greater activity and calling. The start of the rainy season is generally the best time to listen for calls. Having said that the frog records show a healthy population in the areas covered where suitable habitat is available.
As mentioned earlier the lizard species diversity is not high for this area and it took a lot of effort to find those that were recorded.

No snakes were recorded in this survey and the two added were seen previously by one of the foresters. There can be a number of reasons for not finding any, the main being that they are very secretive and aways difficult to see. People living in an area may get to see them from time to time and unfortunately people working in the plantations do kill them. Other factors could be time of year, snakes being very active and more visible at the beginning of the summer during the mating season and just before winter when moving to find a spot to over winter. On a previous survey in Dec 2009 after very heavy rains 4 species of snake were recorded. There was a lot more frog activity at that time which may have had an influence. An old method of finding snakes was to dig up old termitaria in the winter to find hibernating snakes but it's very destructive and not recommended.

- **Ngome Plantation (22-26 January 2024)**

4. Results

During the survey we came across healthy populations of the species found. As mentioned previously the ground cover was thick and the initial days were overcast and drizzling. This helped in keeping the reptiles under the rocks and for us to be able to find them. We had good samples of Common Girdled Lizard (*Cordylus vittifer*), Common Crag Lizard (*Pseudocordylus melanotus*) and Montane Dwarf Burrowing Skink (*Scelotes mirus*). Although we had drissle and wet conditions ideal for frogs we did not hear many species calling. Only the Bush Squeker was active and a Mozambique rain frog for a short spurt.

4.1. Totals

Only the species that have been recorded in the Atlas are used which excludes those species highlighted in yellow in the species list.

Frogs: Out of a total of 14 frog species 9 were recorded which equates to 64%.

Lizards: Out of a total of 12 lizard species 9 were recorded which equates to 75%.

Snakes: Out of a total of 12 species 4 were recorded and which equates to 33%.

6. Concerns and recommendations

6.1. Mist belt Forest

Mist belt forests in Kwazulu-Natal occur on south facing slopes and consist of small isolated patches usually between 1200 m.a.s.l and 1400 m.a.s.l but can go down to 560 m.a.s.l and 1720 m.a.s.l. Ngome forest is the furthest north of these sites (Birdlife South Africa. KwaZulu-Natal Mistbelt Forests. 2015 https://www.birdlife.org.za/iba-directory/kwazulu-natal-mistbelt-forests/) A small part of the Ngome SAFCOL plantation falls within the Ngome mist belt forest. A much larger section is under DAFF and managed accordingly.

Concerns affecting fauna:

a. Alien vegetation in the forest and on the forest margin and proximity of plantations to natural forest.
b. Intensity and Frequency of fires on margins.
c. Fragmentation.
d. Overgrazing by cattle.

Recommendations:

a. Keep up the alien vegetation control noted. Doing this will decrease the fire risk and increase the margin between plantation and forest.
b. Natural vegetation will not burn with the same intensity as alien vegetation. No fires during droughts. A natural burning regime on margins and not every year.
c. Allow existing corridors to function naturally and create corridors if necessary.

6.2. Riparian zone and wetlands

Wetlands are considered to be one of the most valuable ecosystems in the world and according to the International Union for Conservation of Nature the 3rd most vital life support system (Ferrar 2007). Apart from the obvious need to conserve these areas for water they provide habitat for a number of species.

Concerns affecting fauna:

a. Afforestation
b. Sedimentation
c. Construction of dams
d. Fire intensity and frequency. Natural fires are important but only surface fires. Subsurface fires are detrimental to the vigor of a wetland.

Recommendations:

a. Keep up with the removal of any alien vegetation from wetland and riverine areas that is currently being done and not to plant any new areas near water or catchments.
b. Restrict the runoff from roads and clear-felled areas from entering directly into streams.
c. Do not build any dams and remove existing dams where possible from streams to allow the natural flow of water.
d. Restrict the frequency of fires and lower the intensity of the burn.

6.3. Grassland

In the study area the grasslands were mostly in good condition. In the quartsite areas bordering local communities there was some disturbance which had been noted on the conservation map.

The Grassland biome of South Africa has been identified as critically endangered and the biome in South Africa most requiring conservation attention through the implementation of efficient, sustainable systematic conservation plans (Matsika, Ruwadzano. 2007). From the land cover of exotic plantations on the escarpment and surrounds large tracts of what would have been natural grasslands, which are known to be very high in biodiversity have been negatively affected.

Concerns affecting fauna

a) Afforestation
b) Fire intensity and frequency of fires
c) Fragmentation
d) Alien vegetation
e) Neglect
f) Under grazing and overgrazing.

Recommendations

a) Do not plant in any of the grassland areas.
b) Speaking to the forester it was noted that burning in the larger areas not designated as fire breaks was burnt on a rotational basis. If possible then restrict the frequency of fires in fire breaks by allowing some areas to be fire free for a period of time and rotate. Burning too often will have a detrimental effect on the small fauna in that area. Being fragmented it will not allow for migration of fauna from other areas.
c) In this plantation there are areas of natural vegetation bordering it. This allows for a greater immigration and migration of fauna. Fragmentation causes problems by not allowing migration of fauna from other areas. Maintain existing corridors and where possible create corridors. Some species are habitat specific and will not use a forest thicket and need a grassland area to move through.
d) Keep up the alien vegetation removal and keep the area clear.
e) Monitor the areas and use the correct burning practices to maintain the areas.
f) Grasslands have evolved with grazers and by allowing some managed grazing by cattle or wildlife will help maintain it which is in practice on Ngome plantation in the form of cattle and goats **(Fig 10)**



Fig 10. Cattle grazing.

Note: Where any runoff is noted Vetiver grass is a viable control method. It has good root systems that don't spread sideways and can stabilize loose ground as well.

Discussion:

Some of the species which may possibly be found in the area may occur in the lower sections if the habitat is suitable. For the frogs with a heavy shower there might have been more activity and calling. Having said that the frog records show a healthy population in the areas covered where suitable habitat is available as well as the lizard species. Snakes are always difficult to locate and by nature are very secretive. Many rocks were turned to find the ones we did and three of the four in one location (G2v). One method of finding snakes was to dig up old termitaria in the winter to find hibernating snakes but it's very destructive and not recommended.

- **Roburnia Plantation (29 January- 02 February 2024)**

6. Concerns and recommendations

6.1. Riparian zone and wetlands

Wetlands are considered to be one of the most valuable ecosystems in the world and according to the International Union for Conservation of Nature (IUCN) the 3rd most vital life support system (Ferrar & Litter, 2007). Apart from the obvious need to conserve these areas for water they provide habitat for a number of species.

Concerns affecting fauna:

a. Afforestation
b. Sedimentation
c. Construction of dams
d. Fire intensity and frequency. Natural fires are important but only surface fires. Subsurface fires are detrimental to the vigor of a wetland.

Recommendations:

a. Keep up with the removal of any alien vegetation from wetland and riverine areas that is currently being done and not to plant any new areas near water or catchments.
b. Restrict the runoff from roads and clear-felled areas from entering directly into streams.
c. Do not build any dams and remove existing dams where possible from streams to allow the natural flow of water.
d. Restrict the frequency of fires and lower the intensity of the burn.

4. Results

During the survey we turned many rocks before finding animals. Pickings were quite sparse and seemed to be better nearer the tower (Compartment A27w). From speaking to the forester, the upper area near the airstrip is burnt annually while the area near the tower is split and sections rotated and burnt bi-annually.

4.1. Totals

Only the species that have been recorded in the Atlas are used which excludes those species highlighted in yellow in the species list.

Frogs: Out of a total of 14 frog species 8 were recorded which equates to 57%.

Lizards: Out of a total of 14 lizard species 12 were recorded which equates to 86%.

Snakes: Out of a total of 16 species 9 were recorded (all by forester) which equates to 56%.

6.2. Grassland

In the study area the grasslands where biannual burning takes place seem to be in good condition.

The Grassland biome of South Africa has been identified as critically endangered and the biome in South Africa most requiring conservation attention through the implementation of efficient, sustainable systematic conservation plans (Matsika, 2007). From the land cover of exotic plantations on the escarpment and surrounds large tracts of what would have been natural grasslands, which are known to be very high in biodiversity have been negatively affected.

Concerns affecting fauna

a) Afforestation
b) Fire intensity and frequency of fires
c) Fragmentation
d) Alien vegetation
e) Neglect
f) Under grazing and overgrazing.

Recommendations:

a) Do not plant in any of the grassland areas.
b) Speaking to the forester it was noted that burning in the larger areas not designated as fire breaks was burnt on a rotational basis. If possible then restrict the frequency of fires in fire breaks by allowing some areas to be fire free for a period of time and rotate. Burning too often will have a detrimental effect on the small fauna in that area. Being fragmented it will not allow for migration of fauna from other areas.
c) In this plantation there are areas of natural vegetation bordering it. This allows for a greater immigration and migration of fauna. Fragmentation causes problems by not allowing migration of fauna from other areas. Maintain existing corridors and where possible create corridors. Some species are habitat specific and will not use a forest thicket and need a grassland area to move through.
d) Keep up the alien vegetation removal and keep the area clear.
e) Monitor the areas and use the correct burning practices to maintain the areas.

Discussions:

Some of the species which may possibly be found in the area may occur in this quarter degree grid if the habitat is suitable. For example the staff on the plantation said they had seen a Python near compartment A15w a few years back which is possible (not added to the list). It may have come from the Eswatini lowveld along the river course.
For the frogs with a heavy shower there might have been more activity and calling. The start of the rainy season is generally the best time to listen for calls. Having said that the frog records show a healthy population in the areas covered where suitable habitat is available.
We found a good representation of lizard species but not in any abundance. Snakes are always difficult to locate and by nature are very shy. The snakes included in the species list had been killed by the foresters' dogs and cat which he photographed and has kindly allowed their use as well as those he has seen and positively identified. Although not seen on this survey they are in the area. An old method of finding snakes was to dig up old termitaria in the winter to find hibernating snakes but it is very destructive and not recommended.

8.1.1.2.2. Bird Monitoring / Avifauna.

Bird surveys have been commissioned by Komatiland Forests since 2008.
The specific objectives of these studies are to:

1. Compile a comprehensive bird species list with corresponding habitats where the birds were either seen or heard during field surveys,
2. Provide a brief description of the status of all species recorded,
3. Present a more detailed description of any red data species recorded,
4. Provide any relevant information on species known to occur in the area although not necessarily recorded during the survey,
5. Provide GPS Co-ordinates of any raptor nests observed during the survey,
6. Mention any relevant avifaunal behavioural data observed during the survey,
7. Present a general synopsis of the 'quality' of habitat available for avifauna within the plantation management unit and identification of any potential threats to the survival of bird populations in the area.

8. Offer recommendations that may assist plantation management to improve habitat quality and to increase the level of protection of certain species etc.

8.1.1.2.2.a 2023 Avifaunal Assessments (Woodbush, Thathe Vondo and Roodeval).

Indalo Agri Consulting and Projects (PTY) LTD was appointed in 2023/24 to conduct assessments on the plantations listed below. Extracts from the reports are provided.

- **Entabeni (Roodeval) Plantation.**

A total of 50 bird species were seen (37) or heard (13) throughout the Roodewal plantation (Table 5). This is lower than what has been seen in Woodbush plantations in previous years (Table 4, Whyte, 2020). It does need to be noted however that it is not always the same species being seen every year. For example, not all species seen in 2013 were seen again in 2015, and new ones were added in 2020.

All birds seen were in the *Least Concern* IUCN conservation category, except one species. The Crowned Eagle is a *Near Threatened* species. A pair was seen calling and displaying indicating that they are likely nesting in the area.

- **Entabeni (Thathe Vondo) Plantation.**

A low total of 35 bird species were seen (21) and heard (13) in the Thathe Vondo plantation this season (Table 6). It is the first time that a survey has been conducted in this plantation, making a comparison impossible. Given the size of the plantation and the type of habitats represented there, it is surprising that the diversity is so low. According to the SABAP2 project the pentad in which Thathe Vondo plantations falls has had a species list of 50 (SABAP2, 2023). It may be that the misty conditions reduced what would have been seen more readily, or that the habitat is too patchy to grant the birds adequate habitat to thrive. More surveys and research would need to be conducted to draw conclusive reasons for the low diversity. All the birds seen in this plantation fell into the conservation category of Least Concern. This is hopefully not a reflection on having lost species that are more at risk.

- **Woodbush Plantation**

A total of 87 bird species were recorded, the total number that have been seen (55) or heard (32) throughout the Woodbush plantation (Table 8). This is lower than what has been seen in other plantations in previous study. It does need to be noted however that it is not always the same species being seen every year. For example, not all species seen in 2013 were seen again in summer 2022 survey, and new ones were added in. All birds seen were in the *Least Concern* IUCN conservation category, except one species. The Crowned Eagle is a *Near Threatened* species. A pair was also seen calling and displaying indicating that they are likely nesting in the area of Woodbush with comparison with Entabeni Plantation.

Discussion

These surveys have been conducted since 2008 and for a number of years they were conducted by I.J Whyte. This meant there was a level of continuity afforded this project, which ensured the same methods were applied. Whyte (2013) produced a template data collection sheet and described a sampling method. It would be highly advantageous to the management of the Komatiland Forests if this template for data collection were passed on to and followed by those tasked with the seasonal surveys.

When this survey is conducted again it would also be advisable that the SABAP2 methodology be applied as well, to continue to gather information on the birds of the area. If it is submitted to SABAP2, the data is stored in a public depository making it accessible for comparisons of bird lists to be made.

Given the lower than expected diversity in Thathe Vondo plantation it would be beneficial to conduct a more in-depth study to determine if it was just something seen this year or if they numbers and species are comparable with previous surveys. Until more is known, it would be considered high risk to the birds using the plantation to transform the land more, unless space is put aside for the indigenous fauna and flora.

8.1.1.2.3. Crowned Eagle (*Stephanoaetus coronatus*) Monitoring



Photo: Dr Garth Batchelor (2023/24)

Komatiland Forests is a significant land manager in Mpumalanga Province being the custodian of a number of threatened bird species. The company is aware of our obligation to identify and to monitor the status of the threatened bird species on our plantations.

A private project monitoring the breeding success of the Vulnerable African Crowned Eagles around Mbombela is now in its 12th year. This project was initiated by David Steyn and is now being continued by the African Crowned Eagle Working Group under the guidance of Dr Garth Batchelor. The aims of this project are to undertake research on and to monitor the breeding populations of Crowned Eagles *Stephanoaetus coronatus*, on SAFCOL plantations in Mpumalanga, in order to establish whether the African Crowned Eagles populations on the plantations in Mpumalanga Province are being impacted by plantation afforestation and to make management recommendations to minimize negative impacts while maximizing positive impacts.

African Crowned Eagles are flagship predators along the escarpment and as such are a good indicator species of the health of the forest ecosystems. Currently there were 30 nests that were being monitored annually around Mbombela. Of these 5 pairs are known to have bred on SAFCOL properties and are being regularly monitored. These include:

- Brooklands, 2 pairs. **B30w** and **M7w**
- Nelshoogte, 1pair. **C1w**
- Witklip, 2 pairs. **B46** and **F23w**

Historically pairs were also recorded on Bergvliet, Berlin, Blyde, Tweefontein, Uitsoek and Wilgeboom plantations. The latter nests have all disappeared and new nest have not been traced.

Other Red Data bird species were also documented. These include the Blue Swallow (critically endangered) Peregrine Falcon (least concern), Lanner Falcon (vulnerable), Half-collared Kingfisher (near-threatened) and Black Stork (vulnerable)

The focus of this research was on monitoring the breeding activity of the Crowned Eagles on known nests.

Active nests were monitored at least twice during the breeding season. The monitoring of breeding activity should commence from July to September, when new nests and reconstruction of old nests is undertaken. The hatching success of the eggs is monitored in December and January, while the fledgling success is monitored in February and March. The fledged chick may remain dependant on the adults for up to 8 months.
This method of monitoring will indicate the breeding success of the species. Considerable time and effort was spent during the past two seasons, trying to locate new Crowned Eagle nests on plantations where they had been previously recorded. Prey items below the nests were searched, documented, and analysed.

Nests can be extremely difficult to find, as they are often placed in thick indigenous forest. An initial analysis of Crowned Eagle territories/nests according to vegetation and topography using vegetation classifications of Acocks and Mcina et.al. and digital terrain mapping was undertaken. There does not seem to be a clear correlation between the density of Crowned Eagle territories and broad vegetation types. A clearer relationship appears to be with topography and drainage lines and the distribution of Crowned Eagles. It appears that there are potentially a number of "vacant territories" which could support Crowned Eagles.

An analysis was also undertaken of the spacing between the Crowned Eagle nests in the study area (wider project area). It was found that 28% of nests were less than 5km apart, 48% 5 to 10km, 21% 11 to 20km and 3% greater than 20km. This analysis indicates that the average spacing between nests is much closer than originally suspected (30km²). Sightings of the Vulnerable Peregrine and Lanner Falcons are also documented. They are sometimes found in the same environments as Crowned Eagles, but are more associated with cliff faces.

Results

Summary of **2022/23** plantation visits and observations
The following 7 plantations were visited and surveyed: Berlin, Bergvliet, Blyde, Brooklands, Morgenzon, Nelshoogte, Tweefontein, Uitsoek, Wilgeboom and Witklip

Plantation	**Nest number**	**Nest**	**Date**	**Inspections**
Berlin	6	Florence Hill		*Nest abandoned in 2016*
	18	Kaapsehoop		*Nest abandoned in 2009*
	none	none	24.7.2022	S11w & B16w inspected but no Crowned Eagles seen, heard or nests located
			2.9.2022	S11w & B16w inspected but no Crowned Eagles seen, heard or nests located. Crowned Eagles seen, but no nests located.

				Black Storks seen at 12h00 Peregrine and Lanner Falcons also seen flying along cliff face.
			18.9.2022	Lanner Falcons also seen flying along cliff face. B16w
			29.9.2022	B16w. Lanner Falcons also seen flying along cliff face.
			1.10.2022	B16w. Lanner Falcons also seen flying along cliff face M51y and M51w surveyed. Nothing located
			6.10.2022	B16w. Lanner Falcons also seen flying along cliff face with 3 fledged immature birds. Black Stork also repeatedly flying into nest on cliff.
			19.11.2022	R4w checked. Nothing located
			22.12.2022	O17w Checked. Nothing located
			12.01.2023	O17w Checked. Nothing located
			18.02.2023	R26w checked. Nothing located
			1.3.2023	O28w checked. Nothing located
Bergvliet	12	Goudstroom		A21w. Nest abandoned in 2012
	none	none	3.10.2022	A21w compartment inspected but no Crowned Eagles seen, heard or nests located. C8w Crowned Eagle seen but could not locate nest.
			26.10.2022	A76w and B25w compartments inspected. Crowned Eagles heard and seen, but no nest located.
			27.12.2022	O37w, N5w1 and

				N7w compartments inspected but no Crowned Eagles seen, heard or nests located.
			5.02.2023	J34w compartment inspected, heard Crowned Eagle calling but did'nt find nest
			22.02.2023	O6w. A Lanner Falcon's nest with 2 fledged immature birds flying around nest.
Blyde	none	none	27.9.2022	Plantation inspected but no Crowned Eagles seen, heard or nests located. 7 Bald Ibis were recorded at Lisbon waterfall, 1 immature bird.
			22.2.2023	Plantation inspected but no Crowned Eagles seen, heard or nests located
Brooklands	54	M7w	18.8.2022	No Crowned Eagles seen and heard near the nest
			2.2.2023	No Crowned Eagles seen or heard near the nest
	45	B30w	18.8.2022	No Crowned Eagles seen or heard near the nest. No new nest found in plantation
			2.2.2023	No Crowned Eagles seen or heard near the nest
			4.3.2023	No Crowned Eagles seen or heard near the nest
Morgenzon	none	none	27.9.2022	Plantation inspected but no Crowned Eagles seen, heard or nests located.
			22.2.2023	Plantation inspected but no Crowned Eagles seen, heard or

				nests located
Nelshoogte	3	Queen Rose (C1a)	16.10.2022	Nest not active. It was not possible to look into the nest. No eagle mutes (droppings) below nest.
			4.11.2022.	Nest not active. Plantation was surveyed but no other Crowned Eagle was heard or seen.
Tweefontein	none	none	12.8.2022	No Crowned Eagles seen or heard and no nest found in plantation. Northern section of plantation surveyed.
			7.11.2022	No adult Crowned Eagles were seen and no nest could found in plantation in the central section of the plantation.
			7.1.2023	No Crowned Eagles seen or heard and no nest found in plantations in the southern section of the plantation including Maritzbos .
Uitsoek	34	Uitsoek	26.8.2022	Nest last active in 2012. *Nest abandoned in 2016.* No new Crowned Eagles nest/s found. An adult Crowned eagle seen over Eagles were seen over indigenous forest in compartment **K1**. Another adult eagle seen in compartment **A24w**. No nest/s found.
			28.9.2022	No new Crowned Eagles nest/s found. No Crowned Eagle seen flying over plantation.

Witklip	43	B46	14.6.2022	Female eagle perched next to nest
			18.10.2022	No apparent activity at the nest or mutes below it.
			13.12.2022	No signs of Crowned Eagle activity at or below the nest. Nest definitely not active.
Witklip/ Swartfontein	47	F23w	14.6.2022	The nest bowl had been lined with fresh pine needles and was evidently being prepared for laying in.
			2.7.2022	Female flew off nest. Eagle incubating egg/s. Two remote cameras were placed below the nest
			14.7.2022	Female Crowned Eagle incubating egg/s
			13.10.2022	Female eagle incubating egg/s
			13.12.2022	Nest empty
Wilgeboom			5.10.2022	No Crowned Eagles seen or heard and no nest found in plantations.
			10.2.2023	A Crowned Eagle was seen and heard flying towards towards J12w. Despite a concentrated search in the densely forested drainage lines a nest could not be located.

Recommendations.

1 The monitoring of Crowned Eagles and especially their nests should continue.
2 Plantation Managers should instruct staff to record and document all sightings of Crowned Eagles, including nests, activities and localities,
3 All sightings of other Red Data species (birds and animals) should be recorded in a register on every plantation .
4 Staff should look out for displaying Crowned Eagles in June and July at the onset of the breeding season. After display flights , Crowned Eagles often fly directly to their nest. These observations should be documented.
5 If possible, harvesting of compartments should take the breeding activity of Crowned Eagles into account. Compartments should be felled after a chick has fledged, usually in March.

6 The removal of snares in plantations should be regularly undertaken. Many wire snares were removed during my visits to the plantations, especially after harvesting and weeding operations.
7 The Witklip Crowned Eagle nests should again be monitored next season to see if the eagles will again use these nests or move to other sites. This has been observed at other nests which have repeatedly been unsuccessful.
8 T rail cameras should be placed below active nests.
9 The service "track" to the Crowned Eagle nest on M7w should be cleared and mowed. The track is very overgrown. If possible a vehicle turning circle should be cleared a little distance from the nest to facilitate monitoring. This should be done when the nest is not active.

Summary of **2023/24** plantation visits and observations.
The following10 plantations were visited and surveyed: Berlin, Bergvliet, Blyde, Brooklands, Morgenzon, Nelshoogte, Tweefontein, Uitsoek, Wilgeboom and Witklip.

Plantation	**Nest number**	**Nest**	**Date**	**Inspections**
Berlin	6	Florence Hill		*Nest abandoned in 2016*
	18	Kaapsehoop		*Nest abandoned in 2009*
	none	none	2.9.2023	S11w & B16w inspected but no Crowned Eagles seen, heard or nests located
			12.10.2023	S11w & B16w inspected but no Crowned Eagles seen, heard or nests located. Crowned Eagles seen, but no nests located. Black Storks seen at 12h00 Peregrine and Lanner Falcons also seen flying along cliff face.
			18.11.2023	R4w checked. Nothing located
			29.2.2023	O17w Checked. Nothing located.
Bergvliet	12	Goudstroom		A21w. Nest abandoned in 2012
	none	none	3.9.2023	A21w compartment inspected but no Crowned Eagles seen, heard or nests located. C8w Crowned Eagle seen but could not locate nest.
			26.10.2023	A76w and B25w compartments

				inspected. Crowned Eagles heard and seen, but no nest located.
			5.11.2023	J34w compartment inspected, heard Crowned Eagle calling but did'nt find nest
			2.02.2024	O6w. A Lanner Falcon flying around nest.
Blyde	none	none	20.9.2023	Plantation inspected but no Crowned Eagles seen, heard or nests located
			18.12.2023	Plantation inspected but no Crowned Eagles seen, heard or nests located. No Bald Ibis were recorded at Lisbon waterfall.
			22.12.2023	Plantation inspected but no Crowned Eagles seen, heard or nests located
Brooklands	54	M7w	14.12.2023	Crowned Eagles seen on the nest with a small chick.
			22.2.2024	Crowned Eagle chick heard then seen about 150m from the nest .
	45	B30w	29.9.2022	Crowned Eagle seen on the nest , apparently incubating.
			6.10.2023	No Crowned Eagles seen or heard near the nest
			22.2.2024	No Crowned Eagles seen or heard near the nest
Morgenzon	none	none	20.9.2023	Plantation inspected but no Crowned Eagles seen, heard or nests located.
			18.12.2023	Plantation inspected but no Crowned Eagles seen, heard or nests located

Nelshoogte	3	Queen Rose (C1a)	26.9.2023	Nest active. It was not possible to look into the nest. Many eagle mutes (droppings) below nest.
			13.2.2023.	Nest active. Camera discs replaced with batteries.
			27/3/2023	Chick still on nest, heard calling loudly on approach. Trail Camera removed.
Tweefontein	none	none	12.9.2023	No Crowned Eagles seen or heard and no nest found in plantation. Northern section of plantation surveyed.
			7.10.2023	No adult Crowned Eagles were seen and no nest could found in plantation in the central section of the plantation.
			7.11.2023	No Crowned Eagles seen or heard and no nest found in plantations in the southern section of the plantation including Maritzbos .
			14.12.2023	No Crowned Eagles seen or heard and no nest found in plantations in the southern section of the plantation including Maritzbos .
			7.1.2024	No Crowned Eagles seen or heard and no nest found in plantations in the northern section of the plantation
Uitsoek	34	Uitsoek	10.9.2023	Nest last active in 2012. *Nest abandoned in 2016.* No new Crowned Eagles nest/s found. An adult Crowned

				eagle seen over No nest/s found.
			24.9.2023	No new Crowned Eagles nest/s found. No Crowned Eagle seen flying over plantation.
			3.11.2023	No new Crowned Eagles nest/s found. No Crowned Eagle seen flying over plantation.
			14.11.2023	No new Crowned Eagles nest/s found. No Crowned Eagle seen flying over plantation.
			10.12.2023	No new Crowned Eagles nest/s found. No Crowned Eagle seen flying over plantation.
			22.1.2024	No new Crowned Eagles nest/s found. No Crowned Eagle seen flying over plantation
Witklip	43	B46	9.10.2023	Female eagle perched next to nest
			18.10.2023	No apparent activity at the nest or mutes below it.
			13.12.2023	No signs of Crowned Eagle activity at or below the nest. Nest definitely not active.
			10.1.2024	No signs of Crowned Eagle activity at or below the nest. Nest definitely not active
Witklip/ Swartfontein	47	F23w	29.9.2023	Nest lined. No eagles present
			18.10.2023	No eagles present.A tree had fallen over the access road

				making it impossible to get to below the nest.
			10.1.2024	I cleared a path through the fallen tree to check the nest. It was empty with no signs of any recent activity.
Wilgeboom			5.10.2023	No Crowned Eagles seen or heard and no nest found in plantations.
			10.1.2024	No Crowned Eagles seen or heard and no nest found in plantations.
			26.1.2024	No Crowned Eagles seen or heard and no nest found .
			23.2.2024	No Crowned Eagles seen or heard and no nest found .

Recommendations:

1. The monitoring of Crowned Eagles and especially their nests should continue.
2 Plantation Managers should instruct staff to record and document all sightings of Crowned Eagles, including nests, activities and localities,
3 All sightings of other Red Data species (birds and animals) should be recorded in a register on every plantation.
4 Staff should look out for displaying Crowned Eagles in June and July at the onset of the breeding season. After display flights, Crowned Eagles often fly directly to their nest. These observations should be documented.
5 If possible, harvesting of compartments should take the breeding activity of Crowned Eagles into account. Compartments should be felled after a chick has fledged, usually in March.
6 The removal of snares in plantations should be regularly undertaken. Many wire snares were removed during my visits to the plantations, especially after harvesting and weeding operations.
7 The Witklip Crowned Eagle nests should again be monitored next season to see if the eagles will again use these nests or move to other sites. This has been observed at other nests which have repeatedly been unsuccessful.
8 Trail cameras should be placed below active nests.
9 The service road to the Crowned Eagle nest on M7w should be cleared and mowed. The track is very overgrown. If possible, a vehicle turning circle should be cleared a little distance from the nest to facilitate monitoring. This should be done when the nest is not active.

8.1.2. Water Quality Monitoring.

In many rivers, flow is strongly seasonal, and there is considerable year to year variability in flow rates. Many streams and rivers may dry up completely outside the rainy season.

The aquatic environment is the habitat of aquatic organisms and is a complex system, as it includes numerous species, habitats and processes, all of which are interlinked and interdependent, and which require protection if a healthy functioning ecosystem structure is to be maintained. For the purpose of protecting and maintaining aquatic ecosystems, prevention, rather than mitigation of the effects of poor water quality must receive greater emphasis than would be the case for other water uses.

As a consequence of the complex and interlinked nature of aquatic ecosystems, the effects of changes in water quality on specific components of ecosystems are often indirect. A simple example of such indirect effects might be that a certain species of fish might disappear as a result of a change in water quality, not because the fish species itself cannot tolerate the change in water quality, but because the organisms that are its primary food source might be eliminated by that particular change in water quality. **(South African Water Quality Guidelines, Volume 7, Aquatic Ecosystems. Department of Water Affairs and Forestry, Second edition 1996)**

Komatiland Forests recognizes the fact that aquatic ecosystems provide a number of "services". These include the following:

1. They provide an aesthetically pleasing environment.
2. They provide for recreation.
3. They provide for livelihoods to communities who depend on water bodies for food.
4. They maintain biodiversity and provide habitats to those biotas, dependant on aquatic ecosystems.
5. They maintain the assimilation capacity of water bodies for certain wastes through self-purification.

As a result, the aquatic ecosystem, known as the resource base must be protected and managed to ensure that the resource remains fit for agricultural, domestic, recreational and industrial use on a sustainable basis.

Komatiland Forests will strive to take a proactive approach to minimize, or where possible, prevent negative impacts that our operations have on the natural environment. It is a well-known fact that roads have one of the greatest impacts on wetlands and rivers, with a result that streams, and wetland crossings must be carefully planned and maintained. This is also closely followed by the encroachment of exotic invasive weeds into the riparian zone.

The water quality biomonitoring for this report period, was undertaken by an independent consultant – Scientific Aquatic Services.

Table 6 below, indicates the scheduling of the catchments as well as showing which plantations fall into which catchment. Each site has a specific reference number so that results can be forwarded to the National River Health Programme (NRHP). The **S**outh **A**frican **S**coring **S**ystem, version 5, known simply as, SASS5, is used. This system, is based on the assessment of the aquatic micro-invertebrates which, based on their

sensitivity to environmental changes in their habitat, serve as biological indicators of stream and river health conditions. According to the South African Water Quality Guidelines, Volume 7 – Aquatic ecosystems, the aquatic ecosystem is defined as the abiotic (Physical and chemical) and biotic components, habitats and ecological processes contained within rivers and their riparian zones, dams and wetlands and their fringing vegetation As a result the consultant must assess the environmental changes, which range from pollution to weed infestations. It is important to note that the assessment is not a chemical analysis, nor will the results indicate that the water can be used for drinking purposes, as it does not take bacteria into consideration. In the scoring process, the micro -invertebrate families that are tolerant to change, have a low score status, whilst the more sensitive families a much higher score status.

Two numerical values are important in determining the quality of the water

- **SASS5** Total Score = The numerical value indicating water quality, which is related to biodiversity numbers
- **ASPT** = **A**verage **S**core **p**er **T**axon reflecting the average of the total score and the number of families recorded.

  The numerical index is specific to a particular site and is thus a reflection of the status of the system, because the condition of the water upstream has an effect on the colonization and development of aquatic organisms downstream. Table 6 shows the different classes (stream conditions) that are obtained from the SASS5 results.
- IHAS = Habitat Integrity.
- MIRAI = Macro-Invertebrate Response Assessment Index Ecostatus tool.

During the period 01 April 2022 to 31 March 2024, the following plantations were assessed.

2022/23

- The Olifants (Belfast)
- The Sabie (Uitsoek, Berlin and Brooklands)

2023/24

- The Crocodile (Nelshoogte and Witklip)
- The Limpopo (Entabeni and Thate Vondu)
- The Usutu (Roburnia and Jessievale).
- Olifants (Blyde)
- Mfolozi (Ngome)

Table 6: Plantations per catchment.

Catchment	Sabie	Crocodile	Limpopo	Olifants	Usutu	Mfolozi	Mkhuze
	Bergvliet	Berlin	Entabeni	Belfast	Blairmore	Ngome	Ngome
	Frankfort	Brooklands	Tate Vondu	Blyde	Jessievale		
	Spitskop	Nelshoogte		JDM Keet	Red Hill		
	Tweefontein	Spitskop		New Agatha	Roburnia		
	Wilgeboom	Uitsoek		Tweefontein			
		Witklip		Woodbush			

Table 7: The different classes (stream conditions) based on the SASS5 results (Dallas 2007)

Class	Condition	Description
A	Natural	Unimpaired – No measurable modification. Generally high diversity of taxa with numerous sensitive taxa.
A/B		
B	Good	Slightly impaired – Largely unmodified. Generally high diversity of taxa but with fewer sensitive taxa.
B/C		
C	Fair	Moderately inpaired – Diversity of taxa generally moderate.
C/D		
D	Poor	Considerably impaired – Largly modified with mostly tolerant taxa present. Very low taxa diversity will also indicate large modifications.
D/E		
E	Very Poor	Severely impaired – Seriously or critically modified. Only tolerant txa present. Such conditions can in some cases be natural where fluctuating dissolved oxygen levels in slow and low flowing rivers are unsuitable for sensitive taxa.

Table 8: The recently adjusted diatom categories for stream condition assessment.

MIRAI Score	Class	Ecological category
18 - 20	High quality	A
17 - 18		A/B
15 – 17	Good quality	B
14 - 15		B/C
12 - 14	Moderate quality	C
10 – 12		C/D
8 – 10	Poor quality	D
6 - 8		D/E
5 – 6	Bad quality	E
4 – 5		E/F
>4		F

8.1.2.1. SASS5 Water Quality Monitoring results: Belfast Plantation - Olifants Catchment (2022/23)

3.3. BIOMONITORING RESULTS

In the table that follows (Table 3-3), SASS5 and overall results are listed in terms of stream category. Stream category classes and corresponding colour codes are listed in Table 2-1. In Table 3-4 2023 MIRAI results are compared against previous data sets and change indicated with arrows.

Table 3-3. A list of stream condition categories per site, based on the MIRAI model, indicating number of sampling events (n), date of lowest MIRAI score, average, and highest score. The 2023 result are also indicated in comparison.

Site No.	Site Name	n	Lowest		Average	Best		2023
			Date	Class		Date	Class	
B41A-01	Vlakplaats	11	15/iv/2002	D	C	10/iii/2005	B	C
B41A-04	Grootspruit	17	03/iv/2003	D	C	24/ii/2015	B	C
B41A-05	Kleinspruit	17	15/ii/2000	D	C	24/ii/2015	B	C/D

Based on the MIRAI results conditions in 2023 were categorised as average, at two of the sites, and below average at the Kleinspruit site.

Table 3-4. A summary of stream conditions per site based on the February 2023 SASS5 monitoring results. Arrows indicate an improvement (upward), deterioration (downward) or no change (horizontal).

SITE CODE	SITE NAME	RIVER	CATEGORY	CHANGE (FROM PREVIOUS SURVEYS)
B41A-01	Vlakplaats	Vlakplaats	C	→
B41A-04	Grootspruit	Grootspruit	C	↘
B41A-05	Kleinspruit	Kleinspruit	C/D	↘

Based on the MIRAI model, stream conditions remained relatively unchanged in 2023 compared to overall results, but deteriorated at the Grootspruit and Kleinspruit sites. The 2023 sampling was preceded by flood flows (see Figure 3-2). This would affect the results, with some biotopes unavailable (i.e., gravel-sand-mud) and others not easy to sample (depth & velocity).

8.1.2.2. SASS5 Water Quality Monitoring results: Morgenzon Plantation - Sabie Catchment (2022/23)

3.3. BIOMONITORING RESULTS

SASS results are presented per site (Tables 3.4 and 3.5), with threats and management recommendations per site in sections 3.3.1 to 3.3.8. In Table 3 4 SASS5 and overall results are listed in terms of stream category. Stream category classes and corresponding colour codes are listed in Table 2 1.

Table 3-3. A list of stream condition categories per site, based on the MIRAI model, indicating number of sampling events (n), date of lowest MIRAI score, average, and highest score. The 2023 result are also indicated in comparison.

Site No.	Site Name	River	n	Lowest		Average	Best		2023
				Date	Class		Date	Class	
X31B-02a	Sptiskop-Witwater Bridge	Spitskopspruit	4	20/i/2023	D	C	25/vi/2013	B	D
X31B-05	Rietfontein Mine	Sabie	18	03/iv/1999	C	C	01/v/2009	B	C
X31B-09	Lower Coopers Creek	Coopers Creek	10	07/iv/2000	D	C	31/i/2023	B	B
X31B-10	Malieveld	Malieveldspruit	10	08/iv/1998	C	C	20/i/2023	B	B
X31B-11	DR de Wet	Dr de Wet	7	08/iv/2004	C	C	17/xii/2017	B	C
X31B-12	The Splash	Frankfortspruit	9	14/xii/2017	D	C	11/iv/2000	B/C	C
X31B-14	Goudstroom	Goudstroom	10	11/iv/2000	C/D	C	10/iv/2007	B	B
X31B-16	Bredasberg	Kamahukwane	7	06/vii/2010	C	C	14/xii/2017	B/C	ns
X31B-17	Lunsklip	Sabie	8	11/iv/2000	C	B/C	20/iii/2020	B	ns
X31D-05	Sabaanview	Sabaan	9	30/vii/2013	D	C	23/iv/1998	B/C	C
X31H-03	Lower Hebron	Witwaterspruit	5	13/vii/2013	D	C	16/iv/1998	A/B	ns
X31H-08	Witwater	Witwaterspruit	11	14/iv/2007	C	C	19/v/2015	B	ns

Four of the sampling sites could not be accessed in 2023, due to high rainfall and poor road conditions.

Table 3-4. A summary of stream conditions per site based on the January 2023 SASS5 monitoring results. Arrows indicate an improvement (upward), deterioration (downward) or no change (horizontal).

SITE CODE	SITE NAME	RIVER	CATEGORY	CHANGE (FROM PREVIOUS SURVEYS)
X31B-02a	Spitskop-Witwater	Spitskopspruit	D	↓
X31B-05	Rietfontein Mine	Sabie	C	↘
X31B-09	Lower Coopers Creek	Coopers Creek	B	↗
X31B-10	Malieveld	Malieveldspruit	B	↗
X31B-11	DR de Wet	DR de Wet	C	↘
X31B-12	The Splash	Unspecified	C	→
17X31B-14	Goudstroom	Goudstroom	B	↑
X31B-16	Bredasberg	Kamahukwane	Not sampled	
X31B-17	Lunsklip	Sabie	Not sampled	
X31D-05	Sabaanview	Sabaan	C	→
X31H-03	Ligtfontein	Witwatersppruit	Not sampled	
X31H-08	Witwater	Witwaterspruit	Not sampled	

8.1.2.3. SASS5 Water Quality Monitoring results: Bergvliet Plantation - Sabie Catchment (2022/23)

3.3. BIOMONITORING RESULTS

SASS results are presented per site, with management recommendations and a brief discussion of site-specific results. In the table that follows (Table 3-4), SASS5 and overall results are listed in terms of stream category. Stream category classes and corresponding colour codes are listed in Table 2-1.

Table 3-3. A list of stream condition categories per site, based on the MIRAI model, indicating number of sampling events (n), date of lowest MIRAI score, average, and highest score. The 2023 result are also indicated in comparison.

Site No.	Site Name	River	n	Lowest		Average	Best		2023
				Date	Class		Date	Class	
B60A-09	Morgenzon	Rotunda Creek	7	25/vii/2007	C/D	C	03/ii/2023	B/C	B/C
B60A-10	Uitval	Rotunda Creek	9	11/vii/2007	C/D	C	14/ii/2018	B	B/C
B60B-07	Frankfort	Molototse	9	27/ii/2020	C	B/C	26/iii/2001	A/B	B/C

The worst conditions (based on the MIRAI model) at the two sites in the Rotunda Creek was encountered in July 2007 (low flow conditions). Fine silt is present in the stream at the Morgenzon (B60A-09) site, which could originate from commercial forestry roads in the upper catchment.

The Frankfort site (B60B-07) was rated as close to natural (A/B) in March 2001, but deteriorated since.

Table 3-4. A summary of stream conditions per site based on the February 2023 SASS5 monitoring results. Arrows indicate an improvement (upward), deterioration (downward) or no change (horizontal).

SITE CODE	SITE NAME	RIVER	CATEGORY	CHANGE (FROM PREVIOUS SURVEYS)
B60A-09	Morgenzon	Rotunda Creek	B/C	↗
B60A-10	Uitval	Rotunda Creek	B/C	↘
B60B-07	Frankfort	Molototse	B/C	↘

Conditions improved at the Morgenzon (B60A-09) site based on the 2023 results but deteriorated slightly at the Uitval and Frankfort sites. At the Uitval site, gravel dominate the stream substrate, which could be mobilised during flood or very high flows. Instability of the substrate will affect the taxa associated with the stones in current biotope if mobilised.

8.1.2.4. SASS5 Water Quality Monitoring results: Tweefontein Plantation - Sabie Catchment (2022/23)

3.3. BIOMONITORING RESULTS

SASS results are presented per site, with management recommendations and a brief discussion of site-specific results. In Table 3-4 SASS5 and overall results are listed in terms of stream category. Stream category classes and corresponding colour codes are listed in Table 2-1.

Table 3-4. A list of stream condition categories per site, based on the MIRAI model, indicating number of sampling events (n), date of lowest MIRAI score, average, and highest score. The 2023 result are also indicated in comparison.

