

ENVIRONMENTAL ASSESSMENT REPORT

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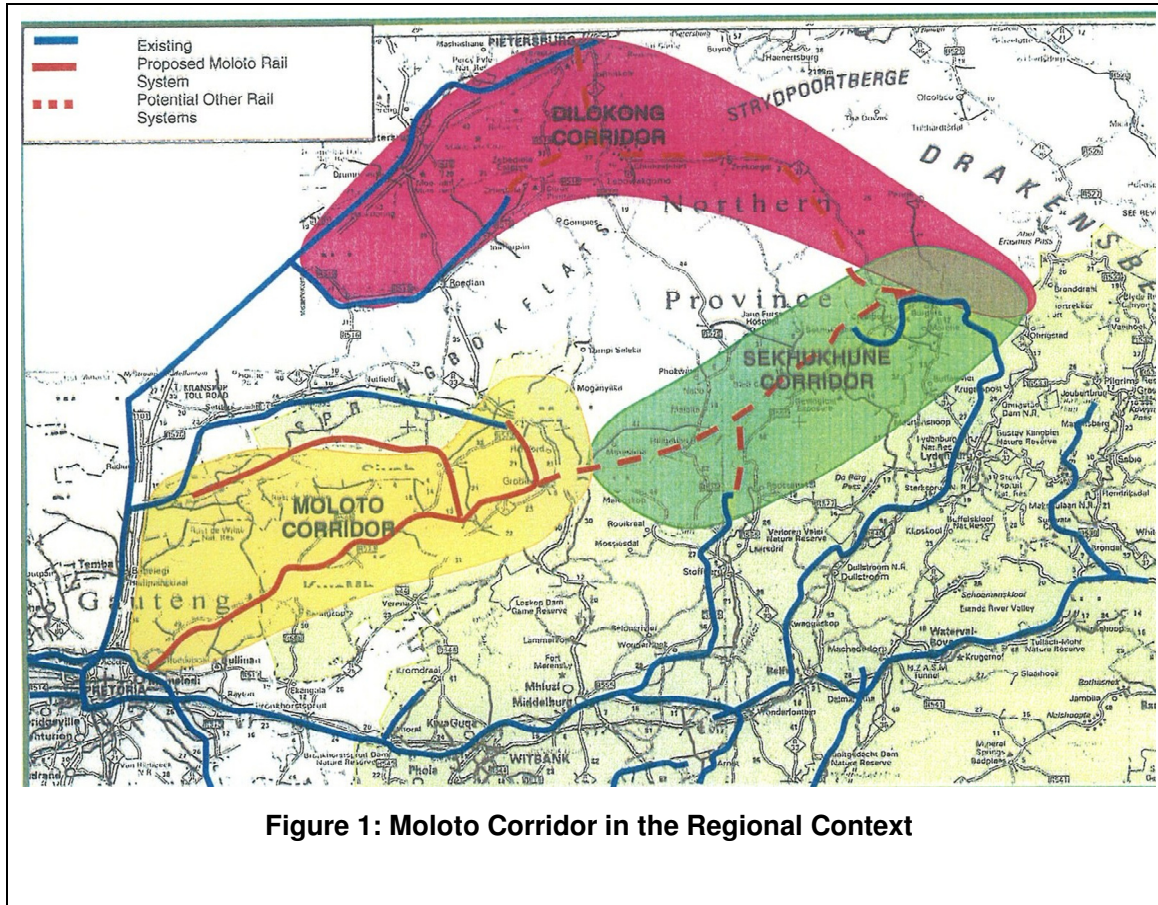
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1. OVERVIEW AND PROJECT APPRECIATION

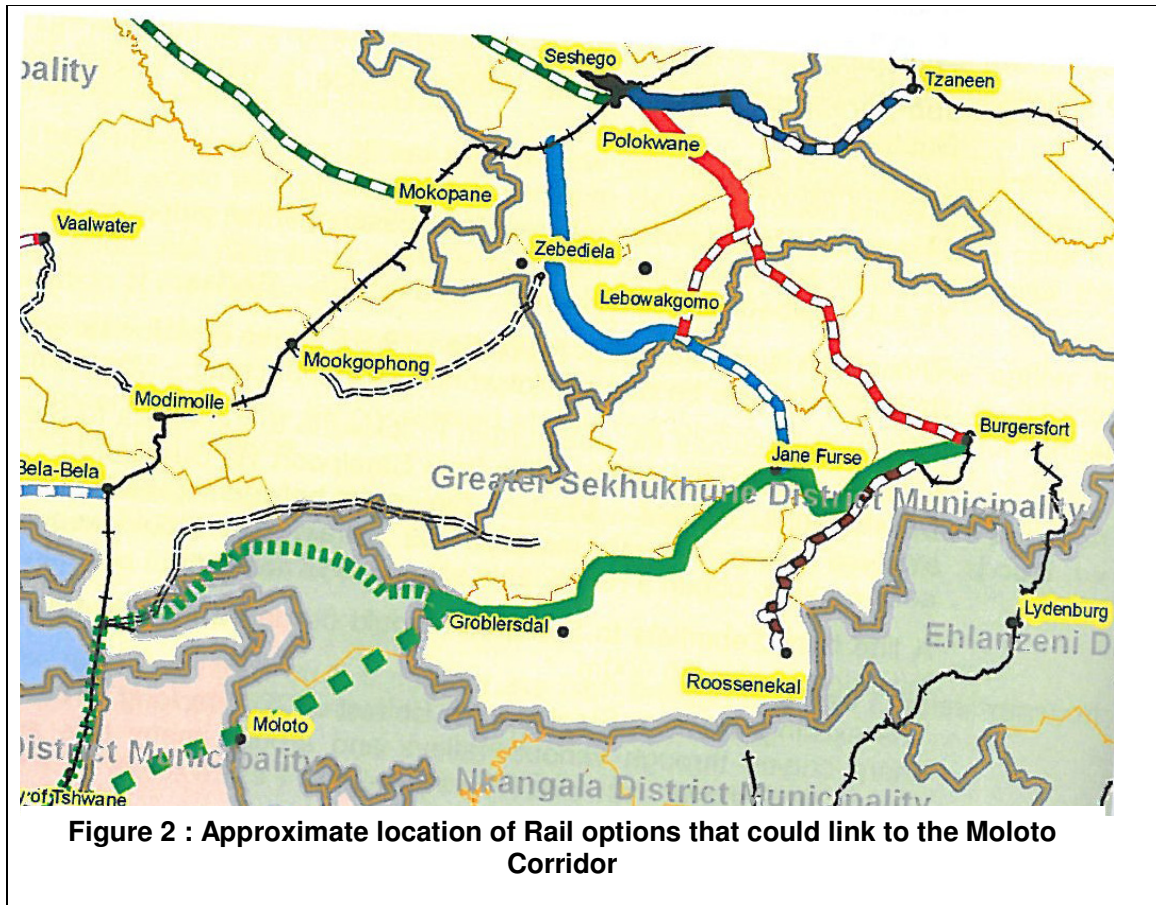
1.1 Introduction

The Moloto Corridor (Refer **Figure 1**) project was accepted by Cabinet to link Moloto in Mpumalanga to Tshwane with a standard gauge rail line. The proposed service would be provided with double decker trainset. The corridor could be extended in future via Jane Furse to Burgersfort.



A 36km new rail line could be provided from Polokwane to Zebediela with a possible extension to the Lebogkomo area. This option would use 19km of the existing mainline between Polokwane and Mokopane. An alternative route to the Lebogkomo area would be from the Polokwane – Mankweng option.

Any one of these options could be extended from the Lebogkomo area to Jane Furse to link with the Moloto Corridor. The total distance from Polokwane to Jane Furse is approximately 150 km (Refer **Figure 2**).



1.2 Scope of Study - Corridor D: Polokwane –Moloto Passenger Rail Corridor

It was recommended in the Phase 1 report that a Conceptual Design be done to link Polokwane with the Moloto corridor which should include the options from Polokwane via Lebowakgomo on the Mankweng route to Jane Furse as well as from Polokwane via Zebediela to Jane Furse where it should link to the possible extension of the Moloto Corridor.

