Systematic regional survey and settlement patterns of the archaeological sites in the Maremani Nature Reserve, northern Limpopo Province

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Declaration

Declaration

I, Nicholas Fletcher, declare that this dissertation is my own original work. Where secondary material is used, this has been properly acknowledged and referenced in accordance with university requirements. This work has not been submitted before, in whole or in part, for any other degree or examination.

Signature:

Date: August 2021

Abstract

The study was based within the confines of Maremani Nature Reserve which is situated in the Northern Limpopo province of South Africa. The focus of the research was on settlement patterns of Middle Iron Age communities between 1200-1300 AD and how these patterns relate to varying environmental variables. The study area is situated approximately 85 km east of Mapungubwe and therefore provides insight on regional variability between the Mapungubwe heartland and its larger hinterland. The paper contextualizes previous site-based studies within regional settlement pattern changes through time. It provides insight into hinterland communities and the type of regional settlement patterns they leave on the landscape. A multiscalar regional survey methodology was used to provide an analytical framework for interpreting spatial data thereby providing a clearer view on the organisation of complex societies within the greater Mapungubwe landscape.

Acknowledgments

To my supervisor Dr Alexander Antonites I would like to say thank you for everything you have taught me over the years, the experiences we have shared and the memories I have gained. I will never forget how much you have done for me.

Thank you to the Aage V. Jensen Charity Foundation for allowing the research to take place within Maremani Nature Reserve.

To my parents Henk and Suzette Fletcher and brother Jack Fletcher thank you for all your support and encouragement over the years it has always meant a lot to me.

To Lara Kraljevic´thank you for all your help with my project over the years, you have supported me and encouraged me till the end and I will always be grateful. Out of all my memories I have gained during my studies it is the ones with you that I will cherish the most.

Table of Contents

List of Figures

List of Tables

Chapter 1 - Introduction

Mapungubwe (1200-1300AD), located in the Shashe-Limpopo Confluence Area (SLCA), is widely regarded as one of southern Africa's earliest complex society characterised by marked social stratification and the establishment of sacred leadership (Huffman 2000). As a result, much research has been devoted to the Shashe–Confluence area itself as a central node in the development of regional complexity. Beyond this area though, minimal regional archaeological research has been conducted.

This study will focus on a particular landscape downriver from the SLCA - located within Maremani Nature Reserve. The study presents the results of archaeological surveys caried out between 2004 and 2018. In total, 202 archaeological sites were identified. While all sites identified will be presented, regardless of time period with the primary focus on the Middle Iron Age period (AD 900-1300) sites, with the aim to identify the (inter-)relationships between communities, their environments and the larger Mapungubwe world.

This research is based on the premise that the manner in which people have used or altered the landscape reflect patterned social behaviour (Harmansah 2014, David and Thomas 2008:41). This behaviour is influenced practical requirements such as the availability of food and water among other thing and a variety of social, political and economic factors. This study combines a regional and site-specific surveys with spatial analysis with the aim of capturing a more holistic view on settlement patterns relating and how these relate to environmental variables over through time.

This will be done by using Geographical Information Systems (GIS) to combine environmental datasets along with archaeological site and artifact data obtained through surveys and excavations. The GIS analysis will seek to establish site densities and identify how environmental variables shape settlement patterns. This project is significant because it is one of the first Iron Age archaeological studies within the Northern Limpopo to analysis multiple environmental variables (vegetation, land types, geology, soils and water systems) in relation to settlement pattern variations over space and time providing a foundation for future comparative studies within the region.

1.2 Problem statement

Recent work has shown that the social, political and economic organisation of Mapungubwe hinterlands differed from that of Mapungubwe core in the confluence area (Antonites 2012). As a result, settlement patterns established for the core, cannot be uncritically extrapolated to other areas. As of yet there has been no published regional study outside of the SLCA to test settlement pattern variability between the Mapungubwe heartland and its hinterlands. This study area is situated 80km east of Mapungubwe and will provide a platform for comparison of settlement patterns in the hinterland to that of the heartland.

1.2.1 Aims and objectives

- Identify and classify all Iron Age sites in the study area into a relative chronology using extant ceramic sequence (cf. Huffman 2007).
- Identify settlement pattern variations over time and their relation to environmental variables.
- Using spatial distribution of sites, explore and identify settlement patterns of Mapungubwe communities in the Maremani Nature Reserve.
- Identify niche environments suitable for farming crops and rearing livestock within a semi-arid environment.
- Identify possible vulnerabilities, resilience strategies and adaptations of communities within the surrounding landscape.

Chapter 2 – Research Area

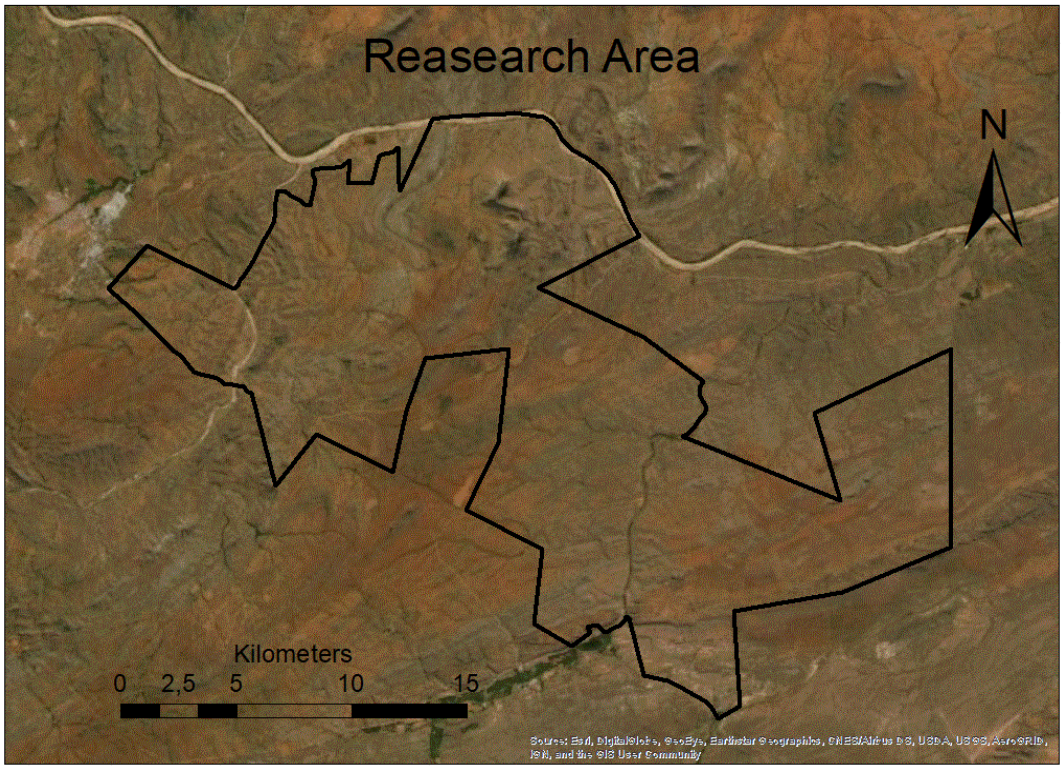

Figure 2-1 research area

The research area is located within the confines of Maremani Nature Reserve, the reserve is rich in biodiversity while the geology is comprised of a vast array of different lithologies. The research area was chosen due to the high resolutions data obtained through previous environmental and archaeological studies. This high resolution data was necessary to adequately explore the relationships between settlement patterns and the environment and how this changes through time.

Maremani Nature Reserve is located in the Limpopo province of South Africa, 80km east of Musina with the reserve covering approximately 41000 ha. The reserve was established in 1999 as and nature conservation project funded by the Aage V. Jensen Charity Foundation.

2.1 Previous research

Several scientific studies have taken place within the confines of what is now Maremani Nature Reserve, some of which are still ongoing. These include geological (Barton 2006, Brandl 1981, Horroks 1981, Sohnge et al 1948), ecological (Joubert

2002), and archaeological research (Antonites and Ashley 2016, Eastwood 1990, Kruger 2004).

The first archaeological work in Maremani was performed by Prinsloo, unfortunately the data gathered during his research is no longer available and was never published (Antonites; pers comm). In 1990 Eastwood was contracted in to compile a database of all the rock art in the southern part of the reserve and in 2004 Kruger preformed a survey of the south eastern parts of the reserve for his uncompleted MA project. He excavated two 19th century sites with students and staff of the University of South Africa. The results are forthcoming. In 2014, Antonites and Ashley initiated an ongoing long-term research project on the Mapungubwe period sites in the reserve.

2.2 Natural Environment

Maremani Nature Reserve is considered a semi-arid enviroment.as the mean annual rainfall for the area is approximately 340 mm (van Rooyen 2002) The driest months are from June through August and the rainy season from October through to March. Approximately 85% of the mean annual rainfall occurs during the rainy season. The mean annual temperature is 23.4°Cwhile the mean daily minimum and maximum temperatures in December are 21.1°C and 32.3°C and for July 10.6°C and 26.6 °C. Extreme maximum of 43.8°C for the summer and extreme minimum 2.7°C in the winter has been recorded and the entire area is frost free (van Rooyen 2002). The landscape is characterised by plains, rocky outcrops, undulating and gravelly hills, high mountain ranges, rivers and streams. The altitude varies 427m at the Limpopo River to 833m at the summit of Mount Dowe.

There are three drainage systems within the reserve, the main being the Limpopo River, and the other two, the Sand and Nzhelele systems. The Nzhelele River is younger than the former two rivers, however it is a valuable water source within the region (Barton 2006).

On a regional scale, the park falls within Mopane Bushveld vegetation type, with pockets of acacia trees and large baobabs (Low and Rebelo 1998). However, within this broad classification, ecologists have identified 17 different distinct plant communities within the reserve (see Appendix A). These plant communities vary along factors of topography, drainage, geology, rockiness, slope, soil texture and depth, and the presence of calcrete and previous land use (Ekotrust CC 2002). These

plant communities are grouped together into six main vegetation types that will be discussed later (p. 12).

2.2.1 Land types

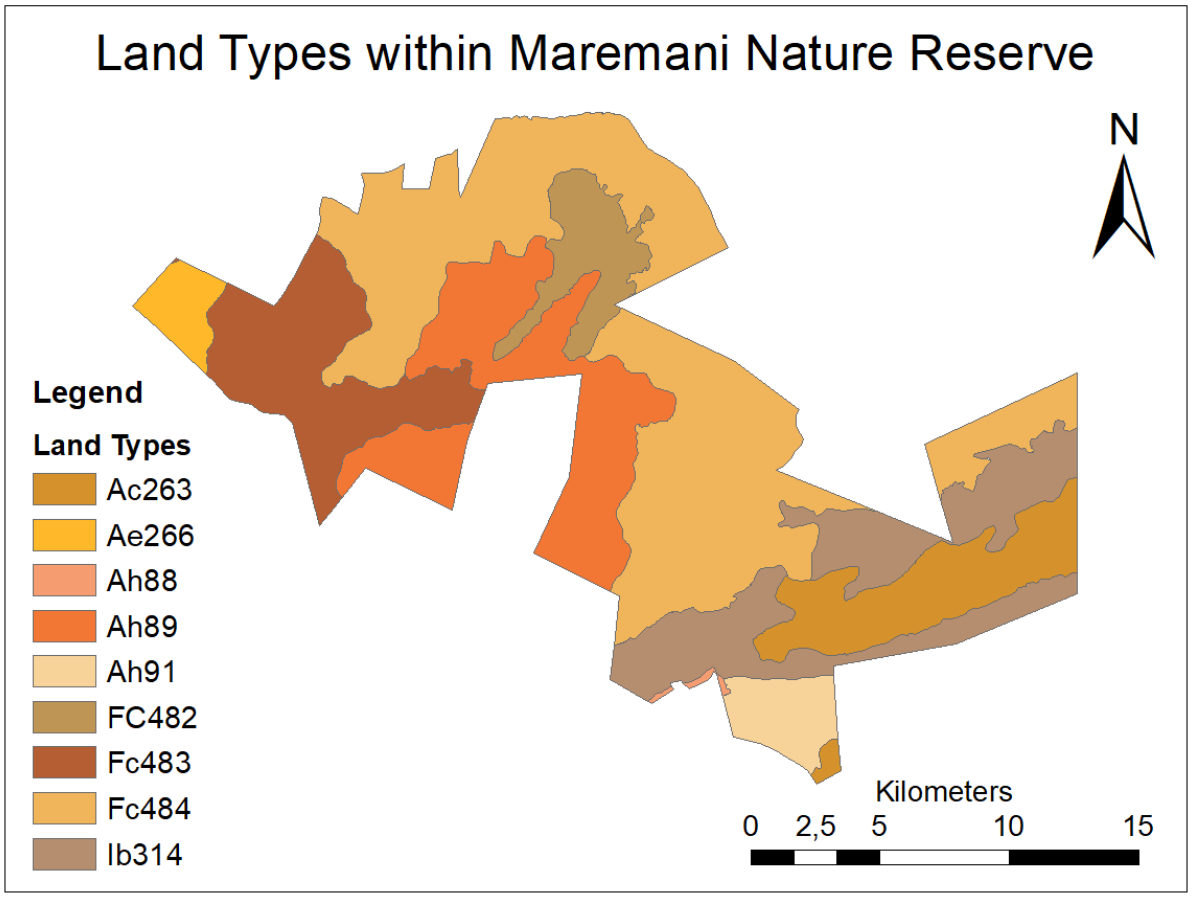

Figure 2-2: Land types within Maremani Nature Reserve

There are nine variations of land types and five soil types that have types that been identified and described on Maremani Nature Reserve. They are Land types **Ib**314, **Ah**88, **Ah**89, **Ah**91**, Fc**482, **Fc**483, **Fc**484, **Ae**265 and **Ae**266.

- The **Ib**314 land type can be found in the hilly areas in the north of the reserve and consists of rocky areas with miscellaneous soils comprised of gneiss and quartzite.
- The **Ah**88 land type is comprised of dolerite and has reddish sandy clay loam soils, with a high clay content.
- The **Ah**89 land type is comprised of gneiss and its soils can be seen as sandy loam to reddish loamy sand.

- The **Ah91** land type is comprised of shale with red and yellow loamy sand, mudstone and silt stone with a clay content of less than 15%.
- The **Ae**265 land type is comprised of basalt and has reddish sandy loam to sandy clay loam soils that are generally deeper than 300mm, while **Ae**266 also contains soils derived from gneiss identified by reddish sandy loam soils
- There are three Fc land types (**Fc**482, **Fc**483, **Fc**484) each of which contain calcrete and calcareous soils. The **Fc**482 land type is comprised of calc-silicate, quartzite and sandstone with loamy sand, and the **Fc**483 land types geology is comprised of gneiss and has sandy loam soils, while the
- **Fc**484 land type is comprised of quartzite and gneiss and has loam sandy soils

2.2.2 Soil types

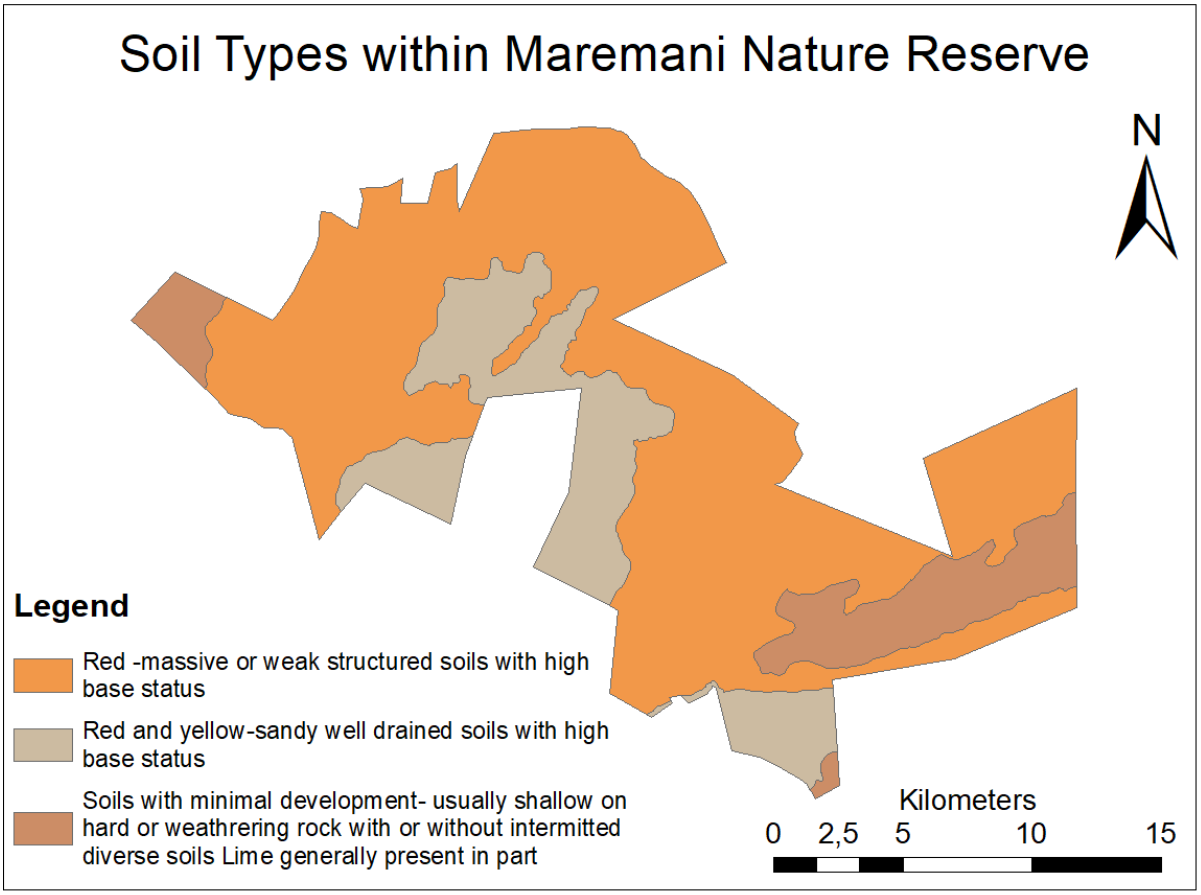

Figure 2-3: soil types within Maremani Nature Reserve

These soil types have been divided into three main structures

(A) Red and yellow sandy well drained soils with high base status

(B) Red massive or weak structured soils with high base status

(C) Soils with minimal development usually shallow on hard weathering rock with, or without, intermitted diverse soils with lime generally present in part

Soil types are related to their positions within land types and their underlying geology. Soils comprised of mudstone, dolerite, basalt, shale and siltstone have a higher nutrient content, and clay content allowing for a greater water holding capacity while soils consisting of sandstone, quartzite and gneiss are generally bleached and have a lower nutrient content. The flood plains along the Limpopo, Nzhelele Rivers along with smaller streams all contain silty and clayey alluvial soils along with the wetland surrounding the Mutanga River on the farm Solitude in the southern part of the Reserve.

Rocks and Mispah soils on crests, scarps and midslopes

This soil group occurs on the crests of all landtypes and on the scarp of Ib314 and the midslopes of Fc483, Fc 484 And Ib314. Mispah soils cover approximately 32% while rocks cover 26% of the study area. Mispah soils are very shallow with a medium to course loamy sand to sandy loam texture and are mostly non- calcareous with a low clay and moisture content and little vegetation cover. Resulting in a low carrying capacity and regeneration potential.

Hutton soils on foot slopes and midslopes

These are found on the lower slopes of land type Ae266 and mid-slopes of Ah89 in the study area and covers approximately 25% of the study area. These soils are shallow and have a medium to course loamy sand to sandy loam texture and are generally non – calcareous with a low clay and moisture content. This results in a low carrying capacity and regeneration potential.

Oakleaf soils in valley bottoms

This soil type represents 13% of the study area and occurs in 65% of valley bottoms. In addition to Oakleaf soils, valley bottoms also contain Clovelly, Hutton and Bainsley soils in small isolated pockets which represent 9% of the study area.

Soils in valley bottoms are generally deeper with a range of texture classes and clay contents. These have been divided into four groups: the first group can be found on land type Ae266 and has a low clay content of 2-6% and 2-8%. The second group can be

found on landtypes Fc483 and Fc484 and has a slightly higher clay content of between 6-15% and 8-20%. The resulting texture is a fine to medium loamy sand to sandy loam. The third group occurs on Land types Ae266, Ah89 and Ib314 and has a higher clay content that the previous group with a range of 10-20% and 15-25%the texture is a medium sandy clay loam. The fourth group has the highest clay content with 15-25% and 20-30%, with a medium sandy clay loam texture. Not all valley bottoms have the same vegetation most likely a result of clay percentage variations. Valley bottoms are preferred by game as vegetation are generally more palatable.

Stream beds

Stream beds account for 2,2 percent of the study area and are found within every land type. It represents 17% of valley bottoms lacks soils and has with no vegetation coverage.

2.2.3 Vegetation

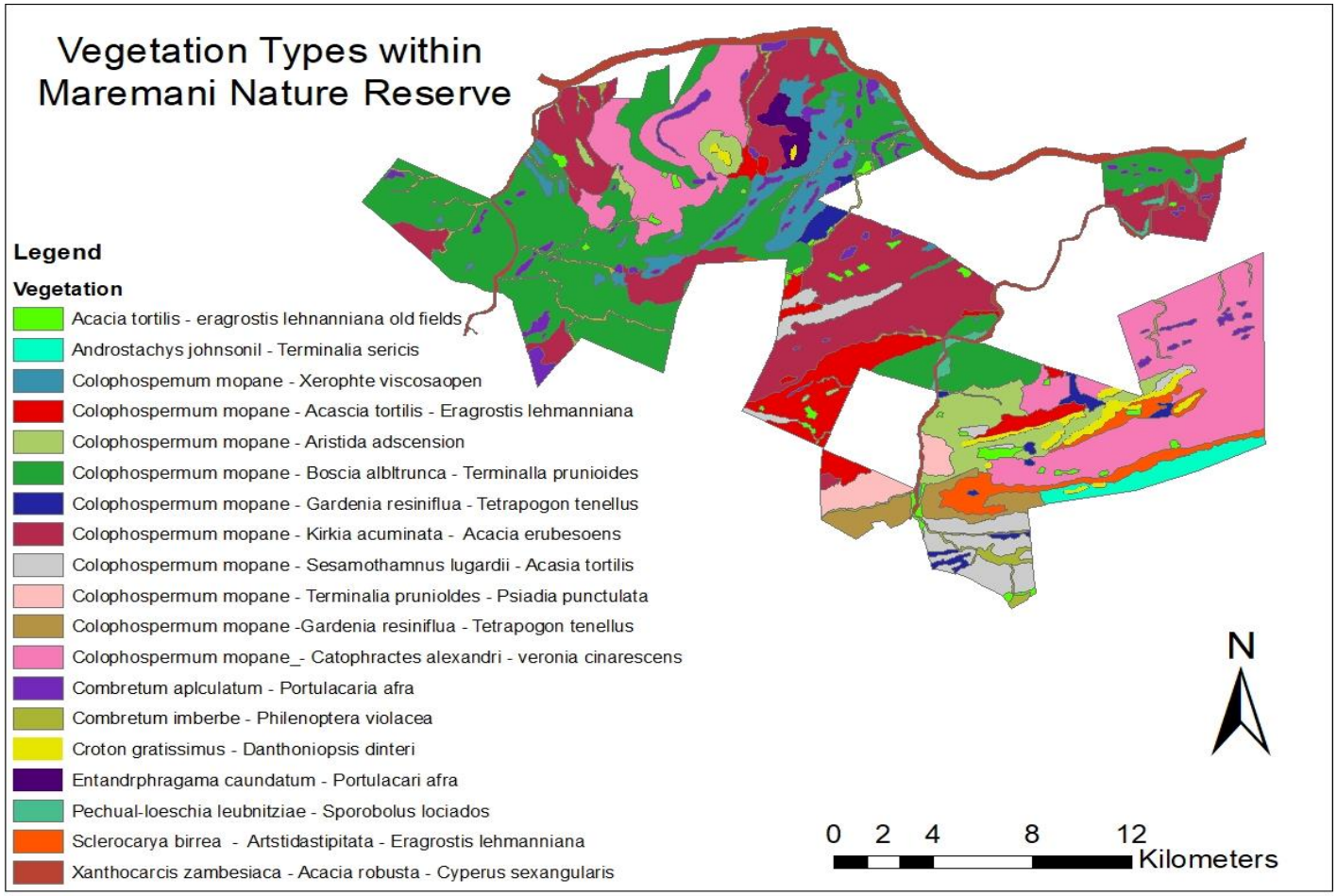

Figure 2-4: vegetation types within Maremani Nature Reserve

The vegetation within the region has broadly been classified as Mophane Bushveld (Low and Rebelo 1998), with pockets of acacia trees and large baobabs. However, within this broader classification, the Reserve contains 17 distinct plant communities (Figure x) that vary according to topography, drainage, geology, rockiness, slope, soil texture and depth, the presence of calcrete and previous land use (Ekotrust CC 2002). These plant communities have been grouped into six main vegetation types:

A. **Rocky outcrops** associated with the small-leaved rock fig *(Ficus tettensis),* large-leaved rock fig *(Ficus abutilifolia),* Paperbark corkwood *(Commiphora marlothii)* and mountain grass *(Danthoniopsis dinteri)* being the conspicuous species (plant communities 1, 2 and 3).

B. **Mopane veld** on a gneiss and quartzite dominated geology with its vegetation consisting of Mopane *(Colophospermum mopane),* Lowveld cluster-leaf *(Terminalia prunioides),* White syringa (*Kirkia acuminata*), Red bushwillow (*Combretum apiculatum*), Resin gardenia *(Gardenia resiniflua,)* and Mountain grass *(Danthoniopsis dinteri)* (plant communities 4, 5, 6, 7 & 8).

This vegetation type can be divided into two subtypes based on environmental features:

- **Mopane bushveld on undulating low rocky hills and gravelly slopes on shallow soils** with a geology consisting of gneiss and quartzite (community 4, Table 6). Plant species consists of Mopane (*Colophospermum mopane*), Red bushwillow (*Combretum apiculatum*), Jacket-plum *(Pappea capensis),* Stunted plane *(Ochna inermis),* White-stem corkwood *(Commiphora tenuipetiolata), Xerophyta viscosa* and Mountain grass (*Danthoniopsis dinteri)* the diagnostic species.

- **Mopane woodland on plains with moderately deep, to deep soils.** Its geology consists of gneiss and quartzite with low rock cover (communities 5, 6, 7 & 8, Table 6). Trees include Mopane

(*Colophospermum mopane****)***, White syringa (*Kirkia acuminata*), Marula (*Sclerocarya birrea*), Red bushwillow (*Combretum apiculatum*), Velvet corkwood (*Commiphora mollis*), Common star chestnut (*Sterculia rogersii*), Blue-thorn **(***Acacia erubescens*), Silver raisin (*Grewia monticola*) and False marula **(***Lannea schweinfurthii*).

C. **Low Mopane bushveld and thickets located on a geology consisting of calcrete, shale and basalt** dominated by Mopane ***(****Colophospermum mopane****),*** Stink shepherd's tree (*Boscia foetida),* Mopane pomegranate *(Rhigozum zambesiacum),* Trumpet thorn (C*atophractes alexandri),* Transvaal sesame bush *(Sesamothamnus lugardii),* Narrow-leaved mustard tree *(Salvadora australis),* the grass*es Tetrapogon tenellus* and Thimble grass *(Fingerhuthia africana)* and the forb *Monechma divaricatum* (plant communities 9, 10 and 11).

D. **Species-poor Mopane thickets and forests** are located along lowlands, ravines, streams and rivers, where Mopane *(Colophospermum mopane),* Lowveld cluster-leaf *(Terminalia prunioides)* and Shepherd's tree (Boscia albitrunca) are the dominant species (plant communities 11, 12 and 13).

E. **Disturbed areas** (overgrazed veld, old fields, watering points and kraals) where the dominant species are Umbrella thorn *(Acacia tortilis)* and Sickle bush *(Dichrostachys cinerea)* (plant community 14)

F. **Riverine communities** on alluvial floodplains, with Leadwood *(Combretum imberbe),* Apple-leaf *(Philenoptera violacea),* Nyala tree (*Xanthocercis zambesiaca*), Ilala palm (*Hyphaene coriacea*) and *Cyperus sexangularis* the dominant species (plant communities 15, 16 and 17) (Table 6 and Figure 2).

2.2.3a Carrying capacity

During this study the economic carrying capacity was used instead of the ecological carrying capacity as this was best suited to the needs of the nature reserve. This was calculated by Van Rooyen (2002). The ecological carrying capacity is the level at which a population would exist unmanaged. However, these numbers can fluctuate dramatically due to prolonged periods of drought and disease which could allow certain species to increase in density and negatively affect more sensitive species. The economic carrying capacity is the point at which maximum sustained yield is reached and is generally between 70% and 80% of the ecological carrying capacity. This maintains species diversity and allows room for expansion in the form of resource abundance.

The ecological index method (Vorster 1982) was used to calculate the carrying capacity but was adapted for the study area by (Van Rooyen 2002). This calculation incorporates the classification of species into groups (Decreases and increasers 1, 2a,2b and 2c) based on the reaction of the species to grazing pressures, biomass production, palatability and preference by herbivores (Van Rooyen 2002).

An economic carrying capacity was calculated for each vegetation type at a mean annual rainfall of 340mm. The economic carrying capacity for game is calculated at 39.2 ha/LAU. The total amount of LAU's recommended for Maremani Nature Reserve is 2113 LAU's, grazers account for 884 LAU's and 1229 LAU's for browsers. The browsers total LAU's are converted to Browsing units (BU) to get total amount of browsers which the environment can sustain this equates to 2927 browsers.

2.2.4Geology

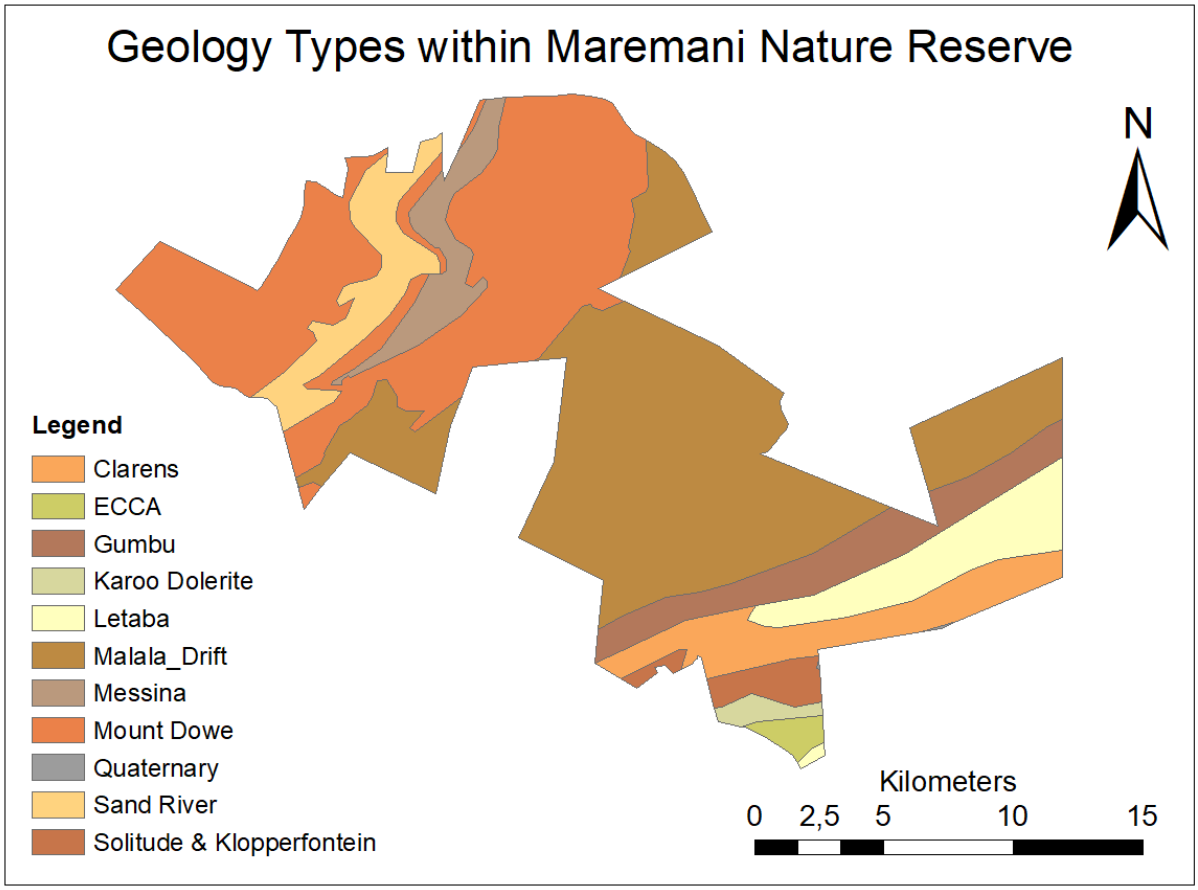

Figure 2-5: soil types within Maremani Nature Reserve

The Maremani Nature Reserve and the larger Messina area is geologically rich and known for its copper ore reserves. The copper mineralization in the area is unique as it is mostly composed of breccia filled with quarts and copper sulphide minerals and is associated with blue quartz and clear quartz crystals which can be found occurring along the Dowe-Tokwe fault that crosses the reserve (Barton 2000).

Table 2-1: Known mineralization within the Maremani Nature Reserve and the farms they occur on (Ecotrust CC 2002)

Mineralization	Farms in the Maremani Nature Reserve where it occurs
Alluvial diamond	Vryheid
Chromite	Bokveld, Boschrand, Steenbokrandjes
Copper	Singelele, Steenbokrandjes, Ter Blanche Hoek, Vryheid
Corundum	Bokveld, Chirundu, Magdala, Palm Grove, Randjesfontein, Steenbokrandjes, Vryheid
Crisotile (asbestos)	Palm Grove

Graphite	Dawn, Woodhall
Iron	Bokveld, Leuwdraai, Magdala, Steenbokrandjes, Twilight, Woodhall
Magnesite	Dawn, Solitude, Twilight
Sillimanite	Randjesfontein
Vermiculite	Malala Hoek, Palm Grove, Randjesfontein, Udini

Some of the oldest rock formations on the earth are located in the reserve, one along the valley of the Sand River known as the Sand River Gneisses. This formation is estimated to be at least 3.2 Ga (*giga annum* or billions of years) old and has undergone several periods of deformation and metamorphism. Others include the oldest layered intrusions known as the Messina layered intrusion and some of the oldest carbonated rocks can be found on the eastern part of the reserve and on the western side of the reserve containing some very rare sapphirine bearing rocks (Horrocks 1981).

Table 2-1: Geological Column for the Maremani Nature Reserve

Time span	Unit	Lithology
Present (<0.002 Ga)		Undifferentiated sand, gravel and conglomerate
Tertiary (0.065 Ga to 0.002 Ga)		Undifferentiated sand, gravel and conglomerate, some associated with the Kalahari beds in Botswana
Jurassic (~0.18 Ga)	Letaba and Clarens Formations, Karoo Supergroup	Interbedded sandstones and mafic lavas
Proterozoic (~1.85 to ~1.9	Mafic dykes	Gabbro, possibly associated with the lavas of the Soutpansberg Group

Ga)		
Archean (~ 3.0 Ga)	Mafic dykes	Deformed and metamorphosed gabbro
Archean (>~3.0 Ga)	Singelele Gneiss	Deformed and metamorphosed granite
Archean (>=3.1 Ga)	Messina Layered Intrusion	Deformed and metamorphosed anorthosite and leuconorite with layers of chromitite and magnetite
Archean (>3.2 Ga)	Beit Bridge Group	Deformed and metamorphosed sediments and felsic volcanoclastic rocks

2.2.5 Major faults

Two major faults exist within Maremani, the Bosbokpoort fault in the southern part of the reserve, and the Dowe-Tokwe fault in the northern part of the reserve. The latter extends west from the farm Twilight on the Limpopo River all the way to All Days, 130km to the west. The Dowe-Tokwe as well as other faults such as the Messina fault, which diverge from the Dowe-Tokwe fault, contain high copper deposits and possibly water sources. The Bosbokpoort fault occurs in the form of a ridge on the northern edge of the Karoo rocks and consists of silicified mylonite and cataclasite. Its age is unknown but is believed to be a significant source of water (Horrocks 1981: 95-96).

2.2.6 Drainage System

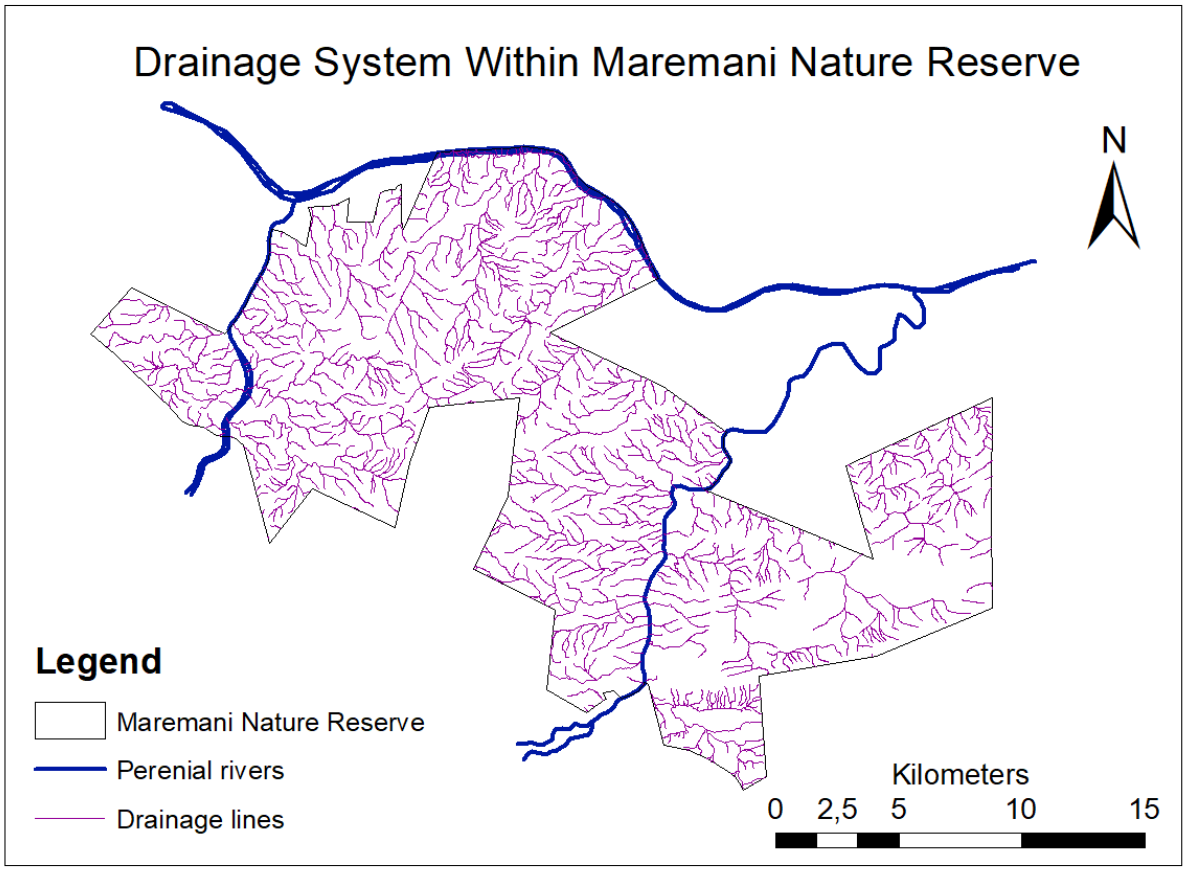

Figure 2-6: Drainage system within Maremani Nature reserve

There are three drainage systems within the reserve, the main being the Limpopo drainage system and the other two, the Sand and Nzhelele systems. The Sand and Limpopo Rivers were far larger than they are now as indicated by their large valleys. The Nzhelele River is younger than the former two rivers, however it is a valuable water source within the region (Barton 2000).

2.2.7 Summary

The landscape of Maremani Nature Reserve is diverse with multitude of varying environments. The Data available on these environments is substantial and perfectly suited to studies focused on human environment interactions and how this is manifested through settlement patterns.

Chapter 3 – Archaeological Background

The Limpopo valley, specifically Shashe Limpopo river confluence area. Is the place where the first state society was formed in southern Africa showing signs of social stratification and sacred leadership (Huffman 2000). The first Iron Age research conducted in the area was prompted by the discovery of golden objects on Mapungubwe hill in 1932. This led to excavations during the 1940s-1950s which were focused on the collection and recording settlement patterns, ceramic vessels and gold (Meyer 1998).

3.1.1 The Late Stone Age (c. 10 000 BC– c. AD 350)

The Later Stone Age in the Limpopo valley likely started by at least 10,980 BC (Van Doornum 2008) and consisted of four different phases. Van Doornum's proposed LSA sequence (2005) is divided into four periods: Early Pre-Contact period (10,000-1220 BC), the late Pre-Contact period (1220 BC – AD 350), the Early Contact period (AD 350-900) and the Zhizo period (AD 900 -1010). The populations associated with stone tool technologies during these time periods are known as foragers and are thought to have lived a lifestyle relying on hunting and gathering to meet daily nutritional needs (Lee 1976:5).

3.1.2 The Early Iron Age (c. AD 350 – AD 900)

The first interaction between farmers and foragers would most likely have occurred at about AD 350 and continued to intensify up until AD 600 (Hall and Smith 2000; Van Doornum 2005:168) when the first signs of Happy Rest ceramics appear on the landscape. These ceramics are thought to be associated with the first farming communities moving through the Limpopo valley (Prinsloo 1974; Hanisch 1981). Other ceramic facies, such as Bambata sherds from Little Muck (Wadley 1996) and Ripple Rim sherds at Buffelskom (Sadr 1998),suggests possible earlier dates, but more likely are the remains of herding communities due to their association with lithics and not farming communities (Hall and Smith 2000).

Initially farming communities did not permanently occupy the valley as there are only a few examples of briefly occupied sites from the first millennium. The reason for this unwillingness to settle in the valley is unclear, but it some have suggested that it is due to unfavourable climatic conditions that would have made farming difficult

(Huffman 2008,2009). Although there were low numbers of farmer sites within the Limpopo valley, there was an increasing number of forager sites, most likely due to ongoing economic interactions with the farming communities further afield in the Soutpansberg (Hall and Smith 2000). Crops and ceramics from farming communities could have bebarton 2006en traded for commodities such as medicinal plants, ivory, ostrich eggshell, and animal skins (Hall and Smith 2000).

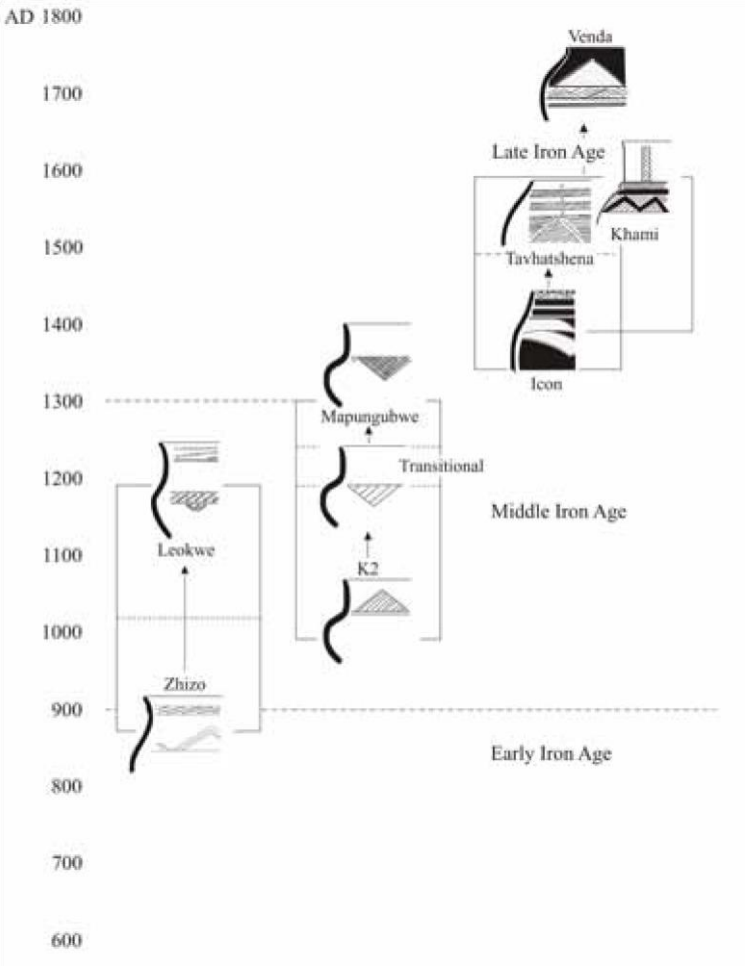

Figure 3-1 Ceramic sequence in the Limpopo valley excluding Happy Rest ceramics (Huffman 2012)

3.1.3 The Middle Iron Age (c. AD 900 – AD 1400)

From AD 900 the Limpopo valley, especially around the Shashe Limpopo Confluence Area, saw a new influx of farming communities. It was first thought that these communities moved out of south western Zimbabwe into the Limpopo valley due to more favourable climatic conditions (Huffman 1996). Isotopic tests later discounted this interpretation Since the Limpopo valley was still unfavourable for farming (Smith 2004). An alternative hypothesis was developed which suggested that communities may have entered the region for resources such as ivory and gold which were desired commodities within the East Indian trade network (Forssman et al. 2014).

The people who settled in the region at the end of first millennium are associated with Zhizo ceramics. Although these communities settled throughout the SLCA the site known as Schroda, seems to have had greater social importance and most likely was regarded as a regional capital by the 11th century (Raath 2014; 2016). As Zhizo occupation of the SLCA expanded, farmer forager relations changed, with foragers altering their subsistence and to coincide with that of the farmers (Forrsman 2017, Van Doornum 2000). Excavations at Schroda yielded large amounts of exotic trade goods such as glass beads and coastal shells (Wood 2000, Chirikure 2014) which were likely exchanged for local resources such as gold and ivory (Calabrese 2005:184, Huffman 2000:19). Further evidence supports this assertion as extensive ivory processing have taken place (Plug 2000, Raath 2014). Schroda's ability to obtain large quantities of resources through its influence over neighbouring communities gave it the ability to establish new trade routes within the interior (Wood 2000:79) and solidify relations with traders along the east coast (Hanisch 1980). This period marks some of the first regional economic structures in the Shashe Limpopo Confluence Area (SLCA) which continue up until the fall of Mapungubwe in AD 1300.

At about AD 1000 we see a decline in Zhizo settlements throughout the region and the appearance of a new population, this time associated with ceramics know as Leopard's Kopje (du Piesanie 2008). The arrival of Leopards Kopje making communities on the landscape led to the displacement and absorption of Zhizo farmers. The Leopard's Kopje community who settled at the base Bambandyanalo Hill, typically referred to as K2, gradually developed into the new regional capital (Wood 2000).

Initially it was thought that all Zhizo-making communities left the SLCA, after the arrival of Leopard's Kopje groups (Huffman 1986; 1994) and moved west to into what is today Botswana. Here, descendant communities can be identified through their use of Toutswe facies ceramics (Denbow 1986). However, it is now clear that some Zhizo communities remained in the Limpopo Valley, where they were incorporated into, or lived-in close proximity to Leopard's Kopje communities. Close interaction between these groups and Leopards Kopje communities is reflected in the changes in the ceramic facies known as Leokwe which is Zhizo ceramics with Leopards Kopje stylistic influences (Calabrese 2000: 206). Radiocarbon dates from Leokwe Hill show that Leopard's Kopje and communities making Leokwe ceramics coexisted in the Shashe Limpopo Confluence Area for at least 200 years from AD 1000 to 1200 (Vogel and Calabrese 2000:183).

The Leopards Kopje communities in the Valley prior to AD 1200 are associated with the facies known as K2. Certain stylistic changes are identifiable in the ceramic assemblages after AD 1200. These ceramics are known as Transitional K2 or TK2 (van der Walt 2012). Changes in social complexity in the period after c. AD 1200 though, is most apparent through an increase in trade activities, rapid population growth and expansion, and a widening political influence (Antonites 2014). By AD 1200 the central cattle kraal at K2 had become too large and is believed that it was moved to a new location outside the settlement. Huffman (1996) suggests that the result was that the court – typically held in the kraal – was no longer associated with the cattle kraal which suggests that cattle are no longer central to these communities' ideological views.

By AD 1220 K2 is largely abandoned and a new royal settlement is established at Mapungubwe Hill, roughly `1.5km away (Calabrese 2000, Huffman 2007, Meyer 1998:263). Changes in settlement pattern and ideology at Mapungubwe illustrate a shift in how these communities functioned and viewed their world. Although this shift began at K2 it only manifests itself physically at Mapungubwe Hill (Huffman 2008). This was apparent in changes to the settlement pattern.

Firstly, the elites settled at the top of the hill and the commoners at the base of the hill. This can be viewed as a way to demonstrate social status and power within a socially stratified society through the spatial separation of people (Huffman 2008). This notion

of separation was not unique to just the elites as certain areas at the base of the hill, such as the southern terrace, were reserved for more important families, while the surrounding area and valleys for less important families (Meyer 1998).

Secondly, the court was no longer associated with the kraal as the kraal no longer served its purpose as a symbolic representation of wealth and was now only associated with commoners and thirdly the construction of stoned walled features on top of Mapungubwe Hill which was previously used as a rain making site (Huffman, 1996, 2005).This new type of settlement layout which emphasises social stratification is termed the Zimbabwe Pattern (ZP) and can be identified by the court situated outside of the kraal, stone walling and the separation of the chief from the rest of the community (Huffman and Hanisch 1987).

The third key transformation is reflected in rain making practices (Schoeman 2006). Originally rain making was left to rain making specialists which in many cases are believed to be authochtenous foraging communities (Schoeman 2006). Since foragers were original inhabitants of the landscape, farming communities likely viewed them as having an intimate relationship with nature and its force providing them with power to control rain (Schoeman 2006). However, starting in the late 12th century, a new pattern emerges. Rain making rituals originally performed by foragers or ritual specialists were increasingly performed by the ruling elite solidifying their role as sacred leaders (Huffman 1996).

At its peak, Mapungubwe was thought to have had a population of five thousand people and is regarded as the first urban centre in southern Africa (Huffman 2000:23, 2009). By AD 1280 we see the decline of Mapungubwe, although it is not yet clear why. Huffman (2008) suggests it could be due to the Little Ice Age leaving the polity politically unstable and vulnerable as many of changes occurring within the material culture and settlement patterns are linked to periods of climatic change (Huffman 1996, Plug 2000). A possible example is the population increase within the Limpopo valley between AD 1000-1250 (Huffman 2009) which corresponds to the Medieval Warm Epoch and the decline of Mapungubwe is associated with the start of the Little Ice Age (Huffman 2008). It is believed that the Little Ice Age left the region colder, dryer and more climatically variable. The decrease in rainfall is believed to be sufficient enough to have disrupted agricultural and pastoral activities (substance

strategies) hampering the elite's capacity to maintain the intensity of trade and its trade relations (Huffman 2008) to a point that the region was no longer able to support its growing population.

3.1.4 Late Iron Age (c. AD 1400 - AD 1800)

The leaders of Great Zimbabwe could have seen used this opportunity to take control of the trade routes (Pikirayi 2001). The ability to obtain resources such as gold and ivory through its increasing regional influence gave Great Zimbabwe the political and economic advantage needed to exceed Mapungubwe (Huffman 2009; 2012, Pikirayi 2001).

Although the Mapungubwe polity collapsed its culture did not. There is evidence that suggests that some Mapungubwe commoners remained in the region to the east of Mapungubwe up until the mid-15th century most notably at Tshitaka-Tsha-Makoleni and Kromdraai (Loubser 1988,1989, Mouton 2017) and it believed that at least one dynasty moved west into Botswana (Huffman 2008).

The Great Zimbabwe state lasted for approximately 150 years until its fall in approximately AD 1450. Though this is debated by some scholars and can be see through Chirikure et al (2018) showing that Great Zimbabwe was already displaying signs of social complexity by 900 AD, a hundred years prior to the arrival of Leopards Kopje communities in the Shashe Limpopo Valley.

After the collapse of Great Zimbabwe two groups rose to regional power, the Mutapa in the north east and the Torwa at Khami in the southwest. Khami communities moved south of the Limpopo establishing sites such as Machemma and Faure (Wood 2005). The Khami phase marks the arrival of Kalanga speaking communities within the Limpopo valley. Khami royal settlements follow the Zimbabwe settlement pattern and can be classified under the settlement hierarchy model put forth by Huffman and Hanisch (1987). The model consists of 5 tiers all linked to political standing which can be measured through settlement pattern variations, site sizes, and stone walling.

During the Kami phase there seems to be four petty chiefs in the Limpopo Valley: one located in the Tuli Block (south east Botswana), one in the Musina area close to present day Maremani and two in the Shashe Limpopo region of which only the one site known as Machema has been excavated. The site has three occupation periods spanning from the 15th century through to the 17th century with the last occupation

period representing the Letaba ceramics facies (Huffman 2012). The long occupation sequence is believed to be evidence of dynastic continuity as new communities would not occupy the *musanda* (settlement) of another group according to the concept of ritual pollution (Ngubane1977).

Venda-speaking groups have been the dominant ethnic group in the Limpopo Valley and the Soutpansberg region in the recent past, up to modern times (see Loubser 1991; Huffman 2007). Archaeologists have hypothesised that Venda identity, is the result of centuries long interaction between various groups in the region around the Soutpansberg. Archaeologically this is reflected in the emergence of Tshavhatsena ceramics which is a merger of two ceramics styles, the one produced by Shona communities and identified as Khami style ceramics. The other by Sotho-Tswana communities making Moloko ceramics (Loubser 1989). Tavhatshena ceramics therefore likely reflects cross cultural marriage patterns hinted at in oral traditions (reference needed) and also the roots of the Venda language which has both Shona and Sotho roots.

By the mid-17th century, the Shona-speaking Singo dynasties moves into the Soutpansberg from southern Zimbabwe (Huffman 2012). The Singo conquered the independent Venda-speaking chiefdoms in the Soutpansberg uniting them to form the first Venda state spanning an estimated 30 000km² (Huffman 2012). This also sees the emergence of a new ceramic facies known as Letaba. The Singo capital is situated in the Nzhelele valley, at the site known as Dzata, which was occupied from the late 17th to the early 19th centuries (Loubser 1989). After the death of king Thohoyandou, Dzata was abandoned and the state split into three independent dynasties known as Mphephu, Tshivhase and Mphaphuli (Huffman 2012).

3.1.5 Terminal Iron Age (c. AD 1800-AD 1950)

The Mphephu dynasty ruled over western Vendaland and much of their territory fell within the confines of what is now Maremani Nature Reserve. There are ethnographic accounts for two communities within the reserve, the Malunguphala and Thsirundu though they are never mentioned together within the same ethnographic accounts.

Malunguphala was a wealthy headman with more than 1000 followers living within the landscape he settled at the site TSH 32, which is the largest stone walled settlement within the research area and was occupied from 1860-1913. Malunguphala

was overthrown by his stepson Kham-Kham who was seen to be a feared diviner. This led to a period of instability and conflict within the region, eventually resulting in Kham-Kham fleeing the site in 1913 moving north into Zimbabwe (Antonites and Kruger 2012, per comm Kruger 2015).

