

ADDENDUM TO  
ECOLOGICAL HABITAT SURVEY AND WETLAND  
ASSESSMENT:  
**WINTER SURVEY JUNE 2019**

**Proposed Lephalale Railway Yard and Borrow Areas, Lephalale, Limpopo  
Province, South Africa**



Dry season form of the widespread *Colotis antevippe*, Red Tip butterfly, at the site.  
Photo: R.F. Terblanche.

**June 2019**

**COMPILED BY:**

**Reinier F. Terblanche**

(M.Sc, *Cum Laude*; Pr.Sci.Nat, Reg. No. 400244/05)

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## I) SPECIALIST EXPERTISE

### SYNOPTIC CV: REINIER. F. TERBLANCHE

Reinier is an ecologist and in particular a habitat specialist with an exceptional combination of botanical and zoological expertise which he keeps fostering, updating and improving. He is busy with a PhD for which he registered at the Department of Conservation Ecology at the University of Stellenbosch in July 2013. Reinier's experience includes being a lecturer in ecology and zoology at the North West University, Potchefstroom Campus (1998-2008). Reinier collaborates with a number of institutes, organizations and universities on animal and plant research.

#### Qualifications:

Qualification	Main subject matter	University
<b>M.Sc Cum Laude, 1998:</b> Botany: Ecology	Quantitative study of invertebrate assemblages and plant assemblages of rangelands in grasslands.	North-West University, Potchefstroom
<b>B.Sc Honns Cum Laude, 1992</b> Botany: Taxonomy	Distinctions in all subjects: Plant Anatomy 75, Taxonomy 84, Modern Systematics 82, System Modelling 75, Plant Ecology 75, Taxonomy Project 77, Statistics Attendance Course.	North-West University, Potchefstroom
<b>B.Sc</b> Botany, Zoology	Main subjects: Botany, Zoology.	North-West University, Potchefstroom
<b>Higher Education Diploma, 1990</b>	Numerous subjects aimed at holistic training of teachers.	North-West University, Potchefstroom

In research Reinier specializes in conservation biology, threatened butterfly species, vegetation dynamics and ant assemblages at butterfly habitats as well as enhancing quantitative studies on butterflies of Africa. He has published extensively in the fields of taxonomy, biogeography and ecology in popular journals, peer-reviewed scientific journals and as co-author and co-editor of books (see 10 examples beneath).

Reinier practices as an ecological consultant and has been registered as a Professional Natural Scientist by SACNASP since 2005: Reg. No. 400244/05. His experience in consultation includes: Flora and fauna habitat surveys, Threatened species assessments, Riparian vegetation index surveys, Compilation of Ecological Management Plans, Biodiversity Action Plans and Status quo of biodiversity for Environmental Management Frameworks, Wetland Assessments, Management of Rare Wetland Species.

Recent activities/ awards: Best Poster Award at Oppenheimer De Beers Group Research Conference 2015, Johannesburg. One of the co-authors of Guidelines for Standardised Global Butterfly Monitoring, 2015, Group on Earth Observations Biodiversity Observation Network, Leipzig, Germany (UNEP-WCMC), GEO BON Technical Series 1. Most recent award: Awarded the prestigious Torben Larsen Memorial Tankard in October 2017; one is awarded annually to the person responsible for the most outstanding written account on Afrotropical Lepidoptera. Lectured as Conservationist-in-Residence in the Wildlife Conservation Programme of the African Leadership University, Kigali, Rwanda 9-23 February 2019.