The purpose should be to guide spatial development along this corridor in order that future rail facilities could support the corridor. The aim of the study is to identify the preferred linkage between Polokwane and Jane Furse. The preferred linkage was determined and is presented in the Option Development Report . This was followed by a Conceptual Design and detailing of infrastructure requirements of the preferred alignment with proposition for station location. An operational Assessment based on our experience of similar project was done as well as a Business case. This report presents the detailing of Environmental Scoping, Risks and Opportunities for the corridor.

1.3 Purpose of this Report

This Technical Report contains technical information required according to the scope of the project and in accordance with PRASA and Limpopo DoRT requirements. The content of this document is based on the understanding of the project's scope of work. Once approved by PRASA and Limpopo DoRT, this Technical Report will form the basis upon which the project will be executed.

1.4 Layout of this Document

In pursuing the objectives and scope of the document the outline of the remaining chapters is as follows:

- Chapter 2 presents the environmental regulations for South Africa.
- Chapter 3 presents the profile of the study area in terms of Bio-Physical Characteristics, Topography, Surface Water, Centres of Endemism, Threatened ecosystems, conservation areas, environmental sensitivity and heritage and cultural aspects for Corridor D-Polokwane Moloto Rail service.
- Chapter 4 presents the Opportunities, Risks and Constraints Analysis
- Chapter 5 presents the conclusion.

2. ENVIRONMENTAL REGULATIONS

2.1 Legal and Regulatory Framework

Various aspects of the construction and operation of new rail infrastructure and services are regulated in South Africa, and require that authorisation be obtained before project options are implemented.

This chapter includes a brief overview of the environmental authorisations that are likely to be required for each of the infrastructure development project options under consideration. It is based on the understanding of the environment and development options obtained from a desktop review of available information and a site visit, and is not intended to be an exhaustive environmental-legal review. It should also be noted that authorisation requirements will change with time as environmental legislation is subject to frequent amendment.

2.2 Environmental Authorisation

GN 544 of 2010 lists activities that require environmental authorisation for which a **Basic Environmental Assessment** is required. GN 545 of 2010 lists activities that require environmental authorisation for which an **Environmental Impact Assessment (EIA)**, including Scoping and Impact Assessment phases, is required. In the case where the project includes activities listed in both GN 544 and 545, a full EIA is required to obtain environmental authorisation.

GN 546 of 2010 lists additional activities requiring Environmental Authorisation in specified geographical areas, in terms of Section 24(2)(b) of the National Environmental Management Act (Act 107 of 1998) (NEMA):

24 (2) The Minister, or an MEC with the concurrence of the Minister, may identify-

(b) geographical areas based on environmental attributes, and as specified in spatial development tools adopted in the prescribed manner by the environmental authority, in which specified activities may not commence without environmental authorisation from the competent authority.

The Olifants Letaba Environmental Management Framework (EMF) has identified a number of environmental attributes within the study area, including for instance threatened ecosystems, steep slopes, and National Parks view-shed protection areas. These attributes are designed to provide inputs to the national and provincial system currently being developed. A number of activities are also identified as requiring environmental authorisation if located in one or more specified geographical areas.

Furthermore, Section 24(2)(c) makes provision for the exclusion of activities for which environmental authorisation is normally required in specific geographical areas:

24 (2) The Minister, or an MEC with the concurrence of the Minister, may identify-

(c) geographical areas based on environmental attributes, and specified in spatial development tools adopted in the prescribed manner by the environmental authority, in which specified activities may be excluded from authorisation by the competent authority.

2.3 Heritage Aspects

Typically, linear developments such as railway lines require approval from the South African Heritage Resources Agency (SAHRA), in accordance with Section 38 of the National Heritage Resources Act (Act 25 of 1999).

Section 38 (1) of the National Heritage Resources Act (Act 25 of 1999) states that:

Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as –

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- (b) the construction of a bridge or similar structure exceeding 50 m in length;
- (c) any development or other activity which will change the character of a site –
 - i. exceeding 5 000 m² extent; or
 - ii. involving three or more existing erven or subdivisions thereof; or
 - iii. involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - iv. the costs of which exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources agency;
- (d) the re-zoning of a site exceeding 10 000 m² in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources agency, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

2.4 Water Related Aspects

According to Chapter 4 of the National Water Act (Act 36 of 1998) (NWA), all water users must have permission to do so. This aspect is termed as Permissible Water Use. There are several different ways in which Permissible Water Uses are exercised.

People who use small amounts of water are automatically authorised to do so under “Schedule 1” of the NWA.

Larger amounts of water used by any entity could impact negatively on the water resource and must therefore be authorised in one of the following methods:

- General Authorisations, where a user may use water without a license provided that water use is exercised within the constraints of the General Authorisation as published in the Government Gazette; or
- Water use authorisation through a license.

A water use license is a legal document issued by the Department of Water Affairs (DWA). It entitles a water user to utilise water in accordance with the requirements of the NWA and conditions specified within the license. The maximum period that a water use license may be issued for is 40 years. The NWA requires that every license issued must be reviewed at least every five years.

Water use activities which require a license have been specified in section 21 of the NWA and include the following:

- a) Taking water from a resource, such as from a stream, river, estuary, wetland or aquifer;
- b) Storing water, such as a dam
- c) Impeding or diverting the flow of water, for example when the flow of a river is changed during the building of bridges or roads;
- d) Stream flow reduction activities, which currently only apply to forestry activities;
- e) Controlled activities, such as irrigation with wastewater;
- f) Discharging waste water directly into a water resource;
- g) Disposal of waste water into dams or ponds or land based disposal facilities such as waste sites, slimes dams etc.;
- h) Disposal of water which contains waste or has been heated from any industrial or power generation activity;
- i) Altering the bed, banks or course of a water course, for example when a water course is turned into a canal, or sand mined from the beds etc.;
- j) Removal of underground water for activities such as mining;
- k) Recreation, such as water sports like boating, swimming etc.

The river crossings involved in the proposed new rail alignments would therefore require a water use license in terms of S21(c) and (i).

The DWA has also published a number of General Authorisation notices, which allow certain types of developments to proceed without water use licences in certain areas. These General Authorisations are valid for a period of five years from publication and are therefore reviewed every five years.

2.5 Waste Related Aspects

GN 718 lists Waste Management Activities in respect of which a waste management licence is required; these include various activities associated with the storage of waste, reuse, recycling and recovery of waste, treatment of waste (which includes the remediation of contaminated land) and disposal of waste. The Schedule to the Notice distinguishes between two categories of waste management activities which require licensing and for which a basic assessment process (for Category A Waste Management Activities) or an Environmental Impact Assessment process (for Category B Waste Management Activities) must be conducted.

Generally, Category A activities involve general waste while Category B involve hazardous waste.

2.6 Protected Areas

In terms of section 50(5) of the National Environmental Management Protected Areas Act, 2003: “No development, construction or farming may be permitted in a nature reserve or world heritage site without the prior written approval of the management authority.”

One of the proposed alignments traverses the Bewaarkloof Nature Reserve, which is a statutory protected area, for which the Lepelle Nkumpi Local Municipality is the management authority.

2.7 Air quality

The National Environmental Management: Air Quality Act regulates atmospheric emissions. No authorisation in terms of this Act are expected to be required for this project.

2.8 Borrow areas

Material from borrow areas or quarries may be required for the construction of rail infrastructure. Government Notice Regulation no. 762 of 25 July 2004 addresses the exemption of organs of State from certain provisions of the Minerals and Petroleum Resources Development Act (Act 28 of 2002) (MPRDA), and state that the Minister of Minerals and Energy, acting in terms of Section 106 (1) of that act exempts Transnet Freight Rail (formerly Spoornet) from the provisions of sections 16, 20, 22 and 27 of the act in respect of any activity to remove any mineral for the construction and maintenance of railway lines and for purposes incidental thereto.