The first headman of the Tshirundu settled near Mount Dowe (Mathers and Kruger 2008). In about 1860 Mphephu gave Ngadembe Tshirundu land in what is now known as the Ha Tshirundu mountains approximately 20km south of Mount Dowe. Mphephu granted Ngadembe the land so that he could perform rainmaking and healing skills in service of his people as Ngadembe was a renowned miracle worker (Mathers and Kruger 2008). Ngadembe then established his kraal at TSH 40 also known as Tshirundus kraal where he eventually passed away (Mathers and Kruger 2008). His son, Tshitakani Tshirundu was born at Thsirundus kraal on the farm Frampton soon after its establishment in 1860 (Fouché 1937, Mathers and Kruger 2008). Tshitakani continued living at kraal till one of his sons drowned in the waterhole. He believed the site was cursed and moved his family into the plains to the north to TSH29. Some point later he moved 2 km west to a koppie known as Kremetantkop where he established a kraal with stone walling and was later buried in 1940. Tshitakanis son, Matenzhe Tshirundu, was born in 1920 his kraal was situated 600m north east of Kremetantkop at the site identified as MNR10. The last headman of the Thsirundu people before they were dispersed by the colonial government and the successor to Matenzhe Tshirundu was Mavhasha Tshikale who passed away in 1974 and is thought to be buried somewhere on the farm Frampton (Mathers and Kruger 2008).

The first white settlers in the region of the Tshirundu mountains were the Boshoff family in 1860. By the late 1860s, farm boundaries had been surveyed and by the 1880s many Boers owned large portions of land (Huffman 2012). Though farm boundaries in the Limpopo Valley and Soutpansberg were only officially mapped at the start of the twentieth century (Mathers and Kruger 2008). After the Rinder Pest epidemic from 1896-98 many Boers had lost their cattle and livelihoods. These Boer families sold their farms to wealthy speculators on the Rand who acquired their wealth through mining ventures elsewhere in southern Africa (Huffman 2012). In 1918, shortly after the end of World War One, the governor general of the Union of South Africa granted returning South African soldier's large portions of land within the Limpopo valley (Mathers and Kruger 200). Three of these farms fell within the

Tshirundus territory namely Frampton, Nzhjelel's Drift and Skirbeek. This forced the Tshirundu people to move to labour camps on these farms while others fled north to Zimbabwe (Mathers and Kruger 2008). Because the geology in the northern Limpopo is rich in mineral resources, it led to the to widespread mining in the region, most notably the Messina mine which opened in 1905 and was operational up until 1992 (Cairncross & Dixon 1999:50).

3.2 Social Complexity in the Limpopo Valley

Huffman (2007; 2014; 2015) sees social complexity in southern Africa starting at about AD 1200 in the Shashe Limpopo Confluence area with the formation of the first urban and socially stratified society centered around the Mapungubwe polity. He believes that Mapungubwe was the first in a sequence of capitals that included Great Zimbabwe (AD 1300-1450) and then Khami (AD 1450-1650). The three-stage sequence follows the idea that once a capital has lost power or declined within a region, a new capital is established in another region.

Recently, Chirikure et al (2013), developed a model which sees the development of social complexity as accruing in a variety of different regions at varying scales simultaneously. According to this model, Mapungubwe, Great Zimbabwe and Khami were individual entities, overlapping chronologically. The implication of this revised chronology is that there may have been significant chronological overlap between polities like Mapungubwe, Great Zimbabwe and Khami that have previously been seen as successive states.

The authors posit that Khami and Mapungubwe developed from the same ceramic culture of Leopard's Kopje while great Zimbabwe instead evolved from the Gumanye facies. This stands in direct contradiction to Huffman's 3 stage model of linear polity succession. Chirikure et al (2013; 2014; 2016), challenges Huffman's 3 stage sequence through evidence displayed at Mapela Hill in south western Zimbabwe.

The first studies at Mapela Hill were conducted by Garlake in 1968. Since then, new research has been carried out by Chirikure et al (2013; 2014; 2016), identifying that Mapela Hill was far larger than originally thought and shared many characteristics that were similar to that of Mapungubwe. These characteristics include the formal terracing on the hilltop, socially stratified settlement pattern and large quantities of prestige goods. Mapela displays signs of being central to its own economic and

political network without the political influence of Mapungubwe, therefore constituting a second polity within the Shashe Limpopo region. Huffman is also critiqued for his view that Mapungubwe was the first polity to initiate the Zimbabwe settlement pattern displaying signs of a socially hierarchically structured society. The critique was formulated through use of carbon dates which recognized that Mapela (AD 1055-1400) predated Mapungubwe (AD 1220-1300) by almost 200 years suggesting that the Zimbabwe settlement pattern first developed at Mapela and later manifest itself at Mapungubwe hill.

Huffman (2015) challenged this interpretation, asserting the data provided was incorrect and that the authors were unable to support their claims through the evidence provided such as Bayesian modelling, ceramic typology and stone walled terracing. Huffman believes is not equivalent to the elite stone walling at Mapungubwe and that Mapela was in fact part of the Woolendale ceramic sequence, which developed out of Mambo an offshoot of K2 ceramics which did not follow the same stylistic trajectory as Mapungubwe ceramics. Whatever the political, social or economic role of these settlements were, it is unlikely that they operated in isolation as both were situated in relatively close proximity to each other, shared similar cultural and social traits and partook in the same regional trade networks.

While these two views attempt to provide insight into the structure of polities at a large scale, they neglect the importance of smaller outlying communities and the role they play in shaping these larger polities. Antonites (2012), focuses on hinterland settlements of the Mapungubwe polity in the northern Soutpansberg where he identifies that social, economic and political relations are structured differently in the hinterland to that of the Mapungubwe heartland. He shows that the relationships in the hinterlands were more complex than models of outright domination suggest (Antonites and Ashley 2016).

3.3 Complexity in the Nzhelele and Sand River basins

Antonites (2012) research builds on previous research done by Loubser (1991), who excavated a series of small hinterland sites on the northern side of the Soutpansberg including Mutamba, which was later excavated by Antonites (2012). Apart from Mutamba another ten Mapungubwe period sites have been excavated within the Sand and Nzhelele River basins. Four of these sites are located within the Maremani Nature

Reserve and will be discussed later. The other seven are situated outside of the reserve to the south with the exception of Kromdraai which is located 5,5km west of the southern portion of the reserve.

Many of the following sites do have multiple occupation phases but only the layers relating to the Mapungubwe period will be discussed here.

3.3.1 Kromdraai

Kromdraai was excavated in the 1980s by H.P. Prinsloo, a lecturer at the University of Pretoria at the time. Six excavations units were opened on the site, but all data and records pertaining to the excavation have been lost with the data never being published. Kromdraai is situated on a large koppie extending out of the plateau with its approach being on the western slope as all other sides are marked by sheer cliffs. It is located between the Nzhelele River to the south and another smaller river to the north west which flows into the Nzhelele River with a natural spring located 250m north west. The site is relatively large, occupying approximately 3.2 ha. The royal area is situated at the eastern point of the koppie which is also the highest position within the confines of the site and is marked with well packed formal walling and large amounts of scattered slag within the vicinity with the kraal directly next to it, beyond the kraal to the west the koppie opens up. Between the kraal and the end of the site to the west there are three parallel terraced areas. The terraces are manmade and extend past the ground level to act as walling. The cultural material excavated by Prinsloo was stored at the University of Pretoria and was recently analyzed by Mouton (2017) for an unpublished honors paper. Mouton's (2017: 63) analysis included a total of 692 glass beads, 202 shell beads, 4 soapstone beads, a soapstone amulet, seven spindle whorls and 203 non utilitarian metal objects as well as some sorghum and millet botanical samples though these have not yet been analysed (Mouton pers comm 2020). Kromdraai was dated to AD 1270-1410 by means of radiocarbon dating of faunal remains. The site can definitely be considered an elite site due to its size, the large amount of trade goods and formal walling associated with elite occupation. Kromdraai most probably acted as the political and economic hub for the area surrounding Maremani Nature Reserve.

3.3.2 Stayt

Also Excavated by H. P. Prinsloo Stayt situated on a sandstone spur 25km south west of Kromdraai. The site is approximately 160 meters x 50 meters (0.8 ha) and has

natural spring located on it (Prinsloo and Coetzee 2001). The Mutamba River is 1 km south of the site with another smaller river directly east of the site which flows into the Mutamba River from the north west. There is also a marsh situated on the flood plains to the south which could have been a possible clay source. The site dates to AD 1227-1283 and is considered to be a single occupation site. The excavated material is stored at the University of Pretoria and was analyzed by Hopf (2017) as part of an unpublished honors project. The study identified a total of 66 glass beads, 208 shell beads and 6 soapstone beads a soapstone amulet, 20 spindle whorls, 15 non utilitarian metal objects and six copper items. Though there were also four copper ingots and 18 gold beads discovered during the excavation which are no longer in the collection (Prinsloo and Coetzee 2001). Faunal analysis also indicates meat consumption consisted of 66.85% domesticates (*Bos taurus*, *Ovis aries*, *Capra hircus*) and 24.72% non-domesticates (Prinsloo and Coetzee 2001).

3.3.3 Mutamba

Mutamba was excavated by Loubser (1988, 1989, 991) and later by Antonites in 2010 and 2011 (Antonites 2019). Its layout is consistent with the commoner site and has a size of approximately 1.2 ha. The site is located in the saddle of a sandstone ridge that runs east to west with the southern slope forming part of the Mutamba River valley slope. The Mutamba River is approximately 250m away from the site and joins the Nzhelele River 12 km to the north Antonites (2012:74). The excavation yielded a variety of artifacts such as 346 glass beads of which four where drawn, 551 shell beads, 187 spindle whorls, 322 individual worked pieces of iron, 4 copper object and 1.8 kg of slag. The vast number of spindle whorls is far above that of any other site in the area. The spindle whorls are considered to be associated with individual household production of cotton along with a comparatively high number of Indo-Pacific trade beads points to an incorporation of these smaller hinterland sites into the larger trade networks (Antonites 2012, 2019). Botanical analysis (Steyn 2018, Steyn and Antonites 2019) also reveals a diversity of domestic plant species being cultivated by the communities occupying the site. This includes mung bean which is an exotic crop originating in Asia. Mutamba displays the first signs of its cultivation in southern Africa and points to new adaptions and opportunities brought about by increasing trade within the region.

Table 3-1: Plant species from Mutamba adapted from Steyn and Antonites (2019)

Family	**Genus**	**Species**	Common name	Wild/Domestic
Anarcardiaceae	*Sclerocarya*	*birrea*	Marula	Wild
Fabaceae	*Acacia*	*Unidentifiable*	Unknown	Wild
Fabaceae	*Vigna*	*radiata*	Mung bean	Domestic
Fabaceae	*Vigna*	*unguiculata*	Cow pea	Domestic
Malvaceae	*Adansonia*	*digitata*	Baobab	Wild
Malvaceae	*Grewia*	*Unidentifiable*	Grewia	Wild
Malvaceae	*Gossypium*	*herbaceum*	Cotton	Wild
Poaceae	*Brachiaria*	*deflexa*	False signal grass	Wild
Poaceae	*Brachiaria*	*nigropedata*	Spotted signal grass	Wild
Poaceae	*Eleusine*	*coracana*	Finger millet	Domestic
Poaceae	*Pennisetum*	*glaucum*	Pearl millet	Domestic
Poaceae	*Sorghum*	*bicolor*	Sorhgum	Domestic
Rhamnaceae	*Ziziphus*	*zeheriana*	Dwarf buffalo thorn	Wild

Abatino (2019) shows Mutamba communities were taking advantage of a range of fauna and that sheep and goat were the preferred domesticates over cattle. Faunal analysis also indicates meat consumption consisted of 65% domesticates and 35% non-domesticates.

Table 3-2Mutamba- Number of remains and relative percentages of species found on the site. (Adapted from Abatino 2019)

Mutamba	**NR**	**% NR**
Cattle	132	22.5%
Sheep and Goats	177	30.2%
Wild bovids and suids	97	16.6%
Small snared animals	66	11.3%
carnivores	48	8.2%
Birds	51	8.7%
Fish	15	2.6%

Total	586	100%

Although Mutamba is a relatively small site it provides a wealth of information on smaller communities and the way in which they utilize their environments to sustain their livelihoods and gain access and take advantage regional trade routes. It also provides insights into craft production and wealth accumulation within smaller hinterland communities.

3.3.4 Princess Hill

Princess Hill is located on a sandstone ridge on the northern section of the Soutpansberg mountains and is approximately 5km north of Mutamba. It is considered to follow the ZCP settlement pattern and is dated to AD 1180 ± 80 (wits 1590). Unfortunately, much of the site has been destroyed during the construction of a house situated on the site. The finds on the site consisted of an iron blade, two pieces of copper wire, elven spindle whorls, five ostrich egg shell beads an achatina bead and two cylindrical figurines (Loubser 1991).

3.3.5 Vhunyela

Vhunyela is situated at the bottom of a sandstone ridge north of the Soutpansberg. It is approximately 10km north of Mutamba and follows the CCP settlement pattern. The site is most apparent through the visible ash and dung concentrations associated with cultural material. Finds consisted of an iron arrowhead, two iron helixes, five spindle whorls and two OES beads (Loubser 1991).

3.3.6 Verulam

Verulam is situated on a flat sandstone koppie just south of the Sand River on the northern side of the Soutpansberg. The site is only approachable from the eastern slope as all other directions are met with sheer cliffs. The bottom layer was associated with Mapungubwe and Eiland ceramics and one wound copper artifact (Loubser 1991).

These sites provide an alternative view of the hinterlands unlike those previously put forth which lack emphasis on the agency and importance of these hinterland communities within a regional and inter regional perspective (Antonites 2012, Moffet and Chirikure 2016,). Sites like Kromdraai, Stayt and Mutamba show how regional elites within the Sand and Nzhelele river basins were able to capitalize on surrounding environmental resources to strengthen their social economic and political ties within

the landscape. This can be seen through an increased settlement sizes and evidence of social stratification within them. An increase in variety and amount of trade goods and increased utilization of the environment resources.

Chapter 4 - Humans and the Environment

This chapter looks at what types of interactions occur between humans and their environments and how environment archaeology can benefit present day human populations

4.1 Environmental Archaeology

Environmental archaeology which can be defined as "study of paleoenvironments as human habitats" (2000:20) these habitats have key aspects which can be defined and examined to better understand human behaviour within in its unique cultural context (2000:20). Environmental archaeology has come into new light as questions regarding its usefulness towards archaeology inquiry and the issues society currently faces (Riede et al 2016, Piskin et al 2018). We live in a time when human activities have shaped and still shapes the climates and environments of the planet. Therefore, environmental archaeology can play a role in current issues as it can identify how past human activities have altered the environment over time and to what extent. These data sets play a role as they assists in understanding ecosystem dynamics and in evaluating the sustainability of human-ecosystem-environmental interactions (Crumley 2019, Sinclair et al 2019, Reide et al 2016). By understanding how people have responded to changes in their environments and how environments have reacted to human activities we can better understand how to utilise our environments in a more sustainable manner (Stump,2013 2019). At the same time, we can also identify how communities have reacted to various environmental and climatological changes by identifying resilience strategies and adaptations and how they've diminished the vulnerabilities of these communities in the face of hazards. This can be beneficial to policy makers (Piskin et al 2018) as it provides long term perspective on human sustainability and adaptation which can benefit communities of the present in the face of continuing risks and hazards

4.2 Vulnerability, Resilience and Adaptation

Human populations are always under constant threat whether it be social, political, economic or environmental. Though humans have adapted to these threats by employing appropriate resilience strategies which lower vulnerability and increase adaptive capacity to give way to new adaptations. These new adaptations in turn are what determine the future coping capacities and vulnerability in the face of continuing risks.

Resilience is a term that has been used in archaeology for many years and can be defined as "…the capacity of society …to respond to and recover from adverse conditions, to counter the effects of inherent environmental insecurity (for instance seasonality), and to reorganise society to meet new conditions…" (Ekblom 2012:481). Resilience theory is most apparent in southern African archaeology through research by Manyanga (2006). Manyanga focuses on the socio-environmental dynamics within the Shashi Limpopo River Basin in southern Zimbabwe. He looks at changing ecological conditions in conjunction with historical and present-day land use practices to identify possible resilience strategies and adaptions within communities which have made it possible for them to survive within semi-arid savanah regions.

Resilience is the main theme in the study of the decline of Mapungubwe, as its collapse supposedly brought about by an inability to react to a climatic events or conditions caused by the little ice age which negatively affected the community's subsistence strategies which eventually led to its demise (Smith et al 2007, Meyer 1998). While resilience speaks to ways to mitigate and avoid change it does not identify the variables leading up to the event which determine the capacity and type of change. Some examples include population demographics, political and social ties, environmental degradation, economic conditions, prior knowledge of environments and even a community's or individuals' insecurity. Resilience strategies and adaptations are not able to account for the variety of interactions between individuals' communities and their environments. Though a better understanding of vulnerability is needed to fully understand its potential for the interpretation of archaeological data and how it might be relevant for communities of the present.

4.2.1 Evolution of the term Vulnerability.

The term vulnerability only really starts to take form in the late 1980s with Chambers (1989). Chambers (1989) Identifies a distinction between Internal And external vulnerability by highlighting differences between the ideas of poverty and vulnerability. Chambers view on vulnerability is thus "Vulnerability has two sides: An external side of risks, shocks and stress to which an individual is subject to; and an internal side which is defenceless, meaning a lack of means to cope without damaging loss. Loss can take many forms-becoming or being physically weaker, economically impoverished, socially dependent, humiliated or psychologically harmed".

This idea of internal/external vulnerability was then expanded upon by Moser (1998) by demonstrating the various complexities of asset management in the context of urban economic crisis and how this affects the vulnerability of the poor due to lack of assets ownership. Moser (1998) believes that "Analysing vulnerability involves identifying not only the threat but also the resilience or responsiveness in exploiting opportunities, and in resisting or recovering from the negative effects of a changing environment. The means of resistance are the assets and entitlements that individual, households, or communities can mobilize and manage in the face of hardship. Vulnerability is therefore closely linked to asset ownership".

Whatts And Bohhle (1993) speak about the space of vulnerability by looking at the inter relationships between hunger, famine and poverty. The way in which they defined space of vulnerability shows that exposure is an external facet of vulnerability whilst potentiality and capacity as internal facets of vulnerability. Sinha and Lipton (1999) WDR expand on the idea of exposure by including exposure to damaging fluctuations, the vulnerability to exposure and aversion.

Clark et al (2000) working within the Research and Assessment Systems for Sustainability Project defined vulnerability "as the risk of adverse outcomes to receptors or exposure units (human groups ecosystems and communities) in the face of relevant changes in climate, other environmental variables and social conditions".

United Nations Development Plan (UNDP) 2004 defines vulnerability as "A human condition or process resulting from physical, social economic and environmental factors which determine the likelihood and scale of damage from the impact of a given hazard"

Intergovernmental Panel on Climate Change (IPCC) 2012 pg. 32daefined in this report “as the propensity or predisposition to be adversely affected. Such predisposition constitutes an internal characteristic of the affected element. In the field of disaster risk, this includes the characteristics of a person or group and their situation that influences their capacity to anticipate, cope with, resist, and recover from the adverse effects of physical events” (Wisner et al., 2004). This definition was streamlined slightly for policy formation within the IPCC 2014 report but is essentially the same definition.

Most of the archaeological work on vulnerability and resilience stems from work done in geography. The concept of vulnerability is a relatively new concept in regards to how it has evolved over the last 20 years within geography and even newer in regards to archaeology as can be seen by Conolly and Lane (2018) An introduction to vulnerability risk and resilience as well as other papers within this volume (world Archaeology 50:4)The concept of vulnerability as defined by the IPCC 2012/2014 is used by many reports that are key to policy formation and climate impact mitigation such as the UNGSD (2015) and IPCC (2016).Since then there have been no other formulations of the term within united nations reports (UNGSD 2019), United Nations Human Development Report (UNHDR)2016 or (IPCC 2016). The definition of vulnerability put forth by the IPCC is applicable to archaeology as they used historical perspective to investigate long term resilience and vulnerability (IPCC 2014) and that most archaeologist using the concept should frame their work within this definition of vulnerability (IPCC 2012: 32) as it makes their work more relevant to current studies and reports used in policy formation and risk mitigation.

By looking at how this term has evolved we can see that it has started to play a large role in the formation of policies on a local and global scale. I believe vulnerability should be included in our interpretations of archaeological data as it will help to better understand the mechanisms taking place between hinterland communities, their capitals and the environment as well as the circumstances leading to their collapse This will aid in providing a better understanding of how communities survive in and utilise semi-arid environments

4.3 Usable pasts

Usable past or applied archaeology (Honeychurch 2010) refers to how data gathered on past communities and environments can be utilised to overcome some of the problems and challenges which communities of present and future might face (Lane 2011, Stump2018). What Archaeology offers that most sciences do not is a long-term perspective on human and environmental trajectories through time and how these trajectories were influenced by varying social and environmental circumstances (Stump 2018, Lane 2011). This is best done by including various approaches such as oral histories, local knowledge and scientifically derived data (Lane 2011).

African Archaeology in the context of usable pasts has best been applied to issues Surrounding food security by applying community based interdisciplinary models of past agricultural systems (Logan et al 2019). Examples of these projects are the African Farming Network, Resilience in East African Landscapes (REAL) and Archaeology of agricultural Resilience in Eastern Africa (AAREA) and Cambridge global food security (Lane 2010, Davies et al 2016), york.ac.uk/a area, globalfood.cam.ac.uk, globalfood.cam.ac.uk). This is because archaeological research can provide long term insight into the cultivation, value and role of food crops within past communities which can then be applied to current communities to increase agricultural resilience (Reed and Ryan 2019) and minimise vulnerability. This long-term perspective on agricultural resilience and adaptive solutions would in theory inform sustainable agricultural and land use practices of present day and future communities (Reed and Ryan 2019, Stump and Richer 2017) as environmental impacts and agricultural sustainability are visible within the archaeological record (Ellis et. al 2013).

The examination of past agricultural and land use practises through archaeological data and methods would generate data on indigenous resources and exploitation strategies which in turn could be replicated or altered to decrease vulnerability and increase resilience of local communities (Logan et al 2019). Reed and Ryan (2019) suggest a food systems approach is best suited to investigating food security and agricultural development over time.

Chapter 5 - Methodological Considerations and Methods

The following chapter discusses the methodological considerations needed to perform a large-scale systematic archaeological survey as well as the methods used to obtain and process the data during the study.

5.1 Regional survey

The regional survey makes use of two techniques, firstly full coverage survey and secondly sample surveys. These two techniques were used in conjunction with each other as they can be complementary when surveying large areas (Dean 1990). The results from the regional survey were used in conjunction with previous surveys to increase the coverage area. This can cause complications as different methodologies would have possibly used different resolution's providing different data sites which are not always directly comparable. Though, this can to some extent be overcome when applying a nested approach. The nested approach is reliant on high resolution coverage from one area which can be applied to an unknown area. Although this method was not designed to include previous research, it has the ability to integrate data from previous surveys with minimal bias when assimilating high resolution data to these previously surveyed areas.

This is also what makes the nested approach such a viable methodology as sampling can be used in conjunction with regional survey (Burger 2002-2004, Honeychurch et al 2007) . The nested intensity survey allows you to study large tracts of land by creating zones of different survey resolutions and applying information in regards to site location from higher resolution surveys to areas which have still not been studied (Honeychurch et al 2007). The advantage of the nested intensity survey is that it provides high quality data of one area which can be applied to an alternate area with a lower resolution of intensity within the same geographic location (Burger 200). This survey design can be used to study settlement patterns in terms of inter-site relationships, their spatial distributions, and how this affects the spatial structure of sites on the landscape (Burger 2004).

Various considerations must be taken into account when selecting a survey area. Most importantly the research question, but also other contributing factors such as landscape, ecological zones, time, resources and previous knowledge of archaeological sites. Different research questions require different research

techniques, in addition to the general foot survey which can be conducted through transects or randomly dependent on the requirements and accuracy of the survey (Bintliff & Snodgrass 1988, Lane 1992). Satellite imagery (Google Earth) can be used to identify points of interest prior to the survey. These include changes in soil colour, vegetation types and coverage and Walling. (Sadr & Rodier 2011). An example of this is Cenchrus ciliaris (Buffalo grass) which grows on cattle kraals and middens and is clearly visible from the air (Denbow 1979), while mines and middens leave a grey discolouration in the soil. Airborne remote sensing (Smith et.al 2014) and aerial photography are also complementary techniques which can be used.

However, the methods mentioned above are not a guarantee and should be investigated through foot survey at a later stage (Reid and Segobyte 2000). Surveys can be structured in terms of partial coverage, full coverage or a representative survey of different ecological zones (Forsmann 2014). Areas can be divided into ecological zones or by a superimposed grid. Squares in the grid can be selected randomly or systematically however it is better to use both to avoid un-intentional clustering within in a specific area (Ammerman 1981, Dunell & Dancey 1983).

These methods were not used as the survey was targeted to specific ecological zones or areas which generally followed landscape features which cannot be contained to any one specific square. Visibility should be a major consideration when doing archaeological surveys as the visibility of the terrain can affect the discovery and identification of archaeological remains. The degree of visibility is generally determined by vegetation coverage or sedimentation of the site (Wandsnider & Camilli 1992). Moreover, the nature of the artefact also has a role to play as certain types of sites or artefacts display a higher degree of obtrusiveness that others. For example, stone-walling are more visible in comparison to small empheral sites with no apparent features. The visibility of a research area must be taken into account as bad visibility can lead to skewed results and uniformity within the archaeological record.

Bias will always be a concern for any type of survey as sites could be missed due to ground visibility, displacement or submergence of artefacts due to Aeolian processes or simply did not fall within the parameters of the survey. Bias can never be

eliminated but it can be reduced by following methodologies appropriately suited and informed by the surrounding environment.

5.1.1 Defining a site

Over the past few decades, surveying has proven to be a valuable tool for archaeological analysis and has progressed to a fully independent mode of inquiry. However, there are some methodological concerns when conducting Archaeological surveys (Bower 1986). Bias towards site type and size is one of the most apparent as certain researchers choose only to record sites suited to their study's criteria and not the entirety of the landscape creating uniformity within the archaeological record (Fish & Kowalewski 1990). A site in its most basic sense can be defined as the presence and accumulation of preserved artefacts within a definable area (Foley 1981).

This definition however does not account for variability between on-site and off-site artefact scatters and their formation processes. Various definitions have been used with some referring to a site as an artefact scatter irrespective of the occupation period or whether it is a multiphase site (Connoly and Bevan 2002-2004). While others identify sites according to density of artefacts (Gallant 1986), this is directly opposite to Foley (1981), which he refers to a site as the presence of artefacts rather than their concentrations. This approach is known as a site-less or off-site survey (Connoly and Bevan 2002-2004).

This research strategy aims to record all archaeological material throughout the entire survey area irrespective of site type or artefact densities. Research strategies are based on research questions, so while some studies use a site as a unit for study others might use artefacts (Ebert 2001), or features (Wilcox 1999). By recording all archaeological anomalies within the landscape one can decrease statistical bias (Foley 1981), thus avoid confusion of what should or should not be defined as a site.

Assessing archaeological features may be difficult at times as multi occupation sites can give the appearance of a single site. Dating such sites can be difficult as dates may relate to either one of the occupations (Sadr 2009). This may be problematic when trying to identify relations between artefacts types or relating artefacts could have

been deposited during different occupational periods (Forsman 2014). However, this can be overcome through further inspection or excavation if possible.

5.2 Survey methods, design and techniques

The survey focused on ecological zones and areas which have not yet been surveyed by previous researchers. Preliminary survey on past field seasons and data collected by N. Kruger from his previous study provided a basic framework in which the survey could be structured. Previous knowledge of settlement types and locations informed survey strategies in regard to which areas would be surveyed. In doing so I was drastically able to reduces the study area by excluding areas which had already been surveyed and certain areas which were seen to have a low probability of sites such as the steep slopes of Mount Dowe and deep sands between the Bosbokpoort fault on Frampton and the Thsirundu Hills.

Though these areas had been sampled during previous field seasons. The survey targeted areas that had not yet been surveyed, areas that showed the highest likely hood of identifying sites and ecological zones relating to soil types, geology, vegetation types and land types which had not yet been sampled. This study uses the term *site* to includes special purpose sites, occupational sites, surface scatters, and off site finds, the same- Willcox (1999) refers to as features (c.f. Forssman et al 2014). Google Earth was used to identify points of interest prior to the survey. Certain sites were visible from the satellite images such as mines which leave a dark grey discoloration on the soil and *Cenchrus ciliaris* growing on some kraal as well as sites with significant stone walling. The survey region was confined to the area within the reserve boundaries mainly cause the area was larger enough to constitute a definable region which was able contextualize previous site-based studies. Fortunately, this project was conducted during the winter months and the visibility of the area can be seen as almost 100% throughout the entire region.

As mentioned previously the Survey methodology was based on a nested survey strategy (see Burger 2004, Honeychurch 2007) with the aim of trying to get as much possible coverage within the time constraints of the project that would constitute to some extent a regional systematic survey. The surveys focus was around these areas which have not yet been surveyed and where known Mapungubwe period sites were

located. The time frame for the survey was 18 days divided into series field trips conducted between 2017 and 2018 recording over 100 sites.

The extensive regional survey made use of two methods. First, a site-less survey using two survey techniques: a targeted survey and a transect survey. Second, a site-specific survey.

The survey consisted of four fieldworkers each carrying a handheld GPS which recorded track logs while they were surveying. Once a site was identified the team would stop surveying and site-specific survey was initiated to establish the extent of cultural material and occupation phase. The only individual to take part in all the surveys was the author of this thesis and was solely responsible for all documentation and classification of features once identified during the initial sightless survey.

5.2.1 Site-less survey

The site-less survey makes use of two techniques to gather data firstly the a transect survey and secondly a targeted survey.

5.2.1a Transect survey

The transect survey employed linear orientated transects were spaced at a hundred meters as the foliage density was minimal and there was a ground visibility of between 90-100%, Lane (1996) argues that the visibility buffer of a transect can be as much as 50m, possibly larger when avoiding certain areas. Once the crew had reached a designated location within the survey area which was based on landscape features determined in the field or prior to the survey, they would shift along the axis and continue surveying in the opposite direction until the designated area had been completely covered. The transect survey focused on the flats and areas between the koppies, hills and ridges.

5.2.1b Targeted survey

The targeted survey focused on the tops and around the bases of the koppies, ridges and elevated areas. This method also used transects space at 100m where possible such as the base of koppies, but certain location like ridges and koppies make transects impossible. Previous research in the region has shown that these locations were preferred as settlement areas (Huffman 2007, Loubser 1989, Fletcher 2015).

5.2.2 Site specific survey

The Site-specific survey took place during the site-less survey once a site had been identified. A team of three performed a transect survey spaced at approximately 10-15 m. Transects were carried out until no cultural material was visible the team would shift along the axis and continue surveying in the opposite direction repeating this process until the full extent of the site had been established. During this process cultural material was recorded and photographed, this included various features such as walling, diagnostic ceramics, small finds, site layout. The information was relayed to the team leader which then recorded all the information pertaining to the site on recording sheets.

Vehicle surveys were used as it allowed for wider coverage in less time. All roads on the reserve were driven stopping of at areas where sites might possibly be located. Vehicle surveys are less reliable in identifying archaeological features but when combined with a foot survey they prove to be quite helpful in increasing coverage.

5.3 Recording

All archaeological and environmental features were recorded using recording sheets (see Appendix B) specifically designed to gather as much data as possible in regard to the relationships between the environment and the surrounding sites. A Garmin Oregon 650 was used to record all the sites' locations. The data input of the GPS contained the site name, co-ordinates, altitude and basic description relating to period and site finds. Each site was then recorded on a site form providing a more comprehensive description then that of the GPS. Recording the site name, co-ordinates, altitude, time period, location, size, all ecological variables (habitat type/plant communities, geology, soil types), animal activity, erosion and settlement period. The amount and type Artefacts and features were also recorded followed by general description of the site and a small site sketch. If a more detailed plan was needed it would be sketched on graph paper.

Initially, the intention was to perform a site-less survey recording all archaeological material within the reserve irrespective of type or density to limit bias or skewed results (Foley 1981, Fish & Kowalewski 1990). This was unfortunately only achieved in regards Iron Age and historical material and not Stone Age material as due to time constraints. I decided to only record stone age material if it exceeded 4 artefacts or if artefact scatter was within an approximate radius of 10m. Sites were then grouped

into their respective time periods Early Iron Age (ESA), Middle Stone Age (MSA), Late Stone Age (LSA) Early Iron Age (EIA), Middle Iron Age (MIA), Late Iron Age (LIA), Historical (HIS). All Iron Age material was classified according to existing typologies from Huffman's (2007) ceramic typology, glass bead typology from Wood (2008. Huffman's (1989) walling and settlement typology for the northern Soutpansberg were used as well as other chronological sensitive markers.

5.4 Data analysis

After field work Ink Scape was used to digitise ceramic drawings. All information recorded on the recording sheets was captured on Excel spread sheets and Microsoft word. Microsoft Excel was used as a platform for data storage and Analysis. An Excel spread sheet containing all survey data pertaining to site name, site co-ordinates, time period, date identified, and description was then uploaded to Esri's ArcMap 10.6 and overlaid onto digital maps pertaining to geology, soil types, contours, land type, plant communities, water sources and satellite imagery. These maps were then used to understand the spatial relations between these sites and their relations to the environment.

The maps relating to geology, soil types, land types and plant communities where digitised and georeferenced using the WGS 1984 co-ordinate system. The data from the excel spread sheets were overlaid onto the various digital map layers to establish what environmental resources a specific site was situated within. Proximity analysis was used to establish distance to water sources from sites. Before doing this the co-ordinated system was changed to a projected co-ordinate WGS 1984 UTM Zone 36S. Each map depicted with sites has and associated table created in excel and a graph generated through the software Jump.

Buffer analysis was conducted to establish what resources (geology, soil types, land types and plant communities) fell within a 4km radius of the site as well as establish the carrying capacity with a 4km radius. The carrying capacity was calculated by dividing the carrying capacity of a specific vegetation type by the area it occupies within a 4km radius. Areas with missing data were given values by calculating the average carrying capacity of the available data within the 4km radius. The total number of LAU's per vegetation type were added up to give a total no of LAU 'within a 4km radius of the site/sites. The current carrying capacity of Maremani

Nature Reserve is 2113 LAU which can be divided up into browsers 1229 LAU or 2927 BU (58,16%) and Grazers 884 LAU (41,83%). These percentages were used to calculate the total no of LAU's for grazer and browser within the 4km buffer zone. To cover LAU of browsers to BU's divide LAU by 0,42 for a total of 2927 Browsers.

The methodology above was able to provide sufficient and viable data within a short time frame. The following two chapters will discuss the results of the survey and analysis.

Chapter 6 - Results and Analysis

During this Survey 103 new sites were identified in Maremani Nature Reserve.

Combined with results of previous surveys, total number of identified sites on Maremani to is 202.They range from the Early Stone Age through to the mid-20th century.

Table 6-1: Sites identified on Maremani Nature Reserve including multiple occupation sites

Time Period	Unknown	Early Stone Age	Middle Stone Age	Late Stone Age	Early iron Age	Middle Iron Age	Late Iron age	Terminal iron age	Historical
This Study	2	2	11	14	1	4	56	6	34
Previous Studies	4	2	8	2	1	3	30	5	33
Total Sites	6	4	19	16	2	7	86	11	67

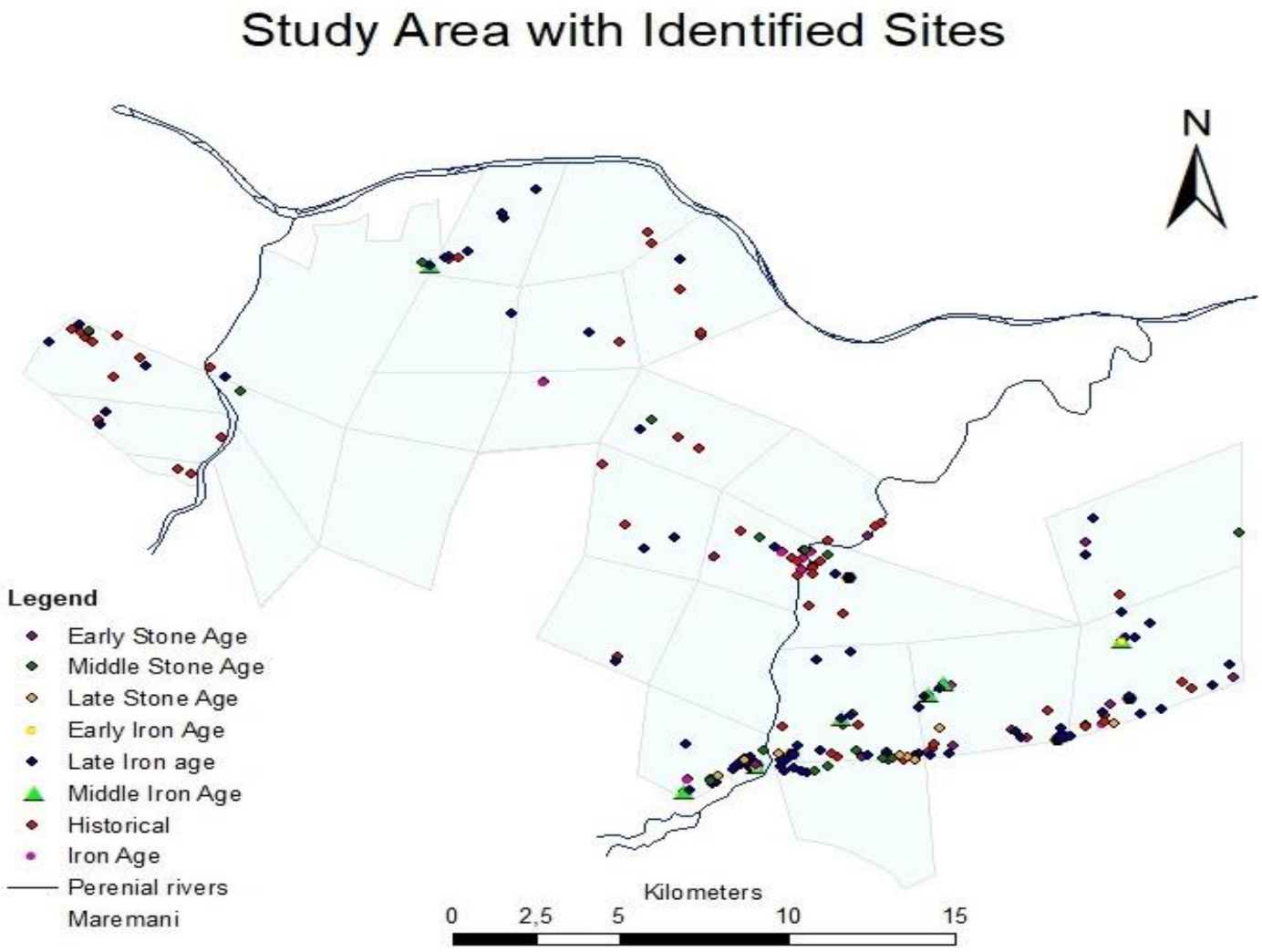

Figure 6-1: Study area with identified sites

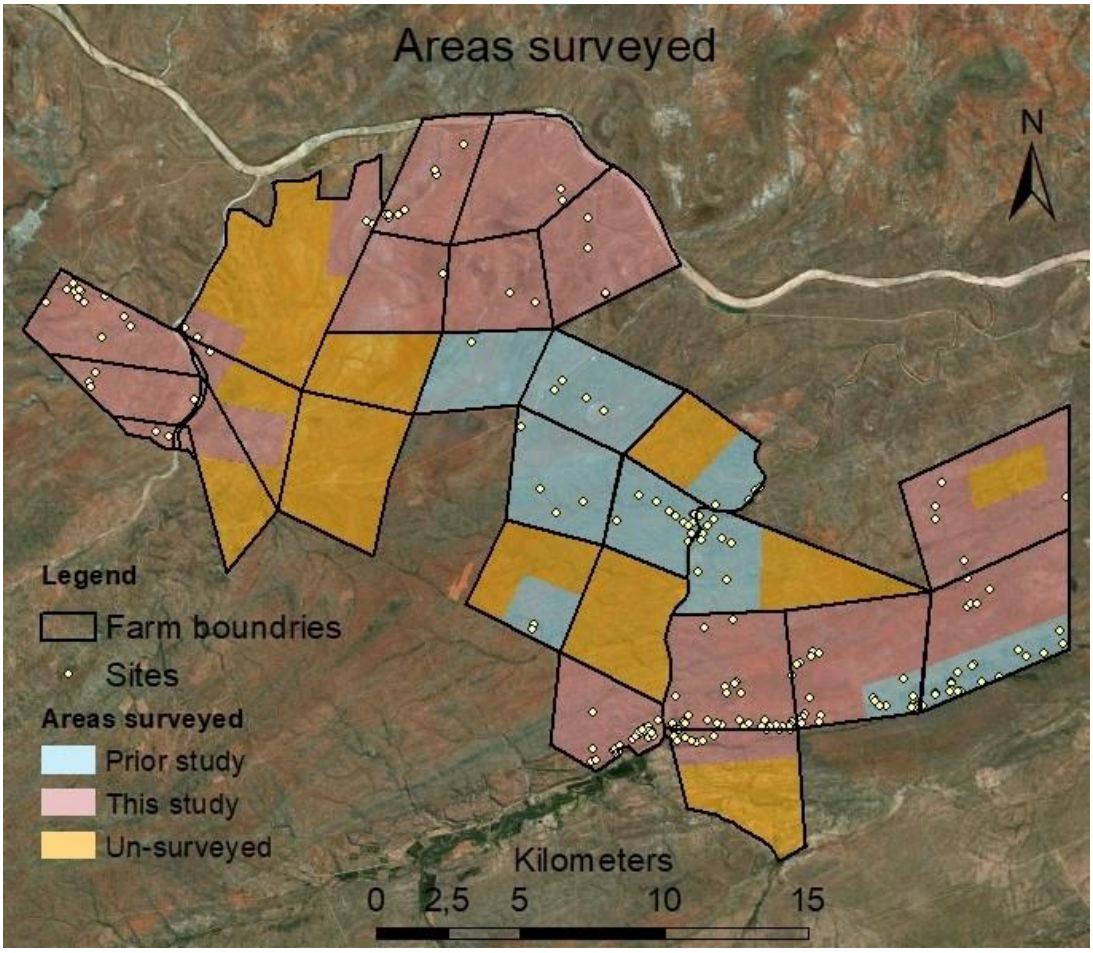

Figure 6-2 Areas surveyed on Maremani Nature Reserve.

Sites identified during the survey

6.1 Early Stone Age sites

MNR 275

S -22.49091 E 030.25846 Altitude: 541m Time period: Early and Middle Stone Age

Date discovered: 02/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 142m Geological formation: Clarens

Geology: arenite Site Type: MSA/LSA artifact scatter and rock shelter

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket)

Site description: The site is a rock shelter situated at the edge of a plateau in a ravine leading down to the flood plains of the Nzhelele. It consists of some low roughly packed stone walling approximately 15m long running from east to west and a small platform approximately 1m wide and 4m long extending out the back of the shelter. Both the walling and platforms are under 0.5m long. Material culture consists of some Early and Middle Stone Age debitage.

Site interpretation: The low informal walling and platforms cannot be ascribed to a certain time period but likely dates to the to some point in the Iron Age.

Figure 6-3 southern section of the shelter with wall feature

b.

Figure 6-4centre of shelter with a filled in platform

6.2 Middle Stone Age sites

MNR 253

S -22.42116 E 030.35530 Altitude: 484m Time period: Early and Middle Stone Age

Date discovered: 28/06/18 Farm: Woodhall 35 Farm mineralogy: graphite, iron

Land type: Fc484 River proximity: 1268m Geological formation: Malala Drift

Geology: gneiss Site Type: Settlement/production site

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane* - *Catophractes alexandri* - *Vernonia cinarescens* low and dense bushveld (Mopane - Trumpet thorn - *Vernonia* low and dense bushveld).

Site description: The site is a medium density Middle and Early Stone Age scatter situated at the base of a large koppie with a stream approximately 80m to the east. It

consists of debitage and formal tools which are located around the entire base of the koppie, however the material scatter does seem to be denser on the southern side.

Preliminary interpretation: The site was likely a stone age settlement/production site.

6.3 Late Stone Age sites

MNR 262

S -22.49563 E 030.245097 Altitude: 498m Time period: Middle and Late Stone Age; Late Iron Age

Date discovered: 01/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land Type: Ib314 River proximity: 656m Geological formation: Solitude and Klopperfontein Geology: shale Site Type: overhang

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of a rock shelter facing south and overlooking a non-perennial waterfall which is 60m south of the shelter. The shelter is approximately 20mx5m² and runs east to west. The rock shelter can almost be divided into two sections by boulders in the middle of the cave. The eastern section has rock art of three different figures against the back wall of the shelter. The first a picture is some sort of antelope which is unidentifiable as the head is no longer visible. The second consists of a small circle with what seems to be a human figurine spread out with its legs and arms touching the inner circumference of the circle. The third figure has faded to the point that it is almost unidentifiable and could possibly resemble a loin cloth which can only be distinguished by some traces of red ochre. Almost all the paintings were executed using red ochre, however white was also used on the antelope's legs. The floor of the eastern side has three upper grinding stones with a high-density pocket of Late Stone Age debitage in the eastern corner. The western side of the shelter has a low informally packed wall with two sharpened lead wood logs. These logs where most probably used as fencing at the entrance of the shelter. There is also a mud grain bin which seems to have burned down and collapsed. There

is a low density Late Stone Age artefact scatter in the cave along with some Middle Stone Age tools. Deposit seems to be in-situ.

Preliminary interpretation: The site is a multiple occupation site consisting of MSA, LSA, and LIA material. The stone age material consists of formal stone tools and debitage as well as some hunter gather paintings. The overhang most probably acted as a cool shaded place to escape the heat of the day as it is significantly cooler under it. The Late Iron Age material is associate with food storage likely due to the dry conditions in under the overhang and food processing likely due it being cooler to work under the overhang as seen in the presence of grind stones.

a.

Figure 6-5: view of shelter from the west

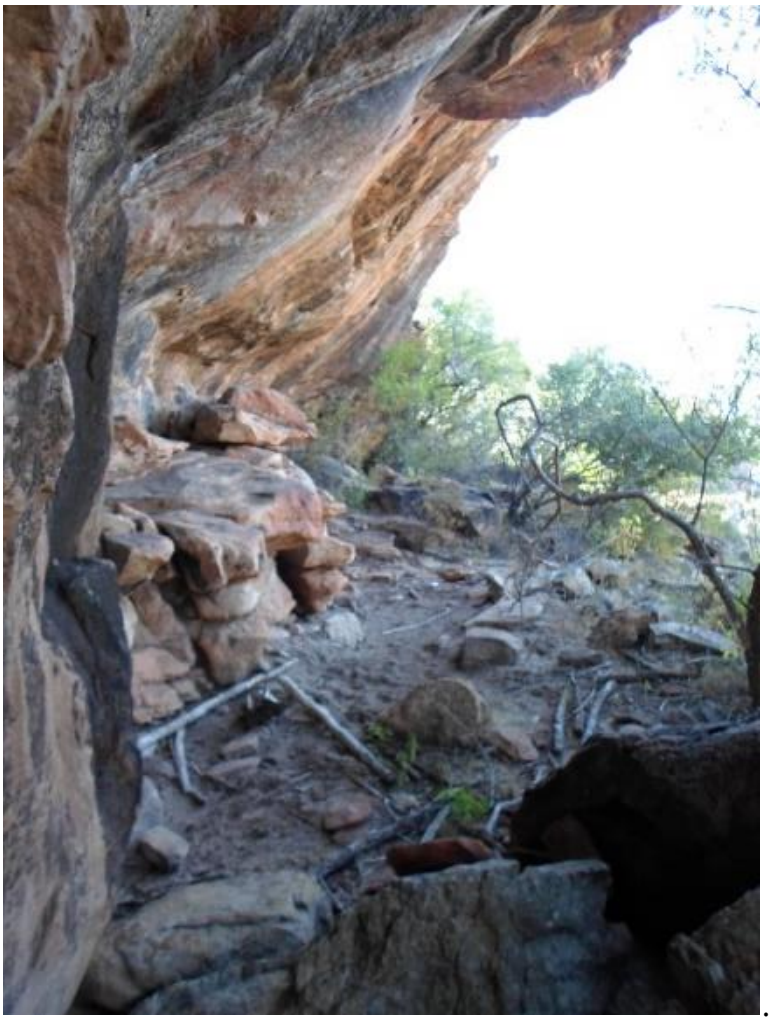 .

Figure 6-6: side view of shelter from the north.

Figure 6-7 northern most section of the shelter with some partially burnt wooden steaks

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Figure 6-8: section of shelter with rock art images

Figure 6-9: picture of antelope without a head painted in red with white horizontal lines on its front legs

Figure 6-10: rock art image with an unidentifiable pattern within a circle painted in red

Figure 6-11: rock art image of a possible loin cloth painted in red

MNR 290

S -22.48910 E 030.30270 Altitude: 522m Time period: Late Stone Age

Date discovered: 14/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 1098m Geological formation: Clarens

Geology: arenite Site Type: low density Late Stone Ages density scatter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of a low density Late Stone Age scatter and is situated at the base of a rocky outcrop

Preliminary interpretation. The site is a low density Late Stone Age scatter and its location is possibly geology preferences in the area as some tools are made from a type of geology identified in the surrounding area

MNR 292

S -22.48848 E 030.30023 Altitude: 527m Time period: Late Stone Age

Date discovered: 14/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 154m Geological formation: Clarens

Geology: arenite Site type: low density Late Stone Age scatter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is a low density Late Stone Age scatter situated on the plateau in an open area.
Preliminary interpretation: The site is a low density late stone age scatter

MNR 293

S -22.48928 E 030.29815 Altitude: 538m Time period: Middle and Late Stone Age

Date discovered: 14/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 124m Geological formation: Clarens

Geology: arenite Site type: low density Late Stone Age scatter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Sclerocarya birrea - Aristida stipitata - Eragrostis lehmanniana* open grass and bushveld (Marula - Long-awned three-awn - Lehmann's love grass open grass and bushveld).

Site description: The site consists of a low density Later Stone Age and Middle Stone Age scatter situated round the base of a rocky outcrop near to a non-perennial river.

Preliminary interpretation: The site consists of a low density Late Stone Age stone tool scatter

MNR 294

S -22.49018 E 030.29713 Altitude: 556m Time period: Late Stone Age

Date discovered: 14/08/18 Farm: Solitude 111 Farm mineralogy: none

Land type: Ib314 River proximity: 886m Geological formation: Clarens

Geology: arenite Site type: low density Late Stone Age scatter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Sclerocarya birrea - Aristida stipitata - Eragrostis lehmanniana* open grass and bushveld (Marula - Long-awned three-awn - Lehmann's love grass open grass and bushveld).

Site description: The site is situated on the plateau in an open area and consists of a high density Late Stone Age scatter with stone tool debitage and formal tools

Preliminary interpretation: The site consists of a low density Late Stone Age stone tool scatter and is possibly located in the area due to its seclusion.

MNR 303

S -22.49199 E 030.27951 Altitude: 558m Time period: Middle and Late Stone Age

Date visited: 15/08/18 Farm: Solitude 111 Farm mineralogy: none

Land type: Ib314 River proximity: 3695 Geological formation: Clarens

Geology: arenite Site type: low density Late Stone Age scatter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is also referred to as 'Shelter of the moon' by Eastwood who complied the RA report for Maremani. There is a small koppie on the plains with rock art on the southwestern side of the koppie. Ten meters to the west there is a low-density Middle Stone Age and Late Stone Age scatter.

Preliminary interpretation: The site is a rock shelter with Khoe Khoen rock paintings

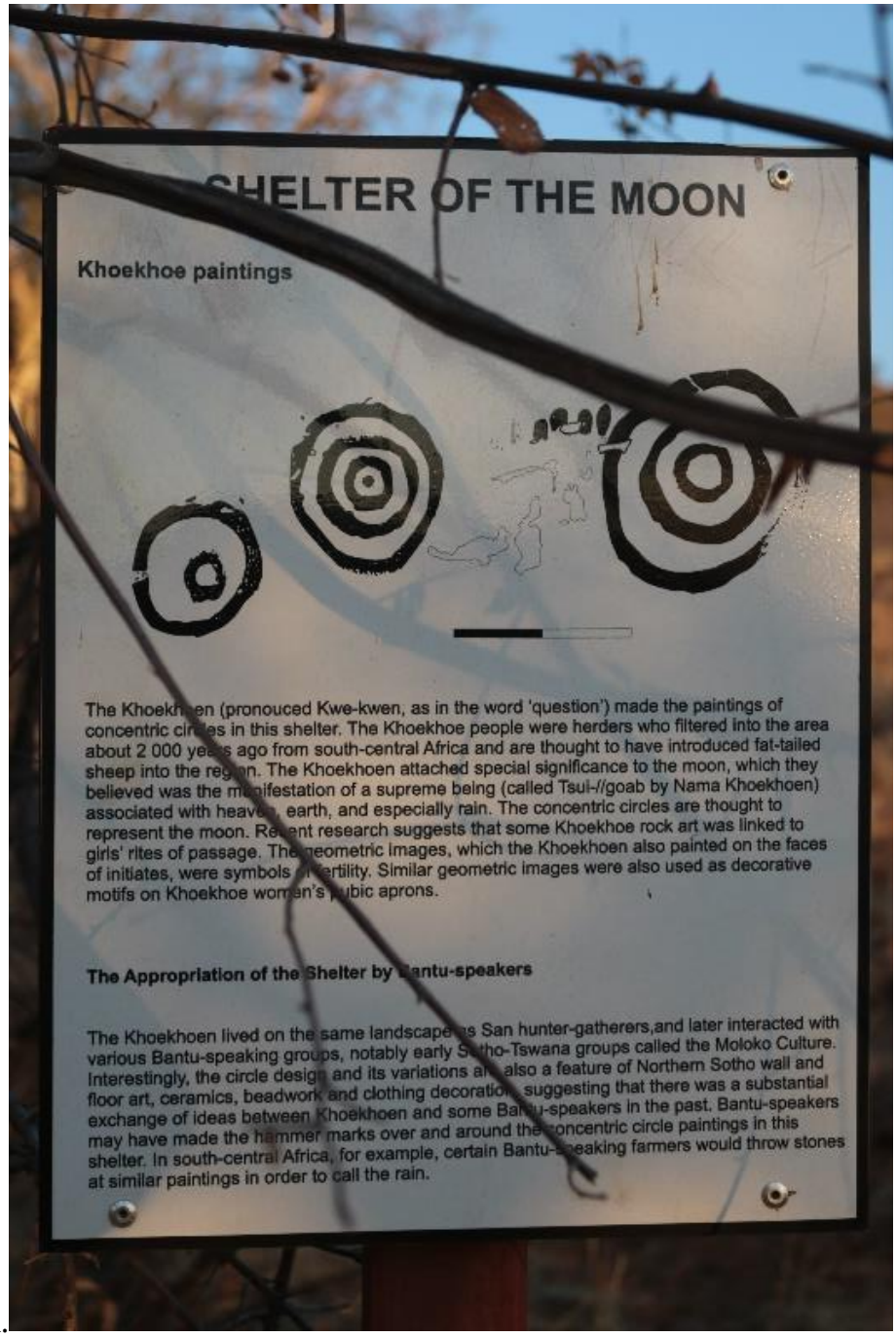
a. 

Figure 6-12: plague with information on the KhoeKhoe and their rock art

MNR 297

S -22.48930 E 030.29537 Altitude: 543m Time period: Middle and Late Stone age

Date discovered: 15/08/18 Farm: Dawn 71 Farm mineralogy: graphite. Magnesite

Land type: Ib314 River proximity: 302m Geological formation: Clarens

Geology: arenite

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of a rock shelter which is west facing and contains Middle and Late Stone Age material. The Shelter is located at the base of a ridge at the southern end. The shelter is approximately 10m long and 4m deep with quite a substantial deposit inside and outside of the shelter.