Site No.	Site Name	River	n	Lowest		Average	Best		2023
				Date	Class		Date	Class	
X31A-01	Grouberg	Sabie	7	10/x/2017	C	B	05/iv/2004	A	B
X31A-02	Long Tom Pass	Sabie	7	09/vi/2010	C	C	31/v/2016	B	B/C
X31A-03	Jantjiesbos	Jantjiesbos	12	10/x/2017	C	B/C	24/iv/2002	B	B
X31A-05	Maritzbos	Lone Creek	7	13/xii/2017	C	B/C	24/iv/2010	A/B	B
X31A-06	Ceylon	Lone Creek	7	13/xii/2017	C	B/C	10/iii/2020	B	B
X31A-07	Lone Creek	Lone Creek	9	05/iv/2004	C	B/C	31/v/2016	A/B	B/C
X31A-11	Bridal Veil	Bridal Veil	7	25/vi/2010	C	B/C	19/iii/2020	B	B/C
X31A-15	Tweefontein	Klein Sabie	29	04/iv/2000	C	B	09/iv/2022	A/B	B
X31C-02	Graskop Veldschool	Mac Mac	12	06/iv/2000	C/D	C	25/vii/2013	B	B/C
X31C-03	Graskop	Graskopspruit	10	02/viii/2013	D/E	C	06/iv/1998	C	D
X31C-04	Maliedyke	Maliedyke	7	12/iv/2004	C	B/C	18/i/2023	B	B
X31C-05	Forest Falls	Mac Mac	10	01/iv/2000	C/D	C	01/vi/2016	B	B/C
X31C-06	Mac Mac Pools	Mac Mac Pools	10	19/xii/2017	C	B/C	06/iv/1999	B	B
X31C-09	Geelhoutboom	Sunlight	7	13/xi/2017	C	C	11/iv/2007	B	C

The worst site in 2023 was the Graskopspruit (X31C-03), which receives stormwater runoff and wastewater seepage from a dysfunctional or abandoned sewage treatment plant in Graskop town. A strong sewage odour was present during the 2023 site visit.

The Sunlight stream (X31C-09) was rated as moderate, with increased sediment input and movement considered the main cause of impairment. A summary of drivers identified as potential causes of impairment are included in Table 3-7.

Table 3-5. A summary of stream conditions per site based on the January-February 2023 SASS5 monitoring results. Arrows indicate an improvement (upward), deterioration (downward) or no change (horizontal).

SITE CODE	SITE NAME	RIVER	CATEGORY	CHANGE (FROM PREVIOUS SURVEYS)
X31A-01	Grouberg	Sabie	B	→
X31A-02	Long Tom Pass	Sabie	B/C	→
X31A-03	Jantjiesbos	Jantjiesbos	B	→
X31A-05	Maritzbos	Lone Creek	B	→
X31A-06	Ceylon	Lone Creek	B	↗
X31A-07	Lone Creek	Lone Creek	B/C	↘
X31A-11	Bridal Veil	Bridal Veil	B/C	↘
X31A-15	Tweefontein	Klein Sabie	B	→
X31C-02	Graskop Veldschool	Mac Mac	B/C	↗
X31C-05	Forest Falls	Mac Mac	B/C	→
X31C-03	Graskop	Graskopspruit	D	↘
X31C-04	Maliedyke	Maliedykespruit	B	↗
X31C-06	Mac Mac Pools	Mac Mac Pools	B	→
X31C-09	Geelhoutboom	Sunlight Creek	C	↘

Conditions at half of the sites (50%) were categorised as largely natural (B). Deterioration was reflected at four of the sites, Lone Creek (X31A-07), Bridal Veil (X31A-11), Graskop (X31C-03), and Geelhoutboom (X31C-09). The Graskopspruit are affected by sewage inputs from Graskop, and the Bridal Veil and Geelhoutboom sites by the movement of substrates during increased flows, gravel-sand-cobble at the Bridal Veil and sand-silt at the Geelhoutboom site.

Table 3-6. A comparison of changes between sites located up- and downstream from each other on the same stream. The comparison is based on all the data collected to date. Arrows indicate an improvement (upward), deterioration (downward) or no change (horizontal).

SITE CODE	SITE NAME	RIVER	CATEGORY	CHANGE FROM UPSTREAM
X31A-01	Grouberg	Sabie	B	↘
X31A-02	Long Tom Pass	Sabie	B/C	
X31A-05	Maritzbos	Lone Creek	B	→
X31A-06	Ceylon	Lone Creek	B	↘
X31A-07	Lone Creek	Lone Creek	B/C	
X31C-02	Graskop Veldschool	Mac Mac	B/C	→
X31C-05	Forest Falls	Mac Mac	B/C	

Conditions at most of the sites shows a downstream deterioration. The only case where conditions stayed similar from up- to downstream was between the two sites on the Mac Mac River, Graskop Veldschool (X31C-02) and Forest Falls (X31C-05).

Slight deterioration was recorded between the Grouberg (X31A-01) and Long Tom Pass (X31A-02) sites on the Sabie River, and from Ceylon (X31A-06) to Lone Creek (X31A-07) on the Lone Creek.

8.1.2.5. SASS5 Water Quality Monitoring results: Wilgeboom Plantation - Sabie Catchment (2022/23)

3.3. BIOMONITORING RESULTS

SASS results are presented for each site, with photographs, threats and management recommendations listed per site. In the table that follows (Table 3-4), stream conditions at its worst, on average, and at its best based on MIRAI are listed. In Table 3-4 changes compared to baseline data are illustrated as arrows for the one site sampled in 2023. Stream category classes and corresponding colour codes are listed in Table 2-1.

Based on previous results, stream conditions in the Ngwaritsana River at the Mariti (X31E-02) site at its best (April 2007) only achieved a B/C (between moderately impaired and largely natural) and were on average moderately impaired (Table 3-3). The Ngwaritsana stream at this point appears to be in good condition, but high quantities of sand and a steep gradient ensures taxa are "blasted" by sand particles when mobilised during high flows. High inputs of sand from upstream road networks are therefore most likely the source of impairment at the Mariti site. The other sites were at its best categorised as natural, and moderately impaired on average.

The Kleinfontein site was categorised as moderately to largely impaired (C/D) in February 2020, but discharge during the sampling period was also very high[3]. The poor results in February 2020 are therefore mainly attributed to sampling efficiency during high flows, and less in terms of impairment. High quantities of soil are entering the Motitsi River at the X31F-04 sampling point due to poor road drainage but was not likely the major cause for impairment.

At the sites on Wilgeboom, conditions are therefore mainly related to instream habitat conditions driven by sedimentation and poor sampling conditions during high flow events.

Table 3-3. MIRAI results for sites sampled on Wilgeboom since 1998, expressed as percentiles.

Site No.	Site Name	River	n	Lowest		Average	Best		2023
				Date	Class		Date	Class	
X31E-02	Mariti	Ngwaritsana	10	07/v/2004	C	C	20/iv/2007	B/C	C
X31E-03	Wilgeboom	Ngwaritsana	8	31/vii/2013	C	B/C	14/ii/2020	B	ns
X31F-03	Roodewal	Motitsi	6	14/ii/2020	C/D	C	03/v/2007	B	ns
X31F-04	Kleinfontein	Motitsi	5	08/v/2007	C	C	31/vii/2013	B	ns

Table 3-4. A summary of stream conditions per site based on the February 2023 SASS5 monitoring results. Arrows indicate an improvement (upward), deterioration (downward) or no change (horizontal).

SITE CODE	SITE NAME	RIVER	CATEGORY	CHANGE (FROM PREVIOUS SURVEYS)
X31E-02	Mariti	Ngwaritsana	C	→
X31E-03	Wilgeboom	Ngwaritsana	Ns	
X31F-02	Roodewal	Motitsi	Ns	
X31F-04	Kleinfontein	Motitsi	Ns	

8.1.2.6. SASS5 Water Quality Monitoring results: Entabeni Plantation - Limpopo Catchment (2023/24)



Figure 3-14. Ecological categories for all sampled in February 2024 based on MIRAI.

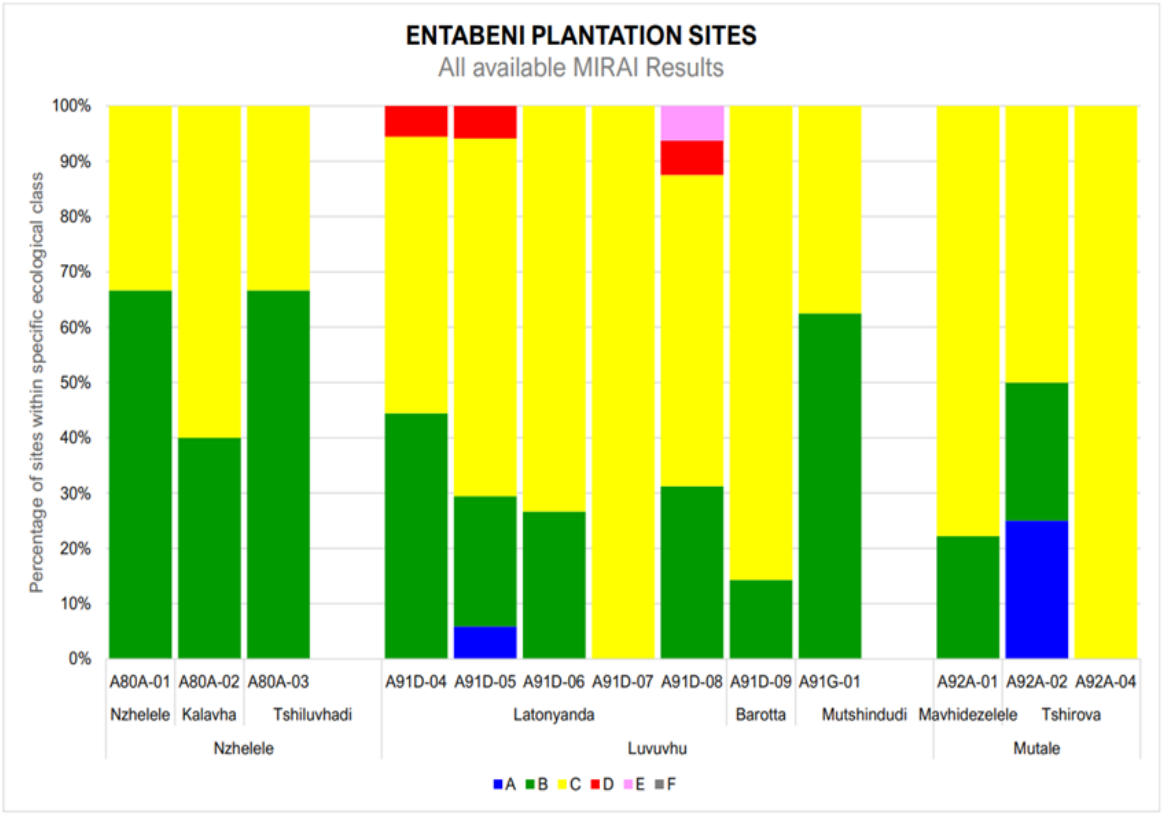


Figure 3-16. A summary of MIRAI results over time, indicating sites continuously rated as moderately to severely impaired.

3.3.1 NZHELELE SUB-CATCHMENT SITES

Three sites are located within the Nzhelele sub-catchment. Site photos and results are indicated per site.

Table 3-2. Stream conditions at the Nzhelele sub-catchment sites based on MIRAI.

SITE CODE	SITE NAME	RIVER	CATEGORY	CHANGE (FROM PREVIOUS SURVEYS)
A80A-01	Upper Nzhelele	Nzhelele	C	↘
A80A-02	Fondwe	Kalavha	B	↗
A80A-03	Passima	Tshiluvhadi	B	↗

Continuous and maintained high flow linked with the above average rainfall experienced resulted in an overall improvement in stream conditions. Slight deterioration was reflected in results of the 2024 survey at the Upper Nzhelele site, A80A-01.

3.3.2 LATONYANDA AND MUTSHINDUDI SUB-CATCHMENT

Six sites are located within the Latonyanda sub-catchment, five on the Latonyanda stream itself, and one (Barotta) on a tributary. One site is in the headwaters of the Mutshindudi but could not be accessed in February 2024. The Latonyanda River is one of the most important in terms of contributing to water quantity into the Luvuvhu River.

SITE CODE	SITE NAME	RIVER	CATEGORY	CHANGE (FROM PREVIOUS SURVEYS)
A91D-04	Veraskop	Latonyanada	C	↘
A91D-05	Seville		C	↘
A91D-06	Lisbon		C	↘
A91D-07	Timbadola		C	↘
A91D-08	Klein Australia		C	↘
A91D-09	Barotta	Barotta	C	↘

3.3.1.1 A80A-01: Upper Nzhelele

At the Upper Nzhelele site, high sediment inputs enter the stream from the approaching road during rainfall runoff (Figure 3-18). High sediment deposition was noted above the crossing (Figure 3-19) and newly formed lateral sediment bars in the river below the crossing (Figure 3-20).

High sediment input and movement during recent high flows is likely the cause of the decrease in taxa associated with stones biotopes. Bank scouring reduced the abundance and diversity of the marginal vegetation biotope, with below average taxa encountered.

The family Leptophlebiidae (prongills) were absent in February 2024, linked to the limited stream out of current habitats associated with the higher flows. The ration of filtering collectors to gathering collectors suggested mobilised fine particulate organic matter (FPOM) or FPOM inputs. Suspended FPOM are generally associated with extended high flows.

Clingers decreased, suggesting instream habitat stability deteriorated, most likely linked to high instream sediment movement.

Water quality (spot in situ measurements) and flow conditions were considered very good, so habitat is the only driver that could negatively affect instream conditions.

3.3.1.2 A80A-02: Fondwe

The instream habitat at the Fondwe site in the Khalavha stream is affected by a fine silt "drape" covering slower flowing portions of the stream.

3.3.1.3 A80A-03: Passima

The Tshiluvhadi stream drains the Passima declared natural heritage site, with commercial forestry limited to small portions in the upper tributaries of the catchment. The stream conditions based on MIRAI for this site varies between moderate and largely natural (Figure 3-16). Other indicators, however, shows very little change in terms of community composition over time. The standard deviation[3] in results for specific indicators (e.g., % sensitive taxa, % clingers, % burrowers, etc.) are some of the smallest, suggesting disturbance is minimal. The catchment is predominantly natural, so the degree of deviation is expected to be smaller than for a stream regularly exposed to anthropogenic impacts.

3.3.2 LATONYANDA AND MUTSHINDUDI SUB-CATCHMENT

Six sites are located within the Latonyanda sub-catchment, five on the Latonyanda stream itself, and one (Barotta) on a tributary. One site is in the headwaters of the Mutshindudi but could not be accessed in February 2024. The Latonyanda River is one of the most important in terms of contributing to water quantity into the Luvuvhu River.

SITE CODE	SITE NAME	RIVER	CATEGORY	CHANGE (FROM PREVIOUS SURVEYS)
A91D-04	Veraskop	Latonyanada	C	↘
A91D-05	Seville		C	↘
A91D-06	Lisbon		C	↘
A91D-07	Timbadola		C	↘
A91D-08	Klein Australia		C	↘
A91D-09	Barotta	Barotta	C	↘

3.3.2.1 A91D-04: Veraskop

The Latonyanda stream at the Veraskop site is located upstream from the Latonyanda waterfall, draining a surface area 5.6 km^2 dominated by commercial forestry. the Passima declared natural heritage site, with a surface area of 5.6 km^2 comprising of predominantly commercial forestry. The stream conditions based on MIRAI for this site varies between largely natural and severely impaired (Figure 3-16). Other indicators, however, shows deterioration in the stone taxa diversity, overall taxa diversity, the total SASS score, and the percentage clingers. This suggests some deterioration, while visually, more sediment deposition and an increase in *Eucalyptus* tree growth and *Eucalyptus* leaf debris in the stream.

The stream crossing can only be crossed by foot, with culverts still present and blocked, but severely damaged. Downstream bank scouring as a result overtopping blocked culverts evident.

3.2.2.2 A91D-05: Seville

The Seville site is located where the Latonyanda flows back into SAFCOL Entabeni (Compartments D1 and B51d). Visually the site recovered in terms of scoured stream banks, with instream habitat visually rated as good. Conditions based on MIRAI was rated as moderate for 2024, ranging from natural to poor in previous surveys.

3.3.2 LATONYANDA AND MUTSHINDUDI SUB-CATCHMENT

Six sites are located within the Latonyanda sub-catchment, five on the Latonyanda stream itself, and one (Barotta) on a tributary. One site is in the headwaters of the Mutshindudi but could not be accessed in February 2024. The Latonyanda River is one of the most important in terms of contributing to water quantity into the Luvuvhu River.

SITE CODE	SITE NAME	RIVER	CATEGORY	CHANGE (FROM PREVIOUS SURVEYS)
A91D-04	Veraskop	Latonyanada	C	↘
A91D-05	Seville		C	↘
A91D-06	Lisbon		C	↘
A91D-07	Timbadola		C	↘
A91D-08	Klein Australia		C	↘
A91D-09	Barotta	Barotta	C	↘

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The Latonyanda stream at the Veraskop site is located upstream from the Latonyanda waterfall, draining a surface area 5.6 km^2 dominated by commercial forestry. the Passima declared natural heritage site, with a surface area of 5.6 km^2 comprising of predominantly commercial forestry. The stream conditions based on MIRAI for this site varies between largely natural and severely impaired (Figure 3-16). Other indicators, however, shows deterioration in the stone taxa diversity, overall taxa diversity, the total SASS score, and the percentage clingers. This suggests some deterioration, while visually, more sediment deposition and an increase in *Eucalyptus* tree growth and *Eucalyptus* leaf debris in the stream.

The stream crossing can only be crossed by foot, with culverts still present and blocked, but severely damaged. Downstream bank scouring as a result overtopping blocked culverts evident.

3.2.2.2 A91D-05: Seville

The Seville site is located where the Latonyanda flows back into SAFCOL Entabeni (Compartments D1 and B51d). Visually the site recovered in terms of scoured stream banks, with instream habitat visually rated as good. Conditions based on MIRAI was rated as moderate for 2024, ranging from natural to poor in previous surveys.

3.3.2.3 A91D-06: Lisbon

This site on the Latonyanda stream is located upstream from the Timbadola Sawmill, and downstream from a log depot. Stream conditions was rated as moderately impaired in February 2024, with conditions over time ranging from largely natural to moderately impaired.

The road drainage at the site is always problematic during rainfall runoff events (Figure 3-28), which results in highly tunid water entering the stream directly. During the February 2024 survey, a tributary draining a portion of block C resulted in the dicoloration of the stream further downstream (Figure 3-2).

In the stream community, the biggest changes in 2024 when compared to previous results were:

- Decrease in stones associated taxa
- Decrease in vegetation associated taxa
- Decrease in overall taxa diversity
- Decrease in total SASS score

3.3.2.4 A91D-07: Timbadola

The Timbadola site is located on the Latontyanda stream downstream from the sawmill and irrigated log deck. Conditions based on MIRAI was rated as moderately impaired in 2024, with previous results all reflecting moderately impaired conditions.

3.3.2.5 A91D-08: Klein Australia

The Timbadola site is located on the Latontyanda stream close to the point where it fows out of Entabeni plantation. Conditions based on MIRAI was rated as moderately impaired in 2024, with previous results falling between largely natural and critically impaired. Critically impaired conditions were recorded following the 2000 floods, which caused severe instream disturbance because of all the stream crossing which failed, and the large volume of sediments that were mobilised.

3.3.2.6 A91D-09: Barotta

The site is located on a tributary of the Latonyanda stream, flowing into a private fruit and nut farm dam further downstream before its confluence with the Latonyanda. Stream conditions was rated as moderate in 2024, ranging between largely natural and moderately impaired in previous monitoring. The stream had no surface water in March 2002, and 2003. It is unclear whether the stream is naturally seasonal or dries up because of anthropogenic impacts.

There are large quantities of fine silt deposition in slower flowing portions of the stream, which affects instream habitat conditions. The last time the extremely sensitive Blepharoceridae family were encountered was in 2010, which suggests sediment inputs and movement ensured unsuitable conditions for this species.

When compared to previous and expected results, there was a considerable decrease in families associated with all the biotopes, and more specifically sensitive taxa and clingers. This data further supports the concern about high sediment input and movement, especially after 2010.

3.3.3 MUTALE SUB-CATCHMENT

Three sites were sampled in the Mutale sub-catchment, with one on the Mavhidezelele which drains into Lake Fundudzi before flowing towards the Mutale. The other two sites are located on the Tshirova stream, up and downstream from the Mukumbani Dam.

3.3.3.1 A92A-01: Mavhidezelele

The Mavhidezelele site is located upstream from Lake Fundudzi. In 2024, conditions were rated as moderately impaired (based on MIRAI). Previous results ranged between largely natural and moderately impaired. The stream is characterised by very low ion concentrations (15 – 40.6 [22] micro-Siemens per centimetre), potentially indicating low taxa diversity under natural conditions. The pH is also generally <7.0, ranging between 6.2 and 7.2, with the pH and electrical conductivity linked to the underlying geology.

Although MIRAI indicates moderate conditions because of the low taxa diversity, other indices suggest improved conditions. Improved conditions are linked to extend high flows maintained prior to sampling.

3.3.3.2 A92A-02: Tshirova

The Tshirova site is located upstream from the Mukumbani Dam, draining a small catchment area characterised by very low water conductivity (ion contents) and pH levels consistently lower than 7.

Based on MIRAI, conditions were rated as moderately impaired in February 2024. Previous conditions ranged from natural to moderately impaired.

The stream is predominantly slow flowing, which limits several taxa, especially those associated with fast flowing rocky habitats. Taxa associated with slow flowing habitats dominate (i.e., Leptophlebiidae, Lestidae: *Lestes plagiatus*, Baetidae: *Cloeon* sp.). As a result, responses are strongly linked to flow conditions prior to and during sampling events. Other indices suggest a slight increase in organic pollution, and an extended period of higher flows with a slight increase in rocky flow dependant taxa.

3.3.3.3 A92A-04: Mukumbani Dam

The Mukumbani Dam site (A92A-04) is located approximately 1.2km (straight line) downstream from the Mukumbani Dam wall. Recent scouring of the stream bed and stream banks were evident, following recent flooding.

Conditions was rated as moderately impaired applying MIRA, with conditions during the previous two sampling events also categorised as moderately impaired. The water conductivity and pH are overall event lower at this site (A92A-04) downstream from the Mukumbani Dam than the upstream site, A92A-02.

In 2024 there was slight decrease in taxa associated with marginal vegetation, mostly linked to the limited availability with bank scouring following flooding. The percentage of clingers was also considerably reduced.

8.1.2.7. SASS5 Water Quality Monitoring results: Nelshoogte Plantation - Crocodile Catchment (2023/24)

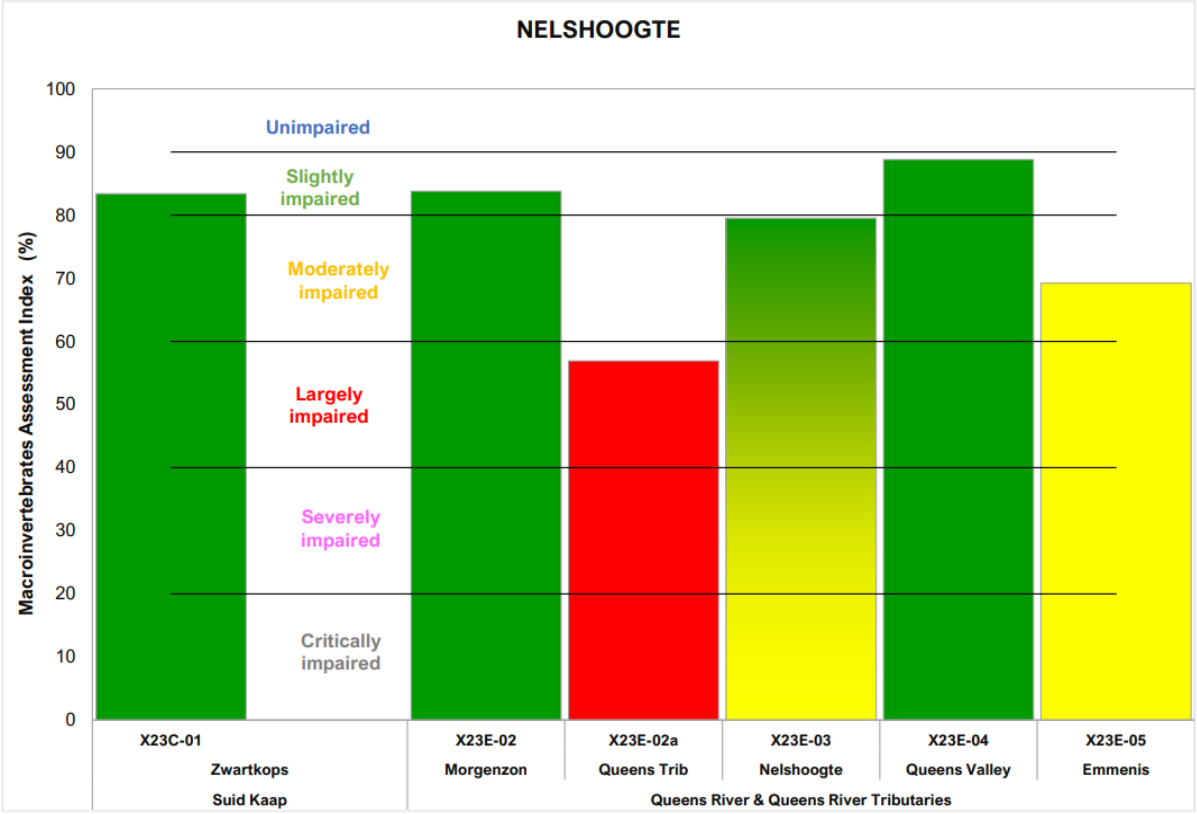


Figure 3-3. A summary of the MIRAI results for sites on Nelshoogte Plantation sampled in February 2024.

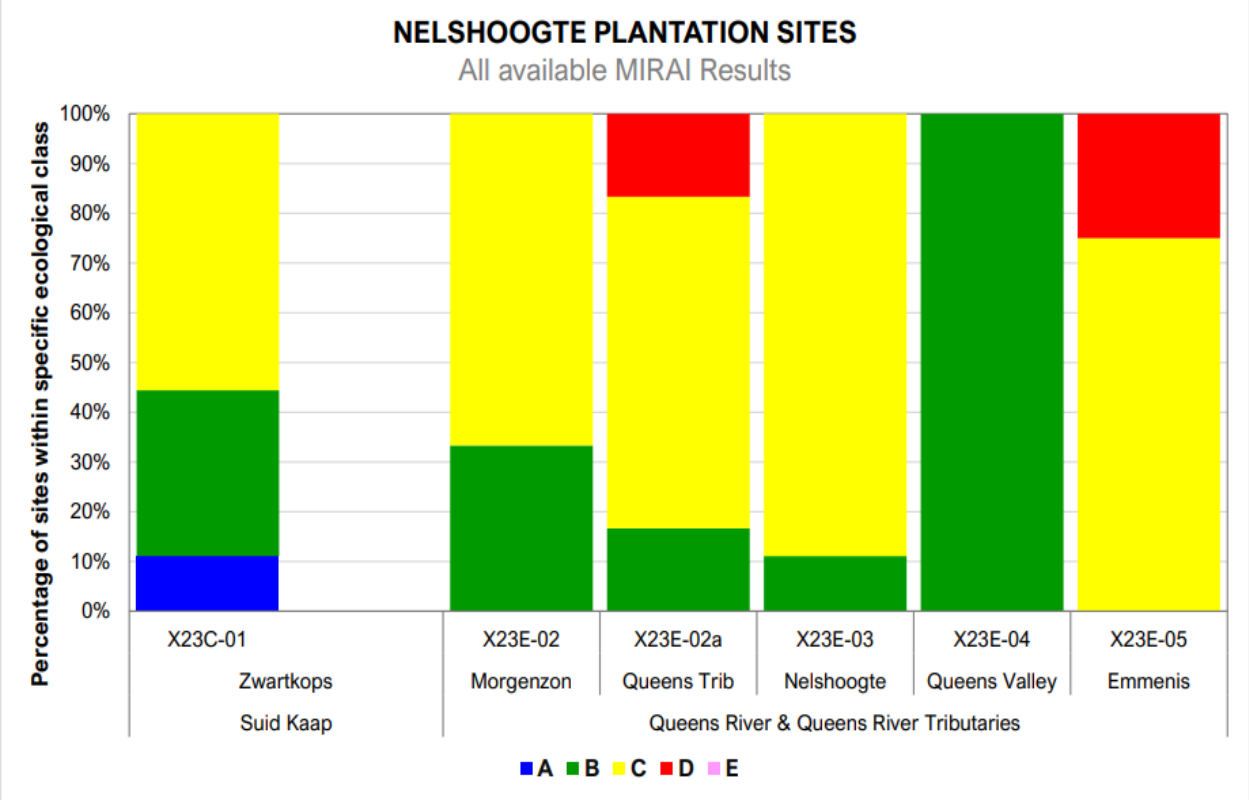


Figure 3-4. A summary of all MIRAI results of streams on Nelshoogte Plantation over time.

3.3.1. X23C-01: ZWARTKOP

The stream is the headwaters of the Suid Kaap River, with the upstream catchment (topographical divide = 27.2 km^2) draining Nelshoogte's commercial compartments in blocks G. F, and H.

Stream conditions, based on MIRAI results, were rated as slightly impaired in February 2024, improving slightly since 2015. High quantities of sand enter the river via road networks, which decreases when forestry operations within the catchment area is minimal. Roads are then overgrown with grass and covered in pine needles, which protects the soil against erosion.

3.3.2. X23E-02: MORGENZON

The stream originates in the Wartburg and Konigstein farm portions, draining commercial forestry compartments in blocks B, E, G and H. The stream flows in a southern direction towards the sampling location, upstream from where it merges with the Quens Trib stream (X23E-02a). The stream flows past the Nelshoogte village and sewage treatment plant.

Stream conditions, based on MIRAI, was rated as slightly impaired in February 2024, with an increase in taxa diversity and slight increase in the percentage of sensitive taxa. Previous results suggest conditions at the site varies between moderately and slightly impaired, with bedrock habitat dominant and limiting for some taxa.

3.3.3. X23E-02a: QUEENS TRIBUTARY

The stream originates in the area west from Jambilakop (block E) in a southern direction past the Nelshoogte office, workshop, and residential area towards the Queens River. An impoundment is situated further upstream from the site, at the entrance road to Nelshoogte offices. A small weir is also located directly upstream from the site.

Based on MIRAI, stream conditions were rated as largely impaired in February 2024, deteriorating when compared to previous results. The Queens Trib site have always been relatively unproductive in terms of taxa diversity, which is considered natural. The ion contents (electrical conductivity) are generally low to very low (Figure 3-2), with high organic material deposition (hence the tea-brown colour) in the weir upstream from the site affecting the number of taxa sensitive to organic pollution.

3.3.4. X23E-03: NELSHOOGTE

The site is located upstream from its confluence with the Weltevredenspruit, but relatively close to where the river flows out of SAFCOL land. Conditions were rated as moderately to slightly impaired in February 2024.

3.3.5. X23E-04: QUEENS VALLEY

The Weltevredenspruit drains through predominantly natural vegetation (Barberton Montane Grassland with Northern Afrotemperate Forest patches. The catchment also has large areas of Serpentine Sourveld areas, of which the geology creates opportunities for several endemic plants, but also affects the stream ion concentrations.

Conditions during all nine sampling events has been categorised as slightly impaired.

3.3.6. X23E-05: EMMENIS

The Emmenis stream drains commercial compartments in block D towards the Ndlovini River, a tributary of the Queens.

Conditions based on MIRAI was rated as moderately impaired in February 2024, with conditions rating between moderately and largely impaired in previous surveys. High sediment input and deposition affects the instream community at this site.

Taxa diversity has been low throughout the sampling history of this site, with its highest diversity recorded in December 2005 (27) the highest. Stones in current habitat, although present, is not well colonised by taxa associated with these biotopes. This is mainly linked to the high volumes of sand entering and moving through the system during high flows and depositing during low flows.

8.1.2.8. SASS5 Water Quality Monitoring results: Jessievale Plantation - Usutu Catchment (2023/24)

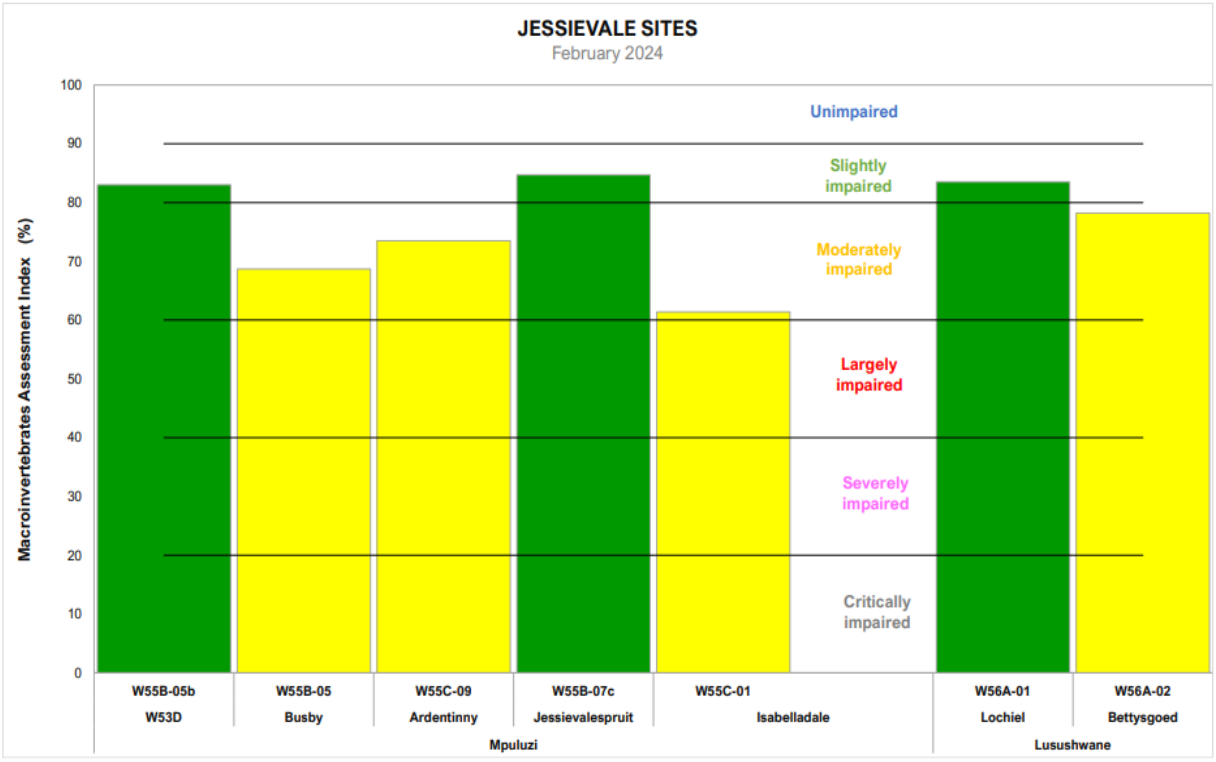


Figure 3-4. A summary of the MIRAI results for sites sampled in February 2024.

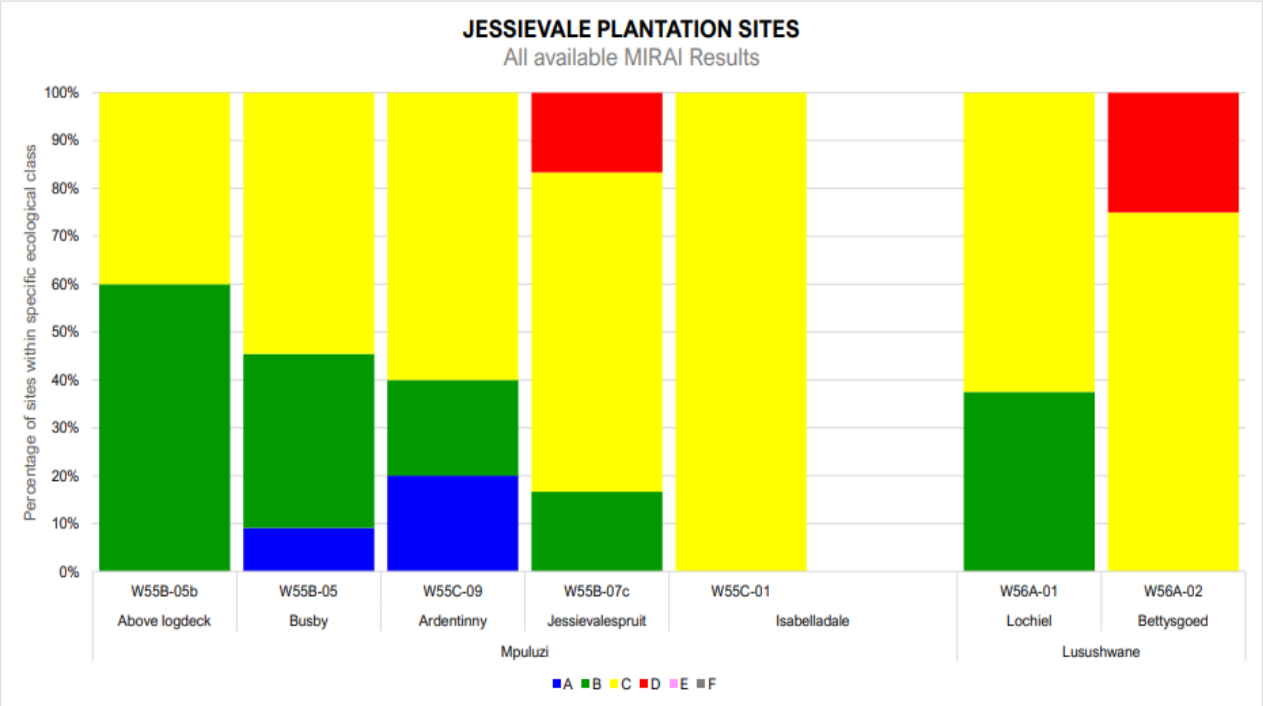


Figure 3-5. A summary of all MIRAI results of streams on Jessievale Plantation over time.

3.3.1. W55B-08b: JESSIEVALE LOG-DECK

The Jessievale log deck site on the Mpuluzi River is located up- and downstream from a low-level bridge adjacent the irrigated log deck (old). The original site (W55B-08a) was <500 m further upstream (above the old log deck) but was located on private land (Busby plantations). The W55B-08a site is not accessible anymore, so was replaced with this site.

3.3.2. W55B-07c: JESSIEVALE C

The Jessievalespruit site (W55B-07c) is located close to the confluence of the Jessievalespruit with the Mpuluzi River. The riparian zone has been severely infested with invasive plants (especially Rubus sp.) since monitoring was initiated in August 2005. The results indicated a dramatic improvement in February 2024, which is attributed to an extended period of high flows. Based on MIRAI, conditions were rated as largely natural, whereas conditions previously ranged from moderate to severely impaired.

3.3.3. W55B-08: BUSBY

The Busby site on the Mpuluzi is located upstream from the W5H011 Busby gauging weir and the region R33 road. Stream conditions was rated as moderate in 2024 based on MIRAI, but high flows made sampling of fast flowing habitats difficult. Conditions are expected to be largely natural if sampling efficiency was not hindered by strong flows. The strong flows ensured the lowest number of taxa and record was encountered (26 against 34 average), but sensitive taxa and clingers still dominant.

3.3.4. W55C-01: ISABELLADALE

The Isabelladale site (W55C-01) is located on a tributary of the Mpuluzi, draining commercial pine plantations on SAFCOL Jessievale on a surface area of 9.1 km^2. It's a small stream on steep terrain, dominated by Mpuluzi Granites. Uncontrolled fires in the catchment area followed by high rainfall pre the 2011 survey caused major bank scouring and high sediment inputs. In 2024, stream conditions were rated as moderately impaired, with a decrease in stones and vegetation taxa resulting in an overall decrease in taxa diversity. The activation of the high volume of sand deposits during high flows is most likely the main instream habitat limitation for taxa sensitive to a 'sandblasting" effect.

3.3.5 W55C-09: ARDENTINNY

The Ardentinny site is located on the Mpuluzi River a few kilometres upstream from the Mayflower Water Treatment Works. High volumes of sand dominate the stream substrate, activated during every high flow event. In 2024 stream conditions (based on MIRAI) was rated as moderately impaired, deteriorating slightly when compared to averaged results.

3.3.6 W56A-01: LOCHIEL

The Lochiel site on the upper portion of the Lusushwane River is located above and below the confluence of two tributaries, with high quantities of sand characteristic of the stream since monitoring was initiated. Stream conditions was rated as slightly impaired in 2024, compared to mostly moderately impaired during previous surveys (Figure 3-5).

3.3.7 W56A-02: BETTYSGOED

The Bettysgoed site is located further downstream on the Lusushwane River, intersected with several small rural community areas between the Lochiel and Bettysgoed sites. Stream conditions was rated as moderately impaired, and overall improved when compared to previous results. The stream was initially (first surveys) dominated by sand with a few gravelly areas, while cobble interspersed with gravel was common in 2024, with sand still dominant.

The improved instream habitat conditions are considered the reason for the slight improvement in conditions in 2024.

8.1.2.9. SASS5 Water Quality Monitoring results: Roburnia Plantation - Usutu Catchment (2023/24)

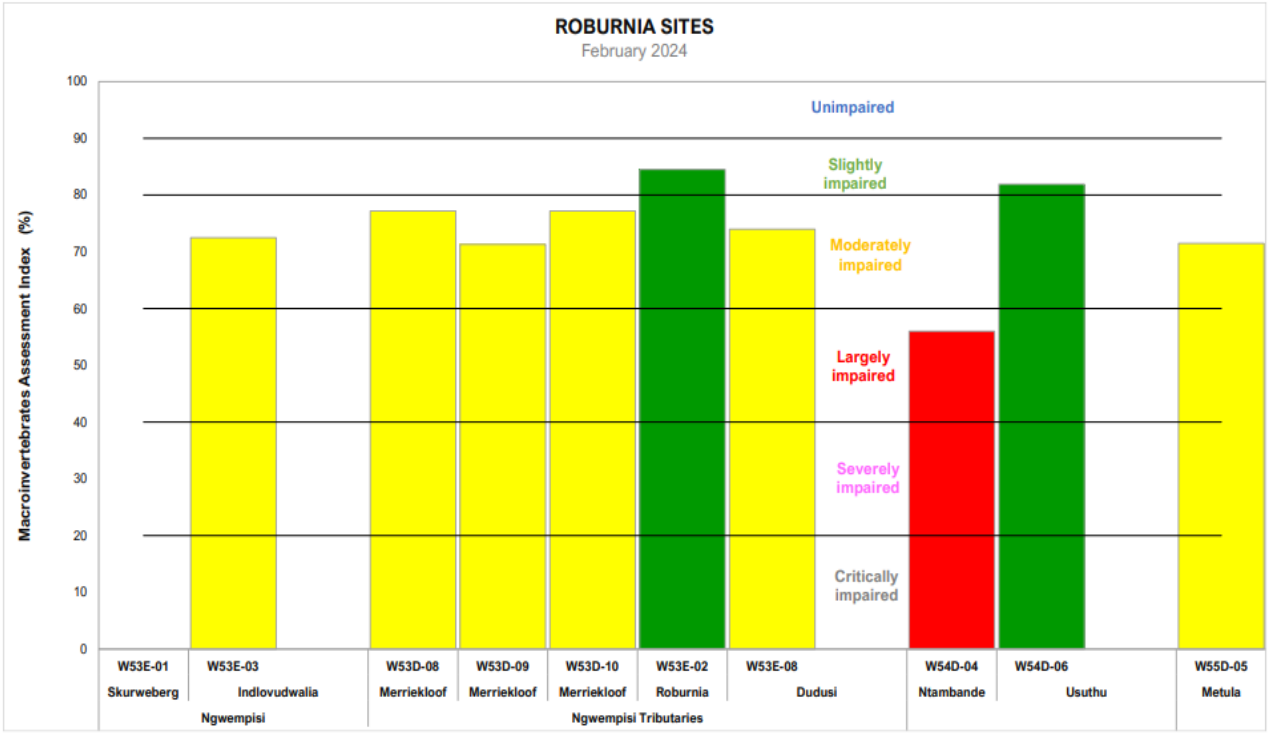


Figure 3-4. A summary of the MIRAI results for sites on Roburnia Plantation sampled in February 2024.