However, in accordance with Section 106 (2) of the MPRDA, the organ of state although exempted from such provisions must submit an Environmental Management Programme (EMP) for approval in terms of Section 39 (4) of the Act, and in so doing should make it clear that the EMP, is submitted for approval and that Transnet is not an applicant.

Section 106 (3) of the MPRDA states “any land owner or lawful occupier of land who lawfully takes sand, stone, rock, gravel or clay for farming or for effecting improvements in connection with such land or community development purposes, is exempt from the provisions of the subsection (1) as long as the sand, stone, rock, gravel or clay is not sold or disposed of”.

3. STUDY AREA PROFILE

3.1. Municipal Areas

The proposed alignments linking Polokwane to the Moloto Corridor traverse the following District and Local Municipalities:

- Capricorn District Municipality, including
 - Polokwane Local Municipality, and
 - Lepelle Nkumpi Local Municipality;
- Greater Sekhukhune District Municipality, including
 - Fetakgomo Local Municipality,
 - Greater Tubatse Local Municipality, and
 - Makhuduthamaga Local Municipality.

3.2. Biophysical Characteristics

3.3. Topography

The topography across the study area is varied and includes a large open flat area, referred to as the Springbok Flats, in the south western part, as well as various hills and mountain terrain (**Figure 3**) in the central part. Enclosed plains/lowlands occur, typically along drainage lines (**Figure 4**).



Figure 3: View from the R37 north of Chuniespoort, facing south

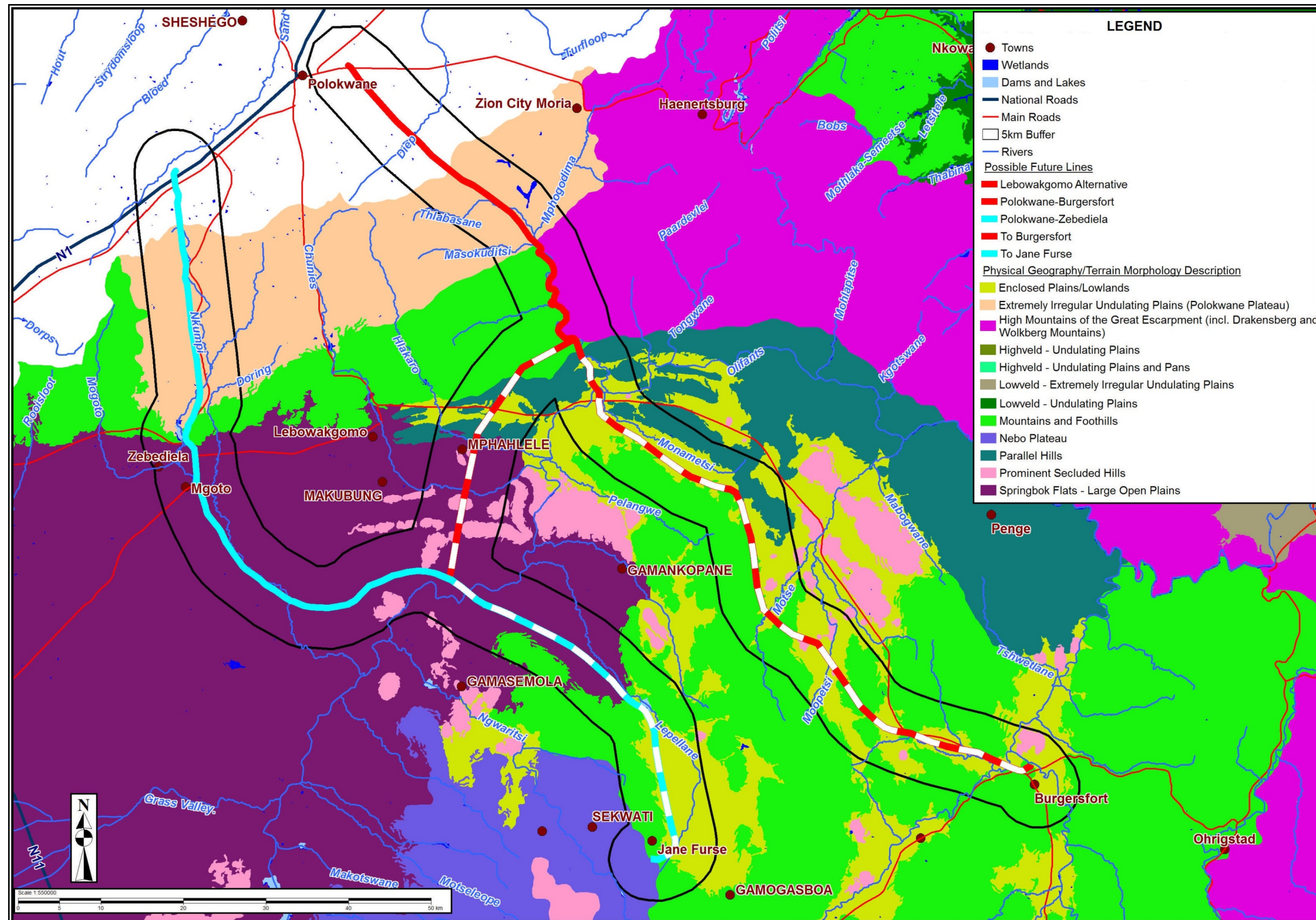


Figure 4: Topography (adapted from DEAT, 2009)

3.4. Surface water

The Olifants River is the main watercourse running through the study area. The proposed new rail alignments also cross a number of smaller rivers, as shown in **Figure 5**.