Preliminary Interpretation. The site is an overhang with a medium density scatter of Middle and Late Stone Age Material and an ostrich eggshell bead. The shelter could have possibly been used as an occupation space for short periods of time. There is also a small geological seam located 100m south east which has the same geological properties as some of the stone tools identified on the site.

Figure 6-13: Eastern view of shelter

Figure 6-14: northern view of shelter

MNR 306

S -22.48730 E 030.26930 Altitude: 546m Time period: Late Stone Age

Date discovered: 16/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 2675m Geological formation: Clarens

Geology: arenite Site type: rock art

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Acacia tortilis* - *Eragrostis lehmanniana* old fields (Umbrella thorn - Lehmann's love grass old fields).

Site description: The site is a north facing overhang with a single rock art image. It is situated on the northern side of the Tshirundu plateau edge. The rock art image is redd in colour with three vertical lines attached to a horizontal line and a possible circle connected to the left bottom corner.

Preliminary Interpretation: The site is a late stone age site with rock art in the overhang

Figure 6-15: southern view of a shelter with a singular rock art image

6.4 Early Iron Age sites

MNR 274

S -22.49050 E 030.25838 Altitude: 536m Time period: Early Iron Age

Date discovered: 02/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 276m Geological formation: Clarens

Geology: arenite Site Type: smelting site

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: MNR274 is an Early Iron Age smelting site situated in a rock shelter located at the edge of a plateau in a ravine leading down to the flood plains of the Nzhelele. The shelter itself is approximately 5x4m² in size and is south facing with some roughly packed stone walling on the eastern side of the shelter and only 2m long and about 0.5m high. The front of the shelter has some large flat stones to make a small flat surface in between theses stones and the rock shelter wall is a small ashy deposit approximately 2x2m² with a large flat stone in the centre. Material culture consists of a lower elongated grinding stone, daga, slag and one ceramic sherd. The site is most likely an Early Iron Age smelting site.

Preliminary interpretation: The site seems to be an Early Iron Age smelting area. Likely situated in its location due to its seclusion and proximity to the Nzhelele River.

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Figure 6-16: north facing view of the shelter

6.5 Late Iron Age sites

MNR 227

S -22.37861 E 030.07109 Altitude: 469m Time period: Late Iron Age

Date discovered: 31/08/17 Farm: Berkenrode 45 Farm mineralogy: none

Land type: Ae266 River proximity: 505m Geological formation: Mount Dowe

Geology: quartzite Site type: Late Iron Age settlement

Soils: Soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime generally present in part.

Vegetation: *Colophospermum mopane* - *Kirkia acuminate*- Acacia *erubesoens* plains bushveld and woodland (Mopane - White syringe - blue thorn plains bushveld and woodland).

Site description: The site seems to be a late Iron Age settlement. It is situated on and between two koppies all the walling platforms and terracing occurs on the western

side of the southern koppie. There are multiple upper and lower grinding stones as well as hammer stones along the western side of the koppie with a light ceramic scatter in front of the northern koppie. In front of the two koppies to the west are multiple areas of ashy deposit of which the context is unsure. There is slag scattered throughout the site of which the majority is copper as well as daga and tuyeres and a small furnace for smithing at the base of the northern koppie. Three diagnostic ceramic sherds are characteristic of the Letaba facies and therefore can be no earlier than AD 1550 (Loubser 1989) but also no older than the late 18th century as it displays no similarity to the later formalised walling found in the southern area of the reserve.

Preliminary Interpretation: The settlement is likely an settlement linked to the copper production and working. The reason why I suspect it is and settlement site is due to the multiple upper and lower grindstones that are associated with the processing of cereals and generally associated with domestic spaces and households. While the settlement is linked to the copper processing process more likely related to smithing than smelting as copper slag was identified on the site but no copper ore. A small smithing furnace was also found.

This site MNR 227 is likely related to site MNR 228 as it is located approximately 150m south of it and displays similar material culture and function relating to copper production and processing.

Figure 6-17: north easterly facing picture of site

Figure 6-18 View of the site from the top of the southern koppie with walling in the bottom of the image

MNR228

S -22.37423 E 030.07293 Altitude: 464m Time period: Late Iron Age

Date discovered: 31/08/17 Farm: Berkenrode 45 Farm mineralogy: none

Land type: Ae266 River proximity: 673m Geological formation: Mount Dowe

Geology: quartzite Site type: Late Iron Age smelting site

Soils: Soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils, Lime generally present in part.

Vegetation: *Colophospermum mopane - Kirkia acuminate-* Acacia *erubesoens* plains bushveld and woodland (Mopane - White syringe - blue thorn plains bushveld and woodland).

Site description: The site is situated at the base of a koppie. There appears to have been three smelting furnaces each of which have large quantities of slag, vitrified tuyères and fragments of furnace walls. All material is situated on the western and northern side of the koppie. with the majority of copper ore occurring at the base of the northern side A piece of copper ribbon wire was also found on the western side where the suspected forges where located. No diagnostic ceramics were identified. Though the site is possibly associated with MNR 227 as it is located approximately 150m north of it and displays similar material culture.

Preliminary Interpretation:

This site does not seem to be an settlement site like the adjacent MNR227, as there is no evidence of artefacts associated with domestic spaces such as lower or upper grindstones. Instead, there is evidence for ore processing and smelting on this site which MNR 227 did not have. If this is in fact the same community utilising two alternate locations one for occupation and the other production of copper.

Figure 6-19: koppie with cultural material at the bottom

Figure 6-20: open area with remains of a furnace

MNR 229

S -22.35175 E 030.05661 Altitude: 521m Time period: Late Iron Age

Date discovered: 31/08/17 Farm: Singelele 6 Farm mineralogy: copper

Land type: Ae266 River proximity: 2487m Geological formation: Mount Dowe

Geology: quartzite Site type: Late Iron Age settlement

Soils: Soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime generally present in part

Vegetation: *Colophospermum mopane - Boscia albltrunca - Terminalla prunioides* open to dense bushveld on plains and low rocky hills (Mopane - Shepherds' tree - Lowfeld cluster-leaf open to dense bushveld on plains and low rocky hills).

Site description: The site is a Late Iron Age settlement situated opposite to a service gate on the western side of the Malala drift road. The site consists of a complex of koppies with scatters of archaeological material on and around them. There are two middens with associated faunal material and undiagnostic ceramics. Copper ores are scattered throughout the site. There are some ashy deposits with no cultural material other than slag and tuyères indicating possible smithing or smelting areas. There is a road running through one of the middens and evidence of modern dumping of trash and rubble is present.

Preliminary Interpretation:

The site is related to copper production and most likely smithing as there is copper ore and slag located within the site.

Figure 6-21: koppie where site is situated

MNR 233

S -22.36387 E 030.10728 Altitude: 429m Time period: Late Iron Age

Date discovered: 01/09/17 Farm: Vryheid 8 Farm mineralogy: Alluvial diamonds, copper, corundum

Land type: Fc483 River proximity: 221m Geological formation: Mount Dowe

Geology: quartzite Site type: Late Iron Age settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Boscia albltrunca - Terminalla prunioides* open to dense bushveld on plains and low rocky hills (Mopane - Shepherds' tree - Lowfeld cluster-leaf open to dense bushveld on plains and low rocky hills).

Site description: The site consists of four terraced platforms with low informal walling approximately 30cm high, all the terraced areas are approximately 2x1m in size and are situated on the western side of a dolerite outcrop. No material culture is present. There is a perennial river/drainage line on the western side of the koppie. The terrain is rugged with steep slopes and lots of loose rocks. The site does not seem to

have been inhabited for a long time, if there was any deposit it was likely washed away.

Preliminary Interpretation:

The site has little to offer in the form of interpretation as there is not enough material culture associated it with. It is likely it was occupied for a short time period but long enough to warrant some labour input into its formation. It is likely related to the Iron Age due to its layout and informal walling.

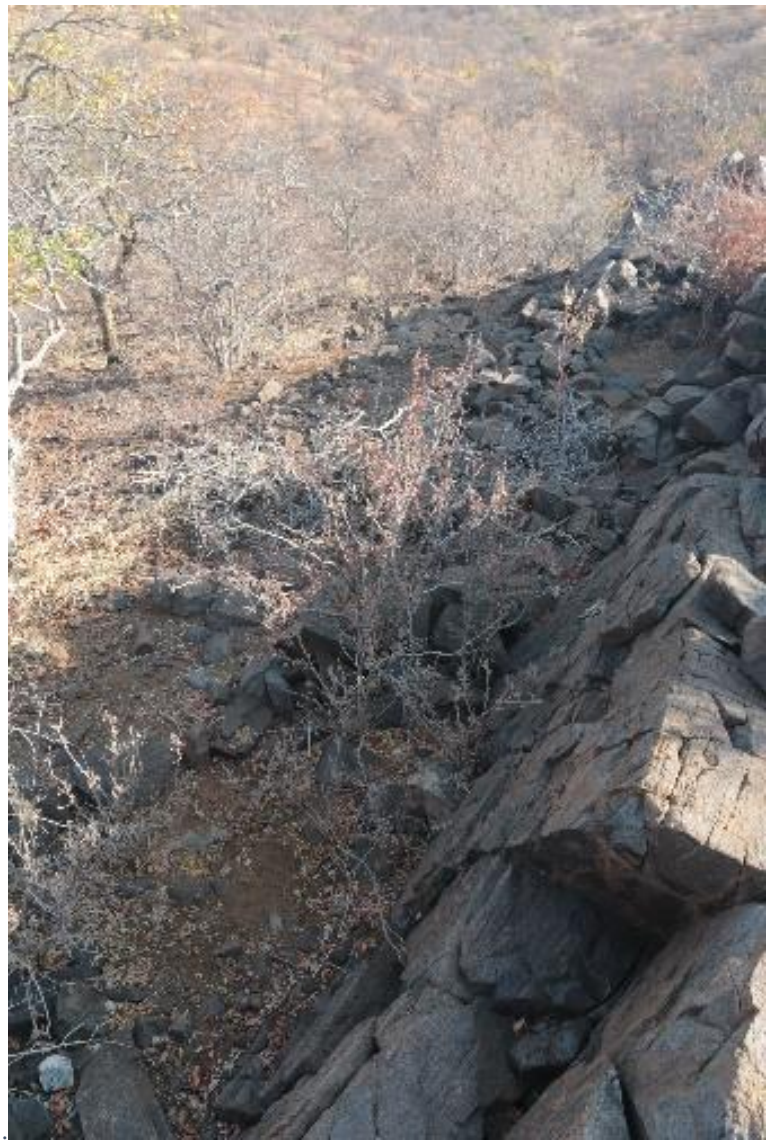

Figure 6-22: informal walling feature at the base of the ridge with terraced area and low walling feature approximately 30cm in height

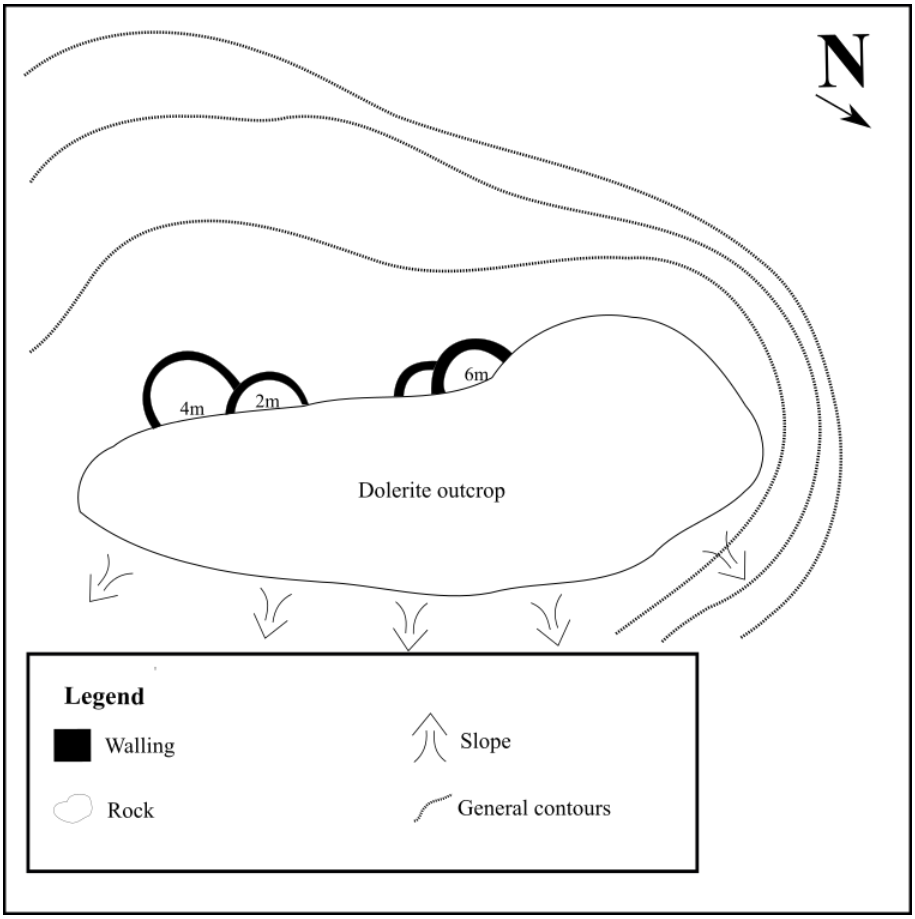

Figure 6-23: Site drawing of MNR 233

MNR 237

S -22.32825 E 030.24004 Altitude: 489m Time period: Late Iron Age

Date discovered: 02/09/17 Farm: Twilight 16 Farm mineralogy: iron, magnesite

Land type: Fc484 River proximity: 1277m Geological formation: Mount Dowe

Geology: quartzite Site type: Late Iron Age settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Boscia albltrunca - Terminalla prunioides* open to dense bushveld on plains and low rocky hills (Mopane - Shepherds' tree - Lowfeld cluster-leaf open to dense bushveld on plains and low rocky hills).

Site description: The site is an Late Iron Age settlement situated on the western side of a ridge below a koppie to the south. The site runs along a ridge from south to north with a dirt road cutting through the site near the base of the koppie. On the northern

side of the road there is a kraal approximately 20x20m in size with a light ceramic scatter and some burnt bone. Above the kraal and between the hill ridges are multiple upper and lower grinding stones with three grain bin bases. As one moves north along the ridge there are lower and upper grinding stones along with polishing stones. On the southern piece of the road there are large upper grinders and a low density ceramic scatter. The ceramics seem to be part of the Letaba facies and there are a total of fifteen lower and six upper grinding stones. There are no historical artifacts potentially suggesting 17th - 18th century date.

Site interpretation:

The site is a Late Iron Age settlement. The large number of grain bin stands and grinding stones suggests a farming focus.

Figure 6-24: kraal

Figure 6-25: domestic area with upper grinding and polishing stones

MNR 242

S -22.31413 E 030.18908 Altitude: 508m Time period: Late Iron Age

Date discovered: 24/04/18 Farm: Bokveld 12 Farm mineralogy: chromite, corundium, iron

Land type: Fc484 River proximity: 1133m Geological formation: Messina

Geology: anorthosite Site Type: Settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Catophractes alexandri - Vernonia cinarescens* low and dense bushveld (Mopane - Trumpet thorn - *Vernonia* low and dense bushveld).

Site description: This Late Iron Age site is situated on top of a koppie at the end of a ridge that runs north east to south west. There are large lower and upper grinding stones present, however there is no intact deposits with only a light ceramic scatter on the surface.

Preliminary Interpretation: The site is likely a short term seasonal settlement relating to farming activities as there are old fields pointing to the faring potential within the area

MNR 243

S -22.32645 E 030.17196 Altitude: 491m Time period: Late Iron Age

Date discovered: 24/04/18 Farm: Bokveld 12 Farm mineralogy: chromite, corundium, iron

Land type: Fc484 River proximity: 1178m Geological formation: Messina

Geology: anorthosite Site Type: Settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Catophractes alexandri - Vernonia cinarescens* low and dense bushveld (Mopane - Trumpet thorn - *Vernonia* low and dense bushveld).

Site description: The site is related to the Late Iron Age (Letaba ceramic facies) and is situated on top of a hill. The site contains one grain bin base, an upper and a lower grind stones and a scatter of copper ore along with some slag and a possible hut floor in the centre of the site. The site has a stream running along the base of the hill to the west and a possible 3x3m mine to the north.

Preliminary Interpretation: The site seems to be an settlement relating to mining and metal production or processing.

Figure 6-26: Small 3 x 3m mine

Figure 6-27 hut foundation

MNR 244

S -22.32635 E 030.17294 Altitude: 506m Time period: Late Iron Age

Date discovered: 24/04/18 Farm: Bokveld 12 Farm mineralogy: chromite, corundium, iron

Land type: Fc484 River proximity: 2069m Geological formation: Messina

Geology: anorthosite Site Type: Settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Combretum aplculatum - Portulacaria afra* mountain bushveld.

Site description: Site seems to be Late Iron Age settlement and is situated along the same ridge as MNR 243. The ridge runs west to east with a gradual slope to the south. There are multiple stone circle scattered across the site and some possible grain bin bases. There is a small terrace on the ridge where there are multiple lower and upper grinding stones and two undiagnostic ceramic sherds. Further west from the domestic area vegetation starts to get less and there are open areas where all the stones have been removed. There is a possible hut due to a mound of khaki coloured soil, while rest of the site has very little deposit on the surface.

Preliminary Interpretation: The site is an settlement likely situated in the location to utilise the soils for farming as there is evidence of cleared fields close to the site.

Figure 6-28: Some low informal stone walling feature 3 x 3m in size

Figure 6-29: location of hut foundation

MNR 248

S -22.48016 E 030.31197 Altitude: 507m Time period: Late Iron Age / Late Stone Age

Date discovered: 26/04/18 Farm: Frampton 72 Farm mineralogy: none

Land type: Ac263 River proximity: 1456m Geological formation: Clarens

Geology: arenite Site Type: Settlement

Soils: Soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime is generally present in parts.

Vegetation: *Colophospermum mopane - Catophractes alexandri - Vernonia cinarescens* low and dense bushveld (Mopane - Trumpet thorn - *Vernonia* low and dense bushveld).

Site description: A Late Iron Age serttlemtn with Letaba ceramics settlement that is consisting of a kraal with vitrified dung, grain bin base a since lower grindstone made from sandstone and three upper grind stones. The kraal is approximately 10 x15m and with large amounts of vitrification. There are two roads running through the site from east to west and north to south. There is evidence of recent activities on the site such a area where cement was mixed f. Two diagnostic ceramics were found which were burnished black as well as some LSA microliths towards the southern side of the settlement.

Preliminary Interpretation: The site is a late Iron Age site likely utilising farmable soils and vegetation for grazing.

Figure 6-30: grain bin base

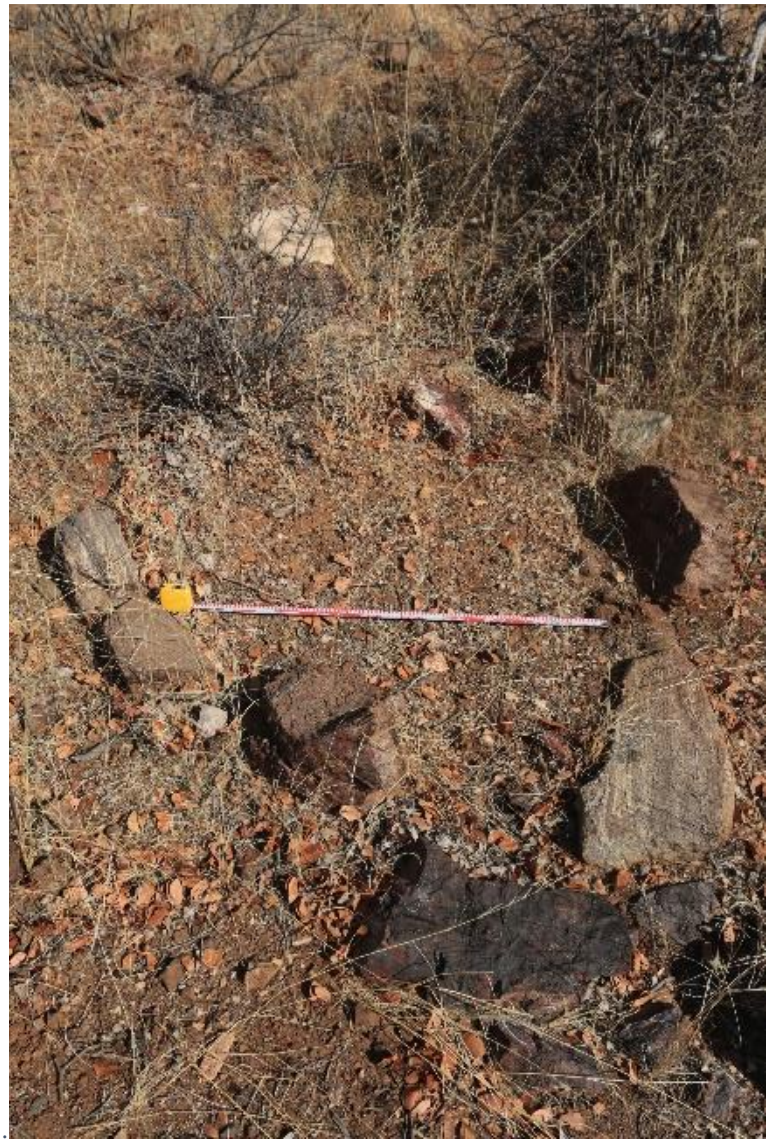

Figure 6-31: rocks placed in a circle

MNR 251

S -22.42517 E 030.35556 Altitude: 481m Time period: Late Iron Age

Date discovered: 28/06/18 Farm: Woodhall 35 Farm mineralogy: graphite, iron

Land type: Fc484 River proximity: 856m Geological formation: Malala Drift

Geology: gneiss Site Type: Settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane* - *Catophractes alexandri* - *Vernonia cinarescens* low and dense bushveld (Mopane - Trumpet thorn - *Vernonia* low and dense bushveld).

Site description: The site is situated on small ridge running east to west. There seems to be a lower grinding stone which has just started being used and an upper grinding stone and a possible grain bin base. No other material culture was present.

Preliminary interpretation: The site seems to have just been occupied for a short while before the occupants moved on.

MNR 254

S-22.41334 E 030.35803 Altitude: 488m Time period: Late Iron Age

Date discovered: 28/06/18 Farm: Woodhall 35 Farm mineralogy: graphite, iron

Land type: Fc484 River proximity: 1268m Geological formation: Malala Drift

Geology: gneiss Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Catophractes alexandri - Vernonia cinarescens* low and dense bushveld (Mopane - Trumpet thorn - *Vernonia* low and dense bushveld).

Site description: The site is an Iron Age settlement and is situated on a ridge running east to west. There is a stream which runs past the southern side of the ridge. The site consists of five lower and four upper grinding stones with a 1x1m midden 20m to the west.

Preliminary interpretation: The site seems to be an site associated with farming. This can be assumed due the lower and upper grinders. The site was not occupied for long as there is no substantial deposit and could possibly be linked to seasonal farming.

MNR 255

S-22.44367 E 030.36570 Altitude: 531m Time period: Late Iron Age

Date discovered: 28/06/18 Farm: Skrikbeek 73 Farm mineralogy: none

Land type: Ac263 River proximity: 218m Geological formation: Gumbu

Geology: marble Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Sclerocarya birrea - Aristida stipitata - Eragrostis lehmanniana* open grass and bushveld (Marula - Long-awned three-awn - Lehmann's love grass open grass and bushveld).

Site description: The site is likely a Late Iron Age settlement situated halfway up the southern side of a ridge which runs east to west. There is a road which cuts through the site exposing a midden. The midden is approximately 2 x 3m in size and is approximately 30cm deep. There is also an upper grinding stone and a small undiagnostic ceramic sherd.

Preliminary interpretation: The site seems to be a Late Iron Age settlement, possibly located here to utilise soils for faring.

Figure 6-32 southern view of site with midden located in the road

Figure 6-33: northern view of site with ridge top

MNR 256

S -22.44719 E 030.37344 Altitude: 553m Time period: Late Iron Age

Date discovered: 28/06/18 Farm: Skirbeek 73 Farm mineralogy: none

Land type: Ib314 River proximity: 1977m Geological formation: Letaba

Geology: basalt Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Croton gratissimus* - *Danthoniopsis dinteri* rocky outcrops (Lavender feverberry - Mountain grass rocky outcrops)

Site description: The site is situated on a ridge running east to west, and is most likely a Late Iron Age site. There is a small midden approximately 2x1m² in size with some bone and an upper grinding stone. Ten meters east of the midden there is a small open area in between rocks with a small low packed stone wall in front of it. In between this area and the midden there are three cupules. Five meters east of this open area there is another with an additional stone wall. Just below the stone wall there is a

packed platform with another three terraces directly east of it as well as three more platforms. No other material culture was identified however there were some sherds from a broken pot about 20m east of the site.

Preliminary interpretation: The site is a Late Iron Age settlement, and its location is likely due to its elevated position on the landscape and that it is situated above a possible water source as water can still sometimes be seen seeping through the rock. It's also located in close proximity to farmable soils and landscape types that have a high carrying capacity

Figure 6-34: terraced and walling area in the centre of the site

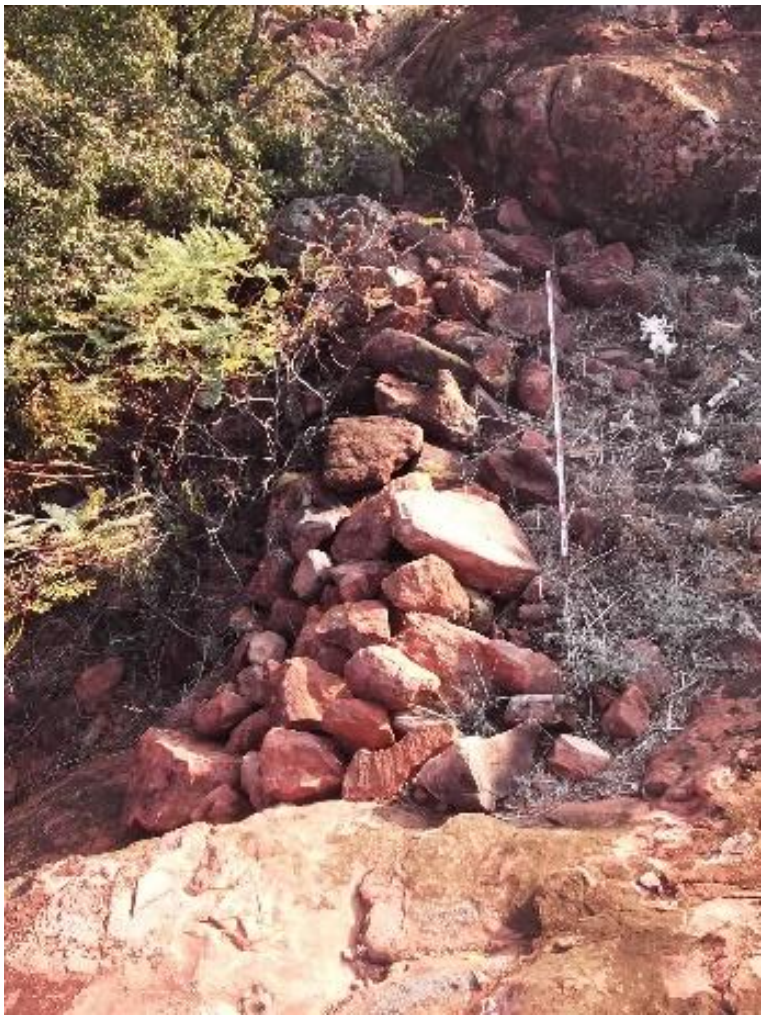

Figure 6-35: terraced platform

MNR 257

S -22.45185 E 030.36667 Altitude: 620m Time period: Late Iron Age

Date discovered: 29/06/18 Farm: Skirbeek 73 Farm mineralogy: none

Land type: Ac263 River proximity: 5157m Geological formation: Letaba

Geology: basalt Site Type: settlement

Soils: Soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime is generally present in parts.

Vegetation: *Croton gratissimus* - *Danthoniopsis dinteri* rocky outcrops (Lavender feverberry - Mountain grass rocky outcrops)

Site description: The site is possibly a late Iron Age cattle outpost situated on a ridge running east to west. There is a large paleo-sand dune on the north western side of the ridge which almost extends to the top off the ridge. Situated directly on top of the dune is a kraal which is approximately 15x15m² in size. It can be identified through colour changes in the soil as well as some nodules of vitrified dung. Just south of the kraal there is some semi-circular walling of which some has been washed away. There is also a low-density ceramic scatter in the surrounding area and one upper and lower grinding stone. There was also a metal implement which can be worn around the neck, presumed to be a sweat scraper. On the top of the ridge there is some roughly packed stones likely to demarcate space however they are barely distinguishable as well as some cupules.

Preliminary interpretation: The site seems to possibly be a cattle outpost as the defining feature of the site is the kraal with only evidence for one lower or upper grinding stone and one walling feature.

Figure 6-36: kraal on top of sand dune on the northern side of the ridge

Figure 6-37: kraal area on dune

MNR 258

S -22.45183 E 030.36904 Altitude: 598m Time period: Late Iron Age

Date discovered: 29/06/18 Farm: Skirbeek 73 Farm mineralogy: none

Land type: Ac263 River proximity: 5463m Geological formation: Letaba

Geology: basalt Site Type: settlement

Soils: Soils with minimal development, usually shallow on hard or weathering rock- with or without intermitted diverse soils Lime generally present in part.

Vegetation: *Sclerocarya birrea - Aristida stipitata - Eragrostis lehmanniana* open grass and bushveld (Marula - Long-awned three-awn - Lehmann's love grass open grass and bushveld).

Site description: The site seems to be of Late Iron Age period. It is situated at the base of a ridge running from east to west. The site is located on a sandy mound and consists of a kraal which is about 20 x 20m in size and has a deposit averaging 30cm

deep. There is a large lower grinding stone, two undiagnostic ceramic sherds and some daga. The kraal has been disturbed slightly by spring hares.

Preliminary interpretation: The site is a Late Iron Age settlement most likely located in the area for the high grazing potential and farmable soils.

Figure 6-38:b western view Site with kraal

Figure 6-39: southern view Site with kraal

MNR 260

S -22.49863 E 030.23950 Altitude: 542m Time period: Late Iron Age

Date discovered: 30/06/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 1078m Geological formation: Solitude and Klopperfontein Geology: shale Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site seems to be a Late Iron Age site due to stone walling and large lower grinding stones, most likely a Letaba site. The site is situated on a koppie on the plateau and is approximately 100m north of MNR259. On the southern section of the koppie there is a cistern and two cupules and a walled off area approximately 6x6m² wide. There are two large lower grinding stones and a small 0.5x0.5m midden within the walled area, the walls are approximately 0.5m high and are stacked roughly. Just above this on the top of the koppie there are two small areas which have been walled off.

Preliminary interpretation: The site is possibly an settlement. It is situated above the Nzhelele river where there are fertile flood plains with a high agriculture potential.

Figure 6-40: walled off section with midden

Figure 6-41: stacked rocks in-between boulders

MNR 264

S-22.49653 E 030.24613 Altitude: 508m Time period: Late Iron Age

Date discovered: 01/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 819m Geological formation: Solitude and Klopperfontein

Geology: shale Site Type: rock shelter

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is a small west facing rock shelter only 3x3m² in size situated on the southern part of the plateau edge and has some low packed walling 0.5m high and a filled platform with no other material culture.

Preliminary interpretation: The reason for the cultural feature within the overhand is unclear

Figure 6-42: shelter with wall in front of it

Figure 6-43: view inside of the shelter

MNR 265

S -22.49609 E 030.24676 Altitude: 523m Time period: Late Iron Age

Date discovered: 01/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 1584 Geological formation: Solitude and Klopperfontein

Geology: shale Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: Colophospermum mopane -Gardenia resiniflua - Tetrapogon tenellus low thicket (mopane - resiniflua - tetrapogon tenellus low thicket (mopane - resin gardena-tetrapogon low thicket)

Site description: The site seems to be of Late Iron Age due to the large lower grinding stones and is situated on the southern part of the plateau edge. The site is in an

isolated area between rocks and consists of a small midden, low density ceramic scatter, three upper grinding stones and four lower grinding stones.

Preliminary interpretation: The site location was likely occupied due its isolation and proximity to the Nzhelele and its flood plains.

MNR 267

S -22.49104 E 030.25411 Altitude: 567m Time period: Late Iron Age

Date discovered: 01/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 2467m Geological formation: Solitude and Klopperfontein

Geology: shale Site type: rock shelter

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is situated in a rock shelter at the base of a koppie. The shelter faces east with a large open area to the north. There are two platforms, one at the southern end of the shelter and the other 5m to the north with a small flat area in between the two. In front of the shelter there is a small 2x2m² midden. The material culture found consists of six upper grinding stones, one lower grinding stone, a green oblate bead, bone and a low-density ceramic scatter with only one undiagnostic sherd. On the western side of the shelter there is a small open area between a rocky outcrop with a small platform and a low-density ceramic scatter. MNR 270 is situated about 40m west of MNR 267 and the two are possibly related.

Preliminary interpretation: The shelter seems to be occupied for a short time period..

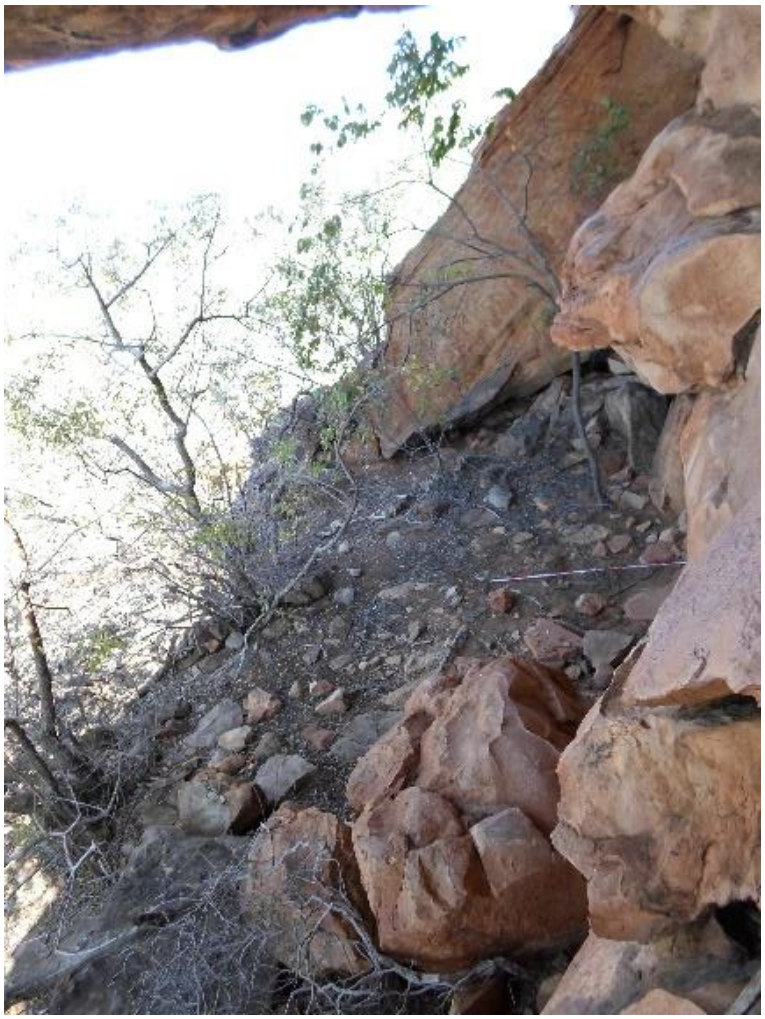

Figure 6-44: south facing view of the shelter

Figure 6-45: informal walling feature extending out of the shelter

MNR 268

S -22.49222 E 030.25199 Altitude: 572m Time period: Late Iron Age

Date discovered: 01/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 484m Geological formation: Solitude and Klopperfontein

Geology: shale Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is most likely a Late Iron Age site due to its large lower grinding stones. It is situated in between a rocky outcrop on a plateau, and it consists of a kraal with an approximate size of 10x10m, three large lower grinding stones, two polishing stones and two undiagnostic ceramics.

Preliminary interpretation: The site seems to be a Late Iron Age site utilising the floods plains of the Nzhelele River for farming and its surrounding vegetation for its high carrying capacity.

Figure 6-46: open area with domestic area in the front and the kraal towards the back

MNR269

S -22.49130 E 030.25281 Altitude: 576m Time period: Late Iron Age

Date discovered: 01/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 3623m Geological formation: Solitude and Klopperfontein

Geology: shale Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of three roughly packed stone walls which is slightly different to that of other Letaba period sites site is situated on a plateau just below the northern side of a ridge. The walling demarcates two spaces with two walls one 2m in size and another 4m big. Approximately 10m north of the walling there is a small midden approximately 2 x 2m in size but there does not seem to be much deposit. There are two upper grinding stones and four undiagnostic ceramics. Twenty meters south of the site on the ridge there are three small cisterns and a cupule. The site is approximately 40m west of MNR267 and the two are most likely related.

Preliminary interpretation: The site is a small late Iron Age site with minimal deposit and does not seem to be inhibited for a long time.

Figure 6-47: view of site from the north with ridge in the back and area with walling feature located against the ridge with the domestic area and the midden to the south

Figure 6-48: stone walling feature approximately 0,5m in height

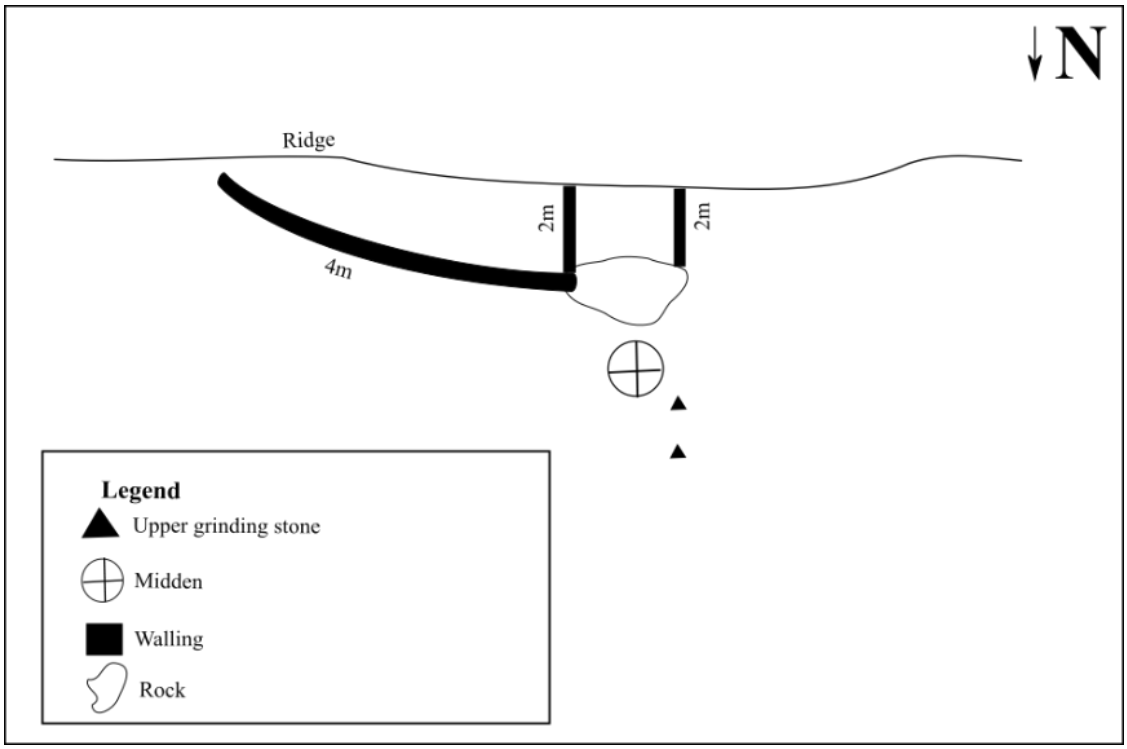

Figure 6-49: Site drawing for MNR 269

MNR 270

S -22.48997 E 030.25409 Altitude: 566m Time period: Late Iron Age

Date discovered: 01/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 1847m Geological formation: Solitude and Klopperfontein

Geology: shale Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site seems to be a Late Iron Age site situated between a rocky outcrop and a koppie. It is approximately 20x20m² in size and is covered by soil forming a mound. The site consists of some roughly packed stone walling situated at the centre of the mound. The walling is like that of MNR269 as the rocks are packed standing up straight instead of stacked on each other such as other formal walling found in Maremani Nature Reserve. There seems to be some ashy deposit which is most likely a midden washing out from under the soil. There are four undiagnostic ceramic sherds on the site and an upper grinding stone. There is also some walling on top of the koppie to the north.

Preliminary interpretation. The site seems to be a Late Iron Age settlement.

Figure 6-50: stone wall feature running east to west on a sand mound

MNR 271

S -22.48900 E 030.25561 Altitude: 555m Time period: Early Stone Age/Late Iron Age Date discovered: 01/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 28m Geological formation: Clarens

Geology: arenite Site Type: Rock shelter

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of two rock shelters situated at the base of a ridge which is situated on a plateau. Both shelters are on the southern side of the ridge. Infront of the larger shelter which is south facing there is roughly packed stone walling which is approximately 0.5m high and 15m in length. In the middle of the platform there are two filled platforms each about 2 x 2m in size. There is a low-density ceramic scatter with one diagnostic sherd and five upper grinding stones. The

smaller shelter that is west facing is approximately 10m away from the larger shelter. In-between the two shelters there are another two platforms which are directly next to the smaller shelter. The smaller shelter has a small wall in front of it and contains two upper grinding stones and one lower grinding stone. There is some Later Stone Age material present within the site.

Preliminary interpretation: The shelters seem to have been utilised for food processing and possibly occupation.

Figure 6-51: eastern view of shelter

Figure 6-52: walling features inside of the shelter

MNR 272

S -22.48845 E 030.25712 Altitude: 550m Time period: Late Iron Age

Date discovered: 02/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 135m Geological formation: Clarens

Geology: arenite Site Type: rock shelter

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of a rock shelter which is situated in an open area between a rocky out crop at the base of a small koppie on a plateau. The shelter is small, only about 3 x 3m in size with a wall-like feature in front of it and some packed stones to level the ground. There is one lower grinding stone but no other material culture.

Preliminary interpretation: The shelter seems to have been utilised for food processing and possibly occupation.

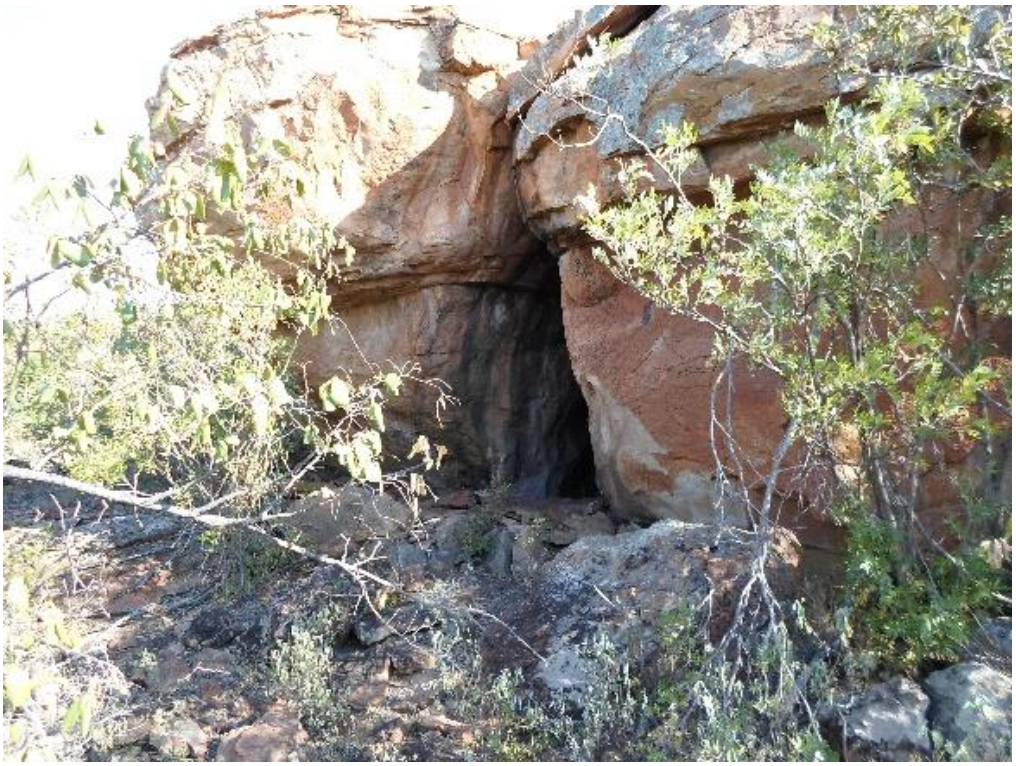

Figure 6-53: view of shelter from the south

MNR 273

S -22.49011 E 030.25829 Altitude: 568m Time period: Early Stone Age/Late Iron Age

Date discovered: 02/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 633m Geological formation: Clarens

Geology: arenite Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site seems to be a late Iron Age settlement and is situated at the edge of the plateau where the Singelele River cuts through the plateau. The site is

located on a large koppie. It is approximately 100 x 80m in size and consists of a large open area at the base of the koppie on the eastern side. This area is enclosed by walling packed in between rocks. Below this walling there is a large grain bin base to the north and light ceramic scatter 30m south. Above the open area to the west leading up to the koppie there are two packed platforms with some walling packed behind an open area above the platforms. To the south of this is a crevice in between rocks where there seems to be packed steps leading to the crevice where there is another platform. Above these two areas to the west there are another four platforms and some low walling. Material culture consists of four lower and four upper grinding stones, ten undiagnostic ceramics and small pockets of Later Stone Age stone tool debitage.

Preliminary interpretation: The site is a Late Iron Age settlement. possibly the largest out of all the settlements with semi formal walling. It is situated in quite a prominent position overlooking the Nzhelele river to the east. There is little in the form of material culture with no evidence for a kraal thou there are Two grain bin basses and lower and upper grinding stones indicating that the site was likely utilising the Nzhjelele's flood plains.

Figure 6-54: informal walling feature with large, packed rocks

Figure 6-55: informal walling on the south western side of the site

Figure 6-56: semi-formally packed stones acting as a wall and terrace

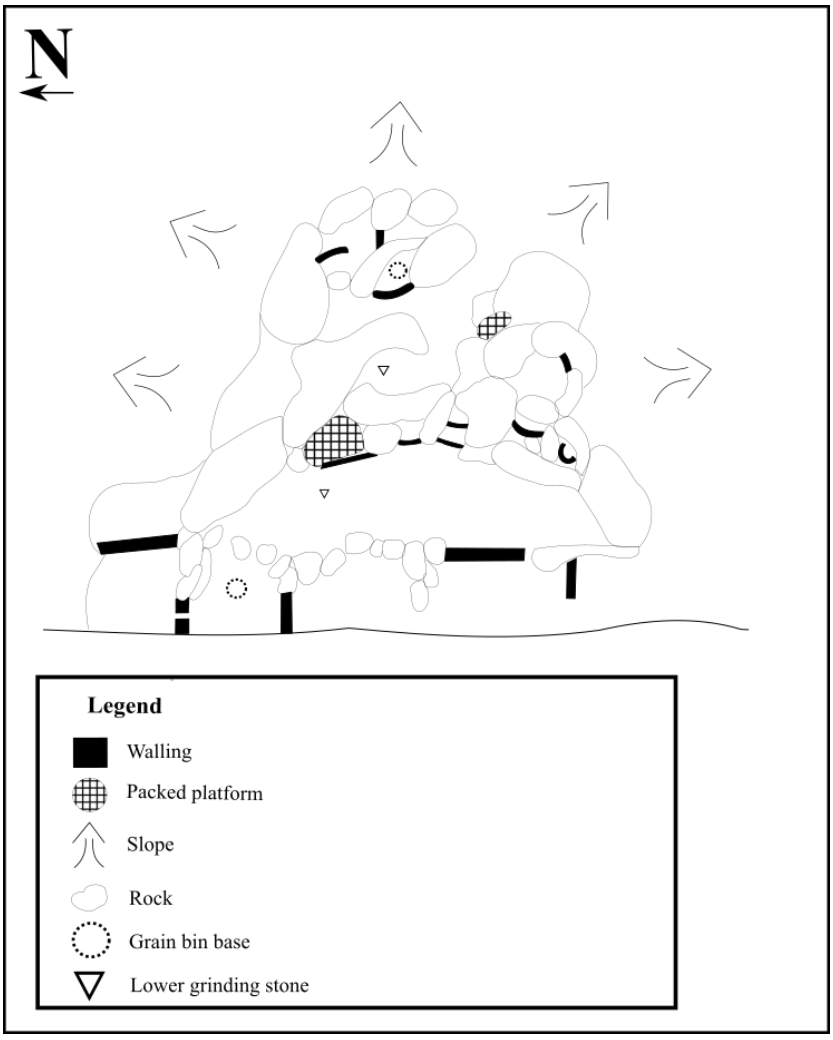

Figure 6-57: Site drawing for MNR 273

MNR 278

S -22.49127 E 22.49127 Altitude: 573m Time period: Late Iron Age

Date discovered: 02/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 338m Geological formation: Clarens

Geology: arenite Site Type: rock shelter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of a small rock shelter on a plateau running east to west. The shelter is approximately 5 x 2m in size and is north facing with some low informal walling and a sharpened lead wood stick likely used to form a protective palasade.

Preliminary interpretation: The rock shelter seems to have been used as a place for storage or short-term occupation.

MNR 279

S -22.49207 E 030.25703 Altitude: 574m Time period: Late Iron Age

Date discovered: 02/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 1615m Geological formation: Solitude and Klopperfontein

Geology: shale Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: MNR 279 is a Late Iron Age site situated on a koppie on a plateau. There is a large well packed stone wall about a meter high and 20m long. At the south

eastern portion of the wall there are two monoliths marking an entrance. There is an open area behind the wall but no material culture other than one upper grinding stone. MNR 280 is situated 30m north of MNR 279.

Preliminary interpretation: The Site is from the Late Iron Age though. It is the only settlement on the western side of the Tshirundu mountains with formal walling (unlike the multiple walled settlements east of the Nzhelele river). This site also doesn't have any other domestic artifacts or features such as middens grain bin basses or upper and lower grinding stones apart from a small ellipsoid grinding stone similar to the one's at MNR 274 and 280.

Figure 6-58: formal walling on top of a small rise

Figure 6-59: entrance way to site

MNR 224

S -22.34614 E 030.06588 Altitude: 557m Time period: Late Iron Age

Date discovered: 30/08/17 Farm: Singelele 6 Farm mineralogy: copper

Land type: Ae266 River proximity: 1318m Geological formation: Mount Dowe

Geology: quartzite Site type: Unknown

Soils: soils with minimal development and are usually shallow on hard or weathering rock, with or without intermitted diverse soils Lime generally present in part

Vegetation: *Colophospermum mopane - Boscia albltrunca - Terminalla prunioides* open to dense bushveld on plains and low rocky hills (Mopane - Shepherds' tree - Lowfeld cluster-leaf open to dense bushveld on plains and low rocky hills).

Site description: There are scattered upper grinding stones and hammer stones surrounding a quart's outcrop, hammer stones and grinding stones possibly used for ore processing. Approximately 100 m south-west of the Singelele River.

MNR 284

S -22.48848 E 030.30909 Altitude: 535m Time period: Late Iron Age

Date discovered: 14/08/18 Farm: Frampton 72 Farm mineralogy: none

Land type: Ib314 River proximity: 1297m Geological formation: Clarens

Geology: arenite Site type: rock shelter

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is a Late Iron Age site which consists of a small rocky shelter approximately 10m long and 5m deep. The rock shelter is situated on the southern side of a rocky outcrop and has some stone walling in front of it. There are some ceramic sherds, daga and a copper bangle.

Preliminary interpretation: The site is a small rock shelter that might have been occupied for a short period or as a place to escape the midday heat..

Figure 6-60: nothern view of rock shelter

Figure 6-61: eastern view of shelter packed with packed platform

MNR 285

S -22.48799 E 030.30588 Altitude: 514m Time period: Late Iron Age

Date discovered: 14/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 882m Geological formation: Clarens

Geology: arenite Site type: rock shelter

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: MNR 285 is a small rock shelter with some packed stones to close it off. The shelter is approximately 4m long and 3m deep. No material culture is visible.

Preliminary interpretation: The site is a small rock shelter that might have been used as a place for storage.

Figure 6-62: north facing view of shelter with stack wall in front of it

MNR 286

S -22.49029 E 030.30756 Altitude: 549m Time period: Late Iron Age

Date discovered: 14/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 882m Geological formation: Clarens

Geology: arenite Soils: Vegetation: Site type: rock shelter

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of a rock shelter approximately 8m long and 2m deep. The rock shelter is situated at the base of a rocky out crop and has stones packed against the back of the shelter. No material culture is visible.

Preliminary interpretation: The site is a small rock shelter that might have been used as a storage area. .

Figure 6-63: sothern view of the shelter with packed rocks in the back

Figure 6-64: southern view of the shelter

Figure *6-65***: outside view of small packed area**

MNR 287

S -22.49003 E 030.30501 Altitude: 541m Time period: Late Iron Age

Date discovered: 14/08/18 Farm: Solitude 111 Farm mineralogy:

Land type: Ib314 River proximity: 2424m Geological formation: Clarens

Geology: arenite Site Type: rock shelter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of a rock shelter approximately 8m long and 3m deep. There is rough stone walling in front of the shelter which is approximately 0.5m high. On the western side of the shelter there is a 2 x 2m packed platform and 30m

north of the shelter there is another packed platform of roughly the same size. Artefacts consist of four lower grinding stones, microliths, freshwater muscle shells. There were also two corn cobs discovered at the entrance of the rock shelter indicating that this shelter could have been used for food storage.

Preliminary interpretation: The rock shelter was likely a place for storage where food processing also took place. Though there are signs of occupation as seen by the presence of the midden.

Figure 6-66: southern view of rock shelter

Figure 6-67: north eastern view of rock shelter

Figure 6-68: terracing and low packed walling feature.

S -22.48859 E 030.30495 Altitude: 535m Time period: Late Iron Age

Date discovered: 14/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 109m Geological formation: Clarens

Geology: arenite Site type: suspected cleared fields and rock shelter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is an area It seems like the area has been cleared of stones for farming found in an open area within a rocky outcrop. The stones appear to have been deposited in small piles south- east of the cleared area. The site also consists of two small rock shelters, one on the south-western side of the open area and the other at the base of the rocky outcrop on the southern side of the open area. Both shelters have packed stones at the entrances. No material culture other than an upper grinding stone is visible.

Preliminary interpretation: The area could be associated with farming and rock shelters with packed stones for storage.

MNR 289

S -22.48913 E 030.30459 Altitude: 525m Time period: Late Iron Age

Date discovered: 14/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 1447m Geological formation: Clarens

Geology: arenite Site type: rock shelter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of a small rock shelter at the base of a rocky outcrop. The shelter is north facing with some roughly packed stone walling approximately 1m high. There is also a packed platform just east of the shelter. There is no material culture present.

Preliminary interpretation: The site is a small rock shelter that might have been used as a place for storage.

Figure 6-69: southern view of rock shelter with collapsed walling

MNR 296

S -22.48818 E 030.29118 Altitude: 560m Time period: Late Iron Age

Date discovered: 15/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 1652m Geological formation: Clarens

Geology: arenite Site type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is likely dating to the Late Iron Age situated on a flat area on the north western side of a ridge running east to west. The Site consists of some circular packed stones 1.5m in diameter and two upper grinding stones. It is located approximately 200m north of MNR298

Preliminary interpretation: The site seems to have been occupied for a short while its function is unclear.