## EXPERIENCE

Lecturer: Zoology 1998-2008	Main subject matter and level	Organization
<b>Lectured subjects</b>	- 3 <sup>rd</sup> year level Ecology, Plantparasitology - 2 <sup>nd</sup> year level Ethology - <u>Master's degree</u> Evolutionary Ethology, Systematics in Practice, Morphology and Taxonomy of Insect Pests, Wetlands.	North-West University, Potchefstroom and University of South Africa
<b>Co-promoter</b>	PhD: Edge, D.A. 2005. Ecological factors that influence the survival of the Brenton Blue butterfly	North-West University, Potchefstroom
<b>Study leader/ assistant study leader</b>	Six MSc students, One BSc Honn student: Various quantitative biodiversity studies.	North-West University, Potchefstroom
<b>Teacher 1994-1998</b>	Biology and Science, Secondary School	Afrikaans Hoër Seunskool, Pretoria
<b>Owned Anthene Ecological CC 2008 – present</b>	- Flora and Fauna habitat surveys - Highly specialized ecological surveys - Riparian vegetation index surveys - Ecological Management Plans - Biodiversity Action Plans - Biodiversity section of Environmental Management Frameworks - Wetland assessments	Private Closed Corporation that has been subcontracted by many companies
<b>Herbarium assistant 1988-1991</b>	- Part-time assistant at the A.P. Goossens herbarium, Botany Department, North-West University, 1988, 1989, 1990 and 1991 (as a student).	North-West University, Potchefstroom

## 10 EXAMPLES OF PUBLICATIONS OF WHICH R.F. TERBLANCHE IS AUTHOR/ CO-AUTHOR

(Three books, two chapters in books and five articles are listed here as examples)

- HENNING, G.A., **TERBLANCHE, R.F.** & BALL, J.B. (eds) **2009**. *South African Red Data Book: butterflies*. SANBI Biodiversity Series 13. South African National Biodiversity Institute, Pretoria. 158p. ISBN 978-1-919976-51-8
- MECENERO, S., BALL, J.B., EDGE, D.A., HAMER, M.L., HENNING, G.A., KRÜGER, M., PRINGLE, E.L., **TERBLANCHE, R.F.** & WILLIAMS, M.C. (eds). 2013. *Conservation Assessment of Butterflies of South Africa, Lesotho and Swaziland: Red List and atlas*. Saffronics (Pty) Ltd., Johannesburg & Animal Demography Unit, Cape Town.
- VAN SWAAY, C., REGAN, E., LING, M., BOZHINOVSKA, E., FERNANDEZ, M., MARINI-FILHO, O.J., HUERTAS, B., PHON, C.-K., KÓRÓSI, A., MEERMAN, J., PE'ER, G., UEHARA-PRADO, M., SÁFIÁN, S., SAM, L., SHUEY, J., TARON, D., **TERBLANCHE, R.F.** & UNDERHILL, L. 2015. Guidelines for Standardised Global Butterfly Monitoring. Group on Earth Observations Biodiversity Observation Network, Leipzig, Germany. GEO BON Technical Series 1.
- TERBLANCHE, R.F.** & HENNING, G.A. **2009**. *A framework for conservation management of South African butterflies in practice*. In: Henning, G.A., Terblanche, R.F. & Ball, J.B. (eds). *South African Red Data Book: Butterflies*. SANBI Biodiversity Series 13. South African National Biodiversity Institute, Pretoria. p. 68 – 71.
- EDGE, D.A., **TERBLANCHE, R.F.**, HENNING, G.A., MECENERO, S. & NAVARRO, R.A. 2013. Butterfly conservation in southern Africa: Analysis of the Red List and threats. In: Mecenero, S., Ball, J.B., Edge, D.A., Hamer, M.L., Henning, G.A., Krüger, M., Pringle, E.L., Terblanche, R.F. & Williams, M.C. (eds). *Conservation Assessment of Butterflies of South Africa, Lesotho and Swaziland: Red List and Atlas*. pp. 13-33. Saffronics (Pty) Ltd., Johannesburg & Animal Demography Unit, Cape Town.
- TERBLANCHE, R.F.**, SMITH, G.F. & THEUNISSEN, J.D. **1993**. Did Scott typify names in *Haworthia* (Asphodelaceae: Alooideae)? *Taxon* **42**(1): 91–95. (International Journal of Plant Taxonomy).
- TERBLANCHE, R.F.**, MORGENTHAL, T.L. & CILLIERS, S.S. **2003**. The vegetation of three localities of the threatened butterfly species *Chrysochrysis aureus* (Lepidoptera: Lycaenidae). *Koedoe* **46**(1): 73-90.
- EDGE, D.A., CILLIERS, S.S. & **TERBLANCHE, R.F.** **2008**. Vegetation associated with the occurrence of the Brenton blue butterfly. *South African Journal of Science* **104**: 505 - 510.
- GARDINER, A.J. & **TERBLANCHE, R.F.** **2010**. Taxonomy, biology, biogeography, evolution and conservation of the genus *Eriksonia* Trimen (Lepidoptera: Lycaenidae) *African Entomology* **18**(1): 171-191.
- TERBLANCHE, R.F.** 2016. *Acraea trimeni* Aurivillius, [1899], *Acraea stenobea* Wallengren, 1860 and *Acraea neobule* Doubleday, [1847] on host-plant *Adenia repanda* (Burch.) Engl. at Tswalu Kalahari Reserve, South Africa. *Metamorphosis* **27**: 92-102.