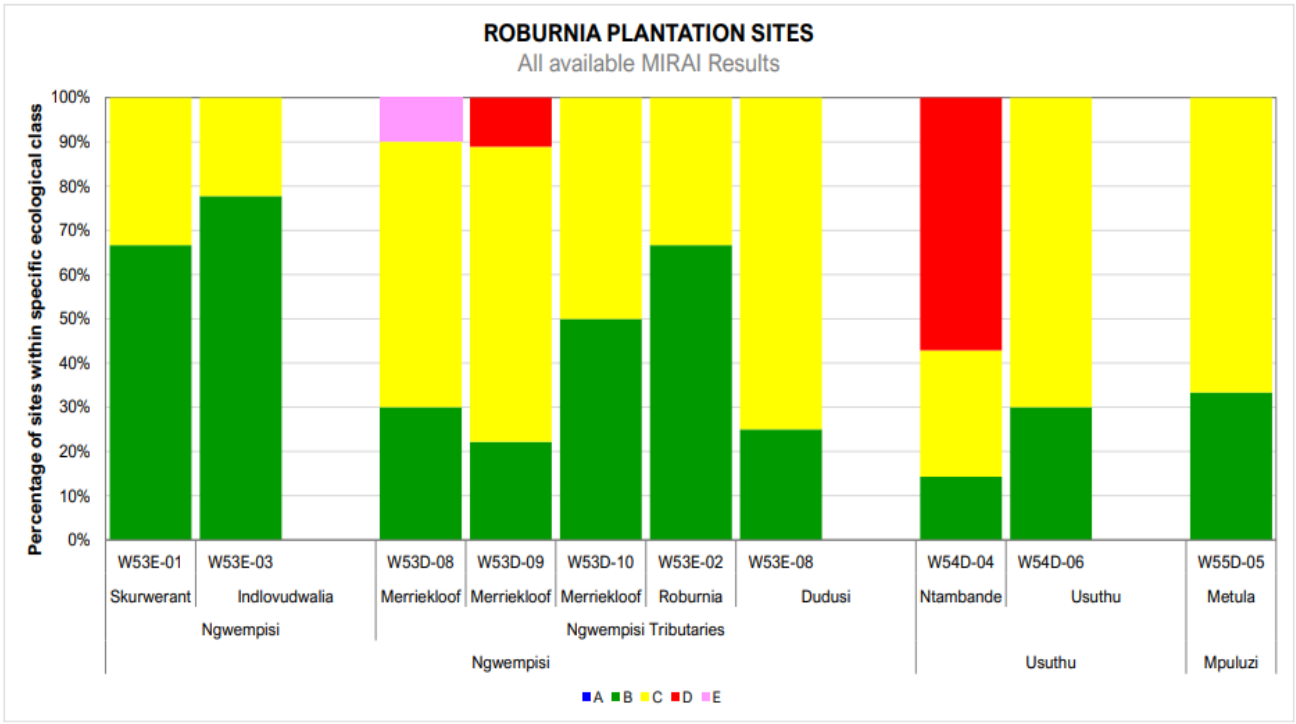


Figure 3-5. A summary of all MIRAI results of streams on Roburnia Plantation over time.

3.3.1. MERRIEKLOOF SUB-CATCHMENT

Three sites are sampled on the Merriekloof stream, one where the stream flows into SAFCOL Roburnia (W53D-08), on further downstream but upstream from the small dam (W53D-09), and the last site close to the Merriekloof's confluence with the Ngwempisi (W53D-10).

Between August 2005 and June 2008, roads and a small impoundment were established in the catchment upstream from the site (private land). Commercial forestry was established after 2008.

Average SASS5 scores and taxa diversity has decreased since the afforestation as indicated below. Unfortunately, the baseline sampling dates was Aug-Sep (low flow) pre-2005, which

SAFCOL changed to Feb-Mar (high flow) since 2015. Comparative analysis will therefore only be reliable when compared over the same time of year.

Table 3-3. Change in stream conditions following development in the afforestation of a natural grassland to commercial pine plantations in the upper Merriekloof catchment (private farm) between 2002 and 2005.

Sampling Period	SASS5 Total Score		No. of Taxa		ASPT	
	W53D-08	W53D-09	W53D-08	W53D-09	W53D-08	W53D-09
Avg. 1999 - 2002	199	198	32	31	6.3	6.5
Avg. 2005 - 2024	144	157	25	26	5.6	6.1
% Change	-28%	-21%	-20%	-16%	-11%	-5%
Category	Considerable	Considerable	Considerable	Moderate	Moderate	Slight

3.3.1.1 W53D-08: Upper Merriekloof

Based on the MIRAI model stream conditions were rated as moderately impaired following the February 2024 survey, deteriorating slightly from the expected (slightly impaired to natural).

3.3.1.3 W53D-10: Lower Merriekloof

The Lower site is situated approximately 5.3 km downstream from the Upper Merriekloof site. Grasses and shrubs dominate the riparian vegetation, while bedrock with sand/mud/silt and cobble dominate the substrate. The stream conditions were categorised as moderately impaired in February 2024, while previous results vary between slightly and moderately impaired.

3.3.1.2 W53D-09: Mid Merriekloof

The Mid Merriekloof site is situated approximately 2.7 km downstream from the Upper Merriekloof site. Grasses and shrubs dominate the riparian vegetation. Based on the MIRAI model, stream conditions in February 2024 were rated as moderately impaired. A summary of MIRAI results suggest the stream at this point falls in the moderately to largely impacted category, and mostly since 2008.

3.3.2 NGWEMPISI RIVER SITES

Two sites are located on the Ngwempisi River, one upstream from the regional Amsterdam-Mkhondo (R33) road, and downstream from gauging weir W5H026. The other site on the Ngwempisi River is located approximately 11 km further downstream (stream length), close to where the Ngwempisi River flows out of South Africa into Swaziland.

3.3.2.1 W53E-01: Skurwerant

Flow conditions were too high to sample the river effectively for SASS monitoring in February 2024. When instream habitats can't be accessed or the flow is too strong to sample, it negatively affects taxa diversity. It creates the illusion (especially when looking at just the data) that taxa might be absent whereas they are most likely still present in habitats that could not be sampled properly.

3.3.2.2 W53E-03: Indlovudwalila

The site is located downstream from a low water bridge. Stream conditions based on MIRAI was rated as moderately impaired in February 2024. Previous results indicate improvement in the Ngwempisis River at the Indlovudwalila site when compared to the upstream Skurwerant (W53E-01) site, with conditions rated slightly impaired 78% of the time compared to 67%.

Taxa diversity at this site is generally high (>32 taxa, average 36), with sensitive taxa dominant. Conditions appear to be stable and improving when compared to the site 11 km further upstream (W53E-01). High flow conditions at this site also affects sampling efficiency, which could provide skewed results.

3.3.3 W53E-02: ROBURNIA

The stream forms a natural boundary between Roburnia's commercial compartment blocks A and F, drains a relatively large portion of these blocks towards the Ngwempisi River. Based on MIRAI, stream conditions were rated as slightly impaired in February 2024. Previous results suggest conditions range between moderately to slightly impaired.

3.3.4 W53E-08: DUDUSI

This site on the Dudusi stream is a tributary of the Mlambo River, draining a large portion of Roburnia's blocks B and C. Most of the stones habitat in the stream is remnant from stream crossing construction but provides good habitat for some flow-rocky substrate associated taxa.

Stream conditions, based on MIRAI, was rated as moderately impaired in February 2024, with previous data suggesting moderate conditions dominate with slightly impaired conditions recorded during a few site visits.

3.3.5 W54D-04: NTAMBANDE

The Ntambande stream drains large portions of Roburnia's blocks J, L and M towards the Msinga stream, a tributary of the Usuthu River. Stream conditions based on MIRAI was rated as largely impaired in February 2024, but instream habitat is considered the main limitation for colonisation by many taxa. The highest percentage of sensitive taxa were recorded in February 2024 when compared to any of the previous six sampling events, but taxa diversity was also the lowest recorded to date. The MIRAI method unfortunately penalises low diversity, but low diversity in these smaller stream systems is most often natural.

3.3.6 W54D-06: LOWER USUTHU

The site is located on the southern boundary of SAFCOL Roburnia's compartment blocks J and K. Stream conditions based on MIRAI were rated as slightly impaired, with previous results ranging between moderately and slightly impaired. The site is located downstream from the Westoe Dam, with hydrological data available suggesting severe flow regulation downstream, therefore strongly affecting downstream conditions for flow dependent taxa.

Sensitive taxa were dominant in the February 2023 sample and were the highest recorded at this site out of nine previous sampling events. The "improved" conditions are attributed to maintained high flow following a good rainy season.

3.3.7 W55D-05: FERNIE

The Fernie site is located on the Metula River, draining SAFCOL Roburnia's blok N compartments towards Swaziland before merging with the Mpuluzi River in Swaziland. Stream

conditions based on MIRAI was rated as moderately impaired in February 2024, with previous conditions ranging between moderate and slightly impaired.

8.1.2.10. <u>SASS5 Water Quality Monitoring results: Witklip Plantation - Crocodile Catchment (2023/24)</u>

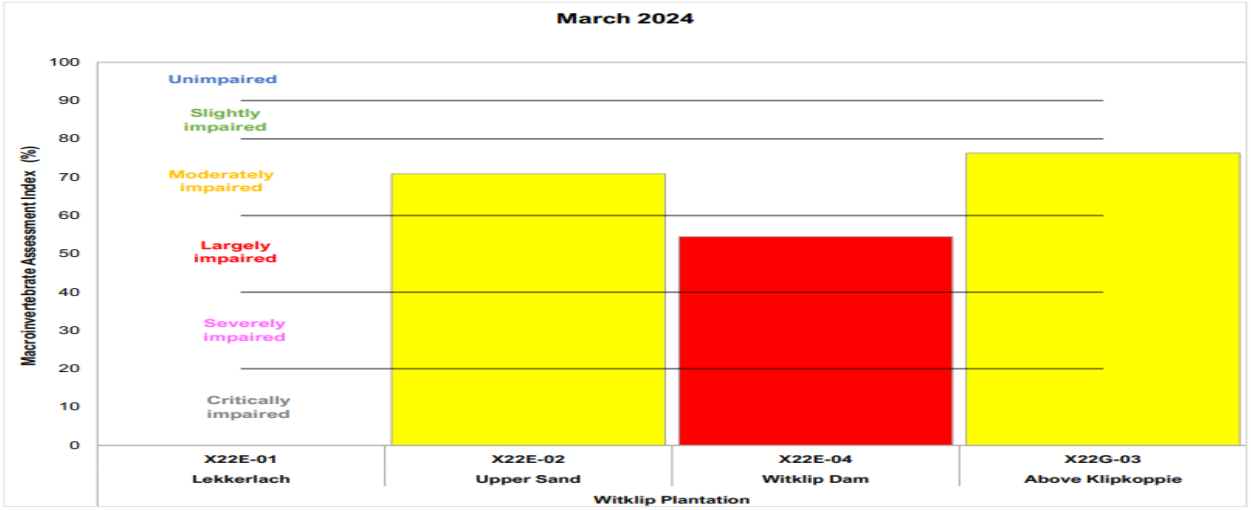


Figure 3-3. A summary of the MIRAI results for sites on Witklip Plantation sampled in March 2024.

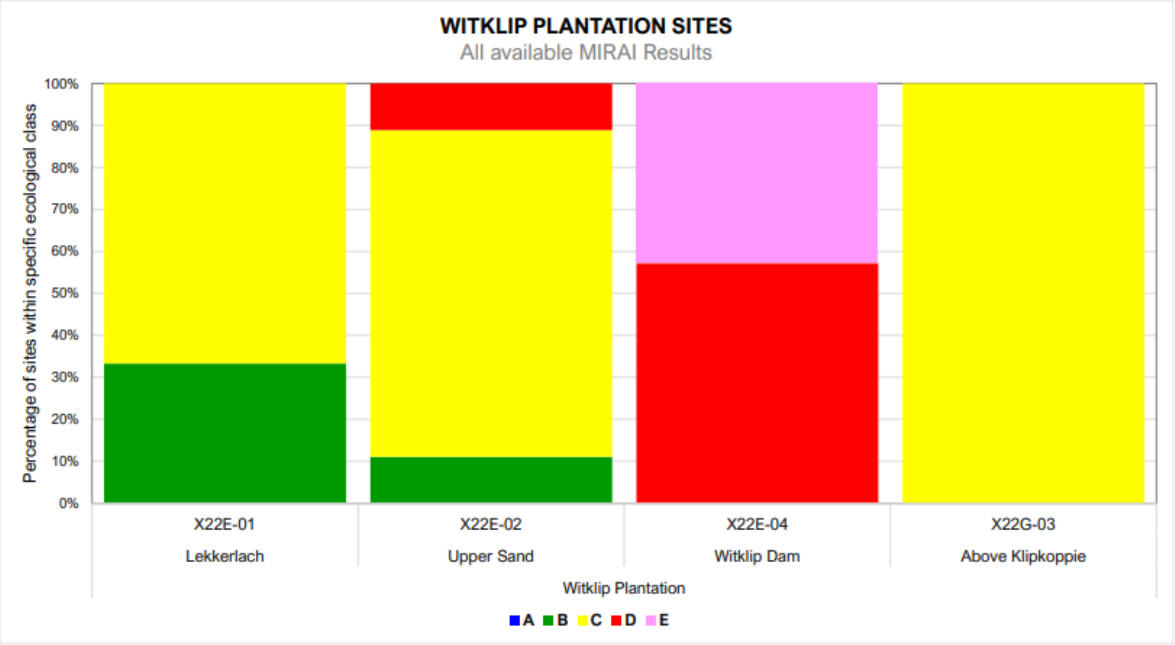


Figure 3-4. A summary of all MIRAI results of streams on Witklip Plantation over time.

3.3.1 X22E-02: UPPER SAND

The site is located on the Sand River, upstream from a small waterfall, and a few kilometres upstream from the Witklip Dam, which the stream feeds. Conditions were rated as moderately impaired in March 2024, with sandy substrates dominant.

3.3.2 X22E-04: WITKLIP DAM

The Sand River is a 5th order stream below the Witklip Dam, draining an upstream catchment surface area of 65 km^2, which is dominated by commercial forestry. The Witklip Dam was completed in 1969, mainly for storing water for agricultural activities (irrigation).

Stream conditions in March 2024 was rated as largely impaired, which is mainly because of the upstream Witklip Dam, which regulated flow conditions, water temperature, organic loads, water chemistry, and more. Conditions over time ranged between severely and largely impaired, mainly affected by the dam release prior to sampling (i.e., no release, bottom release, or overflow).

3.3.3 X22G-03: ABOVE KLIPKOPPIE DAM

The Blinkwaterspruit is at the Above Klipkoppie (X22G-03) site is located directly upstream from Klipkoppie Dam. Construction of the Klipkoppie Dam was completed in 1960, with its main purpose to store irrigation water for agricultural activities.

8.1.2.11. SASS5 Water Quality Monitoring results: Blyde Plantation - Olifants Catchment (2023/24)

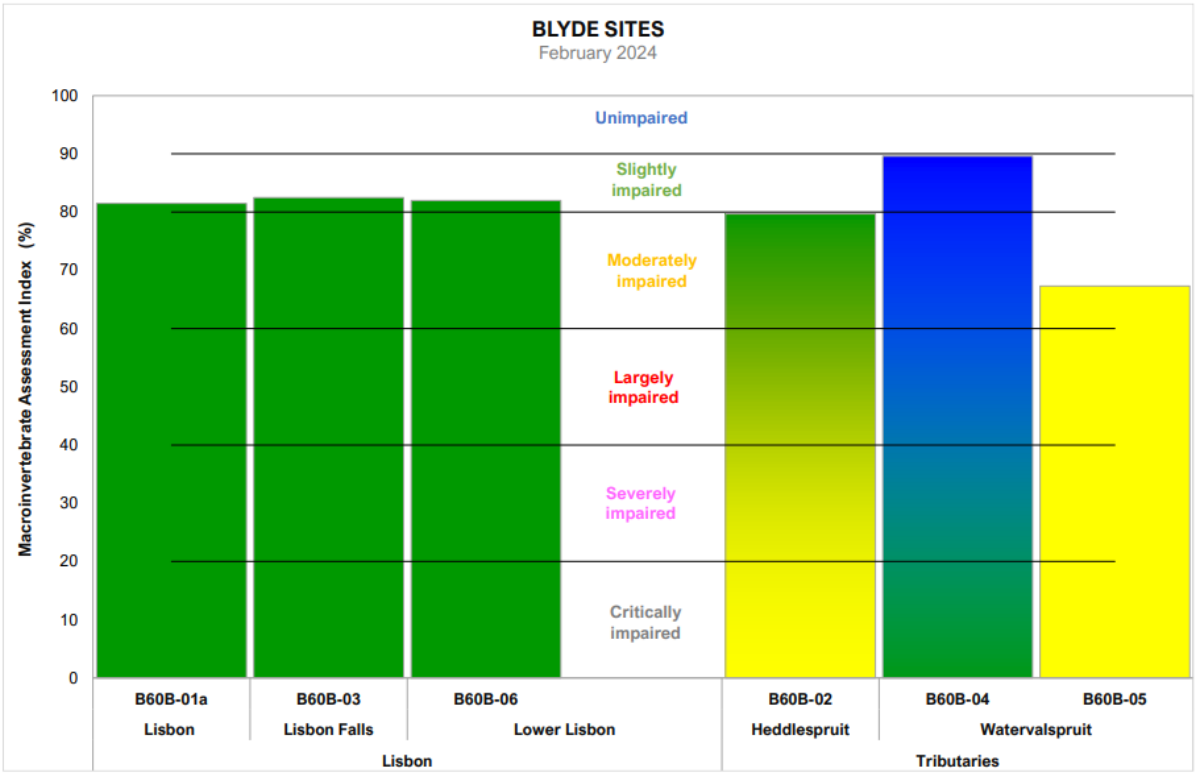


Figure 3-3. A summary of the MIRAI results for sites on Blyde Plantation sampled in February 2024.

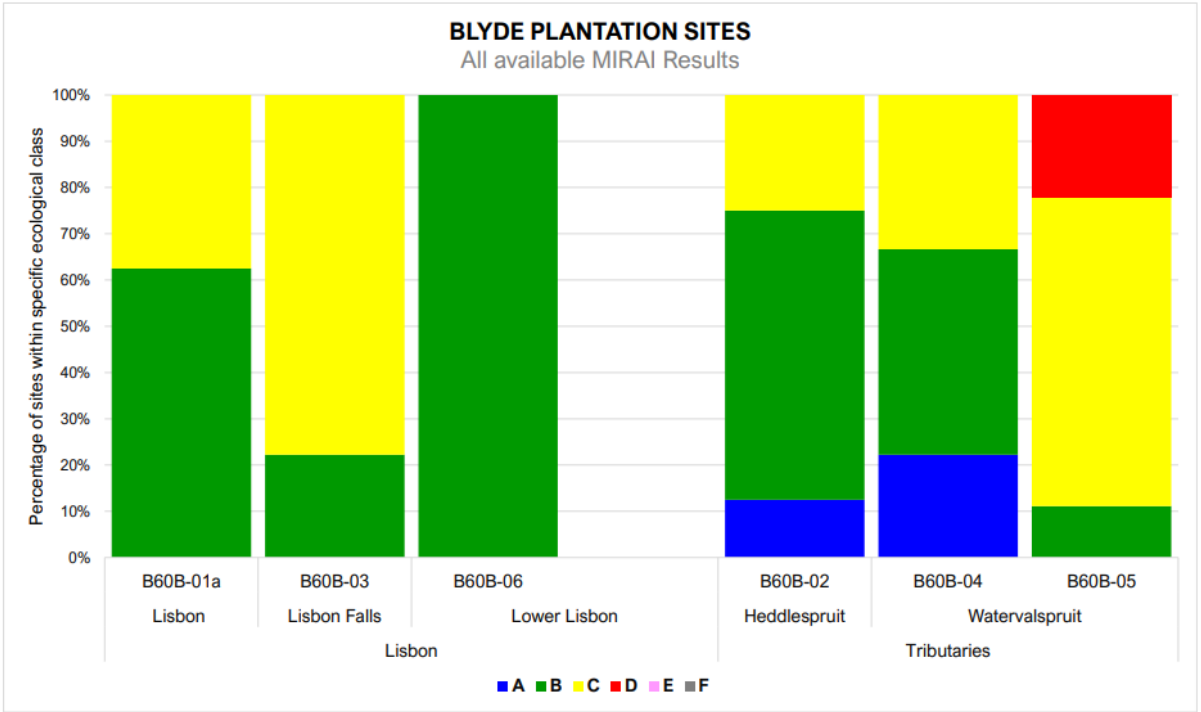


Figure 3-4. A summary of all MIRAI results of streams on Blyde Plantation over time.

3.3.1. B60A-01a: LISBON

The Lisbon site is in the headwaters of the Lisbon River, upstream from the national R532 road. Commercial tree plantations cover the largest portion of the catchment, draining a catchment surface area of 16.1 km^2.

Conditions in 2024 were rated as slightly impaired, with conditions over time ranging between moderately and slightly impaired. Conditions in this stream (based in similarity in underlying geology, elevation, and catchment surface area) is expected to be similar to the Upper Watervalspruit, which mostly ranges between unimpaired and slightly impaired.

3.3.2. B60B-02: HEDDLESPRUIT

The stream drains a predominantly natural area and was initially selected as a reference site. High quantities of sand, however, suggests an upstream source of impairment. Stream conditions in 2024, based on MIRAI, was rated as slightly to moderately impaired.

3.3.3. B60B-03: LISBON FALLS

This site on the Lisbon River is located downstream from the Lisbon Falls. The Blyde village, and open cast mining operations (Figure 3-10) are located upstream from the sampling site.

3.3.4. B60B-04: UPPER WATERVALSPRUIT

The Upper Watervalspruit site (B60B-04) is situated in the Watervalspruit, close to the point where the stream flows from the Blyde Nature Reserve into SAFCOL Blyde plantation.

Stream conditions in February 2024 was rated as unmodified to slightly modified.

3.3.5. B60B-05: LOWER WATERVALSPRUIT

The Lower Watervalspruit site is located on the Watervalspruit, upstream from its confluence with the Lisbon River. Based on MIRAI, conditions in February 2024 were rated as moderately impaired. However, the high flow status in February 2024 limited access to habitats sampled during previous surveys. The shape and depth of the stream channel makes SASS sampling very challenging during high flows, which affects taxa diversity and abundance. Conditions in 2024 are therefore considered closer to slightly impaired (B class) than moderately impaired (C class) at the Lower Watervalspruit site.

The water was discoloured during the 2024 survey, which could be due to deposited sediment activated, or loose soil entering the stream further upstream.

3.3.6. B60B-06: LOWER LISBON

The Lower Lisbon site is situated on the Lisbon River, close to where the river flows out of SAFCOLs Blyde plantation. Condition in February 2024, based on MIRAI, was rated as slightly impaired. Conditions in previous surveys were continuously rated as slightly impaired, suggesting conditions are stable.

8.1.2.12. SASS5 Water Quality Monitoring results: Ngome Plantation - Umfolozi Catchment (2023/24)

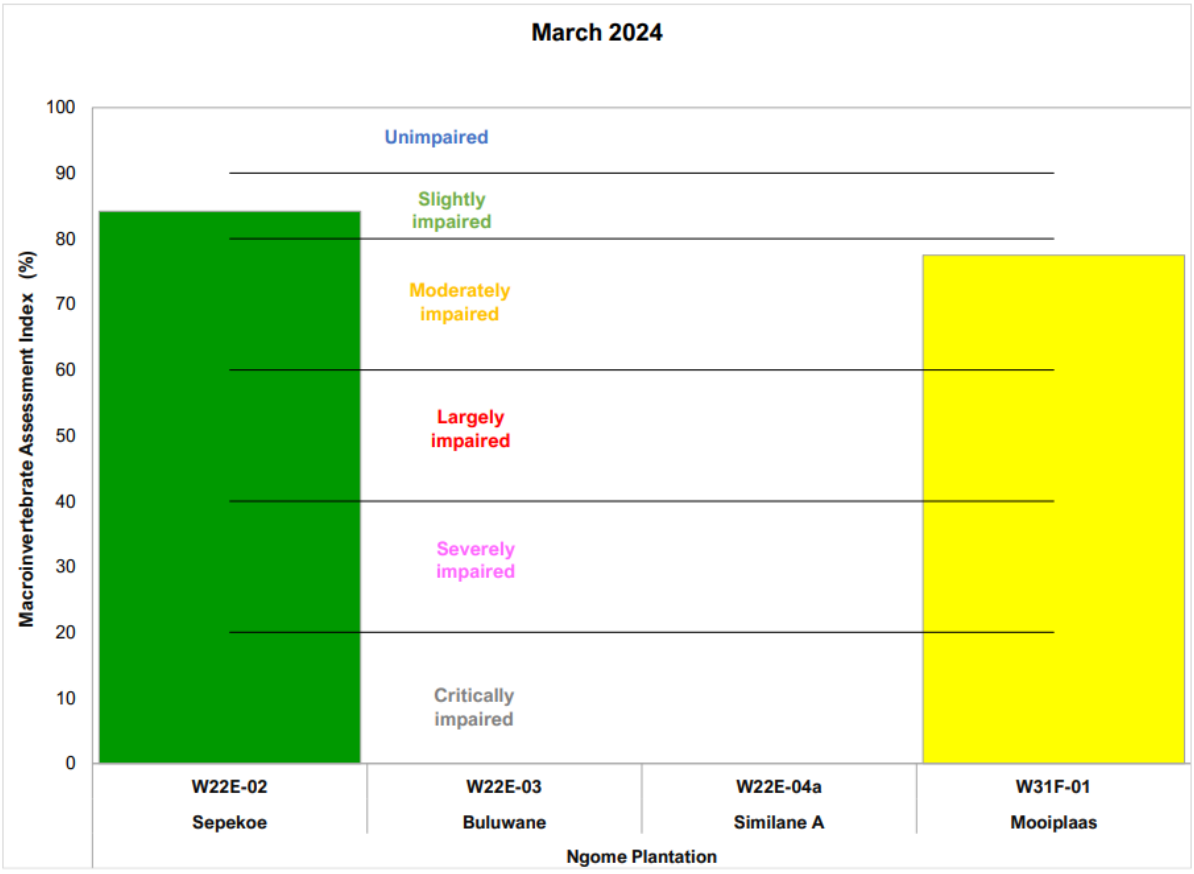


Figure 3-3. A summary of the MIRAI results for sites on Ngome Plantation sampled in February 2024.

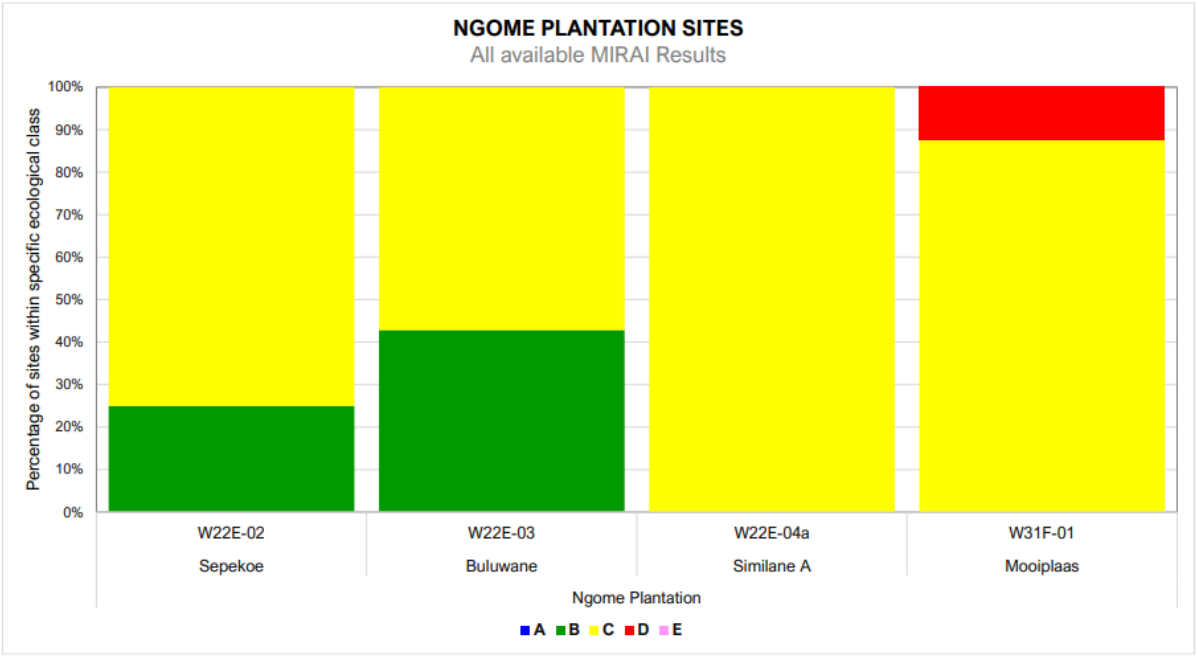


Figure 3-4. A summary of all MIRAI results of streams on Ngome Plantation over time.

3.3.1. W22E-02: SEPEKOE DAM

The Sepekoe site drains a large portion of Ngome plantation's block D towards the Sankuzi dam. The Sankuzi Dam belongs to Sapekoe Tee plantations and is used for irrigation.

Stream conditions in February 2024 was rated as slightly impaired, improving when compared to the average of previous surveys carries out since 1999.

3.3.2. W31F-01: MOOIPLAAS

The Mooiplaas site is situated on the Pambaan stream, draining a large portion of Ngome's block G towards the Sihlengeni River, which is a tributary of the Mkuze River.

Stream conditions were categorised as slightly to moderately impaired in February 2024, with an overall increase in taxa diversity and the percentage sensitive taxa.

8.1.3. Grassland monitoring.

South Africa is divided into nine biomes that are areas of the country sharing certain ecological and climatic characteristics. The grassland biome is the largest of these biomes and covers approximately a third (30%) of the country.

In the grassland biome, approximately only 1 in 6 plant species are grasses. The remainder species comprise of bulbous plants that include arum lilies, orchids, aloes, red hot pokers, watsonias, gladioli and ground orchids. Wetland ecosystems also form an important part of the grassland biome.

The grassland biome is one of the most threatened biomes in South Africa. Forestry and agriculture have been key transformers of this biome with urban expansion and mining beginning to show significant impacts. These areas host a high diversity of indigenous plant species (3370), second only to the Cape Floristic Region, several endemic fish species, high numbers of threatened mammal species, 10 of the 14 globally threatened bird species and 52 of the 122 Important Bird Areas in South Africa.

Since 1999, Komatiland Forests has taken a proactive approach to grassland conservation, and today grassland monitoring is done on an annual basis on several plantation forestry estates. To ensure sound management of these grasslands, knowledge of grasses and their habitat preferences, their usefulness to man (grazing) and their responses to various management practices is essential. As a result this monitoring was conducted by an independent consultant (Enviropulse cc)

A number of objectives have been identified in conjunction with the consultant:

- To obtain a high species diversity.
- To have high water catchment potential in the wet grasslands and wetlands.
- Reduce the fire risk to the surrounding timber plantations.

The status of the vegetation with regard to the realization of these management objectives can only be determined by this process of monitoring.

The Integrated System for Plant Dynamics (ISPD) is used. This is a qualitative degradation model, which is constructed specifically for each site, to determine if the management objectives are being achieved. The vegetation must be managed in such a way so as to encourage high diversity of short grassland and wetland species, but must not reach the climax or moribund stage of that specific grassland. The climax stage is reached should the area be over rested as a result in a low fire regime frequency.

In order to achieve the balance, the report provides management recommendations for the specific grassland surveyed. These recommendations must then be implemented by the plantation managers.

The following grasslands were monitored during this report period (1 April 2022 to 31 March 2024):

1. Belfast Plantation.
2. Jessievale Plantation and Grootvlei.
3. Spitskop Plantation.
4. Blyde Plantation and Lisbon Ridge.
5. Tweefontein Plantation.(Maliedyke)
6. Roburnia Plantation.
7. Uitsoek Plantation
8. Berlin (Blouswaelvlakte (DFFE reserve) and Kaapschehoop)
9. Nelshoogte
10. Witklip

11. Woodbush
12. Wilgeboom
13. Entabeni

In conjunction with the grassland assessments, the at selected sites, grazing capacity was also assessed. An assessment of the total plant species, i.e. grasses and forbs, on certain sites, was increased in order to identify the Total Species Richness and the Plant diversity.

During 2022/23, The Biodiversity Company was appointed to conduct the assessments. For the 2023/24 period, Ecoleges Environmental Consultants was appointed.

8.1.3.1. **Grassland monitoring results. The Biodiversity Company 2022/23**

Below is an extract from the report

> The biodiversity present on the SAFCOL green belts which have been surveyed is exceptional. Many of these areas are pristine grasslands, which represent isolated islands of biotic heritage. These areas must be maintained and where possible improved.
>
> From the previous 2020 surveys most of the sites have remained in a fairly stable condition. The most prolific problems are shrub encroachment and invasive alien plants, which threaten not only the grazing potential of the sites but also the rare and endangered plants known and unknown at these sites. Management intervention at the sites with encroaching indigenous and alien invasive plants is needed to restore these areas to pure grasslands and restore the functional integrity of the sites.
>
> Where rare plant populations are present such as the *Protea parvula* and *Aloe simii* populations, monitoring initiatives must be established and maintained as these can go a long way to improving the sustainability of the population.

The information in the tables, 2020 vs 2023, is a comparison from The Biodiversity Company who were successfully awarded the order in 2020 and 2023.

8.1.3.1.a. Belfast

Site 1:

Year	2020	2023	Year	2020	2023
Veld Condition Score	393	441	Canopy cover (%)	84	91

Grazing capacity (Ha/LSU)	2.90	2.66	**Basal cover (%)**	30	27
Grazing capacity	2.55	2.96	**Grass species richness**	20	23
			Dominant species	*Eragrostis curvula (12.5%) Digitaria tricholaenoides (9.5%)*	Digitaria monodactyla (11%)
Grazing capacity (Ha/LSU) Phytomass	3.64	2.85	**Other species richness**	N/A	N/A
Fuel Load (kg/ha)	2869	3663	**Total species richness**	N/A	N/A
Ecological state	Climax (58%) - Sub-climax (41%)	Climax (58%) - Sub-climax (40%)	**Shannons**	N/A	N/A
			True	N/A	N/A
Grazing status	Increaser 2 (44%)	Increaser 2 (42%)	**Simpsons**	N/A	N/A
Management recommendations:	Burn during 2023.				

Site 3:

Year	**2020**	**2023**	**Year**	**2020**	**2023**
Veld Condition Score	491	500	**Canopy cover (%)**	93	90
Grazing capacity (Ha/LSU)	2.16	2,54	**Basal cover (%)**	17	18
Grazing capacity	2.37	2,82	**Grass species richness**	13	*14*
			Dominant species	*Themeda triandra (25.56) Alloteropsis semialata (10%)*	Themeda triandra (26%)
Grazing capacity (Ha/LSU) Phytomass	3.04	2.36	**Other species richness**	18	20
Fuel Load (kg/ha)	3435	4431	**Total species richness**	31	34
Ecological state	Climax (94%)	Climax (97%)	**Shannons**	2.81	2.88
			True	16.61	17.87
Grazing status	Increaser 1 (53%)	Decreaser (67%)	**Simpsons**	0.90	0.91
Management recommendations:	Grazing is recommended. Burn during 2023.				

Site 5:

Year	**2020**	**2023**	**Year**	**2020**	**2023**
Veld Condition Score	553	553	**Canopy cover (%)**	84	86
Grazing capacity (Ha/LSU)	2.10	2.46	**Basal cover (%)**	23	22
Grazing capacity	2.28	2.7	**Grass species richness**	15	21

Grazing capacity (Ha/LSU) Phytomass	3.10	2.38	**Other species richness**	18	15
Fuel Load (kg/ha)	3368	4386	**Total species richness**	33	37
Ecological state	Climax (86%)	Climax (95%)	**Shannons**	2.72	2.68
			True	15.19	14.63
Grazing status	Decreaser (43%)	Decreaser (52%)	**Simpsons**	0.89	0.86
Management recommendations:	Burn in the 2023 winter season.				

Site 6:

Year	**2020**	**2023**	**Year**	**2020**	**2023**
Veld Condition Score	333	374	**Canopy cover (%)**	63	70
Grazing capacity (Ha/LSU)	2.48	2.39	**Basal cover (%)**	18	16
Grazing capacity	2.66	2.58	**Grass species richness**	12	14
			Dominant species	*Forbs (21%) Diheteropogon filifolius (20%) Cymbopogon pospischilii (11%)*	*Diheteropogon filifolius (18%)*
Grazing capacity (Ha/LSU) Phytomass	3.06	3.9	**Other species richness**	N/A	5
Fuel Load (kg/ha)	3406	2673	**Total species richness**	N/A	19
Ecological state	Climax (85%)	Climax (85%)	**Shannons**	N/A	2.55
			True	N/A	12.85
Grazing status	Increaser 1 (38%)/Increaser 3 (38%)	Increaser 1 (33%) - Increaser 3 (32%)	**Simpsons**	N/A	0.91
Management recommendations:	Grazing is recommended. Do not burn in 2023				

Site 7:

Year	**2020**	**2023**	**Year**	**2020**	**2023**
Veld Condition Score	336	372	**Canopy cover (%)**	94	97
Grazing capacity (Ha/LSU)	2.38	2.32	**Basal cover (%)**	29	23
Grazing capacity	2.66	2.58	**Grass species richness**	13	14

			Dominant species	Forbs (26%) Andropogon appendiculatus (26%) Tristachya leucothrix (5%)	*Andropogon appendiculatus* (14%)
Grazing capacity (Ha/LSU) Phytomass	1.82	1.83	**Other species richness**	N/A	N/A
Fuel Load (kg/ha)	5718	5702	**Total species richness**	N/A	N/A
Ecological state	Climax (90%)	Climax (95%)	**Shannons**	N/A	N/A
			True	N/A	N/A
Grazing status	Decreaser (38%) - Increaser 1 (35%) - Increaser 3 (34%)		**Simpsons**	N/A	N/A
Management recommendations:	Grazing is recommended. Burn in late winter 2023.				

8.1.3.1.b. Berlin Plantation (Blue Swallow Forest Nature Reserve (BSNR) and Kaapschehoop grasslands (KH))

Site 1 (BSNR):

Year	**2020**	**2023**	**Year**	**2020**	**2023**
Veld Condition Score	386	394	**Canopy cover (%)**	99	95
Grazing capacity (Ha/LSU)	2.50	2.5	**Basal cover (%)**	25	23
Grazing capacity	2.80	2.79	**Grass species richness**	20	17
			Dominant species	*Loudetia simplex (14.5%) Andropogon chinensis (14%)*	Rendlia altera (12%)
Grazing capacity (Ha/LSU) Phytomass	2.54	3.3	**Other species richness**	N/A	N/A
Fuel Load (kg/ha)	4111	3156	**Total species richness**	N/A	N/A
Ecological state	Climax (88%)	Climax (88%)	**Shannons**	N/A	N/A
			True	N/A	N/A
Grazing status	Increaser 1 (68%)	Increaser 2 (36%) - Increaser 1 (30%)	**Simpsons**	N/A	N/A
Management recommendations:	Do no burn during this year. Condition of this site is stable and has improved slightly. Site is dominated by *Rendlia altera*.				

Site 2 (BSNR):

Year	2020	2023	Year	2020	2023
Veld Condition Score	371	404	**Canopy cover (%)**	89	88
Grazing capacity (Ha/LSU)	2.84	2.77	**Basal cover (%)**	19	18
Grazing capacity	2.84	2.76	**Grass species richness**	19	14
			Dominant species	*Eragrostis curvula (33.5%) Forbs (17%)*	*Eragrostis curvula (49%)*
Grazing capacity (Ha/LSU) Phytomass	4.14	3.09	**Other species richness**	N/A	N/A
Fuel Load (kg/ha)	2518	3377	**Total species richness**	N/A	N/A
Ecological state	Sub-climax (60%)	Sub-climax (71%)	**Shannons**	N/A	N/A
			True	N/A	N/A
Grazing status	Increaser 2 (63%)	Increaser 2 (71%)	**Simpsons**	N/A	N/A

Management recommendations:	Burn during this year. Encroachment by *Phymaspermum acerosum* is evident, however since the 2020 surveys, the latest burning regime has helped control the encroachment somewhat and the veld condition has slightly improved. The site is still in a sub-climax condition and with good management can return to a climax dominated state.

Site 3 (BSNR):

Year	2020	2023	Year	2020	2023
Veld Condition Score	418	455	**Canopy cover (%)**	94	99
Grazing capacity (Ha/LSU)	2.73	2.65	**Basal cover (%)**	26	27
Grazing capacity	2.73	2.65	**Grass species richness**	16	*13*
			Dominant species	*Rendlia altera (28.5%) Forbs (18%)*	Rendlia altera (38%)
				Andropogon chinensis (11.5%)	
Grazing capacity (Ha/LSU) Phytomass	3.52	2.68	**Other species richness**	N/A	3
Fuel Load (kg/ha)	2960	3899	**Total species richness**	N/A	16
Ecological state	Climax (97%)	Climax (97%)	**Shannons**	N/A	2.09
			True	N/A	8.12
Grazing status	Increaser 1 (42%) - Increaser 3 (37%)	Increaser 3 (40%) - Increaser 1 (34%)	**Simpsons**	N/A	0.81

Management recommendations:	Burn this site this year if conditions permit. Site is dominated by *Rendlia altera* and *Loudetia simplex*.