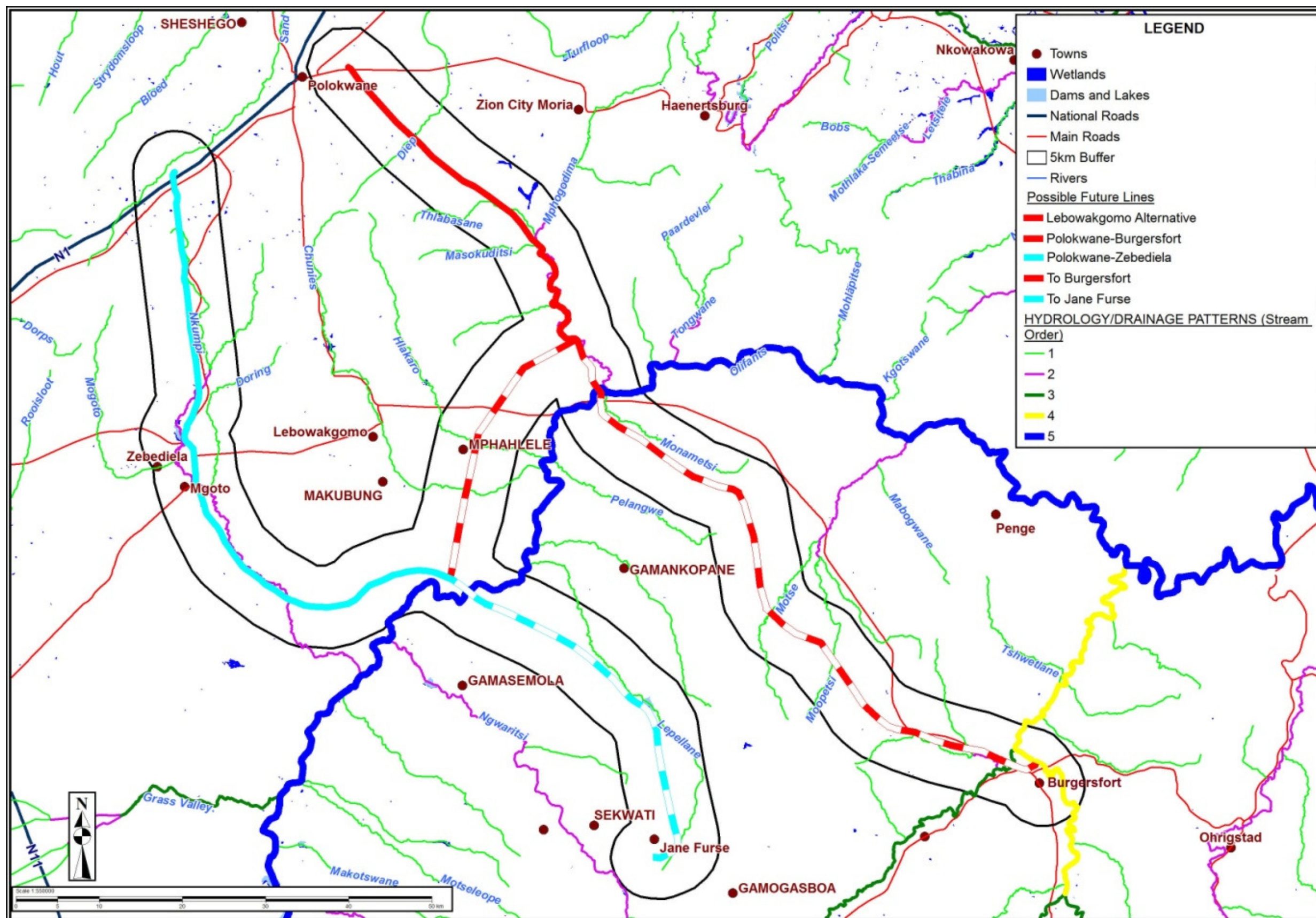


Figure 5: Hydrology (adapted from DEAT, 2009)



Figure 6: Wetland at Ga-Mashabela

Wetlands also occur in the study area (**Figure 6**), although not all wetlands are indicated on **Figure 7**.

3.5. Centres of endemism

The proposed rail alignments traverse two centres of endemism (**Figure 7**), namely the Sekhukhuneland, and Wolkberg Centres of Endemism. These Centres of Endemism contain high levels of diversity with many species restricted entirely to these areas. As such they are of high priority in terms of conservation. The high biodiversity and the many unique plant species restricted to these areas means that they are particularly vulnerable.

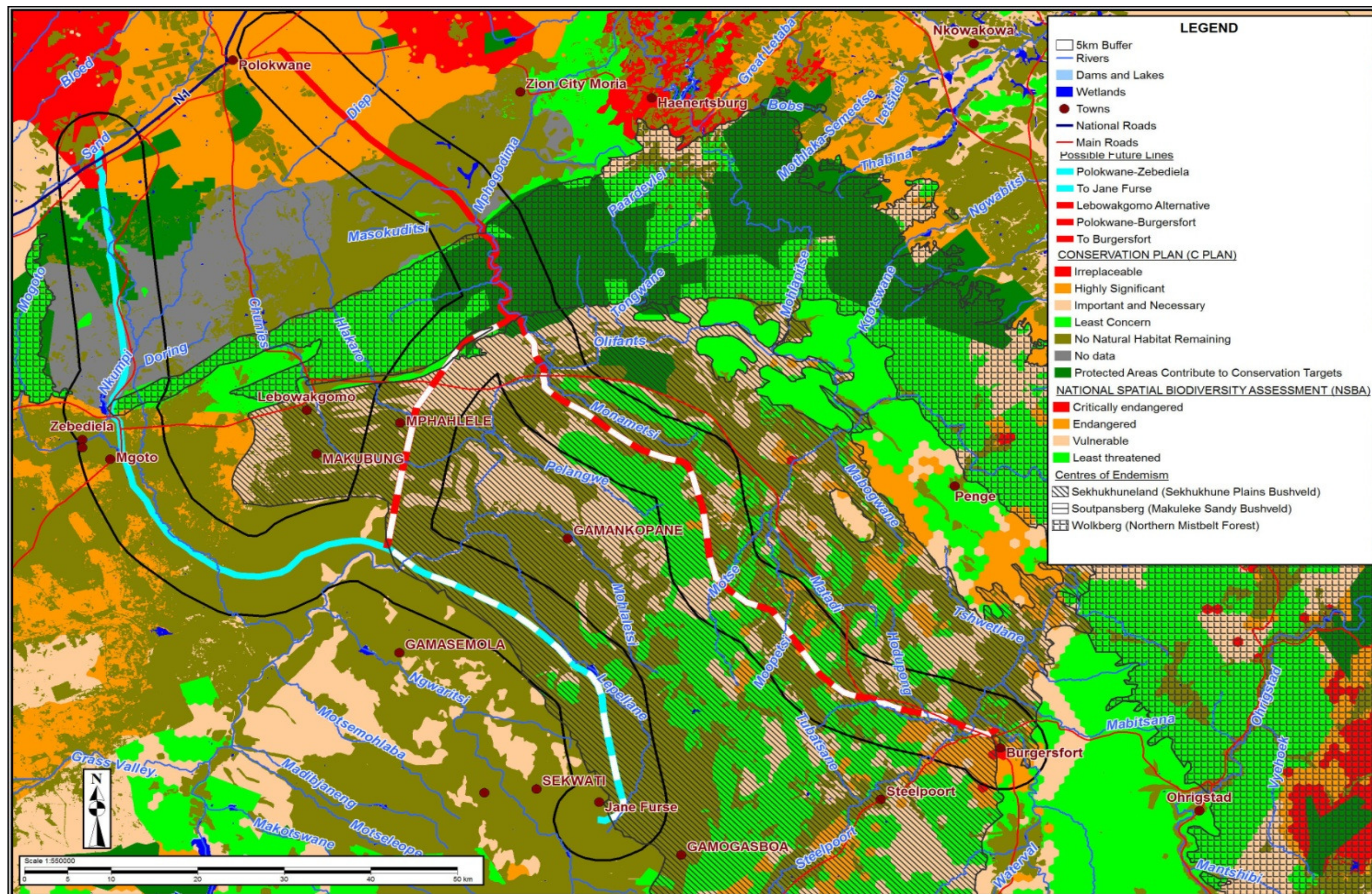


Figure 7: Threatened ecosystems (adapted from DEAT, 2009)

The **Wolkberg Centre** is extremely rich floristically. More than 40 species endemic/near endemic to the dolomites and more than 90 to the quartz- and shale-derived substrates occur in the area. These figures are conservative, with more taxa likely to be added as knowledge of the flora improves.

The three families with the largest number of endemics on the quartzitic and related rock types are the Asteraceae, Iridaceae and Liliaceae. The asteraceous genus *Helichrysum*, with 10 species being the most prolific in producing endemics. *Gladiolus* has more than ten species endemic to the region as a whole. The Liliaceae is the family with the largest number of dolomite endemics to the region as a whole, followed by the Euphorbiaceae, Lamiaceae and Acanthaceae. For mosses, the Wolkberg Centre is one of the main southern African centres of diversity and a secondary centre of endemism.

Significantly, nearly all the endemics (notably the quartzitic ones) are grassland species. Most of the taxa endemic to the Wolkberg Centre appear to be palaeoendemics. The Wolkberg Centre, especially the arid dolomite areas, shares many species with the adjacent Sekhukhuneland Centre, several of which are endemic to the combined region.

The vegetation of the **Sekhukhuneland Centre** has not been studied in detail. It is usually mapped as Mixed Bushveld. However, floristically the bushveld of Sekhukhuneland Centre is quite unique and certainly deserves recognition as a separate type. The *Kirkia wilmsii*, a species that is relatively rare in other parts of the Mixed Bushveld is a characteristic tree of this area. Vegetation differences between the north- and south-facing aspects of the mountains are often striking. Intriguing vegetation anomalies associated with heavily eroded soils are present throughout the region.

The flora of the Sekhukhuneland Centre is still poorly known, with many apparently endemic species awaiting formal description. Families particularly rich in Sekhukhuneland Centre endemics include the Anacardiaceae, Euphorbiaceae, Liliaceae, Lamiaceae and Vitaceae. A still-to-be-described monotypic genus of the Alliaceae is endemic also. The area around Burgersfort is reputed to have the highest concentration of *Aloe* species in the world. The Leolo Mountains harbour relic patches of Afromontane Forest, Fynbos-type vegetation and several Sekhukhuneland Centre endemics. There are also some rare wetlands in the summit area.

