

### 6.5.5. Mining

The majority of the mines within the study area are involved in platinum mining, in fact according to the North West Environmental Outlook State of Environment Report, platinum has exceeded gold mining in the province. Mining is more of a dominant feature of the landscape south-east of the Pilanesberg (Rustenberg area). The mining houses found in the study are reflected in Figure 21 and they are namely:

- Anglo Platinum, the world's largest platinum and palladium producer, under its subsidiary company, Rustenburg Platinum Mines Limited (RPM), operates the RPM Bafokeng-Rasimone mine.
- Impala Platinum, generally known as Implats is South Africa's second largest platinum producer.
- Platinum Group metals.
- Wesizwe Platinum Limited.

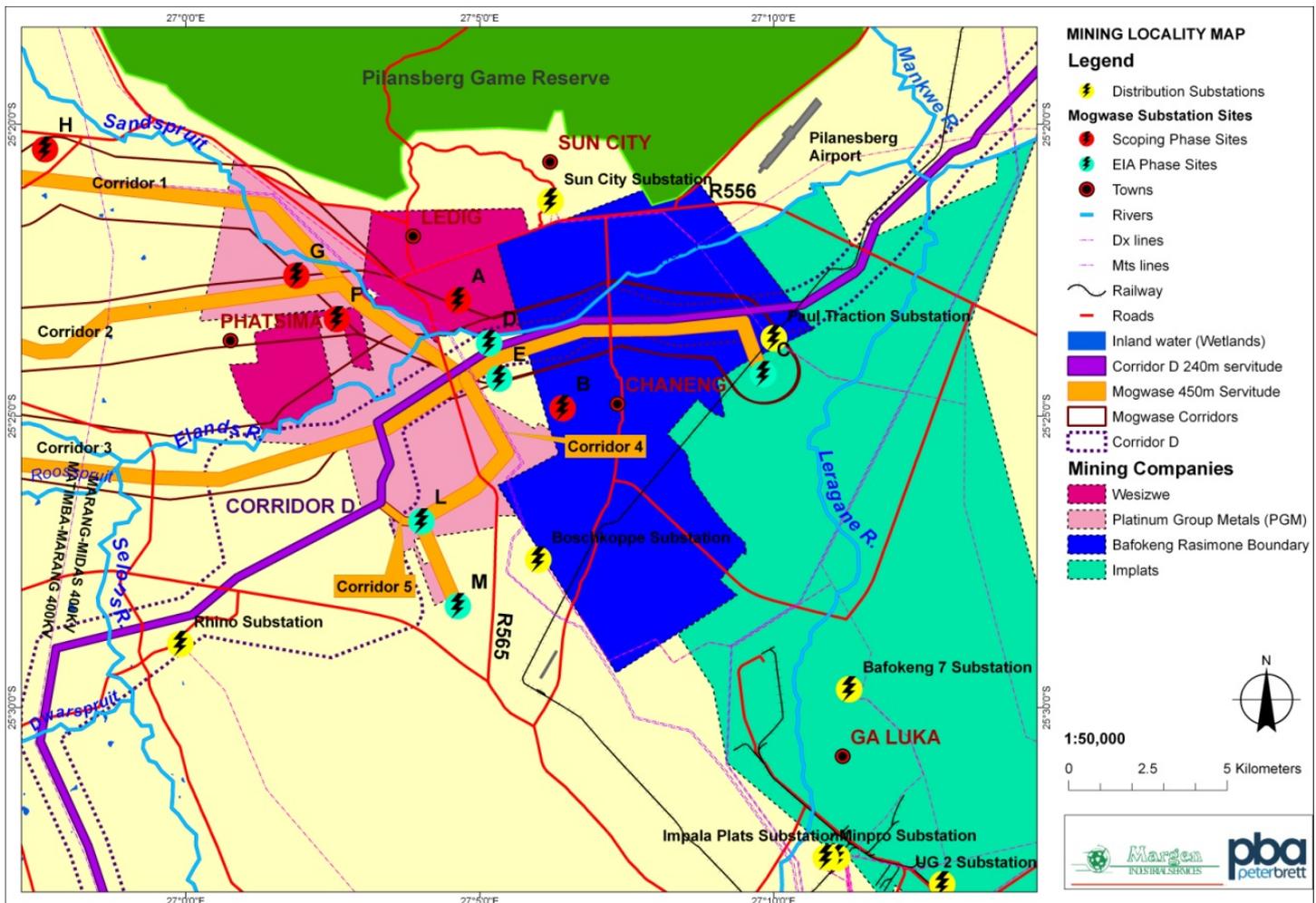


Figure 21: Mining Map

## **6.6. AVIFAUNA**

(See Appendix 4 for Avifauna Report)