Site 4 (BSNR):

Year	2020	2023	Year	2020	2023
Veld Condition Score	374	402	Canopy cover (%)	96	99
Grazing capacity (Ha/LSU)	2.53	2.47	Basal cover (%)	26	27
Grazing capacity	2.83	2.77	Grass species richness	14	*13*
			Dominant species	*Forbs (26.5 %) Rendlia altera (23.5 %) Tristachya leucothrix (9%)*	Rendlia altera (28%)
Grazing capacity (Ha/LSU) Phytomass	3.22	3.21	Other species richness	N/A	N/A
Fuel Load (kg/ha)	3240	3250	Total species richness	N/A	N/A
Ecological state	Climax (95%)	Climax (91%)	Shannons	N/A	N/A
			True	N/A	N/A
Grazing status	Increaser 1 (39%) - Increaser 3 (34%)	Increaser 1 (38%) - Increaser 3 (34%)	Simpsons	N/A	N/A
Management recommendations:	Do not burn in 2023. Vigour of the grasses is excellent. The site is in a stable condition consisting of mostly *Rendlia altera*, *Loudetia simplex* and *Themeda triandra*. Increasing the percentage of *Themeda triandra* will in the long term improve the grazing potential of the site.				

Site 5 (BSNR):

Year	2020	2023	Year	2020	2023
Veld Condition Score	491	347	Canopy cover (%)	99	94
Grazing capacity (Ha/LSU)	2.32	2.59	Basal cover (%)	17	20
Grazing capacity	2.58	2.9	Grass species richness	14	20
			Dominant species	*Themeda triandra (20%) Rendlia altera (16%)*	*Rendlia altera (14%) Eragrostis curvula (12%)*

Grazing capacity (Ha/LSU) Phytomass	2.59	3.5	**Other species richness**	N/A	N/A
Fuel Load (kg/ha)	4026	2983	**Total species richness**	N/A	N/A
Ecological state	Climax (91%)	Climax (68%)	**Shannons**	N/A	N/A
			True	N/A	N/A
Grazing status	Decreaser (40%)	Increaser 2 (30%) - Increaser 1 (24%) - Decreaser (23%) - Increaser 3 (22%)	**Simpsons**	N/A	N/A
Management recommendations:	Do not burn this year. Management of the encroaching *Phymaspermum acerosum* population will be needed. Some selective thinning is all that is currently needed.				

Site 6 (BSNR):

Year	**2020**	**2023**	**Year**	**2020**	**2023**
Veld Condition Score	484	460	**Canopy cover (%)**	99	100
Grazing capacity (Ha/LSU)	2.34	2.37	**Basal cover (%)**	17	17
Grazing capacity	2.60	2.64	**Grass species richness**	13	14
			Dominant species	*Rendlia altera (22%)*	*Loudetia simplex (24%)*
				Themeda triandra (19.5)	*Themeda triandra (21%)*
Grazing capacity (Ha/LSU) Phytomass	2.49	2.7	**Other species richness**	N/A	N/A
Fuel Load (kg/ha)	4184	3865	**Total species richness**	N/A	N/A
Ecological state	Climax (94%)	Climax (92%)	**Shannons**	N/A	N/A
			True	N/A	N/A
Grazing status	Increaser 1 (40%) - Decreaser (30%)	Increaser 1 (40%) - Decreaser (29%)	**Simpsons**	N/A	N/A
Management recommendations:	Burn in late winter 2023. This site has remained more or less in the same condition as in 2020.				

Site 7 (BSNR):

Year	2020	2023	Year	2020	2023
Veld Condition Score	340	411	**Canopy cover (%)**	90	93
Grazing capacity (Ha/LSU)	2.61	2.47	**Basal cover (%)**	16	17
Grazing capacity	2.91	2.75	**Grass species richness**	17	15
			Dominant species	*Forb (32%) Eragrostis curvula (15%) Tristachya leucothrix (10%)*	*Themeda triandra (16%)*
Grazing capacity (Ha/LSU) Phytomass	2.87	3.71	**Other species richness**	N/A	N/A
Fuel Load (kg/ha)	3639	2811	**Total species richness**	N/A	N/A
Ecological state	Climax (71%)	Climax (71%)	**Shannons**	N/A	N/A
			True	N/A	N/A
Grazing status	Increaser 1 (33%) - Increaser 2 (29%) - Decreaser (23%)	Decreaser (48%)	**Simpsons**	N/A	N/A
Management recommendations:	Do not burn. This site has improved markedly since the 2020 surveys. It has gone from a increaser dominated site to a decreaser dominated site. This is excellent and shows that with patience and good management, succession towards a good g				

Site 8 (BSNR):

Year	2020	2023	Year	2020	2023
Veld Condition Score	324	214	**Canopy cover (%)**	97	91
Grazing capacity (Ha/LSU)	2.62	2.88	**Basal cover (%)**	13	14
Grazing capacity	2.95	3.22	**Grass species richness**	15	
			Dominant species	*Forb (23.5%) Tristachya leucothrix*	Rendlia altera (13%)

				(16%) Rendlia altera (13%)	
Grazing capacity (Ha/LSU) Phytomass	2.63	3.36	**Other species richness**	N/A	16
Fuel Load (kg/ha)	3968	3101	**Total species richness**	N/A	34
Ecological state	Climax (94%)	Climax (94%)	**Shannons**	N/A	2.98
			True	N/A	19.77
Grazing status	Increaser 1 (65%)	Increaser 1 (74%)	**Simpsons**	N/A	0.94
Management recommendations:	Do not burn this year. There is a small encroachment threat from *Phymaspermum acerosum*. Monitoring of the extent and density of the Phymaspermum is advised.				

Site 1 (KH):

Year	**2020**	**2023**	**Year**	**2020**	**2023**
Veld Condition Score	240	321	**Canopy cover (%)**	68	72
Grazing capacity (Ha/LSU)	2.89	2.7	**Basal cover (%)**	18	14
Grazing capacity	3.18	2.96	**Grass species richness**	11	10
			Dominant species	*Melinis nerviglumis (32%) Forb (14%) Melinis repens (10.5%)*	*Melinis nerviglumis (42%)*
Grazing capacity (Ha/LSU) Phytomass	4.31	3.04	**Other species richness**	N/A	N/A
Fuel Load (kg/ha)	2417	3433	**Total species richness**	N/A	N/A
Ecological state	Climax (83%)	Climax (100%)	**Shannons**	N/A	N/A
			True	N/A	N/A
Grazing status	Increaser 1 (56%)	Increaser 1 (76%)	**Simpsons**	N/A	N/A
Management recommendations:	Do not burn this year.				

Site 2 (KH):

Year	**2020**	**2023**	**Year**	**2020**	**2023**
Veld Condition Score	447	493	**Canopy cover (%)**	97	93
Grazing capacity (Ha/LSU)	2.40	2.34	**Basal cover (%)**	15	27
Grazing capacity	2.67	2.58	**Grass species richness**	21	20

			Dominant species	*Rendlia altera (12.5%) Eragrostis curvula (10%)*	*Eragrostis curvula (21%)*
Grazing capacity (Ha/LSU) Phytomass	3.04	4.33	**Other species richness**	12	N/A
Fuel Load (kg/ha)	3427	2406	**Total species richness**	33	N/A
Ecological state	Climax (75%)	Climax (59%)	**Shannons**	3.05	N/A
			True	21.13	N/A
Grazing status	Increaser 1 (38%) - Decreaser/Increaser 3 (23%)	Increaser 2 (41%)	**Simpsons**	0.94	N/A
Management recommendations:	Do not burn this year. Site has improved slightly. Signs of encroachment, with the current bushes coppicing from the base after the last fire.				

Site 3 (KH):

Year	**2020**	**2023**	**Year**	**2020**	**2023**
Veld Condition Score	254	230	**Canopy cover (%)**	67	71
Grazing capacity (Ha/LSU)	2.87	2.91	**Basal cover (%)**	9	13
Grazing capacity	3.14	3.21	**Grass species richness**	13	*13*
			Dominant species	*Melinis nerviglumis (33%) Forb*	Melinis nerviglumis (33%)
				(19.5%) Sedge (10%) Loudetia flavida (9%)	
Grazing capacity (Ha/LSU) Phytomass	2.93	2.77	**Other species richness**	N/A	14
Fuel Load (kg/ha)	3562	3758	**Total species richness**	N/A	27
Ecological state	Climax (78%)	Climax (93%)	**Shannons**	N/A	2.33
			True	N/A	10.28
Grazing status	Increaser 1 (70%)	Increaser 1 (72%)	**Simpsons**	N/A	0.87
Management recommendations:	Burn in late winter 2023.				

Site 4 (KH):

Year	**2020**	**2023**	**Year**	**2020**	**2023**
Veld Condition Score	252	273	**Canopy cover (%)**	83	94
Grazing capacity (Ha/LSU)	2.81	2.74	**Basal cover (%)**	21	20
Grazing capacity	3.14	3.09	**Grass species richness**	11	*9*
			Dominant species	*Styppeiochloa gynoglossa (46.5%) Loudetia flavida (15.5%)*	*Styppeiochloa gynoglossa (42%)*

Grazing capacity (Ha/LSU)	4.31	2.21	**Other species richness**	N/A	4
Phytomass					
Fuel Load (kg/ha)	2417	4714	**Total species richness**	N/A	13
Ecological state	Climax (97%)	Climax (93%)	**Shannons**	N/A	1.77
			True	N/A	5.88
Grazing status	Increaser 1 (95%)	Increaser 1 (97%)	**Simpsons**	N/A	0.77

Management recommendations:	Burn this year if conditions are acceptable. The veld condition has improved slightly since the 2020 surveys.

8.1.3.1.c. Blyde Plantation.

Site 1:

Year	**2020**	**2023**	**Year**	**2020**	**2023**
Veld Condition Score	341	243	**Canopy cover (%)**	77	72
Grazing capacity (Ha/LSU)	3.557427534	3.97	**Basal cover (%)**	18	12
Grazing capacity	4.02	4.54	**Grass species richness**	19	18
			Dominant species	*Panicum natalense (18%) Loudetia simplex, Tristachya leucothrix (8%)*	*Styppeiochloa gynoglossa* (11%)
Grazing capacity (Ha/LSU)	2.60	3.11	**Other species richness**	N/A	3
Phytomass					
Fuel Load (kg/ha)	4011	3357	**Total species richness**	N/A	21
Ecological state	Climax (80%)	Climax (84%)	**Shannons**	N/A	2.51
			True	N/A	12.31
Grazing status	Increaser 1 (44%) - Decreaser (34%)	Increaser 1 (48%) - Increaser 2 (28%)	**Simpsons**	N/A	0.88

Management and burning recommendations:	Burn late winter 2023. Grazing is recommended.

Site 2:

Year	2020	2023	Year	2020	2023
Veld Condition Score	354	366	**Canopy cover (%)**	99	97
Grazing capacity (Ha/LSU)	3.43	3.40	**Basal cover (%)**	24	31
Grazing capacity	3.96	3.91	**Grass species richness**	16	17
			Dominant species	*Loudetia simplex (22.5%) Rendlia altera (20%)*	*Rendlia altera (20%)*
Grazing capacity (Ha/LSU) Phytomass	2.47	3.13	**Other species richness**	9	12
Fuel Load (kg/ha)	4220	3330	**Total species richness**	25	29
Ecological state	Climax (96%)	Climax (99%)	**Shannons**	2.42	2.8
			(True)	11.24	16.42
Grazing status	Increaser 1 (46%)	Increaser 3 (35%)	**Simpsons**	0.87	0.92
Management and burning recommendations:	Do not burn this year. Pristine high altitude grassland. Has a poor to moderate grazing potential. Grazing is however encouraged.				

Site 3:

Year	2020	2023	Year	2020	2023
Veld Condition Score	170	141	**Canopy cover (%)**	63	64
Grazing capacity (Ha/LSU)	4.38	4.53	**Basal cover (%)**	17	14
Grazing capacity	5.02	5.24	**Grass species richness**	12	11
			Dominant species	*Loudetia simplex (17%) Trichopteryx dregeana (14.5)*	*Trichopteryx dregeana (19%)*
Grazing capacity (Ha/LSU) Phytomass	2.82	2.58	**Other species richness**	N/A	21
Fuel Load (kg/ha)	3698	4040	**Total species richness**	N/A	32
Ecological state	Climax (70%)	Climax (55%)	**Shannons**	N/A	2.64
			(True)	N/A	14
Grazing status	Increaser 1 (84%)	Increaser 1 (56%)	**Simpsons**	N/A	0.88
Management and burning recommendations:	Burn late winter 2023. Grazing is recommended. Grazing potential is poor.				

8.1.3.1.d. Blyde Plantation (Lisbon Ridge)

Site 1:

Year	2020	2023	Year	2020	2023
Veld Condition Score	430	409	Canopy cover (%)	93	96
Grazing capacity (Ha/LSU)	3.57	4.08	Basal cover (%)	23	28
Grazing capacity	3.64	3.72	Grass species richness	16	16
			Dominant species	*Rendlia altera (26%) Eragrostis racemosa (10.5%)*	*Rendlia altera (32%)*
Grazing capacity (Ha/LSU) Phytomass	2.99	2.76	Other species richness	8	10
Fuel Load (kg/ha)	3493	3781	Total species richness	24	26
Ecological state	Climax (85%)	Climax (93%)	Shannons	2.53	2.32
			True	12.60	10.12
Grazing status	Increaser 3 (28%) - Increaser 1 (26%)	Increaser 2 (32%) - Increaser 3 (38%)	Simpsons	0.89	0.85

Management recommendations:	Grazing should be permitted. Site is in a stable condition. The near threatened *Protea parvula* was present at this site.
Burning recommendations	Burn this year if weather conditions are acceptable.

Site 2:

Year	2020	2023	Year	2020	2023
Veld Condition Score	534.5	504	Canopy cover (%)	99	95
Grazing capacity (Ha/LSU)	2.91	3.00	Basal cover (%)	24	17
Grazing capacity	3.28	3.37	Grass species richness	14	13
			Dominant species	*Themeda triandra (34%) Loudetia simplex (14%)*	*Themeda triandra (36%)*
Grazing capacity (Ha/LSU) Phytomass	2.34	2.09	Other species richness	N/A	12
Fuel Load (kg/ha)	4449	4989	Total species richness	N/A	25
Ecological state	Climax (91%)	Climax (89%)	Shannons	N/A	2.37
			True	N/A	10.65
Grazing status	Decreaser (53%) Increaser 1 (33%)	Decreaser (45%) - Increaser 2 (29%)	Simpsons	N/A	0.83

Management and burning recommendations:	Burn in mid - late winter 2023. Moribund. Bramble is invading the site. Control measures are needed..

Site 3b:

Year	2020	2023	Year	2020	2023
Veld Condition Score	361.5	271	**Canopy cover (%)**	91	92
Grazing capacity (Ha/LSU)	4.29	4.18	**Basal cover (%)**	14	17
Grazing capacity	3.92	4.37	**Grass species richness**	16	22
			Dominant species	*Styppeiochloa gynoglossa (21.5%) Eragrostis racemosa (17.5%)*	*Loudetia flavida (21%)*
Grazing capacity (Ha/LSU) Phytomass	4.70	3.93	**Other species richness**	12	13
Fuel Load (kg/ha)	2220	2655	**Total species richness**	28	35
Ecological state	Climax (58%) - Sub-climax (41%)	Climax (76%)	**Shannons**	2.44	2.87
			True	11.51	17.6
Grazing status	Increaser 1 (47%) - Increaser 2 (41%)	Increaser 2 (57%)	**Simpsons**	0.88	0.91
Management and burning recommendations:	Do not burn in 2023. Overall condition is moderate. Not moribund. Grazing should be permitted. Exceptional diversity at this site.				

Site 4:

Year	2020	2023	Year	2020	2023
Veld Condition Score	462	380	**Canopy cover (%)**	95	95
Grazing capacity (Ha/LSU)	3.11	3.36	**Basal cover (%)**	26	25
Grazing capacity	3.52	3.84	**Grass species richness**	14	17
			Dominant species	*Rendlia altera (27%) Tristachya leucothrix (11.5%)*	*Rendlia altera (24%)*
Grazing capacity (Ha/LSU) Phytomass	2.91	3.56	**Other species richness**	N/A	5
Fuel Load (kg/ha)	3580	2930	**Total species richness**	N/A	22
Ecological state	Climax (96%)	Climax (95%)	**Shannons**	N/A	2.58
			True	N/A	13.15
Grazing status	Increaser 3 (35%) - Decreaser (32%)	Increaser 3 (36%) - Decreaser (29%)	**Simpsons**	N/A	0.89
Management and burning recommendations:	Not moribund. Do not burn in 2023. Grazing should be allowed. Bramble and bracken fern should be removed.				

8.1.3.1.e. Entabeni Plantation

Site 1: Ebbe Dam

Year	2020	2023	Year	2020	2023
Veld Condition Score	401	423	Canopy cover (%)	79	91
Grazing capacity (Ha/LSU)	2.77	2.69	Basal cover (%)	39	35
Grazing capacity	3.06	3.00	Grass species richness	10	12
			Dominant species	*Eragrostis plana (40%)*	*Eragrostis plana (52%)*
Grazing capacity (Ha/LSU) Phytomass	20.86	9.69	Other species richness	5	10
Fuel Load (kg/ha)	<500	2883	Total species richness	15	22
Ecological state	Sub-climax (74%)	Sub-climax (90%)	Shannons	1.96	1.85
			True	7.07	6.41
Grazing status	Increaser 2 (85%)	Increaser 2 (98%)	Simpsons	0.79	0.70
Management recommendations:	A grazing lawn has formed, dominated by increaser 2 species. Attempt to implement some form of rotational grazing where the veld can rest from continuous grazing. This will improve the veld condition, canopy cover and grass vigour, not to mention the performance of the grazing animals themselves.				
Burning recommendations	Do not burn during the 2022/2023 season. Under the current grazing regime burning will not be possible.				

Site 2: Kliphuis

Year	2020	2023	Year	2020	2023
Veld Condition Score	194	186.36	Canopy cover (%)	48	73
Grazing capacity (Ha/LSU)	15.40	3.19	Basal cover (%)	10	8
Grazing capacity	27.97	3.78	Grass species richness	14	10
			Dominant species	*Loudetia flavida (52%)*	*Loudetia simplex (43%)*
Grazing capacity (Ha/LSU) Phytomass	20.86	7.68	Other species richness	16	22
Fuel Load (kg/ha)	<1500	1357	Total species richness	30	32
Ecological state	Climax (73%)	Climax (76%)	Shannons	2.12	2.38
			True	8.36	10.78
Grazing status	Increaser 2 (91%)	Increaser 2 (96%)	Simpsons	0.72	0.79
Management recommendations:	Continuous grazing is suppressing the production of sufficient grass. This build up in order to allow for later burns so as to suppress the encroachment of *Helichrysum kraussii* and *Tetraselago natalensis* evident in the above photo.				
Burning recommendations	Do not burn during the 2022/2023 season. Under the current grazing regime burning will not be possible. Management intervention to thin out the shrub encroachment is needed.				

Site 3: Aloe vossii

Year	2020	2023	Year	2020	2023
Veld Condition Score	247.5	296	**Canopy cover (%)**	69	69
Grazing capacity (Ha/LSU)	12.63	3.06	**Basal cover (%)**	15	15
Grazing capacity (Ha/LSU)	19.53	3.38	**Grass species richness**	17	14
			Dominant species	*Loudetia flavida (19%)*	Paspalum scrobiculatum (19%)
Grazing capacity (Ha/LSU) Phytomass	20.86	5.45	**Other species richness**	26	33
Fuel Load (kg/ha)	<500	1912	**Total species richness**	43	47
Ecological state	Climax (48%)	Climax (30%) - Sub-climax (66%)	**Shannons**	3.17	3.18
			True	23.81	23.95
Grazing status	Increaser 2 (51%)	Increaser 2 (90%)	**Simpsons**	0.94	0.93
Management recommendations:	Allow the site to rest from selective grazing. Remove the cattle to allow the grass material to build up. Grass material needs to build up in order to allow for later burns so as to suppress the invasion of various *Helichrysum* species evident in the above photo.				
Burning recommendations	Do not burn during the 2022/2023 season. Under the current grazing regime burning will not be possible. Management intervention to thin out the shrub encroachment is needed.				

8.1.3.1.f. Jessievale Plantation

Site 1:

Year	2020	2023	Year	2020	2023
Veld Condition Score	397	506	**Canopy cover (%)**	86	95
Grazing capacity (Ha/LSU)	1.74	1.64	**Basal cover (%)**	21	31
Grazing capacity	1.88	1.78	**Grass species richness**	21	*20*
			Dominant species	*Digitaria tricholaenoides (19.5%) Tristachya leucothrix (8.5%)*	*Themeda triandra (13%)*
Grazing capacity (Ha/LSU) Phytomass	3.31	2.66	**Other species richness**	NA	N/A
Fuel Load (kg/ha)	3153	3911	**Total species richness**	NA	N/A
Ecological state	Climax (94%)	Climax (98%)	**Shannons**	NA	N/A
			True	N/A	N/A
Grazing status	Decreaser (48%) - Increaser 1 (37%)	Decreaser (46%) - Increaser 1 (44%)	**Simpsons**	NA	N/A
Management recommendations:	Grazing is recommended. Burn this site this year if the conditions permit. Veld is in a good condition				

Site 2:

Year	2020	2023	Year	2020	2023
Veld Condition Score	442	482	**Canopy cover (%)**	93	99
Grazing capacity (Ha/LSU)	1.69	1.65	**Basal cover (%)**	21	32
Grazing capacity	1.84	1.8	**Grass species richness**	19	16
			Dominant species	*Rendlia altera (28%) Tristachya leucothrix (11.5)*	*Rendlia altera (24%)*
Grazing capacity (Ha/LSU) Phytomass	3.52	2.79	**Other species richness**	8	5
Fuel Load (kg/ha)	2966	3737	**Total species richness**	27	21
Ecological state	Climax (84%)	Climax (84%)	**Shannons**	2.59	2.61
			True	13.29	13.61
Grazing status	Increaser 3 (30%) - Decreaser (27%) - Increaser 1 (26%)	Decreaser (31%) - Increaser 1 (28%) - Increaser 3 (26%)	**Simpsons**	0.88	0.9
Management recommendations:	Burn in 2023.				

Site 3:

Year	2020	2023	Year	2020	2023
Veld Condition Score	523	500	**Canopy cover (%)**	87	94
Grazing capacity (Ha/LSU)	1.64	1.64	**Basal cover (%)**	21	22
Grazing capacity	1.76	1.78	**Grass species richness**	21	21
			Dominant species	*Themeda triandra (22%) Rendlia altera (7.5)*	Themeda triandra (27%)
Grazing capacity (Ha/LSU) Phytomass	2.75	2.32	**Other species richness**	N/A	18
Fuel Load (kg/ha)	3789	4486	**Total species richness**	N/A	39
Ecological state	Climax (81%)	Climax (91%)	**Shannons**	N/A	2.69
			True	N/A	14.82
Grazing status	Decreaser (50%)	Decreaser (55%) - Increaser 1 (25%)	**Simpsons**	N/A	0.88
Management recommendations:	Grazing is recommended. Burn in late winter 2023. Veld is in a good condition.				

8.1.3.1.g. Jessievale Plantation (Grootvlei)

Site GV1:

Year	2020	2023	Year	2020	2023
Veld Condition Score	610	553	**Canopy cover (%)**	92	84
Grazing capacity (Ha/LSU)	1.56	1.61	**Basal cover (%)**	18	26
Grazing capacity	1.69	1.73	**Grass species richness**	17	17
			Dominant species	*Themeda triandra (25%) Panicum natalense (9%)*	Themeda triandra (22%)
Grazing capacity (Ha/LSU) Phytomass	2.94	3.57	**Other species richness**	10	11
Fuel Load (kg/ha)	3551	2917	**Total species richness**	27	28
Ecological state	Climax (88%)	Climax (88%)	**Shannons**	2.65	2.83
			True	14.22	16.9
Grazing status	Decreaser (72%)	Decreaser (57%)	**Simpsons**	0.90	0.92

Management recommendations:	Grazing is recommended. Do not burn in 2023. Veld is in a good condition. Good diversity of grasses.

Site GV2:

Year	2020	2023	Year	2020	2023
Veld Condition Score	438	499	**Canopy cover (%)**	75	88
Grazing capacity (Ha/LSU)	1.73	1.65	**Basal cover (%)**	17	29
Grazing capacity	1.84	1.78	**Grass species richness**	25	23
			Dominant species	*Tristachya leucothrix (10%) Rendlia altera (9.5%)*	Digitaria tricholaenoides (14%)
Grazing capacity (Ha/LSU) Phytomass	5.34	2.56	**Other species richness**	N/A	2
Fuel Load (kg/ha)	1952	4064	**Total species richness**	N/A	25
Ecological state	Climax (74%)	Climax (83%)	**Shannons**	N/A	2.78
			True	N/A	16.15
Grazing status	Increaser 1 (35%) - Decreaser (26%)	Increaser 1 (33%) - Decreaser (30%)	**Simpsons**	N/A	0.93

Management recommendations:	Since the 2020 surveys, the veld has recover substantially, especially the borrow pit adjacent to the site. Burn during the 2022/2023 season.

Site GV3:

Year	2020	2023	Year	2020	2023
Veld Condition Score	386	428	**Canopy cover (%)**	87	84
Grazing capacity (Ha/LSU)	1.75	1.71	**Basal cover (%)**	12	17
Grazing capacity	1.89	1.85	**Grass species richness**	23	19
			Dominant species	*Digitaria tricholaenoides (8.24%) Alloteropsis semialata (7.69)*	Panicum natalense (16%)
Grazing capacity (Ha/LSU) Phytomass	2.80	2.17	**Other species richness**	17	14
Fuel Load (kg/ha)	3718	4804	**Total species richness**	40	33
Ecological state	Climax (83%)	Climax (88%)	**Shannons**	3.18	2.9
			True	24.15	18.22
Grazing status	Decreaser (40%)	Decreaser (53%)	**Simpsons**	0.96	0.95
Management recommendations:	Grazing is recommended. Burn in late 2023. Veld is in a good condition.				

Site GV4:

Veld Condition Score	586	**Canopy cover (%)**	97
Grazing capacity (Ha/LSU)	1.57	**Basal cover (%)**	17
Grazing capacity	1.71	**Grass species richness**	16
		Dominant species	*Themeda triandra (38%)*
Grazing capacity (Ha/LSU) Phytomass	1.75	**Other species richness**	10
Fuel Load (kg/ha)	5934	**Total species richness**	26
Ecological state	Climax (99%)	**Shannons**	2.41
		True	11.18
Grazing status	Decreaser (62%)	**Simpsons**	0.82
Management recommendations:	Grazing is recommended. Lots of moribund material is present. This site must burn this year.. Veld is in a good condition.		

Site GV5:

Year	2020	2023	Year	2020	2023
Veld Condition Score	410	432	**Canopy cover (%)**	98	97
Grazing capacity (Ha/LSU)	1.71	1.69	**Basal cover (%)**	11	20
Grazing capacity	1.87	1.85	**Grass species richness**	21	18
			Dominant species	*Eragrostis curvula (13.14%) Tristachya leucothrix (12.57%)*	*Eragrostis curvula (16%)*
Grazing capacity (Ha/LSU) Phytomass	2.72	2.49	**Other species richness**	11	15
Fuel Load (kg/ha)	3831	4196	**Total species richness**	32	33
Ecological state	Climax (72%)	Climax (73%)	**Shannons**	2.97	2.95
			True	19.39	19.18
Grazing status	Increaser 1 (40%)	Decreaser (44%)	**Simpsons**	0.94	0.93
Management recommendations:	Grazing is recommended. Burn in late winter 2023.				

Site GV6:

Year	2020	2023	Year	2020	2023
Veld Condition Score	462	360	**Canopy cover (%)**	97	94
Grazing capacity (Ha/LSU)	1.67	1.76	**Basal cover (%)**	7	18
Grazing capacity	1.82	1.92	**Grass species richness**	26	*19*
			Dominant species	*Brachiaria serrata (17.5%) Setaria sphacelata var. sphacelata (13.5%)*	Setaria sphacelata var. sphacelata (16%)
Grazing capacity (Ha/LSU) Phytomass	2.53	2,91	**Other species richness**	22	N/A
Fuel Load (kg/ha)	4121	3588	**Total species richness**	48	N/A
Ecological state	Climax (93%)	Climax (95%)	**Shannons**	3.20	N/A
			True	24.42	N/A
Grazing status	Decreaser (63%)	Decreaser (66%)	**Simpsons**	0.94	N/A
Management recommendations:	Do not burn during this year. Veld is in a much better condition. The bramble is severely reduced.				

8.1.3.1.h. Spitskop Plantation

Site 1:

Year	2020	2023	Year	2020	2023
Veld Condition Score	400	432	Canopy cover (%)	91	94
Grazing capacity (Ha/LSU)	2.52	2,46	Basal cover (%)	15	20
Grazing capacity	2.21	2,16	Grass species richness	22	24
			Dominant species	*Loudetia simplex (18.5) Digitaria monodactyla (17%)*	Loudetia flavida (23%)
Grazing capacity (Ha/LSU) Phytomass	3.57	2,15	Other species richness	N/A	11
Fuel Load (kg/ha)	2919	4840	Total species richness	N/A	35
Ecological state	Climax (67%)	Climax (86%)	Shannons	N/A	2,59
			True	N/A	13,37
Grazing status	Increaser 2 (34%) – Increaser 1 (33%)	Increaser 2 (40%) - Decreaser (26%)	Simpsons	N/A	0,88
Management recommendations:	Burn in 2023 if conditions permit. Condition of the site is improving. This site has a high diversity of grasses.				

Site 2:

Year	2020	2023	Year	2020	2023
Veld Condition Score	533	511	Canopy cover (%)	94	97
Grazing capacity (Ha/LSU)	1.87	1,88	Basal cover (%)	16	20

Grazing capacity	2.04	2.06	**Grass species richness**	21	21
			Dominant species	*Themeda triandra (29.5%) Tristachya leucothrix (15.5%)*	*Themeda triandra (29%)*
Grazing capacity (Ha/LSU) Phytomass	3.00	2.68	**Other species richness**	N/A	11
Fuel Load (kg/ha)	3480	3888	**Total species richness**	N/A	32
Ecological state	Climax (94%)	Climax (99%)	**Shannons**	N/A	2,61
			(True)		13,7
Grazing status	Decreaser (48%) - Increaser 1 (35%)	Decreaser (50%)	**Simpsons**	N/A	0,87
Management recommendations:	Burn this year if conditions are acceptable. Veld condition is stable. No encroachment.				

8.1.3.1.i. Tweefontein Plantation (Maliedyke)

Site 4:

Year	**2020**	**2023**	**Year**	**2020**	**2023**
Veld Condition Score	628	363	**Canopy cover (%)**	98	100
Grazing capacity (Ha/LSU)	1.72	2.8	**Basal cover (%)**	27	39
Grazing capacity	1.87	3.17	**Grass species richness**	12	7
			Dominant species	*Sporobolus centrifugus (66%) Sporobolus sanguineus (11%)*	*Sporobolus centrifugus (73%)*
Grazing capacity (Ha/LSU) Phytomass	2.47	3	**Other species richness**	4	3
Fuel Load (kg/ha)	4221	3484	**Total species richness**	16	10
Ecological state	Climax (95%)	Climax (93%)	**Shannons**	1.38	1.03
			True	3.96	2.8
Grazing status	Increaser 1 (95%)	Increaser 2 (81%)	**Simpsons**	0.55	0.45
Management recommendations:	Grazing is recommended. Burn during winter 2023 if possible.				

Site 5:

Year	2020	2023	Year	2020	2023
Veld Condition Score	497	412	**Canopy cover (%)**	100%	99%
Grazing capacity (Ha/LSU)	1.83	2,7	**Basal cover (%)**	32%	21%
Grazing capacity	2.01	3,03	**Grass species richness**	16	17
			Dominant species	*Rendlia altera (29.5%)*	*Themeda triandra (23%)*
				Themeda triandra (24%)	
Grazing capacity (Ha/LSU) Phytomass	1.75	2,92	**Other species richness**	7	8
Fuel Load (kg/ha)	5972	3576	**Total species richness**	23	25
Ecological state	Climax (96%)	Climax (95%)	**Shannons**	2.09	2,48
			True	8.11	11,97
Grazing status	Increaser 1 (35%) - Increaser 3 (32%) - Decreaser (30%)	Increaser 1 (35%) - Increaser 3 (25%) - Decreaser (33%)	**Simpsons**	0.82	0,88
Management and burning recommendations:	Grazing is recommended. Bracken fern is encroaching at an alarming rate, Immediate removal is needed. Do not burn this year.				

Site 6:

Year	2020	2023	Year	2020	2023
Veld Condition Score	543	547	**Canopy cover (%)**	100	100
Grazing capacity (Ha/LSU)	1.79	1,79	**Basal cover (%)**	24	25
Grazing capacity	1.96	1,95	**Grass species richness**	14	14
			Dominant species	*Rendlia altera (21%) Themeda triandra (18.5)*	*Themeda triandra (24%)*
Grazing capacity (Ha/LSU) Phytomass	2.62	3,21	**Other species richness**	10	11
Fuel Load (kg/ha)	3975	3246	**Total species richness**	24	25
Ecological state	Climax (97%)	Climax (96%)	**Shannons**	2.52	2,49
			True	12.39	12,1
Grazing status	Decreaser (46%) - Increaser 3 (29%)	Decreaser (43%) - Increaser 3 (32%)	**Simpsons**	0.89	0,87
Management recommendations:	Veld in excellent condition. Heavier grazing was evident. Burn in 2023 if weather permits.				

8.1.3.1.j. Uitsoek Plantation

Site 1:

Year	2020	2023	Year	2020	2023
Veld Condition Score	435	357	**Canopy cover (%)**	96	88
Grazing capacity (Ha/LSU)	3.11	3,36	**Basal cover (%)**	20	30
Grazing capacity	3.52	3.82	**Grass species richness**	18	13
			Dominant species	*Rendlia altera (27%) Loudetia simplex (13%)*	*Rendlia altera (23%)*
Grazing capacity (Ha/LSU) Phytomass	2.35	2.75	**Other species richness**	17	11
Fuel Load (kg/ha)	4431	3788	**Total species richness**	35	24
Ecological state	Climax (99%)	Climax (100%)	**Shannons**	2.68	2,72
			(True)	14.58	15,23
Grazing status	Increaser 3 (41%) - Decreaser (29%) - Increaser 1 (24%)	Increaser 3 (37%)	**Simpsons**	0.89	0,91
Management recommendations:	Burn late winter 2023				

Site 4:

Year	2020	2023	Year	2020	2023
Veld Condition Score	520	488	**Canopy cover (%)**	98	82
Grazing capacity (Ha/LSU)	3.20	3,34	**Basal cover (%)**	24	23
Grazing capacity	3.24	3,34	**Grass species richness**	23	16
			Dominant species	*Rendlia altera (15%) Andropogon chinensis (13%)*	*Themeda triandra (20%); Rendlia altera (20%)*
Grazing capacity (Ha/LSU) Phytomass	3.65	3,86	**Other species richness**	2	11
Fuel Load (kg/ha)	2854	2702	**Total species richness**	25	27
Ecological state	Climax (85%)	Climax (93%)	**Shannons**	2.72	2,64
			True	15.20	14,01
Grazing status	Increaser 1 (34%) - Decreaser (29%) - Increaser 3 (20%) - Increaser 2 (19%)	Decreaser (33%) - Increaser 3 (29%) - Increaser 2 (27%)	**Simpsons**	0.91	0,9
Management recommendations:	Grazing is recommended. Do not burn in 2023. High diversity in pristine high altitude grasslands.				

Site 12:

Year	2020	2023	Year	2020	2023
Veld Condition Score	448	470	Canopy cover (%)	95	79
Grazing capacity (Ha/LSU)	3.07	3,07	Basal cover (%)	29	24
Grazing capacity	3.48	3,4	Grass species richness	14	*16*
			Dominant species	*Rendlia altera (19.5%) Themeda triandra (15.5%)*	*Andropogon schirensis (17%)*
Grazing capacity (Ha/LSU) Phytomass	3.32	3,57	Other species richness	5	11
Fuel Load (kg/ha)	3144	2917	Total species richness	19	27
Ecological state	Climax (92%)	Climax (90%)	Shannons	2.48	2,7
			True	12	14,89
Grazing status	Increaser 1 (31%) - Increaser 3 (27%) - Decreaser (26%) - Increaser 2 (16%)	Increaser 1 (38%) - Increaser 3 (21%) - Decreaser (25%) - Increaser 2 (16%)	Simpsons	0.90	0,91
Management recommendations:	Do no burn in 2023. Excellent pristine grassland.. Condition of the site is improving.				

8.1.3.1.k. Wilgeboom Plantation

Site 2:

Year	2020	2023	Year	2020	2023
Veld Condition Score	394.5	328	Canopy cover (%)	99	91
Grazing capacity (Ha/LSU)	3.30	2.9	Basal cover (%)	5	13
Grazing capacity	3.78	3.27	Grass species richness	11	12
			Dominant species	*Paspalum scrobiculatum (20%) Pteridium aquilinum (Forb) (14%)*	Unknown grass species (26%)
Grazing capacity (Ha/LSU) Phytomass	N/A	5.62	Other species richness	7	11
Fuel Load (kg/ha)	N/A	1855	Total species richness	18	23
Ecological state	Sub-climax (63%) - Climax (36%)	Sub-climax (47%) - Pioneer (41%)	Shannons	2.48	2.35
			True	11.95	10.35
Grazing status	Increaser 2 (54%)	Increaser 2 (91%)	Simpsons	0.90	0.86
Management recommendations:	Site has low grass species richness due to some form of disturbance thus it is recommended that management use grazing and resting in combination with fire to increase the diversity and vigour of the grasses.				

8.1.3.1.l. Woodbush Plantation

Site 1:

Year	2020	2023	Year	2020	2023
Veld Condition Score	383.5	333	**Canopy cover (%)**	89	95
Grazing capacity (Ha/LSU)	1.16	1.17	**Basal cover (%)**	20	10
Grazing capacity	1.24	1.26	**Grass species richness**	14	18

			Dominant species	*Panicum ecklonii (11.5%) Loudetia flavida (10.5%)*	*Loudetia simplex (21%)*
Grazing capacity (Ha/LSU) Phytomass	3.32	2.54	**Other species richness**	13	16
Fuel Load (kg/ha)	3145	4094	**Total species richness**	27	34
Ecological state	Climax (87%)	Climax (83%)	**Shannons**	2.89	2.82
			True	18.06	16.79
Grazing status	Decreaser (40%) Increaser 1 (33%)	Decreaser (31%) - Increaser 2 (33%)	**Simpsons**	0.94	0.91

Management recommendations:	Overall condition is average. Moribund material present. Grazing should be permitted. Bracken fern infestation should be thinned or completely removed.
Burning recommendations	Burn if weather conditions are acceptable.

Site 2:

Year	2020	2023	Year	2020	2023
Veld Condition Score	496	275	**Canopy cover (%)**	96	100

Grazing capacity (Ha/LSU)	1.11	1.19	**Basal cover (%)**	29	22
Grazing capacity	1.19	1.28	**Grass species richness**	16	13
			Dominant species	Monocymbium ceresiiforme (13%) *Eragrostis racemosa (11%)*	*Digitaria maitlandii* (24%)
Grazing capacity (Ha/LSU) Phytomass	3.61	2.77	**Other species richness**	13	12
Fuel Load (kg/ha)	2887	3758	**Total species richness**	29	25
Ecological state	Climax (87%)	Climax (88%)	**Shannons**	2.86	2.38
			True	17.53	10.88
Grazing status	Decreaser (32%) Increaser 1 (28%)	Decreaser (40%) - Increaser 2 (28%)	**Simpsons**	0.93	0.87

Management recommendations:	Overall condition is good. Not moribund. Grazing should be permitted.
Burning recommendations	Do not burn during the 2022/2023 season.

8.1.3.2. Grassland monitoring results. Ecoleges Environmental Consultants 2023/23.

8.1.3.2.a. Belfast

Site 1

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	20 species (24 incl. <1% species) = High (Medium)
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Digitaria monodactyla* (*One-Finger Grass*) – 31% • *Eragrostis racemosa* (Narrow Heart Love Grass) – 7% • *Microchloa caffra* (Pinchusion Grass) – 7%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.5 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	2 913 kg/ha = Medium
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	33 species (39 incl. <1% species) = Medium
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.77 = Medium
HERB SPECIES DIVERSITY TREND	While the herbaceous species trend indicates improvement since the last survey in 2019, the time elapsed is too long to draw a definitive conclusion.
VELD CONDITION (according to Tainton, 1988)	DEGRADED/ SELECTIVELY GRAZED
VELD CONDITION TREND	Trend negative. The abundance of Increaser 1 species has significantly decreased, while Increaser 2 species have increased. Within the Increaser 1 category, *Panicum natalense* exhibited the most substantial decline. Conversely, *Digitaria monodactyla* demonstrated the greatest increase among the Increaser 2 species. Selective grazing continues to occur. Phytomass within acceptable norms.
CURRENT GRAZING CAPACITY	Not assessed

Site 3

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	8 species (9 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Themeda triandra* (Rooigras) – 75% • *Setaria nigrirostris* (Rootstock Manna Grass) – 9% • *Tristachya leucothrix* (Hairy Trident Grass) – 4%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.0 cm = Low
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 446 kg/ha = High
VELD CONDITION (according to Tainton, 1988)	GOOD
VELD CONDITION TREND	Veld condition is stable. Fluctuations within the frequency abundance recorded of grass species do not suggest trend. Sustained high phytomass is observed, which could be detrimental to the veld condition over the long term.
CURRENT GRAZING CAPACITY	0.233 LSU/ha or 4.3 ha/LSU (Tainton's method) & 0.25 LSU/ha or 4.0 ha/LSU (Danckwerts's Key Species method) – in the absence of a rotational grazing system, apply stocking rate that corresponds to 50% of the current grazing capacity.

Site 5

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	19 species (23 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Themeda triandra* (Rooigras) – 25% • *Digitaria tricholaenoides* (Purple-seed Finger Grass) –21% • *Heteropogon contortus* (Tangleshead / Pylgras) – 14%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.6 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 618kg/ha =Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	GOOD
VELD CONDITION TREND	VCA trend negative on long term. A slight deterioration of the grass basal cover on the long term is observed while there was an improvement observed in grass species richness and diversity. Phytomass very high. Veld condition still better compared to firebreak. *Senecio inornatus* in abundance, about 35 individuals/100m² halfway through transec. Compare firebreak on south of paved road with the north of the paved road in terms of abundance of *Senecio inornatus*. Grass structure: Uniformly short Organic material on soil surface: 2/5 = Low Droppings: 0/100m²
CURRENT GRAZING CAPACITY	0.219 LSU/ha or 4.6 ha/LSU (Tainton's method) & 0.226 LSU/ha or 4.4 ha/LSU (Danckwerts's Key Species method) – in the absence of a rotational grazing system, apply stocking rate that corresponds to 50% of the current grazing capacity.