3.6. Threatened Ecosystems

Large sections of the proposed corridors are degraded to a point where no natural habitat is remaining. There are however vulnerable and endangered ecosystems within the study area (**Figure 7**) which will have to be taken into account in the EIA and final design of the alignment.

3.7. Conservation Areas

There are a number of ecologically important areas within the study area and various conservation areas have been proclaimed (**Figure 8**), namely:

- Kuschke Nature Reserve;
- Polokwane Game Reserve; and Bewaarkloof Nature Reserve.

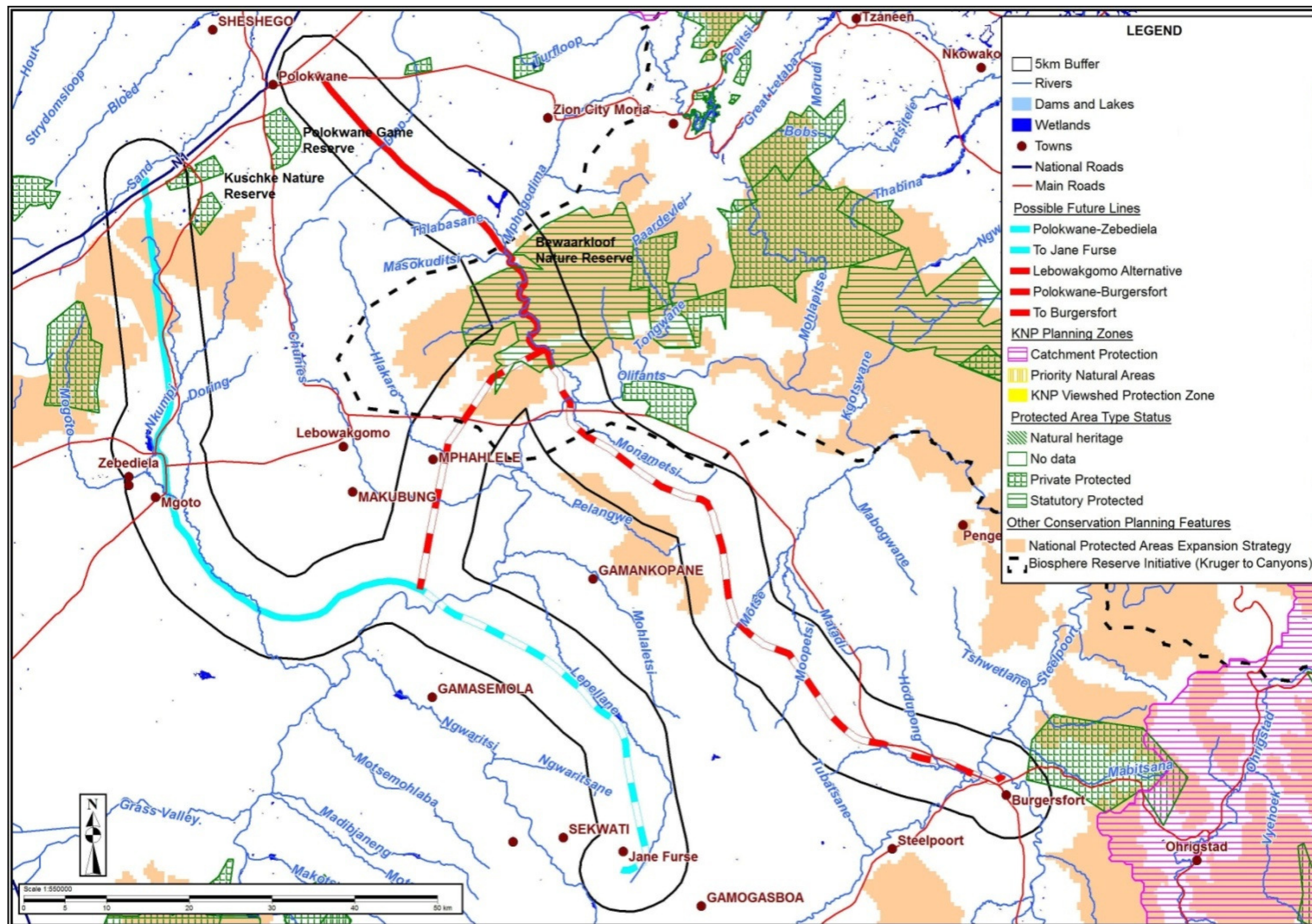


Figure 8: Protected areas and conservation planning (adapted from DEAT, 2009)

Several areas along the corridors are also earmarked as part of the National Protected Areas Expansion Strategy and should be avoided.

Part of the Kruger to Canyons Biosphere Reserve falls within the study area (**Figure 8**). Biosphere reserves are intended to fulfil three functions:

- Conservation: preserve genetic resources, species, ecosystems and landscapes;
- Development: foster sustainable economic and human development; and
- Logistic support: support activities related to issues of conservation and sustainable development.

3.8. Environmental Sensitivity

Figure 9 indicates environmental sensitivity in the study area based on the following key elements:

- Protected areas;
- Threatened ecosystems;
- Remaining natural vegetation;
- Steep slopes; and
- Hydrological features.