Open grassland patches, arable and cultivated lands represent significant feeding areas for many bird species, including power line sensitive birds. Open grassland patches typically attract korhaans, storks, and many other power line sensitive species such as the Secretary bird, Blue Crane and Lanner Falcon. Blue Cranes are particularly fond of foraging in arable lands at various stages of the crop production. Storks, korhaans and even Secretary birds are also known to use these areas at particular times of year. Water birds such as the African-Marsh Harrier, Yellow-billed Stork, Greater and Lesser Flamingo may occur in areas around water are likely to occur in wetlands, dams and watercourses.

According to the IUCN Red Data categories, the African Marsh-Harrier, Blue Crane, White backed vulture, Tawny Eagle, Martial Eagle are classified as vulnerable. The near threatened birds likely to occur in the study area includes the two species of Flamingo, Secretary bird and various species of Storks. A comprehensive list is detailed in the Avifauna Report.

The proposed development falls within two Important Bird Areas (IBAs), namely SA 023 Pilanesberg and SA 025 Magaliesberg and Witwatersrand areas (Figure 22). The former is known to have over 300 bird species including collision sensitive birds such as the Secretary bird, Kori Bustard, Blue Crane and Black Stork. The latter has large population of raptors and in fact has two breeding colonies of Cape Vultures.

This development falls within two IBA's, the SA 023 Pilanesberg National Park and the SA 025 Magaliesberg and Witwatersberg areas.

These two areas are important for the following reasons:

### **SA 023- Pilanesberg National Park**

- Over 300 bird species found in this area
- Situated between two Cape Vulture colonies and regularly holds populations of foraging birds
- White-backed and Lappet-faced Vultures also found in the area
- Large population of raptors
- Known populations of Secretary bird, Kori Bustard, Blue Crane and Black Stork (all of which are collision sensitive species).

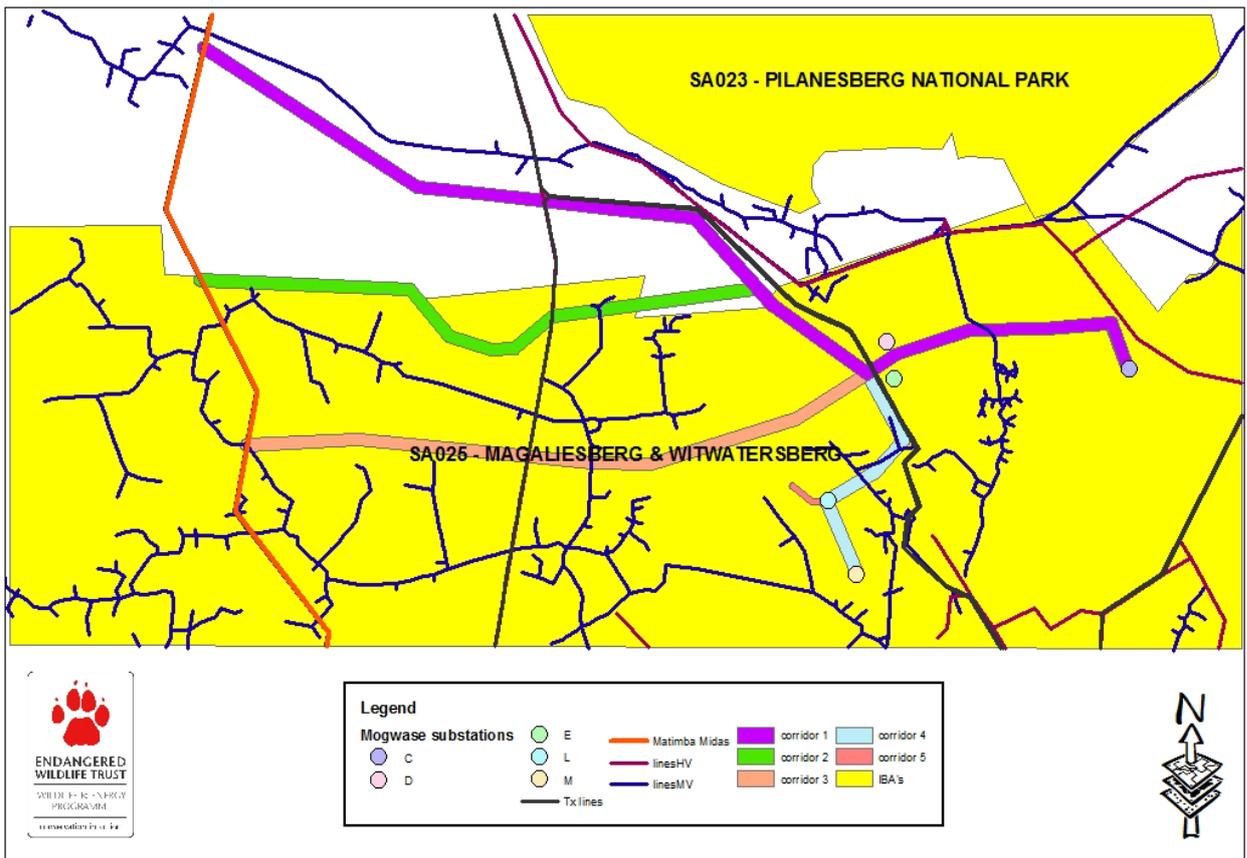
### **SA 025- Magaliesberg and Witwatersberg**