Site 6

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	17 (20) species = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Digitaria monodactyla* (One Finger Grass) – 28% • *Melinis nerviglumis* (Bristle-leaved Red Top) –20% • *Aristida transvaalensis* (Rock Three Awn) –19%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.3 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	2 649 kg/ha = Moderate
VELD CONDITION (according to Tainton, 1988)	Climax/Selectively Grazed. [Selectively grazed, for there is no proportion in composition comprised of Decreasers and high proportion Increaser 1 and 2 species].
VELD CONDITION TREND	Trend stable within the selectively Grazed zone. Increaser 1 contribution (Climax) over years seemed to be stable. Phytomass within acceptable norms.
CURRENT GRAZING CAPACITY	Not assessed

Site 7

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	21 species (29 incl. <1% species) = High
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Eragrostis curvula* (Weeping Love Grass) – 19% • *Diheteropogon filifolius* (Thread-leaved Andropogon) – 17% • *Panicum natalense* (Natal Buffalo Grass) – 14%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.94 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	3007 kg/ha = High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	27 species (35 incl. <1% species) = Low (Medium)
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.72 = Medium
HERB SPECIES DIVERSITY TREND	While the herbaceous species trend indicates improvement since the last survey in 2017, the time elapsed is too long to draw a definitive conclusion.
VELD CONDITION (according to Tainton, 1988)	SLIGHTLY DEGRADED / CLIMAX
VELD CONDITION TREND – long term	Trend negative: There was a significant decrease in the Decreaser species and a slight increase in the Increaser 1 species. Within the Decreaser species *Digitaria tricholaenoides* demonstrated the greatest decline. Conversely, within the Increaser 1 category, *Panicum natalense* exhibited the most substantial increase. Phytomass within acceptable norms.
CURRENT GRAZING CAPACITY	Not assessed

8.1.3.2.b. Berlin Plantation.

Site 1 Kaapschehoop

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	7 species (11 incl. <1% species) = Low (Medium)
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Styppeiochloa gynoglossa* – 57% • *Aristida transvaalensis* (Rock Three-awn) – 18% • *Loudetia simplex* (Common Russet Grass / Stingelgras) – 8%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.3 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 652 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	9 species (13 incl. <1% species) = Low (Medium)
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	1.77 = Low
HERB SPECIES DIVERSITY TREND	This was a baseline survey, therefore it is not possible to determine any trends from the data.
VELD CONDITION (according to Tainton, 1988)	CLIMAX
VELD CONDITION TREND	The overall veld condition remains stable within the climax zone. The species composition is unchanged, with *Styppeiochloa gynoglossa* continuing to dominate. However, phytomass levels are very high, and a deterioration in basal cover has been observed.
CURRENT GRAZING CAPACITY	Not assessed

Site 2 Kaapschehoop

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	19 species (22 incl. <1% species) = Medium (High)
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Eragrostis curvula* (Weeping Love Grass) – 18% • *Melinis nerviglumis* (Bristle-leaved Red Top) – 16% • *Digitaria monodactyla* (One-finger Grass) – 12%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	6.7 cm = Low
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 548 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	26 species (31 incl. <1% species) = Low
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.46 = Medium
HERB SPECIES DIVERSITY TREND	While the previous forb assessment was conducted quite some time ago (2019), making it challenging to draw a definitive conclusion, there is a clear improvement in forb richness and diversity compared to previous years.
VELD CONDITION (according to Tainton, 1988)	SELECTIVELY GRAZED
VELD CONDITION TREND	Slightly positive. Decreasers increased slightly while the Increaser 2 species decreased slightly. A deterioration in the basal cover is observed though.
CURRENT GRAZING CAPACITY	Not assessed

Site 3 Kaapschehoop

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	12 species (16 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Eragrostis plana* (Tough Love Grass) – 22% • *Melinis nerviglumis* (Bristle-leaved Red Top) – 18% • *Aristida transvaalensis* (Rock Three-awn) – 16%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	6.5 cm = Low
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 455 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Selectively grazed
VELD CONDITION TREND	Stable within the climax zone. Increaser 1 species decreased slightly and the Increaser 2 species increased slightly. A deterioration in the basal cover is observed though over the long term. *E. plana* fluctuated in abundance in two years (see Run 1 and Run 3 of ISPD-graph). Climax/Selectively Grazed. [Selectively grazed, for there is no proportion in composition comprised of Decreasers and high proportion Increaser 1 and 2 species].
CURRENT GRAZING CAPACITY	Not assessed

Site 4 Kaapschehoop

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	6 species (9 incl. <1% species) = Low (Medium)
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Styppeiochloa gynoglossa* – 72% • *Stiburus alopecuroides* (Stiburus) – 10% • *Loudetia simplex* (Common Russet Grass) – 8%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.8 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 358 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	CLIMAX
VELD CONDITION TREND	Stable. *Styppeiochloa gynoglossa* is dominant and has been stable. Phytomass remains very high.
CURRENT GRAZING CAPACITY	Not assessed

Site 1 Blue Swallow Reserve

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	14 species (17 incl. <1% species) = Medium (High)
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Loudetia simplex* (Common Russet Grass) – 29% • *Andropogon chinensis* (Hairy Bluegrass) – 14% • *Eragrostis curvula* (Weeping Love Grass) – 14%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.8 cm = Medium (Low)
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 599 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Climax
VELD CONDITION TREND	Veld condition remains stable within the climax zone. It may be too soon to declare a change in the past trend. The water catchment ability deteriorated.
CURRENT GRAZING CAPACITY	3.78 ha/LSU

Site 2 Blue Swallow Reserve

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	18 species (19 incl. <1% species) = Medium (High)
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Loudetia simplex* (Common Russet Grass) – 22% • *Andropogon chinensis* (Hairy Bluegrass) – 14% • *Rendlia altera* (Mahem's Crest) – 11%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.6 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 608 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Climax
VELD CONDITION TREND	Despite a slight improvement in the veld condition, the overall state remains stable in the climax zone. The phytomass is very high, impeding adequate sunlight to penetrate the soil.
CURRENT GRAZING CAPACITY	6.01 ha/LSU

Site 3 Blue Swallow Reserve

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	14 species (16 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Rendlia altera* (Mahem's Crest) – 39% • *Loudetia simplex* (Common Russet Grass) – 12% • *Themeda triandra* (Rooigras) – 8%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.4 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 215 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Climax / Undergrazed
VELD CONDITION TREND	Veld condition is stable, but it seems that the basal cover may be deteriorating.
CURRENT GRAZING CAPACITY	4.04 ha/LSU

Site 4 Blue Swallow Reserve

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	12 species (14 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Rendlia altera* (Mahem's Crest) – 24% • *Loudetia simplex* (Common Russet Grass) – 20% • *Themeda triandra* (Rooigras) – 20%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.9 cm = Low
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	6 133 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Climax
VELD CONDITION TREND	The overall veld condition remains stable in the climax zone. The phytomass is very high, impeding adequate sunlight to penetrate the soil. Prolonged high phytomass will have a negative impact on basal cover, which was observed here.
CURRENT GRAZING CAPACITY	4.31 ha/LSU

Site 5 Blue Swallow Reserve

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	15 species (19 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Eragrostis curvula* (Weeping Love Grass) – 30% • *Trichopteryx dregeana* (Carpet Grass) – 16% • *Eragrostis capensis* (Heart-seed Love Grass) – 13%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.5 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	6 397 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	SELECTIVELY GRAZED
VELD CONDITION TREND	**Grass composition trend is negative, due to a drop in Decreaser grass species. Basal cover is also deteriorating.**
CURRENT GRAZING CAPACITY	5.95 ha/LSU

Site 6 Blue Swallow Reserve

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	17 species (18 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Themeda triandra* (Rooigras) – 30% • *Rendlia altera* (Mahem's Crest) – 21% • *Loudetia simplex* (*Common Russet Grass*) – 8%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.5 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 456 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Climax (Undesired)
VELD CONDITION TREND	**Negative changes are noted: Trend is negative. There is a trend towards the climax. The basal cover is also deteriorating. Grass basal cover also deteriorated.**
CURRENT GRAZING CAPACITY	4.08 ha/LSU

Site 7 Blue Swallow Reserve

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	14 species (16 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Themeda triandra* (Rooigras) – 21% • *Eragrostis curvula* (Weeping Love Grass) – 18% • *Loudetia simplex* (Common Russet Grass) – 17%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.1 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	6 443kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	UNDERGRAZED / CLIMAX
VELD CONDITION TREND	Despite a slight improvement in the veld condition, the condition remains stable in the climax zone. It appears that the site is transitioning away from the undesirable *Eragrostis curvula*-dominated climax conditions that was prevalent over the past years. The phytomass remains high.
CURRENT GRAZING CAPACITY	5.99 ha/LSU

Site 8 Blue Swallow Reserve

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	9 species (10 incl. <1% species) = Low (Medium)
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Melinis nerviglumis* (Bristle-leaved Red Top) – 35% • *Panicum natalense* (Natal Buffalo Grass) – 18% • *Eragrostis racemosa* (Narrow Heart Love Grass) – 14%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	6.3 cm = Low
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 035/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Climax
VELD CONDITION TREND	**VELD CONDITION REMAINS STABLE within the climax zone. The phytomass remains very high**
CURRENT GRAZING CAPACITY	7.82 ha/LSU

8.1.3.2.c. Blyde Plantation.

Site 1.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	16 species (18 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Styppeiochloa gynoglossa* – 40% • *Loudetia flavida* (Russet Grass) – 12% • *Andropogon chinensis* (Hairy Bluegrass / Tweevingergras) – 9%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.1 cm = Medium (High)
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 044 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	28 species (33 incl. <1% species) = Low (Medium)
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.63 = Medium
HERB SPECIES DIVERSITY TREND	While the herbaceous species trend indicates improvement since the last survey in 2017, the time elapsed is too long to draw a definitive conclusion.
VELD CONDITION (according to Tainton, 1988)	CLIMAX
VELD CONDITION TREND	Slightly negative. Veld condition on the ISPD-graph illustrates trend is towards the left, where climax grasses dominate. The Increaser 1 grass species *Styppeiochloa gynoglossa*, increased slightly while *Panicum natalense* decreased. There was an improvement in basal cover observed.

Site 2.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	17 species (18 incl. <1% species) = Medium (High)
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Loudetia simplex* (Common Russet Grass) – 21% • *Panicum natalense* (Natal Buffalo Grass) – 15% • *Rendlia altera* (Mahem's Crest) – 14%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.1 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	6 604 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	CLIMAX
VELD CONDITION TREND	Stable within the climax domain. The undesired Increaser 1 grass species *Rendlia altera* and *Loudetia simplex*, (often associated with selective grazing) increased slightly. The phytomass was very high. A deterioration in basal cover was observed, possibly due to sustained high fule load over the years.

Site 3.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	12 species (16 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Trichopteryx dregeana* (Carpet Grass) – 60% • *Loudetia flavida* (Russet Grass) – 11% • *Melinis nerviglumis* (Bristle-leaved Red Top) – 5%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.9 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 155 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	CLIMAX (DISTURBED)
VELD CONDITION TREND	Slightly negative. The frequency of *Trichopteryx dregeana*, the dominant species within the same order of abundance over the last six surveys (except for 2019), increased since 2020. In 2019 there was a high frequency of the Increaser 2, *Eragrostis capensis*, which made the assessment on the ISPD-graph that year (Run 3) an outlier. The increase in abundance of that species was also observed at other grasslands that year. There was an improvement in basal cover observed.

8.1.3.2.d Blyde Plantation (Lisbon Ridge)

Site 1.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	14 species (16 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Rendlia altera* (Mahem's Crest) – 30% • *Loudetia simplex* (Common Russet Grass) – 23% • *Tristachya leucothrix var. filiformes* (Hairy Trident Grass) – 15%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	3.7 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 800 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not recorded
VELD CONDITION (according to Tainton, 1988)	UNDESIRED CLIMAX
VELD CONDITION TREND	Stable. The abundance of two dominant Increaser 1 species, namely *Rendlia altera* and *Tristachya leucothrix* remained stable. *Loudetia simplex* though doubled in abundance. Increaser 2 abundance increased in 2019. A similar observation and pattern of change over the years is made as with the herb's species diversity, for the veld condition changed in 2019, but improved again in 2024.
CURRENT GRAZING CAPACITY	Not assessed

Site 2.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	15 species (16 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Rendlia altera* (Mahem's Crest) – 19% • *Digitaria tricholaenoides* (Purple Finger Grass) – 18% • *Themeda triandra* (Rooigras) – 18%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.0 cm = High (Medium)
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 794 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Climax
VELD CONDITION TREND	Stable. The veld condition value on the ISPD-graph shows minimal fluctuation within the climax domain, where climax grasses dominate, especially over the last three surveys. Overall, the Decreasers and Increasers 2 categories have remained stable. However, there was a short-term fluctuation within the Increaser 1 category. *Tristachya leucothrix* has decreased, *Eragrostis curvula* was not found, and *Panicum natalense* has shown a slight increase compared to the previous survey in 2021.
CURRENT GRAZING CAPACITY	Not assessed

Site 3b.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	19 species (22 incl. <1% species) = Medium (High)
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Loudetia simplex* (Common Russet Grass) – 20% • *Tristachya leucothrix* (Hairy Trident Grass) – 15% • *Eragrostis racemosa* (Narrow Heart love Grass) – 11%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.4 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 833 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	43 species (47 incl. <1% species) = High
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	3.57 = High
HERB SPECIES DIVERSITY TREND	While the herbaceous species trend indicates improvement since the last survey in 2017, the time elapsed is too long to draw a definitive conclusion.
VELD CONDITION (according to Tainton, 1988)	CLIMAX
VELD CONDITION TREND	Very slight improvement, but stable. The veld condition value on the ISPD-graph shows minimal fluctuation within the climax domain, where climax grasses dominate, especially over the last three surveys. Overall, the Increaser 1and Increaser 2 categories have remained stable. However, there was a short-term fluctuation within the Decreaser category. *Digitaria tricholaenoides and Monocymbium ceresiiforme* has increased slightly increase compared to the previous survey in 2021.
CURRENT GRAZING CAPACITY	Not determined

Site 4.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	15 species (19 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Rendlia altera* (Mahem's Crest) – 22% • *Loudetia simplex* (Common Russet Grass) – 15% • *Tristachya leucothrix var. filiformes* (Hairy Trident Grass) – 12%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.2 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 551 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	29 species (32 incl. <1% species) = Low (Medium)
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.69 = Medium
HERB SPECIES DIVERSITY TREND	While the herbaceous species trend indicates a slight improvement since the last survey in 2019, the time elapsed is too long to draw a definitive conclusion.
VELD CONDITION (according to Tainton, 1988)	CLIMAX
VELD CONDITION TREND	Slightly negative. Veld condition on the ISPD-graph illustrates trend is towards the left, where climax grasses dominate. *The* undesired Increaser 1 grass species *Rendlia altera*, often associated with selective grazing) increased slightly.
CURRENT GRAZING CAPACITY	Not determinrd

8.1.3.2.e. Entabeni Plantation.

Site 1 (Aloe vossi)

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	7 species (10 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Loudetia simplex* (Common Russet Grass) – 35% • *Paspalum scrobiculatum* (Creeping Paspalum) – 17% • *Perotis patens* (Cat's Tail) – 15%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	6.5 cm = Low (Medium)
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	526 kg/ha = Low
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	SELECTIVELY GRAZED / DISTURBED
VELD CONDITION TREND	Veld condition change points towards a potential negative trend, with an undesired climax grass, *Loudetia simplex*, that dominates. The phytomass is persistently very low and the basal cover deteriorated. Shrubs, primarily *Helichrysum kraussii*, encroached significantly since the veld condition was assessed in 2021. *H. kraussii* is associated with disturbed areas such as recently cleared plantations (TL Morgenthal et. al., 2006).

NOTES	Refer to site photos over time to assess the extent of encroachment by *H. kraussii*. The density is approximately 36 individuals per 100m² for the first 35 meters, then it extends laterally along the transect down to a tributary of the Mutshedzi River, located 130 meters further. This encroachment complicates the survey process and negatively impacts the vegetation dynamics and overall ecology.
CURRENT GRAZING CAPACITY	0.04 LSU/ha or 22.37 ha/LSU – in the absence of a rotational grazing system, apply stocking rate that corresponds to 50% of the current grazing capacity.

Site 2 (Ebbe dam)

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	5 species (8 incl. <1% species) = Low
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Eragrostis plana* (Tough Love Grass) – 57% • *Paspalum scrobiculatum* (Veld Paspalum) – 25% • *Eragrostis curvula* (Weeping Love Grass) – 11%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Moderate >4-6 cm & Low > 6cm)	3.4 cm = Moderate. The average distance between adjacent tufts of grasses initially appearing satisfactory. However, given the predominance of Tough Love Grass (*Eragrostis plana*) and Veld Paspalum (*Paspalum scrobiculatum*), this average distance is deemed moderate at best, indicating a concerning trend. It has been noted that these grass species tend to exhibit this behavior, particularly during instances of overgrazing, with young sprouts emerging between the tufts of grass.
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	2 761 kg/ha = Moderate
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Overgrazed and selectively grazed
VELD CONDITION TREND	Trend is negative, towards overgrazing. The Increaser 2 component increased in abundance since 2012. It was noted that the camp were severely overgrazed and disturbed over the long term. This conclusion is supported by the absence of Decreaser species, Tough Love Grass (*Eragrostis plana*) were uprooted and scattered by cattle (see photos below) and that Tropical Mexican Clover (*Richardia brasiliensis*), an indicator of disturbance and poor ground cover, were observed.
CURRENT GRAZING CAPACITY	0.05 LSU/ha or 21.59 ha/LSU – in the absence of a rotational grazing system, apply stocking rate that corresponds to 50% of the current grazing capacity.

Site 3b (Kliphuis)

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	16 species (18 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Axonopus fissifolius* (Common Carpet Grass) – 26% • *Diditaria spp.* (Finger Grass) – 15% • *Melinis repens* (Natal Red Top) – 14%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.6 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	1 518 kg/ha = Low
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Overgrazed / Selectively grazed
VELD CONDITION TREND	This survey was conducted at a different location than the historical monitoring site of 2017, making it the second survey at the new location. A trend can be identified, and a more meaningful conclusion drawn, only after completing a third survey. Despite this being the second survey and considering the time elapsed since 2021, it has been observed that the Increaser 2 grass species has increased, while the basal cover has deteriorated, both indicating a degradation of the veld condition. Additionally, the phytomass is at the lower threshold value of 1.5 tons/Ha.
CURRENT GRAZING CAPACITY	Not assessed

8.1.3.2.f. Jessivale Plantation.

Site 1.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	18 species (23 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Tristachya leucothrix* (Hairy Trident Grass) – 22% • *Alloteropsis semialata* (Black Seed Grass) – 14% • *Brachiaria serrata* (Velvet Signal Grass) – 11%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.8 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 128 kg/ha = High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	37 species (40 incl. <1% species) = Medium
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	3.08 (High, which is good)
HERB SPECIES DIVERSITY TREND	While the herbaceous species trend indicates improvement since the last survey in 2017, the time elapsed is too long to draw a definitive conclusion.
VELD CONDITION (according to Tainton, 1988)	CLIMAX
VELD CONDITION TREND	Despite a slight improvement in the veld condition, the condition remains stable within the climax zone. The phytomass remains high, which can cause veld degradation over the long term.

Site 2.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	14 species (17 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Rendlia altera* (Mahem's Crest) – 34% • *Alloteropsis semialata* (Black Seed Grass) – 14% • *Setaria nigrirostris* (Black-seed Bristle Grass) – 12%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.3 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 231 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Climax
VELD CONDITION TREND	The veld condition trend remains very stable within the climax zone. However, there has been a decrease in Decreaser grass species compared to the previous survey in 2020, while the Increaser 2 species have increased. If these trends continue, the veld condition may deteriorate over the long term.

Site 3.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	19 species (23 incl. <1% species) = Medium (High)
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Themeda triandra* (Rooigras) – 37% • *Tristachya leucothrix* (Hairy Trident Grass) – 15% • *Digitaria tricholaenoides* (Purple Finger Grass) – 8%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.6 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 942 kg/ha =Low
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	GOOD
VELD CONDITION TREND	The veld condition trend remains very stable within the climax zone. However, the basal cover has deteriorated. The phytomass is also very high.

8.1.3.2.g Jessievale Plantation (Grootvlei)

Site 1.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	8 species (11 incl. <1% species) = Low (Medium)
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Themeda triandra* (Rooigras) – 45% • *Setaria nigrirostris* (Black-seed Bristle Grass) – 32% • *Eragrostis curvula* (Oulandsgras) – 6%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	7.2 cm = Low
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 530 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	22 species (27 incl. <1% species) = Medium
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.57 = Medium
HERB SPECIES DIVERSITY TREND	No Plant Diversity Assessments (PDA) were conducted on this site by either myself or Francois de Wet. Therefore, this PDA serves as a baseline survey, and no trends can be determined at this time.
VELD CONDITION (according to Tainton, 1988)	GOOD
VELD CONDITION TREND	The trend remains stable within the zone of effective veld management. However, there is a noticeable decline in the basal cover.

Site 2.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	13 species (16 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Digitaria tricholaenoides* (Purple Finger Grass) – 24% • *Brachiaria serrata* (Velvet Signal Grass) – 19% • *Heteropogon contortus* (Spear grass) – 16%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.2 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	3317 kg/ha =High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	31 species (37 incl. <1% species) = Medium
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	3.03 = High
HERB SPECIES DIVERSITY TREND	Positive trend: The Shannon index reveals a clear improvement in the forb component over time, indicating an increase in species richness and diversity.
VELD CONDITION (according to Tainton, 1988)	GOOD
VELD CONDITION TREND	**Positive trend:** The basal cover is good, and there has been a slight improvement in the Decreaser species. However, there is also an increase in the Increaser 2 species, and the phytomass remains high.

Site 3.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	11 species (14 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Themeda triandra* (Rooigras) – 28% • *Digitaria tricholaenoides* (Purple Finger Grass) – 20% • *Rendlia altera* (Mahem's Crest) – 12%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.5 cm = High
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	3 674 kg/ha = High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not assessed in 2024.
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not assessed in 2024.
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Good
VELD CONDITION TREND	**Positive trend:** The phytomass has significantly recovered from its low level in 2020, with Decreaser species still dominating. However, there are early signs of basal cover deterioration.

Site 4.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	15 species (19 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Tristachya leucothrix* (Hairy Trident Grass) – 29% • *Setaria nigrirostris* (Black-seed Bristle Grass) – 23% • *Themeda triandra* (Rooigras) – 20%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.8 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 180 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	GOOD
VELD CONDITION TREND	**Slight positive trend:** The ISPD-graph do reflect little change in veld condition (veld condition could even be viewed as being stable) within the climax zone. The basal cover deteriorated compared to the previous survey in 2020.

Site 5c.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	20 species (24 incl. <1% species) = High
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Setaria nigrirostris* (Black-seed Bristle Grass) – 29% • *Themeda triandra* (Rooigras) – 16% • *Eragrostis curvula* (Weeping Love Grass) – 10%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.8 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 588 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	22 species (24 incl. <1% species) = Low
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.15 = Medium
HERB SPECIES DIVERSITY TREND	No Plant Diversity Assessments (PDA) were conducted on this site by either myself or Francois de Wet. Therefore, this PDA serves as a baseline survey, and no trends can be determined at this time.
VELD CONDITION (according to Tainton, 1988)	GOOD
VELD CONDITION TREND	**Positive trend:** The basal cover is good, and there has been a slight improvement in the Decreaser species and grass species richness.

Site 6.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	10 species (12 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Eragrostis curvula* (Weeping Love Grass) – 44% • *Setaria nigrirostris* (Black-seed Bristle Grass) – 24% • *Hyparrhenia dregeana* (Hairy Blue Thatching Grass) –18%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	8.1 cm = Low
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 622 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	38 species (42 incl. <1% species) = Medium
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.87 = Medium
HERB SPECIES DIVERSITY TREND	While the herbaceous species trend indicates improvement since the last survey in 2017, the time elapsed is too long to draw a definitive conclusion.
VELD CONDITION (according to Tainton, 1988)	UNDESIRED CLIMAX (Eragrostis curvula dominates)
VELD CONDITION TREND	**Negative trend:** The abundance of the Decreaser species declined, whereas the Increaser 1 species saw a rise in abundance. Additionally, there was a noticeable deterioration in the basal cover. These changes are likely attributable to the sustained high phytomass at this site.

8.1.3.2.h. Spitskop Plantation.

Site 1.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	21 species (24 incl. <1% species) = High
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Loudetia flavida* (Russet Grass) – 24% • *Eragrostis racemosa* (Narrow Heart Love Grass)– 20% • *Digitaria monodactyla* (One-finger Grass) – 10%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	6.5 cm = Low
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning	4 432 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	27 species (35 incl. <1% species) = Low (Medium)
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.72 = Medium
HERB SPECIES DIVERSITY TREND	While the herbaceous species trend indicates improvement since the last survey in 2017, the time elapsed is too long to draw a definitive conclusion.
VELD CONDITION (according to Tainton, 1988)	SELECTIVELY GRAZED
VELD CONDITION TREND	Negative: Selective grazing persisted, leading to a significant decline in Decreaser species while the Increaser 1 component rose sharply.
CURRENT GRAZING CAPACITY	Not assessed

Site 2.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	16 species (18 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Rendlia altera* (Mahem's Crest) – 31% • *Tristachya leucothrix* (Trident Grass) – 20% • *Themeda triandra* (Rooigras) – 9%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.6 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 760 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	CLIMAX
VELD CONDITION TREND	Slightly negative trend. Veld condition trend is towards the climax, with a decrease in the Decreaser component (*Monocymbium ceresiiforme* and *Themeda triandra* decreased in frequency abundance) while there is an increase in the Increaser 1 component (*Rendlia altera* increased in frequency abundance)
CURRENT GRAZING CAPACITY	Not assessed

8.1.3.2.i. Tweefontein Plantation (Maliedyke)

Site 3.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	7 species (9 incl. <1% species) = Low
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Sporobolus centrifugus* (Olive Dropseed) – 86% • *Cymbopogon nardus* (Giant Turpentine Grass) – 5% • *Cymbopogon caesius* (Broad-leaved Turpentine Grass) – 3%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.7 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	6 044 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	11 species (17 incl. <1% species) = Low
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	1.77 = Low – It confirms the veld condition (Degraded)
HERB SPECIES DIVERSITY TREND	While the herbaceous species trend indicates improvement since the last survey in 2017, the time elapsed is too long to draw a definitive conclusion.
VELD CONDITION (according to Tainton, 1988)	Climax (Disturbed)
VELD CONDITION TREND	Trend negative, points toward climax. The rate of change seems slow. No Decreaser and Increaser 2 species observed. Phytomass very high.
CURRENT GRAZING CAPACITY	Not assessed

Site 4

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	15 species (18 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Themeda triandra* (Rooigras) – 29% • *Rendlia altera* (Mahem's Crest) – 28% • *Monocymbium ceresiiforme* (Wild Oatgrass) – 12%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	3.7 cm = High
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	6 244 kg/ha = High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Climax (Undesired)
VELD CONDITION TREND	Trend is stable within the climax zone. Undesired climax grasses like *Rendlia altera* and, to a lesser extent, *Loudetia simplex* dominate.
CURRENT GRAZING CAPACITY	Not assessed

Site 6

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	14 species (19 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Rendlia altera* (Mahem's Crest) – 25% • *Themeda triandra* (Rooigras) – 25% • *Andropogon schirensis* (Stab Grass) – 12% • *Loudetia simplex* (Common Russet Grass / Stingelgras) - 12%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.3 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 698 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	31 species (36 incl. <1% species) = Medium
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.73 = Medium
HERB SPECIES DIVERSITY TREND	While the herbaceous species trend indicates improvement since the last survey in 2018, the time elapsed is too long to draw a definitive conclusion.
VELD CONDITION (according to Tainton, 1988)	CLIMAX
VELD CONDITION TREND	The veld condition has slightly improved due to an increase in forb abundance. However, a slight decline in basal cover has been observed over the long term, likely resulting from consistently high phytomass since 2015.
CURRENT GRAZING CAPACITY	Not assessed

8.1.3.2.j. Uitsoek Plantation.

Site 1.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	14 species (18 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Rendlia altera* (Mahem's Crest) – 52% • *Eulalia villosa* (Yellow Velvet Grass) – 7% • *Loudetia simplex* (Common Russet Grass) – 6%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.2 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	6 387 kg/ha = High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	27 species (33 incl. <1% species) = Medium
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.69 = Medium
HERB SPECIES DIVERSITY TREND	While the herbaceous species trend indicates improvement since the last survey in 2017, the time elapsed is too long to draw a definitive conclusion.
VELD CONDITION (according to Tainton, 1988)	Undesired *Rendlia altera* dominated climax
VELD CONDITION TREND	Negative. Decreasers decreased in abundance and the Increaser 1 component increased within the last seven years. There is an increase in the abundance of the undesired Increaser 1 grass, *Rendlia altera*. The basal cover has deteriorated, most likely due to the persistently high phytomass over the past few years.
CURRENT GRAZING CAPACITY	Not assessed

Site 4.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	15 species (17 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Themeda triandra* (Rooigras) – 29% • *Rendlia altera* (Mahem's Crest) – 24% • *Andropogon schirensis* (Stab Grass) – 8%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.3 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 056 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Climax
VELD CONDITION TREND	Slightly positive, to the climax, with an increase in the Increaser 1 component, and a decrease in Increaser 2 contribution. Trend must be confirmed. No trend with contribution on species is clear yet. The persistent high phytomass can be detrimental to basal cover and species composition in the long term.
CURRENT GRAZING CAPACITY	Not assessed

Site 11.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	14 species (17 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Rendlia altera* (Mahem's Crest) – 51% • *Eragrostis racemosa* (Narrow Heart love Grass) – 11% • *Loudetia flavida* (Russet Grass) – 9%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.6 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	6 313 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not recorded
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not recorded
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	CLIMAX
VELD CONDITION TREND	The trend is stable within the climax zone. Overall, the results are largely consistent with the 2021 survey, showing minimal changes.
CURRENT GRAZING CAPACITY	Not assessed

8.1.3.2.k. Roburnia Plantation,

Site 1.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	14 species (15 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Brachiaria serrata* (Velvet Signal Grass) – 15% • *Rendlia altera* (Mahem's Crest) – 12% • *Themeda triandra* Rooigras) – 10%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.7 cm = Medium (Low)
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	3 087 kg/ha = High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not assessed
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not assessed
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	CLIMAX
VELD CONDITION TREND (This survey is not exactly on the historical monitoring locality).	Negative. There is an increase in *Panicum natalense* and the undesired *Loudetia simplex*, and a decrease in the semi palatable *Tristachya leucothrix*. Deterioration in basal cover is observed.
CURRENT GRAZING CAPACITY	Not assessed

Site 2b.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	15 species (16 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Themeda triandra* (Rooigras) – 19% • *Hyparrhenia dregeana* (Hairy Blue Thatching Grass) – 15% • *Imperata cylindrica* (Cottonwool Grass) – 15%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	7.6 cm = Low
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 041 kg/ha = Low
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	39 species (43 incl. <1% species) = Medium (High)
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	3.19 = High
HERB SPECIES DIVERSITY TREND	This is a baseline survey. No trend can therefore be determined. However, it is important to note that a potentially red-listed plant species has been identified in this area. A detailed discussion follows below.
VELD CONDITION (according to Tainton, 1988)	CLIMAX
VELD CONDITION TREND	Two surveys have been conducted so far. A meaningful trend can only be established after a third survey is completed within three years of the most recent survey. There was a notable increase in the Increaser 1 grass species, particularly *Imperata cylindrica* and the woody *Cymbopogon nardus* and *Hyparrhenia dregeana*, which significantly contributed to the shift in the veld condition.
CURRENT GRAZING CAPACITY	Not determined

Site 3b.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	17 species (21 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Hyparrhenia hirta* (Common Thatching Grass) – 19% • *Themeda triandra* (Rooigras) – 15% • *Cymbopogon caesius* (Broad-leaved Turpentine Grass) – 13%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.1 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	3 884 kg/ha = High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	24 species (27 incl. <1% species) = Low
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.60 = Medium
HERB SPECIES DIVERSITY TREND	This is a baseline survey. No trend can therefore be determined.
VELD CONDITION (according to Tainton, 1988)	SLIGHTLY OVERGRAZED
VELD CONDITION TREND	Two surveys have been conducted so far. A meaningful trend can only be established after a third survey is completed within three years of the most recent survey. There was a notable decrease in the Decreaser and Increaser 2 components and an increase in the Increaser 1 component.
CURRENT GRAZING CAPACITY	Not determined

8.1.3.2.l. Wilgeboom Plantation.

Site 1

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	5 species (7 incl. <1% species) = Low
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Trichopteryx dregeana* (Carpet Grass) – 38% • *Imperata cylindrica* (Cottonwool Grass) – 27% • *Eragrostis cf. volkensii* – 22%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	10.1 cm = High
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	6 335 kg/ha = Very High
VELD CONDITION (according to Tainton, 1988)	Degraded
VELD CONDITION TREND	This is only the second survey, so it is premature to draw any meaningful conclusions about the trends. However, since January 2021, there has been a slight increase in the Increaser 1 species, and the basal cover has deteriorated. Additionally, there was a significant decline in the red-data species *Eragrostis volkensii* and an uptick in the wetland grass *Trichopteryx dregeana*. It is worth noting that *T. dregeana* was not in flower in 2021, and due to its unique leaves resembling those of *E. volkensii*, these species might have been mistaken for one another. Nevertheless, this likely did not significantly affect the results as both species are classified as Increaser 2 species. Encroachment of Bramble and Bracken Fern increased.

8.1.3.2.m. Woodbush Plantation.

Site 1.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	15 species (17 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Eragrostis curvula* (Weeping Love Grass) – 26% • *Alloteropsis semialata* (Black Seed Grass) – 25% • *Sporobolus centrifugus* (Olive Dropseed) – 10%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	5.5 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	3 539 kg/ha = High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not assessed
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not assessed
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Undesired Climax/ *Eragrostis curvula* 'climax'.
VELD CONDITION TREND	This is my second assessment of this site. A trend can only be confirmed after the third assessment. However, preliminary observations suggest a potential improvement in the veld condition over time, indicated by the declining abundance of *Eragrostis curvula* and *Loudetia simplex*.
CURRENT GRAZING CAPACITY	Not assessed

Site 2.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	15 (16) species = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Eragrostis curvula* (Weeping Love Grass) – 43% • *Alloteropsis semialata* (Black Seed Grass) – 12% • *Microchloa caffra* (Pinchusion Grass) – 6%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	4.1 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	4 668 kg/ha = Very High
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not assessed
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not assessed
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Undesired Climax/ *Eragrostis curvula* 'climax'.
VELD CONDITION TREND	This is my second assessment of this site. A trend can only be confirmed after the third assessment. However, preliminary observations suggest a stable veld condition within the climax zone.
CURRENT GRAZING CAPACITY	Not assessed

8.1.3.2.n. Witklip

Site 1.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	14 species (16 incl. <1% species) = Medium
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Loudetia simplex* (Common Russet Grass) – 31% • *Panicum natalense* (Natal Buffalo Grass) – 21% • *Themeda triandra* (Rooigras) – 11%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential - High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	7.4 cm = Low
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 696 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	Not assessed
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	Not assessed
HERB SPECIES DIVERSITY TREND	Not applicable
VELD CONDITION (according to Tainton, 1988)	Climax
VELD CONDITION TREND	This was a baseline survey, therefore it is not possible to determine any trends from the data.
CURRENT GRAZING CAPACITY	Not assessed

Site 2.

GRASS SPECIES RICHNESS (Number of grass species: <10 spp = low; 10-19 spp = medium; >20 spp = high)	8 species (11 incl. <1% species) = Low (Medium)
GRASS SPECIES ABUNDANCE (DOMINANT SPECIES)	• *Eragrostis racemosa* (Narrow Heart Love Grass) – 46% • *Andropogon chinensis* (Hairy Bluegrass / Harige blougras) – 17% • *Hyparrhenia sp.* (Thatching Grass) – 17%
AVERAGE GRASS TUFT DISTANCE (Water Catchment Potential: High is ≤4 cm, Medium >4-6 cm & Low > 6cm)	6.0 cm = Medium
GRASS PHYTOMASS (Fuel Load) - 4 tons/ha is threshold for burning.	5 260 kg/ha = Very high
HERB SPECIES RICHNESS (Number of herb species: High is = >40 spp, Low < 30 species)	22 species (27 incl. <1% species) = Low
HERB SPECIES DIVERSITY (High is >3.00, Low is < 2.0)	2.55 = Medium
HERB SPECIES DIVERSITY TREND	This was a baseline survey, therefore it is not possible to determine any trends from the data.
VELD CONDITION (according to Tainton, 1988)	SLIGHTLY DEGRADED
VELD CONDITION TREND	This was a baseline survey, therefore it is not possible to determine any trends from the data. There is a correlation between the herb species diversity and the veld condition.
CURRENT GRAZING CAPACITY	Not assessed

8.1.3.3. Grazing assessments.

The table below indicates where grazing assessments were conducted in addition to the current years assessments.

Plantation						
Jessievale	**Methodology**	**Site 1(A52w)**	**Site 2(L14w)**	**Site 3 (S5x)**	**Site 2(L17w)**	**Site 3(l37w)**
February 2017	Tainton's	6.2ha/LAU	4.6ha/LAU	4.5ha/LAU	**-**	**-**
February 2019	Tainton's	5.4ha/LAU	-	-	4.3ha/LAU	4.3ha/LAU
November 2020	Tainton's	4.9ha/LAU	-	-	-	-
Jessievale	**Methodology**	**Site 2(A10y)**	-	-	-	-
November 2020	Tainton's	5.2ha/LAU	-	-	-	-
December 2021	Tainton's	-	3.1	2.9	-	-
March 2024	Tainton's	4.9ha/LSU	-	-	-	-
Jessievale	**Methodology**	**Site 1**	**Site 2**	**Site 3**	**GV1**	**GV2**
March 2023		2.66ha/LSU	2.79ha/LSU	2.32ha/LSU	3.57ha/LSU	2.56ha/LSU
Jessievale	**Methodology**	**GV3**	**GV4**	**GV5**	**GV6**	**-**
March 2023		2.17ha/LSU	1.75ha/LSU	2.49ha/LSU	2.91ha/LSU	-
Belfast	**Methodology**	**Site 3(C25v)**	**Site 5(C11w)**	**Site 7(E8v)**	**Site 1(B19w)**	**Site 2(A10v)**
February 2017	Tainton's	4.3ha/LAU	4.6ha/LAU	5.6ha/LAU	-	-
	Danckwert's	3.9ha/LAU	3.9ha/LAU	4.9ha/LAU	-	-
January 2019	Tainton's	4.2ha/LAU	4.3ha/LAU	-	5.3ha/LAU	3.5ha/LAU
	Danckwert's	3.8ha/LAU	4.4ha/LAU	-	4.7ha/LAU	4.6ha/LAU
February 2020	Danckwert's	-	-	-	2.15ha/LSU	2.15ha/LSU
March 2023		2.82ha/LSU	2.70ha/LSU	2.58ha/LSU	-	-
March 2024	Tainton's	4.3ha/LSU	4.6ha/LSU	-	-	5.6 – 6.0ha/LSU
Belfast	**Methodology**	**Site 2 (B22w)**	**Site 1**	**Site 6**	-	-
November 2020	Tainton's	5.9ha/LAU	-	-	-	-
	Danckwert's	5.1ha/LAU	-	-	-	-
March 2020	Tainton's	3.2	-	-	-	-
	Danckwert's	3.3	-	-	-	-
	Fourie /Roberts	3.2	-	-	-	-
	KZN	1.6	-	-	-	-
March 2023		-	2.96ha/LSU	3.9ha/LSU	-	-
Blyde	**Methodology**	**Blyde 1**	**Blyde 2**	**Blyde 3**	**-**	**-**
March 2023		4.54ha/LSU	3.91ha/LSU	5.24ha/LSU	**-**	**-**
Blyde – Lisbon Ridge	**Methodology**	**Lisbon 1**	**Lisbon 2**	**Lisbon 3b**	**Lisbon 4**	**-**
March 2023		4.08ha/LSU	3.37ha/LSU	4.37ha/LSU	3.84ha/LSU	**-**
Roburnia	**Methodology**	**Site1(E35w)**	**Site 2(G10w)**	**Site 3(M39y)**	**Site 2**	**Site 3**
February 2017	Tainton's	4.7ha/LAU	4.4ha/LAU	4.7ha/LAU	-	-
	Danckwert's	3.1ha/LAU	3.4ha/LAU	3.3ha/LAU	**-**	**-**
December 2018	Tainton's	4.1ha/LAU	-	-	5.4ha/LAU	4.7ha/LAU
	Danckwert's	3.3ha/LAU	-	-	3.5ha/LAU	3.4ha/LAU
February 2019	Tainton's	4.8ha/LAU	4.5ha/LAU	5.1ha/LAU	-	-
	Danckwert's	3.1ha/LAU	3.5ha/LAU	3.3ha/LAU	-	-
December 2021	Tainton's	2.5ha/LAU	2.3ha/LAU	4.5ha/LAU	-	3.2ha/LAU
	Danckwert's	2.3ha/LAU	2.5ha/LAU	2.4ha/LAU	-	2.3ha/LAU
March 2023		2.9ha/LSU	2.55ha/LSU	20-30ha/LSU	**-**	**-**
Roburnia	**Methodology**	**Site4(E39z)**	**-**	**-**	**-**	**-**
December 2021	Tainton's	3.3ha/LAU	-	-	-	-
	Danckwert's	2.4ha/LAU	-	-	-	-

Spitskop	**Methodology**	**Site 1(B9w)**	**Site 2(B49w)**	**-**	**-**	**-**
December 2018	Tainton's	4.7ha/LAU	4.0ha/LAU	-	-	-
March 2023		2.46ha/LSU	2.68ha/LSU	-	-	-
Nelshoogte	**Methodology**	**Site 1(E5w)**	**Site 2(F9w)**	DFFE (Nelsberg)	-	-
January 2019	Tainton's	4.5ha/LAU	5.0ha/LAU	-	-	-
January 2019	Danckwert's	4.3ha/LAU	4.2ha/LAU	-	-	-
December 2020	Tainton's	4.9ha/LAU	4.7ha/LAU	4.7ha/LAU	-	-
	Danckwert's	4.4ha/LAU	4.4ha/LAU	4.3ha/LAU	-	-
Ngome	**Methodology**	**Site 1(C6y)**	**Site 2(G7w)**	**Site 3(DFFE)**	**Site 4(G1x)**	**Site 1c (D35v)**
December 2018	Tainton's	4.01ha/LAU	4.73ha/LAU	3.96ha/LAU	4.27ha/LAU	-
October 2020	Tainton's	-	4.89ha/LAU	-	-	4.99ha/LAU
Uitsoek	**Methodology**	**Site 1**	**Site 4**	**Site 11**	E43x (Kemp)	E30w (Lisabon)
March 2017	Tainton's	4.1ha/LAU	3.79ha/LAU	4.17ha/LAU	-	-
October 2017	Tainton's	4.4ha/LAU	4.24ha/LAU	4.61ha/LAU	-	-
January 2019	Tainton's	4.15ha/LAU	3.96ha/LAU	4.48ha/LAU	-	-
March 2023		3.82ha/LSU	3.86ha/LSU	3.57ha/LSU	-	-
March 2024	Tainton's	-	-	-	4.18ha/LSU	7.66ha/LSU
Berlin (K/H)	**Methodology**	**Site 1** (B27w)	**Site 2** (B12w)	**Site 3**	**Site 4**	-
March 2017	Tainton's	7.38ha/LAU	7.76ha/LAU	8.55ha/LAU	8.62ha/LAU	-
November 2017	Tainton's	8.34ha/LAU	7.85ha/LAU	7.97ha/LAU	8.76ha/LAU	-
December 2019	Tainton's	8.03ha/LAU	8.37ha/LAU	8.11ha/LAU	8.74ha/LAU	-
November 2020	Tainton's	8.9ha/LAU	9.1ha/LAU	-	-	-
March 2022	Tainton's	3.6	2.9	-	-	-
	Danckwert's	2.4	2.5	-	-	-
	Fourie /Roberts	5.1	3.2	-	-	-
March 2022	KZN	5.0	2.6	-	-	-
March 2023		3.04ha/LSU	4.33ha/LSU	3.21ha/LSU	3.09ha/LSU	-
Entabeni	**Methodology**	**H27x**	**G26v**	**H7z**	**Site 1 (Aloe)**	**Site 2 (Ebbe)**
February 2020	Danckwert's	12.63ha/LSU	2.77ha/LSU	15.40ha/LSU	-	
February 2021	Tainton's	22.53ha/LSU	21.74ha/LSU	-	-	
March 2023		-	-	-	5.45ha/LSU	9.69ha/LSU-
March 2024	Tainton's	-	-	-	22.37ha/LSU	21.59ha/LSU
Entabeni	**Methodology**	Kliphuis				
March 2023		7.68ha/LSU	-	-		
Woodbush	**Methodology**	**Woodbush 1**	**Woodbush 2**			
February 2020	Danckwert's	1.16ha/LSU	1.11ha/LSU			
March 2023		2.54ha/LSU	2.77ha/LSU			
Wilgeboom	**Methodology**	**W/boom 1**	**W/boom 2**			
February 2020	Danckwert's	3.03ha/LSU	3.30ha/LSU			
March 2023		-	5.62ha/LSU			
Tweefontein	**Methodology**	**R19w**	**R70z**	**Malidyke 3**	**Malidyke 4**	**Malidyke 6**
March 2023		-	-	3.17ha/LSU	3.03ha/LSU	3.21ha/LSU
March 2024	Tainton's	4.3ha/LSU	6.6ha/LSU	-	-	-
Witklip	**Methodology**	Witklip 1	Witklip 2			

March 2023		3.75ha/LSU	3.88ha/LSU			

LAU = Large Animal Unit / LSU = Large Stock Unit

8.1.4. High Conservation Values.

High Conservation value areas are defined as: Zones and physical spaces which possess and/or are needed for the existence and maintenance of identified High Conservation Values.
There are six types of High Conservation Values (HCV) that could be applicable. These are:

- HCV 1 – Species diversity. Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.
- HCV 2 – Landscape-level ecosystems and mosaics. Intact forest landscapes and large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.
- HCV 3 – Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia.
- HCV 4 – Critical ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.
- HCV 5 – Community needs. Sites and resources fundamental for satisfying the basic necessities of local communities or Indigenous Peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or Indigenous Peoples.
- HCV 6 – Cultural values. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or Indigenous Peoples, identified through engagement with these local communities or Indigenous Peoples.