\* A detailed CV with more complete publication list is available.

## II) SPECIALIST DECLARATION

I, Reinier F. Terblanche, as the appointed independent specialist, in terms of the 2014 EIA Regulations (as amended), hereby declare that I:

- I act as the independent specialist in this application;
- I perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 (as amended) and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Name of Specialist: Reinier F. Terblanche



Signature of the specialist

Date: 14 June 2019

# 1 INTRODUCTION

A winter ecological survey is required for the proposed Lephalale Railway Yard and two proposed Borrow Areas, 30 km west-southwest of Lephalale in the Limpopo Province, South Africa. This document serves as an addendum to earlier surveys and reports at the site. Survey focused on the possibility that threatened fauna and flora known to occur in the Limpopo Province are likely to occur within the proposed development or not. Other species which are not listed as threatened or near threatened but which are of known particular conservation concern also received attention in the survey.

## 1.1 OBJECTIVES OF THE HABITAT STUDY

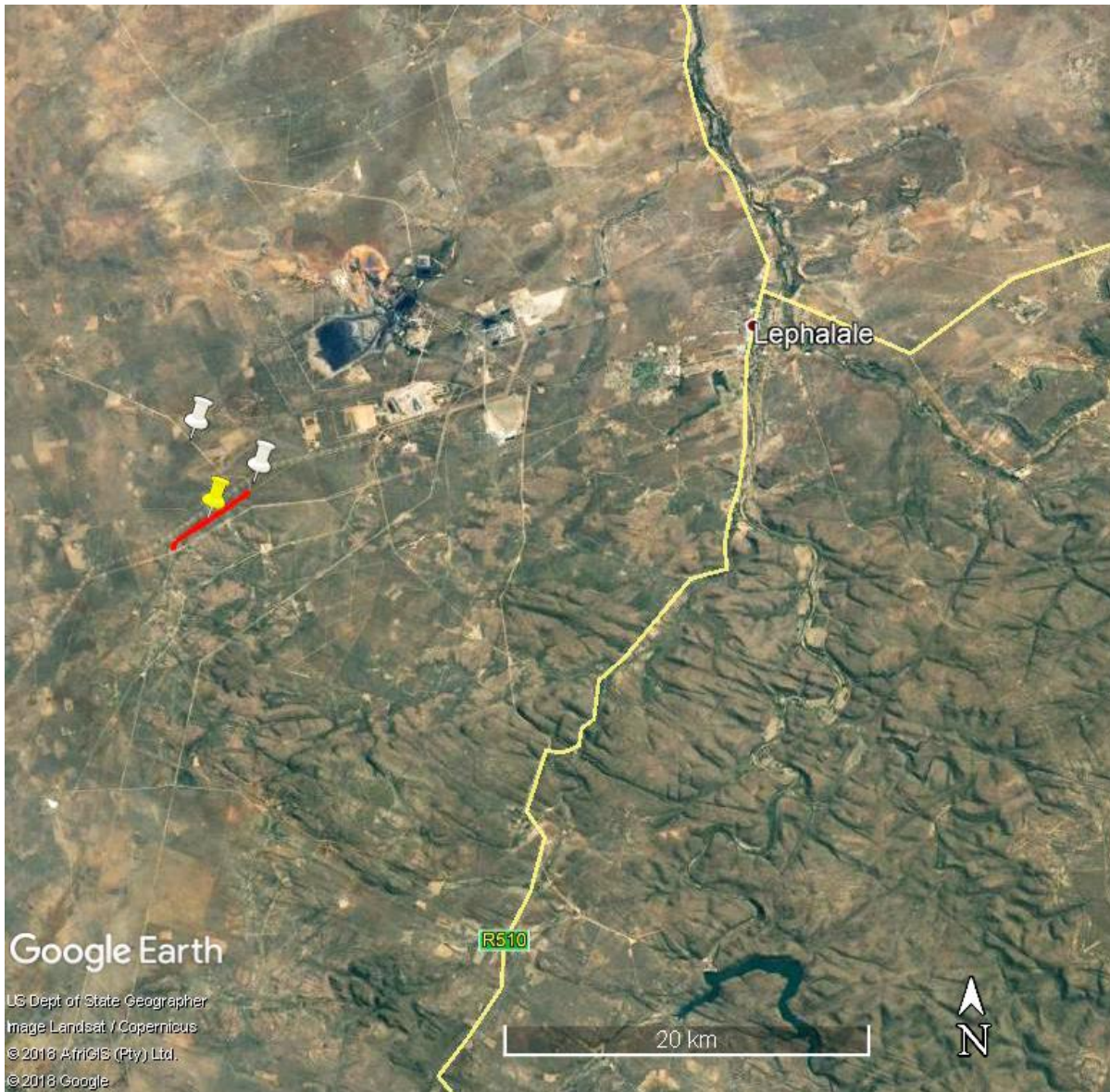
The objectives of the habitat study are to provide:

- A detailed fauna and flora habitat survey;
- A detailed habitat survey of possible threatened or localised plant species, vertebrates and invertebrates;
- Recording of possible host plants (=foodplants) of fauna such as butterflies.
- Evaluate the conservation importance and significance of the site with special emphasis on the current status of threatened species;
- Literature investigation of possible species that may occur on site;
- Make recommendations that could lead to reducing or minimising impacts, in application process for developments.

## 1.2 SCOPE OF STUDY

- A survey consisting of visits to investigate key elements of habitats on the site, relevant to the conservation of fauna and flora.
- Recording of any sightings and/or evidence of existing fauna and flora.
- The selective and careful collecting of voucher specimens of invertebrates where deemed necessary.
- An evaluation of the conservation importance and significance of the site with special emphasis on the current status of threatened species.
- Recording of possible host plants or foodplants of fauna such as butterflies.
- Literature investigation of possible species that might occur on site.
- Integration of the literature investigation and field observations to identify potential ecological impacts that could occur as a result of the development.
- Integration of literature investigation and field observations to make recommendations to reduce or minimise impacts or enhance further surveys towards applications for developments.

## 2 STUDY AREA



**Figure 1** Map with an indication of the location of the site.

Map information were analysed and depicted on Google images with the aid of Google Earth Pro (US Dept. of State Geographer, MapLink/ Tele Atlas, Google, 2019).

Site is 30 km west-southwest of Lephalale in the Limpopo Province, South Africa. Outlines of the vegetation types at the site are given in earlier reports.



### **3 METHODS**

A desktop study comprised not only an initial phase, but also it was used throughout the study to accommodate and integrate all the data that become available during the field observations.

Surveys by R.F. Terblanche took place from 9-12 June 2019 at the site and also surrounding areas to note key elements of habitats on the site, relevant to the conservation of fauna and flora. The main purpose of the site visits was ultimately to serve as a habitat survey that concentrated on the possible presence or not of species of particular conservation concern as well as ecosystems of particular conservation concern.

More detail about the methods are such as outlined in two earlier reports about the same site of which this report is an addendum. Main literature sources which were used are given in the references section of this report.