- Two breeding colonies of Cape Vulture in this area
- Large populations of raptors
- Some reports of Blue Crane

The area between these two IBA's is academic as the birds being so mobile could, and probably will, occur within the area not identified as an IBA. The area that is not classified as an IBA is also very narrow and thus the same species are likely to occur in this area. Thus no great advantage is gained from keeping the development out of the IBA's in this area. Furthermore the presence of this IBA does not mean the development cannot take place. Micro-habitats are important in establishing the type of birds likely to occur in any particular areas and within the study area, there are three micro - habitats that have been identified namely; grassland patches, agricultural land and wetland, dams and watercourses.

Collisions and electrocutions, disturbance of breeding birds and destruction of habitat all impacts that power lines could have on birds. Collisions are seen as the biggest threat posed by transmission lines. Electrocutions are not seen as a problem because of the large size of the clearance between live components of the power lines making it virtually impossible for birds to bridge the air gap between the components.

Destruction and transformation of microhabitats could lead to an alteration of or reduction in suitable habitat that could lead to birds leaving an area. The construction process includes noise and an increase in human population and movement could also impact on breeding activities leading to breeding failure.



**Figure 22: Proposed lines and locations of Important Bird Areas (IBA's).**

The communal areas north of Rustenburg towards Pilanesberg have large populations of livestock, particularly donkeys, and carcasses of the latter are scavenged by the vultures. Pilanesberg IBA represents a large, well managed protected area that has extensive populations of waterbirds including Red Data species such as White-backed Night Heron, African Finfoot and Black Stork (Delta-Epsilon EIA,2010). It is also an important draw card for raptors, and has an active vulture restaurant. The relevant bird populations that have been reported by the South African Bird Atlas Project can be found below in Table 13.