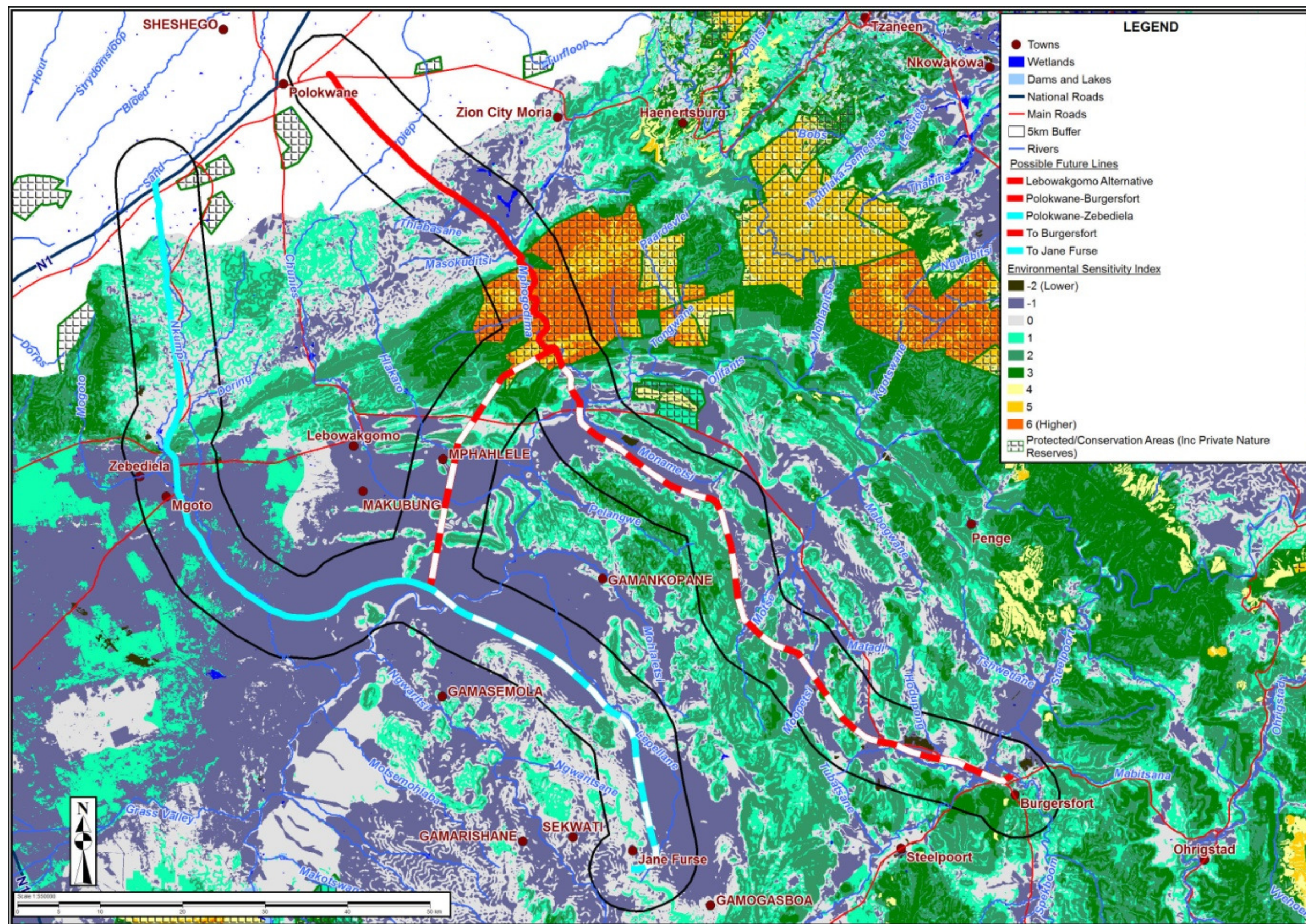


Figure 9: Environmental sensitivity (adapted from DEAT, 2009)

The only area of high environmental sensitivity along the proposed corridors is at the Bewaarkloof Nature Reserve, located 40 km south east of Polokwane. The Polokwane-Zebediela-Jane Furse is over-all the least sensitive.

3.9. Socio-economic Characteristics

3.9.1. Human Settlement and Development

The study area is characterised by scattered rural settlements and subsistence farming. **Figures 10** and **11** show built up areas and the current use of land/landcover.

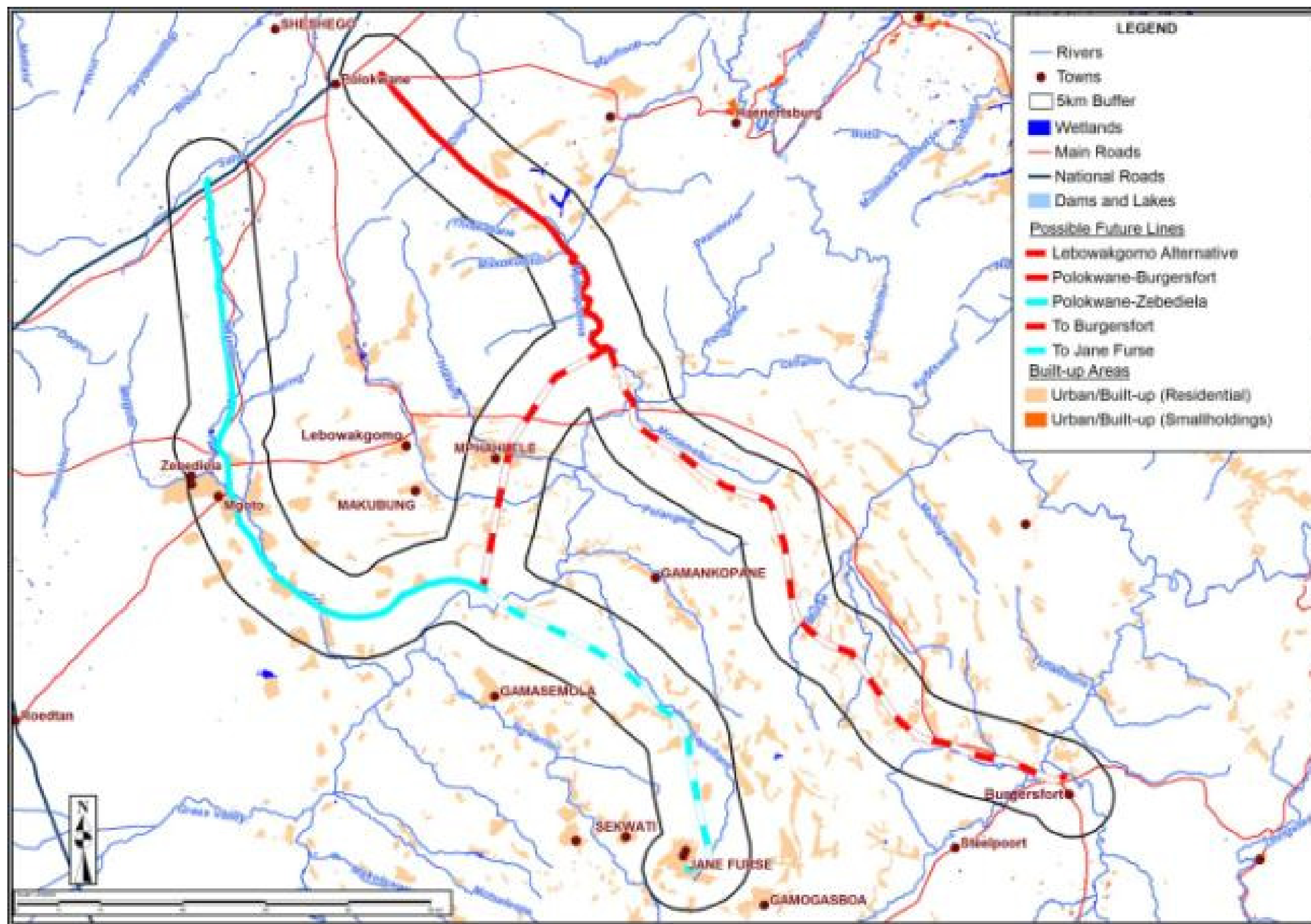


Figure 10: Built-up areas (adapted from DEAT, 2009)