## **4 RESULTS AND DISCUSSION**

### **Ecosystem considerations in winter**

A mosaic of dry grass, evergreen trees, deciduous trees and herbaceous plant species is a striking feature in the winter at the site. Some of the deciduous trees take longer to shed their leaves which adds to the diversity of microclimates of the savanna vegetation. Certain herbaceous plant species flower in the winter. While the vegetation has been impacted by development in the past at the present railway line, railway reserve and hitherto excavated areas, the bushveld vegetation still supports for example activity of a number of invertebrate species. In the winter ecologically disturbed areas could also be at its most vulnerable especially where clearings took place. Other aspects of the vegetation at the site noted in earlier reports have been confirmed with the winter surveys.

Non-perennial streams and wetlands at the site were dried up during the June 2019 survey. This confirms that attenuation of water at the site is dependent on rainfall events. Other aspects noted in earlier reports about the small pans and non-perennial drainage have been confirmed in the winter survey.

An ecological aspect of concern which was perhaps more visible in the winter is erosion adjacent to the railway line. If the development is approved at the site, gradients of slopes and stormwater regulation at and adjacent to the railway infrastructure should be carefully planned especially because rainstorms in summer could result in flash-flood situations.

### **Connectivity**

Vegetation becomes more open in the savanna at the site during winter. Considering this decrease in ground cover and crown cover in winter could result in more pressure for corridors such as drainage lines and stepping stone corridors such as small pans (or their alternatives) to support vegetation and fauna at the site.

## **Species of particular conservation concern**

Winter surveys at the site confirmed the findings of the earlier surveys in terms of plant and animal species of particular conservation concern at the site.

Most conspicuous protected tree species at the site has been confirmed to be *Sclerocarya birrea* (Marula). Small individuals of *Sclerocarya birrea* (Marula) are found adjacent to the present railway line. The scope for planting some of these Marula trees at the site therefore appears to be ideal even in disturbed areas. Marking of these *Sclerocarya birrea* (Marula) trees in late winter would be difficult because many could have shed their leaves by then. A protected tree species such as *Boscia albitrunca* (Shepherd's Tree) could be marked throughout the winter because the foliage leaves are normally retained in winter.



**Photo 1** View of part of the site in a western direction in winter.  
Photo: R.F. Terblanche



**Photo 2** Savanna vegetation in winter along road south of present railway line at the site.  
Photo: R.F. Terblanche



**Photo 3** Visible erosion at banks next to the present railway line at the site.  
Photo: R.F. Terblanche



**Photo 4** Small Pan 2, which had dried up during June 2019.  
Photo: R.F. Terblanche



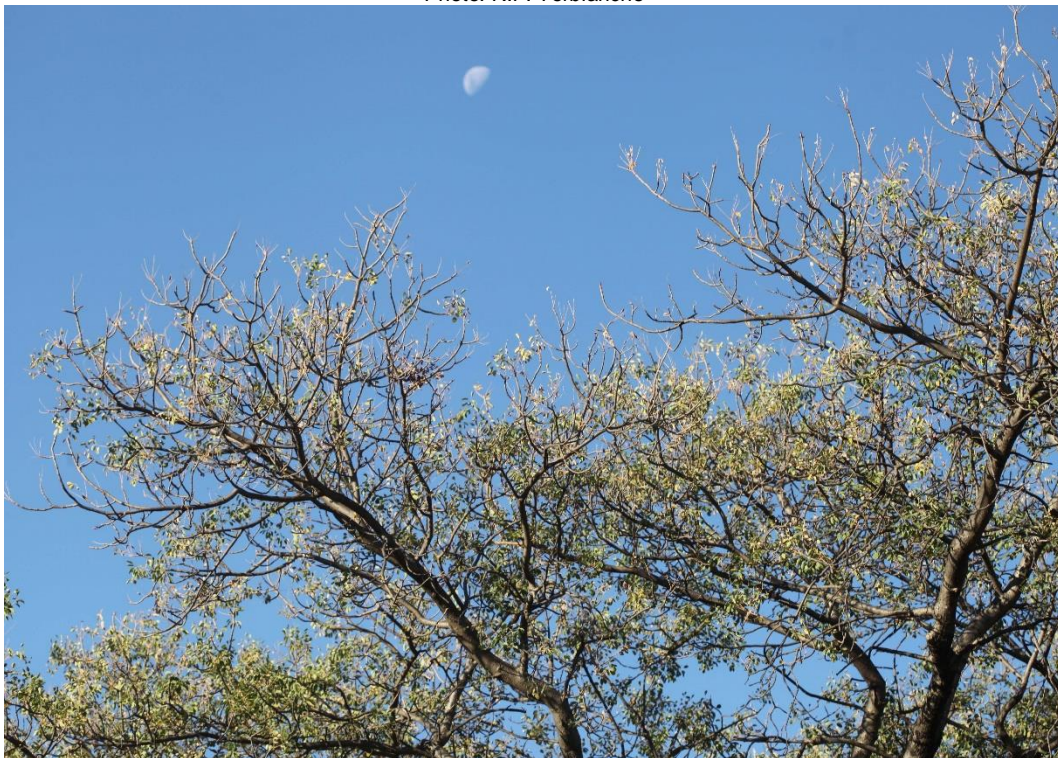
**Photo 5** Hitherto cleared strip through savanna at proposed Borrow Area 1.  
Photo: R.F. Terblanche