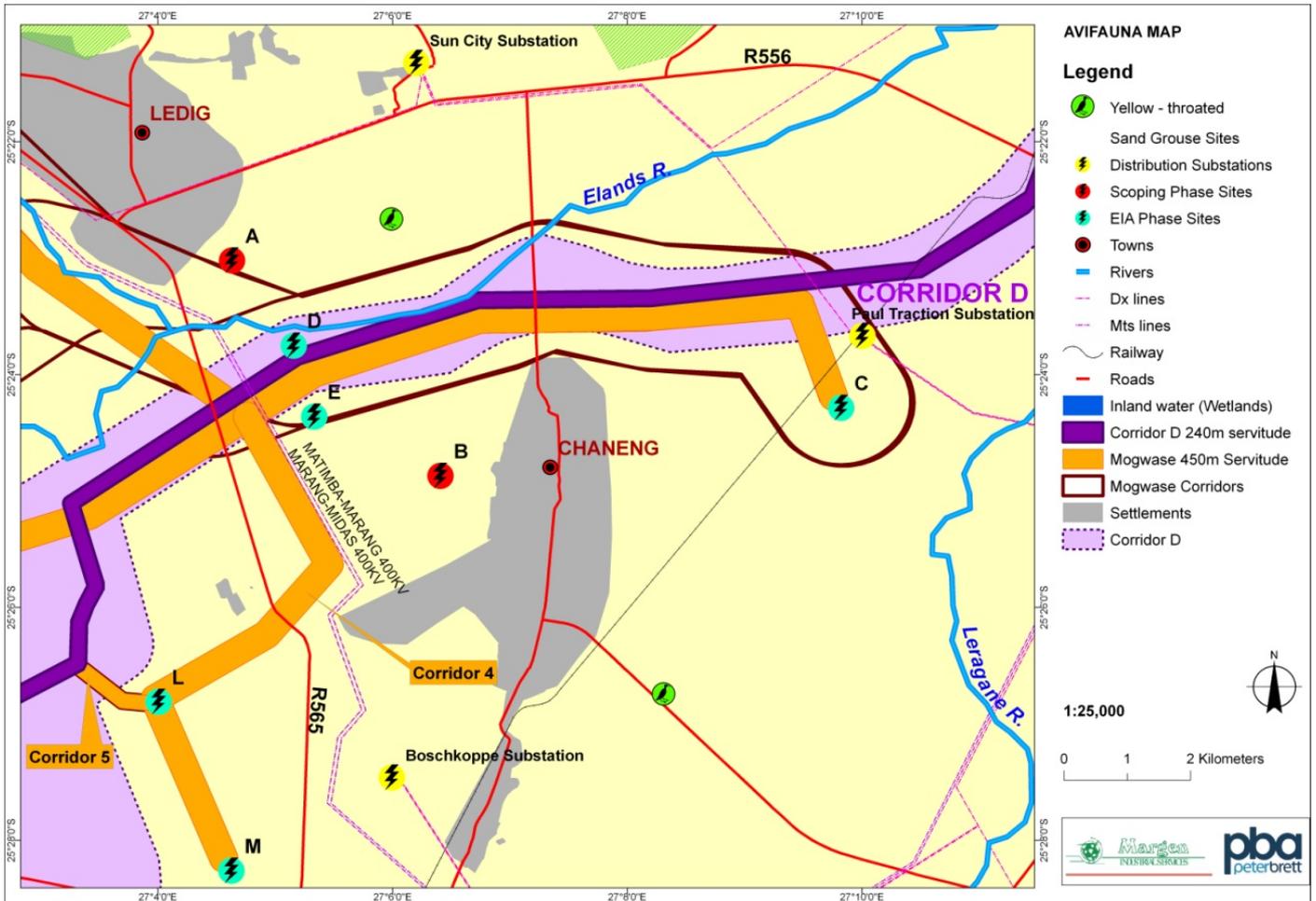
**Table 13: Red Data species report rates for the two quarter degree squares which cover the study area (Harrison *et al*, 1997)**

Total Cards		162		
Total Species		346		
Total Breeding Species		130		
Name	Conservation status	2527AC	Habitat	Likelihood of occurrence
White-backed Night-Heron	VU	1	Quiet tree-lined rivers and streams, mangroves; less commonly in reedbeds along rivers and in marshes	Unlikely
Cape Vulture (Griffon)	VU	22	Mostly mountainous country, or open country with inselbergs and escarpments; less commonly in savanna or desert	Likely
White-backed Vulture	VU	14	Savanna and bushveld	Likely
Lappet-faced Vulture	VU	1	Savanna to desert	Likely
Tawny Eagle	VU	3	Woodland and savanna to semi-arid savanna or grassland with scattered Acacia trees	Likely
Martial Eagle	VU	7	Woodland, savanna or grassland with clumps of large trees or power pylons for nest sites	Likely
African Marsh-Harrier	VU	1	Marsh, vlei, grassland (usually near water); may hunt over grassland, cultivated lands and open savanna	Unlikely
Lesser Kestrel	VU	1	Open grassveld, mainly on highveld, usually near towns or farms	Likely
Blue Crane	VU	3	Midland and highland grassveld, edge of karoo, cultivated land, edges of vleis	Unlikely
African Grass-Owl	VU	1	Long grass, usually near water, vleis, marshes	Possible
Black Stork	NT	2	Feeds in or around marshes, dams, rivers and estuaries; breeds in mountainous regions	Unlikely
Marabou Stork	NT	1	Open to semi-arid woodland, bushveld, fishing villages, rubbish tips, lake shores	Likely
Yellow-billed Stork	NT	12	Mainly inland waters; rivers, dams, pans, floodplains, marshes; less often estuaries	Unlikely
Greater Flamingo	NT	2	Large bodies of shallow water, both inland and coastal; saline and brackish waters preferred	Unlikely
Lesser Flamingo	NT	1	Larger brackish or saline inland and coastal waters	Unlikely
Secretarybird	NT	23	Semidesert, grassland, savanna, open woodland, farmland, mountain slopes	Likely
Lanner Falcon	NT	7	Mountains or open country from semidesert to woodland and agricultural land; also cities	Likely
Yellow-throated Sandgrouse	NT	1	Short-grass plains, usually not far from water; also recently burnt ground, cultivated fields, especially on black clay soils	Likely
Half-collared Kingfisher	NT	1	Fast-flowing perennial streams, rivers and estuaries, usually with dense marginal vegetation	Unlikely
Melodious (Latakoo) Lark	NT	4	Open climax grassland, especially Red Grass (Rooigras) <i>Themeda triandra</i> and species of <i>Eragrostis</i> and Russet Grass <i>Loudetia simplex</i> , sometimes with rocky outcrops, termite mounds or sparse bushes; also cultivated fields of Teff <i>Eragrostis tef</i> ; in KwaZulu-Natal at 550-1750 m elevation, rainfall 400-800 mm/year; moves into e Karoo after good rains.	Likely
Red-billed Oxpecker	NT	32	Savanna and bushveld	Likely
White Stork	Bonn	9	Highveld grasslands, mountain meadows, cultivated lands, marshes, karoo	Possible
Abdim's Stork	Bonn	4	Mainly highveld grassland; also semi-arid Kalahari (especially after rain), cultivated lands, inland waters	Possible