Figure 6-70: circular packed stones

MNR 298

S -22.48724 E 030.29684 Altitude: 540m Time period: Late Iron Age

Date discovered: 15/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 667m Geological formation: Clarens

Geology: arenite Site type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: This Late Iron Age site is situated on a ridge running north to south with the site located on the northern side of the ridge. The site consists of a 10m long wall which is approximately 1m high with some semi-circular packed stones 20m to the north. At the base of the ridge to the east is a possible kraal. There are two upper grinding stones but no other cultural material.

Preliminary interpretation: The site is a Late Iron Age settlement likely utilising the soils and vegetation in the valley below.

Figure 6-71: formally packed walling extending northwards

Figure 6-72: open area between circular walling feature

MNR 299

S -22.48671 E 030.28789 Altitude: 548m Time period: Late Iron Age

Date discovered: 15/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ac263 River proximity: 4948m Geological formation: Clarens

Geology: arenite Site type: settlement

Soils: Soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime is generally present in parts.
Vegetation: *Sclerocarya birrea - Aristida stipitata - Eragrostis lehmanniana* open grass and bushveld (Marula - Long-awned three-awn - Lehmann's love grass open grass and bushveld).

Site description: The site is situated on a koppie and consists of three game boards and two lower grinding stones carved into the eastern side of the koppie under a small overhang. There are some upper grinding stones and a few ceramic sherds on the western side of the koppie with a low-density Middle and Late Stone Age material

scatter surrounding the koppie, slightly more substantial on the northern side of the koppie.

Preliminary interpretation: The site seems to have been utilised through multiple time period though the Late Iron Age seems to show more significant occupation the game boards and some walling on the eastern side of the koppie.

Figure 6-73: game boards

MNR 302

S -22.48662 E 030.27737 Altitude: 562m Time period: Late Iron Age

Date discovered: 15/08/18 Farm: Dawn 71 Farm mineralogy: none

Land type: Ib314 River proximity: 7682m Geological formation: Clarens

Geology: arenite Site type: rock shelter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Sclerocarya birrea - Aristida stipitata - Eragrostis lehmanniana* open grass and bushveld (Marula - Long-awned three-awn - Lehmann's love grass open grass and bushveld).

Site description: The site is a Late Iron Age site consisting of an east facing overhang 1m deep and 3m long with a small roughly packed wall feature 2m in front of the overhang which is approximately 2m long. There is no visible material on the surface.

Preliminary Interpretation: The site seems to be utilised as a possible short-term shelter or a place for storage.

Figure 6-74: southern view of the overhang

MNR 304

S -22.49335 E 030.27575 Altitude: 582m Time period: Late Iron Age / Late stone age

Date discovered: 15/08/18 Farm: Solitude 111 Farm mineralogy: none

Land type: Ib314 River proximity: 126m Geological formation: Clarens

Geology: arenite

Soils: Red and yellow soil, sandy well drained soils with high base status present.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: MNR304 is a Letaba site situated on a ridge on a plateau which runs east to west. The site is extremely isolated and hidden away. There are numerous well packed walls within the site. There is a central wall which is rectangular in nature and has lead wood pillars protruding out the wall to the east of the central wall. There is a midden and some platforms with small walls approximately 0.5m in height. Forty meters east of that is a well packed wall approximately 1.5m high and has monoliths on top of it and east of this wall is a kraal. Artefacts found consist of an upper grinding stone and some microliths.

Preliminary interpretation: The site is one of the largest formal stone walling sites within the study area and was likely occupied by a petty chief.

Figure 6-75: rectangular central wall with entrance way and kraal area further to the back

Figure 6-76: open area with walling 2m west of the kraal

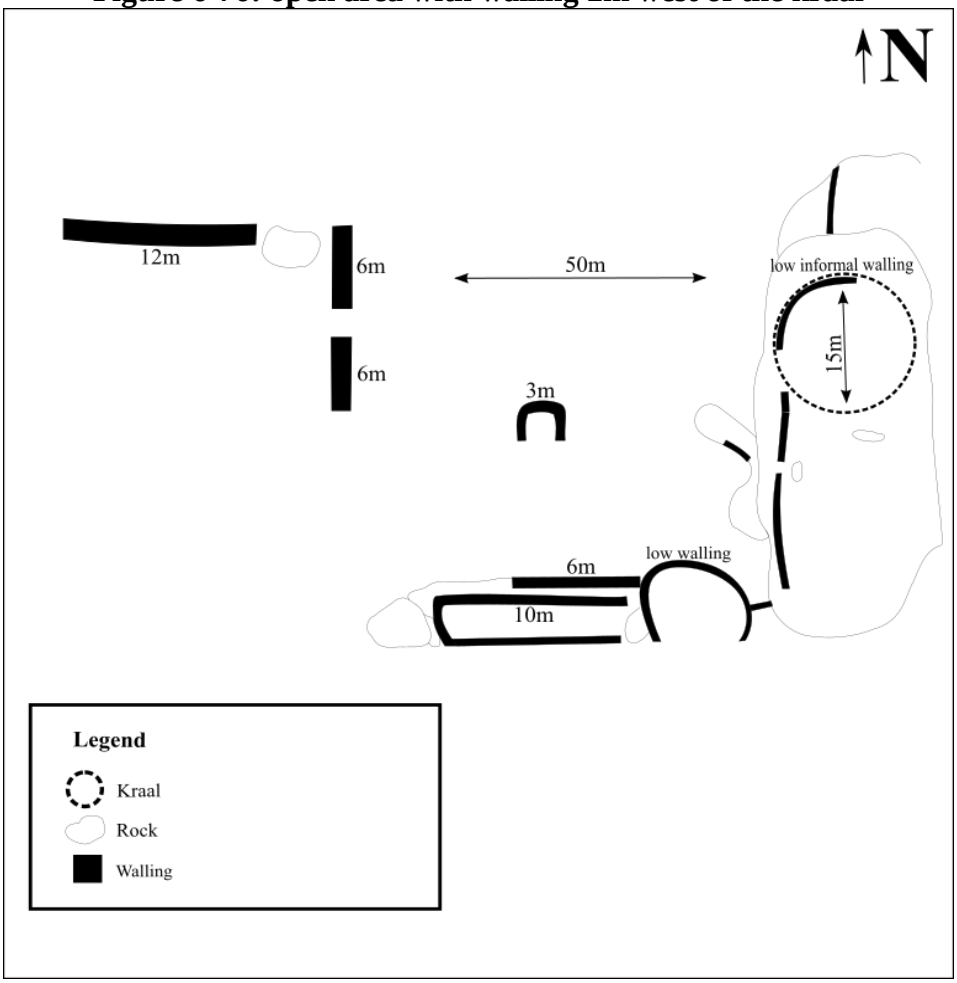

Figure 6-77: Site drawing for MNR 304

MNR 305

S -22.48513 E 030.27059 Altitude: 541m Time period: Late Iron Age

Date discovered: 16/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 5153m Geological formation: Clarens

Geology: arenite Site type: rock shelter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is a small east facing rock shelter situated at the base of a koppie on a plateau. It is 2m wide and the shelter is packed closed with rocks and has a small opening at the top. No material culture is visible.

Preliminary Interpretation: The rock shelter was likely utilised as a place for storage.

Figure 6-78: western view of cave

MNR 308

S -22.48778 E 030.26592 Altitude: 548m Time period: Late Iron Age

Date discovered: 16/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 2549m Geological formation: Clarens

Geology: arenite

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of a small roughly packed wall approximately 0.5 high running from north to south in between two rocky outcrops. Twenty meters south of the wall is a small rock shelter which has been packed with stones. No visible material culture was found on the site.

Preliminary interpretation: The site could have been used as a short-term occupation.

Figure 6-79: wall running down the slope between two rocky outcrops

MNR 309

S -22.48949 E 030.26571 Altitude: 544m Time period: Late Iron Age

Date discovered: 16/08/18 Farm: Solitude 111 Farm mineralogy: none

Land type: Ib314 River proximity: 1048m Geological formation: Clarens

Geology: arenite Site type: settlement

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: This Late Iron Age site is situated on the western side of the plateau in between koppies. Walling of the site is well preserved and up to 1.5m high in some areas. There are two middens, one at the entrance of the site, the other next to the large free-standing wall. No material culture other than one ceramic sherd was found. Twenty-five meters west more stone walling in between koppies can be seen.

Preliminary interpretation: The Site is a Late Iron Age settlmet hidden away behind a rocky out crop likely for its seclusion. .

Figure 6-80: wall situated in the centre of the site

Figure 6-81: walling 5m north of central wall

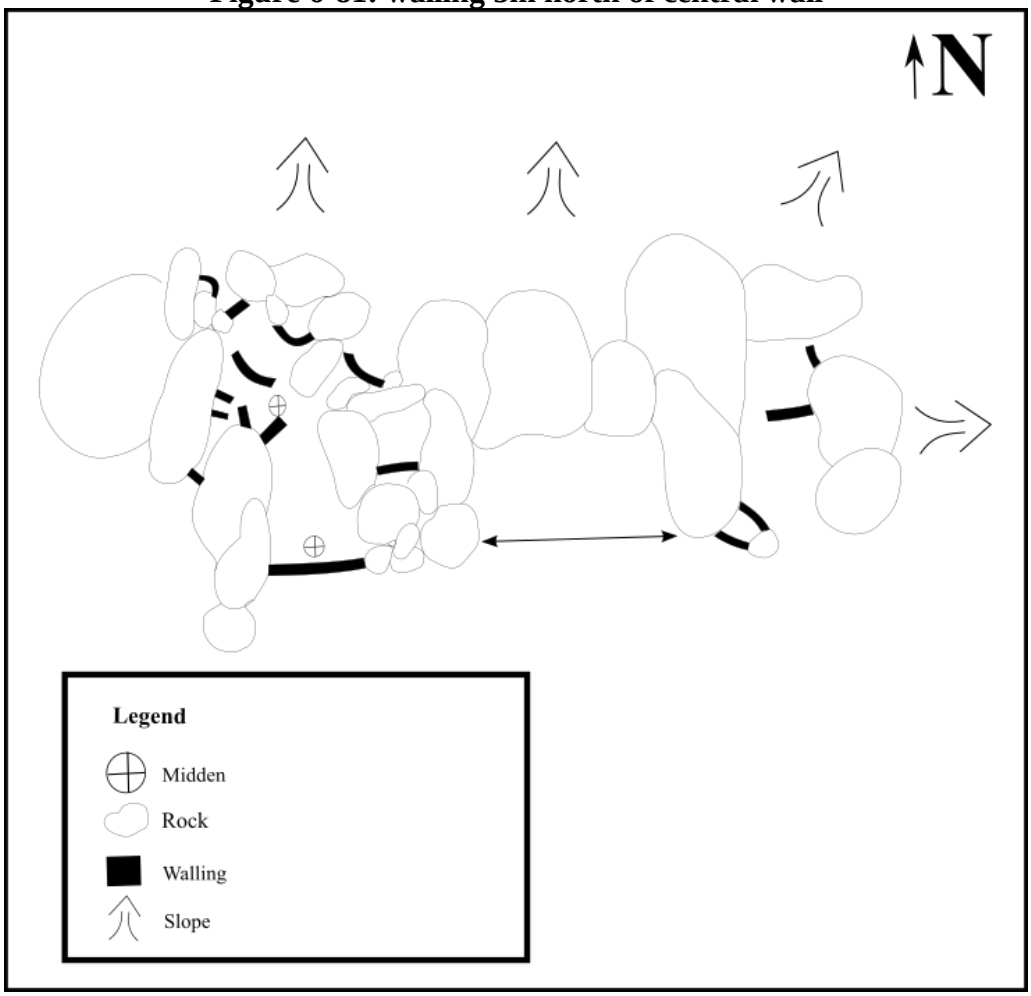

Figure 6-82: Site drawing of MNR 309

MNR 311

S -22.48948 E 030.26617 Altitude: 545m Time period: Late Iron Age

Date discovered: 16/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 1069m Geological formation: Clarens

Geology: arenite Site type: settlement

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane* - *Gardenia resiniflua* - *Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: This is an Late Iron Age site which is situated on a plateau edge in between a rocky outcrop. The site is south facing and consists of a small rock shelter as well as an intact midden approximately 2x2m² in size, a grain bin base and a semi-circular wall less than 0.5m high. Artefacts found consist of two diagnostic ceramic sherd and two lower grinding stones.

Preliminary interpretation: The site has been classified as a Late Iron Age. It's likely this site is located here for its isolated position in the landscape but still in close proximity to the Nzhjelele River.

Figure 6-83: southern view of the eastern side of the site

Figure 6-84: centre of site with midden to the right

MNR 312

S -22.48498 E 030.26617 Altitude: 545m Time period: Late Iron Age

Date discovered: 16/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 197m Geological formation: Clarens

Geology: arenite Site type: rock shelter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is situated on a plateau at the base of two free standing koppies which run from north to south. Both koppies have rock shelters on the western side, each with a small roughly packed wall in front of them. In the northern shelter there is a slightly elongated lower grinding stone and a ceramic sherd. At the base of the southern koppie on the eastern side there are two more overhangs. The one overhang has 60 glass beads, most likely left as an offering of some sort in the form of a necklace as some beads still have string inside of them.

Preliminary results. Site seems to have been used as a space to process food and escape the mid-day heat. There are multiple beads in the lower half of the koppies it is unclear as to the reason why it was left there.

Figure 6-85: northern koppie with overhang to the east and west

Figure 6-86:Southern koppie with overhang on the eastern and western side

MNR 313

N -22.48943 E 030.26732 Altitude: 564m Time period: Late Iron Age

Date discovered: 16/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 129m Geological formation: Clarens

Geology: arenite Site type: low density Late Stone Age scatter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is located on a plateau on top of a koppie. There are seven game boards on the koppie with some ceramic sherds found on the site. The site is located 300m west of Shelter of the Moon.
Preliminary interpretation: The Site is suspected to be a Late Iron Age site but it is not possible to narrow down the chronology any further.

MNR 314

S -22.49156 E 030.26564 Altitude: 546m Time period: Late Iron Age

Date discovered: 17/08/18 Farm: Solitude 111 Farm mineralogy: none

Land type: Ib314 River proximity: 1023m Geological formation: Clarens

Geology: arenite Site type: settlement

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Acacia tortilis - Eragrostis lehmanniana* old fields (Umbrella thorn - Lehmann's love grass old fields).

Site description: This is a Late Iron Age site situated on western side of plateau edge. The site is east facing and is located against a ridge. There is extensive well-packed walling south and west of the ridge. There are large upper grinding stones but no lower grinding stones. There is one small midden heaped against some walling on the northern side of the ridge. There are some diagnostic ceramic sherds found on the site.

Preliminary interpretation: This site relatively large and relates to the Late Iron Age. It's likely located in the area due to its secluded position on the plateau with access to the Nzhjelele river with fertile flood plains.

Figure 6-87: open area north west of walling; circular packed walling extending out of the ridge to the west

Figure 6-88: walling extending out of the northern section of the ridge

Figure 6-89: stones packed in between boulders to form a wall on the northern side of the ridge

MNR 316

S -22.49212 E 030.26942 Altitude: 542m Time period: Late Iron Age

Date discovered: 17/08/18 Farm: Solitude 111 Farm mineralogy: none

Land type: Ib314 River proximity: 2887m Geological formation: Clarens

Geology: arenite Site type: rock shelter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is a southeast facing rock shelter located on a plateau at the base of a koppie. There is some stone walling approximately 10m long around the eastern side of the koppie. The walling ends on the southern side where there is a natural platform which extends 1.5m above the ground with the shelter becoming more prominent. Some undiagnostic ceramic sherds and freshwater mussel was found on the platform.

Preliminary interpretation: The site is likely a short-term occupation site relating to the Late Iron Age.

Figure 6-90 western view of rock shelter

Figure 6-91: informal walling feature in front of the koppie

MNR 317

S -22.49293 E 30.26696 Altitude: 549m Time period: Late Iron Age

Date discovered: 17/08/18 Farm: Solitude 111 Farm mineralogy: none

Land type: Ib314 River proximity: 2469m Geological formation: Clarens

Geology: arenite Site type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The Late Iron Age site is situated on the southwestern part of the plateau at the base of a koppie. The site consists of a small roughly packed wall approximately 2m in length situated on the northern side of the koppie which is located 5m in front of a small overhang. On the western side of the koppie is a small shelter and another small roughly packed wall on top of the koppie. Fifty meters southwest (S22.49347 E030.26643) of the koppie is a ridge with some well packed stone walling approximately 1.5 m high and 6m long and some more roughly packed walling southwest of that. No material culture is visible on the site.

Preliminary Interpretation: The site seems to be Late Iron Age due to formal walling.

Figure 6-92: walling feature in front of the koppie

Figure 6-93: formal walling situated on ridge 50m south west of koppie

MNR 318

S -22.49414 E 030.26763 Altitude: 549m Time period: Late Iron Age

Date discovered: 17/08/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 349m Geological formation: Solitude and Klopperfontein

Geology: shale Site type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: This Late Iron Age site is situated on the southern edge of the plateau at the base of a ridge. The site consists of some stone walling that is different to other walling in that large flat stones are stacked up straight next to each other. There is a

2x2m circular space indicated by packed stones and a large flat monolith. Twenty meters north of that are three circular enclosures, one likely used as kraal. Inside the enclosures there are some ceramic sherds and microliths, possibly indicating a Khoi settlement. Two hundred meters south of the settlement (S22.49347 E030.26643) is another semi-circular roughly packed wall with a large monolith but no visible cultural material.

Preliminary interpretation: The site is most likely a Late Iron Age settlement due to its formal falling. It is quite peculiar as it also has large flat stones incorporated in the walling which other sites with this formal walling do not. The artefacts inside of the stone walling also consist of ceramics as well as microliths.

Figure 6-94:) circular walled extending out from a ridge with large monolith

b.

Figure 6-95: larger structure of the site on the edge of the plateau

Figure 6-96: flat stones extending out of main structure most likely a stock pen

MNR 319

S -22.49353 E 030.27320 Altitude: 551m Time period: Late Iron Age

Date discovered: 17/08/18 Farm: Solitude 111 Farm mineralogy: none

Land type: Ah91 River proximity: 554m Geological formation: Clarens

Geology: arenite Site type: settlement

Soils: Red and yellow soil, sandy well drained soils with high base status present. Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: MNR319 is a Late Iron Age site situated on the southern side of the plateau on top of a ridge. The site consists of some well packed stone walling. There are a total of eight walls which are all approximately 1m high. There is a small midden and cupule on the northern side of the settlement south of the beforementioned wall. There is no other cultural material on the summit of the ridge. At the base of the ridge directly below the settlement to the north there seems to be a domestic area (-22.49316, 30.27290) with multiple lower and upper grinding stones as well as two possible grain bin bases. Fifty meters north of this area is MNR320, a rock shelter most likely used by the inhabitants of MNR319. MNR304 is located 200m east on the same ridge and displays the same type of walling. There also seems to be a pathway used by people and cattle leading west towards MNR320 from MNR304. These two sites are most likely part of the same community.

Preliminary interpetation: The site is a Late Iron Age site and is located in quit a prominet position in the landscape. Belief it is part of MNR 304 a settlment like relating to a petty chief in the area.

Figure 6-97: south facing formal walling

Figure 6-98: south facing formal walling

Figure 6-99: ashy deposit with walling infront of it to the south

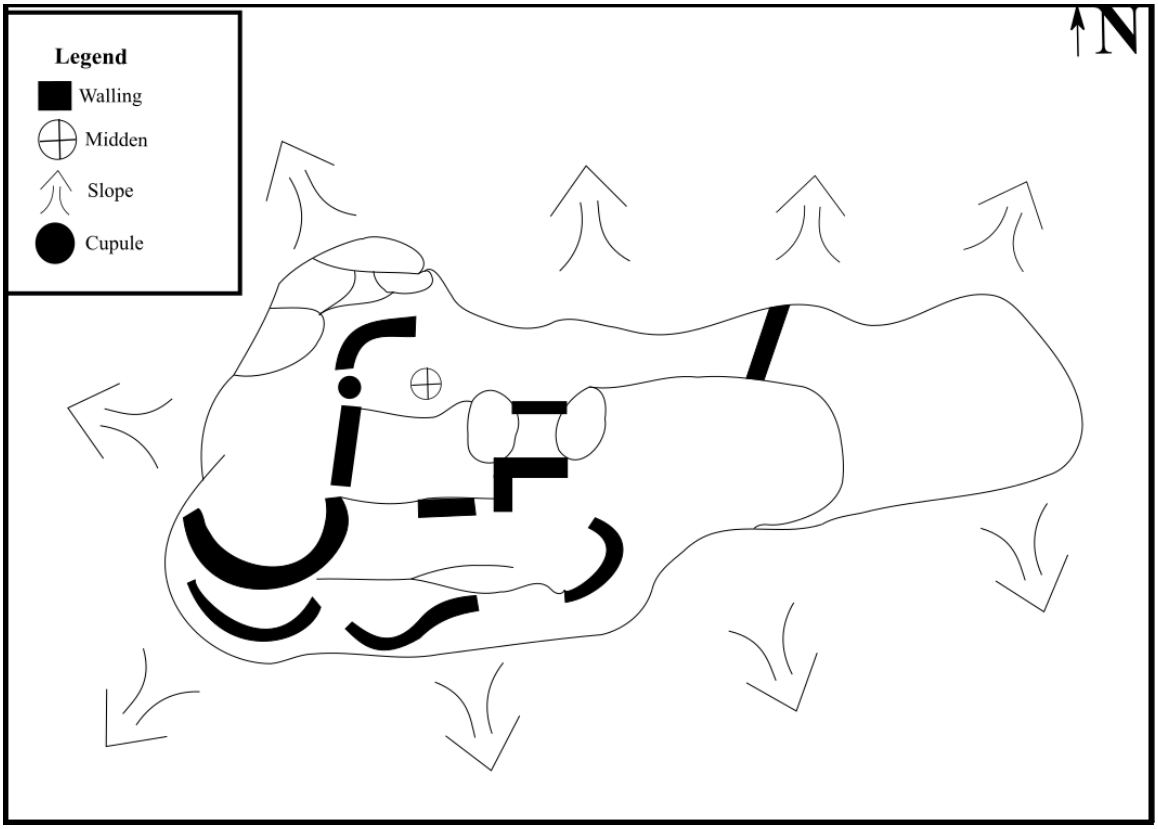

Figure 6-100: Site drawing of MNR 319 not to scale

MNR 320

S -22.49324 E 030.27185 Altitude: 544m Time period: Late Iron Age

Date discovered: 17/08/18 Farm: Solitude 111 Farm mineralogy: none

Land type: Ah91 River proximity: 1342m Geological formation: Clarens

Geology: arenite Site type: rock shelter

Soils: Red and yellow soil, sandy well drained soils with high base status present.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is situated on a plateau at the base of a koppie. The site consists of a north facing rock shelter with some roughly packed stone walling in front of it. There is also a packed-up area at the back of the shelter. There is a large lower grinding stone and an upper grinding stone in front of the shelter. The shelter is 50m north of MNR319 and the sites are likely related.

Preliminary interpretation: The site is a Late Iron Age rock shelter. Likely used by the inhabitants of MNR304 and MNR 305.

Figure 6-101: rocks packed in the back of the shelter to the left and right

Figure 6-102: walling feature infront of the shelter

MNR 321

S -22.493268 E 030.275632 Altitude: 543m Time period: Late Iron Age

Date discovered: 17/08/18 Farm: Solitude 111 Farm mineralogy: none

Land type: Ib314 River proximity: 1284m Geological formation: Clarens

Geology: arenite Site type: rock shelter

Soils: Red and yellow soil, sandy well drained soils with high base status present. Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of a rock shelter with some packed stones in front of it. It is situated on the southern part of the plateau at the base of a ridge directly below MNR304. the back of the shelter is also packed closed with rocks and there are some upper and lower grinding stones located within it.

Preliminary interpretation. The rock shelter was likely used as a place of storage and food processing and utilised by the inhabitants of MNR 304.

6.6 Terminal Iron Age sites

MNR 281

S -22.48522 E 030.31028 Altitude: 522m Time period: Terminal Iron Age

Date discovered: 14/08/18 Farm: Frampton 72 Farm mineralogy: none

Land type: Ac263 River proximity: 2158m Geological formation: Clarens

Geology: arenite Site Type: settlement

Soils: Soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils Lime is generally present in parts.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: This historical settlement is situated on a rocky outcrop on the southern side of an agricultural field. The site is approximately 15x15m² in size and contains some stone walling approximately 1m high. Artefacts consist of some pieces of metal; glass and an iron axe head.

Preliminary interpretation: The site seems to be an historical homestead possibly located in the region for the farming potential of the soils.

Figure 6-103: formal walling on the western section of the site

Figure 6-104: formal walling

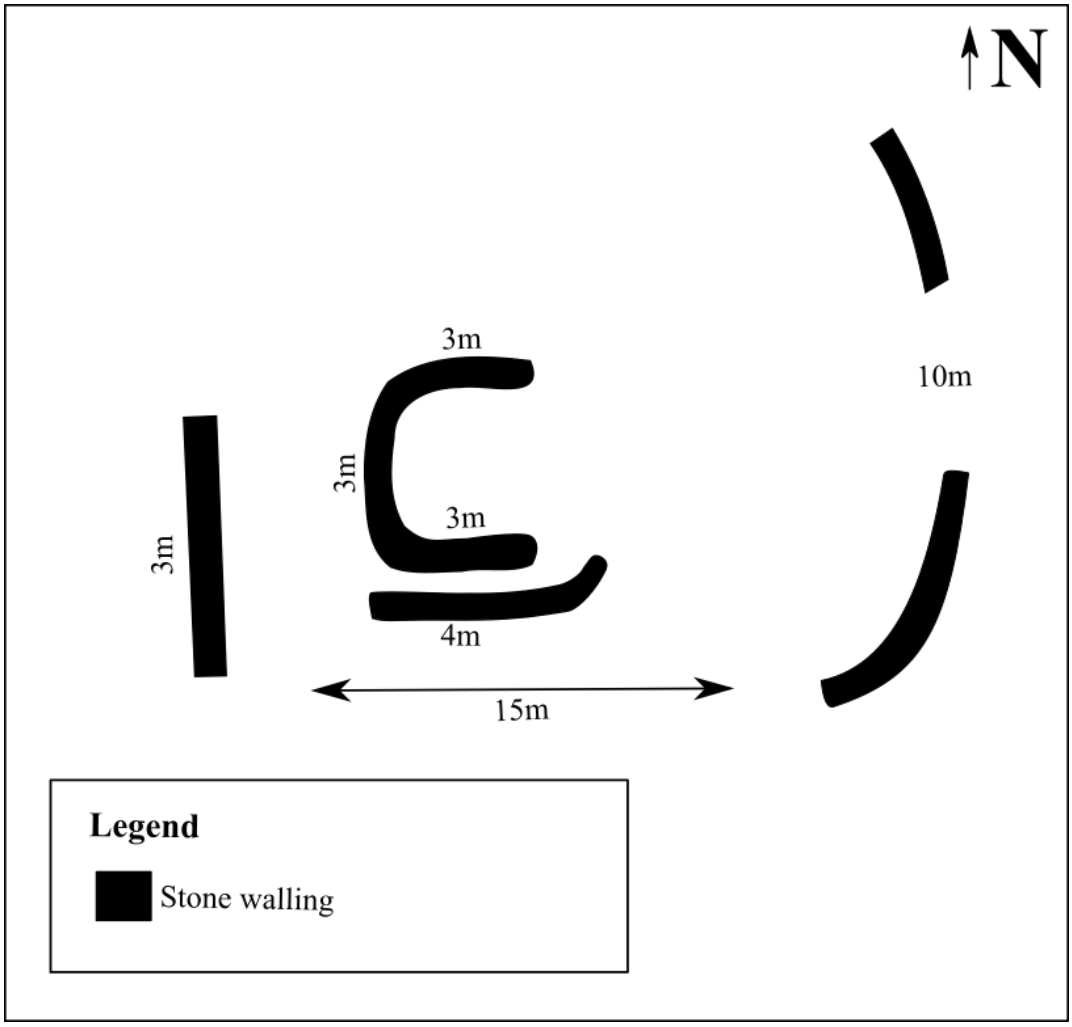

Figure 6-105: Site Drawing of MNR 281

MNR 282

S -22.48648 E 030.30979 Altitude: 526m Time period: Terminal Iron Age

Date discovered: 14/08/18 Farm: Frampton 72 Farm mineralogy: none

Land type: Ib314 River proximity: 823m Geological formation: Clarens

Geology: arenite Site Type: Unknown

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is a Terminal Iron Age site situated on the northern side of a koppie. The site consists of a small platform approximately 2 x 1m in size with an upper grinding stone and has a small cistern approximately 10m to the right. The site is possibly related to MNR281 as it can be found 100m south of it.

Preliminary interpretation: The Site is small and possibly be related to food processing

MNR 283

S -22.48741 E 030.30854 Altitude: 526m Time period: Terminal Iron Age

Date discovered: 14/08/18 Farm: Frampton 72 Farm mineralogy: none

Land type: Ib314 River proximity: 385m Geological formation: Clarens

Geology: arenite Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is a historical settlement situated in between two koppies on a small rocky outcrop. There is some stone walling which has been neatly packed with flat stones and are approximately 1m high. There is a small 2 x 2m midden just north of the walling with no material culture visible and a small kraal 10m south of the walling. Artefacts consist of a lower and upper grinding stone, three undiagnostic ceramic sherds and unidentifiable pieces of metal.

Preliminary interpretation: The site seems to be a small Late Iron Age Settlement.

MNR 295

S -22.48881 E 030.28934 Altitude: 506m Time period: Terminal Iron Age

Date discovered: 15/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 3597m Geological formation: Clarens

Geology: arenite Site type: settlement

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Sclerocarya birrea - Aristida stipitata - Eragrostis lehmanniana* open grass and bushveld (Marula - Long-awned three-awn - Lehmann's love grass open grass and bushveld).

Site description: MNR295 is aTerminal Iron Age settlement located right around the base and on top of a koppie. The area on the summit of the koppie is most likely a high-status area due to its elevated position, seclusion and its difficulty to access. There is some stone walling stacked around the edges of the summit and within the centre the walling varies from 0.5m to 1m in height. Artefacts at the summit of the site consists of two glass beads, low density ceramic scatter and some lower and upper grinding stones. At the base of the koppie to the south there are two small rock shelters, one with walling in front of it and the other packed closed. To the east of the koppie there are some platforms and walls. To the west of the koppie there is a midden and some packed platforms. At the base of the koppie to the north is a possible kraal located in a large open area with multiple upper and lower grinding stones a midden and a collapsed filled wall approximately 10m long.

Preliminary interpretation: The site is a Terminal Iron Age Settlement.

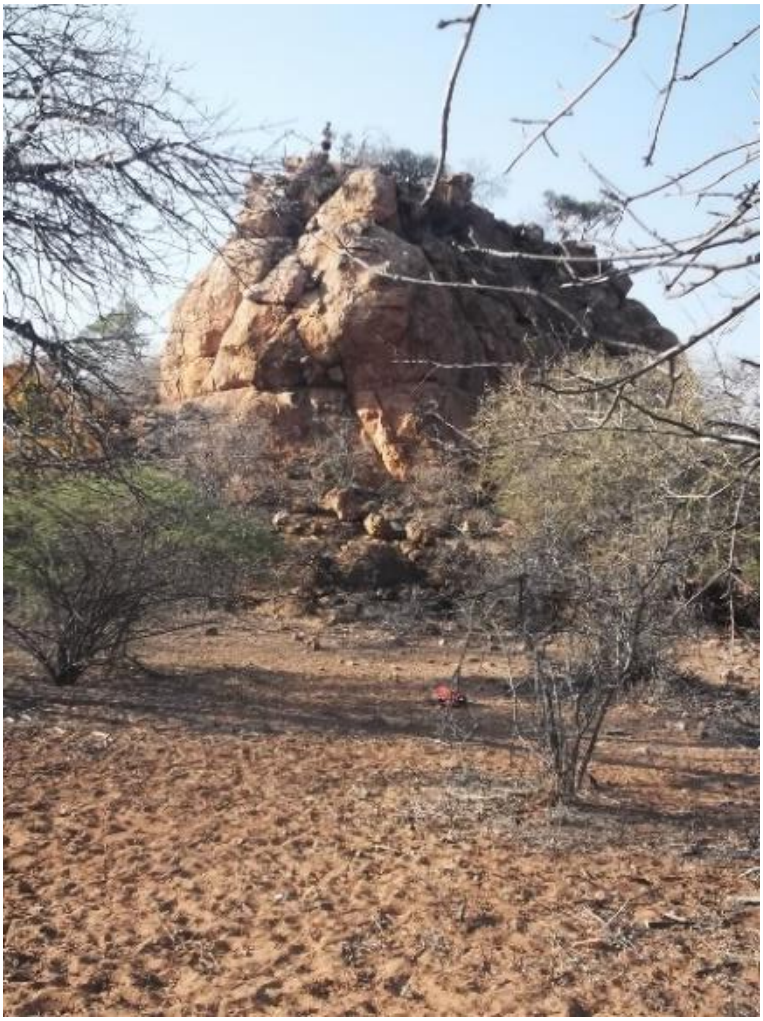

Figure 6-106: Southern view of domestic area below high status area on top of the koppie

Figure 6-107: northen view of domestic area from the top of the koppie

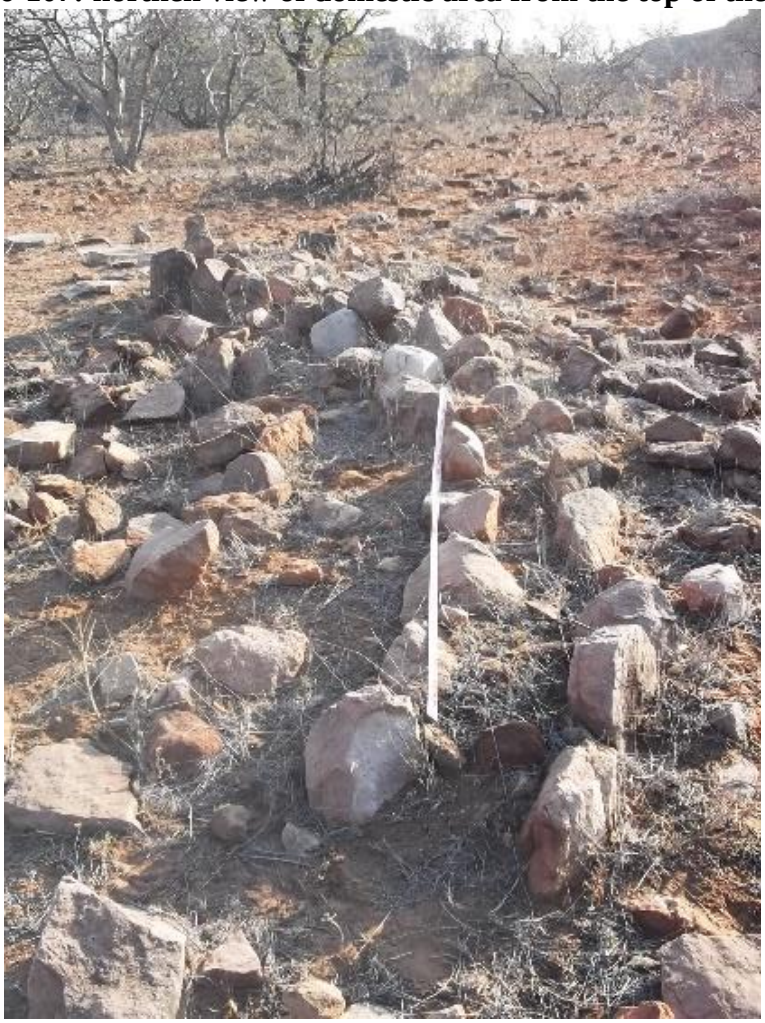

Figure 6-108: filled wall situated in domestic area

Figure 6-109: domestic area with large lower grinding stones

MNR 301

S -22.48787 E 030.28068 Altitude: 557m Time Period: Terminal Iron Age

Date discovered: 15/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 6226m Geological formation: Clarens

Geology: arenite Site type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Sclerocarya birrea - Aristida stipitata - Eragrostis lehmanniana* open grass and bushveld (Marula - Long-awned three-awn - Lehmann's love grass open grass and bushveld).

Site description: The site is a historical Iron Age settlement (Letaba) situated on a small hill in the flats. There is a road that runs west of the site with the kraal located 20m to the east of the road. The kraal is 30x40m² in size and has a small wall northeast off it. Southeast of the kraal is the domestic area where rocks have been cleared. Each cleared area has its own lower and upper grinding stones. The site has a central kraal in the centre with household and domestic areas around it. Artefacts found here consist of broken glass shards and pieces of metal.

Preliminary interpretation: The site is a Terminal Iron Age settlement likely situated in its location to utilise farmable soil and vegetation for grazing to the north.

Figure 6-110: open area with kraal

Figure 6-111: western view of walling on the eastern side of the kraal

Figure 6-112: open areas with associated large lower grinding stones;

MNR 291

S -22.49014 E 030.30121 Altitude: 543m Time period: Terminal Iron Age

Date discovered: 14/08/18 Farm: Solitude 111 Farm mineralogy: none

Land type: Ib314 River proximity: 1722m Geological formation: Clarens

Geology: arenite Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: This Terminal Iron Age settlement is situated in an open area on a rocky out crop located on the southern section of the plateau. The site consists of a hut foundation with some stone walling 5m to the east. The walling is approximately 1m high with the midden located directly above to the north. Cultural material consists of glass fragments, an iron belt buckle, a pot, and a nail.

Preliminary Interpretation: The site is a terminal Iron Age settlement.

6.7 Iron Age sites

MNR 230
S -22.35998 E 030.08482 Altitude: 446m Time period: Iron Age

Date discovered: 31/08/17 Farm: Singelele 6 Farm mineralogy: copper

Land type: Fc483 River proximity: 8m Geological formation: Mount Dowe

Geology: quartzite Site type: Low density ceramic scatter

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Combretum imberbe - Philenoptera violacea* stream community (Leadwood - apple leave stream community).

Site description: The site consists of a low-density ceramic scatter is small, roughly 10x10m in size. It is situated at the base of a hill on a gradual slope and is located 100m south of a river. There is no deposit with the ceramic scatter consisting only of four undiagnostic sherds.

Preliminary Interpretation: The site does not have enough material culture related to it to make a meaningful interpretation other than its likely relation to the Iron Age.

Figure 6-113: open area with ceramic scatter

MNR 263

S -22.49538 E 030.24563 Altitude: 514m Time period: Iron Age

Date discovered: 01/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: IB314 River proximity: 1221m Geological formation: Solitude and Klopperfontein Geology: shale Site type: rock shelter

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is situated on the southern side of the plateau. It consists of a small south facing rock shelter. It is approximately 2m deep and 4m long with an undiagnostic ceramic sherd and a filled platform.

Preliminary interpretation. The site consists of a rock shelter and mostly likely acted as a space to settle for a short time period or escape the heat of the day.

Figure 6-114: side view of shelter

MNR 276

S-22.48988 E 030.25545 Altitude: 572m Time period: Iron Age

Date discovered: 02/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 735m Geological formation: Solitude and Klopperfontein

Geology: shale Site Type: rock shelter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site is a rock shelter situated on the southern section of a ridge which is situated on the plateau. It consists of a small, packed platform approximately 3x3m² in size with a large open area in front of it which seems to have been cleared for farming. There is one upper grinding stone but no other material culture.

Preliminary Interpretation: The rock shelter is small and there is not much cultural material to provide a meaning full interpretation.

Figure 6-115: northern view of rock shelter and platform

Figure 6-116: area in front of the shelter

MNR 277

S -22.48981 E 030.25730 Altitude: 576m Time period: Iron Age

Date discovered: 02/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 353m Geological formation: Solitude and Klopperfontein Geology: shale Site Type: rock shelter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of a small rock shelter situated on a plateau running east to west. The site is approximately 2 x 3m in size and is south facing with a small platform. No other cultural material is present.

Preliminary interpretation: The reason for the utilisation of the shelter is unclear but could have been occupied for a while or used as a place for storage.

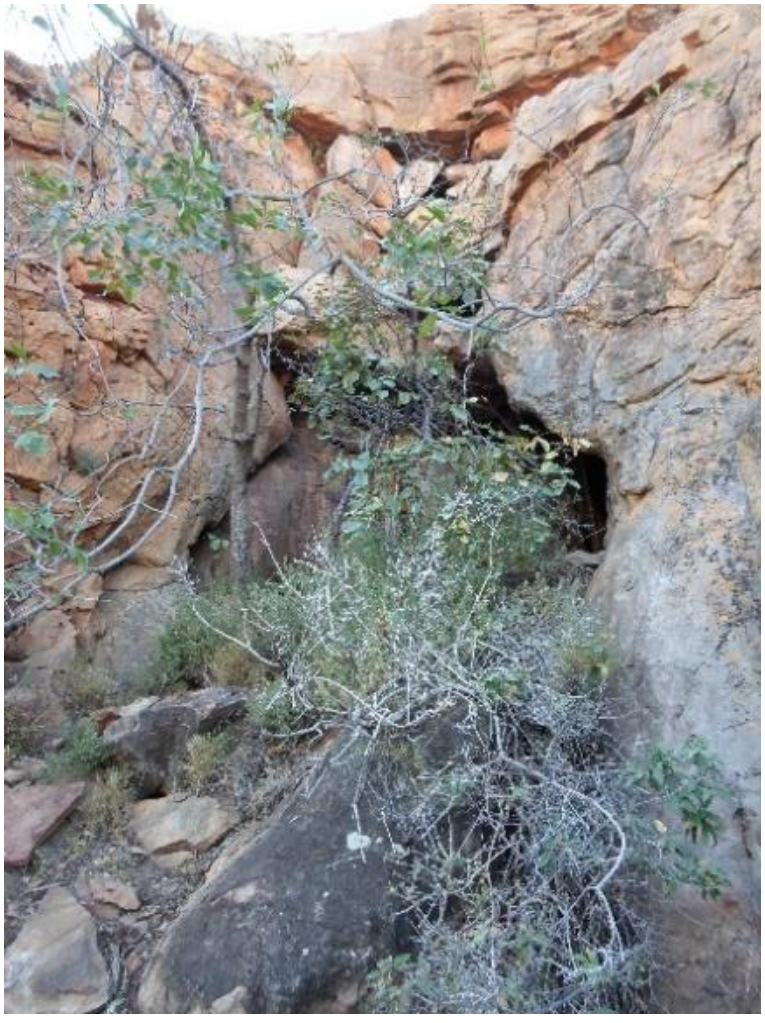

Figure 6-117: north facing view of the entrance to the shelter

Figure 6-118: southern view from inside the shelter and filled platform

MNR 261

S -22.49533 E 030.23854 Altitude: 549m Time period: Iron Age

Date discovered: 30/06/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 655m Geological formation: Clarens

Geology: arenite Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane* - *Gardenia resiniflua* - *Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site seems to be a Late Iron Age settlement situated on a ridge on the northern side of the plateau in between an enclosed area. There is some daga with some pole imprints possibly from a furnace or hut. There is some large animal burrowing, and the soil seems to be quite deep and could be covering the rest of the site. There is no other cultural material visible.

Preliminary interpretation: The site is a Iron Age site though it is unclear to what its function or purpose was.

Figure 6-119: open area located on the northern edge of the plateau

Figure 6-120: daga with pole imprints

MNR 310

S -22.48946 E 30.26613 Altitude: 544m Time period: Iron Age

Date discovered: 16/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 1097m Geological formation: Clarens

Geology: arenite Site type: rock shelter

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site consists of a rock shelter situated on the western side of the plateau. There is a small roughly packed wall in front of the shelter. Artefacts found consist of one upper and two lower grinding stones.

Preliminary interpretation: The site dates to the Iron Age and is situate in a rock shelter. The site was likely used as an area to store and process food .

a.

Figure 6-121: rock shelter

6.8 Historical sites

MNR 220

S -22.34853 E 030.06834 Altitude: 547m Time period: Historical

Date discovered: 30/08/17 Farm: Singelele 6 Farm mineralogy: copper

Land type: Ae266 River proximity: 584m Geological formation:Mount Dowe

Geology: quartzite Site type: Historical settlement

Soils: soils with minimal development, usually shallow on hard or weathering rock, with or without intermitted diverse soils. Lime is generally present in part.

Vegetation: *Colophospermum mopane - Boscia albltrunca - Terminalla prunioides* open to dense bushveld on plains and low rocky hills (Mopane - Shepherds' tree - Lowfeld cluster- leaf open to dense bushveld on plains and low rocky hills)

Site description: The site is situated around the base and summit of a low quartzite koppie. A single undiagnostic ceramic shard and old tin and some glass on top of the koppie with a lower grindstone on the north western side and a low-density ceramic scatter at the base on the western side of the koppie, as well as some ashy soils. There is a small river flowing past the western side of the koppie. 50m south south west of the koppie there is a 20th century settlement approximately 20x20m in size. There seems to only be evidence for one structure with an associated midden approximately2x2m in size artifacts consist of bricks, rubber and glass.

Preliminary Interpretation: The site situated to the east of the koppie seems to be an historical homestead. the historical artefacts on the koppie possibly relate to this settlement while the lite ceramic scatter at the base of the hill is most likely due to an earlier occupation.

Figure 6-122: location of historical site with koppie in the backround to the west

MNR 221

S -22.35188 E 030.06940 Altitude: 541m Time period: Historical

Date discovered: 30/08/17 Farm: Singelele 6 Mineralogy: copper

Land type: Ae266 River proximity: 586m Geological formation: Mount Dowe

Geology: quartzite Site type: Historical settlement

Soils: soils with minimal development- usually shallow on hard or weathering rock- with or without intermitted diverse soils Lime generally present in part

Vegetation: *Colophospermum mopane - Boscia albltrunca - Terminalla prunioides* open to dense bushveld on plains and low rocky hills (Mopane - Shepherds' tree - Lowfeld cluster-leaf open to dense bushveld on plains and low rocky hills).

Site description: This historical settlement is situated in a flat area There is evidence of a square structure with a stone packed floor and a circular stone feature with a filled in gravel floor 5m to the south east while a 3x5m rectangular collapsed brick

structure can be found 20 m west. There are numerous historical artifacts such as sheet metal, bricks and glass on the surface.

Preliminary Interpretation: The site seems to be an historical homestead. Though its reason for its location on the landscape is unclear.

Figure 6-123: collapsed brick structure

Figure 6-124: packed stone platform possible floor of a structure

MNR 222

S -22.35035 E 030.06713 Altitude: 542m Time period: Historical

Date discovered: 30/08/17 Farm: Singelele 6 Farm mineralogy: copper

Land type: Ae266 River proximity: 1287m Geological formation: Mount Dowe

Geology: quartzite Site type: Historical collapsed building

Soils: soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils Lime generally present in part

Vegetation: *Colophospermum mopane - Boscia albltrunca - Terminalla prunioides* open to dense bushveld on plains and low rocky hills (Mopane - Shepherds' tree - Lowfeld cluster-leaf open to dense bushveld on plains and low rocky hills).

Site description: The site consists of an historical brick building which is situated at the base of a small koppie. The structure size is roughly 5x4m in size with some brick wall foundations still visible and scattered bricks as well as some metal and glass.

Preliminary Interpretation: The site could be related to the brick works at MNR 223 located approximately 150 m north west. But there is no substantial evidence for this apart from its proximity to the brickworks.

Figure 6-125: bricks from historical building most probably from a collapsed wall.

MNR 223

S -22.34866 E 030.06627 Altitude: 547m Time period: Historical

Date discovered: 30/08/17 Farm: Singelele 6 Farm mineralogy: copper

Land type: Ae266 River proximity: 847m Geological formation: Mount Dowe

Geology: quartzite Site type: Historical brick works

Soils: soils with minimal development and are usually shallow on hard or weathering rock, with or without intermitted diverse soils. Lime is generally present in parts.

Vegetation: *Combretum imberbe - Philenoptera violacea* stream community (Leadwood - apple leave stream community)

Site description: There Large mounds of bricks approximately 10 x 3 x 1.5m in size and lots of partially vitrified clinker fragments. Ashy deposit 20 m west of brick mounds suggests brick making furnaces were made and used. Further upstream to the west of this area there are more brick mounds with excavated area and a possible clay source.

Preliminary Interpretation: The site is an old brick works with clay extraction occurring 150m to the west of the site.

Figure 6-126: row of bricks 30 x 2 x 0.5m in size

Figure 6-127: possible clay source 30 x 30 x 1.7 m with a river running 20m to the south.

MNR 225

S -22.349939 E 030.07632 Altitude: 485m Time period: Historical

Date discovered: 30/08/17 Farm: Singelele 6 Farm mineralogy: copper

Land type: Ae266 River Proximity: 661m Geological formation: Mount Dowe

Geology: quartzite Site type: Historical claim board

Soils: soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime generally present in part.

Vegetation: *Colophospermum mopane - Boscia albltrunca - Terminalla prunioides* open to dense bushveld on plains and low rocky hills (Mopane - Shepherds' tree - Lowfeld cluster-leaf open to dense bushveld on plains and low rocky hills).

Site description: The site consists of a beacon found in between a road and the boundary fence: the inscription that is stamped into the metal reads (Messina TV1

DEV CO LTD line Beacon 398 B M claims). This stands for: Messina Transvaal Development Company Ltd. Which was the main mining operation in Messina

Preliminary Interpretation: The beacon seems to be marker indicating the varying claims owned by the Messina Development Company.

Figure 6-128: Beacon

MNR 226

S -22.37694 E 030.07033 Altitude: 504m Time period: Historical

Date discovered: 31/08/17 Farm: Berkenrode 45 Farm mineralogy: none

Land type: Ae266 River proximity: 1126m Geological formation: Mount Dowe

Geology: quartzite Site type: Historical mine

Soils: soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime generally present in part.

Vegetation: *Colophospermum mopane - Kirkia acuminate-* Acacia *erubesoens* plains bushveld and woodland (Mopane - White syringe - blue thorn plains bushveld and woodland).

Site description: The site consists of three small open scale cast mines scattered around the area with 1m x 1m packed stone heaps. The site situated on a slightly elevated area and is approximately 15x15m in size. It seems like vermiculite was being mined here due to the mineralogy present in the profiles of the mines though this cannot be said for certain. There is no material culture located within the proximity of the site.

Preliminary Interpretation: The mining seems to be related to the vermiculite occurring in the area. Though there is no evidence of any structures or artifacts to place a definitive date on the site. There is only evidence for mining vermiculite in the Historic period within the study area and not during the Iron Age. However, site MNR 227 a Late Iron Age associated with metal working and smelting can be found 200m east of the site.

Figure 6-129: packed stones with mine and spoil heap in the background

MNR 231

S -22.36333 E 030.07540 Altitude: 482m Time period: Historical

Date discovered: 01/09/17 Farm: Singelele 6 Farm mineralogy: copper

Land type: Fc483 River proximity: 765m Geological formation: Mount Dowe

Geology: quartzite Site type: Historical settlement

Soils: Red massive or weak structured soils with high base status

Vegetation: *Combretum imberbe* - *Philenoptera violacea* stream community (Leadwood - apple leave stream community).

Site description: The site is situated on top of a koppie with a river approximately 20m away from the base of the koppie. There are two circular enclosed areas, one with a wall and there is a light ceramic scatter with some copper ore and historical items. There are patches of ashy soil though it is unclear what they are a result off. The site is likely from the historical period as glass and unidentifiable pieces of metal are present on the site.

Preliminary interpretation: The site is somehow associate with the copper production process however it is unclear how. Possibly smelting due to the copper ore and ashy deposits located within the site but it also could just be a location where ore is being processed.

Figure 6-130: platform on top of koppie

MNR 232

S -22.36072 E 030.10298 Altitude: 453m Time period: Historical

Date discovered: 01/09/17 Farm: Vryheid 8 Farm mineralogy: Alluvial diamonds, copper, corundum.

Land type: Fc483 River proximity: 2026m Geological formation: Mount Dowe

Geology: quartzite Site type: Mining settlement and mine

Soils: Red, massive or weak structured soils with high base status.

Vegetation: Colophospermum mopane, Boscia albltrunca, Terminalla prunioides open to dense bushveld on plains and low rocky hills (Mopane, Shepherds' tree, Lowfeld cluster-leaf open to dense bushveld on plains and low rocky hills).

Site description: The site is an settlement related to mining. The site is situated at the base of a hill and extends northwards to the banks of the sand river. It consists of two

copper pit shaft mines enclosed by circular stone walls. To the north of the mine across the road is a settlement which contains a cattle kraal with its fencing still visible. At the boundary of the kraal there are some core samples. Ten meters east of the kraal there is a cement building foundation, hut foundation and a circular hut made from stone and plastered with daga. North of that there are another six building foundations with two middens and another three buildings west of that with two associated middens. There are some more building foundations to the north and west along the riverbank. Glass and metal are found scattered throughout the site as well as one upper and lower grinding stones. The site is possibly also associated with a shaft mine located on the opposite side of the sand river which has been sealed off.

Preliminary Interpretation: This site is the largest historical site linked to mining in Maremani. It seems that this was the mining camp for the miners working in the copper shaft mine located on the opposite side of the sand river to the west. This is also likely the largest copper mine within the study area.

Figure 6-131: remains of a stone build structue with some intact walling

Figure 6-132: site with remains of multiple structures

MNR 234

S -22.36826 E 030.11169 Altitude: 485m Time period: Historical/Middle Stone Age

Date discovered: 01/09/17 Farm: Magdala 9 Farm mineralogy: none

Land type: Fc483 River proximity: 72m Geological formation: Mount Dowe

Geology: quartzite Site type: Mine

Soils: Red -massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Boscia albltrunca - Terminalla prunioides* open to dense bushveld on plains and low rocky hills (Mopane - Shepherds' tree - Lowfeld cluster-leaf open to dense bushveld on plains and low rocky hills).

Site description: There are three historical vermiculite open cast mines located on a hill. The mines are approximately 3x3 m in size and 1m deep with small spoil heaps situated next to them. 20m north of the three mines there is a small low density Middle Stone Age scatter.

Preliminary Interpretation: The mines are relatively small and are evidence of small-scale artisanal mining.

Figure 6-133: open cast vermiculite mine

MNR 238

S -22.32726 E 030.17297 Altitude: 516m Time period: Historical

Date discovered: 03/09/17 Farm: Bokveld 12 Farm mineralogy: chromite, corundium, iron

Land type: Fc484 River proximity: 1552m Geological formation: Messina

Geology: anorthosite Site type: Grave

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Combretum aplculatum* - *Portulacaria afra* mountain bushveld.

Site description: The site consists of a possible lone grave, approximately 2x1m in size. There are some low packed stones in a rectangle facing east to west. The assumed grave is located 30m south of MNR 244, a Late Iron Age site.

Preliminary Interpretation: The grave orientation suggests Christian burial practices and therefore is not related to MNR 244 which likely predates the burial.

MNR 239

S -22.44305 E 030.28480 Altitude: 458m Time period: Historical

Date discovered: 03/09/17 Farm: Nzhelele Drift 38 Farm mineralogy: none

Land type: Fc484 River proximity: 1505m Geological formation: Malala Drift

Geology: gneiss Site type: Mining settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane* - *Aristida adscensionis* bushveld (Mopane - Nine-awned grass bushveld)

Site description: The site is a historical homestead likely for miners mining in the vicinity. It is situated on top of a hill there is a road running through it to the north and a road to the east that turns left before the remains of a structure built from rocks. Site consists of a small mine on the western side of the road, the mine is 2x2m in size though it is unclear what was being mined. There are some metal and glass artefacts

as well as a possible grave identified through rocks stacked in a rectangular which are orientated east to west on the southern side of the structure's remains.

Preliminary Interpretation: The homestead was most likely established so that its occupants could access the areas surrounding mineral resource more efficiently.