8.1.4.1. Indigenous Forest Monitoring.

Due to the fact that forests play an important role in water and soil conservation, provide habitats for a large variety of invertebrates and birds and the fact that the forest biome is small and fragmented, the conservation and preservation of all forests are important. All indigenous forests are deemed to be of high conservation value in South Africa, but some forests may be of 'higher' value than others, due to forests not been homogeneous in their species composition and ecological importance. The identification of these 'higher value' forests is possible through an exploratory survey approach that assesses the diversity of forest types within the footprint of KLF's plantations, and surrounds. The results should provide sufficient information to later select those forests of higher conservation value. These forests then get scheduled for vigilance monitoring.

A number of plantations have undergone monitoring since monitoring commenced. The comprehensive reports are available at the Plantation offices.

In consultation with specialists, the following main broad objectives apply for the initial assessments, noting however, that each forest may have unique characteristics:

1. Total flora list and proportional species composition of forest trees.
2. Classification of forest into plant communities.
3. Functional classification of forest according to its grain (fine- or coarse-grained forest).
4. Assessment and density of threatened or medicinal plant species.
5. Revisit the conservation status of plants following recent publication of the Red List of South African Plants.
6. Improve forest plant inventory.
7. Collect herbarium specimens and lodge these in herbaria for scientific value.

8. Assess the impact of invasive alien plants on the forest.
9. Assess whether the forest is being harvested for tree bark.

The following Forests have been monitored since monitoring was established:

- Bergvliet (Lemonwood Forests)
- Ngome Forest
- Berlin Forest
- Uitsoek Forest
- Entabeni Forest
- Woodbush Forest
- New Agatha Forest
- Morgenzon (Clivia Forest)
- Wilgeboom Forest
- Tweefontein Forests (Bonnet, Wooden-pear, Geelhoutboom, Maritzbos and Long Tom Pass)

During 2022/23 and 2023/24, Komatiland Forests procured the services of Forestwood cc, to conduct vigilance monitoring in three identified High Conservation Value forests. The 2022/23 forests that were monitored, included: Entabeni, New Agatha and Woodbush forests. The 2023/24 assessments included the forests Frankfort at Bergvliet, Geelhoutboom and Wooden-Pear at Tweefontein.

The objective of these vigilance assessments, was to assess the current status of the forest by:

1. Assess the location of this forest in relation to natural fire pathways and why this forest persisted in this locality.
2. Assess the condition of the forest margins in relation to the adjacent vegetation, including plantation stands.
3. Assess the condition of the forest canopy.
4. Assess the state and impact of invasive alien plant species and other impacts in the general area.
5. Assess the forests for evidence of tree bark harvesting / resource use, and determine the survivorship of harvested trees.
6. Assess harvesting impact and anticipated effect on forest composition.
7. Revisit the conservation status of plants following recent updates of the Red List of South African Plants and GPS any species of conservation concern.
8. Improve forest plant inventory by augmenting existing plant lists.

The methodology should also include time spent investigating:

1. Invasion of alien plants into forest and on forest margins.
2. Signs of bark harvesting (Movement trails and recent harvesting).
3. Sampling of trees harvested for bark to assess the degree of harvesting, species selected and survivorship.
4. Assess recruitment of trees into gaps.
5. Report on status of species of conservation importance.

The sections below, briefly provide the results.

8.1.4.1.a Vigilance monitoring of Entabeni High Conservation Value Forest Complex on SAFCOL / Komatiland Forests Entabeni Plantation Forestry Estate in Levubu area, Limpopo Province - Report Number FW-03/23, dated February 2023.

"*The Entabeni HCVF Complex is generally in a good condition overall. The Entabeni Section has been planted since before 1937 and the Thathe Vondo Section since after 1951. The areas visited on the Thathe Vondo Section showed that tree vegetation is expanding in the general absence of fire, even into the plantation stands. Such tree vegetation becomes naturalized into areas where they did not*

exist before the establishment of the plantations. The use of the aerial photographs of 1937 for the Entabeni Section and of 1951 for the Thathe Vondo Section helped with a clearer view of the very fragmented location of the evergreen forest patches prior to afforestation. The hypothetical fire pathways presented in this report in Section 3.1 should be tested when fires do occur, to evaluate the actual fire pathways and fire shadow areas, and to plan logistical arrangements when a fire occurs. Understanding the fire patterns should also guide the successful and lasting rehabilitation of natural forest that should be confined to fire-shadow areas, but also considering that much of the plantation area has become a fire-shadow area. The areas in the vicinity of all monitoring plots in the Entabeni Section (plots EB1-5) were visited, but not the two plots in the Thathe Vondo Section. The concern is that the seven plots provide no basis for being monitored since the first measurements, because the plots and trees are not marked, the plots are not representing the variation in the floristic and structural composition of the forests visited, and they are too few to enable a reliable subdivision of this forest area into species associations. It was recommended that a more representative sampling be done of the natural forests on Entabeni PFE, including the developing low, dense, closed forests in parts of the Thathe Vondo Section. A brief scan of the canopy condition of the forests in the two sections, on Google Earth Pro images after 2021, showed the canopy to be generally in a good condition. Condition of the forest interior, at the points entered around the monitoring plots in the Entabeni Section showed the forest to be in a mature stage with mostly large trees, a general lack of seedlings, saplings and poles of canopy tree species, and a very open ground cover. It was suggested that paired exclosure plots be implemented to test if the open ground cover was the consequence of a relatively closed canopy or browsing by antelope or roaming cattle. In general, very few invasive alien plant species were seen along the roads through the evergreen forests and inside the forest. A note was made of the need to remove the single trees or small groups of spreading small to large trees of eucalypts and pines that were seen in different parts of natural areas in the Thathe Vondo Section, as a matter of urgency. Of special concern are the extent of spreading of the shade-tolerant Camphor tree (Cinnamomum camphora) and the geophytic White Ginger Lily (Hedychium coronarium) in the Matiwa area. A special effort is needed to clear out all the shade-tolerant invasive species in that area. A note was made that the dense stands of test plantings below the Entabeni office could be thinned to stimulate a mixed growth with natural forest species along that river. Two examples were presented of what happens with buffer strips between the planted pine stands and natural forest. In relation to the comments about the expanding woody vegetation in the absence of fire, plantation forestry is not threatening natural forest but rather nurse the expansion and development of natural forest. If not yet done so, the policy on maintaining buffer strips should be changed towards not maintaining such buffers because either invader plant species or indigenous forest species become established in those open strips, and productive plantation areas are being lost. A 'give and take' approach was recommended for an area to the west of the Thathe Vondo Holy Forest that could have environmental and economic benefits for both the natural forests and for the plantation forestry estates. Two examples of resource use were assessed. In the Entabeni Section, the only resource use seen was in the Matiwa area where most of the tree harvesting was old but with a more recent cutting of few small poles (sprouting) and one bark-stripping. The larger cut stems showed no sprouting, and this could be an inherent problem with the specific species (doubtful) or the result of browsing by antelope and/or cattle. In the Thathe Vondo Section, a small demonstration was made of the potential to do selective stem thinning of suppressed and deformed stems of the even-aged, strongly light-demanding developing stands of Mobola plum (Parinari curatellifolia) – a potential approach to deal with illegal resource use of bark, firewood, and poles through user groups (not individuals), where such a problem develops."

8.1.4.1.b Vigilance monitoring of New Agatha High Conservation Value Forest on SAFCOL / Komatiland Forests New Agatha Plantation Forestry Estate near Tzaneen, Limpopo Province - Report Number FW-01/23, dated February 2023.

"The New Agatha HCVF is generally in a state of expansion from former small strips along streams in the former fire-adapted grasslands in the largely fire-prone landscape below the escarpment. The natural forests expand in the general absence of fire, even into the plantation stands. They become naturalized into areas where they did not exist before the establishment of the plantations because they are tolerant of shade and their regeneration and establishment are nursed by both the planted stands and the invader plant stands. However, this natural succession process can be managed cost-effectively, to the benefit of plantation forestry, the natural forests and towards better control of the invader plants. The fire pathways were somewhat disguised by the extensive plantations and aerial photographs of 1949, prior to afforestation, were used to assess the natural fire pathways. The hypothetical fire pathways presented in this report should be tested when fires do occur, to evaluate the actual fire pathways, fire shadow areas, and to plan logistical arrangements when a fire occurs. It was seldom possible to have a good view of the canopy condition of mature forest. Where it was possible, the canopy of the developing forest is low, dense, and closed. Condition of the forest interior, mostly in cases of developing forest, had relatively dense stems with an open understory. In the sites where the harvesting of bark and wood was seen, no large gaps developed, and even the understory of relatively mature forest appeared to be in a good condition. The presence of Trifid Weed (Chromolaena odorata) and of Lantana (Lantana camara) was minimal in the natural forest margins and of no concern. Forest species and developing forest developed in such areas of Trifid Weed and Lantana, to the detriment of the two invasive species. The high stem density and low, dense canopy cover of the developing forest would suppress any development of the two light-demanding scramblers. Bugweed (Solanum mauritianum) and Guava (Psidium guajava) was minimally present in the natural forest, mostly on the forest margin with plantation stands. However, both species were abundant in the adjacent plantation stands. The natural forest margins, in general, are in a good condition. No buffer strips between the natural and planted stands were seen, and this is recommended to be a better approach than to keep such buffer strips open. Plantation stands pose no threat to natural forest as some people think. A 'give and take' approach was recommended to convert natural strips of developing forest to productive plantation stands, and to convert small plantation stand within natural forest, to natural forest. It has environmental and economic benefits, both for the natural forests and for the plantation forestry estates. In one part of the identified Area A, several trees were found to be harvested for bark, poles and larger pieces of wood. The observed situation probably requires a more detailed survey of that area, and a need to discuss the issues with the resource users. Such bark, pole and wood use could be managed in different ways, as outlined in the report. It is recommended that a system of sustainable bark/pole/wood use could be developed with such user groups (not individuals) that would ensure recovery of the harvested species and their regeneration to provide a resource for the future, in a style of participatory forest management."

8.1.4.1.c Vigilance monitoring of Woodbush High Conservation Value Forest on SAFCOL / Komatiland Forests Woodbush Plantation Forestry Estate near Tzaneen, Limpopo Province – Report number FW 02/23, dated February 2023.

"The Woodbush HCVF is generally in a good condition, in a stable state in terms of its location pattern as one large continuous area of natural evergreen forest, managed by both SAFCOL/KLF and DFFE: Forestry. The specific larger landscape contributed to its protection against fires driven by the

north-westerly Bergwinds. This forest area is located to the north of the main plantation forestry area. The fire protection and planted small pine stands to the western side appear to have contributed to the recovery of the natural forest on the eastern side, probably within the area managed by DFFE: Forestry. It was possible to apply the identified fire pathways to the area between the Woodbush Office and the Woodbush HCVF, suggesting that the main fire protection should be done at the boundary with the drier lowlands to the west of the mountain range. The hypothetical fire pathways presented in this report should be tested when fires do occur, to evaluate the actual fire pathways, fire shadow areas, and to plan logistical arrangements when a fire occurs. It was seldom possible to have a good view of the canopy condition of mature forest, but the areas seen showed a good canopy condition. The Google Earth image of July 2022 showed a general intact forest canopy. With fire spotting from the west during the north-westerly Bergwinds almost controlled, the only options for larger canopy gaps to stimulate regeneration would be lightning strikes and windfalls. This may not be a good situation, because of a general lack of regeneration of canopy trees in the generally mature forest interior, with widely scattered large trees and a general lack of young trees (seedlings, saplings, and poles) of canopy tree species. The few areas observed of the interface between the planted pine stands and adjacent natural forest showed what could be considered as a good approach to manage such interfaces, without a buffer zone between the two systems. Buffer strips should not be maintained because either invader plant species or indigenous forest species become established in those open strips, and productive plantation areas are being lost. Plantation stands pose no threat to natural forest as some people think. Very few invasive alien plants were seen in the forest environment because of the mainly mature forest. The only form of resource use from the natural forest observed was one old sawpit of timber harvesting long ago. No bark harvesting was seen. It is recommended that periodic monitoring be maintained to remove invasive alien plants establishing along the road through the natural forest when they are still small and few in numbers, and to spot illegal resource use timeously."

8.1.4.1.d. Vigilance monitoring of Frankfort High Conservation Value Forest on SAFCOL / Komatiland Forests Bergvliet Plantation Forestry Estate at Sabie, Mpumalanga – Report number FW-03/24, dated February 2024.

"*The stated cover of this forest is 36 ha, but this study has shown it to be* ***60.5 ha with a boundary length of 5.93 km, most of which is with planted tree stands. After assessing the natural evergreen forests on the old aerial photographs between 1939 and 1956, a specific expanded area of this HCVF is proposed, adding 82.2 ha with a boundary length of 18 km, mostly with plantation forestry stands. This will cover the different forest patches within the catchment, and their links through forested streams. The January 2024 assessment confirmed the assessment of 2019 that this HCVF is generally in a healthy state in terms of the canopy being in a generally good condition, with only one tree of the introduced Camphor tree observed to have been bark-stripped. The main part of the assessment focused on the margin of the HCVF with grassland along the firebreak (in good condition with few trees of introduced species), and with streambank vegetation developing towards forest, with many establishing trees of forest species covered in tangles of vines and climbers. The silvicultural foresters, who were unaware of the 2019 assessment, participated in this 2024 assessment, and this contributed to useful interactive discussions. For the sake of context, the important results of the 2019 assessments are included in this assessment.***

The observations showed that the forest is nowhere threatened by the planted stands, but that forest species expand into the planted stands. The concepts of planted and naturalizing stands of introduced species nursing the expansion of natural forest species, and the fallacy of the concept of buffer strips, were presented in the context of the ecology of fire interaction in the natural ecotone

between natural forest and grassland. This included the situation with planted tree stands on the forest margin and their internal microclimate, with the exclusion of fire. It is recommended that there should be no buffer strip left open between the newly planted stands and the natural forest because such a strip either gets filled with invader plants incurring additional maintenance costs, or with regeneration of natural forest species which defeats the idea of a buffer strip.

Specific recommendations are provided for logistical arrangements for future vigilance monitoring (including feedback on acceptance or not of the recommendations of the report, relating to issues that most foresters and certification auditors are not aware of), revised monitoring procedures, and proposed expansion of Frankfort HCVF."

8.1.4.1.e. Vigilance monitoring of Geelhoutboom High Conservation Value Forest on SAFCOL / Komatiland Forests Tweefontein Plantation Forestry Estate at Sabie, Mpumalanga - Report Number FW-02/24, dated February 2024.

"*The stated cover of this forest is 90 ha, but this study has shown it to be 108 ha (based on a mapping of the forest on Google Earth). The assessment showed that Geelhoutboom HCVF is in a healthy state: canopy condition and forest interior is good, with no signs of resource use inside the forest. The assessment covered the fire flow patterns of four fires between August 2019 and November 2023 in the valley to the west of the ridge above the HCVF, showing that each fire following a different route in generally the same direction from the north-east, with a different impact. The main part of the assessment focused on the margin of the HCVF with grassland and with planted tree stands. The main concern with the condition of the forest margins with the grasslands is the stands of spreading pines, Black wattle, and Australian Blackwood in several places. There was no action to control those trees and stands since January 2019, when they pose a threat to the larger area in terms of fire spotting, and to the forest margin in terms of creating a hard forest edge that would make the forest margin vulnerable to fire damage. Guidelines are provided to control and remove those trees and stands cost-effectively. There was also no action to deal with the recommendations related to the buffer strips between the natural forests and planted stands. The development in the sites visited, since the previous visit, showed that the forest is nowhere threatened by the planted stands but that forest species expand into the planted stands. The observations on the forest expansion into the buffer zones and beyond were presented in the context of the ecology of fire interaction in the natural ecotone between natural forest and grassland, and what the situation is with planted tree stands on the forest margin and their internal microclimate, with the exclusion of fire. It is recommended that there should be no buffer strip left open between the newly planted stands and the natural forest because such a strip either gets filled with invader plants incurring additional maintenance costs, or with regeneration of natural forest species which defeats the idea of a buffer strip.*

Specific recommendations are provided for logistical arrangements for future vigilance monitoring (including feedback on acceptance or not of the recommendations of the report, relating to issues that most foresters and certification auditors are not aware of), revised monitoring procedures, and proposed expansion of Geelhoutboom HCVF."

8.1.4.1.f. Vigilance monitoring of Wooden Pear High Conservation Value Forest on SAFCOL / Komatiland Forests Tweefontein Plantation Forestry Estate at Sabie, Mpumalanga - Report Number FW-04/24, dated February 2024.

"The stated cover of this forest is 24 ha, but this study has shown it to be 36.5 ha (based on forest mapping on Google Earth). The 2019 assessment showed that Wooden Pear HCVF was in a healthy state. The canopy was generally in a good condition, and there were no signs of resource use inside the forest. The interior of the forest showed a good variation in the size range of stems and stand structure. Most stands visited showed mostly smaller-sized stems, which may be the result of frequent windfalls in different parts visited in the forest, from higher to lower altitude. This variation in stand structure, and good regeneration of tree species, would maintain the diversity of species favouring different types of internal stand conditions. Most of the forest lies within fire shadow areas of the Bergwinds that control the location pattern of this forest, on a steep south-easterly slope below a relatively narrow ridge. The forest is now surrounded in total by planted tree stands since about 1956, turning the entire Wooden Pear HCVF into a temporary fire shadow area. Natural forest species became established within the buffer zone, which then require that the planted area boundary be moved further back from the forest margin, and this causes a loss of productive plantation area. The observations during the assessment contradict the Forestry SA (2018) recommendations in terms of a buffer zone, and other ideas around invasion of invader plant species into the forest. These were pointed out in the discussions in 2019, and in this report. It is recommended that there should be no buffer strip left open between the newly planted stand and the natural forest because such a strip either get filled with invader plants incurring additional maintenance costs, or with regeneration of natural forest species which defeats the idea of a buffer strip. Three areas had been identified that could be assisted through passive management to convert invader plant stands to developing natural forest cost-effectively. It was proposed to expand the Wooden Pear HCVF (adding 151 ha) to cover the total natural forest system, making it one integrated system within this catchment. It would not create additional work to the PFE because streams (riparian zones) and evergreen forest are catered for under plantation management procedures, and will reduce the costs of invader plant control, based on recommendations in this report.

Specific recommendations are provided for logistical arrangements for future vigilance monitoring (including feedback on acceptance or not of the recommendations of the report, relating to issues that most foresters and certification auditors are not aware of) and revised monitoring procedures."

8.1.4.2. Heritage (Rock / San art) monitoring.

During this reporting period, all sites were visited (Routine inspection) by a heritage consultant to determine the status of the art and the implementation of the management guidelines / recommendations. The specialist visits the sites once every two years.

Rock art is a priority for all custodians in terms of cultural resources management. Rock art sites can play a major role in understanding the history of the San people who once lived in this area. It is stated under the general principles for heritage resources management specified in the National Heritage Resource Act , Section (5), that "all authorities performing functions and exercising powers

in terms of this Act for the management of heritage resources must recognise certain principles" such as:

1. the lasting value of heritage resources and the valuable, finite, non-renewable and irreplaceable aspects thereof.
2. the moral responsibility.
3. to ensure that heritage resources are effectively managed.
4. laws and procedures should be clear and available.
5. heritage resources form an important part of the history and beliefs of communities;
6. heritage resources contribute to research and education and should be developed in a respectful way".

The table below indicates the assessments / inspections undertaken by an appointed Heritage Consultant during this reporting period.

Consultant	**Report title**	**Date of assessment**
Adansonia Heritage Consultants Member: Association of South African Professional Archaeologists.	Routine Heritage Inspection and Evaluation report for Rock Art sites: Lochiel 1 and Lochiel 2 (Redhill Plantation), Syde 1 and Syde 2 (Roburnia Plantation), Blairmore, Ringkink 1a and 1b (Jessievale Plantation) and Northdene A and B (Roburnia Plantation), Lochiel, Warburton and Amsterdam areas.	January 2024
Adansonia Heritage Consultants Member: Association of South African Professional Archaeologists.	Routine Heritage Inspection and Evaluation report for the following Rock Art sites: Spitskop 1 ("Baboon Rock"), Ophir 1 ("Vlei Rock Paintings); Malieveld Vallei 1 (Bakenkop), Sabie area.	January 2024
Adansonia Heritage Consultants Member: Association of South African Professional Archaeologists.	**Newly Identified site:** Phase 1 Archaeological Impact Assessment, Survey and Management Guidelines for a Rock Art Site, 802055, OPHIR 2, on the farm Ophir 191JT, portion REM, Spitskop Plantation, dated January 2024.	January 2024
Adansonia Heritage Consultants Member: Association of South African Professional Archaeologists.	Routine Heritage Inspection and Evaluation report for the following Rock Art site: Majuba 1, Berlin Plantation, Kaapschehoop, Mpumalanga.	February 2024
Adansonia Heritage Consultants Member: Association of South African Professional Archaeologists.	**Newly Identified site:** Phase 1 Archaeological Impact Assessment, Survey and Management Guidelines for a Rock Art Site, 736033, SCHOONGELEGEN1, on the farm Schoongelegen 231JT, Witklip Plantation.	March 2024

Below is an extract from the various reports as listed above.

8.1.4.2.a Routine Heritage Inspection and Evaluation report for Rock Art sites: Lochiel 1 and Lochiel 2 (Redhill Plantation), Syde 1 and Syde 2 (Roburnia Plantation), Blairmore, Ringkink 1a and 1b (Jessievale Plantation) and Northdene A and B (Roburnia Plantation), Lochiel, Warburton and Amsterdam areas – dated January 2024.

Several rock art sites fall under the jurisdiction of Komatiland Forests (SAFCOL) in the Lochiel, Warburton and Amsterdam areas. The annual inspections by a Heritage Practitioner, are crucial to monitor and measure compliance with the Heritage Management Guidelines. New information is also included in this report, as a few previously unseen images, were documented during the current inspections.

Adansonia Heritage Consultants conducted routine heritage inspections of the rock art sites, from 23 - 26 November 2023. The previous site inspections with recommendations, took place in October / November 2021. Phase 1 Heritage assessments and the documentation of the sites were conducted between 2008 and 2019, and management guidelines were drawn up to assist Komatiland Forests (KLF) (SAFCOL) to preserve this fragile heritage asset and to comply with responsible and effective management measures.

The management guidelines form the basis of the inspections, and are discussed in the current report. Recommendations were made to KLF / SAFCOL compliance officers and plantation managers to monitor the sites according to the management guidelines and to ensure the continuous preservation of these sites.

LOCHIEL 1 & LOCHIEL 2 were inspected on 24 November 2023, near Redhill Plantation. ***SYDE 1 and SYDE 2*** as well as ***NORTHDENE 1A and NORTHDENE 1B***, were inspected on 25 November 2023 in the Roburnia area. ***RINGKINK 1a & 1b***, were inspected on 26 November 2023, at the Jessievale Plantation.

No obvious changes were observed in the condition of the images, at any of the sites. Vegetation in general is under control at most of the sites, but there are concerns at the ***LOCHIEL 1 & LOCHIEL 2*** and ***SYDE 1 and SYDE 2*** sites where vegetation is growing in the previously excavated holes directly under the images. The Heritage Specialist removed most of the vegetation which were posing a direct fire risk. Re-growth of invasive species (wattle and bugweed) is visible at the ***LOCHIEL 1 & LOCHIEL 2*** and ***SYDE 1 and SYDE 2*** sites, and needs to be monitored and / or removed. Bracken Fern infested the ***LOCHIEL 2*** site and is growing up to the rock art panels, which is a huge concern. It was already a discussed during the previous inspections, and is now posing a huge fire risk. Bracken Fern is also slowly invading the ***NORTHDENE 1A & 1B*** sites, and must be controlled before it becomes a bigger problem. Vegetation directly under the ***NORTHDENE 1B*** panel, was not controlled and the vegetation was rubbing against the faint images. The Heritage Practitioner removed vegetation directly below the images, during the site inspection.

Efforts have been made to control and maintain vegetation, but it is crucial to do follow-up inspections at all the sites to remove any dead vegetation and branches from the buffer zones around the sites. A great concern is that there is evidence that recent fires burnt against the rock art panels of the ***LOCHIEL 1 & 2***

*& **SYDE 1 & 2** sites*. Most of the rock art images are situated close to ground level and therefore KLF will have to make an effort to slash or remove vegetation from the sites before the fire season, to ensure that the fires do not impact negatively on the rock art. Firebreaks (buffer zones of 15m) should be made at each site. Please refer to specific concerns in the text for mitigation measures at the various sites.

Existing excavations were expanded at both the ***LOCHIEL 1 & LOCHIEL 2*** sites as well as the ***SYDE 2*** site, which indicate that the sites are still visited illegally. Human activity is still evident at ***SYDE 1 & SYDE 2***. The site of ***RINGKINK*** is also visited by hikers on the Grootvlei Hiking trail. The Senior Environmental Practitioner (SAFCOL) and the Heritage Specialist (author) visited the owners of Springgrove Estate in July 2022, to sensitize them about the vulnerability of the ***RINGKINK 1a & 1b*** sites by visitors from the farm. KLF has also put signage up at the site, and up to now, no further interference with the rock art site was observed.

Chip marks have damaged all the sites and some of the images can no longer be identified. The chip marks were done before the rock art inspections, and no recent / new chip marks were observed at any of the sites.

Domestic animal activity is still noticed at all the sites, but no negative impact from domestic animals is visible directly on the rock art panels. Animals such as porcupine make use of some of the shelters at night, but they do not pose a threat to the rock art (***NORTHDENE 1A / SYDE 2***).

Natural water seepage is a huge threat to the rock art at ***RINGKINK 1a***. A line of silicone was applied in 2015 above one of the images which was obscured due to constant seepage. The silicone diverted the water away from the image. A slight improvement in the visibility of the image was noticed during the 2021 / 2022 inspection. The silicone was removed by a visitor in 2021/2022, but was again replaced in 2022. During the 2023 inspection, the visibility of the image is almost the same, but in addition to the original image, another very faint image was now revealed above the original image, which proves the long-term efficiency of this mitigation measure. Water seepage occurs at all the sites.

Varnish was illegally applied over the feline image at ***RINGKINK 1b*** in 2015. It was noted that the varnish has deteriorated almost completely by 2021/ 2022. This site is monitored to see if the varnish has a long-term negative impact on the image, but no changes have been observed since the previous inspections.

New "hidden" images were observed for the first time at the ***LOCHIEL 1*** site, at ***NORTHDENE 1B***, at ***SYDE 1***, and at ***RINGKINK 1a***. This will be discussed in detail within the report.

8.1.4.2.b Routine Heritage Inspection and Evaluation report for the following Rock Art sites: Spitskop 1 ("Baboon Rock"), Ophir 1 ("Vlei Rock Paintings); Malieveld Vallei 1 (Bakenkop), Sabie area, January 2024.

Several Rock Art sites on the Mpumalanga Escarpment, fall under the jurisdiction of Komatiland Forests (SAFCOL). There are at least 31 rock art sites in the Escarpment region, mostly situated in remote and inaccessible mountainous terrains or on loose standing boulders. Komatiland Forests, as the landowner of some of these sites, have a legal obligation to preserve these fragile heritage assets for future generations.

Adansonia Heritage Consultants have drawn up management guidelines to assist Komatiland Forests with the monitoring of these sites. The sites were recently inspected in the Sabie area between November 2023 and January 2024. The sites were previously inspected in 2022, and assessed in terms of the management guidelines. Recommendations were made to plantation managers to monitor the sites quarterly as well as annually and to ensure effective management and conservation measures of the rock art sites.

The three rock art sites which were recorded and inspected are ***SPITSKOP 1*** (on the farm *Spitskop 195JT*), ***OPHIR 1*** (on the farm *Ophir 191JT)* and ***MALIEVELD VALLEI 1*** (on the farm *Malieveld Vallei 192JT*). The sites are recorded in the Komatiland Forests Areas of Special Interest (ASI) as 819-001 *Baboon Rock (Spitskop 1);* and ASI *819-001 Vlei Rock Paintings (Ophir 1). Malieveld Vallei 1*, or *Bakenkop* was removed from Komatiland Forests' inventory of *Areas of Special Interest (*ASI), as its location was not known for many years.

No obvious changes were observed at any of the three sites, since the last inspection in 2022. One of the images at *Spitskop 1* was damaged in 2016 by human interference in the form of graffiti. This graffiti was done in a chalk base substance, which has since disappeared. Traces of it can only be seen when the image is enhanced. A white bird dropping which was observed in 2020 has completely disappeared. Bird droppings do not leave a lasting effect on the images, and will disappear naturally in time. Some prominent specs of lizard faeces were observed above the floating figure image in 2020. Only faint remains of these specs are currently visible. The site is still regularly visited by geocache enthusiasts, but no negative interference was observed at the site. A copy of the *SAHRA Code of Conduct for Rock Art Sites*, was put in the geocache. In the 2020 recommendations, it was recommended that the path that leads to the site be rehabilitated, but this has not been done to date.

The *Ophir 1* site is not known to the general public, and no human interference was observed since the past inspection date. A line of silicone was applied above the images at the *Ophir 1*

site to divert constant water seepage which had left a black stain, away from the images. This was done during the 2018 inspection, and the positive effect of this mitigation measure was already notable during the 2020 inspection. During the 2021 inspection the stain was visibly lighter than in 2018 and during the 2024 inspection the stain has deteriorated quite substantially. The sections of the images below the water stain, are however completely destroyed. The biggest concern currently at the Ophir 1 site, is fire management. A recent fire burnt up to the base of the boulder. The images are very close to the surface and fire damage will contribute to the further deterioration of the images.

The *Malieveld 1* was visited in January 2024. No obvious changes were observed during the inspection. It was observed that grass is growing in the cracks of the shelter and the Heritage Specialist removed it. This will have to be monitored and removed on a quarterly basis. The rock art panel was drier when it was compared to the previous inspection in February 2022. Lichen growth stays a huge problem at this site and is obscuring most of the images. The natural drainage lines above the site should be re-directed away from the rock art site. The site will need to be visited later in 2024 by the Heritage Specialist and the Environmental Practitioner to discuss the implementation of a plan of action. One previously hidden image was observed during the 2024 inspection.

It is crucial that plantation managers monitor the sites on a quarterly basis and the Heritage Specialist annually to conduct monitoring and maintenance work. Effective management and conservation measures are crucial to ensure immediate remedial actions if necessary. It is also essential to work closely with rock art specialists and institutions as well as heritage agencies, should any negative impacts be observed.

The grass at all the sites needs to be trimmed before it is getting dry and posing a fire hazard. Please refer to further discussions in the text for the sites before the winter season, to prevent accidental fires from damaging the rock art.

8.1.4.2.c Routine Heritage Inspection and Evaluation report for the following Rock Art site: Majuba 1, Berlin Plantation, Kaapschehoop, Mpumalanga, February 2024.

Several rock art sites fall under the jurisdiction of Komatiland Forests (SAFCOL) in Mpumalanga. One of the sites, *Majuba 1* is near Kaapsehoop. Komatiland Forests have a legal obligation to preserve heritage assets in their areas of jurisdiction, for future generations. The annual inspections by a Heritage Specialist are crucial to monitor and measure compliance with the Heritage Management Guidelines. A Phase 1 Heritage assessment and the

documentation of the site was conducted in August 2012, and management guidelines were drawn up to assist Komatiland Forests (KLF) (SAFCOL) to preserve this fragile heritage asset and to comply with responsible and effective management measures.

Adansonia Heritage Consultants conducted a routine heritage inspection of the *Majuba 1* rock art site on 17 January 2024. The previous site inspection with recommendations, took place in 2021 / 2022. New information is included in the current report, as new features were noticed during the current inspection.

The *Majuba 1* rock art site is recorded in the Komatiland Forests Areas of Special Interest (ASI) as 703-043 Berlin Rock art and was given the official name of *Majuba 1* (after the farm on which it is situated), as is specified and is standard practice by the Rock Art Research Institute at the University of the Witwatersrand (Wits).

The recent routine inspection revealed that alien vegetation at the site was better controlled although alien vegetation is still a problem in the woodland vegetation near the site and on the route to the site. KLF assisted to open a path to the site and it is suggested (as during previous inspections) that the path to the site be regularly maintained. Vegetation that was cut and maintained at the site should be removed from the overhang or rock face to keep the natural buffer and to ensure that it does not pose a fire risk to the art.

No new signs of illegal visitation or other human interference were observed at the *Majuba 1* site, since the 2020 inspection, and no significant natural changes were observed in the rock art itself.

KLF needs to manage this site according to the Heritage Management guidelines (2012). Please refer to further discussions, recommendations and mitigation measures in the text.

8.1.4.2.d Phase 1 Archaeological Impact Assessment, Survey and Management Guidelines for a Rock Art Site, 802055, OPHIR 2, on the farm Ophir 191JT, portion REM, Spitskop Plantation, dated January 2024.

This study was done in the area known as Spitskop Plantation, situated near the Plantation offices, Sabie, Mpumalanga, on the farm *Ophir 191JT portion REM*. A new rock art site was discovered by Mr. Simon Attwood just south-east of the Ligfontein-Spitskop road on the Spitskop Plantation. Komatiland Forests requested that the new rock art site, ***OPHIR 2***, be assessed and management guidelines drawn up. The site is included in Komatiland Forests' inventory of *Areas of Special Interest* (ASI) on Spitskop Plantation. The site is numbered as ***ASI 802- 055***.

A phase 1 Heritage Impact Assessment was conducted and surveyed for archaeological and historical cultural remains. The site is situated along the Ligfontein-Spitskop road, close to the R537, the main road from Sabie to White River. The paintings were done on a loose standing sandstone / quartsite boulder in a stretch of grassland vegetation in a firebreak. The panel is small and one image is still clearly visible. The other two images are indistinct. Faint markings on the rock suggest that there were more images which have faded already. The site faces the edge of the Escarpment and is one of five known sites in close vicinity. There are no signs of recent illegal visitation to this site, although vandalism has taken place in the form of chip marks on the images.

The National Heritage Resources Act, no 25 (1999)(NHRA), protects all heritage resources, which are classified as national estate, and it is stated in section 27(18) that "no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site," and in section 35(4) "No person may without a permit issued by the responsible heritage resources authority – (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological site.

It is recommended that the Management Guidelines, as set out in Part II, be implemented by the Komatiland Forests Plantation Manager for the Spitskop section and that quarterly and annual monitoring takes place (see PART II for Management Guidelines), to ensure effective management and conservation of the rock art sites.

Conclusion and recommendations

The significant amount of information that could be captured from the rock art of the Mpumalanga Escarpment justifies the conservation and preservation of these sites. The sites provide valuable research potential to enhance the understanding of the lifestyles of the Stone Age San communities who lived in this area. [49]

The rock art site, ***OPHIR 2***, as is the case of all rock art sites, is extremely important in terms of its pre-historic connection with a heritage that is no longer with us. There are no known descendants of the painters left in the vicinity, as is also the case at the Highveld sites (at Roburnia and Jessievale), and every attempt should be made to gather information about this heritage that is almost lost.

All heritage features identified in the area as a whole, are protected under the National Heritage Resources Act no. 25 of 1999, and changes are subject to professional research and impact assessment.

In light of the above information as well as the specifications as stipulated in the NHRA, it is recommended that Management Guidelines, as set out in Part II, be implemented by the Komatiland Forests Plantation Manager for the Spitskop / Ophir sections, and that quarterly and annual monitoring takes place (see PART II for Management Guidelines).

8.1.4.2.e Phase 1 Archaeological Impact Assessment, Survey and Management Guidelines for a Rock Art Site, 736033, SCHOONGELEGEN1, on the farm Schoongelegen 231JT, Witklip Plantation, dated March 2024.

This study was done in the area known as Witklip Plantation, situated to the north of the Plantation offices between Sabie and White River, Mpumalanga, on the farm *SCHOONGELEGEN 231JT*. A new rock art site was discovered by Mr. Simon Attwood on the WITKLIP Plantation south of the R537 road between Sabie and White River. Komatiland Forests requested that the new rock art site ***SCHOONGELEGEN 1*** be assessed and management guidelines drawn up. The site is included in Komatiland Forests' inventory of *Areas of Special Interest (*ASI) on the Witklip Plantation. The site is numbered as ***ASI 736-033***.

A phase 1 Heritage Impact Assessment was conducted and surveyed for archaeological and historical cultural remains. The paintings were done on a large granite vertical rock face on the side of a dome shaped outcrop in grassland vegetation. It is also situated directly within a large fire belt (B31x). The panel is small and the images are faint and naturally deteriorated. Two faint markings suggested that there were more images which have faded already. There are no signs of illegal visitation to this site but fire, lichen damage and water seepage are the greatest threats to the site.

The National Heritage Resources Act, no 25 (1999)(NHRA), protects all heritage resources, which are classified as national estate, and it is stated in section 27(18) that "no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site," and in section 35(4) "No person may without a permit issued by the responsible heritage resources authority – (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological site.

It is recommended that the Management Guidelines, as set out in Part II, be implemented by the Komatiland Forests Plantation Manager for the Witklip section and that quarterly and annual monitoring takes place (see PART II for Management Guidelines), to ensure effective management and conservation of the rock art sites.

Conclusion and recommendations

The significant amount of information that could be captured from the rock art of the Mpumalanga Escarpment justifies the conservation and preservation of these sites. The sites provide valuable research potential to enhance the understanding of the lifestyles of the Stone Age San communities who lived in this area. [52]

The rock art site, ***SCHOONGELEGEN 1***, as is the case of all rock art sites, is extremely important in terms of its pre-historic connection with a heritage that is no longer with us. There are no known descendants of the painters left in the vicinity, as is also the case at the Highveld sites and every attempt should be made to gather information about this heritage that is almost lost.

All heritage features identified in the area as a whole, are protected under the National Heritage Resources Act no. 25 of 1999, and changes are subject to professional research and impact assessment.

In light of the above information as well as the specifications as stipulated in the NHRA, it is recommended that Management Guidelines, as set out in Part II, be implemented by the Komatiland Forests Plantation Manager for the Witklip Plantation, and that quarterly and annual monitoring takes place (see PART II for Management Guidelines).

8.1.4.3. Non-Timber Forest Products (NFTPs)

Non-Timber Forest Products cover a wide variety of non-timber related resources that can be harvested for economic or subsistence use. These forest products include any biological resource collected from the wild by people for direct consumption or income generation, but do not include the lumber produced from plantations.