VU=Vulnerable; NT= Near Threatened; Bonn= Protected under the Bonn Convention

It was also discovered that a known location of the occurrence of the Yellow-throated Sandgrouse were found in the project area south of Chaneng (Figure 23). This bird is classified not a power line sensitive bird, it is classified as a Near Threatened species and therefore the

destruction of its habitat in the area would cause a concern. More locations were obtained but are all situated further west and outside the study area for this development.



**Figure 23: Yellow throated Sandgrouse Sites of Occurrence Map**

**Summary**

- Collisions and electrocutions, disturbance of breeding birds and destruction of habitat all impacts that power lines could have on birds.
- Collisions are seen as the biggest threat posed by transmission lines. Electrocutions are not seen as a problem because of the large size of the clearance between live components of the power lines making it virtually impossible for birds to bridge the air gap between the components
- Destruction and transformation of microhabitats could lead to an alteration of or reduction in suitable habitat that could lead to birds leaving an area.
- The construction process includes noise and an increase in human population and movement could also impact on breeding activities leading to breeding failure.
- The proposed development falls within two Important Bird Areas (IBAs), namely SA 023 Pilanesberg and SA 025 Magaliesberg and Witwatersrand areas.

## 6.7. BIODIVERSITY

(See Appendix 6 or the Biodiversity Report)

Of the seven major recognized biomes of South Africa, only the savanna and grassland biomes occur in the North West Province. Most of the Province (71%) including the study area falls within the Savannah Biome with its associated Bushveld vegetation. The remaining parts are grassland biome.<sup>31</sup>

The proposed substation sites are located within the 2527AC and 2526BD ¼ degree grid that is predominantly Zeerust Thornveld vegetation type, whilst the proposed corridors will in addition also traverse through the Gold Reef Mountain Bushveld vegetation type. According to SANBI database no threatened flora species are present within this grid. It is however also known that *Myrothamnus flabellifolia* (Resurrection plant, Data Deficient), *Searsia maricoana* (Vulnerable), *Aloe peglerae* (Red hot poker, Endangered) and the succulent herb *Frithia pulchra* (Fairy Elephant's foot, Rare) occurs in the region and regional vegetation types and is highly likely to be present within areas that are regarded suitable habitat for this species (Table 24). Protected trees species known to occur in the region of the study area include *Boscia albitrunca* (Shepard's Tree) and *Erythrophysa transvaalensis* (Transvaal Red Balloon).

The Gold Reef Mountain Bushveld occurs mostly on rocky hills and ridges that are often west-east facing slopes. The tree and shrub layers are typically continuous with a herbaceous layer dominated by grasses. The endemic succulent shrub *Aloe peglera* and the succulent herb *Frithia pulchra* are represented in this vegetation type. Some of the representative tree species include: *Cathium gilfilanii*, *Mystroxydon aeethiopicum*, *Acacia caffra*, *Protea Caffra*. The herbs include the *Helichrysum nudifolium*, *Pellaea calomelanos* and *Senecio venosus*. An extended list of the representative species is contained in the Biodiversity Report. The vegetation type is categorised at *least threatened* with approximately 22% of the 24% conservation target, conserved in the Rustenburg, Wonderboom and Suikerbosrand Nature Reserves.

Most of the Red Data faunal species known to occur in the region will most likely not occur in the project area because of the degraded status of parts of the project area. The extended list comprising of 45 Red Data faunal species can be viewed in the Biodiversity Report.