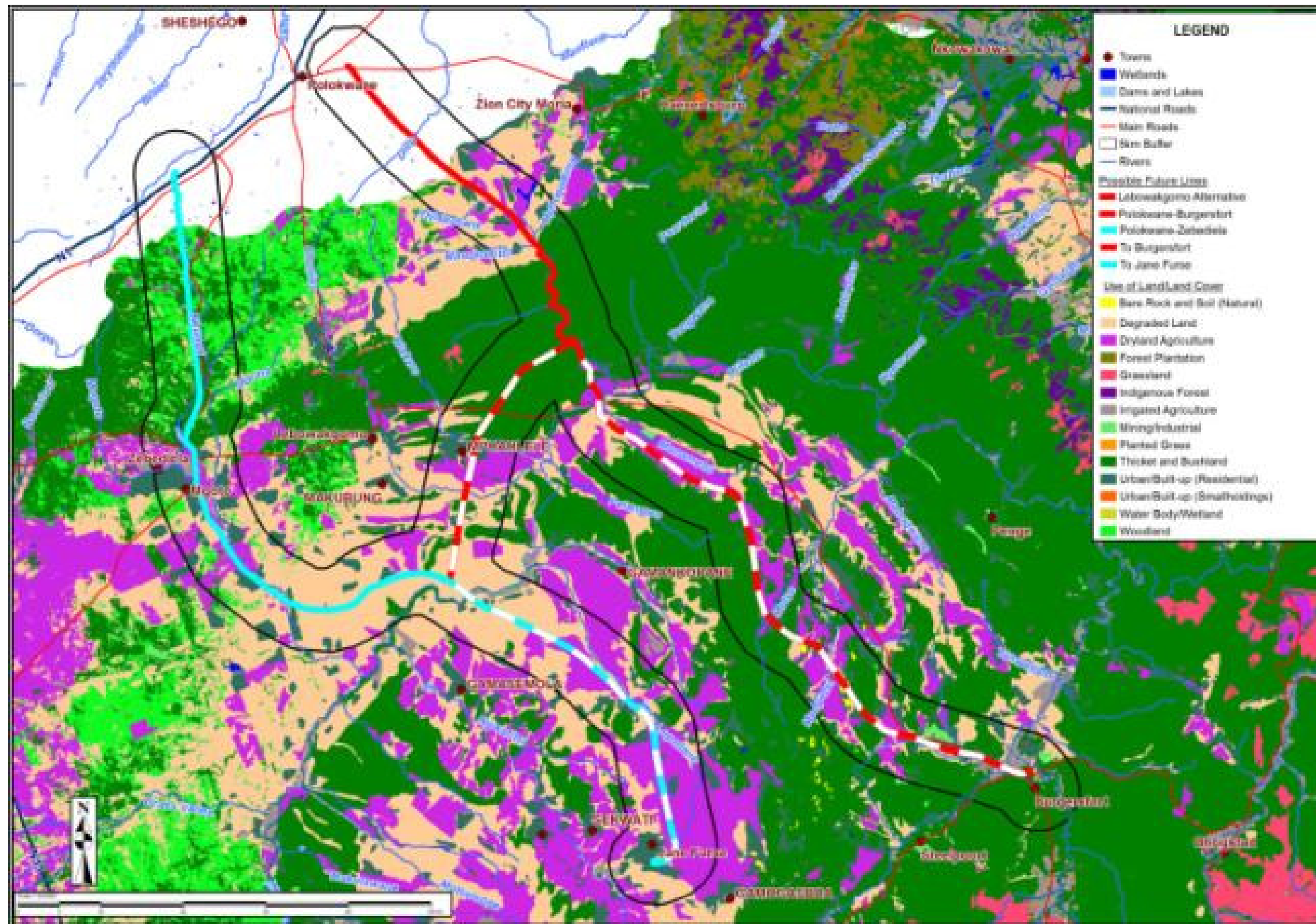


Figure 11: Landuse/Landcover (adapted from DEAT, 2009)

3.9.2.Land capability

Large sections of the proposed corridors are unsuitable for arable agriculture. Arable land is mostly found around the Lebowa kgomo area and south of Zebediela (**Figure 12**). Citrus farming is common in these areas (**Figure 13**).

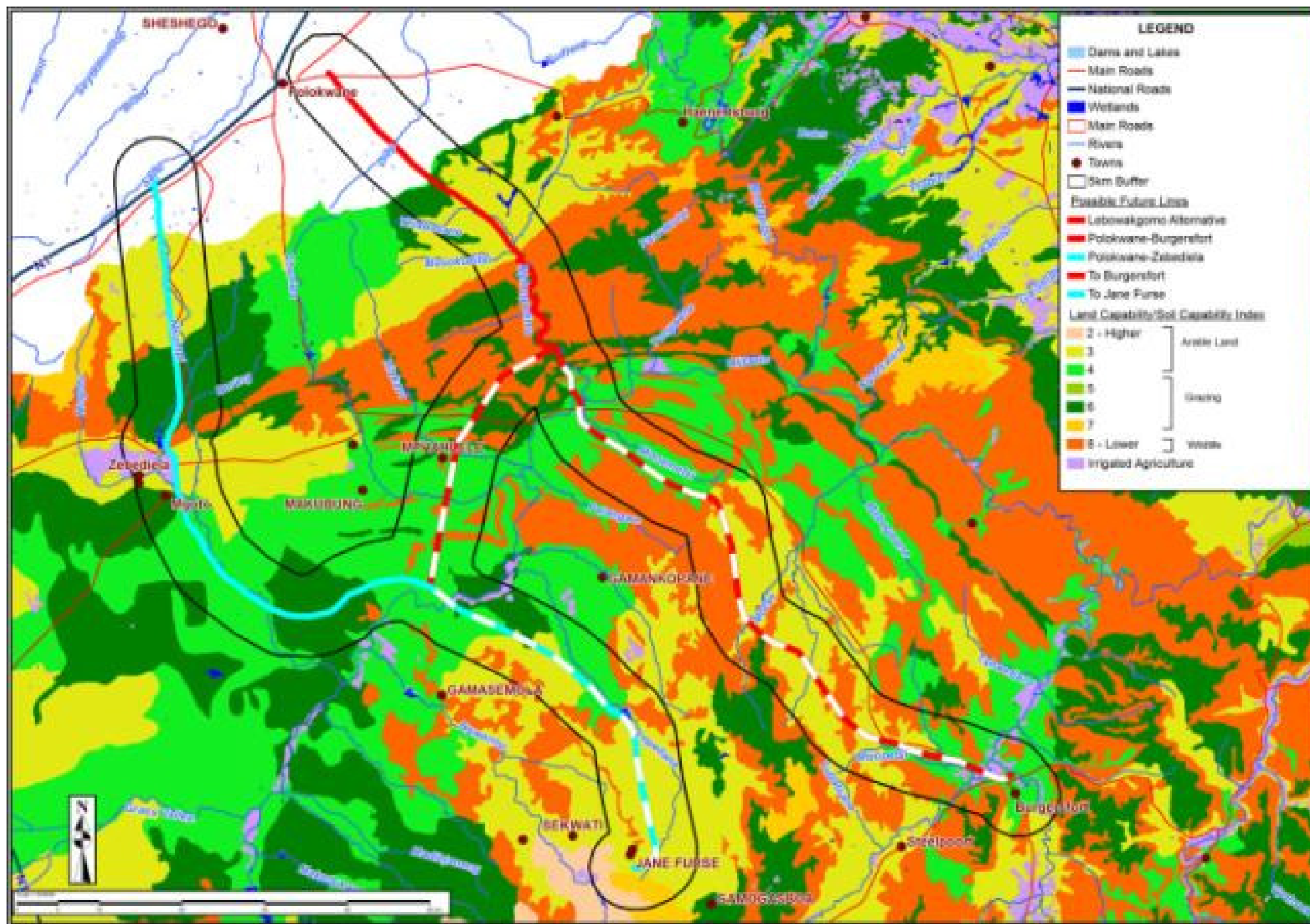


Figure 12: Land capability for arable agriculture (adapted from DEAT, 2009)



Figure 13: Oranges for sale near Lebowa kgomo

3.10. Heritage and Cultural aspects

Graves, as well as artifacts dating from the Stone Age, Iron Age and historical periods have been found in the study area (**Figure 14**).