MNR 241

S -22.47845 E 030.28409 Altitude: 471m Time period: Historical

Date Discovered: 24/04/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ac263 River proximity: 721m Geological formation: Letaba

Geology: basalt Site Type: Settlement

Soils: Soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime is generally present in part.

Vegetation: *Sclerocarya birrea - Aristida stipitata - Eragrostis lehmanniana* open grass and bushveld (Marula - Long-awned three-awn - Lehmann's love grass open grass and bushveld).

Site description: The site was probably a homestead for farm workers as these farms were owned by white farmers after 1920. It is situated on a slope with a river at its base and. There is a lot of metal and glass objects along with a considerable amount of lower and upper grinding stones. There is a large cattle kraal approximately 20 x 30m.

Preliminary Interpretation:The site likely acted as a homestead for farm workers living on the farms.

Figure 6-134: southern view of the kraal

MNR 245

S -22.35279 E 030.24546 Altitude: 457m Time period: Historical

Date discovered: 24/04/18 Farm: Twilight 16 Farm mineralogy: iron, magnesite

Land type: Ib314 River proximity: 39m Geological formation: Malala Drift

Geology: gneiss Site Type: Settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Acacia tortilis* - *Eragrostis lehmanniana* old fields (Umbrella thorn - Lehmann's love grass old fields).

Site description: The site is a historical settlement situated 50 m away from a river to the east and consists of two occupational areas. One at the base of the hill on the western side and the other on the top of the hill. At the base of the hill there is a road cutting through the site from north to south there are some building foundations with some brick along with some rubber, glass, tin, porcelain and other miscellaneous metal items on the western side of the road there is another building foundation. On the western side of the road. On top of the hill there is a flat area which contains some historical and some Iron Age artefacts (grain bin base, lower and upper grinding

stone, four undiagnostic ceramics sherds), in the centre of the hill there seems to be signs of a possible kraal due to grey ashy soil and fencing wire. The top of the hill also contains a historical midden to the northwest and there is a wall on the western part of the hilltop about 4 m long and built from larger rocks filled in with smaller ones.

Preliminary Interpretation: The site is an historical settlement. Its reason for its location is unclear but it is associated with a cattle kraal and is located close to a stream. It is unclear whether the Iron Age material is related to the historical period of the site but most likely predates it.

Figure 6-135: location of historical site at the base of the koppie

Figure 6-136: Location of kraal and walling at the top of the hill

MNR 246

S -30.24546 E 030.36510 Altitude: 480m Time period: Historical

Date discovered: 24/04/18 Farm: Woodhall 35 Farm mineralogy: graphite, iron

Land type: Ib314 River proximity: 924m Geological formation: Gumbu

Geology: marble Site Type: Mine

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Sesamothamnus lugardii - Acacia tortilis* open to dense low bushveld (Mopane - Transvaal sesame bush - Umbrella thorn open to dense low bushveld).

Site description: small mine in the shape of a T was found on the site. It is situated at the base of the koppie on a small slope next to a road. Dimensions are 20x6m² and is approximately 2m deep with spoil heaps to the north and south. It was most likely opened up by mechanical diggers who possibly mined iron ore (banded iron). No material culture was present.

Preliminary Interpretation: The site is a small-scale historical iron ore mine.

MNR 247

S -22.41890 E 030.39973 Altitude: 488m Time period: Historical/Middle Stone Age

Date discovered: 24/04/18 Farm: Woodhall 35 Farm mineralogy: graphite, iron

Land type: Ib314 River proximity: 162m Geological formation: Gumbu

Geology: marble Site Type: Settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane* - *Catophractes alexandri* - *Vernonia cinarescens* low and dense bushveld (Mopane - Trumpet thorn - *Vernonia* low and dense bushveld).

Site description: The site is a small homestead situated in a drainage area and consists of some cement foundations and bricks as well as metal tubing and a ceramic sherd and a light scatter of Middle Stone Age debitage.

Preliminary Interpretation: The site seems to be an o settlement. Though its reason for settlement location is unclear.

Figure 6-137: bricks

MNR 266

S -22.49156 E 030.26566 Altitude 544m Time period: Historical

Date discovered: 17/08/18 Farm: Solitude 111 Farm mineralogy: none

Land type: Ib314 River proximity: 1023m Geological formation: Clarens

Geology: arenite Site Type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Acacia tortilis* - *Eragrostis lehmanniana* old fields (Umbrella thorn - Lehmann's love grass old fields).

Site description: The site is a historical period site with a lower and upper grindstone likely situated in the area for farming as it is located in old fields.

Preliminary interpretation: The Site location is likely related to farming potential of the soils.

MNR 300

S -22.48852 E 030.28212 Altitude: 552m Time period: Historical

Date discovered: 15/08/18 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 6248m Geological formation: Clarens

Geology: arenite

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Sclerocarya birrea - Aristida stipitata - Eragrostis lehmanniana* open grass and bushveld (Marula - Long-awned three-awn - Lehmann's love grass open grass and bushveld).

Site description: This historical settlement is situated on the northern side of a koppie at its base. There is a small midden 1x1m² in size with almost no deposit as it has been washed away. Artefacts found on the site consist of some glass and a metal kettle.

Preliminary interpretation: The site is a Historical settlement its function is unclear.

Figure 6-138: open area 100m east of MNR 314

6.9 Middle Iron Age Sites and associated data

MNR 236

S -22.33823 E 030.23959 Altitude: 494m Time period: Historical

Date discovered: 02/09/17 Farm: Twilight 16 Farm mineralogy: iron, magnesite

Land type: Fc484 River proximity: 92m Geological formation: Mount Dowe

Geology: quartzite Site type: Historical water pump

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Boscia albltrunca - Terminalla prunioides* open to dense bushveld on plains and low rocky hills (Mopane - Shepherds' tree - Lowfeld cluster-leaf open to dense bushveld on plains and low rocky hills).

Site description: A water pump in the form of a windmill with an iron frame is found here. The site is located on a hill slope with old road running south towards the top of the hill. The well still seems to have water in it but the windmill is no longer functioning.

Preliminary Interpretation: The windmill likely acted as a water source for the occupants of the farm.

MNR 240

S -22.28348 E 030.17003 Altitude: 474m Time period: Middle/Late Iron Age

Date discovered: 03/09/17 Farm: Dawn 71 Farm mineralogy: graphite, magnesite

Land type: Ib314 River proximity: 1981m Geological formation: Letaba

Geology: basalt Site type: settlement

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: The site seems to have two occupation periods, first during the 13th century with evidence of Mapungubwe facies ceramics and secondly during early 17th century with evidence of Letaba facies ceramics. The site is situated on a koppie surrounded by low rocky hills. There is a small dried out stream close to the base on the south and southwestern side of the koppie. At the summit of the koppie on the western side one finds a high-status area indicated by well build terracing and stone walling. The walls which form an enclosure around the summit have collapsed onto the terracing below. The terraced area directly below the summit may contain slight midden deposit. No other middens have been found although there is an ashy deposit present in between the rock and crevices of the slopes. This indicates that there was no specific midden, and that waste was thrown over the side of the koppie. High density scatter of Letaba and Mapungubwe ceramics, however Mapungubwe ceramics are more prevalent on the eastern side of the koppie. There is a well packed step leading to the summit of the koppie. No kraal was identified relating to the settlement however there is an area at the base of the koppie to the north which shows signs of possible kraal deposit, but this is most likely historical due to low rectangular walling.

Figure 6-139: top of the koppie where high status area is situated

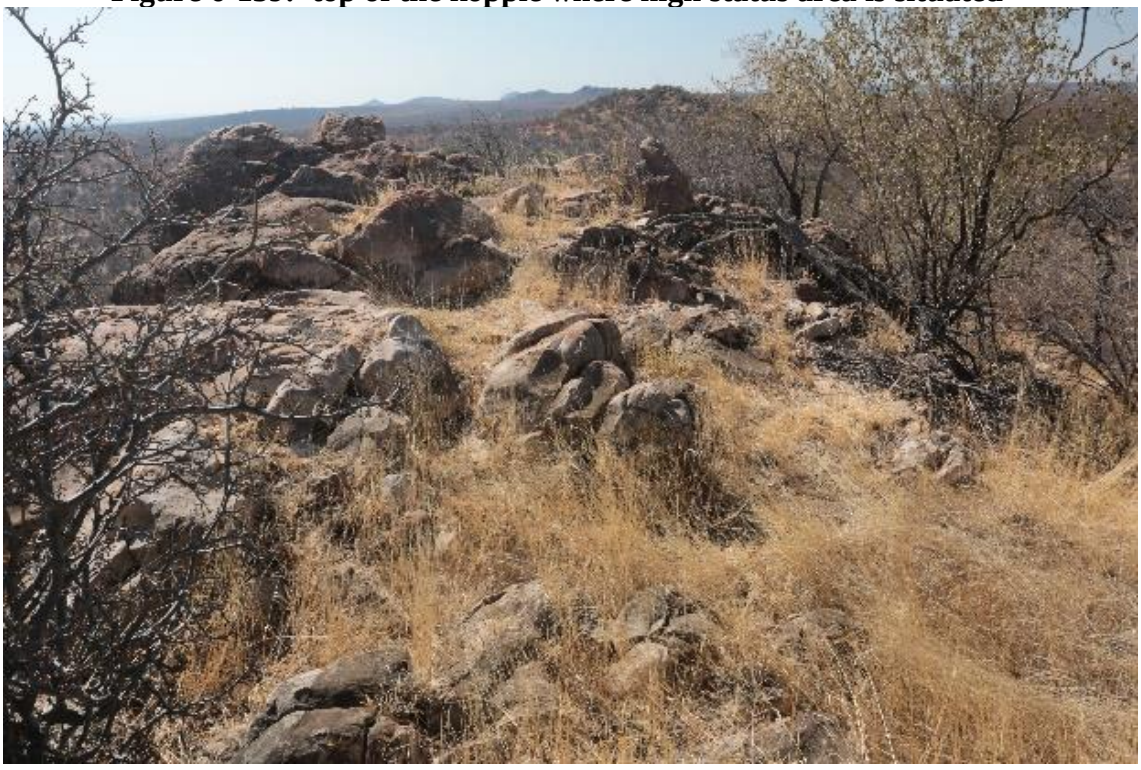

Figure 6-140: section of the koppie to the east of the high-status area

Figure 6-141: step at entrance to high status area

Figure 6-142: north eastern side of koppie with Mapungubwe period terraced platform below terraced platform where middle iron Age material is located

3.1 Environmental analysis

Table 6-2: Ecological variables within a 4km radius of MNR 240

Plant communities	Land type	Geological formation	Geology	Soil type
1	Ah91	Gumbu	Marble	A
2	Ah88	Clarens	Arentite	B
5	Ib314	Quaternary	Sedimentary	c
		Solitude &		
6	Ac263	Klopperfontein	Shale	
8	Fc484	Karoo Dolerite	Dolerite	
9	Ib314	Malala Drift	Gneiss	
10	Ac263	Letaba	Basalt	
11	Ib314			
12	Fc484			
13				
14				
15				
16				
17				

17% of the vegetation data within the 4km radius is unavailable

Table 6-3Carrying capacity within a 4km radius of MNR 240

Total LAU's with missing data (17%)	Total LAU's with average calculation	Number of grazers	Number of browsers
129,999	152	64	88

MNR 252

S -22.45278 E 030.36540 Altitude: 481m Time period: Middle Iron Age

Date discovered: 28/06/18 Farm: Skirbeek 73 Farm mineralogy: none

Land type: Ac263 River proximity: 6307m Geological formation: Letaba

Geology: basalt Site type: settlement

Soils: Soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime is generally present in parts.

Vegetation: *Sclerocarya birrea - Aristida stipitata - Eragrostis lehmanniana* open grass and bushveld (Marula - Long-awned three-awn - Lehmann's love grass open grass and bushveld).

Site description: This Mapungubwe period settlement is located on the north western slopes of a ridge which runs east to west. The site is estimated to be 30x50m in size and consists of terracing and filled platforms of which most have collapsed. There is some washed midden deposit on the slopes, however no in-situ deposit is visible. There is a low-density ceramic scatter and a lower and two upper grinding stones.

Figure 6-143: collapsed terracing

Figure 6-144: Mapungubwe long necked jar sherd

Environmental analysis

Table 6-4: Ecological variables within a 4km radius of MNR 252

Plant communities	Land types	Geological formations	Geology	Soil types
1	Fc729	Gumbu	Marble	A
2	Ah91	Clarens	Arentite	B
3	Ib314	Solitude & Klopperfontein	Sedimentary	C
6	Ac263	Quaternary	Shale	
9	Fc484	Karoo Dolerite	Dolerite	
10		Malala Drift	Gneiss	
11		Letaba	Basalt	
12				
13				
14				

18,9% of the vegetation data within the 4km radius is unavailable.

Table 6-5: Carrying capacity within a 4km radius of MNR 252

Total LAU's with missing data (18.9%)	Total LAU's with average calculation	Number of grazers	Number of browsers
137	162	68	94

MNR 259

S -22.49920 E 030.23745 Altitude: 533m Time period: Middle Iron Age

Date discovered: 30/06/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 1372m Geological formation: Solitude and Klopperfontein

Geology: shale Site type: settlement

Soils: Red -massive or weak structured soils with high base status

Vegetation: *Colophospermum mopane* - *Gardenia resiniflua* - *Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Site description: This Mapungubwe period site with an estimated size of 150x150m is situated on a plateau running east to west with a road running directly through the site from north to south. The site consists of a kraal approximately 10x10m, two large middens, each with an approximate size of 4x4m and are situated above and below the kraal. The midden above the kraal is approximately 20m north of the kraal while the southern midden is directly below the kraal and at least another four smaller household middens. There are approximately 45 grain bin bases and low-density ceramic scatter throughout the site with some lower and upper grinding stones and three cupules on the north eastern corner of the site. There were two ostrich eggshell beads and a partially complete stone bead found at the southern midden.

Figure 6-145: view of site from an easterly direction

Figure 6-146: view of site from an easterly direction

Figure 6-147: view of site from MNR 260

Environmental analysis

Table 6-6: Ecological variables within a 4km radius of MNR 259

Plant communities	Land type	Geological formations	Geology	Soil types
5	Ah91	Gumbu	Marble	A
6	Fc489	Clarens	Arenite	B
7	Ah88	Solitude & Klopperfontein	Shale	
9	Ib314	Karoo Dolerite	Dolerite	
10	Fc484	ECCA	Arenite	
11	Ah89	Malala Drift	Gneiss	
12	Ib314			
13	Fc484			
14				
15				
16				
17				

72% of the vegetation data within the 4km radius is not available

Table 6-7: Carrying capacity within a 4km radius of MNR 259

Total LAU's with missing data (72%)	Total LAU's with average calculation	Number of grazers	Number of browsers
37,974	132	55	77

MNR 280

S -22.49140 E 030.25861 Altitude: 574m Time period: Middle Iron Age

Date discovered: 02/07/18 Farm: Bosbokpoort 70 Farm mineralogy: none

Land type: Ib314 River proximity: 596m Geological formation: Clarens

Geology: arenite Site type: settlement

Soils: Red, massive or weak structured soils with high base status.
Vegetation: *Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus* low thicket (Mopane - Resin gardenia - *Tetrapogon* low thicket).

Sire description: This Middle Iron Age site is situated on the plateau edge where the Singelele River flows north, cutting through the plateau. The site is approximately 30x30m² in size and consists of three open areas in between rocks. The open area to the east has a small wall-like feature protruding from the soil. Five meters north of it is a small wall in between two boulders and an elongated lower grinding stone and an upper grinding stone. Five meters north of that is another small platform. The second open area 5m east has a small rock shelter with a 2x2m² platform. There is daga supposedly from a furnace directly next to the shelter and a second filled platform 5m south of the shelter. There is some Late Stone Age debitage and ceramic sherds.

Figure 6-148: open area in-between rocks with small wall like feature extending west

Figure 6-149: informal east of the open area

Figure 6-150: location of forge with pieces of daga

Environmental analysis

Table 6-8: Ecological variables within a 4km radius of MNR 280

Plant communities	Land types	Geological formations	Geology	Soils
1	Ah91	Gumbu	Marble	A
5	Fc489	Clarens	Arenite	B
6	Ah88	Solitude & Klopperfontein	Shale	C
7	Ib314	Karoo Dolerite	Dolerite	
9	Ac263	ECCA	Arenite	
10	Fc484	Malala Drift	Gneiss	
11	Ib314	Letaba	Basalt	

12	Fc484
13	
14	
15	
16	
17	

44,3% of the vegetation data within the 4km radius not available

Table 6-9: Carrying capacity within a 4km radius of MNR 280

Total LAU's with missing data (44,3%)	Total LAU's with average calculation	Number of grazers	Number of browsers
97,897	141.267	59	82

MNR 73

N-22.47333, E30.30611 Altitude: 547m Time period: Middle Iron Age

Date discovered: during 2004 Farm: Frampton 72 Farm mineralogy: none

Land type: Ib314 River proximity: 4288m Geological formation: Gumbu

Geology: marble Site type: settlement

Soils: soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime is generally present in part

Vegetation: *Colophospermum mopane - Aristida adscensionis* bushveld (Mopane - Nine-awned grass bushveld)

Site description: The site is a Middle Iron Age site situated in between two koppies its size is uncertain as there is only evidence for a few ceramics and terracing on the on the north eastern side of the southern koppie. The site is located approximately a 100m south west of MNR 78 another Middle Iron Age site

Environmental analysis

Table 6-10: Ecological variables within a 4km radius of MNR 73

Plant communities	Land type	Geological formation	Geology	soil types
1	Ah91	Gumbu	Marble	A
2	Ib314	Clarens	Arentite	B
5	Ac263	Quaternary	Sedimentary	C
6	Fc484	Solitude & Klopperfontein	Shale	
8	Ib314	Karoo Dolerite	Dolerite	
9	Ac263	Malala Drift	Gneiss	
10	Ib314	Letaba	Basalt	
11	Fc484			
12				
13				
14				
16				

11,5% of the vegetation data within the 4km radius is unavailable.

Table 6-11: Carrying capacity within a 4km radius of MNR 73

Total LAU's with missing data (11,5%)	Total LAU's with average calculation	Number of grazers	Number of browsers
125	139	58	81

MNR 75

N-22.47333, E30.30611 Altitude: 547m Time period: Middle Iron Age

Date discovered: during 2004 Farm: Frampton 72 Farm mineralogy: none

Land type: Ib314 River proximity: 4288m Geological formation: Gumbu

Geology: marble Site type: settlement

Soils: soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime is generally present in part

Vegetation: *Colophospermum mopane* - *Aristida adscensionis* bushveld (Mopane - Nine-awned grass bushveld)

Site description: The site is a Middle Iron Age settlement situated on a ridge that runs east to west. The settlement it located around a rocky outcrop on the western side of the ridge. Stone walling and terracing can be found right around the outcrop however it is more prominent on the northern and western section of the out crop. there is a kraal 15 m west of the outcrop and is approximately 10x10m in size. Directly to the west of the kraal there is a small wall shaped like a L the wall is quite informal and is approximately 70cm high. Artifacts found on the site consist of ceramics and lower and upper grinding stones.

Environmental analysis

Table 6-12: Ecological variables within a 4km radius of MNR 75

Plant communities	Land types	Geological formation	Geology	soil types
1	Ah91	Gumbu	Marble	A
2	Ib314	Clarens	Arentite	B
5	Ac263	Quaternary	Sedimentary	C
		Solitude &		
6	Fc484	Klopperfontein	Shale	
6	Ib314	Karoo Dolerite	Dolerite	
8	Ac263	Malala Drift	Gneiss	
9	Ib314	Letaba	Basalt	
10	Fc484			
11				
13				
14				
16				

10,3% of the data within the 4km radius unavailable

Table 6-13: Carrying capacity within a 4km radius of MNR 75

Total LAU's with missing data (10.3%)	Total LAU's with average calculation	Number of grazers	Number of browsers

132	149	63	86

MNR 79

N-22.47333, E30.30611 Altitude: 547m Time period: Middle Iron Age

Date discovered: during 2004 Farm: Frampton 72 Farm mineralogy: none

Land type: Ib314 River proximity: 4288m Geological formation: Gumbu

Geology: marble Site type: settlement

Soils: soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime is generally present in part

Vegetation: *Colophospermum mopane - Aristida adscensionis* bushveld (Mopane - Nine-awned grass bushveld)

Site description: The site seems to be Middle Iron Age settlement. The site is small approximately 15x15m and is situated on the northern side of a ridge the runs east to west and is located 200m south east of MNR 78. The artifacts on the site consist of some ceramics, two upper grindstones and a possible grain bin base.

Environmental analysis

Table 6-14: Ecological variables within a 4km radius of MNR 79

Plant communities	Land type	Geological formation	Geology	soil types
1	Ah91	Gumbu	Marble	A
2	Ib314	Clarens	Arentite	B
5	Ac263	Quaternary	Sedimentary	C
6	Fc484	Solitude & Klopperfontein	Shale	
8	Ib314	Karoo Dolerite	Dolerite	
9	Ac263	Malala Drift	Gneiss	
10	Ib314	Letaba	Basalt	
11	Fc484			
12				
13				

14

16

11,5% of the vegetation data within the 4km radius is unavailable.

Table 6-15: Carrying capacity within a 4km radius of MNR 79

Total LAU's with missing data (11,5%)	Total LAU's with average calculation	Number of grazers	Number of browsers
125	139	58	81

6.9.1 Excavated Mapungubwe period sites

The following sites: MNR 74, MNR 78 and MNR 04, are all Middle Iron Age sites which have been excavated by Dr Alexander Antonites and Prof Ceri Ashley. With the addition of MNR 259 which was excavated during October 2019, but this data has not yet been fully analysed and will not be discussed during this section.

MNR 74 and MNR 78

Both these sites are located on the farm Frampton and are approximately 600m away from each other. They are situated on Bosbokpoort Fault which forms a ridge that runs parallel to Bosbokpoort and extends north east From the Nzhelele River running through the farms Frampton, Dawn and Skirbeek. The river is believed to have been a significant source of water as hydro graphite deposits occur along its length.

MNR 74

N-22.47333, E30.30611 Altitude: 547m Time period: Middle Iron Age

Date discovered: during 2004 Farm: Frampton 72 Farm mineralogy: none

Land type: Ib314 River proximity: 4288m Geological formation: Gumbu

Geology: marble Site type: settlement

Soils: soils with minimal development, usually shallow on hard or weathering rock with or without intermitted diverse soils. Lime is generally present in part

Vegetation: *Colophospermum mopane* - *Aristida adscensionis* bushveld (Mopane - Nine-awned grass bushveld)

Site Description: The site MNR 74 was initially recorded by Kruger in 2004 and was later excavated by Antonites and Ashley in 2013. The site consisted of low informal walling with a small kraal. The deposit is shallow with a depth ranging from 5 to 10 cm. The site is located 1km away from a river which currently has no water during the dry season and 4.5km away from the Nzhelele River which is a permanent source of water throughout the year. Both rivers can be found west of the site.

Site layout and excavation units

The site is situated on a ridge in between two rock outcrops, one to the west and one to the east which is slightly larger. There was suspected midden deposit on the eastern side of the western outcrop which is believed to have washed down from a midden and had collected at the bottom of a few boulders. Between the outcrops to the south of the midden deposit, there is an open area with undifferentiated deposits followed by a small, low semi-circular informal wall attached to the western site of the koppie to the south east and is believed to have been a small stock pen.

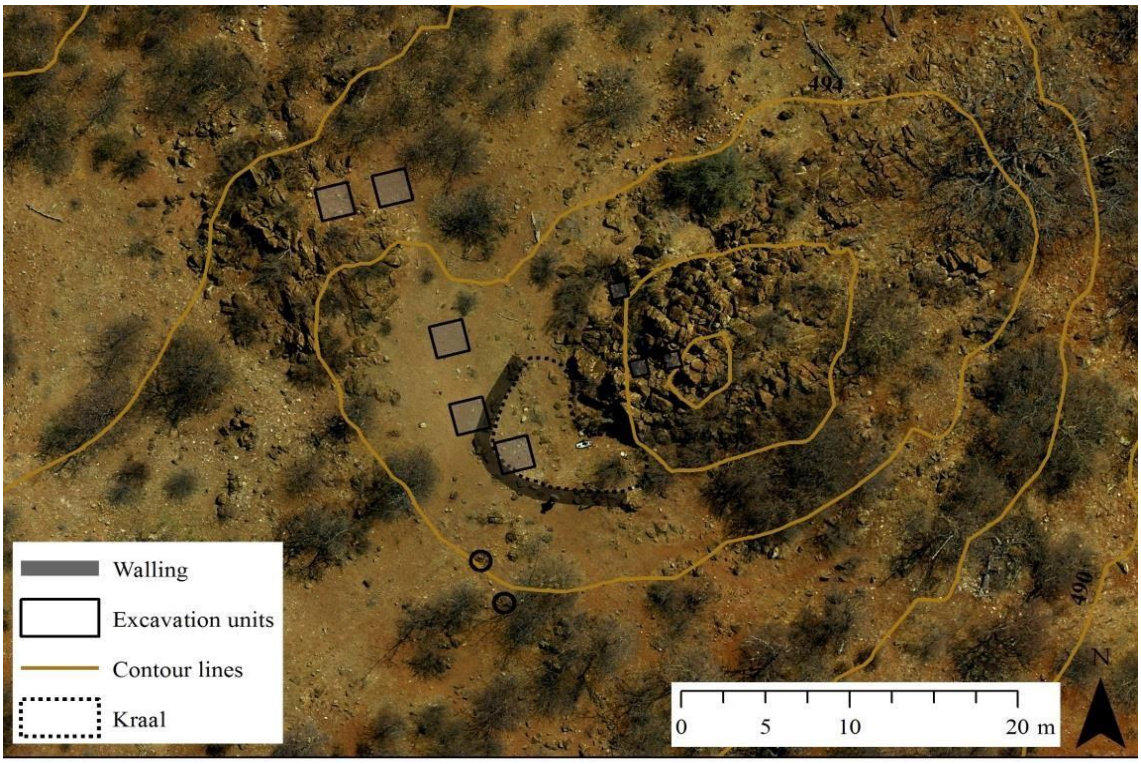

Figure 6-151: MNR 74 Excavation Units and contexts (Lippert 2019)

Excavation units

There was a total of eight excavation units set up of which three were test trenches all relating to a permanent site datum of (N100 E100). Two excavation units were set up in the midden area to the north of the site (N115 E93.5, N115 E97), while one was set up in the open area (N105 E98) between the midden area and the kraal. Another two setup were one on the western side of the walling (N100 E98) and the other on the eastern side (N92 E100) in what is considered to be the kraal. The three test trenches were situated in between the rocky outcrop on the southwestern side of the site. There was little deposit with only a few ceramics sherds found here.

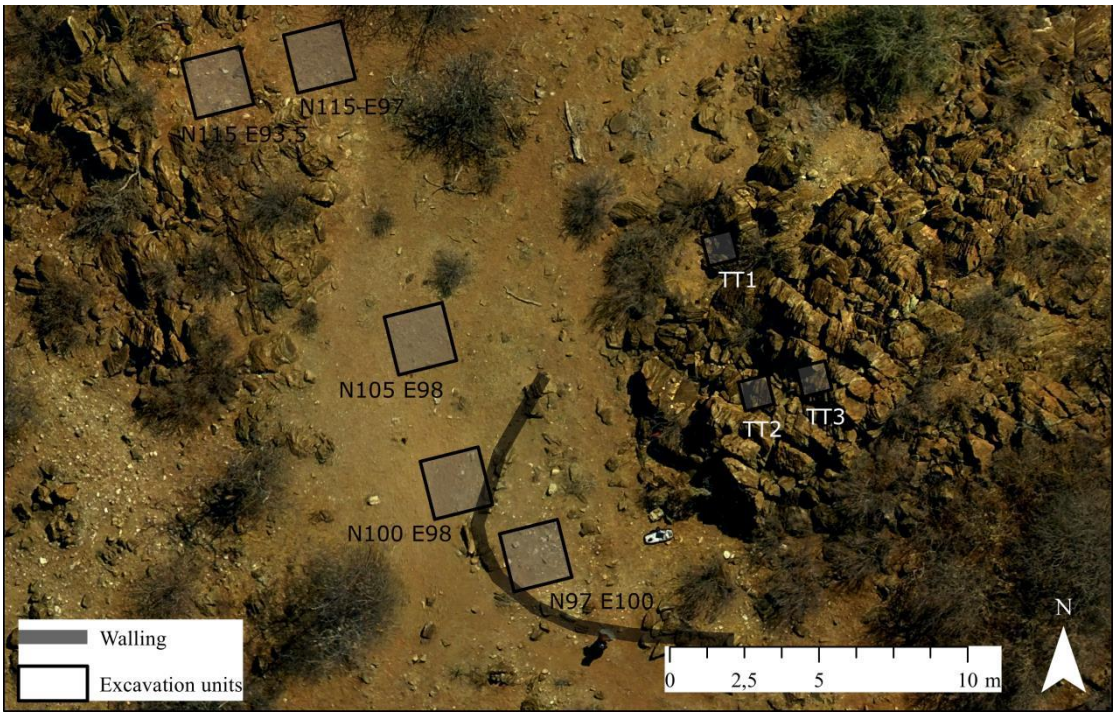

Figure 6-152: MNR 74 excavation units (Lippert 2019)

(N115 E93.5 N115 E97).

C1006: Sandy Surface Layer

C1007: Midden deposit with gravel inclusions and light loamy soil, with clusters of bone and ceramics.

C1008: Midden deposit ends on a gravel layer which contains more ceramic and bone clusters before ending on bed rock

(N105 E98)

C1001: Sandy surface layer

C1004: Topsoil with gravel inclusions and undifferentiated deposit

C1005: Increase of gravel inclusions before ending on bed rock

(N100 E98)

C1001: Ashy surface layer

C1002: Dung layer with gravel inclusions

C1003: Dung gravel interface.

(N97 E100)

C1001: Ashy surface layer

C1002: Dung layer with gravel inclusions

C1003: Dung gravel interface.

Small finds analysis

Most small finds were discovered within the midden deposit. The glass beads identified relate to the east coast Indo-Pacific glass bead sequence which occurs during the 13th century (Wood 2000) and reaffirms the 13th century radiocarbon dates for the site (Lippert 2019).

Table 6-16: Distribution of small finds at MNR 74 (Lippert 2019)

Context Description	Glass Beads (n)	Disk Beads (n)	Metal Helixes (n)	Metal Other (n)	Slag Weight (g)	Spindle Whorls (n)
General surface	7	6	-	-	-	1
Kraal deposit	-	12	-	-	-	3
Undifferentiated Occupation	5	2	1	-	-	-
Midden	17	16	1	1	12.9	3
Ashy Deposit	4	-	-	-	-	2

Faunal Analysis

Faunal analysis (Antonites et al 2016) showed a mix of wild animals and domesticates (the latter constitutes 42% of all identified taxa; NISP 128), with small stock (sheep/goat) predominant within the domesticate fauna.

Botanical analysis

Only Five seeds were discovered in the botanical sample of which only 3 were identifiable. All three coming from wild plant species, though this does not mean grains were being utilized as there are grain bin bases on the site.

Table 6-17: Botanical remains found on MNR 74

Family	Genus	Species	Wild /Domestic
Fabaceae	Unknown	Unknown	Wild
Poacea	Bracharia	Bracharia nigropedata	Wild
Chenopodiceae	Chenopodium	Unknown	Wild

Environmental analysis

Table 6-18:Ecological variables within a 4km radius of MNR 74

Plant communities	Land types	Geological formation	Geology	soil types
1	Ah91	Gumbu	Marble	A
2	Ib314	Clarens	Arentite	B
5	Ac263	Quaternary	Sedimentary	C
6	Fc484	Solitude & Klopperfontein	Shale	
6	Ib314	Karoo Dolerite	Dolerite	
8	Ac263	Malala Drift	Gneiss	
9	Ib314	Letaba	Basalt	
10	Fc484			
11				
13				
14				
16				

10,3% of the data within the 4km radius unavailable

Table 6-19: Carrying capacity within a 4km radius of MNR 74

Total LAU's with missing data (10.3%)	Total LAU's with average calculation	Number of grazers	Number of browsers
133	147	62	85

MNR 78

N-22.46597, E30.31329 Altitude: 550m Time period: Middle Iron Age

Date discovered: during 2004 Farm: Frampton 72 Farm mineralogy: none

Land type: Ib314 River proximity: 428m Geological formation: Gumbu

Geology: marble

Soils: Red, massive or weak structured soils with high base status.

Vegetation: *Colophospermum mopane - Aristida adscensionis* bushveld (Mopane - Nine-awned grass bushveld)

Site description: MNR 78 was initially recorded by Kruger in 2004 and was later excavated by Antonites and Ashley in 2014. The site is located on a ridge between a rocky outcrop which forms part of Gumbu geological formation and is situated 5km east of the Nzhelele River. The site consists of some rough informal terracing and walling.

Site Layout and excavation units

Figure 6-153: Overview MNR 78 (Lippert 2019)

The site is situated between a rocky outcrop creating a natural terrace that slopes to the south and is enhanced by some roughly stacked terracing at the southern end of the site. To the west of the site there are four low informal walls all blocking open areas between boulders. This could be considered foundations for wood palisades which direct movement and restrict access within the site (Antonites 2016). There is a small midden 10m south of the wall and to the north where midden deposit has collected against some boulders. Twenty meters south of the midden there is a hut floor associated with another wall directly west of it. Midden material can also be found in between rocks on the natural forming terrace on the southernmost part of the site. In the centre of the site there is some undifferentiated deposits with some low stone walling features.

Excavation units

In total there are 12 excavation units of which four are test trenches and two test pits with the four test trenches located on the north western section of the site. TT1 is related to the midden deposit while TT3 and TT4 are located between TT1 and TT2 which is associated with a grain bin base. South of the test trenches there are three

excavation units, (N98 E85) is situated in an open area below a boulder outcrop, Excavation unit (N92 E80) is situated in an open area 5m south east of excavation unit (N98 E85), while excavation unit (N87 E75) is a further 7m south east and relates to a daga floor with an associate grain bin base. East of unit (N98 E85) there are three more excavation units. Unit (N100 E96) was set up to investigate some wash occurring on the northern slope of the outcrop while (N92 E102) was excavated to identify a wall-like feature situated on bed rock. Excavation unit (N94 E94) was set up to investigate the large open area in the centre of the site. Test trench one and two were placed over midden deposit which had collected between boulders.

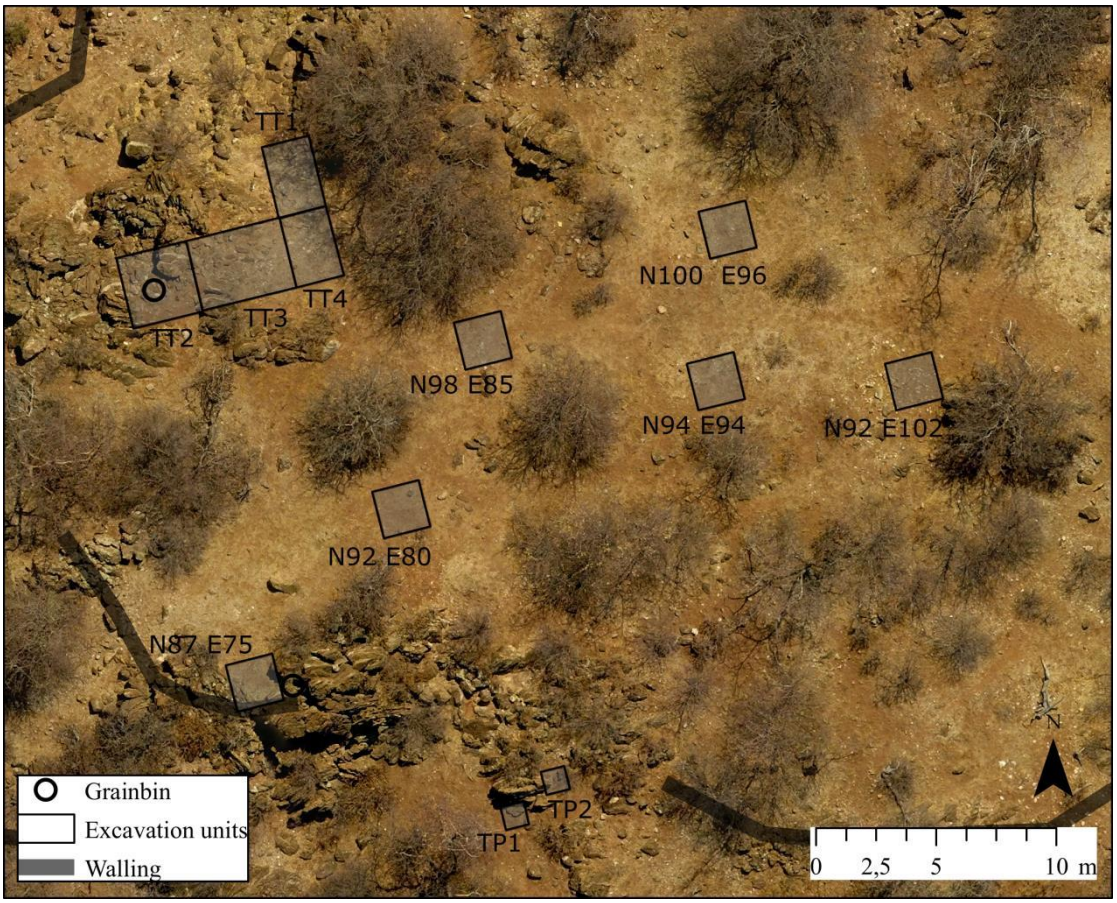

Figure 6-154: MNR 78 excavation units. (Lippert 2019)

(N87 E75)

C1001: Sandy surface layer

C1002: Reddish brown soil with gravel inclusions ending on a compact gravel floor

C1003 Sandy layer beneath floor with a decrease in artefact density

(N92 E80)

C1004: Sandy Surface Layer with some ceramics

C1005: Sandy deposit with some artefacts ending in sterile gravel deposit

(N98 E85)

C1004: Disturbed Surface Layer

C1006: Sandy deposit ending on sterile gravel

(N94 E94)

C1004: Disturbed surface layer

C1007: Compact soil ending on sterile gravel

(N100 E96)

C1008: Gravely surface layer with some pot sherds

C1009: Sandy soil with gravel inclusion ending on sterile gravel layer

(N92 E102)

C1010: Disturbed surface layer

C1009: Sandy soil with gravel inclusion ending on sterile gravel layer

Site Analysis

Small finds analysis

Most finds were associated with the undifferentiated wash occurring on the north eastern side of the site, which most likely came from the occupation area to the south and the midden material from test trench one and test pits one and two (Lippert 2019).

Table 6-20: Distribution of the small finds at MNR 78. (Lippert 2019)

Context Description	Disk Beads (n)	Stone Beads (n)	Metal Helixes (n)	Metal Other (n)	Slag Weight (g)	Spindle Whorls (n)
General surface	2	-	-	-	-	1
Household	1	-	-	-	-	1

General occupation	11	-	3	-	-	2
Gravel wash	-	-	-	-	-	1
Stone wall	4	-	-	-	-	-
Midden	7	-	11	-	147.2	4
Undifferentiated wash	54	1	27	3	-	4

Botanical Analysis

The botanical analysis for MNR 78 was originally analysed by Uys in 2016 for an unpublished master thesis but has since been reanalysed by Steyn for her PHD dissertation which is still in process of being completed.

Table 6-21: Botanical samples from MNR 78 (Stein per comm 2020)

Family	Genus	Species	Common name	Wild/domestic
Fabaceae	Acacia	unknown	Depends on species	Wild
Fabaceae	Vigna	unknown	Depends on species	Unknown, probably domestic
Amaranthaceae	Chenopodium	unknown	Depends on species	Wild
Poaceae	Sorghum	bicolor	Sorghum	Domestic

Environmental analysis

Table 6-22: Ecological variables within a 4km radius of MNR 78

Plant communities	Land type	Geological formation	Geology	soil types
1	Ah91	Gumbu	Marble	A
2	Ib314	Clarens	Arentite	B
5	Ac263	Quaternary	Sedimentary	C

6	Fc484	Solitude & Klopperfontein	Shale
8	Ib314	Karoo Dolerite	Dolerite
9	Ac263	Malala Drift	Gneiss
10	Ib314	Letaba	Basalt
11	Fc484		
12			
13			
14			
16			

11,5% of the vegetation data within the 4km radius is unavailable.

Table 6-23: Carrying capacity within a 4km radius of MNR 78

Total LAU's with missing data (11,5%)	Total LAU's with average calculation	Number of grazers	Number of browsers
125	139	58	81

Oxygen Isotopic ($\delta^{18}O$) analysis of MNR74 and MNR78

Fresh water molluscs were used for isotopic analysis by Kruger (2016) on the sites MNR 74 and MNR 78. One sample was obtained from MNR74 and two from MNR78. The results of the analysis showed that the mollusc from MNR74 was harvested during late summer or the beginning of winter. While one of the two samples obtained from MNR78 showed signs that it was harvested during late summer or the begging of autumn while the other was harvested during late autumn or the begging of winter. The result of the isotopic analysis shows that these two sites were occupied during the same season (Kruger 2016).

PXRF analysis for MNR74 and MNR78

Research on ceramic technology was done on MNR74 and MNR78 by Kraljević (2016). The research used portable x-ray fluorescence on undiagnostic sherds from both sites to study their chemical compositions. The ceramics were first grouped into

fabric groups based on macroscopic features prior to pXRF analysis. This research showed a broad similarity in chemical fingerprints of clays from both sites apart from one fabric group which was chemically different to everything else and only appeared at MNR78. This fabric group was also noted as unique during macroscopic analysis. The similar clays can speak for a similar, if not the same clay source being used by both groups for clay production. The unique clay could show a series of imported clay or pots or also a potter who had separate access to a unique clay source.

Dating: MNR74 and MNR78

MNR74 and MNR78 were both dated using radiocarbon analysis of charcoal whereby two samples per site were selected. Both of the MNR74 samples came from the midden area (C1007). Their corresponding uncalibrated dates were 729 ± 31 BP (D-AMS-4205) and 837 ± 35 BP (D-AMS-4206). Since both samples occurred within the same context (C1007) and were combined using the OxCal v. 4.2 (Bronk Ramsey 2009) and then calibrated using the southern hemisphere curve (Hogg et al. 2013), they produce a calibrated 2-sigma range of cal. AD 1226–1300. The two radiocarbon dates from MNR78 samples are (D-AMS8695) and (D-AMS8694). The former associated with the midden area (C1013) to the north west of the site calibrate to cal. AD 1212–1278. While the latter is associated with the hut floor (C1003) at the southern end of the site and cal. AD 1222–1297.

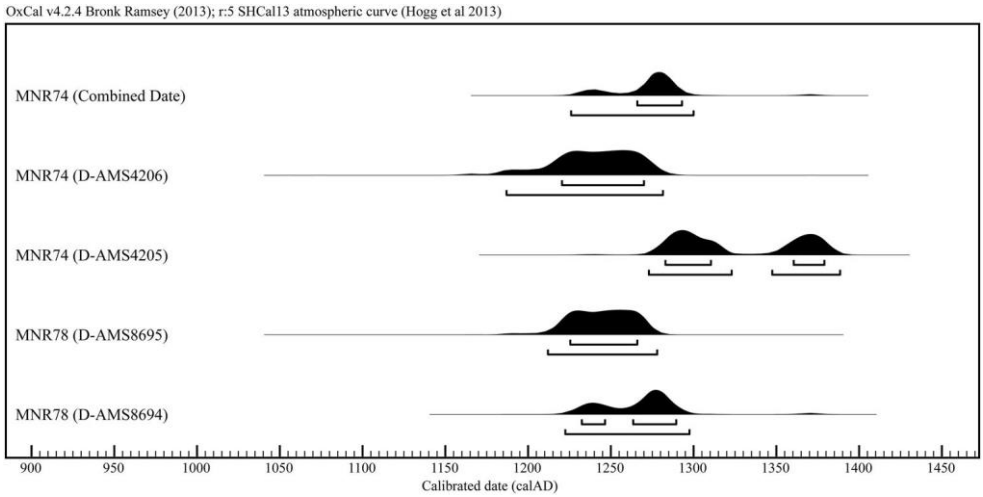

Figure 6-155: Radio Carbon Dates

Plot of the calibrated radiocarbon dates from MNR74 and MNR78. Results are calibrated to the Southern Hemisphere calibration curve (Hogg et al. 2013) and plotted in OxCal 4.2 (Bronk Ramsey 2009). The combined date for MNR74 represents D-AMS-4205 and D-AMS-4206.

Radiocarbon results from MNR74 and MNR78. Results are calibrated to the Southern Hemisphere calibration curve (Hogg et al. 2013) in OxCal 4.2 (Bronk Ramsey 2009). The combined date for MNR74 represents D-AMS-4205 and D-AMS-4206.

Table 6-24: Radio Carbon Results

Site	Laboratory number	Uncalibrated age BP	1-Sigma range (cal. AD)	2-sigma range (cal. AD)
MNR78	D-AMS-8694	785 ± 28	1232–1289	1222–1297
	D-AMS-8695	835 ± 24	1225–1266	1212–1278
MNR74	D-AMS-4206	837 ± 35	1220–1270	1187–1281
	D-AMS-4205	729 ± 31	1283–1379	1273–1388
	(Combined Date)		1266–1293	1226–1300

MNR 04

N -22.32917 E30.1675 Altitude: 515m Time period: Middle Iron Age

Date discovered: during 2004 Farm: Vryheid 8 Farm mineralogy: alluvial diamonds, copper, corundum

Land type: Fc484 River proximity: 189m Geological formation: Messina

Geology: anorthosite Site type: settlement

Soils: Red, massive or weak structured soils with high base status

Vegetation: *Combretum aplculatum - Portulacaria afra* mountain bushveld.

Site description: MNR04 was excavated during three different field seasons (October 2014, September 2015 and September 2018). It is located 5km east of the Sand River

and 3km south of the Limpopo River and it situated on a ridge with a spur associated with a smaller river 189m to the north. The western side of spur (Area A) is associated with two occupation periods: a small late Iron Age homestead (17th century) on the top of the ridge at the western end of the site and a section of the Mapungubwe period settlement situated on the southern slope containing the kraal with a possible domestic area directly below it to the south. The eastern side of the spur has cultural material associated with the Mapungubwe period only and is situated on the northern (Area C) and southern side (Area B) of the ridge. Area C contained little cultural deposit while Area B produced more cultural material and was associated with 21 visible stone grain bin bases.

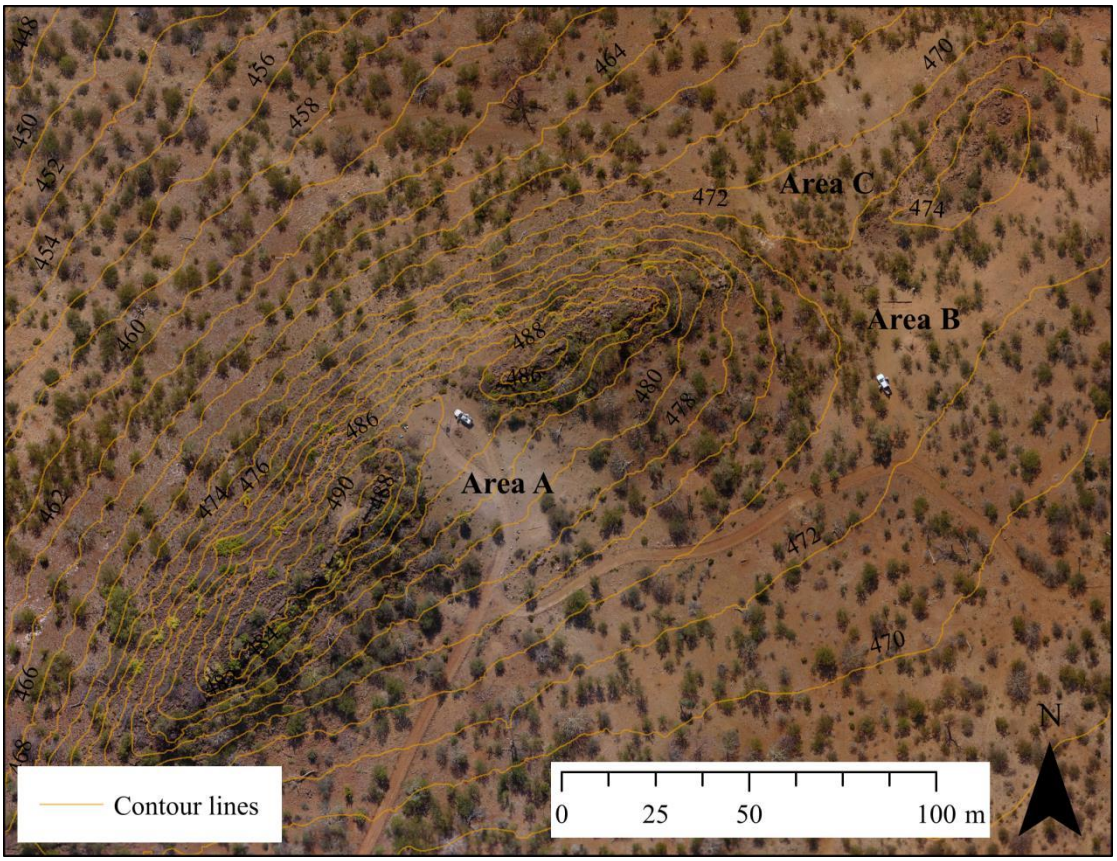

Figure 6-156: MNR 04 excavation areas (Lippert 2019)

Area A

Four excavation units were set up within the deposit relating to the Mapungubwe period and consisted of three 2m x 4m units and one 2m x 2m unit. Units N89 E94 and N90 E112 are situated within the kraal which was identified through large quantities of vitrified dung lying on the surface. Units N69 E94 and N70 E110 are situated 15m south of the former two units between two rocky outcrops which are related to the domestic area identified through a grain bin base and grinding stones.

Excavation units N90 E66, N111 E87 and N102 E91 will not be discussed as they relate to the 17th century settlement. While excavation units relating to the Mapungubwe period (N89 E94, N90 E112, N69 E98 and N70 E110) will.

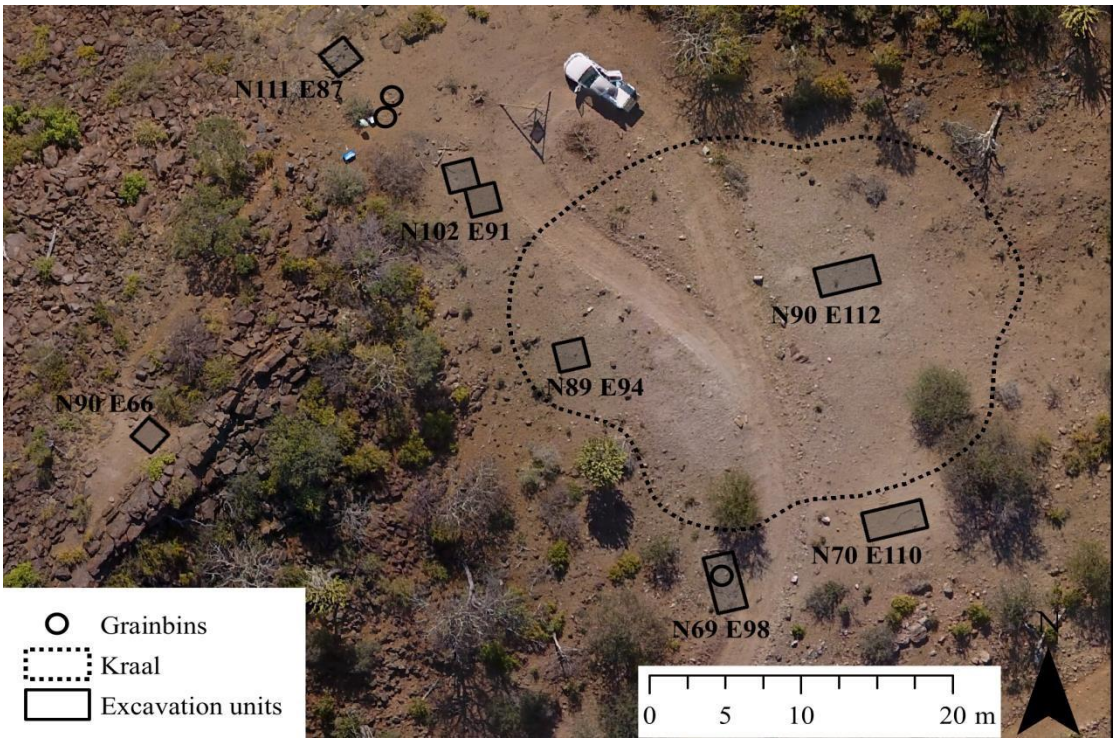

Figure 6-157: MNR 04 Area A excavation units (Lippert 2019)

Excavation units

(N89 E94) size: 2m x 2m

C1010: Disturbed surface layer, light brown in colour with some ceramic sherds.

C1011: Yellow brown dung layer

C1012: Brownish grey ashy layer ending on bedrock.

(N90 E112) size: 2m x 4m

C1013: Dark brown soil with rock inclusions.

C1014: Soft soil with increasing dung inclusions.

C1015: Light grey vitrified dung.

(N69 E98) size: 4mx 2m

C1006: Sandy surface layer with large rock inclusions. A few Ceramics and shell are visible on the surface.

C1007: Soil with some scattered dung inclusion and large rocks trapping cultural material

Circular Grain bin stand

(N70 E111) size: 2m x 4m

C1001: Loose brown surface sand

C1004: brown gravel layer with ashy intrusions

Area B

Area B is situated at the base of the ridge on the southern side of the slope and consists of three excavation units: a 2m x 2m unit (N99 E222), a 2m x 8m unit (N96 E216) and a 4m x 8m unit (N104 E230). These units were placed here to identify the context of the grain bin basses in relation to the midden and rest of the site.

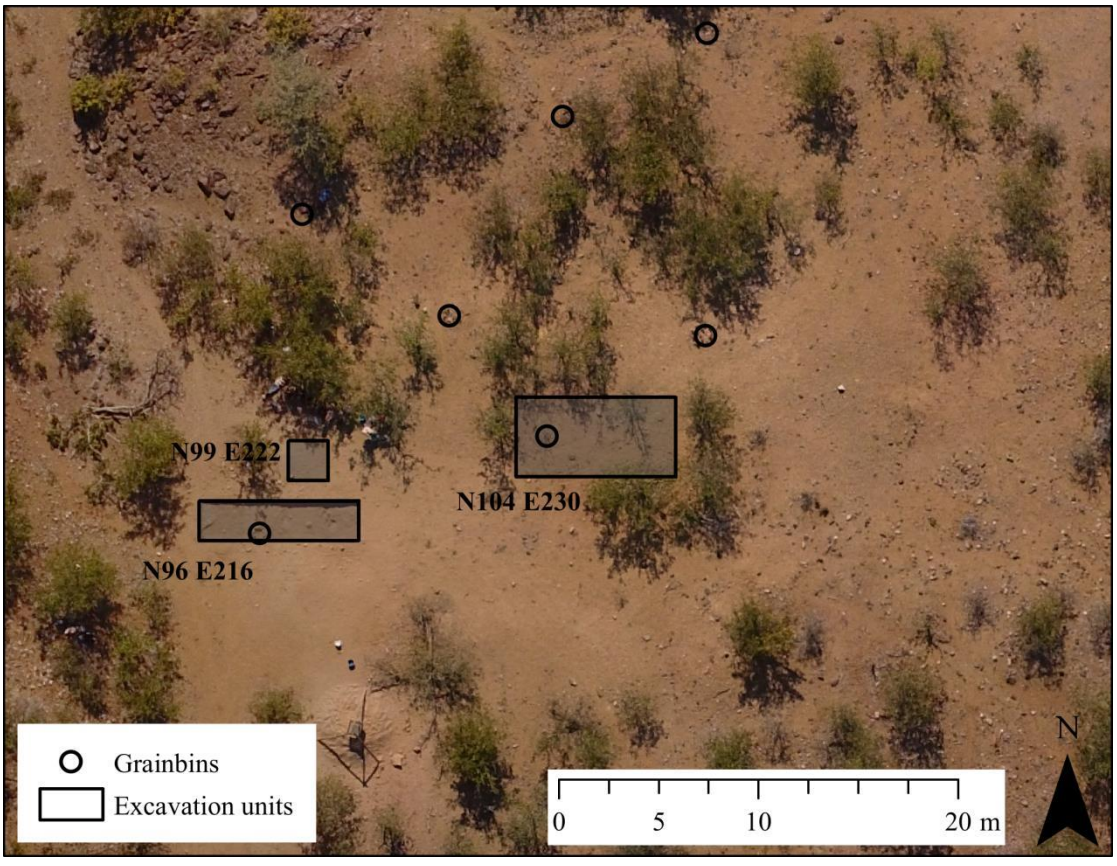

Figure 6-158: MNR 04 Area B excavation units (Lippert 2019)

Excavation units

(N99 E222) size: 2m x 2m

C1002: Disturbed grey surface layer, ashy in texture.
C1008: Soft shy soil ending on red sterile soil.