The following VEGMAP (Mucina & Rutherford, 2006) vegetation types will be affected by the proposed development:

- Gold Reef Mountain Bushveld; and
- Zeerust Thornveld.

Both these units form part of the Central Bushveld region, situated in the Savanna Biome. Most savanna has an herbaceous layer usually dominated by grass species and a discontinuous to sometimes very open tree layer. The woody component often forms an irregular series of interlocking, often low, canopies with openings and sometimes little distinction can be made between tall shrubs and small trees. 'Savanna grasslands' may grade into 'Tree savanna', 'Shrub savanna', 'Savanna woodland' or 'Savanna parkland'. Structure of the woody component of savanna is important to animals – for example tree height which determines the available browse, dense woody entanglements forming impenetrably barriers, availability of shade and protection against predators or scavengers, etc.

Floristically similar vegetation can be structurally different, but there is often an excellent correlation between vegetation patterns and soil types, with much floristic variation along rainfall gradients, even with similar substrates. Also, there are most often major differences in the herbaceous layer under canopies and areas between tree canopies; woody plants can serve as sites of protection for certain grass species. Soil nutrient enrichments and increase

soil organic matter is found underneath trees, especially large ones, due to various mechanisms including leaf litter, stem flow and throughfall of rain and N-fixation under leguminous trees. Thinning or even total removal of savanna trees is a common practice to counter the apparent suppression of herbaceous plants to improve grazing. In bottomland *Acacia* communities in the Pilanesberg Game Reserve, spatial analysis suggested competition among trees as a mechanism controlling their size and density.

### **Gold Reef Mountain Bushveld**

Original area (ha)	203,098ha
Remaining area	171,727ha (85%)
% Protected	22%
Threat Status	Least Threatened

This vegetation type is situated on rocky hills and ridges often west-east facing slopes associated with distinct florist differences (e.g. preponderance of *Acacia caffra* on the southern slopes). Tree cover elsewhere is variable. Tree and shrub layers are often continuous and the herbaceous layer is dominated by grasses. Some 22% is statutorily conserved mainly in the Rustenberg, Wonderboom and Suikerbosrand Nature Reserves. At least an additional 1% is conserved in other reserves, bringing the total conserved very close to target. About 15% is transformed mainly by cultivation and urban and built-up areas. Some areas with dense stands of the alien *Melia azedarach* (Seringa) but which is often associated with drainage lines or alluvia (i.e.azonal vegetation) embedded within this unit.

The endemic succulent shrub *Aloe peglerae* and the succulent herb *Frithia pulchra* are present in this vegetation type. The following species are regarded representative of the Gold Reef Mountain Bushveld vegetation type.

- **Small Trees**

*Acacia caffra* (Common hook-thorn), *Combretum molle* (Velvet Bushwillow), *Protea caffra* (Common sugarbush), *Celtis africana* (White stinkwood), *Dombeya rotundifolia* (Common wild pear), *Englerophytum magalismontanum* (Transvaal milkplum), *Ochna pretoriensis* (Mountain plane), *Searsia leptodictya* (Mountain karee), *Vangueria infausta* (Wild medlar), *V. parvifolia* and *Ziziphus mucronata* (Buffalo thorn).

- **Tall Shrubs**

*Canthium gilfillanii* (Velvet rock alder), *Ehretia rigida* (Puzzle bush), *Grewia occidentalis* (Cross berry), *Gymnosporia buxifolia* (Common spike-thorn) and *Mystroxydon aethiopicum* (Kooboberry).

- **Low Shrubs**

*Athrixia elata* (Daisy tea-bush), *Pearsonia cajanifolia*, *Searsia magalismontana* (Mountain karee) and *S. rigida* (Rock karee).

- **Woody Climber**

*Ancylobotrys capensis* (Dwarf wild apricot)

- **Graminoids**

*Loudetia simplex* (Common russet grass), *Panicum natalense* (Natal Panicum), *Schizachyrium sanguineum* (Red autumn grass), *Trachypogon spicatus* (Giant spear grass), *Alloteropsis semialata* (Black-seed grass), *Bewsia biflora* (False love grass), *Digitaria tricholaenoides* (Purple finger grass), *Diheteropogon amplexans* (Broad-leaved bluestem), *Sporobolus*

*pectinatus* (Fringed dropseed), *Tristachya leucothrix* (Hairy trident grass) and *T. biseriata* (Broom trident grass).

- **Herbs**

*Helichrysum nudifolium* (Hottentot's tea), *H. rugulosum*, *Pentanisia angustifolia* (Wild verbena), *Senecio venosus* and *Xerophyta retinervis* (Monkey's tail).