**Photo 6** Dry *Eragrostis pallens* grass in winter at Borrow Area 1.  
Photo: R.F. Terblanche



**Photo 7** Savanna which contains prominent *Sclerocarya birrea* (Marula Tree) at proposed Borrow Area 2.  
Photo: R.F. Terblanche



**Photo 8** Partial loss of leaves of *Sclerocarya birrea* (Marula Tree) in winter at proposed Borrow Area 2.  
Photo R.F Terblanche



**Photo 9** *Boscia foetida* subsp. *rehmanniana* (Smelly Shepherds Tree) in winter at the site.  
Photo: R.F. Terblanche





**Photo 10** Streamcrossing No 1 at the site in winter.  
Photo: R.F. Terblanche



**Photo 11** Dry season form of the widespread *Colotis antevippe*, Red Tip butterfly, at the site.  
Photo: R.F. Terblanche.

## 5 CONCLUSION

- A mosaic of dry grass, evergreen trees, deciduous trees and herbaceous plant species is a striking feature in the winter at the site. While the vegetation has been impacted at a number of areas at the site the bushveld vegetation still supports for example activity of a number of invertebrate species (some of which even has winter forms; see Photo 11).
- In the winter ecologically disturbed areas could also be at its most vulnerable especially where clearings took place in the past.
- Non-perennial streams and wetlands at the site were dried up during the June 2019 survey. This confirms that attenuation of water at the site is dependent on rainfall events. Other aspects noted in earlier reports about the small pans and non-perennial drainage have been confirmed in the winter survey.
- An ecological aspect of concern which was perhaps more visible in the winter is erosion adjacent to the railway line. If the development is approved at the site, gradients of slopes and stormwater regulation at and adjacent to the railway infrastructure should be carefully planned especially because rainstorms in summer could result in flash-flood situations.
- Decrease in ground cover and crown cover in winter could result on more pressure on corridors such as drainage lines and stepping stone corridors such as small pans (or their alternatives) at the site, which emphasises their importance.
- Winter surveys at the site confirmed the findings of the earlier surveys in terms of plant and animal species of particular conservation concern at the site.
- Most conspicuous protected tree species at the site has been confirmed to be *Sclerocarya birrea* (Marula). Small individuals of *Sclerocarya birrea* (Marula) are found adjacent to the present railway line. The scope for planting some of these trees at the site therefore appears to be ideal even in disturbed areas. Marking of these *Sclerocarya birrea* (Marula) trees in late winter would be difficult because many could have shed their leaves by then. A protected tree species such as *Boscia albitrunca* (Shepherd's Tree) could be marked throughout the winter because the leaves are normally retained in winter.
- Overall the winter survey confirmed the outcomes of the earlier surveys. Results of the winter survey emphasize the importance of conservation corridors, erosion control and indigenous savanna vegetation for the sake of conservation of indigenous heritage in the larger area.

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