(N96 E216) size: 2m x 8m

C1002: Disturbed grey surface layer, ashy in texture.
C1003: Consolidated brown wash with gravel and ash inclusions.
C1005: Dark brown dung layer ashy in texture with decreasing gravel intrusion and little cultural material before ending on bed rock.

(N104 E238) size: 4m x 8m

C1020: loose sandy soil with gravel inclusions and some ceramic sherds and bone.
C1021: Compact gravely dark yellowish-brown deposit with a decrease in compactness and gravel intrusions.
C1022: Soft ashy brown layer with vertically exposed cultural material.
C1023: Brown gravel surface containing daga intrusion situated on a gravel floor.

Area C

Area C is situated at the base of the ridge on the northern slopes. Two 2m x 2m excavation units were opened to identify the context of what was thought to be a midden due to the ashy texture of the soil and grey discolouration.

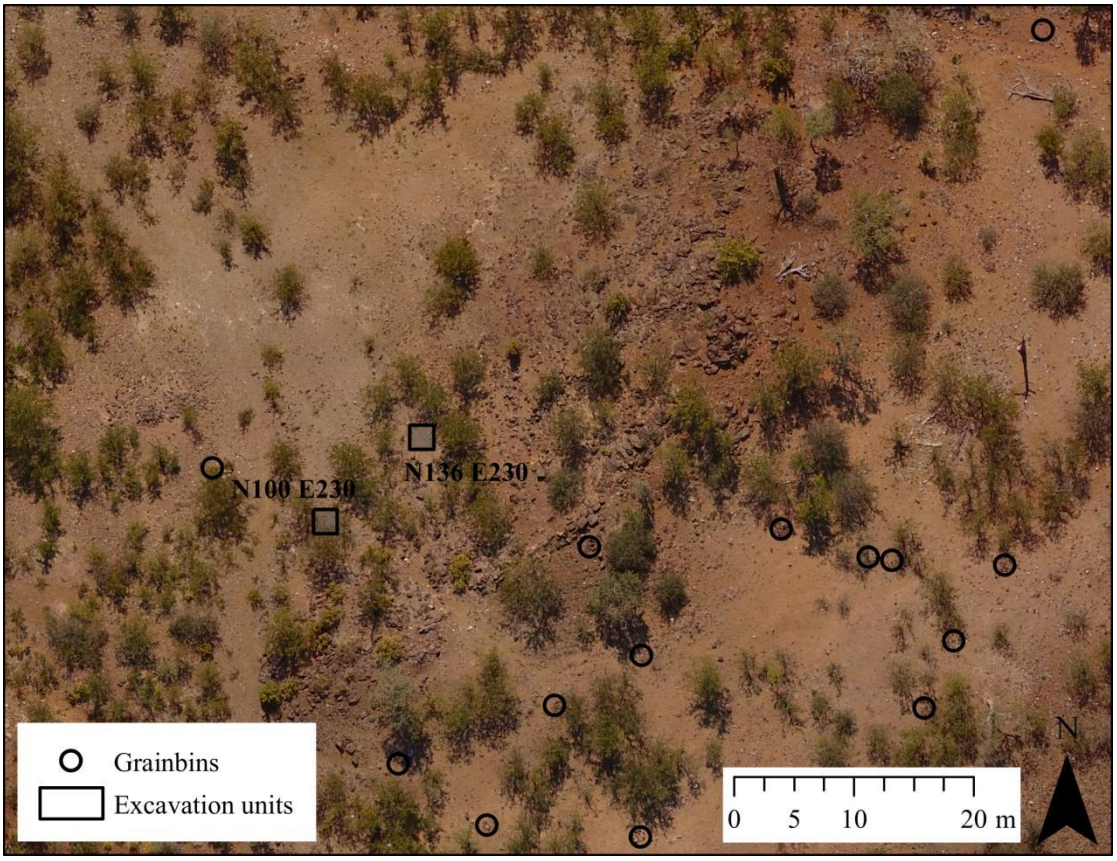

Figure 6-159: MNR 04 Area C excavation units (Lippert 2019)

Excavation units

(N100 E230) size: 2m x 2m

C1018: Brown ashy surface layer
C1019: Fine ashy loam layer with an increase in cultural material before ending on bedrock

(N136 E230) size: 2m x 2m

C1009: loose surface soil ashy in texture
C1017: Greyish brown layer with gravel inclusions which contains some cultural material before ending on a sterile gravel layer.

Small finds analysis

The small finds were analysed by Lippert (2019) in an unpublished master's thesis.

Table 6-25: Distribution of small finds at MNR 04 (Lippert 2019)

Context Description	Glass Beads (n)	Disk Beads (n)	Metal Helixes (n)	Metal Other (n)	Slag Weight (g)	Spindle Whorls (n)
Area A						
General surface	2	5	-	1	-	1
Kraal	5	6	3	1	229.6	3
Grain bin	2	12	4	1	18.8	1
Slope wash	-	-	-	-	-	-
Area B						
Surface	-	3	-	1	-	-
Ashy Kraal Deposit	2	1	-	-	-	1
Unconsolidated Wash	-	-	-	-	-	-
Gravel wash	3	3	1	-	-	-
Gravel floor	1	4	1	-	74.6	-
Area C						
Surface	2	5	-	1	-	-
Midden	1	13	2	-	-	1

Botanical Analysis

The botanical analysis for MNR 04 was originally analysed by Uys in 2016 for and unpublished master thesis but has since been reanalysed by Steyn for her PHD dissertation which is still in process of being completed.

Table 6-26: Botanical samples from MNR 04 (Stein per comm 2020)

Family	Genus	Species	Common name	Wild/domestic
Malvaceae	Gossypium	herbaceum	Cotton	Wild

Fabaceae	Acacia	unknown	Depends on species	Wild
Poacea	Pennisetum	glaucum	Pearl millet	Domestic
Malvaceae	Grewia	unknown	Depends on species	Wild
Anarcardiaceae	Sclerocarya	birrea	Marula	Wild
Malvaceae	Adansonia	digitata	Baobab	Wild
Fabaceae	Vigna	unguiculata	Cowpea	Domestic
Amaranthaceae	Chenopodium	unknown	Chenopod	Wild
Fabaceae	Vigna	unknown	Depends on species	Unknown, probably domestic

Environmental analysis

Table 6-27: Ecological variables within a 4km radius of MNR 04

Plant communities	Land types	Geological formation	Geology	soil types
1	FC482	Messina	Anorthosite	A
1,1	Fc484	Mount Dowe	Quartzite	B
3	Ah89	Sand River	Gneiss	
7				
8				
9				
12				
13				
14				
16				
17				

16,3% of the vegetation data within the 4km radius not available

Table 6-28: Carrying capacity within a 4km radius of MNR 04

Total LAU's with missing data (16.3%)	Total LAU's with average calculation	Number of grazers	Number of browsers
94	109	46	63

Dating

Five charcoal samples were carbon dated, three of which came from the kraal in Area A while the other two came from the ashy deposit in Area B

The first sample came from Area A in excavation unit N69 E98, context C1007 which is located at the south western point of the kraal and provides an uncalibrated date of 822 ± 23 BP (D-AMS 008600) which produced a calibrated 2 sigma date of cal. AD 1219-1279. The second sample comes from Unit N90 E112, context C1016. The unit is located in the centre of the kraal and produced an uncalibrated date of 917 ± 35 BP (D-AMS 008688). The third sample comes from unit N90 E112, context C1012 located in the north wester section of the kraal and provided an uncalibrated date of 1075 ± 22 BP (D-AMS 008691 and when calibrated produces a 2 sigma date range of cal. Ad 985 – 1034

The two samples from Area B come from unit N99 E222, context C1008 and provide an uncalibrated date of 952 ± 22(D – AMS 008692) and 902 ± 25 (D-AMS 008693) and calibrated too two sigma range are cal. AD 1043-1190 and 1096-1259.

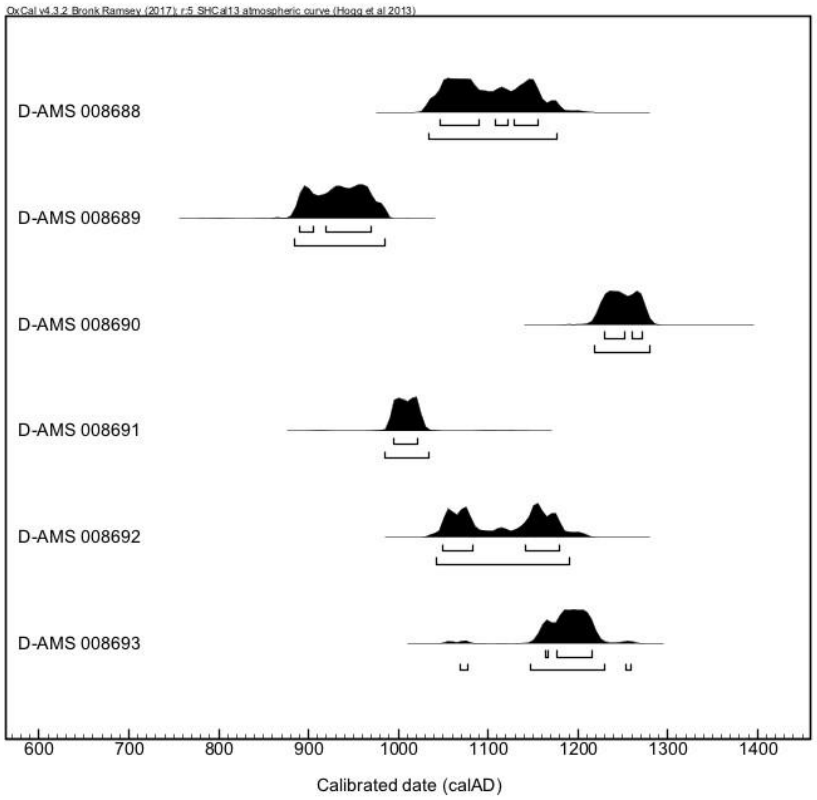

Figure 6-160; Radio carbon dates for MNR 04

The results are calibrated using the Southern Hemisphere calibration curve (Hogg et al. 2013) and are plotted in OxCal v4.3.2 (Bronk Ramsey 2017).

Results are calibrated using the Southern Hemisphere calibration curve (Hogg et al. 2013) and are plotted in OxCal v4.3.2 (Bronk Ramsey 2017).

Table 6-29 Radiocarbon dates from MNR 04

Laboratory number	**Uncalibrated age BP**	**1-Sigma range (cal. AD)**	**2-Sigma range (cal. AD)**
D-AMS 008688	917 ± 25	1046-1156	1033-1076
D-AMS 008690	822 ± 23	1230-1271	1219-1279
D-AMS 008691	1075 ± 22	955-1021	985-1034
D-AMS 008692	952 ± 22	1049-1179	1043-1190
D-AMS 008693	902 ± 25	1164-1216	1069-1259

Chapter 7 – Discussion

In this section I will discuss the findings of the study by using maps generated on GIS software and data gathered during the field survey. In the hope of identifying settlement patterns linked to environmental resources and exploitation and how these changes occur over time and space. Firstly, the total number of sites will be compared with environmental variables to see what general patterns emerge and then the total number of sites per time period with associate artifact types and site features

Based on the observation on site locations within Maremani Nature Reserve we can see that site preference is affected by various ecological factors and that this preference does vary over time. The ecological variables discussed during this study relate to geology, soil, vegetation, land type, and proximity to water, all of which play some role in determining the settlement location choices of communities.

7.1 Environmental variables pertaining to the total number of sites

The analysis of total sites in relation to environmental variables regardless of time period and site function does provide some insight into settlement location choices if you have multiple environmental variables with related high-resolution data. Analysis of environmental variables with low resolution data such as vegetation, geology and soil types without high resolution such as the associated carrying capacity, mineralization or soil depth does not provide enough information to create a meaning full assessment of how site density is related to varying environmental resources and how they were being utilizes within the landscape.

7.1.1 Soil types

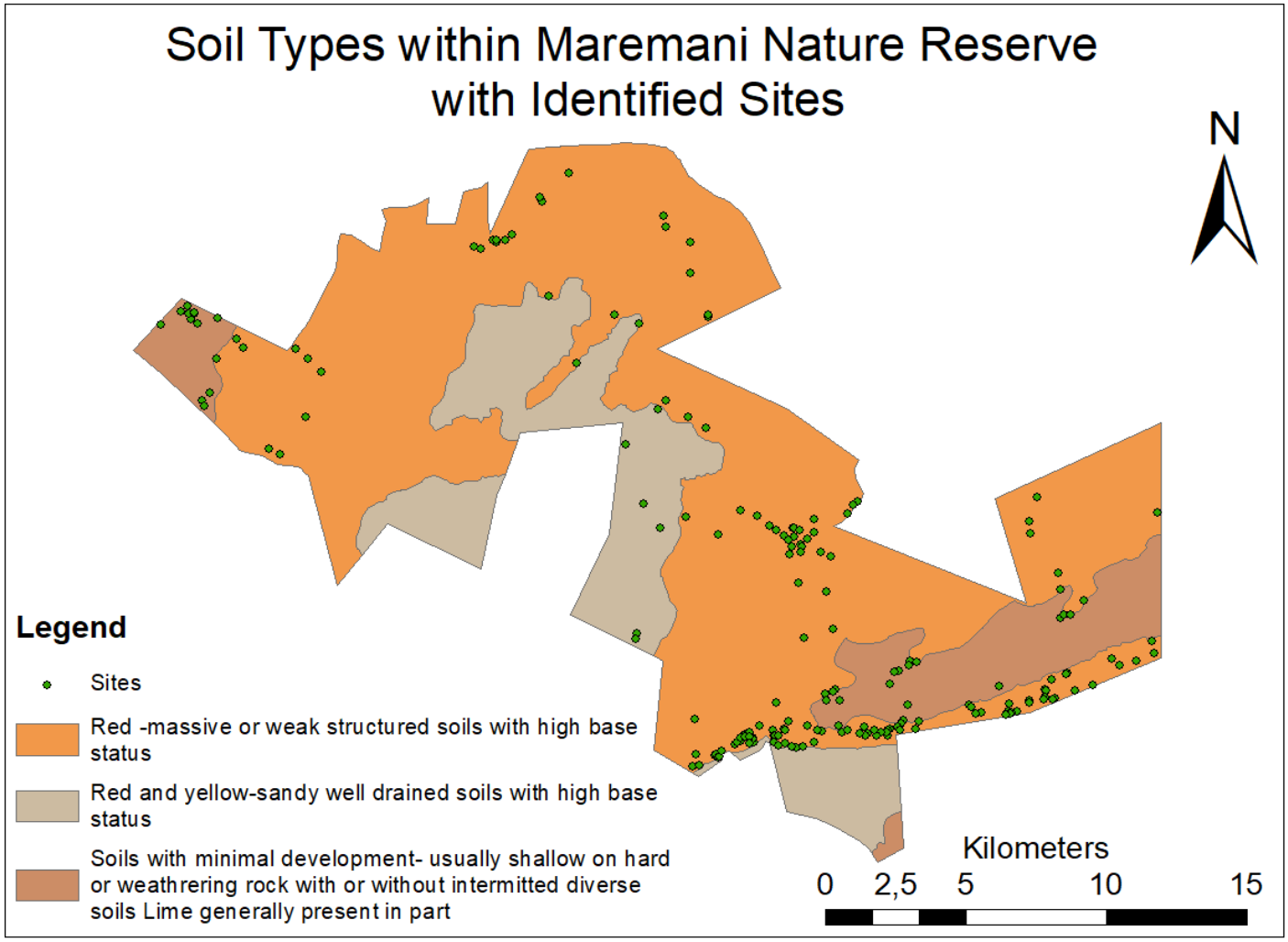

Figure 7-1: soil types in Maremani Nature Reserve with identified sites

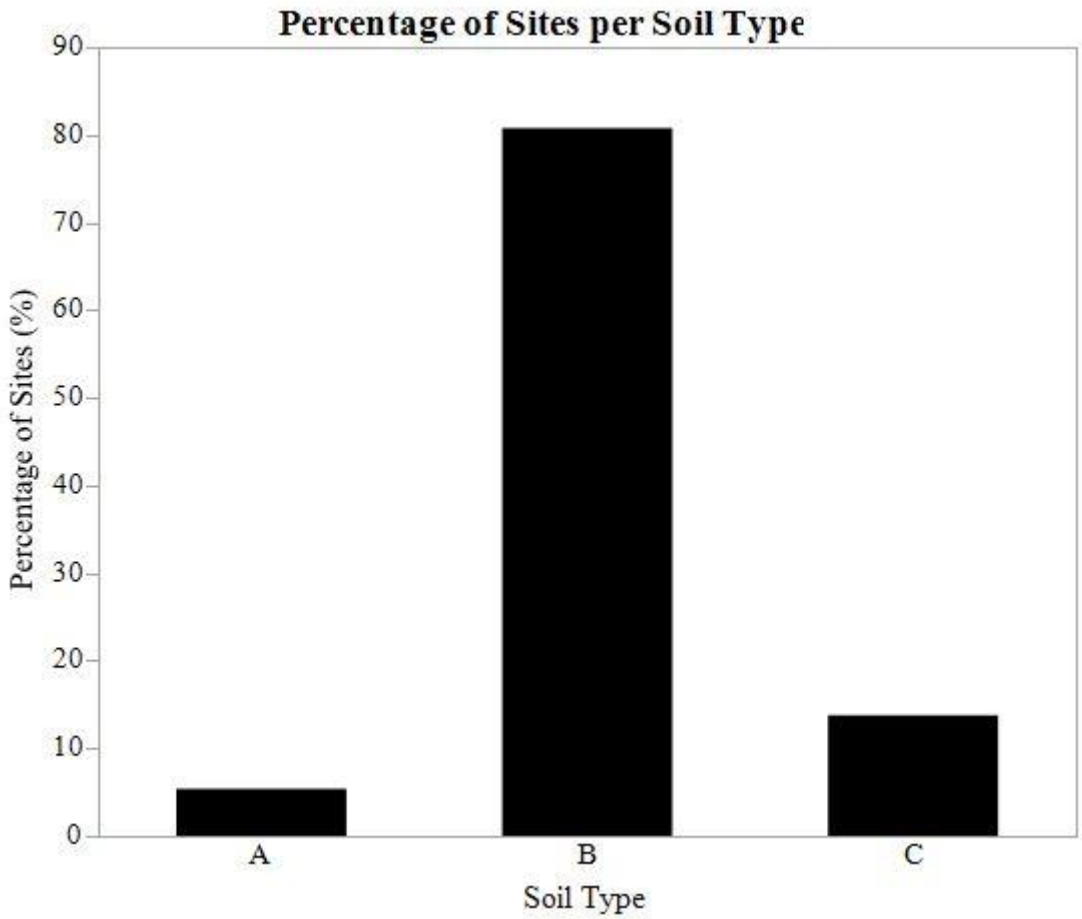

Figure 7-2:Percentage of sites per soil type

Table 7-1: Percentage of sites per soil type

Soil type	Total percentage
A	5,418
B	80,788
C	13,793

Soil type B has the majority of the sites located within it with a total of 80,79%. The high percentage of sites within this soil type is most likely due to it occupying the largest area within the reserve and that 48% of all sites are situated within the Thsirundu hills where this soil type is also located. The reason that this soil type is not a defining variable for settlement choice is that it has no to little agricultural potential as soils are shallow and minimally developed with lime present in part. What is interesting though is that soil type A and C have a better agricultural potential than soil type B but has less sites situated within in them.

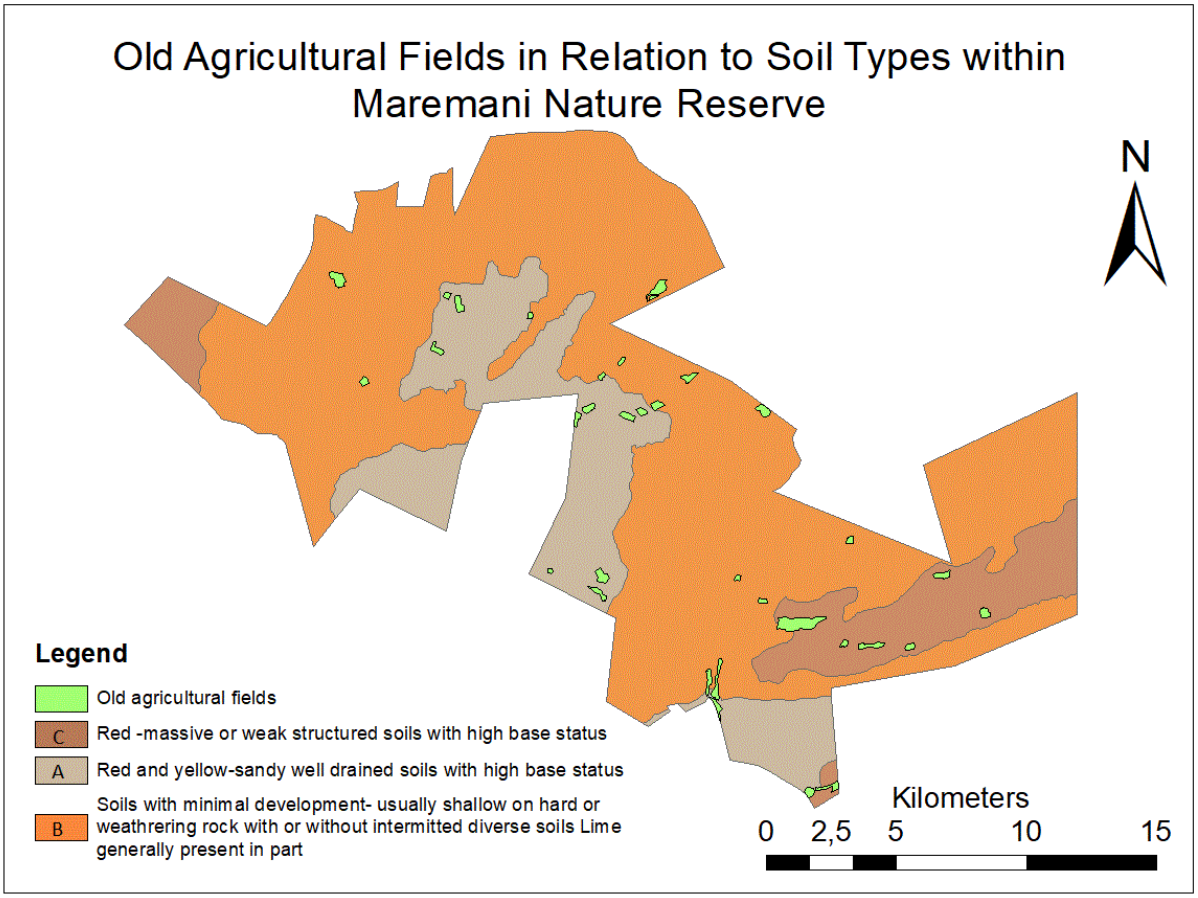

Figure 7-3: Old agricultural fields in relation to soil types within Maremani Nature Reserve

The agricultural potential for soil types A and C is also evident in the number of old fields situated within them as Soil type A has 13 Agricultural fields and soil Type C has 8. Soil type B does have more agricultural fields than soil type C which has 11 sites but it does cover a far larger area. What can also be seen is that the old field within Soil type B are cluster around specific areas. Possibility pointing to niche farmable areas within this soil group.

7.1.2 Land types

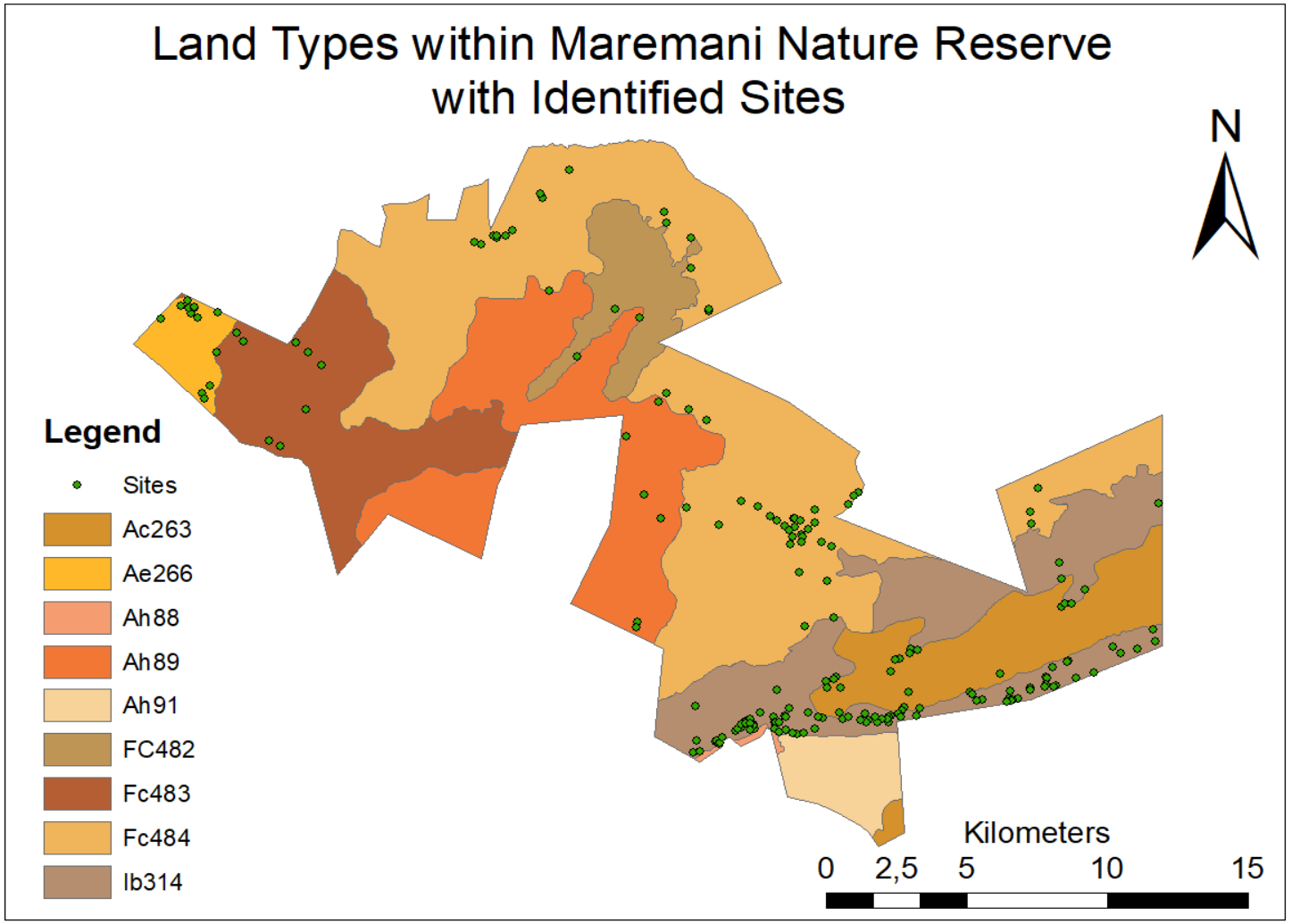

Figure 7-4: Land types within Maremani Nature Reserve with identified sites

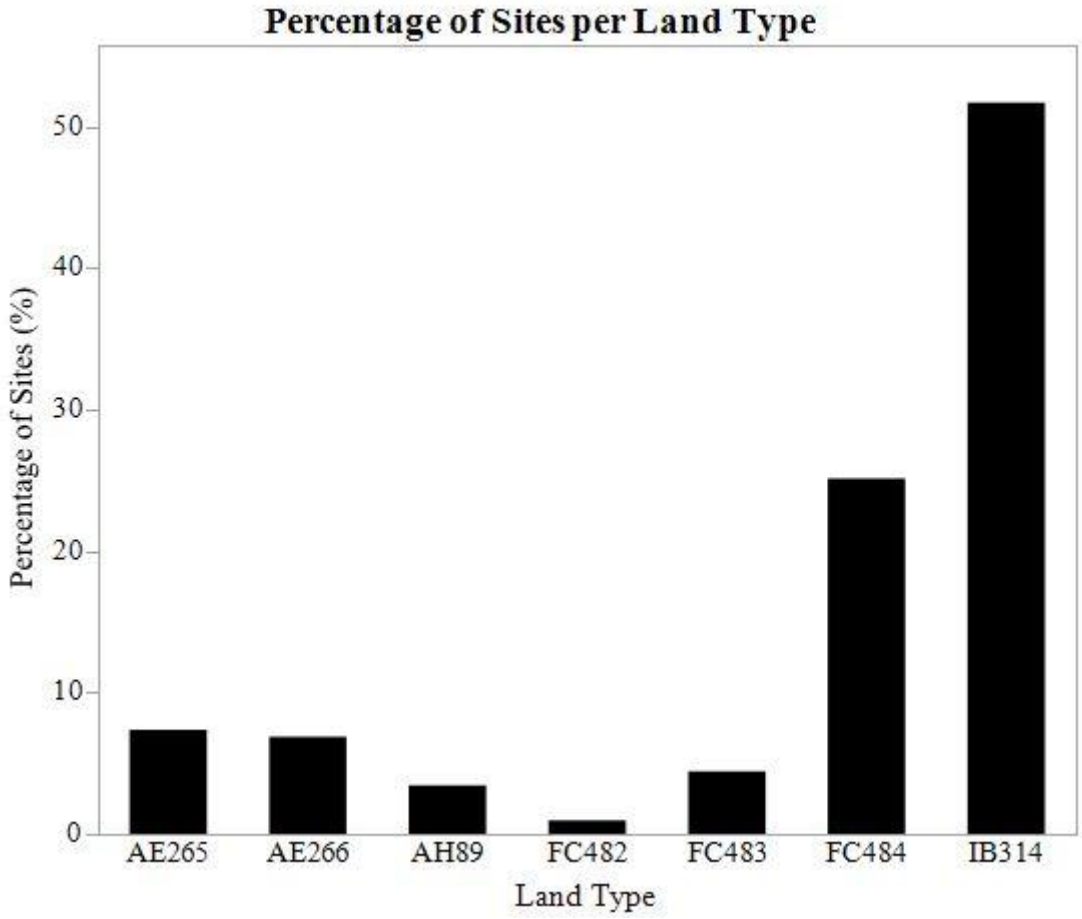

Figure 7-5: Graph indicating percentage of site per land type

Table 7-2 : percentage of sites per landtype

Land types	Total percentage
AE265	7,389%
AE266	6,896%
AH89	3,448 %
FC482	0,985%
FC483	4,433%
FC484	25,123%
IB314	51,724%

Land type Ib314

Land type Ib314 has 51,72% of all the sites situated within it. It is located on the southern end of the reserve and consists of steep mountainous terrain that occupies 12% of the study area. This 51,72% accounts for 105 sites of which 93 are situated in the Tshirundu hills. The reason for this is most likely due to the area's seclusion and elevated position in the landscape. As Land type Ib314 has limited farming potential especially within the Thsirundu hills.

Land type Fc484

Land type Fc484 has 25,12% of all the sites situated within it.it is located in the central and northern part of the reserve and occupies 40,5% of the study area. Land type Fc484 consist of steeper and shorter slopes on crests and mid slopes. A possible reason for settlement location on this land type is that Oakleaf soils occur on valley bottoms and have a depth range of between 600mm-1200m while Fernwood soils can be found on mid-slopes near to stream beds and are between 900-1200mm. The agricultural potential for this landtype can also be seen through the number of old fields located within it at 29,03%

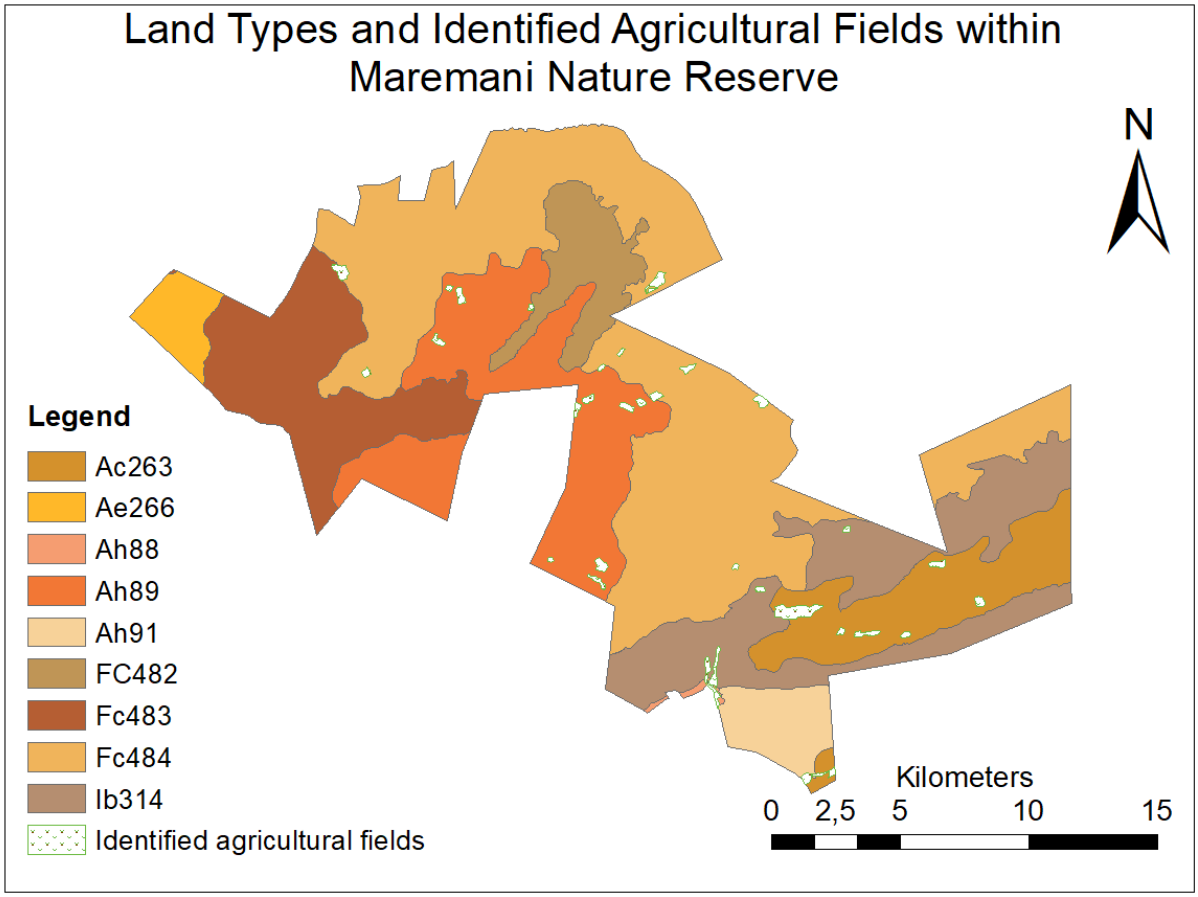

Figure 7-6: land types and identified agricultural field within Maremani Nature Reserve

Other land types that also show a high farming potential are land types Ah89 as it has oakleaf soils that meet adequate farming depth of 1200m and has 35,48% of all the old fields situated within it. landtype Ae265 has no data on soil depth though its agricultural potential is evident as it has 19,35% of all the old fields situated within it.

7.1.3 Geology types

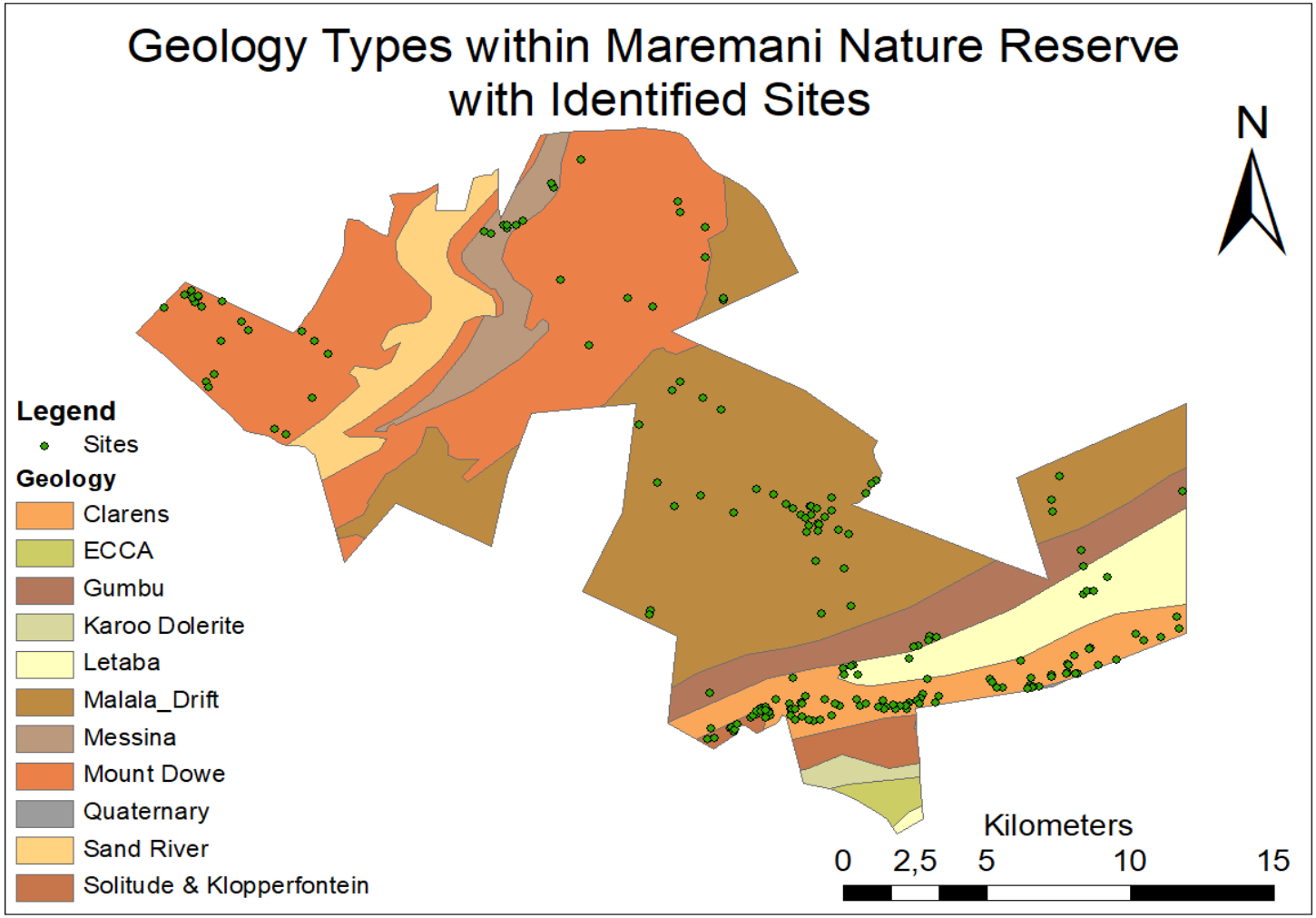

Figure 7-7: Geology types within Maremani Nature Reserve with identified sites

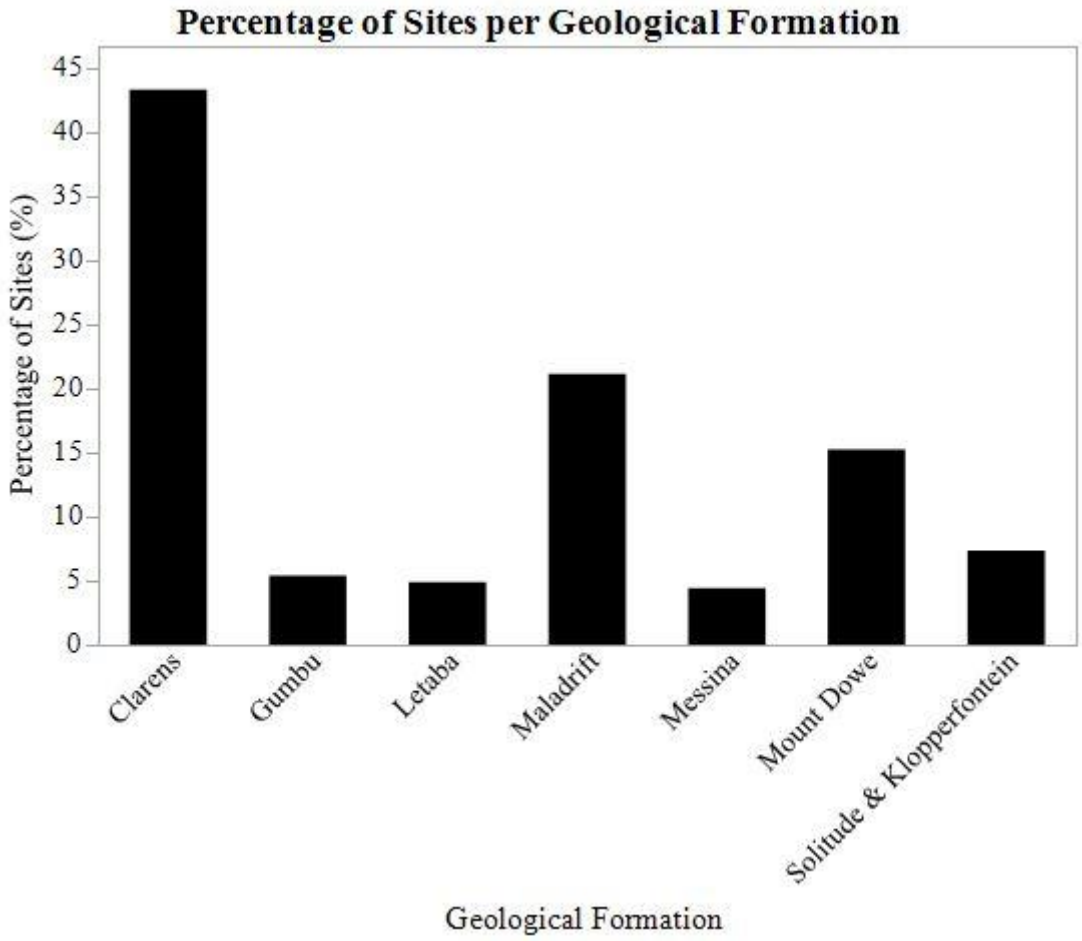

Figure 7-8: Graph depicting percentage of sites per land type

Table 7-3: Percentage of site per geology type

Geological Formation	Total %
Clarens	43,379
Gumbu	5,418
Letaba	4,926
Malala Drift	21,182
Messina	4,433
Mount Dowe	15,27
solitude &Klopperfontein	7,389

The Clarens gelogical formation has 43,37% of all the sites situated within it. This is most likely due to the landscape topography of the Thsirundu hills and not the gelogical properties of the formation.The Maladrift formation has the second most sites with 21,12% though this is more likely due to a clusters sites more closely related to Agricultural potential than geology. Mineralisation does seem to play some type of role especially on the northern side of the reserve where small clusters of sites can be identified on farms where known mineralisation occurs. Geological faults also seem to play a role as sites can be found within them or wthin close proximity this is mostlikely because fault lines contain much of the mineralistion in the reserve and are possible sources of water

7.1.4 Vegetation types

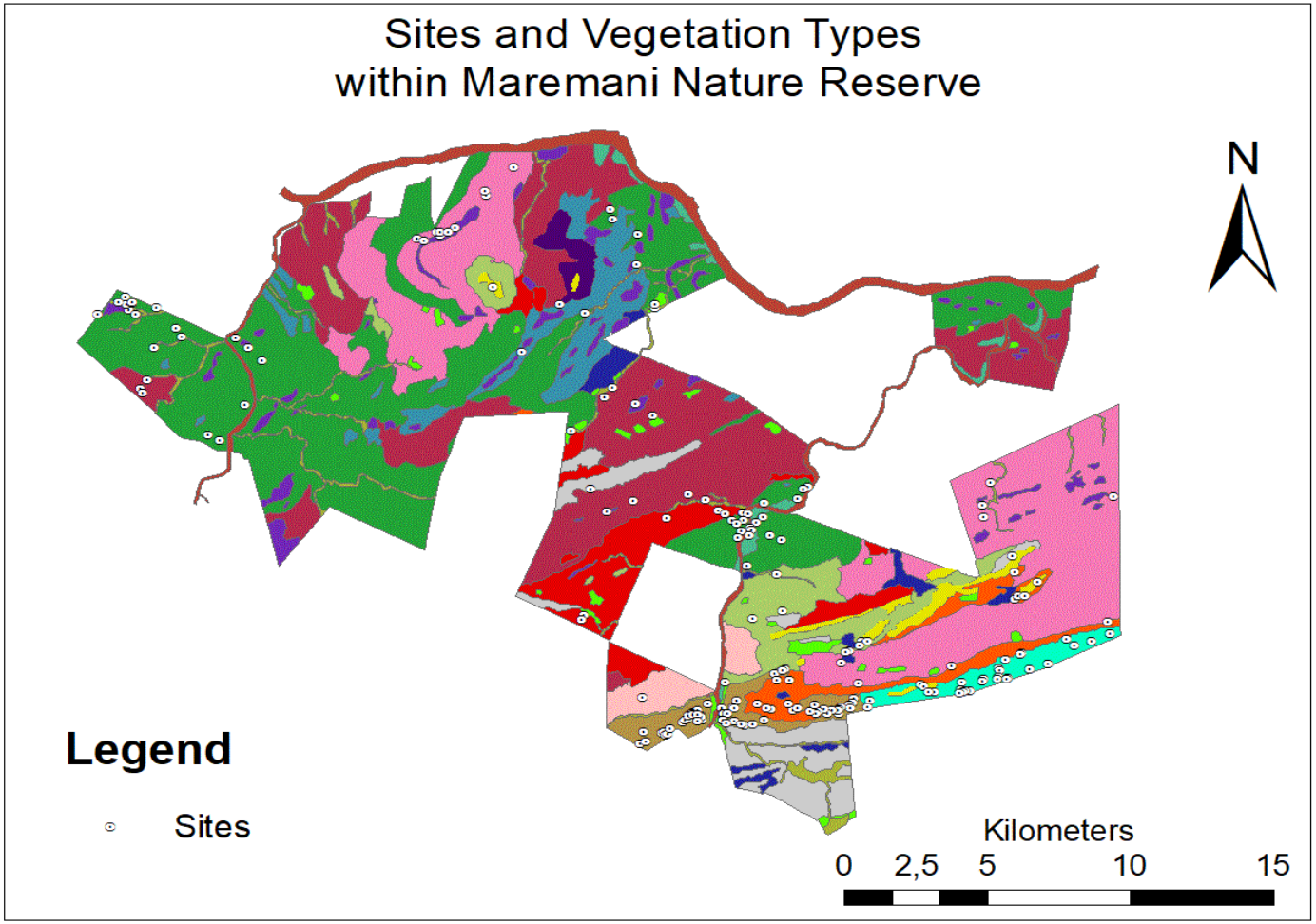

Figure 7-9: sites and vegetation types within Maremani Nature Reserv

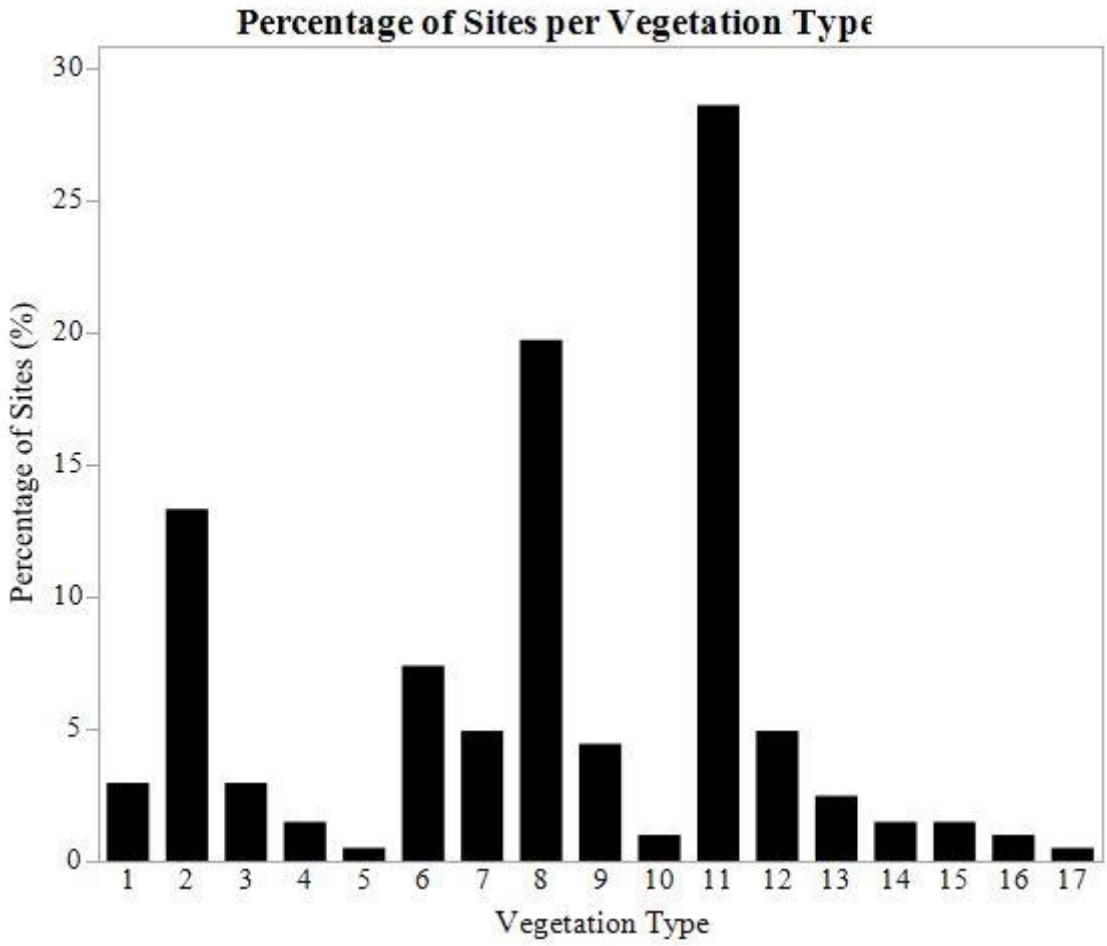

Figure 7-10:Graph depicting percentage of sites per vegetation type

Table 7-4: Percentage of sites per vegetation type

Vegetation types	Total percentage	Vegetation types	Total percentage
1	2,955	10	0,985
2	13,3	11	28,571
3	2,955	12	4,926
4	1,477	13	2,463
5	0,492	14	1,477
6	7,389	15	1,477
7	4,926	16	0,985
8	19,704	17	0,492
9	4,433		

Vegetation type seems to play little role in site location choices when purely looking at the geographic location of sites as a whole. Vegetation type 11 has the most sites situated in it with 28,57%. Though this is more likely to do with the topography than vegetation type as it is located In the Tshirundu hills.

Vegetation type 8 has the second most sites with 19,70% though this is also not likely to be related to vegetation type but instead the wide area this vegetation type occupies and clusters of sites occurring within it but more likely related to other environmental variables.

When considering the carrying capacity of vegetation types a clear pattern emerges and that is that the carrying capacity of the landscape is linked to site location preferences as multiple site clusters are in close proximity to vegetation types with high carrying capacities.