Many people throughout the world make extensive use of biological forest products from the wild. These items, commonly termed non-timber forest products (NTFPs), can be harvested for both subsistence and commercial use. The interest in NTFPs have increased in recent years as a result of their economic benefit, while in South Africa many rural communities have to fall back on NTFPs during times of need. NTFPs not only add to people's livelihood security but may also have cultural significance and value. The attractiveness of NTFPs is that economic benefits can be derived from the environment without sacrificing a single plant. However, there is a very real growing concern about the sustainability of the resources from which these products originate, and an associated interest in managing for these products has materialized. Komatiland Forests has a ForestNET report that studied the Non-Timber Forest Product resource to provide guidelines on how to manage the difficult issue of availability and sustainability.

The objectives of the study, **"Assessing the Non-Timber Forest Products Resource for Komatiland Forest Plantations: Inventory, Assessment and Guidelines for their Sustainable Use** "were to:

1. Describe the range of products incorporated under NTFPs.
2. Understand the context and legal requirements of NTFPs
3. Assess the diversity and availability of NTFP resources occurring on KLF plantations.
4. Comment on the availability of resources to ensure sustainable utilization of priority medicinal tree species, looking at stem size class distributions and density of canopy trees per hectare.
5. Assess priority species responses along environmental and biodiversity gradients.
6. Propose guidelines or recommendations to guide the sustainable utilization of most NTFPs when a request is made for such to the Plantation manager.

These guidelines were taken up into the Conservation Management Plans of the plantations

Table 7: A list of the variety of NTFP resources, which may potentially be harvested on Komatiland Forest plantations.

NTFP	***Subsistence***	***Commercial***	***Destructive***	***KLF Available***	***Legal Requirements***	***Comment***
Plant						
Woody climbers (*Secamone* spp.) - baskets	N?	Y	Y?	Y	KLF permit DFFE*	Currently no request received
Athrixia - brooms	?	Y	N?	Y	KLF permit	Sustainability not confirmed but probable
Cut flowers	N	Y	N	Limited	DFFE* MTPA*	Few suitable species available
Grass - grazing	Y	Y?	N?	Y	KLF permit	Associated negative impacts for plantations
Grass - mats	Y	Y	N	Y	KLF permit	
Grass - thatching	Y	Y	N	Y	KLF permit	
Grass - brooms	?	Y	N	Y	KLF permit	
Bark - medicinal plants	Y	Y	Y	Limited	DFFE* MTPA*	Unsustainable
Geophytes - medicinal plants	Y	Y	Y	Limited	DFFE* MTPA*t	Unsustainable
Herbs (excluding rootstock) - medicinal plants	Y	Y	N?	Limited	DFFE* MTPA*	
Pine needles - mulch	N	Y	N	Y	KLF permit	
Reeds - construction	Y	N	N	Y?	KLF permit	Presumed limited resource
Reeds - weaving	Y	N	N	Y?	KLF permit	Presumed limited resource
Wild fruits	Y	Y (fermented)	N	Limited	DFFE* MTPA* KLF permit	Few suitable species available. Currently no request received
Wild Spinach (marog)	Y	N	N	Y	DAFF* KLF Permit	Extent unknown
Wood - firewood	Y	Y	N	Y	DFFE* MTPA* KLF permit	
Animal						
Bushmeat	Y	N	Y	Limited	DFFE* MTPA Permit	Negative impact on wildlife populations
Fish - natural	Y	N	?	DWAF* MTPA fishing license	Uncertain resource base	Fish - natural
Fish - trout	N	Y	N	Limited	MTPA Fishing license KLF Permit	Economic activity
Insects - edible	Y	N	Y?	Unknown	DFFE*	Uncertain resource base
Insects - honey	Y	Y	N	Y	DFFE* KLF permit	

Fungal						
Mushrooms	Y	Y	N	Y	DFFE* Tender/contract	Presumed sustainable

Y = Yes

N = No

? = uncertain or possible

KLF = Komatiland Forest

DFFE = Department of Forestry, Fisheries and the Environment

DFFE* = if occurring in a forest, or a Protected tree species

MTPA = Mpumalanga Tourism and Parks Agency.

MTPA* = permit required only where plants are Protected plant species according to provincial Act.

8.1.4.3.a. A management guideline towards sustainable bark harvesting to assist SAFCOL Plantation Forestry Managers when dealing with traditional healers or unauthorized bark harvesting. January 2024.

With the conducting of indigenous forest monitoring, the specialist identified various degrees of bark harvesting, from past to present activities. Such incidences are also recorded in the specific forest reports. A recommendation was made that one should not prevent such activities especially where local communities may benefit and hence a guideline document was requested to assist managers when confronted with such activity. Below is an extract from the Executive summary:

“

All timber plantations in South Africa have large areas of natural vegetation, including indigenous forests and seasonal woodlands. In several of these areas, the use of bark for traditional medicine by rural societies has caused concerns over possible detrimental impacts of such bark harvesting. However, bark harvesting can be managed in different ways. This requires an understanding of the importance of bark use in rural societies for traditional medicine and the associated commercial trade that has developed along with this traditional use, and the ecological functioning of bark of a tree. SAFCOL/Komatiland Forests required this project to provide them with a list of species that are of medicinal importance, species-specific bark harvesting systems that would ensure recovery of the harvested species and their regeneration to provide a resource for the future, a comparison of whole tree harvesting versus strip harvesting, and approaches to developing alternative resources. This report provides a relevant background and context to the use of bark and the eco-physiology of tree response to debarking. It presents an overview of the kinds of bark harvesting encountered in different Plantation Forestry Estates (PFEs) of SAFCOL/KLF and other natural forests associated with forestry plantations in South Africa. It is important to consider that historically traditional source areas are now covered in timber plantations. Such traditional use of medicinal plants needs to be acknowledged where relevant, to develop collaborative, participatory forest management practices in such areas, *but not to initiate such collaborative bark use management* in PFEs where there are no such bark use actions. The gathered information was used, with practical examples, to develop the guideline document. It is presented in four steps to deal with different options for the management of bark harvesting and use. Step 1 is to assess the area{s} of perceived bark harvesting through regular patrolling within the relevant PFE as a passive law enforcement action, to demonstrate presence and prevent future expanded bark harvesting, and to assess the existence and extent of bark harvesting, the tree species involved, and severity of impact. A table is provided to assist with assessing the

potential for strip harvesting versus whole tree harvesting. Step 2 is to determine who is responsible for debarking of trees and to contact involved individuals or groups to develop a bark user group as basis for participatory, collaborative management, to refrain from confrontational law enforcement, to distinguish between different levels of bark use (true subsistence users, conservative commercial users and aggressive commercial users). An example is presented of the formation of a medicinal bark harvesters association. Step 3 is to develop a sustainable, integrated, multiple-use bark-harvesting management system, *only after developing such a collaborative relationship with user groups (not individuals)*. The exact procedures to follow will be determined by the characteristics of the species preferred by the harvesters, the recovery characteristics of each tree species, and the type and intensity of debarking (small wounds to total tree cutting). This is where the local knowledge of experienced bark harvesters is very useful. More information is provided on the silvicultural practices associated with whole tree harvesting and involvement of the bark harvesters as local entrepreneurs to cut severely debarked trees, to use all the timber and bark, and to manage the coppice regrowth towards a future resource. Step 4 is to consider developing alternative resources. Several different potential approaches are presented, including obtaining adequate numbers of recruiting plants cost-effectively, whether from vegetative sprouting, seedlings developing naturally on the regeneration sites or planting of seedlings obtained from natural areas and occasionally raised seedlings. Finally, it will be important to follow an adaptive management approach with monitoring and adaptation to overcome many yet unknown procedures.

The report provides the following concluding remarks:

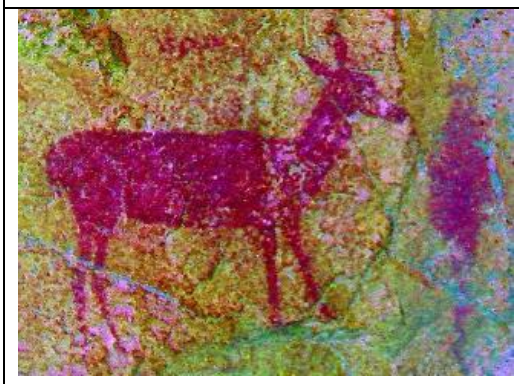
The harvesting and sustainable management of medicinal plants is still a relatively new approach in forestry. We still need to learn many things, but can make progress through an adaptive management approach, linking regular monitoring of the implemented practices and responses with adjusted practices in a continuous loop. This monitoring and adaptation should form part of the participatory management between the PFE Management and the harvester group(s), and other landowners, on a continuous basis.

8.2. Management of areas of special interest (ASI) and Natural Heritage Sites

Areas of Special Interest (ASI) are part of Special Management Zones (SMZ), which are areas within the plantation, both in open and commercial areas, that contain features that are man-made or natural and require particular management strategies due to their scientific, ecological, paleontological, archaeological, historical, traditional, aesthetic or recreational values.

Elements that can be considered as ASIs, according to the second category of the GALLA Model for cultural heritage management are the following:

EXAMPLE	TYPE	QUANTITY
	**Buildings** – These are structures that were erected to protect people, animals, equipment and produce from negative impacts. They are structures which have roofs. They are usually protected due to their size, style or architectural significance. The photo shows an old mining house at Berlin plantation. Record nr: 703-013 (Miners house – Sparky)	38
 	**Structures** – These are immovable things that have been constructed in the ground or on the surface and can include: foundations, walls, wind pumps, wells, bridges, weirs, cattle kraals, ruins and graves. The photo shows a memorial stone on the Berlin plantation. Record nr 703-005 (N16 JG Roscher Memorial Stone) This photo shows a grave site at the Berlin plantation Record no. 703-008 (B37w Kaapschehoop Community Graveyard)	470

	**Infrastructural elements** – These are engineering works and include: railway lines, electricity lines, pipe lines, water canals, furrows and roads. The photo shows a water berm at Jessievale, constructed over bedrock that was used to arrest water flow and divert to a homestead. Record nr 711-R66 (N11x water berm)	16
	**Activity areas** – These are sites where no buildings or structures exist, either because nothing was ever erected, or they were destroyed by environmental factors or demolished by humans and includes: Archaeological sites, rock art sites, rock shelters, battlefields and gardens The photo shows a rock art site on Jessievale plantation. Record nr 711-R75 (L24b Rock Art site)	31
	**Planted vegetation** – This includes indigenous and exotic species and includes any planted vegetation found in gardens, orchards, lanes and hedges. The photo shows Yellowwood trees planted by the Duke and Duchess of Devonshire on the 13th June 1939 at Ngome plantation. Record nr 715 - 048	28
 	**Other (RTE species, Geological, etc) –** This includes red Data species and geological areas The photo shows a *Brachystelma ngomense,* a critically endangered species, which has been found at Ngome. Record nr 715-49 (*Brachystelma ngomense*) This photo shows a geological formation (Godwan lava) that is visible in a road cutting on Berlin Plantation. Record 703020 (A10 Rock formation)	34

To be able to determine if a place or object has cultural significance, one needs to know the meaning of cultural significance.

Cultural significance means possessing historical, archaeological, architectural, technological, aesthetic, scientific, spiritual, social, traditional or other special cultural significance associated with human activity

For certain situations Komatiland Forests, makes use of Heritage Consultants to conduct impact assessments and to assist in the management of these sites by providing written management guidelines.

Komatiland Forests, records “Areas of Special Interest” (ASIs), according to the prescriptions outlined in the Integrated Management System. These sites are then tabled in the plantation specific Conservation Management Plan (CMP), each with a specific management plan, GIS plotted and then mapped on plantation maps.

During plantation activities such as harvesting and silviculture, all ASI’s in that specific work area must be recorded on the operational plans and demarcated as “NO –GO” areas. Directional felling at such sites is necessary and a minimum 5m buffer zone must be allocated to all sites except water features (e.g. waterfalls, natural pools etc), which will justify a larger buffer zone in terms of water quantity and quality management. These buffer zones may not be encroached upon.

It is important that the need to increase the awareness of the importance of conserving ASIs is communicated to all labour and Plantation staff. Any newly identified sites must be reported to management encountered.

Although the present Natural Heritage Programme is no longer applicable to the current situation, Komatiland Forests / SAFCOL, is proud to have and manage seven declared Natural Heritage Sites (NHS). This was a voluntary programme, based on a goodwill relationship between the landowner and the conservation authorities. The six sites are listed below:

- Lakenvlei NHS – Belfast plantation
- Kalkoenvlakte NHS – Roburnia plantation
- Kempshoogte NHS – Uitsoek plantation
- Grootvlei NHS – Jessievale plantation
- Maliedyke NHS – Tweefontein plantation
- Padzima NHS – Entabeni plantation
- Barotta Vlei NHS – Entabeni plantation

During 2020 the wetlands at Belfast Plantation were assessed by Kruger to Canyon and Birdlife SA as part or the International Union of Conservation of Nature (IUCN), OECM project.
OECM stands for “Other Effective area-based Conservation Measures”.

The key OECM Principles are:

1. It is a global framework to recognize and report existing conservation measures.
2. There is a structured framework with flexible indicators.
3. Recognising and reporting OECMs requires the governance authority’s consent.
4. OECMs cannot be protected areas.

There are two categories:

- ✓ A candidate OECM. This refers to a geographically define space that has been identified as a “Potential OECM” and the governance authority has consented to it been assessed against the Convention on Biological Diversity (CBD) criteria (IUCN- World Commission on Protected Areas Task Force on OECMs);
- ✓ Confirmed OECM. This is a geographically defined space that has been identified as a “Potential OECM”, undergone preliminary assessments against OECM characteristics by the governance authority(or equivalent authority) and up-listed to a candidate OECM, and has ultimately satisfied the criteria through site specific assessments per the reporting authority(ies) requirements

The wetland areas on the Belfast Plantation was identified as a “Candidate OECM”. The varied landscape as well as ownership, governance and land use types made the wider area suitable to conduct the Case Study Assessments of the identified potential OECMs. The Kruger to Canyons (Non profit company) was identified as a strong implementation partner. A total of 9 sites were identified as candidates in South Africa, but only 6 were considered confirmed OECMs. These included:

- ✓ Game farm / reserve
- ✓ Community owned land
- ✓ Eco tourism site
- ✓ State Military site
- ✓ State Forestry site (Belfast Plantation)
- ✓ Education institute.

A video of the wetlands can be viewed at:
https://www.ecologygateway.com/100823/Edgar%20Conrad/IUCN,%20International%20Union%20for%20Conservation%20of%20Nature/Earth%20biosphere/Nature%20Stewardship%20Beyond%20Protected%20Areas:%20Belfast%20Wetlands%20(OECM%20case%20study%203)

On 19 October 2021, the Minister of DFFE, published in the Government Gazette 45435, the declaration of Forest Nature Reserves, under section 8(1) and 9 Of the National Forest Act 1998 (Act 98 of 1998)

SCHEDULE

PROPERTIES DECLARED AS FOREST NATURE RESERVES

Name of forest nature reserve	Property description	Size of property (ha)	Locality
Tweefontein	A part of ptn 1 of the farm Hartebeestvlakte 183 JT; A part of the Remainder of the farm Geelhoutboom 585 KT; A part of the Remainder of the farm Tweefontein 167 JT; A part of the Remainder of the farm Ceylon 197 JT; A part of the Remainder of the farm Mountain Top 161 JT; A part of the farm Lot E 201 JT; A part of the farm Lot D 202 JT; A part of the Remainder of the farm Lot C 204 JT; Ptn 1 of the farm Lot C 204 JT	1118,86	Thaba Chweu, Registration Division KT
Berlin	A part of the Remainder of the farm The Narrows 482 JT; A part of the farm Coetzeestroom 479 JT; A part of the farm Uitkyk 502 JT; A part of the Remainder of the farm Bridle 511 JT; A part of the Remainder of the farm KaapscheHoop 483 JT; A part of the Remainder of the farm Berlin 446 JT; A part of the farm The Wattles 509 JT; A part of the Remainder of the farm Majuba 508 JT	1288,29	Mbombela, Registration Division JT
Blyde	A part of the Remainder of the farm Berlyn 506 KT; A part of the Remainder of the farm Lisbon 531 KT; A part of the Remainder of the farm New York 530 KT; A part of ptn 1 of the farm Lisbon 531 KT	1482.73	Thaba Chweu, Registration Division KT
Uitsoek	A part of the Remainder of the farm Lisabon 262 JT; A part of the Remainder of the farm Kantoorboe 263 JT; A part of ptn 1 of the farm Uitkyk 264 JT	352,91	Thaba Chweu, Registration Division KT
Morgenzon	A part of ptn 3 of the farm Morgenzon 525 KT; Ptn 1 of the farm Peach Tree No 544 KT; A part of the Remainder of the farm Peach Tree No 544 KT	607,11	Thaba Chweu, Registration Division KT
TOTAL		4847,89	

8.2.1. Relocation of desecrated Maria Shires and William Bowman Historical graves.

Komatiland Forests / SAFCOL became aware in September 2021 as regards the desecration of the Maria Shires graves on the Tweefontein Plantation.

In order to rehabilitate the site, Komatiland Forests engage the South African Heritage Resource Agency (SAHRA) for guidance. Following the recommendations from SAHRA, a Heritage Specialist was appointed to assess the damage, engage descendants, other stakeholder groups and provide recommendations in order to restore and rehabilitate the disturbed site in compliance to the permit conditions, to be issued by SAHRA, in line with the National Heritage Resources Act.

Maria Shires Grave Site

Our Ref:

an agency of the Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Elijah Dumisani Katsetse
Tel: 0214624502
Email: ekatsetse@sahra.org.za
CaseID: 17964

Date: Tuesday February 22, 2022
Page No: 1

Letter

In terms of Section 35(4) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Christine Rowe
Adansonia Heritage Consultants

TO RELOCATE DESECRATED HISTORICAL GRAVES AT TWEEFONTEIN PLANTATION NEAR SABIE / PILGRIM'S REST, MPUMALANGA. The site is situated on a small hill next to the Maria Shires Waterfall.

Dear Anton,

RE: Maria Shires Grave Site

Thank you for your permit appplication for the rescue relocation including recording and excavation of Maria Shires and William Bowman's graves on the Farm Geelhoutboom 565KT, Tweefontein Plantation, Graskop, Mpumalanga Province. SAHRA has succesfully reviewed and approved your application. Kindly note your permit is valid until 31 March 2023.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Elijah Dumisani Katsetse
Heritage Officer
South African Heritage Resources Agency

In April 2023, the relocation of the grave was successfully concluded as all permissions had been obtained by the Heritage Specialist (Adansonia Heritage Consultants) from the various authorities.
Below is an extract from the final relocation report.

CONCLUSIONS AND RECOMMENDATIONS

Christine Rowe (Adansonia Heritage Consultants) was appointed by SAFCOL to conduct a rescue excavation of two historical graves that had been recently vandalized by grave robbers. Mr. A. Pelser from APELSER ARCHAEOLOGICAL CONSULTING cc, assisted as Principal Investigator. The project included the relocation of any possible human skeletal remains from the graves which had recently been vandalized by grave robbers, as well as the vandalized headstones of the two graves, to the Pilgrims Rest Historical Cemetery. The two graves are those of Maria Shires and William Bowman, located close to the Maria Shires Waterfall in SAFCOL's Tweefontein Plantation. The historical grave site is situated on the farm Geelhoutboom 565KT, in the Sabie district of Mpumalanga.

The work was done under SAHRA Permit Case ID#17694, and in conjunction with Tswelopele Funerals after they obtained their relevant permits from the Provincial Department of Health in

Mpumalanga.

When the rescue excavations at the site were carried out, it was clear that subsequent to the previous desecration/vandalism, a second attempt was made in removing either cultural material (grave goods), and/or human remains from the site. A new trench was dug into the Maria Shires grave. Soil from the trench was discarded against the stone-wall demarcation of the site, and also over the original William Bowman grave position. The first focus was the removal of the two historical headstones from the site, to safeguard them against any further damage during the rescue excavation. After this, the excavation work on site began. The partially open pit at the Maria Shires grave site was first investigated to see if any possible human skeletal remains and/or grave goods were left behind. No human skeletal remains or grave goods could be found.

Secondly, the area around the original William Bowman grave was excavated again, up to the level of the original burial pit, and also the entire trench that was previously dug by the grave robbers. Again, no material was present. All the soil and material discarded during the vandalism/illegal excavation of the two graves were then worked-through to see if any skeletal remains and/or grave goods could be found. The soil was used to backfill the open burial pits and to level/rehabilitate the site as best as possible. The only human skeletal remains found was a fragment of bone, most likely part of a femur head, that articulates with the pelvis. One old rusted iron coffin nail was also recovered from here. The fragments of a late 19th century rum bottle were recovered from under the soil that was piled against the stone-wall around the site, directly to the right of the Bowman grave. Although it is impossible to determine clearly if this bottle is associated with any of the burials, it is contemporary in terms of the time-period when the two individuals were buried during the 1870's. Therefore the fragments were also included for reburial purposes.

After the rescue work was completed and the site was rehabilitated, the remains recovered and the historical graves headstones were taken directly to the Pilgrims Rest Historical Cemetery. A new grave plot was prepared under guidance from staff of the Pilgrims Rest Museum in an open plot close to the well-known Robber's Grave, in the cemetery. The new coffin with the scant remains were placed here, and both historical headstones will be re-erected at the site, once they had been repaired properly.

8.3. Rehabilitation and restoration of degraded sites.

Komatiland Forests currently identifies degraded sites, records and compiles a management plan. This process is ongoing and eventually all degraded sites will be identified and brought into some

form of management. Management may be in the form of, leave as is, if stable and no negative impact, to rehabilitation. This rehabilitation activities can be in degraded natural areas, weed infested areas, erosion, quarries, waste sites, etc. A degraded area is characterised by some form of disturbance and is often associated with the removal of vegetation and subsequent erosion. This disturbance can occur naturally or as a result of human interference.

The restoration works must be carried out at least to the extent that no further soil loss is occurring. Areas that are actively eroding are treated rather than considering areas that may look unsightly, but are stable. It is important that areas that have been depleted of plant cover should be revegetated either naturally or with some assistance. If the damage is minimal, removal of the cause of degradation may result in a quick recovery. In more extreme cases, revegetation will not occur naturally and will require assistance. Techniques used for revegetation will vary. They may include drainage and control, ground preparations, seeding, fertilizing, mulching, irrigation, protection and management.



The use of Eco blankets and eco logs on a degraded site 703-02 at Berlin Plantation.

8.4. Wetlands.

The word “wetland” is a family name given to a variety of ecosystems, ranging from rivers, springs, seeps and mires in the upper catchment, to midlands marshes, pans and floodplains, to coastal lakes, mangrove swamps and estuaries at the bottom of the river basin.
All these ecosystems share a common primary driving force: water. Its prolonged presence in wetlands is a fundamental determinant of soil characteristics and plant and animal species composition.
Any part of the landscape where such water accumulates for long enough periods which is enough to influence the plants, animals and soils occurring in that area, is thus a wetland (DWAF 2005).

The National Water Act defines wetlands as: ‘*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 in normal circumstances supports or would support vegetation typically adapted to life in saturated soils’* (DWAF 2005).

Wetlands must have one or more of the following attributes:

1. Wetland (hydromorphic) soils that display characteristics resulting from prolonged saturation**.**
2. The presence, at least occasionally, of water-loving plants (hydrophytes).
3. A high-water table that results in saturation at or near the surface, leading to anaerobic conditions developing in the top 50cm of the soil.

8.4.1. Wetland / riparian delineation.

Wetland / riparian delineation is the process whereby the boundary of the wetland / riparian area is determined and marked. The boundary of a wetland is the outer edge of the temporary zone of wetness, which is characterised by saturation within 50cm of the soil surface for less than three months of the year. The boundary of a riparian zone is the outer edge of vegetation associated with the macro channel, this is the edge of “more vigorous growth”. The delineation exercise thus strives to accurately identify and delineate the spatial extent of wetlands and riparian habitats with the intention of preventing past and future commercial afforestation transgressions into these sensitive habitats. In plantations the delineation and marking exercise includes placing a 20 metre buffer, from the edge of the temporary zone of wetness / edge of vegetation of vigorous growth.
After clear felling each compartment must be assessed. During 2022 (November), all responsible Silvicultural foresters, received delineation training by a soil scientist. It is the responsibility for the plantation management to take ownership of the programme and implement it, according to the SAFCOL guideline document: “Wetland and Riparian Habitat Delineation BOP, document BOP – FSE - 020”. This Best Operating Procedure (BOP) provides the Purpose, Scope, and Operational Control guidance. The Environmental section is to provide oversight. When required, audits, conducted by an external, suitably qualified and experienced contractor can be undertaken to check on the quality of the delineation work or where it is difficult to interpret the conditions (Special cases – Black Quartzite).

SAFCOL is also an active member of the Mpumalanga Wetland Forum and has hosted meetings in 2023 and 2024.



Practical training for wetland delineation.

8.5. Weed control

Komatiland Forests developed a Tactical Weeding plan for the commercial areas with the purpose to develop and demonstrate measurable annual progress in weeding. This is a responsibility of the Silvicultural Manager.

The goal is to increase the area under maintenance over a period of time. Resource availability and allocations will determine the period to achieve maintenance phase. The definition for Maintenance used *"Maintenance phase is achieved when the average norm for weeding is ≤1 units/ha/year or when infestation level is less 10 % and applies only to compartments after tending period (applies to Acacia; Pinus and Eucalyptus spp) ".* Tending regimes for the different working circles were also defined.

The same concept is applicable for the conservation areas. To verify the accuracy of the information on the system, foresters are required to conduct a visual assessment for both commercial and non-commercial areas. Any changes are then reported on the Microforest weed module.

Methodology

A baseline was drawn using a desktop exercise to define compartments that were on maintenance for all plantations and also classifying the level of infestation. Both visual assessment and actual operations was used to update the weed phase of each compartment, all the weeding job codes are linked to a weeding phase. The conservation area base line was populated using 4 categories i.e. initial, follow up 1, follow up 2 and maintenance. Commercial compartments qualify to be classified as maintenance after the tending period.

Harvesting and pruning tactical plans were used to generate future weeding schedules. Pruning and harvesting operations will be the main drivers of the weeding plans. The area under maintenance will be increased by the new compartments which will be treated to meet the

maintenance status. Felled compartments will fall into tending area as part of the normal rotation cycle.

Plantation blocks were classified according to their geographical location i.e. Lowveld, Highveld and Escarpment and rates differentiated accordingly.

Priority ranking was done so that compartments on maintenance are kept clean whilst weeding progresses from light to heavy infestation. A criterion for prioritization was defined as follows:

- Priority 1: All compartments on maintenance in the current year, tending, pruning, thinning and clear-felling compartments.
- Priority 2: Compartments that are lightly infested.
- Priority 3: Compartments that have a medium infestation.
- Priority 4: Compartments that have a heavy infestation.

The Silviculture forester is responsible for the integrity of the compartment database and the execution of the plan.

<u>The Plantation and district manager</u> must sample and verify the integrity of the database.

At the beginning of the new financial year weeding maps must be requested from planning reflecting maintenance area.

Weeding plans will be part of the annual silviculture audit scope.

In 2015, Syndicate Database Solutions (Pty) Ltd was approached to develop a new weed management system. After discussions, two excel documents that were currently in use: “Integrated Long-Term Weeding Plan” and “Nelshoogte MUCP” a proposal was provided.

<table>
<tr><td colspan="2">Microforest</td><td colspan="2">KLF’s Weeding Requirements</td></tr>
<tr><td rowspan="2">Plantation Manager (PMI)</td><td>Landuse Database</td><td>Comprehensive Weed Register</td><td rowspan="4">Reporting</td></tr>
<tr><td>Tactical Planning System (TPS)</td><td>Medium Term Weed Control</td></tr>
<tr><td rowspan="2">Business Suite (BS)</td><td>Operations, Costing and Budgeting</td><td>Financial Planning</td></tr>
<tr><td>Works Orders and Operational Control</td><td>Operations Control and re-scheduling</td></tr>
</table>

It was identified that there was a good fit between KLF’s weed management requirements and the existing MicroForest processes and components. However most of these processes and components have not been optomised for strategic weed management purposes, and a

substantial amount of streamlining and new development would be required in the MicroForest system.

An Integrated Microforest Weed Management Module, would offer the following key benefits tp Komatiland Forests.

- ✓ New, important functionality e.g. tactical weed planning and weeds register.
- ✓ One complete solution as opposed to multiple, loosely integrated applications
- ✓ Phased implementation and data migration
- ✓ Common functionality available for both commercial and non-commercial areas, system flexible allowing users to determine when advanced feature should be used.

These tools are used to generate weed status reports on weekly and monthly basis and communicated with all plantations for them to keep track of their progress.

Weeding progress

Plantation	Area	COMMERCIAL AREA (Ha)					Area	NON-COMMERCIAL AREA-MAINTENANCE (Ha)					NON-COMMERCIAL AREA-MAINTENANCE (%)					COMMERCIAL AND NON-COMMERCIAL				
		2022	2023	2024	2025	2026		2022	2023	2024	2025	2026	2022	2023	2024	2025	2026	2022	2023	2024	2025	202
Belfast	4 482,94	2 043,16	1 953,62	2 465,39			1 549,59	1542,7	1 384,12	1 495,99			99,66	89,32	96,54			59,51	55,33	65,67		
Berlin	7 718,97	443,18	1 657,66	3 155,56			5 485,25	380,48	2 338,47	2 679,56			7,05	42,63	48,85			6,20	30,26	44,19		
Jessievale	12 840,42	8 721,85	8 927,46	9 298,50			5 595,68	4278,1	4 396,23	4 408,04			77,28	78,56	78,78			70,67	72,27	74,35		
Ngome	2 412,15	357,47	219,56	634,88			3 493,71	1930	1 936,54	2 210,34			56,02	55,43	63,27			46,37	36,51	48,18		
Uitsoek	6 498,39	2 804,22	2 587,23	3 580,27			4 833,85	3673,8	3 928,12	3 919,70			76,48	81,26	81,09			66,28	57,49	66,18		
Nelshoogte	8 169,36	4 594,30	1 188,09	3 955,29			3 159,23	2522,2	2 101,27	2 575,58			81,82	66,51	81,53			63,01	29,04	57,65		
Witklip	5 427,62	906,88	1 102,78	1 565,61			4 547,86	2269,6	2 684,20	2 794,40			50,28	59,02	61,44			30,91	37,96	43,71		
Roburnia	10 462,09	6 944,48	4 661,83	5 989,83			4 833,21	3968,5	4 625,60	3 973,47			80,39	95,70	82,21			71,33	60,72	65,14		
Bergvliet	10 955,65	4 664,13	2 894,21	4 540,13			6 461,02	1951,3	3 199,83	2 108,68			30,22	49,53	32,64			38,29	34,99	38,17		
Blyde	6 992,18	4 704,07	4 113,04	5 004,24			5 615,36	4769	5 009,01	4 356,82			85,22	89,20	77,59			71,67	72,35	74,25		
Brooklands	8 687,19	1 254,35	857,88	2 913,55			4 069,52	1583,7	2 239,28	2 241,54			39,00	55,03	55,08			23,09	24,28	40,41		
Tweefontein	12 059,79	1 076,38	4 425,88	3 058,13			6 582,21	5254,2	4 497,31	3 640,89			80,62	68,33	55,31			34,43	47,87	35,94		
Wilgeboom	6 238,13	436,53	1 270,02	2 897,35			2 693,41	1704	651,60	599,19			63,52	24,19	22,25			22,90	21,51	39,15		
Woodbush	6 250,34	2 348,87	2 623,01	3 152,71			2 951,67	1769,9	1 523,25	2 026,23			59,99	51,61	68,65			44,47	45,06	56,28		
Entabeni	11 333,04	2 894,72	983,79	2 848,14			6 027,50	2682,8	2 698,93	2 397,97			45,00	44,78	39,78			32,30	21,21	30,22		
Totals	**120 528**	**44 195**	**39 466**	**55 060**			**65805**	**40280**	**43 214**	**41 428**			**Actual Maintenance percentage**									
			0.33	**0.46**									**62**	**66**	**63**			**45**	**44**	**52**		

8.6. Erosion Risk Programmes.

"Erosion" means "to eat away, destroy, and gradually wear out". This can sometimes be rapid, but in most instances, happens in small increments with a result that the damage is hardly noticed at all.
Soil erosion is a double disaster, as a vital resource, soil, disappears from where it is desperately needed only to be dumped where it is equally unwanted. As a result, erosion results in the following negative impacts:

1. Land is lost. A valuable resource, soil, which is vital to the sustainability of a crop, is lost.
2. The productivity of the land is reduced.
3. Roads and bridges are damaged or destroyed due to the increased erosive energy of sediment laden water.
4. Siltation of water courses and dams.
5. Aquatic habitat is lost.
6. Wetlands become clogged up thus reducing / destroying the ecosystem services.
7. Water quality and quantity degradation.

The Conservation of Agricultural Resources Act, (Act 43 of 1983), makes it the responsibility of the land user to protect the soil he uses. Section 13(1) states "Every land user shall by means of as many of the measures set out in regulations 4, 5 and 9 as are necessary in his situation, effectively restore or reclaim the land on his farm unit on which excessive soil loss due to erosion occurs or has occurred"

Factors affecting the rate of erosion include vegetation cover, length of the slope, gradient of the slope, soil type (erodibility) and rainfall intensity. Only the first three factors can be manipulated to control erosion, and this formed the backbone of the erosion control programmes. The projects involved determining the risk profile of the affected areas, which considered all the factors above.
KLF has not had large scale devastating fires, as was the case in 2007 and 2008. As a result no major erosion control projects have been under taken. However, the information to determine areas of erosion risk is available at the planning department. The section below describes the actions that can be implemented in the case of erosion projects as a result of large wildfires.

The Environmental Section in cooperation with the Planning Section formulate an erosion risk profile for the affected areas (AfriGis). This is done by overlaying the gradient, erodibility of the soil and the intensity of the fire in the GIS database. From this desktop study, burnt compartments can be rated from 1-10 for erosion risk (1 = highest risk and 10 = Lowest risk).
For management purposes the erosion risk categories are adjusted as follows:

1 - 3 = High risk
4 - 7 = Moderate Risk
> 7 = Low risk.

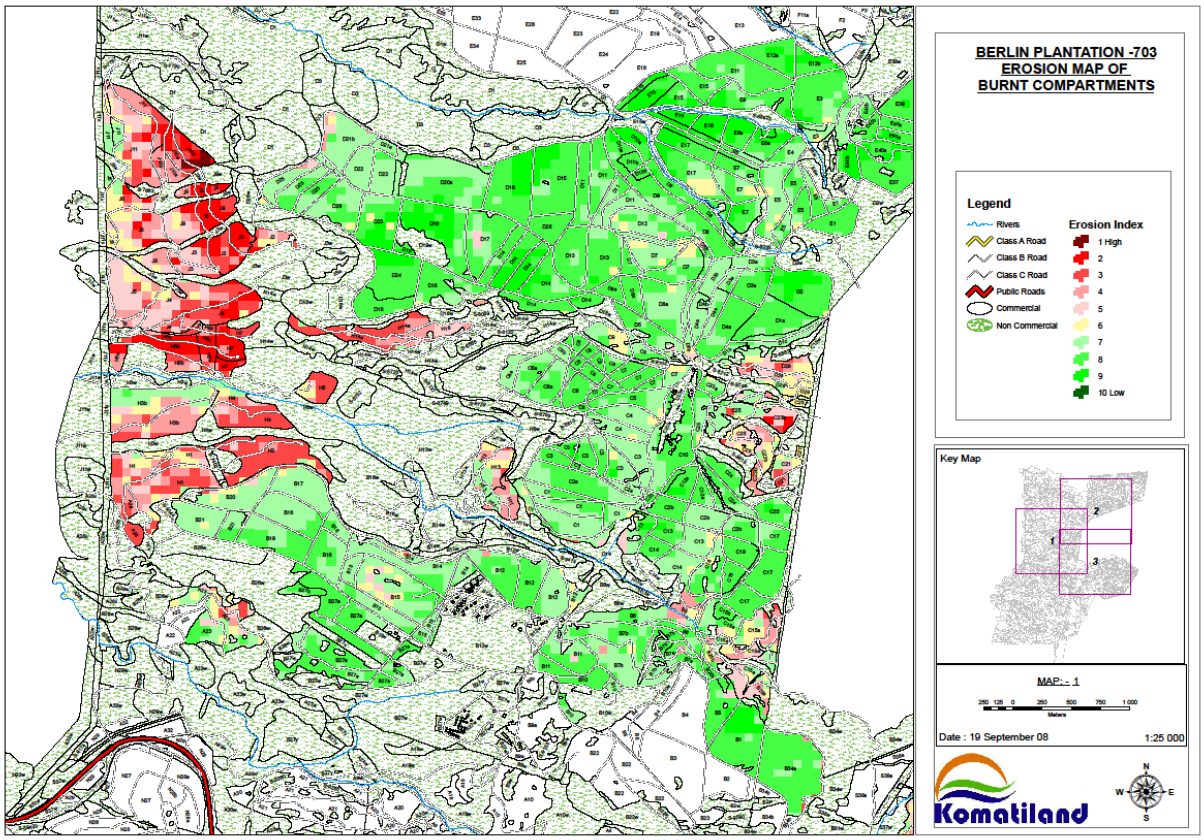


Figure 11: A map indicating erosion risk per compartment.

The anti erosion measures then focuses on the identified high risk areas. In conjunction salvaging operations have to incorporate site specific control measures, irrespective of the erosion potential for the specific compartment.

Site specific erosion control measures, range from the stacking of sand bags (drainage channels) to the packing of branches/tree crowns on contour lines coupled with the sowing of grass seed.

In areas that are predetermined as having a high risk and where the tree ages ranged from 0 – 8 years are considered as the foremost priority. These areas pose the most severe risk as there is often very little, if any, plant material left to stack on contour lines. The packing of sand bags in gully's and on slopes together with the sowing of indigenous grass seed is the only proven viable method of combating soil erosion. In conjunction with this activity, areas are also sloped / landscaped and the exposed soil, revegetated, by either planting grass collected over a wide area, or the active sowing of seed. By vegetating the exposed soils, one is able to decrease water velocity, thus increase water infiltration into the soil, which decreases water runoff. It also protects the soil from the 'splash' effect.

In addition, each compartment has a Fire Risk Category, which must be implemented when site preparation with the use of fire for slash management is considered

Fire Risk Categories		
Key	**Constraint**	**Comment**
Green	If the dominant site type within a compartment does not have an Organic Carbon content in the categories very high or extremely high **and** a Clay content less than 20% **and** a dominant slope > 20% irrespective of area	Low erosion risk associated with the use of fire as a management tool in the compartment. Ensure controlled burning is done in accordance with IMS prescriptions.
Yellow	If the dominant site type within a compartment has a Clay content less than 20% **or** the dominant slope of the compartment is greater than 20% **and** the area of **both** in the compartment is greater than 50%	Moderate erosion risk if fire is used as a management tool in the compartment. Ensure controlled burning is done strictly in accordance with IMS prescriptions.
Orange	If the dominant site type within a compartment has a Clay content less than 20% **and** if the dominant slope of the compartment is greater than 20% **and** the area of **both** in the compartment is greater than 20%	High erosion risk if fire is used as management tool in the compartment. Alternative methods to be used to achieve management objectives. Controlled burning only allowed as a last resort.
Red	If the dominant site type within a compartment has an Organic Carbon content in the categories very high or extremely high **and** a Clay content less than 20% **and** the area of **both** in the compartment is greater than five percent irrespective of slope	Extreme risk to the destruction of the soil if fire is used as management tool in the compartment. No controlled burning of the compartment allowed due to the presence of soils with High Organic Carbon and Low Clay percentage (Peat).

9. Safeguarding and control of pesticide use.

A pesticide is a collective name for herbicides, insecticides, fungicides and rodenticides.
Komatiland Forests is an active member of the Timber Industry Pesticide Working Group (TIPWG).
The Timber Industry Pesticide Working Group of Forestry South Africa (FSA) exists to promote responsible and effective use of pesticides in South African commercial timber plantations.
The group has four main roles:

1. **Technical support.**
   To provides technical support and recommendations to Forestry South Africa (FSA), its Environmental Management Committee (EMC) and the forestry industry:
   a. Adoption of new pesticides and removal of older, less effective formulations and active ingredients.
   b. Coordinating industry registration applications, pesticide research and integrated pest management (IPM) practices
   c. The endorsement of new pesticides for regulatory approval.

2. **Industry Collaboration.**
   To facilitate collaboration on pesticide, use across the forestry industry:
   a. Managing the list of approved pesticides
   b. Needs analysis for new pesticides.
   c. Research regarding new pesticides for registration or label extensions.
   d. Communicating industry's voice to external bodies.

3. **Compliance.**
   TIPWG seeks to achieve industry compliance with local legislation, international conventions and standards.

4. **Provision of guidelines**
   TIPWG facilitates collaboration on socially acceptable, environmentally responsible and economically viable pesticide use across the forestry industry.
   a. To create and develop a database on pesticides and associated information (SDS, labels, approved use and application);
   b. To develop standard operating procedures (SOP) with respect to pesticide usage, including minimising pesticide reliance and implementing IPM practices and bio-control.
   c. To advise on which generics are not polluted with contaminants.

More information regarding TIPWG can be found at the following website address: www.tipwg.co.za.

KLF only uses chemicals that appear on the TIPWG approved list. These lists include chemicals that have been screened to determine if they comply to the FSC® thresholds. These lists are updated on a regular basis and distributed to all plantations.

KLF is committed to the responsible use and reduction of pesticides over the long term, as this is essential to ensure sustainable forestry, safeguard human and animal health, protect our environment and to minimize improper use, misuse and abuse of products.
Plantation managers are responsible to submit returns as regards the type and number of pesticides used as well as the area of application. These are then captured into a database. It is a requirement that these figures are made available during the third-party external audit.

The new FSC® Pesticide Policy, requires an Environmental and Social Risk Assessment (ESRAs) to be conducted at National, Regional and local levels. For plantations, the local level refers to the compartments where a pesticide is used. In doing so the ESRA has become integral to the FSC® Integrated Pest Management (IPM) strategies.

Although KLF has developed a ESRA template for implementation, it is important that lessons learnt from all companies during the implementation and auditing of this aspect, is used to improve these assessments. It is also important to note, that the use of pesticides is not “business as usual”, and one is now required to apply one’s mind to ensure that if a pesticide is the preferred option, it can be shown that it is socially, environmentally and economically beneficial.