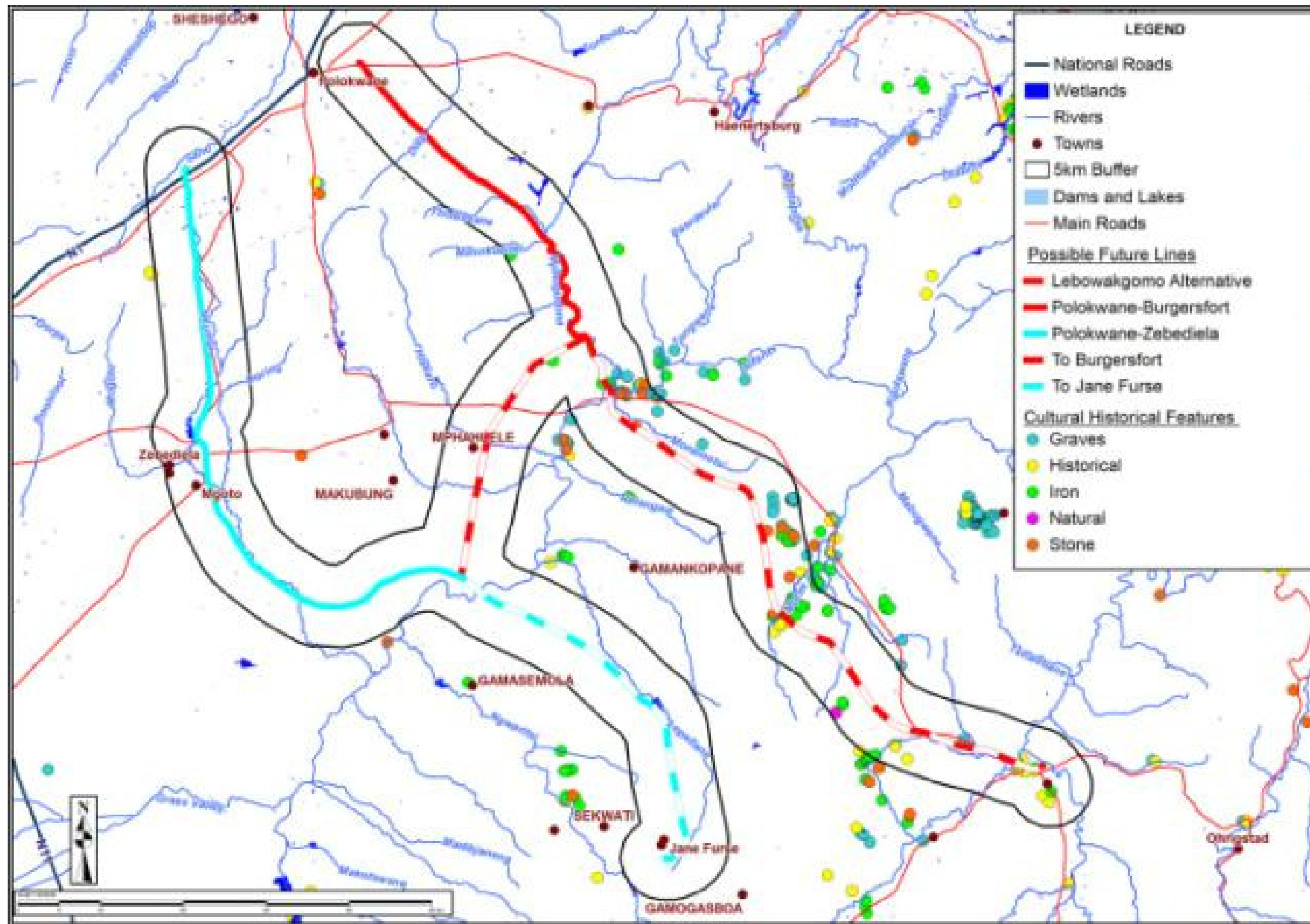


Figure 14: Known cultural historical features (adapted from DEAT, 2009)

4. OPPORTUNITIES AND CONSTRAINTS ANALYSIS

4.1. Opportunities

The proposed new rail infrastructure and services can foster ecological, social and economic sustainability in the region in the following ways:

- Connecting regional administrative and economic hubs, thereby increasing mobility and access to facilities and employment opportunities, and contributing to alleviating poverty;
- Increasing transport options and reducing dependency on road based private and public transport, thereby contributing to reducing road accidents as well as users' carbon footprint and ultimately contributing to addressing air quality issues and climate change;
- In instances where the new rail infrastructure can be built parallel to the road alignment, this will significantly minimise impacts and (in some cases) maximise accessibility and passenger numbers.

4.2. Risks and Constraints

- Two of the proposed options traverse a protected area, the Bewaarkloof Nature Reserve (**Figure 15** and **Figure 16**), which constitutes a red flag;
- The mountains of the Bewaarkloof Nature Reserve are potentially challenging for the construction and maintenance of new rail infrastructure;
- There are vulnerable and endangered ecosystems on the proposed new rail alignments which will have to be taken into account in the design and EIA phases of the project;
- There are known heritage sites on the proposed new rail alignments which will have to be taken into account in the design and EIA phases of the project;
- No fatal flaws or no-go areas have been identified.



Figure 15: Mphogodima River in Bewaarkloof Nature Reserve

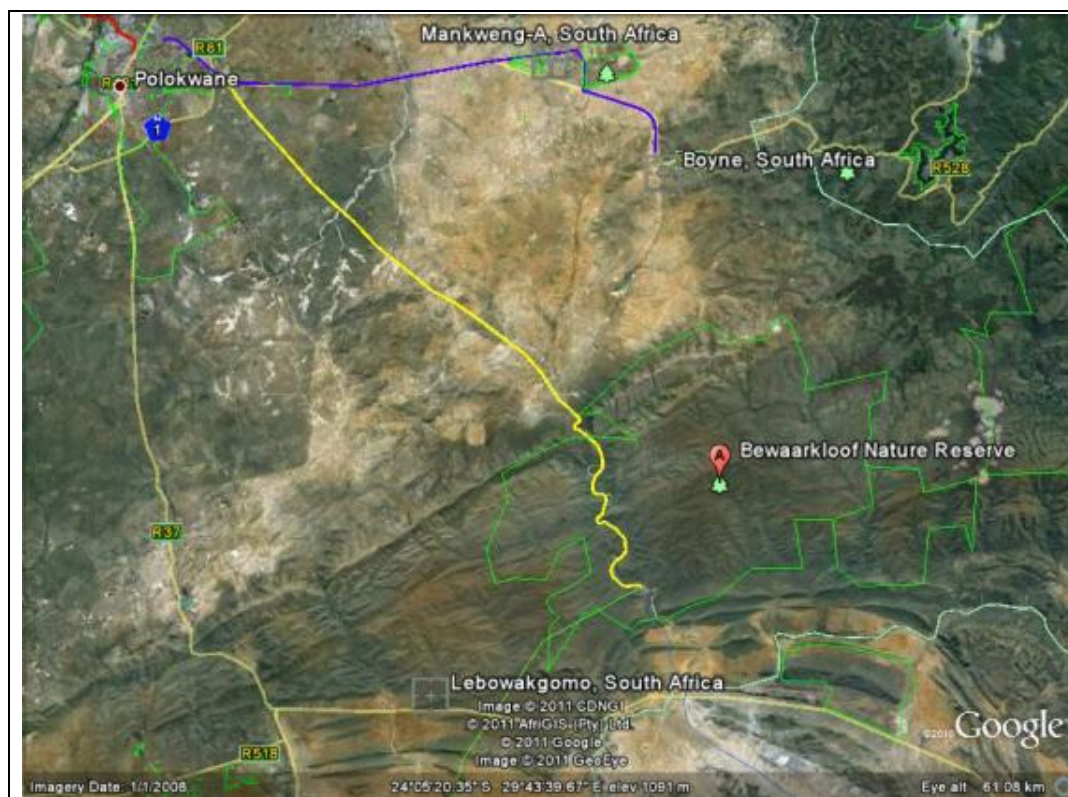


Figure 16: Polokwane to Lebowaikgomo through Bewaarkloof nature reserve

4.3. Areas most suited for Development

Based on environmental and social sensitivity, areas most suited for development include:

- Degraded areas,
- Areas in the vicinity of road alignments.

4.4. Areas least suited for Development

The only major environmental constraint on the proposed corridors is the Bewaarkloof Nature Reserve, which is a protected area. Other areas which should be avoided as far as possible include:

- Vulnerable and endangered ecosystems;
- Known heritage sites.

4.5. Key Environmental issues to be considered in the EIA Phase

The following issues should be considered in the EIA phase:

- Protected areas: to be avoided or impacts to be adequately mitigated;
- Vulnerable and endangered ecosystems: to be avoided or impacts to be adequately mitigated (e.g. plant rescue programme and offsets);
- Heritage sites: to be avoided or impacts to be adequately mitigated;
- Oil leaks: there are often oil leaks associated with existing rail services, these leaks are mostly limited to the tracks but should nonetheless be considered in the EIA phase.

5. CONCLUSION-COMPARATIVE ASSESSMENT OF OPTIONS

5.1. Conclusion

There are three main options to link Polokwane to the Moloto corridor:

1. Polokwane to Jane Furse via Zebediela (approx. 120 km),
2. Polokwane to Jane Furse via Lebowakgomo (approx. 180 km), and
3. Polokwane to Burgersfort via Lebowakgomo (approx. 160 km).

In terms of environmental sensitivity, the first option (Polokwane – Zebediela – Jane Furse) is the least environmentally sensitive. The other two options present a higher environmental sensitivity, mainly due to the fact that they traverse a protected area. Other factors include the presence of vulnerable and endangered ecosystems, as well as cultural and historical features.

Although options 2 and 3 may still be environmentally feasible, to be confirmed in the detailed EIA, the cost of mitigation measures required can be expected to be greater than for option 1, which may negate other advantages.