7.1.5 Drainage systems

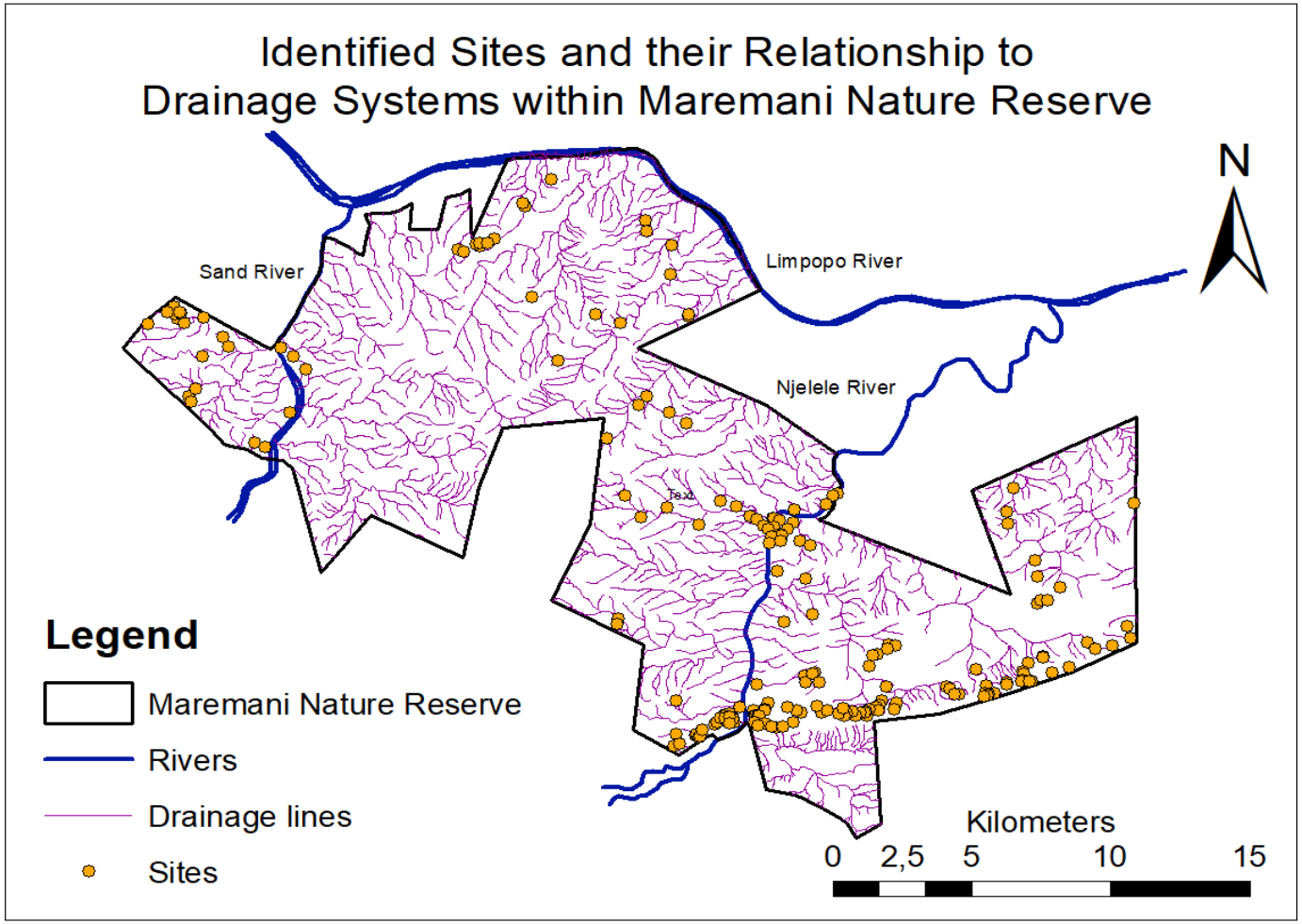

Figure 7-11: Identified sites and their relationship to drainage systems within Maremani Nature Reserve

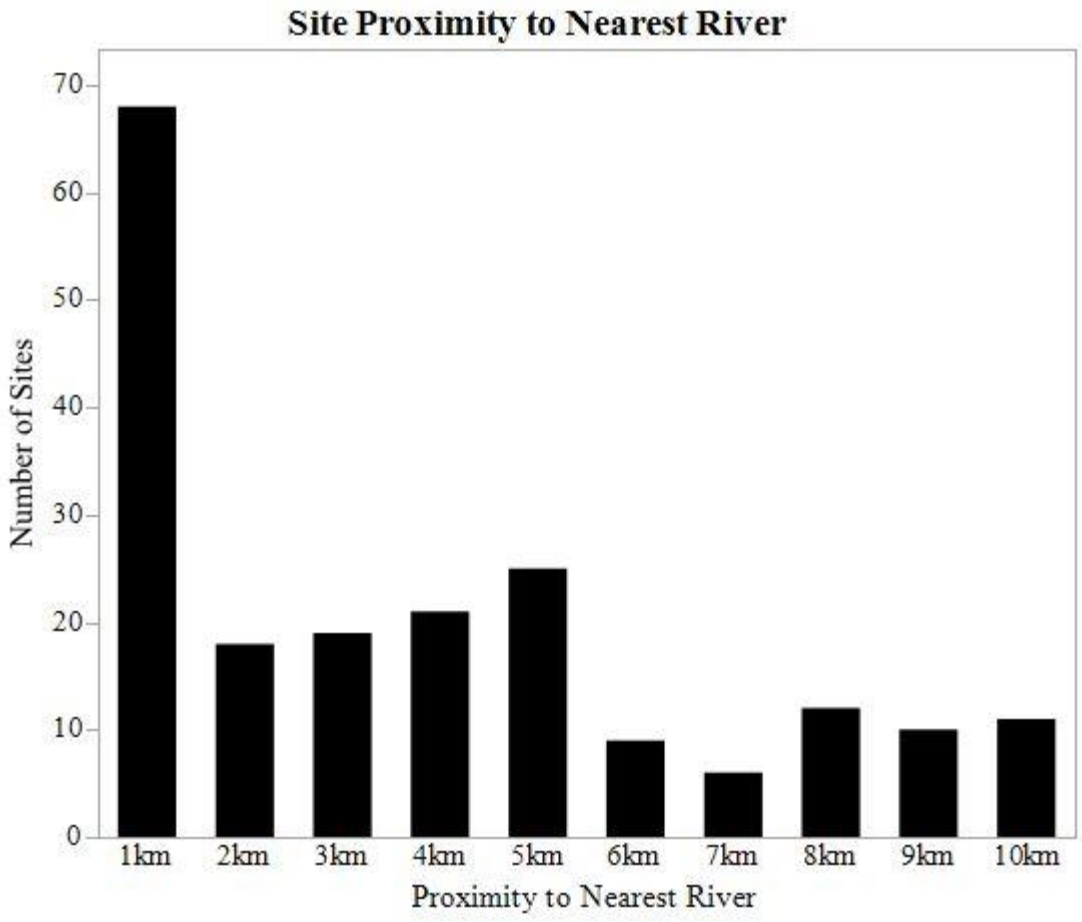

Figure 7-12:Graph depicting proximity of sites to the nearest river

Table 7-5:Proximity of sites to the nearest river

Distance to river	Number of Sites	Distance to river	Number of Sites
1 km	68	6 km	9
2 km	18	7 km	6
3 km	19	8 km	12
4 km	21	9 km	10
5 km	25	10km	11

When looking at the proximity of sites to rivers, 34% of all the sites are located within 1km of a river this drops quite dramatically past 1km with the following for 4 km only accounting for 41,7% of the sites. Past 5km there is another drop as only 24,12% of the sites can be found within the remaining 5km. There is a clear link between rivers

and site placement as there is a progressive decrease in sites as you move away from rivers.

From the data presented above some general settlement patterns are visible. When looking at the total number of sites and their locations in relation to environmental variables you can see that the main determining factor for site placement is the topography of the Clarens geological formation which can be found in landtype Ib314. This area is situated at the southernmost end of the reserve and is known as the Thsirundu hills and has 48% of all the sites located within this area. Vegetation seems to play little part in site location choices at face value as vegetation types with higher site percentages are likely due to other environmental variables. Geology also seems to play little role apart from in a topographic aspect until mineralization and water sources along fault lines are considered. Landscapes seem to play a slightly larger role when considering general landscape topography and soil structure occurring within them. This can be seen by the site density in the Thsirundu hills and land type Fc484 which has a higher farming potential. River proximity also seems to play a role in site placement as there is a clear decrease in sites as you move further away from the rivers.

Site density decreases as you move away from rivers, 34% of all sites are situated within 1km of a river and 75% within the first 5km.Geology plays little role except for in the case of topography topographic aspect until mineralization and water sources along fault lines are considered. Soils do have an impact, but this is very generalised as high resolution data is only available for five of the landtypes. Though old agricultural fields do seem to be occurring in land types with deeper soils which are more favourable for farming. There are no clear patterns to vegetation type regarding site density though the vegetation types with the highest carrying capacity are situated around the Thsirundu hills.

The Tshirundu hills is the favoured place for settlement location. This can be seen by the large quantities of sites situated there. I belief there are two reasons for this settlement pattern. which can best be explained through varying scales of analysis firstly relating to settlement of region, which is the region within a landscape where a community has chosen to settle which is able to meet daily nutritional social and cultural needs of a given population and secondly settlement of place which is where

a community has chosen to settle within the selected region. When looking at the region in which the Thsirundu hills are situated you can see that it is surrounded by the five vegetation types with the highest carrying capacity and is also in close proximity to soils which have high farming potential

I belief that it is most likely due to the terrain topography than other environmental variables that people have chosen to settle here. The Area is elevated over the landscape and is filled with small koppies and ridges that in some areas can be a maze to navigate. The Thsirundu hills topography provides a sense of protection and seclusion that no other location within the study area can

7.1.6 Summary

This data provides a verry generalised view of how environmental variables affect settlement patterns and more aspects need to be considered such as site function, artifact types and densities and changes in environmental preferences through time, to better understand how the environment was utilised and for what reasons.

In the following section I will look at how an understanding of settlement location preferences through time and an understanding of site function and artifact types can provide better insight into the past by contrasting them with multiple environmental variables.

7.2 Environmental variables pertaining to number of sites across time periods

7.2.1 Soil Type

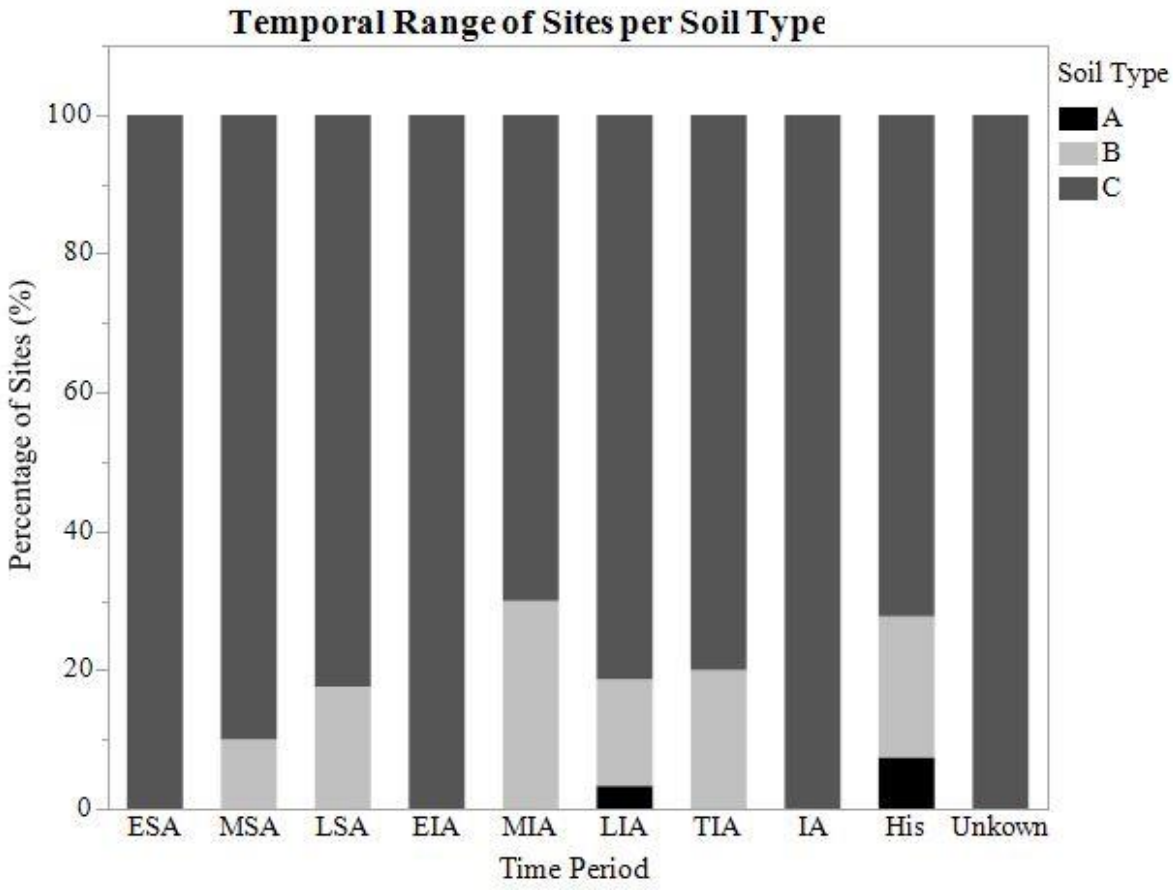

Figure 7-13: Graph depicting temporal range of sites per soil type

Table 7-6: Temporal range of sites per soil type

	ESA	MSA	LSA	EIA	MIA	LIA	TIA	IA	Historical	Unknown
A	_	_	_	_	_	3 (3,29%)	_	_	4 (7,40%)	_
B	4 (100%)	18 (90%)	14 (82,352%)	1 (100%)	6 (54,54%)	74 (81,31%)	8 (80%)	16 (100%)	39 (72,22%)	6 100%)
C	_	2 (10%)	3 (17,647%)	_	5 (45,45%)	14 (15,38%)	2 (20%)	_	11 (20,37%)	_

7.2.2 Geology

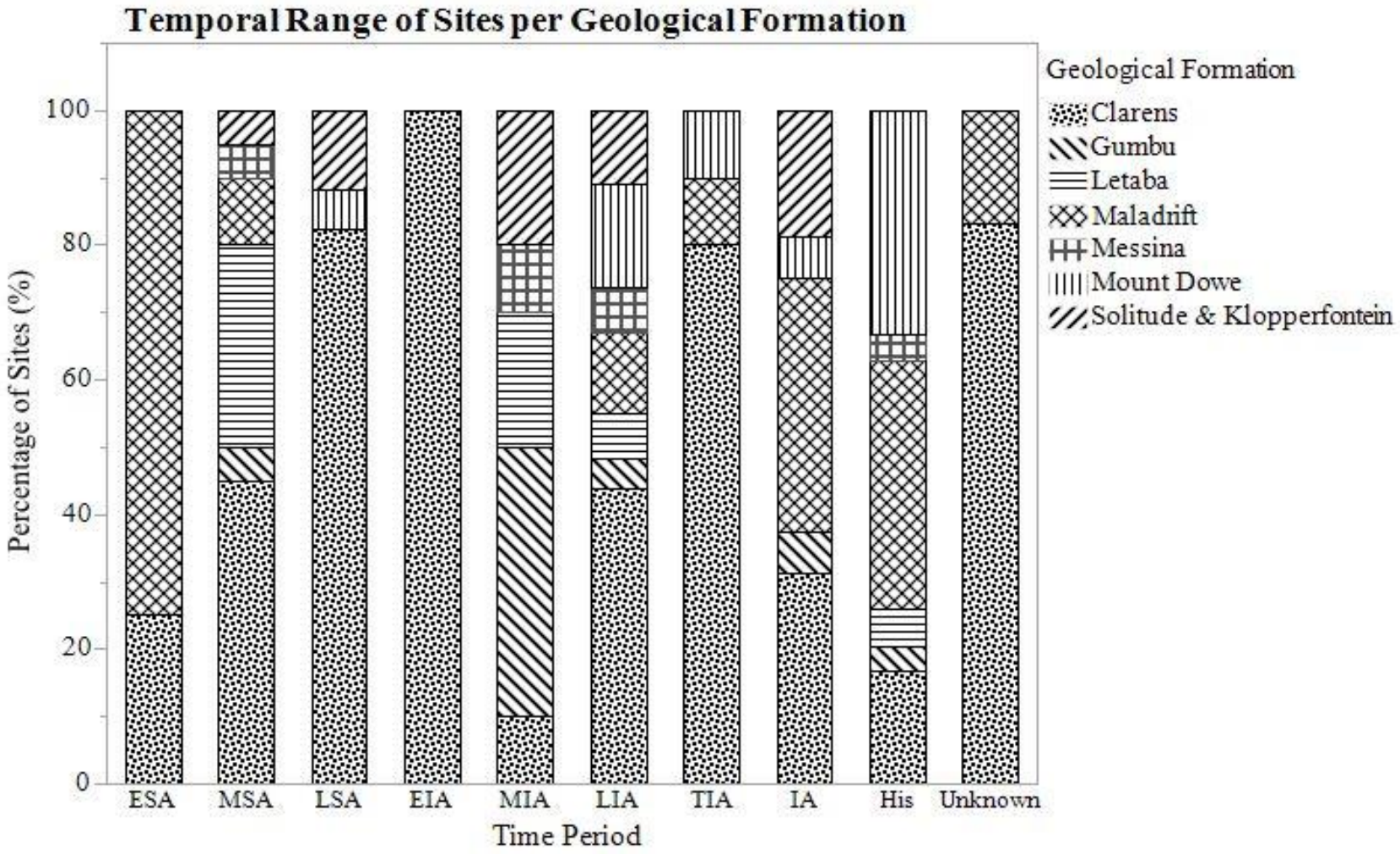

Figure 7-14: Graph depicting temporal range of sites per geological formation

Table 7-7: Temporal range of sites per geological formation

	ESA	MSA	LSA	EIA	MIA	LIA	TIA	IA	His	Unknown
Clarens	1 (25%)	9 (45%)	14 (82,35%)	1 (100%)	1 (9,09%)	40 (43,95%)	8 (80%)	5 (31,25%)	9 (16,66%)	5 (83,33%)
Gumbu	_	1 (5%)	_	_	5 (45,45%)	4 (4,39%)	_	1 (6,25%)	2 (3,70%)	_
Letaba	_	_	_	_	2 (18,18%)	6 (6,59%)	_	_	3 (5,55%)	_
Maladrift	3 (75%)	6 (30%)	_	_	_	11 (12,08%)	1 (10%)	6 (37,5%)	20 (37,03%)	1 (16,66%)
Messina	_	1 (5%)	_	_	1 (9.09%)	6 (6,59%)	_	_	2 (3,70%)	_
Mount Dowe	_	2 (10%)	1 (5,88%)	_	_	14 (15,38%)	1 (10%)	1 (6,25%)	18 (33,33%)	_

Solitude & Klopperfontein	_	1 (5%)	2 (11,76%)	_	2 (18,18%)	10 (10,98%)	_	3 (18,75%)	_	_

7.2.3 Land type

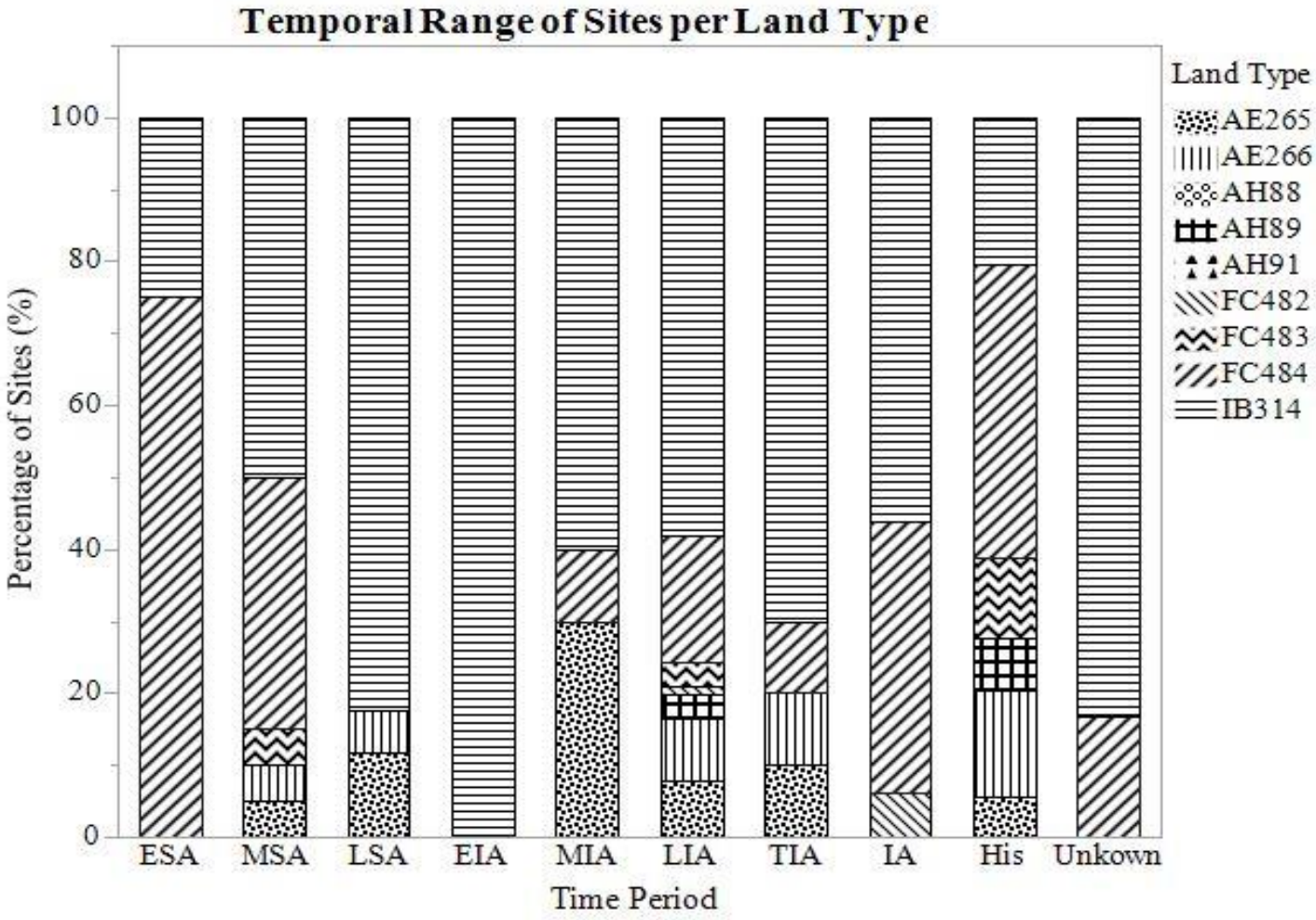

Figure 7-15: Graph depicting temporal range of sites per land type

Table 7-8: temporal range of site per land type

	ESA	MSA	LSA	EIA	MIA	LIA	TIA	IA	His	Unknown
Ae265		1 (5%)	2 (11,76%)		5 (45,45%)	7 (7,69%)	1 (10%)		3 (5,55%)	
Ae266		1 (5%)	1 (5,88%)			8 (8,79%)	1 (10%)		8 (14,81%)	
Ah89						3 (3,29%)			4 (7,40%)	
Fc482						1 (1,09%)		1 (6,25%)		
Fc483		1 (5%)				3 (3,29%)			6 (11,11%)	

Fc484	3 (75%)	7 (35%)			1 (9,09%)	16 (17,58%)	1 (10%)	6 (37,5%)	22 (40,74%)	1 (16,66%)
Ib313	1 (25%)	10 (50%)	14 (82,35%)	1 (100%)	5 (45,45%)	53 (58,24%)	7 (70%)	9 (56,25%)	11 (20,37%)	5 (83,33%)

7.2.4 Vegetation

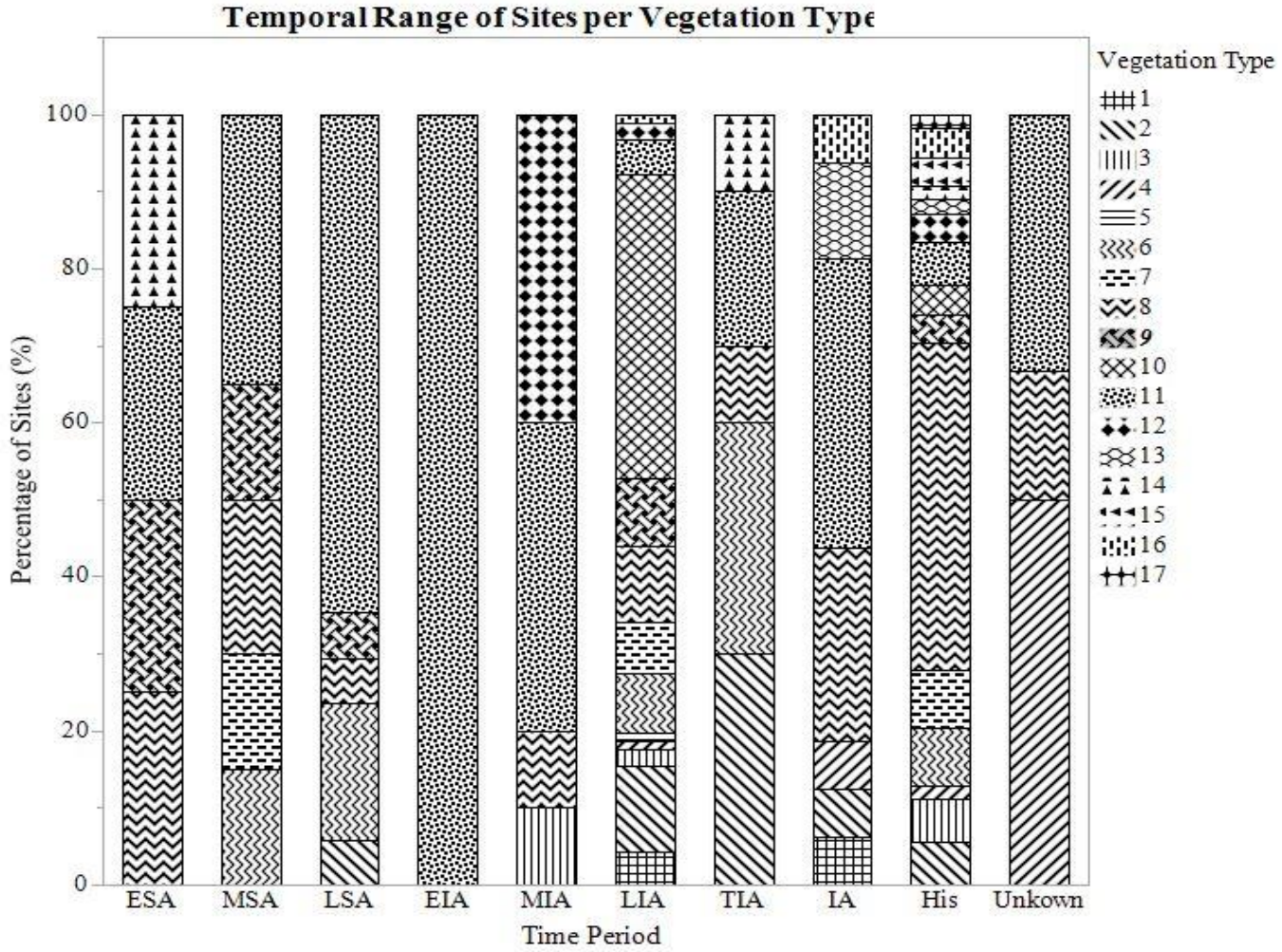

Figure 7-16: Temporal range of sites per vegetation type

Table 7-9: Temporal range of sites per vegetation type

	ESA	MSA	LSA	EIA	MIA	LIA	TIA	IA	Historical	Unknown
1	_	_	_	_	_	4 (4,39%)		1 (6,25%)	_	_
2	_	_	(5,81%)	_	_	10 (10,98%)	3 (30%)	1 (6,25%)	3 (5,55%)	_
3	_	_	_	_	1 (9,09%)	2 (2,19%)	_	_	3 (5,55%)	_
4	_	_	_	_	_	1 (1,09%)		1 (6,25%)	1 (1,851%)	3 (50%)
5	_	_	_	_	_	1 (1,09%)	_	_	_	_
6	_	3 (15%)	3 (17,64%)	_	_	7 (7,69%)	3 (30%)	_	4 (7,40%)	_
7	_	3 (15%)	_	_	_	6 (6,59%)	_	_	4 (7,40%)	_
8	1 (25%)	4 (20%)	1 (5,88%)	_	1 (9,09%)	9 (9,89%)	1 (10%)	4 (25%)	23 (42,59%)	1 (16,66%)
9	1 (25%)	3 (15%)	1 (5,88%)	_	-_	8 (8,79%)	_	_	2 (3,70%)	_
10	_	_	_	_	_	_	_	_	2 (3,703%)	_
11	1 (25%)	7 (35%)	11 (64,70%)	1 (100%)	4 (36,36%)	36 (39,56%)	2 (20%)	6 (37,5%)	3 (5,55%)	2 (33,33%)
12	_	_	_	_	5 (45,45%)	4 (4,39%)	_	_	2 (3,70%)	_
13	_	_	_	_	_	2 (2,19%)		2 (12,5%)	1 (1,85%)	_
14	1	_	_	_	_	_	1	_	1	_

	(25%)						(10%)		(1,85%)	
15	–	–	–	–	–	–	–	–	2 (3,703%)	–
16	–	–	–	–	–	1 (1,09%)	–	1 (6,25%)	2 (3,703%)	–
17	–	–	–	–	–	–	–	–	1 (1,851%)	–

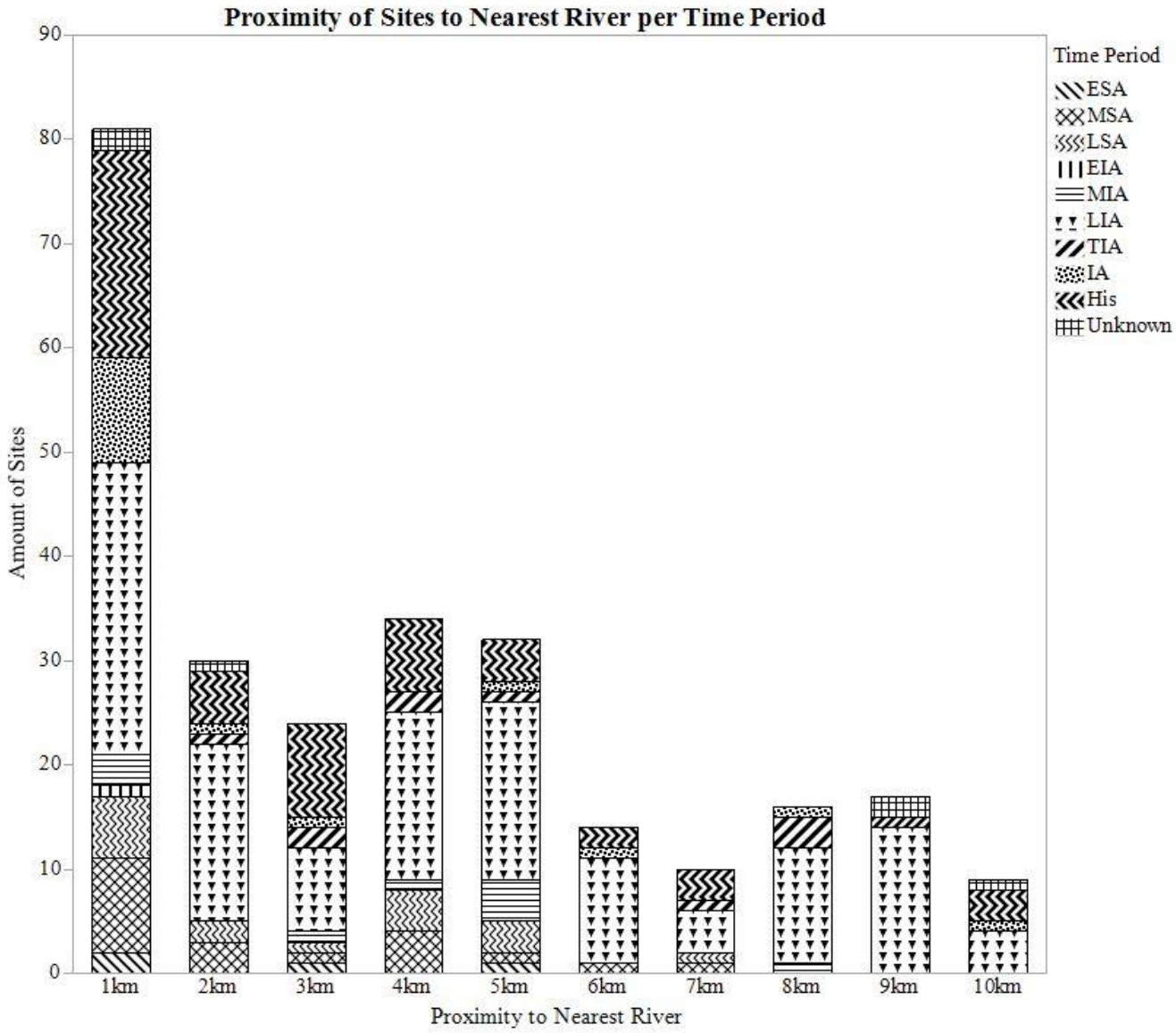

Figure 7-17: Graph depicting proximity of sites to the nearest river per time period

Table 7-10: proximity of site to the nearest river per time period

	1km	2km	3km	4km	5km	6km	7km	8km	9km	10km
ESA	2	0	1	0	1	0	0	0	0	0
MSA	9	3	1	4	1	1	1	0	0	0
LSA	6	2	1	4	3	0	1	0	0	0
EIA	1	0	0	0	0	0	0	0	0	0
MIA	3	0	1	1	4	0	0	1	0	0
LIA	28	17	8	16	17	10	4	11	14	4
TIA	0	1	2	2	1	0	1	3	0	0
IA	10	1	1	0	1	1	0	1	0	1
His	20	5	9	7	4	2	3	0	1	3
Unkn-own	2	1	0	0	0	0	0	0	2	1

7.3 Summary of Environmental variables per time period

7 3.1 Early Stone Age

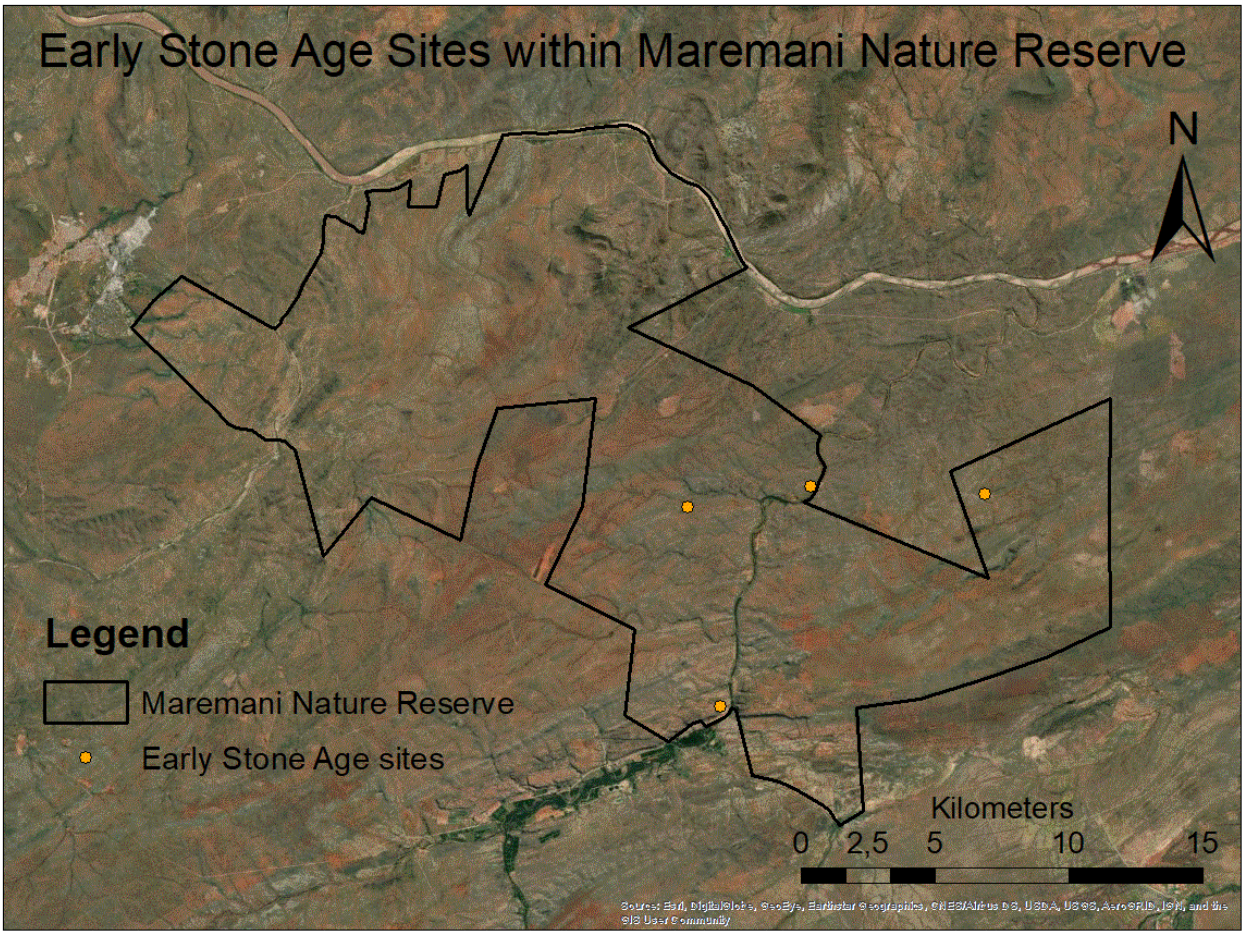

Figure 7-18: Early Stone Age sites within Maremani Nature Reserve

There are a total of four Early Stone Age sites within the study area. There is no clear pattern in regards to site location and vegetation type, however all of the sites are located within soil group B and three of the sites are located within geological formation Malala Drift (Gneiss) and land type Fc484.Only one out of the three sites do not have a dual occupation relating to Middle Stone Age material. All fall within 200m of a Drainage line or seasonal stream while two fall within 1km of a river.

Interpretation

What is most apparent is the relationship of Early Stone Age sites to drainage lines or seasonal streams. This could be to the availability of cobles to make stone tools or even point seasonal exploitation of the environment. There is an unlikely correlation between soil types and the Early Stone Age as Agricultural practices had not yet been developed. Geology is likely to play a role, but this will only be apparent if the geological properties of the utilised materials are identified and possibly traced to its source. Vegetation type will

also play a role, but this will not be apparent until the carrying capacity is worked out for Homo Sapiens which will provide some insight into other hominin species.

7.3.2 Middle Stone age

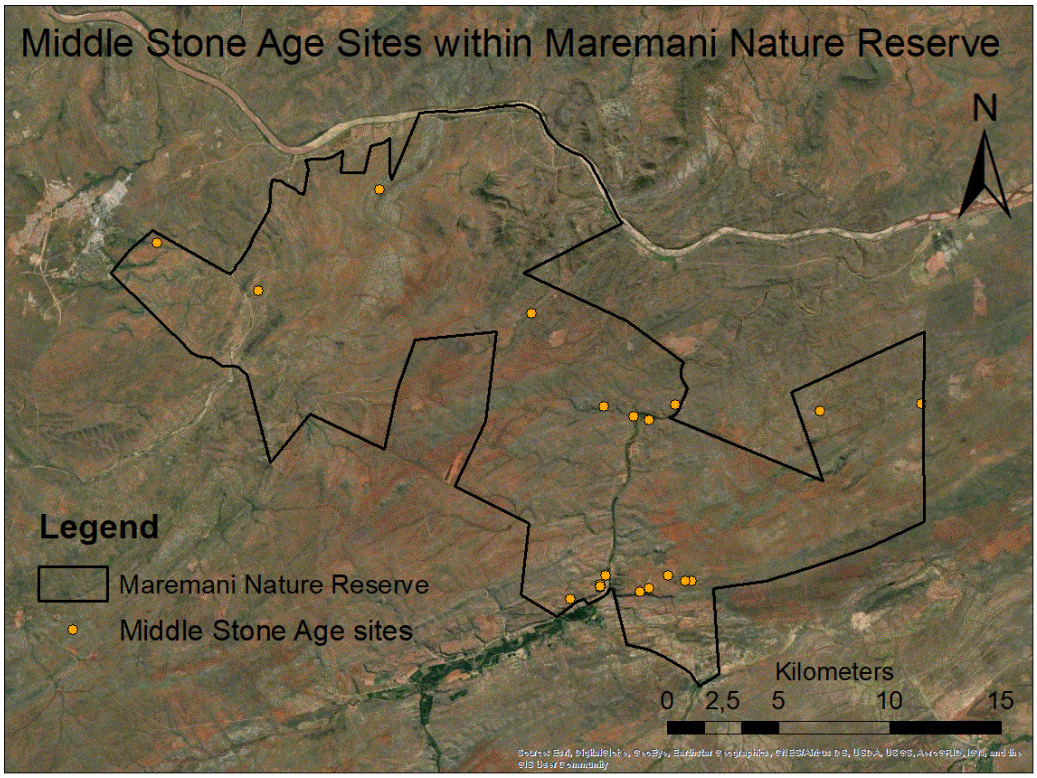

Figure 7-19: Middle Stone Age sites within Maremani Nature Reserve

There is a total of 19 Middle Stone Age sites, of which 45,45% of them occur on the southern part of the reserve within the Thsirundu hills. While the other 65,64% are scattered throughout the central and northern parts of the study area. Seven sites have Late Iron Age and three have historical material situated on them. Most of the sites are situated on either the Clarens (45%) or Malala drift (30%) geological formations and the Ib314 (50%) and Fc484 (35%) landtypes, with the most prominent soil type being B which has 90% of the sites situated within in it. The site location in regard to vegetation type is quite variable but vegetation type eleven (Colophospermum Mopane - Gardenia resiniflua) is more prominent with 35% of the sites situated within it. Eighty percent of the sites fall within 200m non-perennial drainage line, while 45,45% of the sites fall within 1km of a river and the other 65,64% are dispersed between 1-7 km away.

7.3.2a Interpretation

What we can see is that the site percentage have increased drastically between the middle and late stone ages. the same environmental preference carried on into the Middle Stone Age as only one out the four Early Stone Age sites were no longer utilised. But a different pattern emerges as almost half of all the Middle Stone Age sites are located in the Tshirundu hills. It is unclear as to why this environment was utilised, but it could be that it provides better protection from the elements and possibly other communities. Vegetation type has little impact on this interpretation as the carrying has not yet been calculated and soil properties also do not play a role. River proximity also seems to be a defining variable as 65% of the sites are located within one km of a river. While a relationship to geology cannot yet be established.

7.3.3 Late Stone Age

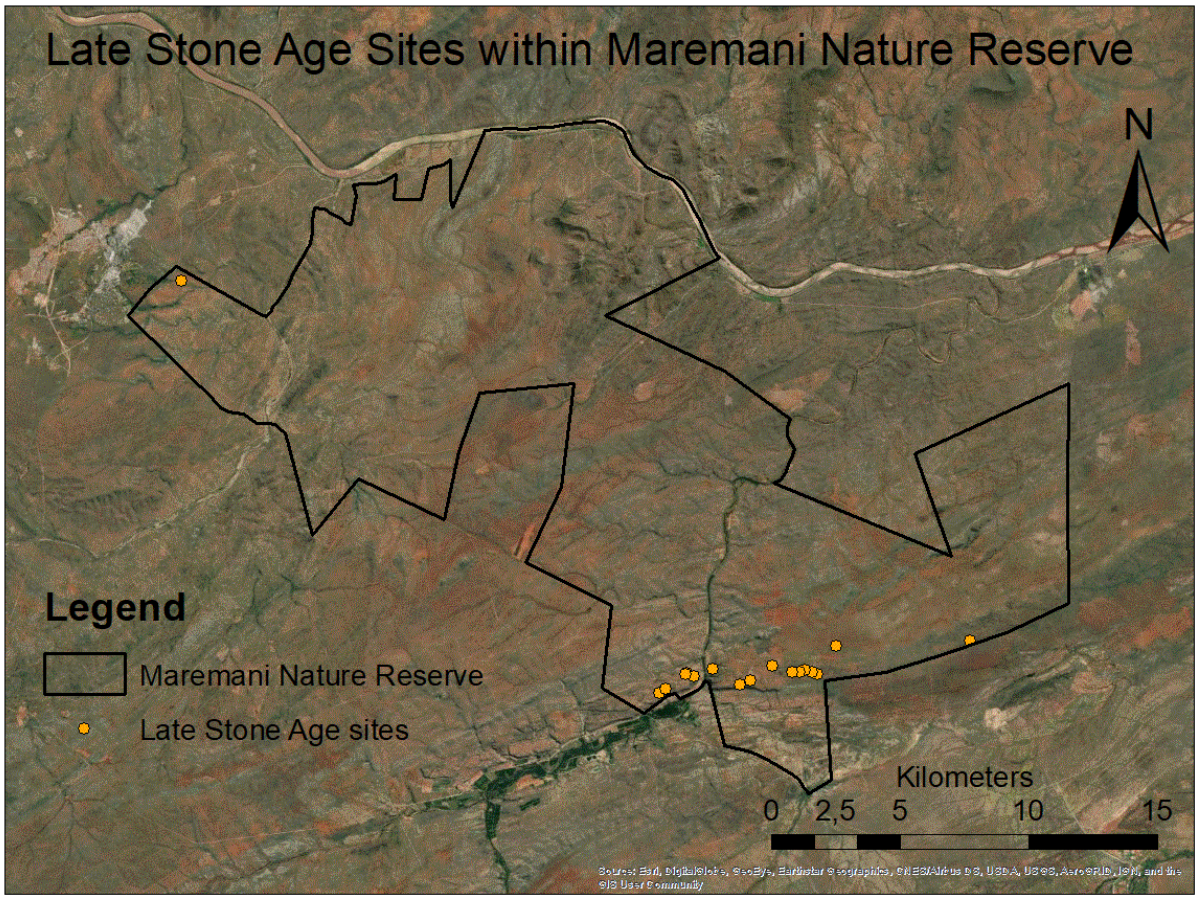

Figure 7-20: Late Stone Age site within Maremani Nature Reserve

There is a total of 17 Late Stone Age sites within the study area all, but one is situated in the Tshirundo hills on the southern part of the study area. Eleven of the sites have Late Iron Age material on them while seven sites have Middle stone age material on them. 82% of all

the sites fall within land types Ib314, Soil type B and the Clarens geological formation. With vegetation type eleven (*Colophospermum Mopane - Gardenia resiniflua*) being most prominent with 64% of sites situated within it. 58,82% of the sites fall within 200m of a non-perennial water line while 41,17% of the sites fall within 500m of a non-perennial water line. 35,29% of the sites are located within 1km of a river while 58,82% are located between 1-5 km's

7.3.3a Interpretation

The preference for settlement location within the Thsirundu hills persists into the Late Stone age but at a far greater intensity with 94% of all the Late Stone Age sites now situated there. One reason for this specifically is that a material used to manufacture stone tools is located within the region another is that domesticates were starting to be utilised amongst Late Stone Age Community's and 64,7% of the sites fall within close proximity to vegetation types with high carrying capacities. proximity to rivers and drainage lines points to similar pattern of drainage system utilization as the Middle Stone Age.

7.3.3b Stone Age Summary

There is a clear change in settlement pattern's location occurring during the Early, Middle and Late Stone Age's. Seventy five percent of the Early Stone Age material is situated in the central parts of the study area with no clear pattern other than choice of geology type. While the settlement patterns of Middle Stone Age material are more scattered throughout the landscape with the preferred settlement location being the Tshirundu hills in the southern part of the study area where 53% of the sites occur. The favourability of settlement location within the Tshirundu Hills persist into the Late Stone Age but at a higher intensity with 94% of the sites occurring there, showing a clear preferential shift in the environments and resources being utilised.

7.3.4 Early Iron Age

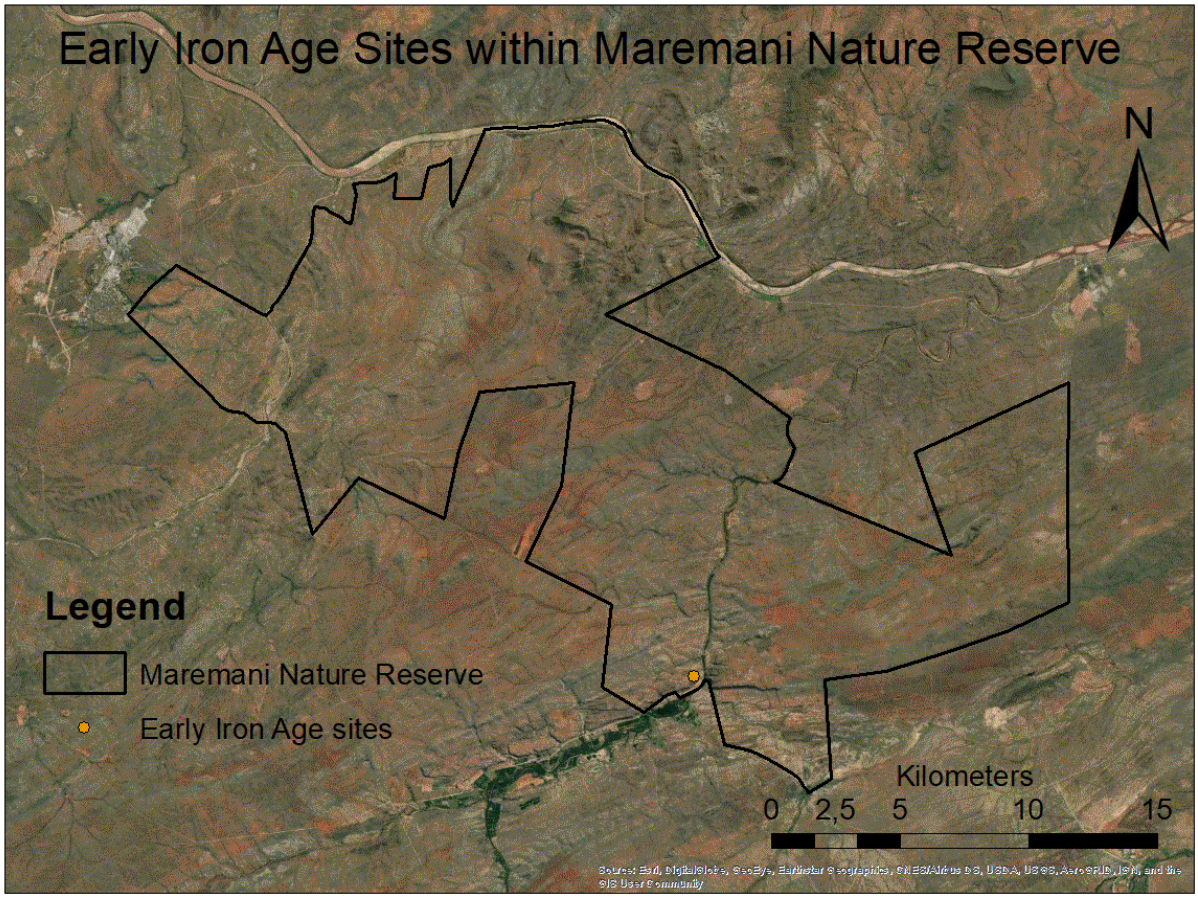

Figure 7-21: Early Iron Age site within Maremani Nature Reserve

Only one Iron Age site was identified during the study relating to smelting activities, situated in the Tshirundo hills in a ravine 100m from the Nzhelele River. It is located within the geological formation Clarens, Landtype Ib314, vegetation type gardenia and soil type B. Its location is most likely due to its seclusion and proximity to the Nzhelele river

7.3.5 Middle Iron Age

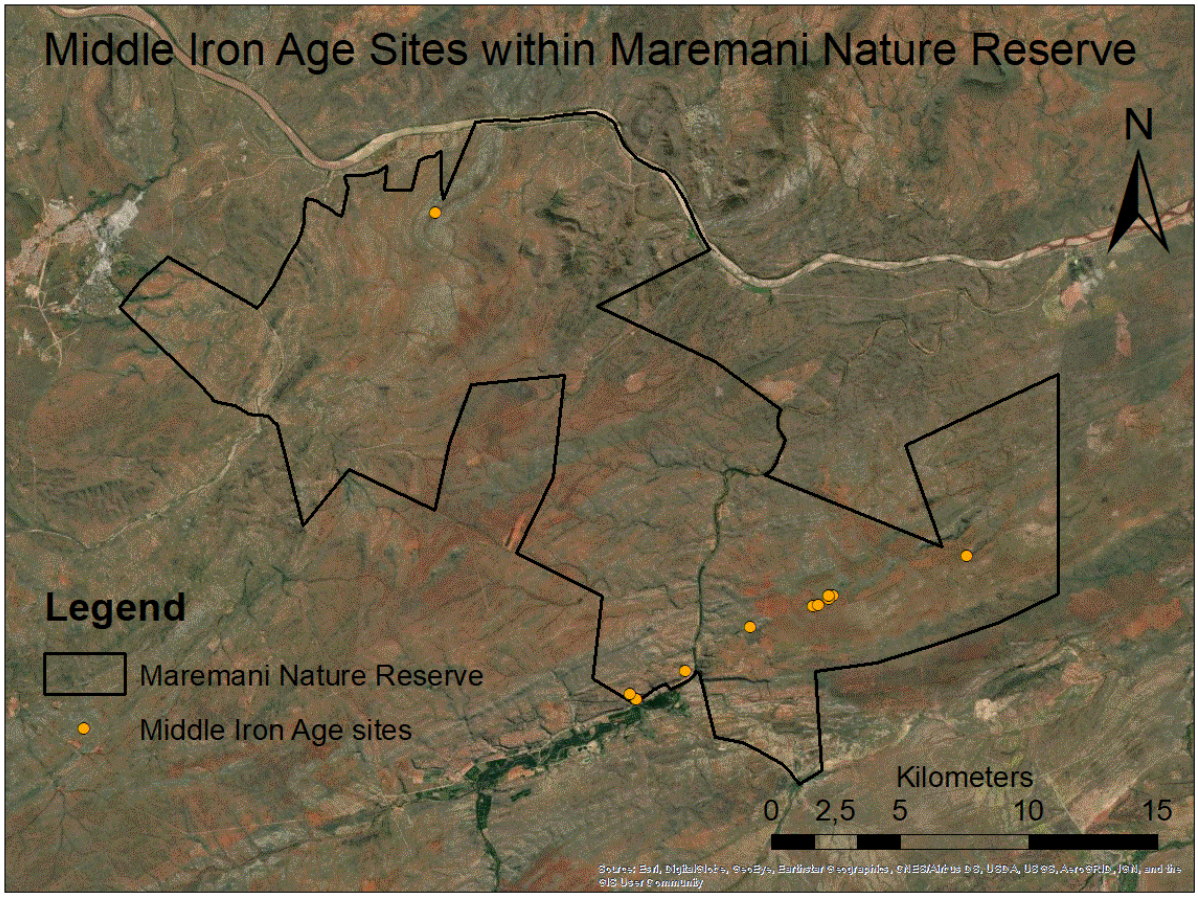

Figure 7-22: Middle Iron Age sites within Maremani Nature Reserve

There are eleven Middle Iron Age sites within the study area. All but one is situated on the southern part of the within the reserve. The most prominent land types are Ae265 and Ib313 each with 45,45% of the sites situated within them. Most the sites fall within the Gumbu formation with 45,45% of all the sites. 45,45% of all the sites are situated in vegetation type 12 while 36,36% is situated in vegetation group 11. Soil type B has the most sites with 54,45% while soil type C has the remainder. 27,27% of the sites are located within 1km of a river while 36,36% are located between 4-5 km's away.

7.3.6 Late Iron Age

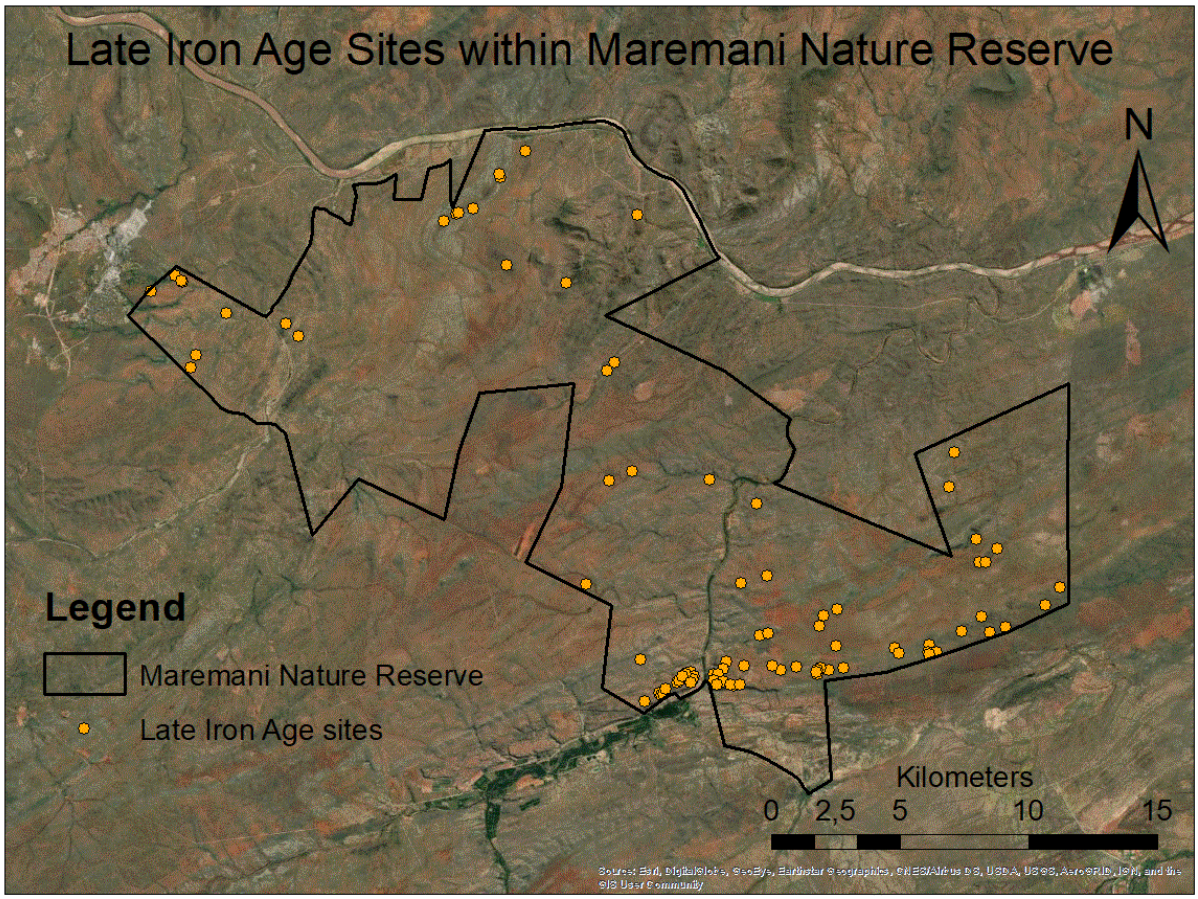

Figure 7-23:Late Iron Age sites within Maremani Nature Reserve

There is a total of 91 Late Iron Age sites within the study area, with thirteen sites being dual occupation sites related to stone age material and one with Middle Iron Age material. The most prominent soil type is B with 81% of the sites while the Clarens geological formation is preferred with 44% of the sites most prominent landtype is Ib314 with 58% of the sites and Fc484 with 17% of the sites. The most prominent vegetation type is 11 with 39% of the sites occurring within it. 21,70% of all the sites occur within 1km of a river while the remainder are located between 1-10km away

52 % of all late Iron Age sites occur within the Tshirundo hills the population living here during this time were most probably utilising the soils of land type Ae 265 to the north as well as the vegetation types with high carrying capacity as 88% of all the Late Iron Age kraals are located within close proximity to these vegetation types

while 10% occur on the north eastern side of the study area and seem to possibly be exploiting vegetations types for grazing and deeper soils for farming as there is no apparent signs of mining or smelting within these sites.