Below is an extract of a TIPWG list effective from 11 December 2023

TIPWG APPROVED PESTICIDE LIST (APL)

TIPWG VERSION 36m. Effective 11 December 2023

															ESRA MITIGATIONS *											
SAFFAS Approved	FSC Rating	Type	Trade name	Reg Nr	Active ingredient(s)	Compartment	Conservation	Firebreak preparation	Nursery	Industrial	Comments	MSDS Information: Indication of danger	MSDS information: Dangerous Goods/Hazardous class	Generic mitigations	Adhere to label requirements	Limiting area to be sprayed	ID and create buffer zones	Dessicating dose	ID & inform local communities / stakeholders	Create buffers around local communites / stakeholders	Hazard 2 criterion	Hazard 3 criterion	Hazard 5 criterion	Hazard 6 criterion	Hazard 7 criterion
Y	Restricted	Disinfectant	Sporekill		N,N-Didecyl-N,N-dimethyl ammonium chloride				x		A contact active liquid agricultural disinfectant / plant sanitizer, active against pathogenic micro - organisms / bacteria			X	X	X	X									
Y	Other	Innoculant	Eco - T	L6038	Trichoderma asperellum	E			E		A fungal inoculant for the suppression of root diseases and for enhanced growth of Eucalyptus species			X	X											
Y	Other	Fungicide / Insecticide	Kangar 932	L7145	Garlic juice extract from Allium Sativa / canola oil				x		An organic broad-spectrum insecticide with fungicidal properties			X												
Y	Restricted	Fungicide	Apron XL	L6837	Metalaxyl - M				x					X	X											
Y	Restricted	Fungicide	Amistar Top	L7898	Azoxystrobin Difenoconazole	W					Wattle (Acacia spp) on Rust (uromycladium spp.)	Harmful, Dangerous for the environment	9 – Miscellaneous Dangerous Goods	X	X	X	X		X	X		X				
Y	Restricted	Fungicide	Custodia 320 SC	L9342	Azoxystrobin Tebuconazole	W					Wattle (A mearnsii) on Rust (uromycladium spp.)	Harmful, Dangerous for the environment	9 – Miscellaneous Dangerous Goods	X	X	X	X		X	X		X	X			
Y	Restricted	Fungicide	Benomyl WP	L7291	Benomyl				x		To be applied in conjunction with Proplant as per label			X	X	X	X		X	X		X	X			
Y	Restricted	Fungicide	Celeste	L6173	Fludioxonil				x					X	X	X	X		X	X						
Y	Restricted	Fungicide	Octave	L3406	Prochloraz manganese chloride				x					X	X	X	X		X	X		X	X			
Y	Restricted	Fungicide	Propizole 250 EC	L7561	Propiconazole	W					Wattle (Acacia spp) on Rust (uromycladium spp.)	Harmful, Flammable	3 – Flammable Liquids	X	X	X	X		X	X			X			
Y	Other	Fungicide	Kalgran 722 SL	L10596	Propamocarb hydrochloride				x					X	X				X	X						
Y	Other	Fungicide	Proplant	L5831	Propamocarb hydrochloride				x		In some instances (See label), it must be applied in conjunction with Benomyl WP (L7291 a.i. Benomyl (Benzimidazole)			X	X				X	X						
Y	Other	Herbicide	GraminX	L10703	Clethodim	E/P				x				X	X											
Y	Other	Herbicide	Grasidim 240 g/l EC	L10781	Clethodim	F/P				x				X	X											
Y	Other	Herbicide	Opslag 120 EC	L10827	Clethodim	x				x				X	X											
Y	Other	Herbicide	Poquer 120 EC	L9008	Clethodim	F/P				x		Harmful	Not classified	X	X											
Y	Other	Herbicide	Select 120 EC	L6343	Clethodim	E/P				x		Harmful, Environmentally Hazardous Substance	Not classified	X	X											
Y	Other	Herbicide	Series 240	L8913	Clethodim	F/P								X	X											
Y	Other	Herbicide	Tarmax 120 EC	L10798	Clethodim	F/P				x				X	X											
Y	Other	Herbicide	Vega	L9265	Clethodim	E/P				x				X	X											
Y	Other	Herbicide	CLE 240 EC	L11352	Clethodim	E/P				x				X	X											
Y	Other	Herbicide	Lancer 100 SL	L9432	Clopyralid pyridine compound	E/P	x				For the control of A. mearnsii and other weeds as listed on the label			X	X	X	X									
Y	Other	Herbicide	Zone	L9916	Clopyralid pyridine compound	E/P	x				For the control of A. mearnsii and other weeds as listed on the label			X	X	X	X									
Y	Other	Herbicide	Lontrel 100 SL	L4819	Clopyralid monoethanolamine salt	E/P					For the control of A. mearnsii and other weeds as listed on the label			X	X	X	X									
Y	Other	Herbicide	Astra 360 SL	L8429	Clopyralid triethylamine salt / Triclopyr trimethylamine salt	x	x					Harmful, Environmentally Hazardous Substance	9 – Miscellaneous Dangerous Goods	X	X	X	X									
Y	Other	Herbicide	Confront 360 SL	L7314	Clopyralid triethylamine salt / Triclopyr trimethylamine salt	x	x			x		Harmful, Dangerous for the environment	9 – Miscellaneous Dangerous Goods	X	X	X	X									
Y	Other	Herbicide	Contest 360 SL	L10337	Clopyralid triethylamine salt / Triclopyr trimethylamine salt		x			x				X	X	X	X									

Table indicating areas treated and pesticide volume for the period 2021/22 to 2023/24

Komatiland Forest Pesticide usage from 2021/22 to 2025/26

	Area (ha)						litres used						l/ha				
Product	2021/22	2022/23	2023/24	2024/25	2025/26	Grand Tota	2021/22	2022/23	2023/24	2024/25	2025/26	Grand Tota	2021/22	2022/23	2023/24	2024/	2025/
Alpha-cypermethrn						-						-					
Clopyralid						-						-					
Cypermethrin						-						-					
Deltamethrin						-						-					
Ethylene Glycol Dispersion						-						-					
Fluroxypyr - methyl	745,02					745,02	526,48					526,48	0,71				
fluroxypyr-mepthyl	1970,96	1 917,75	1 623,59			5 512,30	1289,96	1 896,86	1 145,01			4 331,83	-	0,99	0,71		
Glufosinate ammonium	287,9	10,19				298,09	208,11	1,02				209,13	0,72				
Glyphosate		1 806,09	415,59			2 221,68		1 537,10	675,27			2 212,37	-		1,62		
Glyphosate ammonium salt	11395,81	8 235,49	5 227,74			24 859,04	10539,26	17 112,52	6 996,15			34 647,93	0,92	2,08	1,34		
Glyphosate potassium salt		235,78	83,40			319,18		447,13	224,05			671,18			2,69		
Glysophate sodium salt	192,93	45,48	21,48			259,89	24,23	95,87	59,93			180,03	0,13	2,11	2,79		
Imazapyr	1206,99	13 350,67	2 884,54			17 442,20	796,37	11 264,01	743,26			12 803,64	0,66	0,84	0,26		
Imazapyr Isoproplamine salt						-						-					
Imidacloprid		248,71				248,71		17,32				17,32		0,07			
Metsulfuron-methyl	1267,81	136,68	198,50			1 602,99	536,5	110,97	422,54			1 070,01	0,42	0,81	2,13		
Mineral Oil	370,76	534,43	21,48			926,67	380,66	238,23	16,97			635,86	1,03	0,45	0,79		
Parafinic mineral oil						-						-					
Picloram isoprop / fluroxypyr						-						-					
Picloran potassium salt	679,82	424,81	909,33			2 013,96	827,99	286,93	212,54			1 327,46	1,22		0,23		
Triclopyr + picloram						-						-					
Triclopyr butoxyethyl ester	119,38	241,88	76,79			438,05	279,51	216,77	83,28			579,56	2,34	0,90	1,08		
Triclopyr triethylammonium salt						-						-					
Sulphonates aromatic acids						-						-					
fertilizer						-						-					
Grand Total	**18 237,38**	**27 187,96**	**11 462,44**	**-**	**-**	**56 887,78**	**15 409,07**	**33 224,73**	**10 579,00**	**-**	**-**	**59 212,80**	**0,84**	**1,22**	**0,92**	**#DIV/0!**	**#DIV/0!**

Page 1

10. Waste management

The waste generated on the plantations must be managed. This management can be seen as encouraging recycling, reducing the amount of waste produced, and the disposal of both non-hazardous and potentially hazardous waste.
In KLF, two classes of waste are produced, namely general waste (garden, domestic and residual materials from the sawmill, and hazardous waste (pesticide containers, oils, fluorescent tubes, batteries, etc). General waste may be disposed of at a municipal designated site..

All general waste produced on the plantations are disposed either at the nearest municipal dump site or in a permitted site on the plantation. Currently KLF manages only one small landfill site on a plantation. We have the desire to close this last remaining waste site by making use of reputable companies that provide “skips” for the collection of waste, or delivering such waste to a designated municipal waste site.

Each plantation has a site-specific waste management plan, wherein all waste stream are highlighted with the preferred method of disposal.

To reduce the negative impacts associated with waste disposal, the first objective with waste management is to strive towards reducing the amount of waste produced. This can be accomplished by investigating the following:

1. Purchase goods in bulk thus reducing the amount of packaging material.
2. Purchase goods in returnable containers/packaging.
3. Purchase goods in recyclable containers.
4. Purchase goods that have a lesser impact on the environment in terms of waste products produced.

The second objective is to encourage recycling. If a recycling plant or collection point is located within 50km from the plantation, a concerted effort must be made to use the opportunity. Minor processing on certain plantations may occur in order to sort the waste and reduce the bulk. People should be encouraged to see waste as wealth when properly handled, especially when recycling is properly done. KLF has seen an increase by the plantations beginning to recycle during this reporting period. However, there is still room for improvement and awareness to encourage such behaviour is encouraged through toolbox talks.

Used oils are stored in suitable containers and returned to agents that accept such lubricants. These include collectors accredited by the “ROSE Foundation” - Recycled Oil Saves the Environment”.
No hazardous waste may be placed in a KLF waste site. All waste must either be:

1. Supplied to a recycling agent or
2. Temporarily stored and then disposed at a site permitted to accept such waste.

CropLife SA, has a well-structured empty container management system with collectors and recyclers that have been vetted and approved as reliable and ethical operators..

In November 2020, the Department of Forestry, Fisheries and the Environment, created and published a new Act in the government gazette, namely the National Environmental Management: Waste Act, 2008 (Act No.59 of 2008) – Regulations Regarding Extended Producer Responsibility (EPR). Following from the umbrella act, the “Extended Producer Responsibility

Scheme for Paper, Packaging and Some Single Use Products" was also published. The draft EPR for agricultural packaging was promulgated in March 2022, which means that each producer of this type of waste will have a responsibility to ensure that there is a scheme in place for collecting and recycling such items. The Act will be applicable to all stakeholders in the agricultural value chain, from supplier to farmer.

CropLife SA already has a well-structured empty container management system with collectors and recyclers that have been vetted and approved as reliable and ethical operators, which means that CropLife SA is already ahead of the curve in this regard. All CropLife SA approved service providers issue farmers / foresters with a Certificate of Adequate Disposal. According to the CropLife SA website, more than 76% of empty containers are collected and recycled through the effective services of the 110+ CropLife SA approved collectors and recyclers.

11. Environmental auditing

11.1 Internal audits.

The KLF in-house audit team, performs annual in-house audits of operations to verify conformance to company policies and procedures. Environmental and Safety audits are conducted by the SHEQ department, whilst operational audits are conducted by the in-house experts. In addition, the human resources division conducts several in-house audits to verify conformance to social criteria.

11.2 Third party audits.

11.2.1 FSC® audits.

Third party operational audits are performed annually by SGS South Africa to evaluate the operations of KLF to FSC® Principles and Criteria as listed in "The FSC National Forest Stewardship Standard of the Republic of South Africa" FSC-STD-ZAF-01-2017 V1-0.

The particulars of the FSC® certificate for KLF (FSC® -C013832) can be viewed (https://info.fsc.org/details.php?id=a0240000005sRaXAAU&type=certificate&return=certificate.php)

Below is summary of FSC® findings raised during the re-assessment and surveillance audit nr 1, which occurred during this report period.

CAR nr	Indicator	Date recorded	CAR detail	Date closed
01	1.3.1	29 June 2022	**Not all applicable laws and regulations and administrative requirements are complied with by a contractor employed by KLF.** <u>Objective Evidence:</u> At Jessievale Plantation a sub-contractor who had employees working at a slashing operation (16 employees) and a pruning operation (18 employees) had not given written contracts of employment to their employees as required by Section 29 of the Basic Conditions of Employment Act 75 of 1997. Section 29 states as follows: An employer must supply an employee, when the employee commences employment, with the following particulars in writing - (a) the full name and address of the employer; (b) the name and occupation of the employee, or a brief description of the work for which the employee is employed; (c) the place of work, and, where the employee is required or permitted to work at various places, an indication of this; (d) the date on which the employment began; (e) the employee's ordinary hours of work and days of work; (f) the employee's wage or the rate and method of calculating wages; (g) the rate of pay for overtime work; (h) any other cash payments that the employee is entitled to; (i) any payment in kind that the employee is entitled to and the value of the payment in kind; (j) how frequently remuneration will be paid; (k) any deductions to be made from the employee's remuneration; (l) the leave to which the employee is entitled; (m) the period of notice required to terminate employment, or if employment is for a specified period, the date when employment is terminate; (n) a description of any council or sectoral determination which covers the employer's business; (o) any period of employment with a previous employer that counts towards the employee's period of employment; (p) a list of any other documents that form part of the contract of employment indicating a place that is reasonably accessible to the employee where a copy of each may be obtained. Furthermore employees were not being given payslips as required by Section 33 of the Basic Conditions of Employment Act 75 of 1997. Section 33 states as follows: An employer must give an employee the following information in writing on each day the employee is paid: (a) The employer's name and address (b) the employee's name and occupation; (c) the period for which the payment is made; (d) the employee's remuneration in money; (e) the amount and purpose of any deduction made from the remuneration; (f) the actual amount paid to the employee; and (g) if relevant to the calculation of that employee's remuneration - (i) the employee's rate of remuneration and overtime rate; (ii) the number of ordinary and overtime hours worked by the employee during the period for which the payment is made; (iii) the number of hours worked by the employee on a Sunday or public holiday during that period; and (iv) if an agreement to average working time has been concluded in terms of section 12, the total number of ordinary and overtime hours worked by the employee in the period of averaging. The employees also said that they had to pay for and provide their own PPE which is a contravention of Section 23 of the Occupational Health and Safety Act 85 of 1993. Section 23 states as follows: No employer shall in respect of anything which he is in terms of this Act required to provide or to do in the interest of the health or safety of an employee, make any deduction from any employee's remuneration or require or permit any employee to make any payment to him or any other person.	23 June 2023

02	2.3.5	29 June 2022	**Workers do not, in all instances, have personal protective equipment appropriate to their assigned tasks** Objective Evidence: Jessievale: At compartment L30W Manual weed control – Slashing. Many of the workers did not have safety boots or overalls. None of the workers had eye protection or hard hats which is appropriate to the task of manual slashing in that area where there are many trees of 2 meters or higher.	23 June 2023
03	2.3.7	29 June 2022	**Safe work procedures are not always carried out at the workplace.** Objective Evidence: **Jessievale**: At compartment L30W on Redhill, manual weed control – slashing. There was no first aid kit available on site at the slashing operation. No firefighting equipment was available at this operation. There was no cell phone signal at the location and no transport or means of contacting the transport should a medical emergency occur at this operation. **Berlin**: Standing sale timber – Makarapa Contractor – Compartment C25 thinning the chainsaw operator (Johan Khoza) was balancing on logs while cross-cutting (photos available).	23 June 2023
04	6.2.2	29 June 2022	**Environmental Impact Assessments undertaken for stream crossings are inadequate** Objective Evidence: A new stream crossing over a permanent stream was constructed on Berlin A4/A10w on 07.10.2021. This site was visited in field and the Environmental Impact Assessment (**EIA)** for this site disturbing activity was reviewed (EIA No. 703/01-2020). The following was noted: 1. Under C: Environmental Impacts, there is no indication that aquatic fauna (fish, eels etc.) were considered. 2. Under I: Legal Requirements, the EIA specifies "N/a", but it is questioned whether a Water Use License (WUL) is necessary for this development? 3. Under Environmental Control Measures, Point 11 specifies that "On alignment of culverts, the movement of aquatic organisms should not be negatively impacted upon where the slope allows for this". Clearly the crossing design does not allow for 2-way movement of aquatic organisms. Regardless of slope, crossing design should allow for this, especially for perennial streams. 4. A crossing design was not included in the EIA, but a "generic" design was provided for this crossing, which specifies "perched" culverts horizontally installed. This clearly prevents 2-way movement of aquatic species. The actual crossing has such perched culverts and reno matrass below the culverts which do not allow for 2-way movement of aquatic species. 5. Where is the culvert size justified? This crossing had 2x800mm culverts, but there is no evidence of justification of this culvert size. E.g. was rainfall, catchment size etc. taken into consideration in determining the culvert size? 6. What flood event is this crossing planned to withstand? (e.g. 1:10 year, 1:20 year or 1:50 year flood event?) Similarly, a crossing was re-built on Roburnia Plantation, EIA No. 737/02-2022, A48/A47b. Here the same 2x 600 mm concrete culverts that were washed away were re-used. No crossing design was included with the EIA, and although the crossing does allow for 2-way movement of aquatic species, points 1, 2, 5, and 6 listed above also apply to this crossing. There is no evidence that a civil engineer and aquatic	23 June 2023

			ecologist/ichthyologist were consulted in terms of the crossing designs and calculation of culvert size.	
05	7.2.1	29 June 2022	**Management actions, procedures and measures to achieve the management objectives are not always implemented.** Objective Evidence: An operational harvest plan dated 28/04/2022 was in place for the harvesting of compartment A73b on Wilgeboom plantation. However, there was no evidence that the prescribed management checklist was regularly used during this operation to monitor the adherence to operational procedures. Also, no post-harvest audit was conducted upon completion of this harvesting operation to monitor whether the operation was conducted in compliance with in-field operational and environmental requirements. These are important surveillance documents to support responsible forest management and should not be neglected.	Escalated to Major 11
06	8.3.1	29 June 2022	**The results of stream crossing assessments and evaluation, are not effectively fed into management planning** Objective Evidence: 1. At all of the plantations visited, only a small sample of stream crossing assessments had been completed using the "Stream Crossing Assessment Form" provided in the IMS for this purpose. No such assessments at all for Blairmore (Roburnia), but extensive problems noted. 2. On all plantations visited the actual number of stream crossings are unknown, and there are no plans to assess all crossings. 3. At most of the plantations visited, the "Stream Crossing Assessment Form" was not properly completed and the impact rating percentages were not completed e.g. Jessievale, Nelshoogte, Brooklands. 4. No watercourse crossing database, so these assessments are not used as a management tool to prioritise maintenance and rehabilitation. Given budget limitations and the thousands of crossings, prioritization based on data, is essential.	23 June 2023
07	10.10.1	29 June 2022	**Road infrastructure is not consistently managed to protect environmental values.** Objective Evidence: 1. Based on interview with roads management staff, there has been little to no attempt to reduce the road network density and the number of watercourse crossings. No evidence provided. 2. Evidence of very poor roads and crossings noted in field throughout the course of the audit. Erosion from the roads causing sedimentation of streams. Examples: • Roburnia (Blairmore) Plantation: Roads and crossings in the L-Block are in shocking condition with very bad erosion e.g. A-class road in the vicinity of L3c; crossing at J1v/J1x; crossing at L19b/L24w; crossing at L23w. 4-Wheel drive was necessary for driving these roads. No road maintenance carried out for Blairmore in 2022. (Photographic evidence of roads and crossings available). • Jessievale: At I40w vlei crossing, there was evidence of excavation from the wetland at the crossing to create a pond to prevent water from flowing down the road (causing erosion on the road). F1w/F74w crossing is a barrier of stones with no culvert to allow 2-way movement of aquatic species. Unprotected crossing at E46w/E17w. On Redhill Plantation poor condition of roads noted.	23 June 2023
08	10.11.2	29 June 2022	**Damage to conservation zones is not always avoided during harvesting.**	Escalated to

			Objective Evidence: Wilgeboom, compartment E32a harvesting, logs are stacked in the conservation area, which is identified as a “no go zone” on the harvest operational plan (HOP). No issue of Special Stacking permit. Similarly at D41 thinning operation, at the area of hand rolling of logs, there is evidence of logs in the opposite conservation area (D55z), also indicated as a no-go zone on the HOP and no issue of special stacking permit. There was no formal corrective action planned for these sites and no schedule for rehabilitation.	Major 13
M09	2.3.10	23 June 2023	**Where worker accommodation is provided on the FMU, it does not in all incidences comply with the minimum requirements outlined in Annex 5. According to Section 11 of Annexure 5 Sufficient, clean water must be available within close proximity. Water must be regularly tested for potability. According to Section 1 Housing constructed must be safe and structurally sound.** At Woodbush, Entabeni, Blyde and Tweefontein Plantation facilities such as villages and offices no potable water testing according to SANS 10241 has been undertaken since December 2022. The frequency of previous testing was monthly for bacteriological parameters and quarterly for the full chemical analysis in terms of SANS 10241. At Blyde Plantation at Ratang Village abandoned house no 3904/77 had exposed wires and the electricity had not yet been disconnected. Also for Thusanang Village an incomplete electrical COC was provided with missing pages and not all houses were included in the COC. A Electrical COC could not be provided for the Ratang Village	21 September 2023
M10	2.5.2	23 June 2023	**Workers are not always supervised correctly to ensure they implement their tasks safely and effectively.** At the slashing operation at Compartment J7 at JDM Keet Plantation (Woodbush) it was noted that the 15 workers were not wearing safety glasses that had been issued to them. A number of workers were also working too close to each other wielding dangerous slashers. The supervisor at this team could not explain why he did not rectify this unsafe condition. At the pruning operation at Compartment L4(a) at Tweefontein Plantation a worker conducting pruning did not allow for a safe distance of the supervisor and auditor whilst pruning the tree. The supervisor did not correct the unsafe condition and when the worker was questioned on the issue he had stated that the wearing of hard hats was protection enough from any falling branches. At a completed slashing operation along a permanent flowing stream within an SMZ at Compartment A26 on Blyde Plantation the slashed Pinus patula regeneration had been thrown back into the stream. Also in this Compartment A26 the planting team had replanted within the delineated excision area adjacent to the permanent stream.	21 September 2023
M11	7.2.1	23 June 2023	**Management actions to achieve management objectives are not consistently implemented.** When evaluating the overall execution of operational forestry targets, with emphasis on thinnings and weed control, the long term trend over the past five years shows a disturbing picture of serious under performance and little, if any, evidence of sustained reversal of this negative pattern. Thinnings, which is arguably the most important silvicultural activity that determines long term yields and hence profitability, are very often not executed on time. Management thinning	13 December 2023

			objectives were not achieved at 11 of its 15 plantations. Only four out of the 15 plantations completed their thinning programmes on time during 2022 with four plantations completing as little as 9-28 % of the scheduled thinnings. Seven of the 15 plantations completed less than half of their scheduled thinnings. The company as a whole achieved only 66% of their planned thinnings in 2022. A similar situation is found in weed control – see table below illustrating maintenance % in commercial areas.Although verifiable targets for monitoring the progress towards operational objectives have been established, the execution of operational activities to achieve the set goals is seriously lacking. This under performance in some of the most basic fundamentals of a forestry organisation was pointed out already during SA2018 (and brought under the attention of management during all subsequent assessments) and should now be resolved as a matter of critical importance.	
12	10.7.7	23 June 2023	**When pesticides are used objective evidence does not always demonstrate that the pesticide is the only effective, practical and cost effective way to control the pest.** ESRAs to assess the effective use of chemicals were in place at Blyde Entabeni and Woodbush. However, in all instances no comparison was done between different chemicals. In all these ESRAs only glyphosate or its derivatives were compared. This even though the ESRA specifically requires at least two active ingredients to be considered. This omission defeats the objective to demonstrate that the chosen pesticide is the only effective, practical and cost-effective way to control the pest.	Target 23 June 2024
M13	10.10.1	23 June 2023	**Damage to conservation zones is not always avoided during harvesting.** At the harvesting operation at Compartment A24 at Blyde Plantation the grapple skidder had been allowed to drive through a permanent stream without any protection of the stream which resulted in siltation of the stream downstream of where the grapple skidder had crossed the stream. At Tweefontein Plantation at the harvested compartment S69 felled commercial timber had been stacked in the SMZ of the Sabie River	21 September 2023

11.2.2. NOSA audits

The annual NOSA Five Star System grading audits were conducted at Komatiland Forests during this report period. The table provides the audit results for the period ending March 2024. The audit took place against the requirements of the restructured CMB150 protocol.

During the audit period, the following sites were physically sampled:

- Corporate
- Pretoria Office
- Nelspruit Office
- Timbadola Sawmill
- Timbadola and Spitskop Clinics
- Platorand Training Centre
- Entabeni Plantation
- Woodbush Plantation
- Belfast Plantation

- Witklip Plantation
- Tweefontein Plantation
- Nelshoogte Plantation
- Berlin Plantation
- Swartfontein Technical Services
- Roads
- Mechanised Harvesting

During the exit meeting, the following was raised:

11.2.2.1. Critical Concerns

- No critical concerns were raised during the audit.

11.2.2.2. Other concerns

- All the risks related to the company activities and facilities were not identified and assessed in the risk assessments, e.g., Playgrounds and cast-iron stoves.
- Ensure that all the activities and use of facilities are identified and assessed in the risk assessments. Affected employees should be aware of all such risks and control measures.
- The personal protective equipment (PPE) compliance inspections were not completed correctly.
- The PPE compliance inspections should be conducted correctly to indicate what PPE is not being worn by employees during the inspections. Retraining in completing the documents is recommended.
- The deviations from the written safe work procedures were not recorded in the planned job observations conducted.
- The deviations identified should be indicated and the corrective actions taken to address the these should be included in the comments section of the document. That will ensure that the observer and the person observed knows what problems were identified and how they should be corrected.
- Several Safety Data Sheets observed at the chemical stores were older than 5 years.
- The Safety Data Sheets should be updated to ensure they are not older than 5 years as required by the Hazardous Chemical Agent Regulations.
- Incident records were not submitted timeously to the SHEQ department as per the procedure.
- Incident records should be submitted within 7 days (Level 4 and 5) and 14 days (Level 1 and 2) to the SHEQ department as per procedure.
- Inhouse audit findings were not closed out within 90 days as required.

- Inhouse audit findings should be actioned, followed up and closed out within 90 days as required.
- Several vehicles were found to be in a poor condition with high kilometres. A policy regarding vehicle usage and replacement indicated that vehicles should be replaced at 250 000 kilometres or 8 years.
- Vehicles should be in a good condition and well maintained to ensure the safety of the drivers and passengers. Old vehicles with high kilometres should be replaced and it should be clearly specified in an approved policy.
- Contractor labour carriers were not according to specifications. Trucks fitted with steel benches and no safety belts were noted. Trucks were also not licensed to carry passengers.
- Contractors should use approved labour carriers with seats and safety belts to ensure employees are transported safety to and from the operations.

11.2.2.3. Achievements.

- Previous audit findings were closed out.
- Inspections on equipment and machinery were conducted and records could be verified.
- Decrease in disabling incidents is encouraging.
- Participation of management in the audit improved.
- Lifting machinery was load tested and most records could be verified. Operators were trained and competent.
- Pressurised equipment was pressure tested and records could be verified.
- Drivers were competent and inspection records could be verified for the vehicles.
- The operators of the chainsaws and other hand tools were competent, and the machinery was inspected and in good condition.
- Noise was managed well with employees wearing the correct hearing protection and annual audiometric testing that is conducted. No noise induced hearing loss incidents were recorded during the period under review.
- Training improved to ensure employees are competent and records could be verified.

11.2.2.4. Effort Score

EFFORT SCORE

Leadership and Worker Participation	87.44 %	Safety	88.16 %	Risk	97.07 %
Planning	92.19 %	Health	89.51 %	System	89.85 %
Support / Operation	88.98 %	Environment	92.06 %	Compliance	86.05 %
Performance Evaluation	84.89 %	Total Points Scored	2157.99	Effectiveness	88.66 %
Improvement	91.23 %		**2426**	Total Effort Score	88.95 %

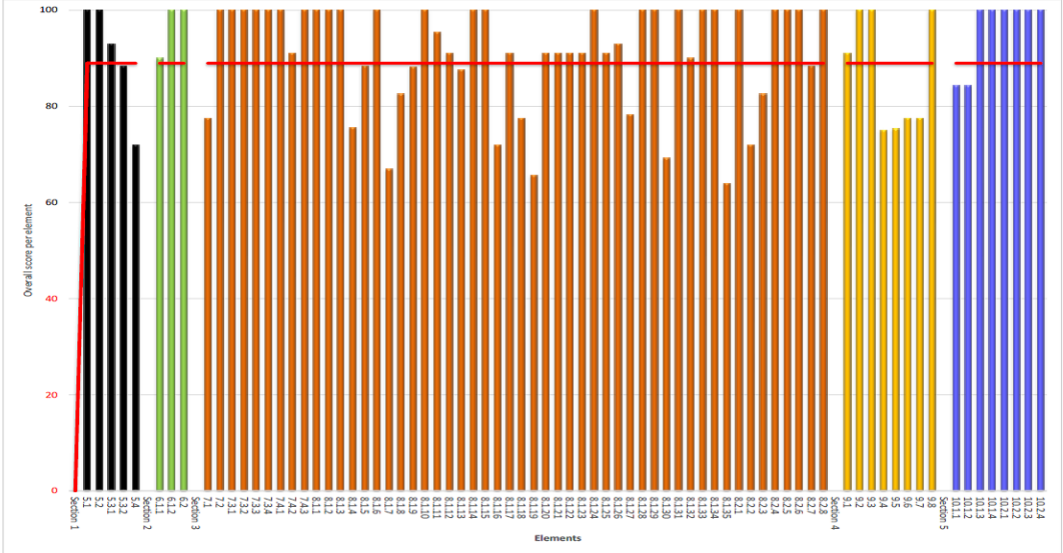
INCIDENT EXPERIENCE									
Date from/to	1 October 2022 – 30 September 2023					Months	12		
Employees/contractors	3057					Man hours	7 046 199		
Number of Disabling Incidents: 29						DIFR: 0.82			
S/F: 0	PD: 0	PPD: 1	LWD: 28	RWD: 0	H/F: 0	IDD: 0	RDD: 0	NIHL: 0	M-ENV: 0

LEGEND FOR DISABLING INCIDENT ABBREVIATIONS:

S/ F	Safety, Fatality	**H/ F**	Health, Fatality	**E/ MAJ**	Environment, Major
S/ LWD	Safety, Lost Work Day	**H/ IDD**	Health, Irreversible Diagnosed Disease		
S/ RWD	Safety, Restricted Work Day	**H/ RDD**	Health, Reversible Diagnosed Disease		
S/PD	Safety, Permanent Disability	**H/NIHL**	Health, Noise Induced Hearing Loss		

CURRENT OUTCOME			
Rating:	4 Green Stars	Peer Reviewer: Graham Kings	Date: 14.03.2024

ELEMENT SCORES



*DIFR – Disabling Injury Frequency Rate

12. Stakeholder involvement.

A stakeholder can be defined as individuals and/or organisations with a legitimate interest in the goods and services provided by Komatiland Forests; and those with an interest in the environmental and social effects of the company's activities, products and services. They include those individuals and organisations which exercise statutory environmental control over the

company, local people, employees, customers and consumers, environmental interest and consumer groups and the general public.
As a result, this may include any community residing adjacent to or within the physical boundaries of property managed by KLF, as well as any community or group having a cultural and/or subsistence interest in the land managed by KLF. This interest may be in the form of grave sites, sites of religious significance, grazing and the collection of building material, firewood and medicinal plants.
Stakeholders in the form of groups or organizations, include environmental NGOs, study groups, consultants, biosphere committees and conservancies.

12.1. Stakeholder communications and complaint resolution.

Any individual, group, organization or community who seeks to establish and maintain formal communication channels, will be engaged.
Due to the fact that there is a whole spectrum of engagement levels ranging from “one way” namely stakeholder protest and informing, to two-way information exchange methods such as consulting, involving, collaborating with, and empowering, the method of communication with a particular stakeholder must be agreed upon and conducted accordingly. By encouraging information exchange a relationship based on trust and cooperation, amongst other benefits, will be developed.
The appropriate level of engagement should take into account a number of factors such as the objectives for engaging with the stakeholders, the social profile of the stakeholders, literacy and the scale of the proposed activity amongst others.

As part of the identification of these stakeholders, Komatiland Forests makes use of established lists and participates on a number of forums and working groups. Each plantation has a list which includes neighbours, communities, authorities, relevant NGOs and specialists.

A social compact is an agreement between parties focussing on both the relationships and established partnerships. It provides for mechanisms and structures, whereby its members plan, manage and administer projects in terms of separate binding agreements as well as to negotiate and resolve conflict. The purpose is to provide recognition, formalise the relationship, provide structured interaction and communication, provide for a structured needs analyses to establish priorities, optimisation of shared values, multifunctional forestry, socio – economic development, and an opportunity for funding, either by KLF or from external sources. Parties involved are the company and the body representatives of the “community” or “stakeholder group”. These parties include municipal structures (councillors), traditional authorities, land claimants, influential role players such as developers, landowners and industry, and employees.

As mentioned, the organisations employees are also stakeholders. To assist with formal communication, the following an in-house methods of communicating with employees are used by the Communications Department:

- ***SAFCOL News*** – An in-house newsletter as regards general information on all aspects of the organisation.
- Regular “***News Flashes – Keeping you informed***”.
- “**Policies and Procedures – Compliance made easy**”.
- **ICT Information Security Awareness.**

- **Health and Safety awareness / bulletins**

All business units are required to maintain a compliant register, which captures details on the complaint, contacts, the issue and how it was closed out to the satisfaction of the complainant. Complaints are categorised into one of the following sections: Staff, social, supplier, and client/customer, environmental or regulating authority.

12.2. Stakeholder consultation forums and working groups

The Covid 19 pandemic had a negative impact on the holding of physical meetings. Fortunately, with the available technology, meetings were able to follow the virtual route. The a hybrid format is often used to day which includes holding such meetings both physically and virtually to allow for a greater meeting participation.

Organization / Community	Participants	Objectives
ENVIRONMENTAL		
Baboon Damage Working Group	Forestry companies, NGOs and NSPCA.	To coordinate issues on a possible solution regarding problematic primates
Bio control Working Group	Forestry companies, government departments, landowners, and NGOs.	Create partnerships with landowners to coordinate the eradication of invasive weeds by biological control methods.
Threatened Grasslands Species Programme (incorporating the Blue Swallow Working Group (BSWG) and the Oribi Working Group (OWG)	EWT, Forestry companies, land owners and other interested parties.	Coordinate the protection of endangered species.
Forestry South Africa. (FSA)	Forestry companies (small medium and large scale growers)	Environmental, water and human resource committees.
Friends of the Haenertsburg Grasslands (FROHG)	Ngos, landowners, forestry companies and government departments.	To coordinate land use practices within the Haenertsburg area.
Joint Working Committee	Government departments and SOEs.	Coordinate engagements between government departments and SOEs
Kaapschehoop Environmental Committee (KHEC)	Representatives of the Kaapschehoop community, Sappi, KLF, EWT, DFFE and MTPA.	To coordinate socio-environmental issues within the Kaapschehoop community.
Reclaiming the Noord-kaap Project	Forestry companies, land owners, irrigation boards, Mining.	To coordinate with landowners, farming organizations, irrigation boards the eradication of invasive weeds within water catchment areas.
Sudwala / Schoemanskloof Sub-Catchment Forum	Forestry companies, land owners.	To coordinate with landowners, farming organizations, irrigation boards the eradication of invasive weeds within

Organization / Community	Participants	Objectives
		water catchment areas.
Limpopo Wetland Forum.	Forestry companies, NGOs, Government departments, Municipalities and MTPA.	Awareness of the importance of wetlands
Mpumalanga Wetland Forum (MWF)	Forestry companies, NGOs, Government departments, Municipalities and MTPA.	Awareness of the importance of wetlands
Mpumalanga Climate Change Forum	Forestry, industries, municipalities, government departments, and NGOs.	Climate change impacts / adaptation
Municipality Waste Management Initiatives.	Forestry companies, municipalities, government departments, WESSA and NGOs.	To develop strategies as regards management of waste within the municipalities.
Mbombela Strategy Steering Committee (StraSC)	DWS, IUCMA, industry, municipalities, irrigation boards	Water requirement and availability reconciliation for Mbombela, including Crocodile and Sabie river systems.
Gert Sibande District Municipality Implementation Task Team and Air Quality Forum	Gert Sibande District municipality and facility operators	Air quality issues / compliance within the District Municipality.
National Grassland Biodiversity Programme (NGBP)	Forestry companies, FSA , South African National Biodiversity Initiative (SANBI)	To coordinate the protection of grasslands for biodiversity protection
Timber Industry Pesticide Working Group (TIPWG)	Forestry companies, DFFE, Croplife SA and EWT	To coordinate the responsible use of pesticides in the forest industry.
Working for Water	KLF, DFFE	Create partnerships with landowners to coordinate the eradication of invasive weeds.
Working for Wetlands.	KLF, SANBI and DFFE	Create partnerships with landowners to coordinate the restoration of wetland functions.
Working on Fire	KLF / SAFCOL, WoF	Firefighting on Private and Public land.
Kruger2Canyon	MTPA, KLF/SAFCOL, DFFE	Biodiversity stewardship for KLF / SAFCOL land to formalize the declaration of Forest Nature Reserves.
AWARD (The Association for Water and Rural Development	KLF / SAFCOL, Institute of Natural Resources, Forestry companies, DFFE	Capacity development for enhancing sustainable forest management in priority diversity areas. RESILIM-O project goal is to reduce vulnerability to climate change through building improved transboundary water and biodiversity governance and management in the Olifants Basin.
The Blyde Restoration Working Group	AWARD, Forestry com, DFFE (NRMP and Forestry),	Collaborative development and implementation of joint strategies and

Organization / Community	Participants	Objectives
	MTPA, Communities, IUCMA, NGOs, SANParks, SANBI and High Altitude Teams (HAT)	plans for long term co-ordinated and integrated restoration. Support for enhanced co-ordination and alignment of natural resources management projects. Development of tenable and appropriate institutional arrangements, to ensure sustainable and socially just restoration and natural resource management practices. Development of custodianship amongst land owners and communities
Tzaneen Weeds and Alien Plant Control Committee	Forestry companies, DFFE, Tzaneen Local Municipality, Working for Water, DWS, Farmers Union, Private companies, Department of Public Works and communities.	To identify the extent of alien vegetation as well as the species and to accurately capture this information graphically. To prioritize focus areas based on location and seriousness of alien plant infestations. To develop action plans on how the eradication and control can be achieved through co-operation of all stakeholders

Social Compacts with Cluster Communities

No.	Province & District	Local Municipality	Cluster Name	Plantation	Communities & Participating Authority
1	Limpopo-Vhembe District	Thulamela Municipality	Tshivhase	Thathe Vondo& Entabeni	Khalavha, Fondwe, Tshiheni, Tshidzivhe, Vondo la Fatshe, Vondo La Thava, Murangoni. Tshivhase Royal/Traditional Authority Mukumbani Vhembe District Municipality Thulamela Municipality & Traditional Authorities
2	Limpopo-Vhembe District	Makhado Municipality	Mphephu/Lutanandwa	Entabeni, Roodewal and Hanglip	Maguada, Vuvha, Ratombo, Tshakuma, Lwamondo Ravele, Songoswi, Shanzha, Botshabelo, Traditional Authorities Makhado & Vhembe Municipality
3	Limpopo-Mopani	Greater Tzaneen Municipality	Greater Tzaneen	JDM Keet, Woodbush & New Agatha	Makgoba, Batlhabine, Modjadji, Mathunyeng, Tsolobolo, Mamabolo Mopani District Greater Tzaneen Municipality Traditional Authorities
4	Mpumalanga-Gert	Mkhondo	Roburnia	Roburnia	KwaThandeka

	Sibande	Municipality			France Vezunyawo Stafford Amsterdam Dladla Family land claimant group Mkhondo Municipality Gert Sibande District
5	Mpumalanga-Gert Sibande	Chief Albert Luthuli Municipality	Blairmore	Portion of Roburnia Plantation	Diepdale Syde Ngodlomezi Devet Nordene Fernie 1 Fernie 2 Chief Albert Luthuli Municipality Gert Sibande District Traditional Authorities
6	Mpumalanga-Gert Sibande	Chief Albert Luthuli Municipality	Redhill	Jessievale	Mayflower Redhill Lochiel Belvedere Haartebeeskop Glenmore Swallownest Bettysgoed Dundonald Robinsdale Chief Albert Luthuli Municipality Gert Sibande District Municipality Traditional Authorities
8	Mpumalanga – Ehlanzeni District	Mbombela Municipality	Berlin	Berlin	Elandshoek community Mankele community Kaapsehoop land claimant group. Mbombela Municipality Ehlanzeni District Municipality
9	Mpumalanga-Gert Sibande	Chief Albert Luthuli Municipality	Mantjolo	Nelshoogte	Mantjolo community& Traditional Authority Chief Albert Luthuli

					Gert Sibande District Municipality
10	Mpumalanga-Ehlanzeni	Bushbuckridge & Mbombela Municipality	Hebron	Wilgeboom& Bergvliet	Maviljan Marite, Collegeview, Nkaning, Marongwane, Sandford, Kgarudi, Mgadzeni/Game, Waterfall, Mandela, Mphenyatsatsi, Tshabalala/Hazyview Traditional Authorities Bushbuckridge and Mbombela Municipality, Ehlanzeni District Municipality
11	Mpumalanga-Ehlanzeni	Thaba Chweu Municipality	Mapulana	Blyde, Tweefontein & Bergvliet	Pilgrim Rest Matibidi, Leroro Hlabekisa Graskop, Glory Hill, Sabie, Harmony Hill, Simile, Brondal, Traditional Authorities Thaba Chweu Municipality Ehlanzeni District Municipality
12	KwaZulu Natal – UmKhayakude District	Mtubatuba Municipality	Palm Ridge	Seed Orchard (Research Centre)	Makhambane Mapheleni Traditional Authorities
13	KwaZulu Natal – Zululand District	Abaqulusi and Nongoma Municipalities	Ngome	Ngome	Sihlengeni Mooiplaas Khambi Dlomodlomo Mhlabaneni Mahashini Ntendeka Oncweleni Hlushwana

					Ngwelu Traditional Authorities
14	Mpumalanga-Ehlanzeni	Mbombela Municipality	Emjindini	Nelshoogte	Emjindini community Traditional Authority Mbombela Municipality Ehlanzeni District Municipality
15	Limpopo-Mopani	Greater Tzaneen Municipality& Bohlabela Municipality	Mamahlola	New Agatha / Woodbush	Mamahlola Community, Metz, Banareng ba Letsoalo Traditional Authority Bohlabela Municipality, Mopani District Municipality

13. Conclusion.

Komatiland Forests would like to thank you for taking the time to read this environmental report.
Our commitment to responsible and improved environmental management practices are clear to see.
We are grateful for the continued constructive participation of our stakeholders. This, together with the commitment of our employees will continue to improve our environmental performance.
Should you require any further information, please contact our General Manager: SHEQ at (013) 754 2700.