- **Geophytic Herbs**

*Cheilanthes hirta*, *Hypoxis hemerocallidea* and *Pellaea calomelanos*.

**Zeerust Thornveld;**

Original area (ha)	412,895ha
Remaining area	348,232ha (84%)
% Protected	3%
Threat Status	Least Threatened

Vegetation of the Zeerust Thornveld conform to deciduous, open to dense short thorny woodland, dominated by *Acacia* species with herbaceous layer of mainly grasses on deep, high base-status and some clay soils on plains and lowlands, also between rocky ridges. It extends along the plains of the Groot Marico and Mabaalstad area and the flats between Pilanesberg and the western end of the Magaliesberg. It holds the endemic and the shrub *Searsia maricoana*, which has a Vulnerable status. Only 3% of this unit is conserved in a number of reserves such as the Pienaar and Marico Bushveld Nature Reserves. Some 16% is transformed mainly by cultivation, with some urban or built-up areas. A few areas occur with scattered plants of the alien *Cereus jamacuru* (Queen of the night) and several other alien species occur scattered elsewhere.

The following species are regarded representative of this vegetation type:

- **Tall Trees**

*Acacia burkei* and *A. erioloba*.

- **Small Trees**

*Acacia mellifera* subsp. *detinens*, *A. nilotica*, *A. tortilis* subsp. *heteracantha*, *Searsia lancea*, *Acacia fleckii*, *Peltophorum africanum* and *Terminalia sericea*.

- **Tall Shrubs**

*Diospyros lycioides* subsp. *lycioides*, *Grewia flava* and *Mystroxyton aethiopicum* subsp. *burkeanum*.

- **Low Shrubs**

*Agathisanthemum bojeri*, *Chaetacanthus costatus*, *Clerodendrum ternatum*, *Indigofera filipes*, *Searsia grandidens*, *Sida chrysantha* and *Stylosanthes fruticosa*.

- **Graminoids**

*Eragrostis lehmanniana*, *Panicum maximum*, *Aristida congesta* and *Cymbopogon pospischilii*.

- **Herbs**

*Blepharis integrifolia*, *Chamaecrista absus*, *C. mimosoides*, *Cleome maculata*, *Dicoma anomala*, *Kyphocarpa angustifolia*, *Limeum viscosum* and *Lophiocarpus tenuissimus*.

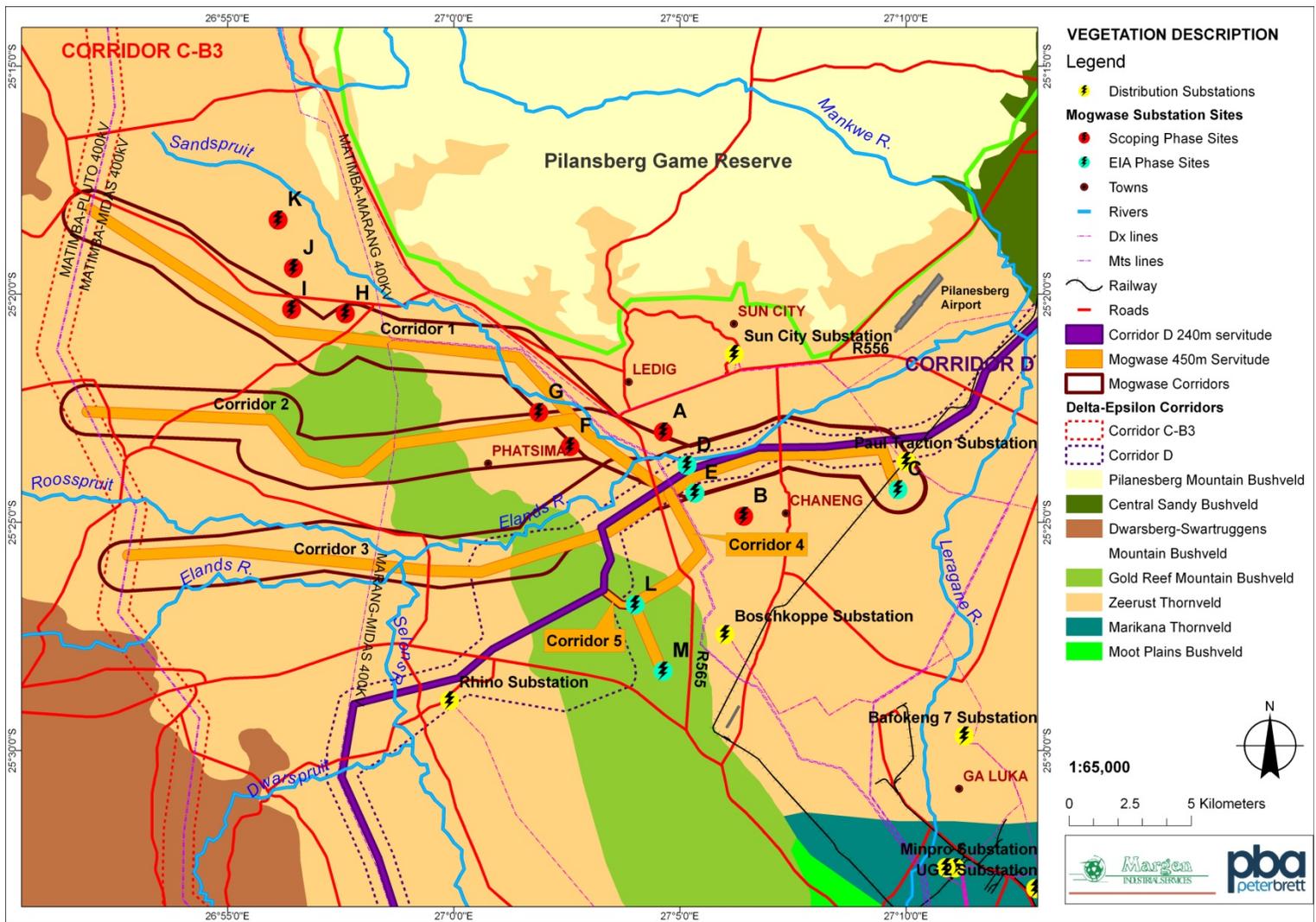


Figure 24: Vegetation Type Map

Due to cultivation, mining and residential developments, extensive areas of natural woodland have been transformed to cultivated fields, resulting in the presence of several settlements, numerous large and informal roads, agricultural areas; mining, extensive parts of the region are therefore regarded as degraded.

## **6.8. HERITAGE**

(See Appendix 6 for the Heritage Survey Report)

The survey area was localised by using several aerial images, maps and shape files were supplied by the client. The survey area is located on two 1:50 000 topographic maps, namely 2526BD and 2527AC. Several reports and other sources were consulted to compile a framework of known heritage sites in the region. Several local intellectuals and residents were consulted in terms of additional information and oral histories.

Cultural heritage remains consist of visible archaeological and historical artefacts (including graves and settlements of cultural significance. The National Heritage Resources Act (NHRA) (Act No. 25 of 1999) protects all archaeological remains, artificial features and structures older than 100 years and historic structures older than 60 years. According to this Act, no archaeological artefact, assemblage or settlement (site), graves or human remains may be moved or destroyed without the necessary approval from the South African Heritage Resources Agency (SAHRA).

Human remains (graves) older than 60 years are also protected by the above-mentioned Act and human remains less than 60 years are protected by the Human Tissue Act (Act No. 65 of 1983 as amended).

According to oral tradition the Bakgatla ba Kgafela separated from the Moseitlha at Momusweng near the Hammanskraal district around AD 1700. The Kgafela settled at various locales on their north-western journey towards the Crocodile (Odi) River and eventually arrived in the Pilanesberg area between AD 1700 and AD 1750. However, on their arrival in the region the Batlhako were already settled in the area and ruled the territory between the Crocodile River and Pilanesberg. Further to the south the Bafokeng ruled over the region north of Rustenburg with the northern border demarcated by the Elands River (south of the Pilanesberg). Another group that settled in the area is the Batlokwa, who lived more towards the south west of Pilanesberg Mountains. Access to Pilanesberg was controlled by positioning extensive settlements at the periphery of Pilanesberg near the entrance to these pathway-like valleys.

Stone-walled settlements situated on these peripheral locals are usually positioned on intermediary spurs, which provided a defendable vantage point to monitor and control the movement of people in and out of Pilanesberg. In addition, rivers exiting Pilanesberg have sufficiently slowed down to create extensive fertile floodplains for agricultural production. The movement and supervision of grazing cattle both inside and outside Pilanesberg were controlled by an extensive cattle outpost system.

A previous regional survey of the area revealed several Late Iron Age (Early Moloko) sites along the floodplain of the Elands River. At least two sites have been archaeologically investigated (i.e. excavations) and results indicate that they are highly significant, especially in terms of their research potential. Findings also suggest that other sites may possibly occur in the area.