There is also a cluster of seven sites (8%) situated in the northern central region of the study area all but one seems to be related to farming practice as more grain bin bases can be found on these sites and there is evidence for cleared fields within the region.

while 11% of the sites occur on the north western side of the study area with sites MNR 227, MNR 228, MNR 229 and MNR 231 all showing evidence for smelting or smithing through copper ore fragments and slag on the sites. while MNR243 only has slag fragments with no copper oxidation on the site. The four former sites and MNR 243 are all related to around the early 17th to the late 18th centuries. There are no Historical artifacts on the sites and the stone walling is also quite informal compared to later settlements formal walling in the area. These sites show the first signs of copper mining and smelting within the study area as there are no signs of copper ore or slag on sites from earlier time periods apart from the MIA site Kromdraai located 5km east of the reserves southern border fence.

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7.3.7 Terminal Iron Age

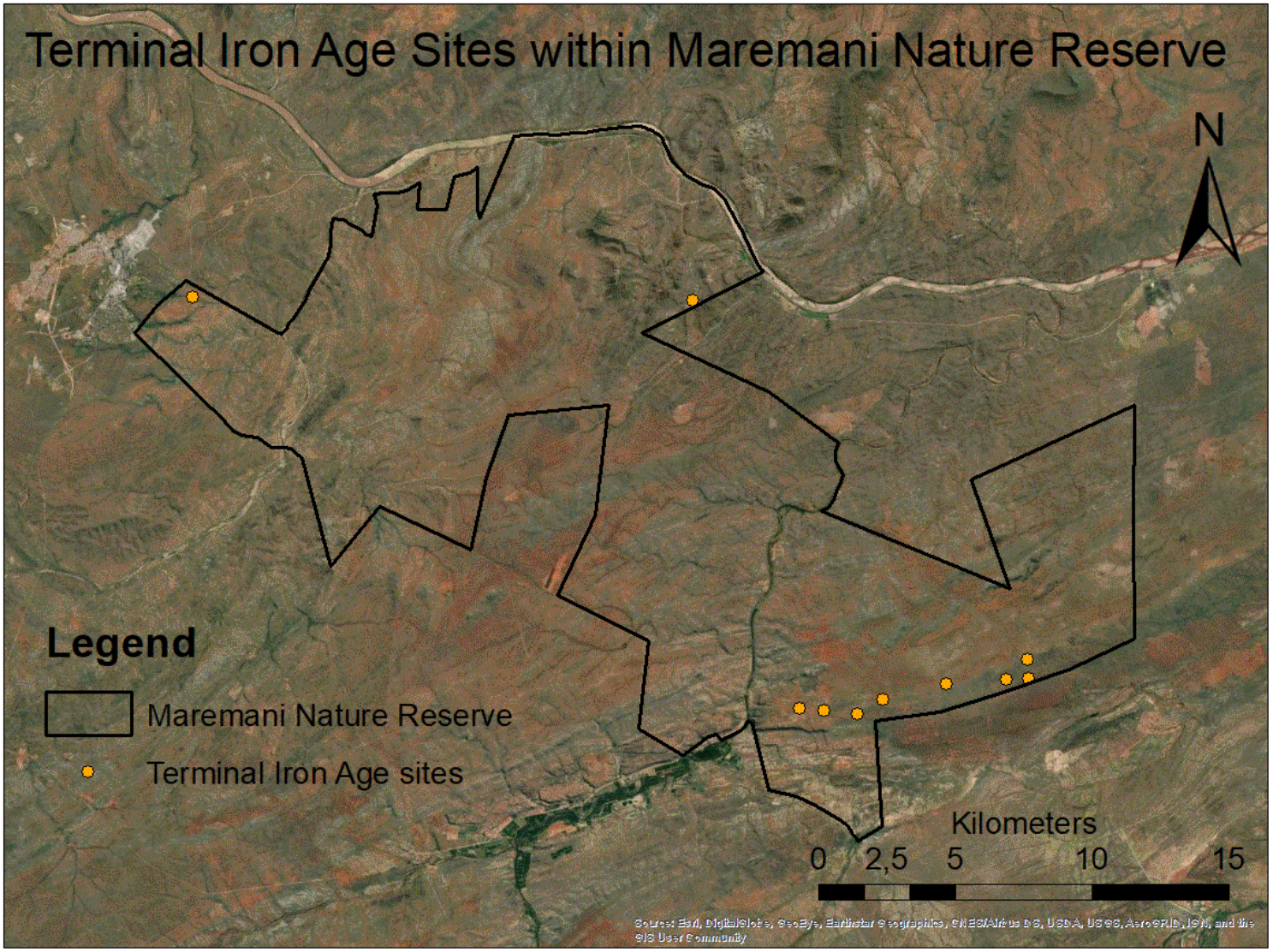

Figure 7-24:Terminal Iron Age site within Maremani Nature Reserve

There are a total of nine Historical Venda sites none of which are dual occupation sites. The most prominent land type is Ib314 with 70% of the sites located within it while 89% of the sites are located within close proximity to vegetation types 2 and 6. The Clarence geological formation and soil B have the most sites situated within in them, at 80% 6 80% of all Terminal Iron Age sites can be found within the Thsirundu hills and display similar settlement preference to that of the Late Iron Age. All site is relatively evenly dispersed when it comes to water proximity and are located between 2-7 km away.

7.3.7a Interpretation

The sites from this time period display similar patterns of environmental utilisation as communities from the Late Iron Age as they are in close proximity to farmable land and all the sites with kraals are located close to vegetation types with high carrying capacity. There is a difference though in the exploitation of geological formations as no sites show evidence for mining or smelting.

7.3.8 Iron Age

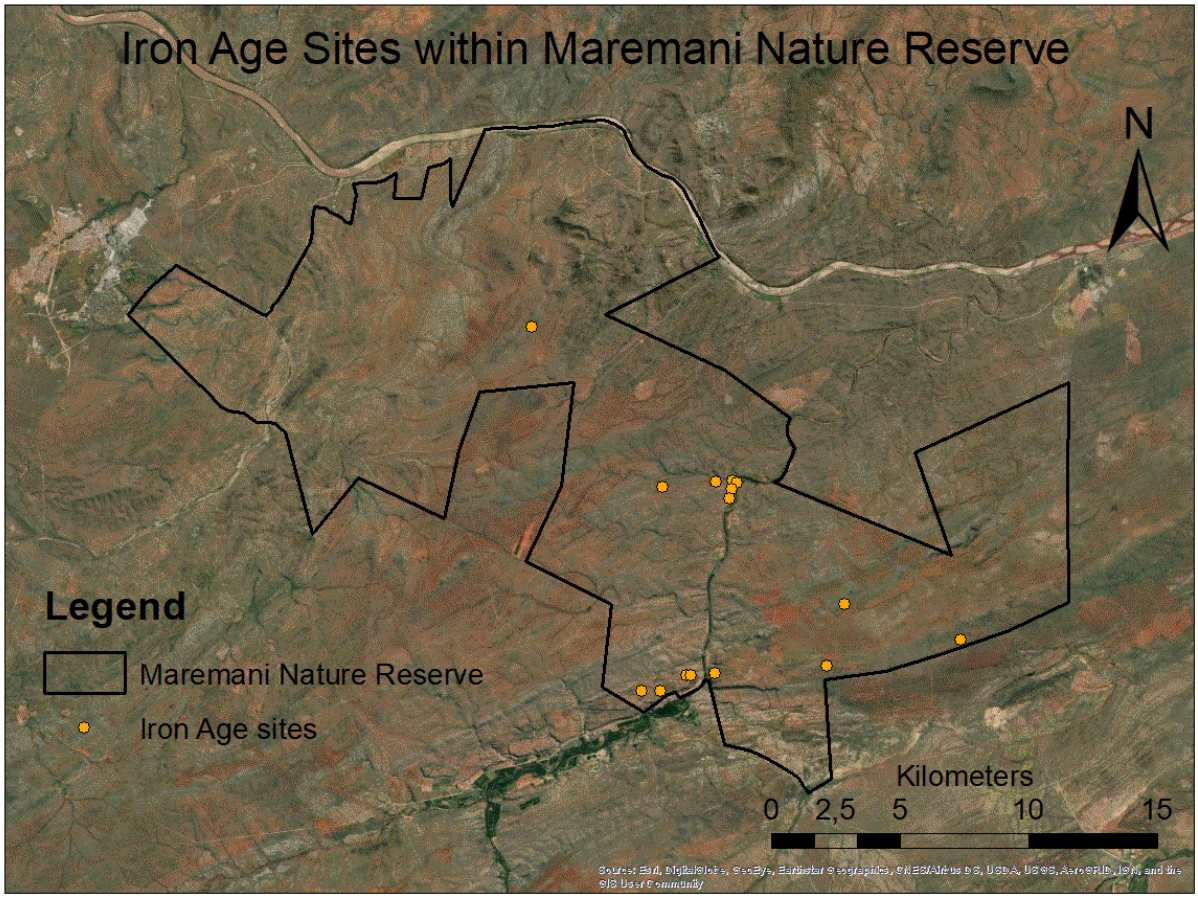

Figure 7-25: Iron Age site within Maremani Nature Reserve

There is a total of 16 Iron age sites within the study area, with 2 sites being dual occupation sites associated with the Early and middle stone age material. The most prominent land types are Ib314 (56%) and Fc484(37%) with all the sites located within soil type B. Mala drift and Clarence geological formations have the most sites situated within them with the former having 37 % of the sites and the later four 31%. 53 % of the sites are located in the region of the Thsirundu hills while 40% are located on the farms Reitz and Nzhelele Drift where vegetation type 6 can be found along the Nzhelele river. 62,5% of these sites fall within the 1km of a river.

7.3.8a Interpretation

The sites recorded as Iron Age sites were done so as there was not enough material culture to classify them under one specific time period during the Iron Age. The Sites on the southern section of the reserve display the same settlement patterns as the rest of the Iron Age site though there is a difference in the central region of the reserve where 40% of the sites are located around vegetation type six but this is more likely due to the deep soils needed for farming than vegetation as the regions with the same vegetation type outside of the reserve are currently being farmed.

7.3.9 Historical

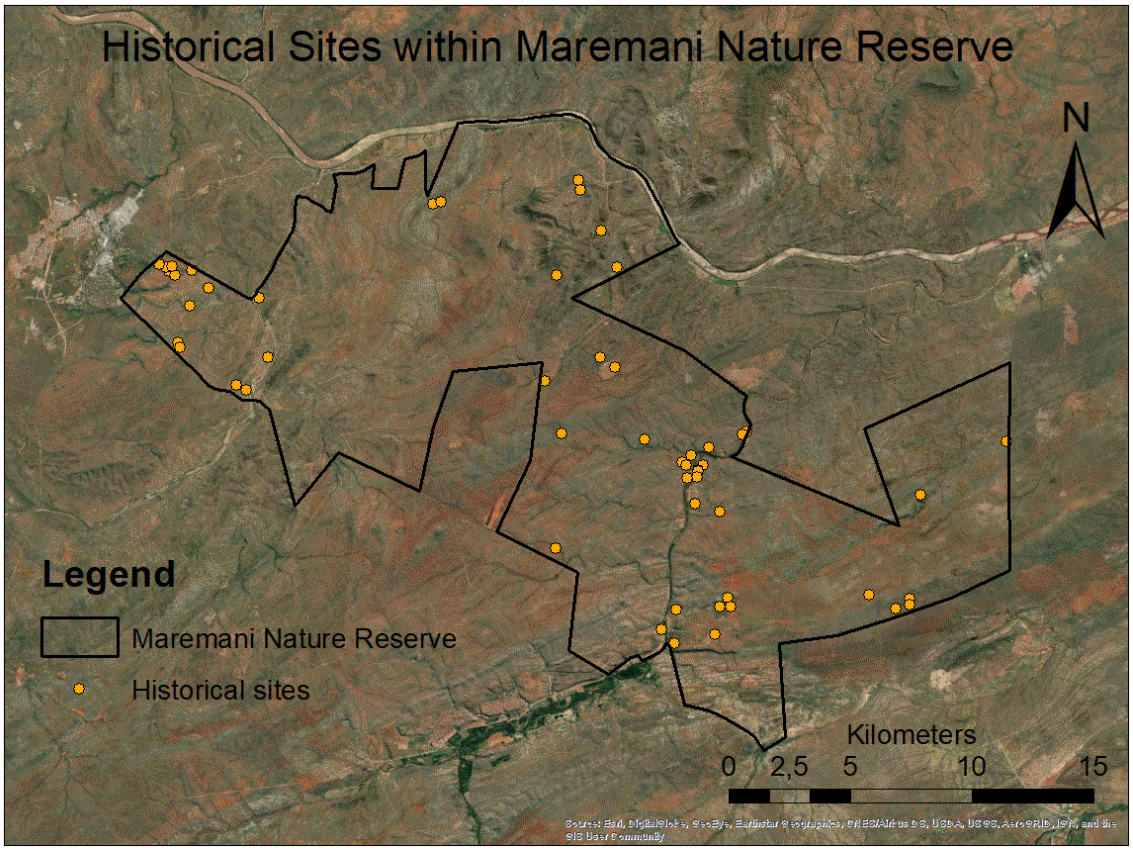

Figure 7-26: Historical sites within Maremani Nature Reserve

There is a total of 54 historical sites with only 3 being dual occupation sites; two relating to the Middle Stone Age and one to the Late Iron Age. The most prominent land type is Fc484 with 40% sites located within it while vegetation types are relatively variable apart from vegetation type eight which has 42% of the sites within it though The Mount Dowe and Malala Drift geological formation have the most sites at 33% and 37% while soil type B has 69 % of the sites located within it. 37,07 % of the sites are located within 1km of a river while the rest are dispersed between 1 -10km away.

7.3.9a Interpretation

I do not believe the vegetation type is a contributing variable to site placement and instead that the soils where vegetation type Sclerocarya birrea occur along the Nzhelele river where the contributing factor for site placement within the first cluster 26% of the sites are located within a close proximity while the second cluster is located on the north western side of the

study area where 24% of the historical sites occur, mostly seen as settlements though there is a large brick works within the area.

Historical settlements seem to be occurring at soils which show potential for farming and areas to the north where minerals such as copper and vermiculite are being mined with little evidence for life stock herding apart from two sites in the north and one in the south

7.3.10 Unknown

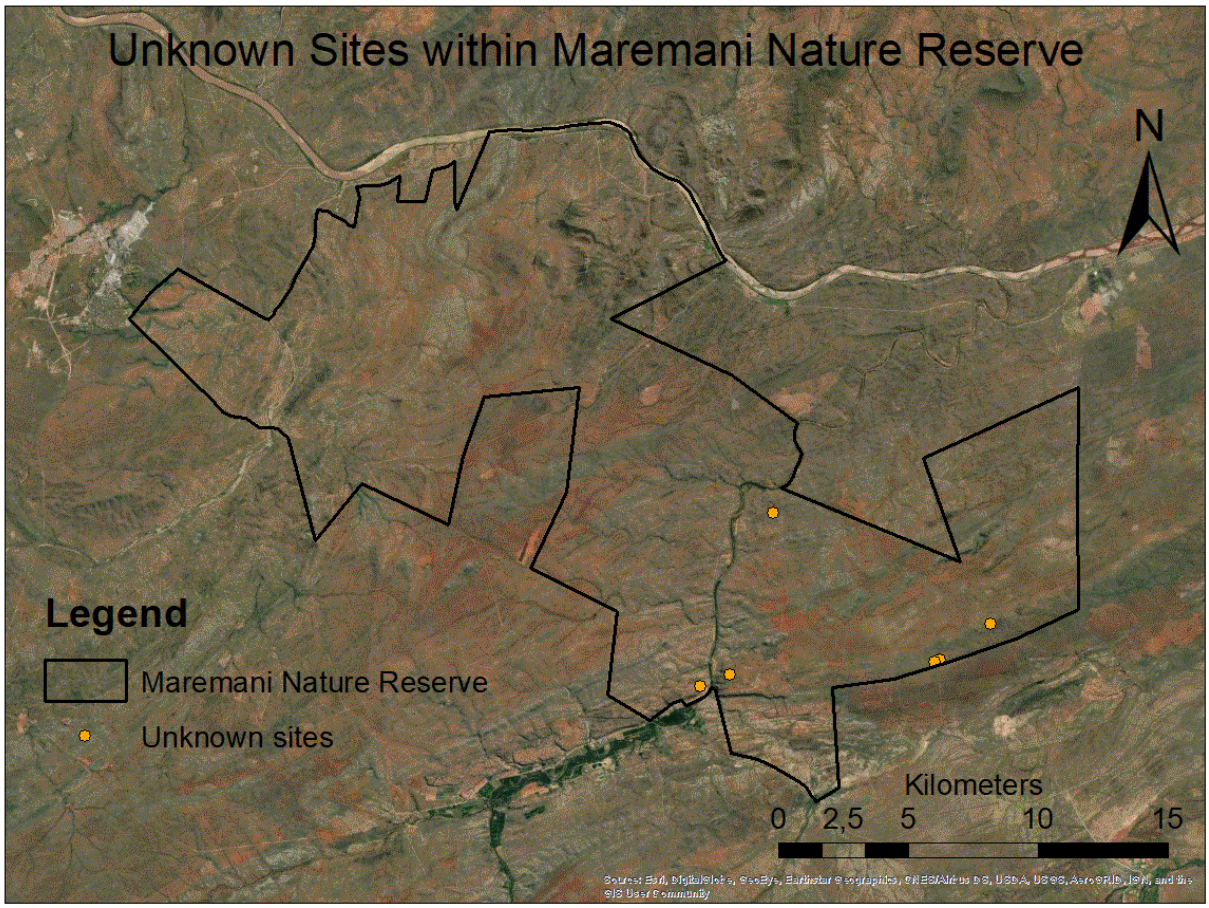

Figure 7-27: Unknown sites within Maremani Nature Reserve

There are six sites that have been classified as unknown all fall within soil type B and 83,33% of the sites fall within the Clarens formation and the Ib313 landtype while vegetation type 4 is most favoured with 50% of all the sites proximity to rivers vary as 50% are located within the first 2 km and the other 50% are located between 9 and 10 km away.

7.3.10a Interpretation

These sites show the same settlement pattern as the other Iron Age sites and are therefore more likely to fall within the Late Iron Age

7.4 Soils crops and farming

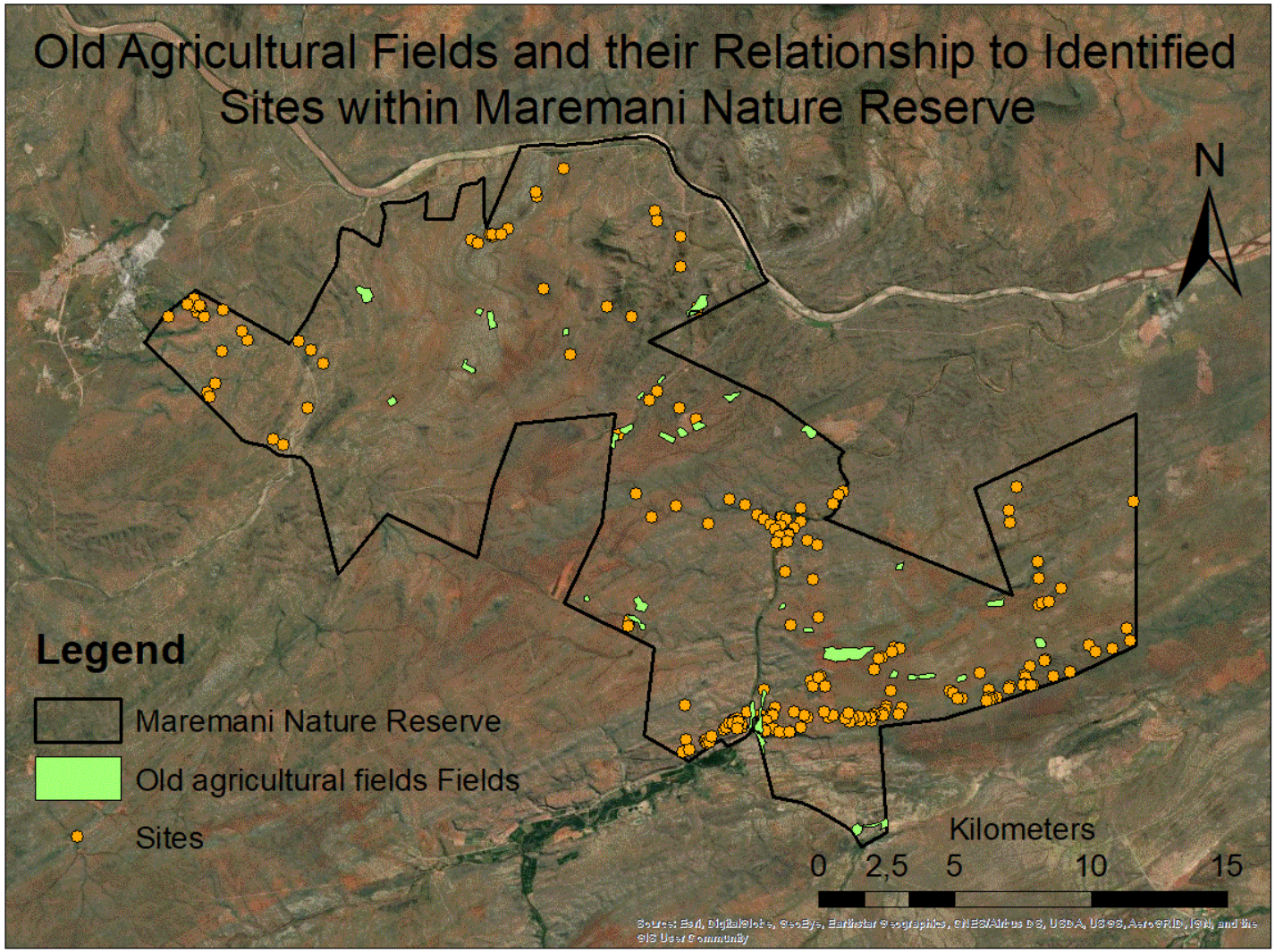

Figure 7-28: Old agricultural fields and their relationship to identified sites within Maremani Nature Reserve

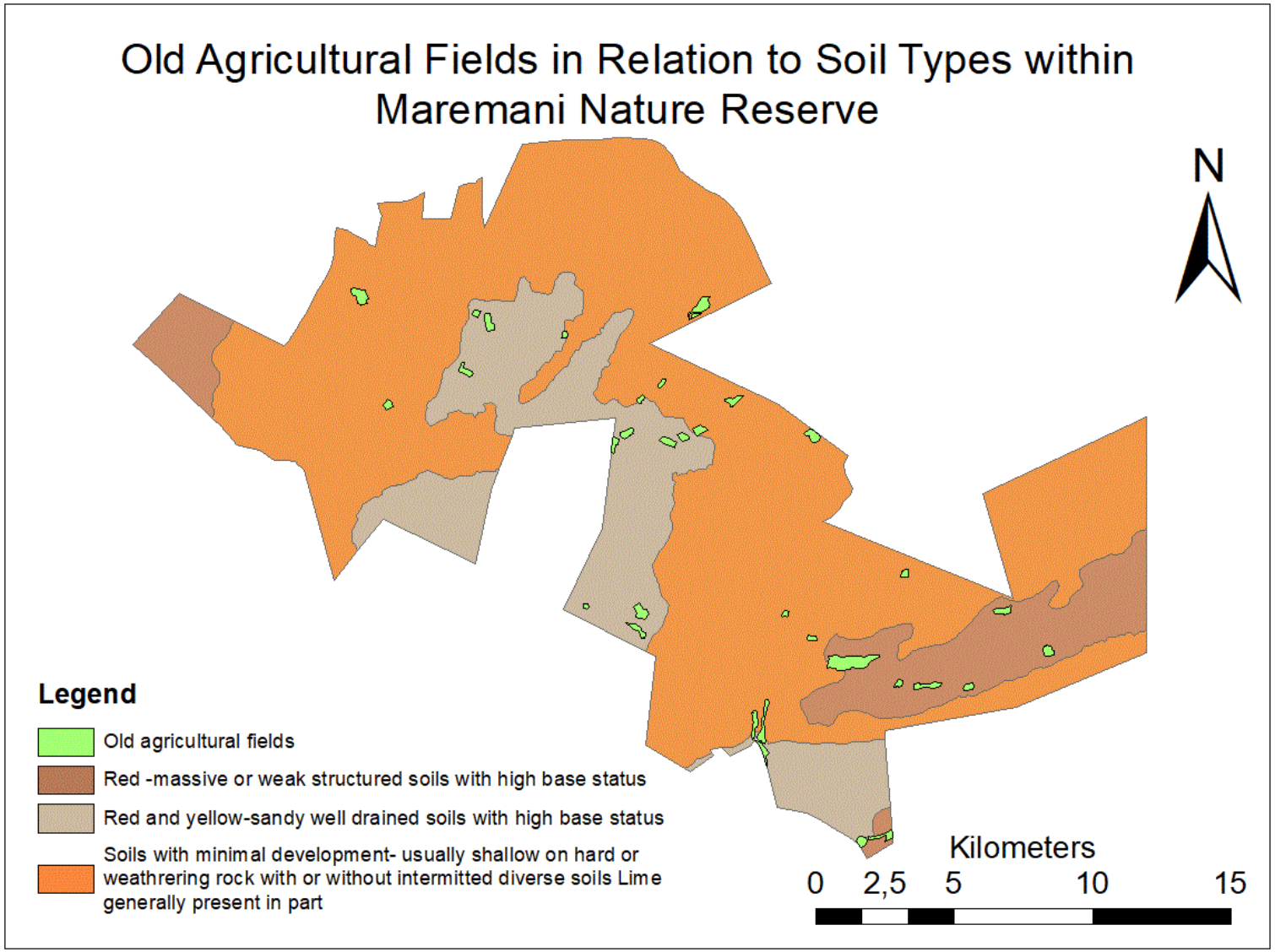

Figure 7-29: Old Agricultural fields in relation to soil types within Maremani Nature Reserve

There is evidence for four domesticated crops being farmed within the study area. They are Pearl Millet, *Sorghum bicolor*, Cow Peas and Maze. The first three crops were identified through botanical analysis of Middle Iron Age sites while a Maze cob was identified in an overhang with Late Iron Age artifacts. By understanding the requirements of these plants, we can better understand which environments were necessary to sustain a community through farming.

Pearl millet (*Pennisetum glaucum)* which was possibly domesticated in northern Africa and is seen as a relatively drought resistant crop. It first identified in southern Africa at the Early Iron Age site silver leaves 250 -395 AD (Huffman 2007: 123). The crop requires an annual rain fall of between 250mm to 700mm and is best suited to temperatures of between 22°c to 30°c but can withstand temperatures of up to 45°c. Its root systems prefer well-drained loam soils with a low clay percentage and a depth of between 1.2m- 2m. It's generally planted early October to November to avoid frost but can be as late as December and generally takes between 90-100 days to reach full maturity (Department of Agriculture, Forestry and Fisheries 2014, Sixtine passot 2016).

Sorghum bicolor

Is also believed to have originated in Africa it is a relatively drought resistant crop but less so than pearl millet. it prefers warm temperatures of between 22°c and 30°C and an annual rainfall of between 400mm-800mm.ts root system prefers soils with a clay loam or loam texture with clay percentage of between 10 and 30 %. And a soil depth of between 1.2-2m. it's generally planted between October and November and takes 140 days to reach full maturity. (Department of Agriculture, Forestry and Fisheries 2010, National Academy of Sciences 1996: 128-143)

Cowpea (*vigina unguiculata*)

Cow pea is also believed to have originated in Africa and is one of the more drought resistant legumes and performs well in semi-arid climates. It requires an average rainfall of between 400 to 700 mm per annum with an average temperature of between 20°C and 35°C. its roots can grow to a depth of 2.4m and prefer well drained sandy loam or sandy soil.it is generally planted during October and takes approximately 70 days to reach maturity (Dept of agriculture and forestry 2011, Davis et al 1991).

When looking at the soil depths of the study area one can see that they are relatively low to what is needed for farming the above-mentioned crops. I believe the main limiting factor to farming within Maremani Nature Reserve is the soil depth which just meets the adequate soil depth requirements of 1200cm for sorghum and pearl millet though no less than 900cmm is required for the crop to be successful, these depths occur in Oakleaf and Fernwood soils which have an average depth of between 600-1200cm.

7.5 Vegetation, carrying capacity and stock herding

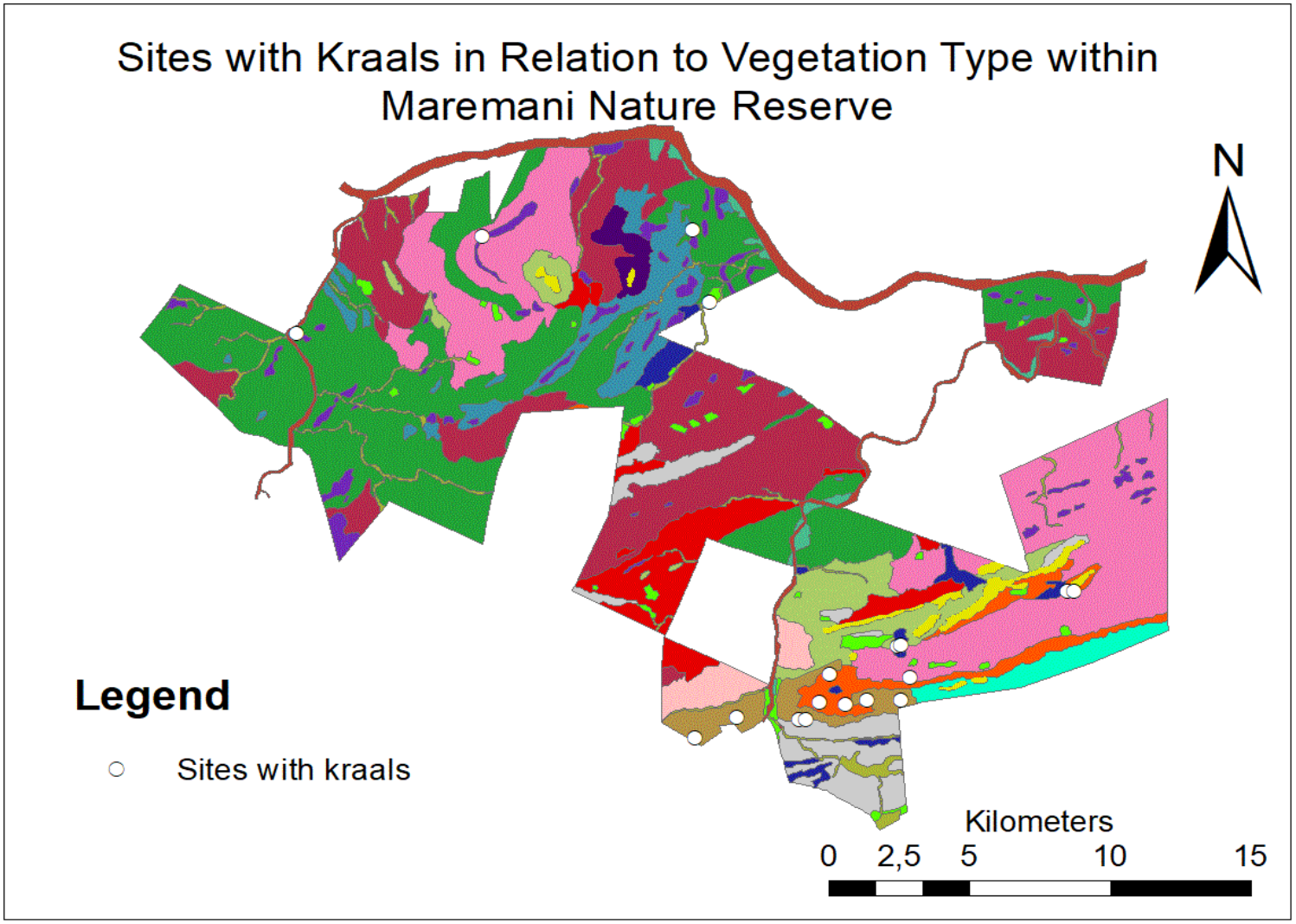

Figure 7-30: Sites with kraals in relation to vegetation types within Maremani Nature Reserve

There is a clear pattern that emerges in regard to pastoralist activities and vegetation types. when looking at the locations of sites which have evidence of kraals you can see that 12 of the 15 sites are situated at the southern end of the study area where the four vegetation types (C*ombretum imberbe, Sclercarya birrea, Colophospermum Mopane- Sesamothamnus Lugardi, Androstachys Johnosi*l) with the highest grazing capacity are located apart from Vegetation type Pechuel-loeschia leubnitziae, Which is located along certain sections of the Sand, Nzhelele and Limpopo Rivers It is most prominent farms Reitz and Nzhelele Drift where there is a cluster of eighteen sites situated within a 1km radius of it. These sites were recorded in previous studies and there is no mention of a kraal in any of them which is in stark contrast to vegetation type Sclerocaraya Birrea Aristida stiptata which has 9 kraals within a 0,5km radius of it. This vegetation type has a mean grass cover of 66% and a carrying capacity of 11.8 ha/LAU. The main grass type occurring in the vegetation type is Lehmanns love grass with an average coverage of 55% and seems to be the preferred grasses for grazing. Lehmann's love grass also occurs in vegetation type *Androstachys Johnosii* with an average coverage of 74% and has 28 sites situated within the vegetation type. Vegetation type Pechuel-loeschia leubnitziae which has the highest grazing potential was not utilised much for stock herding but does seem to be related to farming as most of these areas have signs of old fields or are currently still being farmed outside of the study area.

7.6 Summary of Middle Iron Age sites

When looking at the locations of the Mapungubwe period sites one can clearly see that these communities are exploiting niche areas relating to farming and life stock activities.

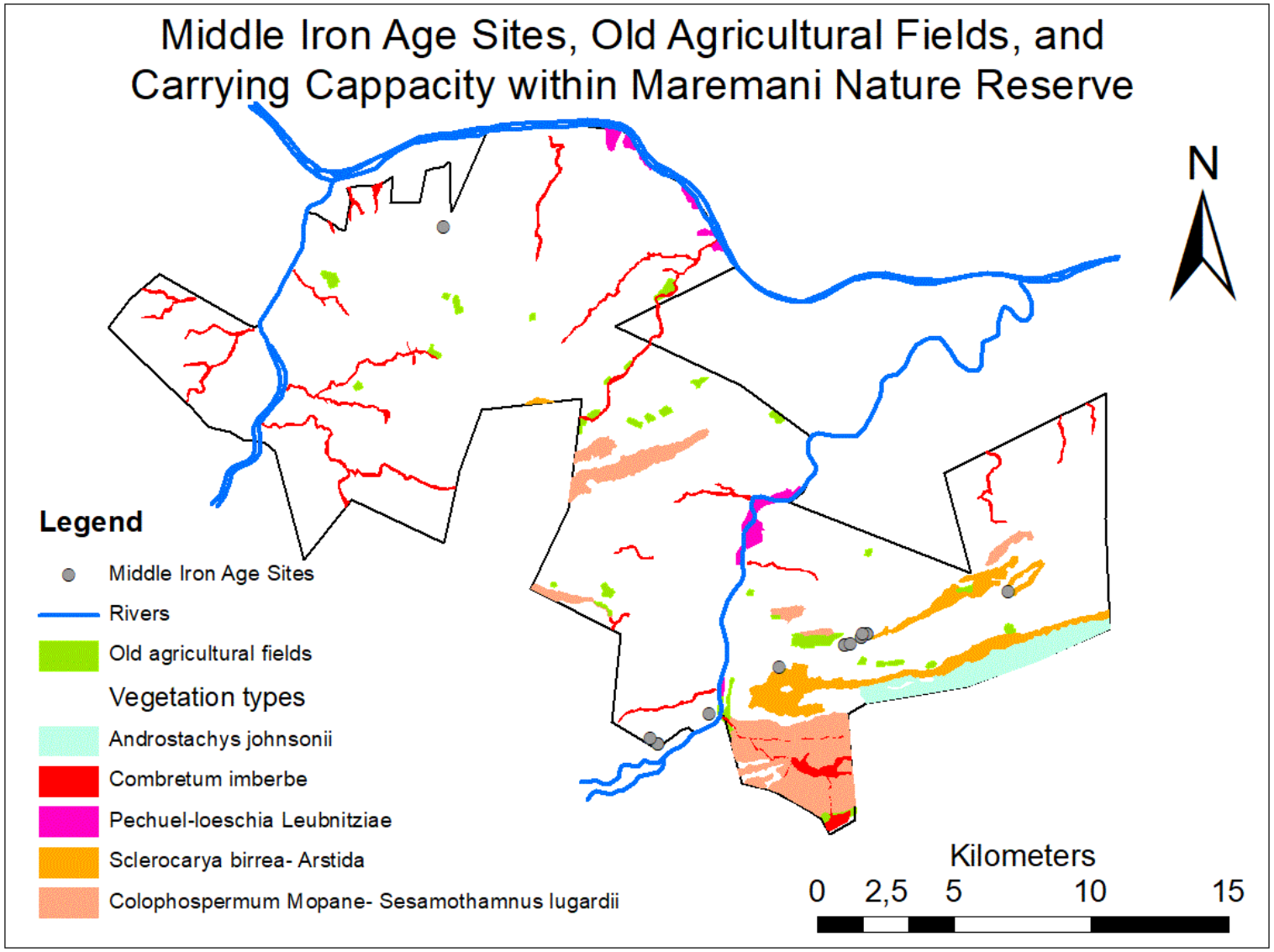

Figure 7-31: Middle Iron Age site, old agricultural field and carrying capacity within Maremani Nature Reserve

7.6.1 Farming

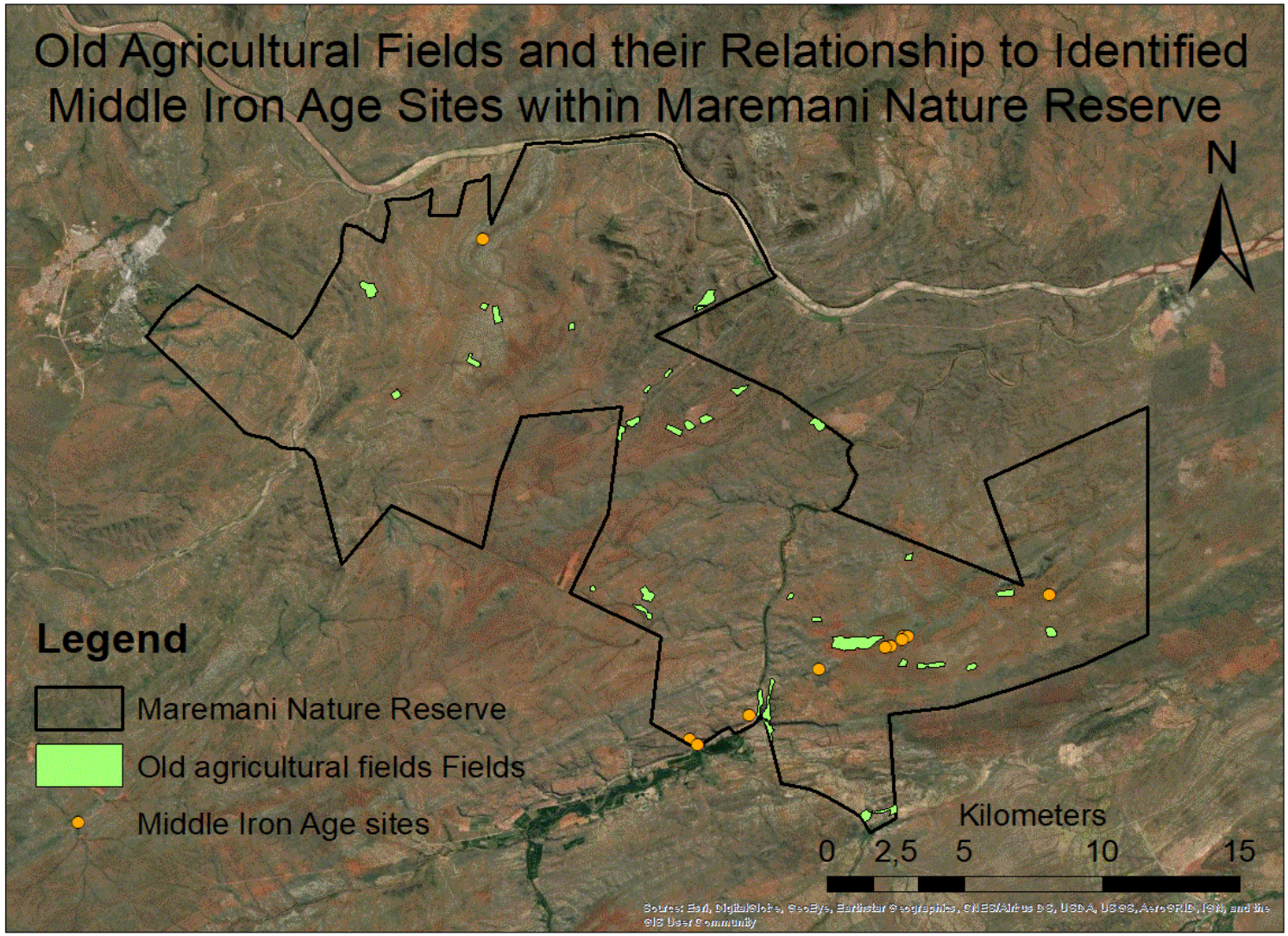

Figure 7-32: Old agricultural field and their relationship to identified Middle Iron Age sites in Maremani Nature Reserve

Unfortunately, there is not enough data on land type Ae265 to create a proper comparison, but various factors do point to its potential for farming. When looking at the location of middle Iron Age sites you can see that Ib 314 has the most sites located within it with 63,36% (MNR 73, 78, 79, 240, 259, 280, 330) of the sites while land type Ae265 has 27.25% (MNR 74, 75, 252) of the sites and land type Fc484 has 9.09% (MNR 04). Ib 314 has the lowest farming potential out of the three land types as oak leave soils which seem to be the preferred soils for farming only account for 2,2% of the land type and these soils do not exceed 900mm.Meaning it is unlikely that these communities settled in this land type for farming purposes alone. Land type Ae 263 has 27,27% of the of the sites located within it. There is minimal data this Land type, but you can see that it has a greater farming potential as there are six old fields within this land type and only 2 in Ib314 ne of which is in close proximity to land type Ae265. 63,63% of the sites are located within or close proximity to Ae 265 showing that these communities where most probably utilising this land type for farming even though majority of them were not located within this land type. The land type Fc484 has 9,09% (MNR04) of the sites located within it, this land type has two soil types that meet the required depth of 1200mm for farming, namely oak leave (10%) and Fernwood (0,8) soils and point to the potential for farming in the area.

Soil texture also seems to play a role in crop selection within the study area as the oakleaf soils in land type Fc484 have a sandy loam texture and a clay percentage of 8-15% in horizon A and 9-18% in horizon B.Land types ib314 Oakleaf soils have a sandy clay loam texture and a clay percentage of 10- 18 % in horizon A and 15-25% in horizon B. While land type Ae265 also has a sandy clay loam texture. When looking at the crops being farmed at MNR 78 And MNR04 we can see that communities at MNR 78 are utilizing soils with a clay loam texture with a higher clay percentage generally preferred by sorghum while the communities at MNR04 are utilising the soils with a sandy loam texture with a lower clay percentage preferred by pearl millet. While cow peas being farmed by both communities is suited to both soil types.

The co-occurrence of cow pea with millet and sorghum on sites MNR 04,74,78 likely points to these community's use of various intercropping strategies as cow peas increase nitrogen levels within the soil and spur on nitrogen intake of cereals (Sarr et al 2008). Creeping cow peas also provide shade for plants and help with moisture and soil conservation (Glotty et al 2016) Another example of possible intercropping occurs at Mutamba where there is

evidence for Pearl millet, Finger millet, Sorghum, Cow peas and Mung bean being farmed. This wide array of domesticated crops points to a substantial knowledge of cropping systems.

Pearl millet, Sorghum and cowpea are all generally planted during October and November and are harvested around the start of February to the end of March. This corresponds with the seasonality of the Oxygen Isotopic values for the molluscs of MNR 74 and MNR 78 which show that the sites were occupied during the summer to early Autumn months while the Oxygen Isotopic values for MNR 04 show it was occupied slightly early than the previous two sites.

7.6.2 Livestock

Sites MNR 73, 74, 75, 78, 79, 240 and 252 are most likely sites related to farming and livestock activities though only two of the seven sites have evidence of kraals the first a small kraal at MNR74 the other slightly larger at MNR 75

These sites are situated on and around the vegetation type (*Sclerocarya birrea*) with the highest grazing capacity but only occupies 924 ha out of the 36583 ha reserve possibly indicating that these sites could have acted as short term cattle outpost for larger communities possibly at MNR 259. MNR04 and MNR 259 are the only Mapungubwe period sites with significant kraals and could be associated with an intensification of farming activities resulting in additional feed for livestock during the dry winter month when natural foliage is minimal.

The carrying capacity around the Mapungubwe period sites MNR 04 is lower than the sites on the southern section of the reserve the main reason for this is that vegetation types such as *Sclercarya birrea, Androstachys Johnosil, Combretum imberbe and Colophospermum Mopane- Sesamothamnus Lugardi* do not occur within a 4km radius of the site. The kraals at MNR 04 and MNR 259 or relatively large compared to the kraals of MNR 74 and MNR 75which points to the possibility that the diets of the livestock were possibly supplemented with stover from crops as there is evidence for intensive farming due to the high amount grain bin basses on sites MNR04 and MNR 259 which have larger kraals.

7.6.3 Smithing and smelting

Of the eleven Mapungubwe period sites within the study area, at least five have signs of iron smithing and possibly smelting through evidence of slag, tuyeres or daga from furnaces. MNR 280 has definite signs of smelting through tuyères and daga from a furnace. MNR 78 has the most metal artifacts at 44 while MNR04 only had 11 iron artefacts but has 58% more slag than MNR 78 (Lippert 2019). The four sites which did not have any evidence of smelting or smithing are MNR 75, 79, 252 and MNR 240, though these sites have not been excavated and could possibly still yield evidence of similar activities.

Kromdraai that falls outside of the study area to the east displays an alternate pattern as large amounts of slag are found on the site some with copper oxidization along with a type of bronze alloy. The evidence of copper and iron slags along with possible bronze alloys points to a better understanding of the areas mineralogy which is very likely as Kromdraai was occupied between AD 1270-1410 giving the community there a longer time to acquire knowledge on the areas minerology, for example Iron ore located within the region of the study area spoils easier during the smelting process than other iron ores, a result caused by high copper percentage within it. If this is the case that Kromdraai was one of the first sites to initiate copper and iron smelting and the creation of new alloys in the area. Then it will surely be a defining variable in the success of this community. But an alternate view is that of calabrese (2000b, 2007) where smelting practices are restricted to the elites and not permitted amongst commoners. Which is plausible considering Kromdraai is suspected to be a regional elitist site. Though MNR 280 shows signs of smelting through furnace fragments and tuyeres and cannot be considered and elites site due to its small size.

Another observation is related lower grinding stones with elongated ellipsoid wear patterns which are different to the general lower grinding stones with a circular wear pattern. There are only three of these grinding stones which were discovered two of which are related to sites with evidence of smelting (MNR 269, MNR 280) while the other slightly larger and less hollow than the previous two most likely relating to Late Iron Age site with no evidence of metallurgy within the vicinity. The associated smelting activity related to these two lower ellipsoid grinding stones on MNR 269 and MNR 280 point to a possible alternate use other than just the processing of cereals (Huffman 2004, 2006) and does not associate these ellipsoid lower grinders to smelting activities.

7.4 Settlement layout and complexity

When classifying the Mapungubwe period sites according to Huffman and Hanisch's (1987) settlement hierarchy model one can see that MNR 73, 74, 75, 78, 79, 240, 252, 280 and 330 are most likely level one sites, though they do not display signs of the central cattle pattern but all vary according to the surrounding geomorphology. MNR 04 and MNR 259 are level two sites as they are larger and have substantial kraals and follow the central cattle pattern layout and also display more intensive farming practices. The level one sites are all situated on the southern part of the reserve and all display varying spatial properties. sites MNR 240 and MNR 252 are similar in that they are both situated on crests and steep slopes of koppies which are terraced in certain areas. While Sites MNR 73, 74, 75,78 and 79 are situated between rocky outcrops on a ridge and also have evidence of terracing. MNR 280 is situated on the plateau between a rocky out crop and is the most secluded of all the sites.
MNR04 and MNR 259 are likely annual sites and not seasonal which I believe is possibly the case this is also supported by the isotopic analysis of molluscs which show seasonal occupation of MNR, 74, 78, and possible annual occupation for MNR 04.
When considering the proximity of the sites to Kromdraai a level three settlement, it is likely to assume that these communities would fall under the authority and rule of the chief occupying this settlement when applying the settlement hierarchy model put forth by Huffman and Hanisch (1987).

7.5 Small finds and trade

Small finds on the Mapungubwe period sites such as spindle whorls, metal objects, slag, ostrich egg shell and stone beads point to small scale production of goods in which most cases were most likely used for the community's own consumption though MNR 78 does show a slight increase in production of iron objects possibly for intra community trade. Foreign trade items are only found on three (MNR259, MNR 74 and MNR 04) of the four excavated Mapungubwe period sites and only consists of glass beads.

Table 7-11: small finds on Mapungubwe period sites within the region

Site name	Glass beads	OES beads	Achatina beads	Stone beads	Gold Beads	Spindle whorls	Figurines	Iron objects	Copper objects	Bronze Objects	Amulet	Slag (g)
Mutamba	346	550	1	0	1	187	0	322	4	0	0	1800
Princess hill	0	5	1	0	0	11	2	1	2	0	0	No data
Vhunyela	1	1	0	0	0	2	0	2	0	0	0	No data
Tavhats-hena	0	0	0	0	0	0	0	4	1	0	0	No data
Verulam	0	0	0	0	0	0	0	13	1	0	0	No data

Stayt	66	191	27	6	18	20	0	15	10	0	1	69,79
Krom draai	692	168	24	7	0	7	0	203	22	5	2	30,67
MNR 74	33	36	1	0	0	9	0	3	0	0	0	12,9
MNR 78	0	76	2	1	0	13	0	44	0	0	0	147,2
MNR 04	18	47	4	0	0	6	0	112	2	0	0	323

7.6 Summary

The Middle Iron Age sites display a slightly alternate settlement pattern than the late Iron Age sites of which % are located in Thsirundu hills. majority of the middle Iron Age sites are located on the fault a few km north of the Tshirundu hills. This area is located directly in the middle of farmable soils and one of the vegetation types that has the highest carrying capacity with a substantial gras cover consisting mostly of Lehman love grass which is the preferred grass for grazing cattle. The grass is also one of the first grasses to start growing towards the end of winter into early spring. Although some of the sites situated on the fault are relatively far from water it is suspected that this fault was a possible water source in the past which there is still some evidence of, as water can be seen seeping out of the koppie about 1km east of MNR 252 on the farm Skirbeek (southern portion of Maremani). It seems that these communities' settlement pattern is purely reliant on the exploitation of natural resources and little to do with social variables. Sites MNR 258 and MNR 330 are situated on the western part of the Tshirundu hills but this also seems more likely due to environmental exploitation as the Nzhjelele and its floodplains are located directly beneath the site. This is also evident on the site as there is evidence for over 40 grain bins bases on MNR259. Site MNR 04 displays an alternative settlement pattern to the other Mapungubwe sites. Firstly, it is the only Middle Iron Age site located on the northern side of the reserve. It is also situated in an area with a low carrying capacity with little evidence for historical fields though there is evidence for late Iron Age agricultural fields on the slopes of the same ridge 200m to the east. MNR 04 also has quite a substantial amount of grain bins compared to the other Middle Iron Age sites apart from MNR259. Showing that this community most probably settled in the location due to its agricultural potential. Even though the carrying capacity is lower for the area around MNR 04 it is located near to the banks of the Limpopo which has a higher carrying capacity than the area surrounding the settlement. This is likely as ethnographic accounts recall how Tshirundo cattle were sometimes moved to the area for grazing. The northern part of the reserve. Environment does seem to be a defining variable in the settlement choices of middle Iron Age communities as all of them are located in close proximity to the environmental variables needed to sustain their way of living.

There is no evidence for the Khami phase within the study area. There is however, a level three Khami settlement to the north west of Maremani Nature Reserve. Communities only seem to repopulate the area in the 17th century as Letaba ceramics start appearing on the landscape. These early Venda settlements seem to display a similar settlement pattern as the MIA sites as many are situated in similar locations with the exception of the sites on the farms Berkenrode 45 And Singelele which are related to copper mining and smelting.

There seems to be to be an alternate settlement pattern emerging somewhere in the late 17th to early 18th century as by the mid-19th century there are already multiple settlements with formal stone walling associated with the Venda situated in the Thsirundu hills which do not occur anywhere else within the study area. This change could be associated with the Singo who moved into the Limpopo sometime in the 1690s and conquered the individual chieftains and united them the to form the first Venda state (Huffman 2012). After Dzata the capital of the Singo was abandoned in the mid-18th century the kingdom split into three independent dynasties with one being the Mphephu who controlled western Venda land. It is during this period that the formal stone walling settlements start emerge within the Tshirundo hills. Ethnographic accounts state that these communities moved into the Tshirundu hills for their seclusion and protection. which is evident in the construction of the walls as some contain portholes. This is an example of how social disturbances can also lead to settlement pattern changes and that not all settlement patterns are a result of environmental exploitation. Though in the case of the Thsirundu we can see that both variables apply as the Thsirundu established their settlement on a koppies in the Thsirundu hills for defence purposes but the environment stilled played a role as the settlement was placed next to a water source that was used by the community for ritual purpose and daily water needs. This shows that even if social factors are the main reason for changes in settlement pattern, environment still plays a role in the settlement location.

The historical settlement pattern is less environmentally reliant but still environmentally orientated. More settlements start occurring on the northern parts of the reserve where geological resources are more abundant while there is a decrease in settlements on the southern side as communities are forced out of the area and

recopied by individual families making a living of small-scale farming or cattle herding. Mining activity also increases on the southern part of the reserve though it is at a far less proportion than the northern part of the reserve.

7.7 Conclusion

There are clear patterns that emerge when considering environmental resources in relation to settlement patterns within the study area. These patterns vary over time but are still associated with the environment irrespective of social or political variables leading to that change. Vegetation types with a high carrying capacity specifically Sclerocarya birrea which contains high quantities of Lehman's love grass and farmable soils mainly Oakleaf soils with a depth of 1200mm seem to be the main determining factor in the Iron Age settlement location choices as majority of the Iron Age sites were located in close proximity to these variables. The Messina geological formation also plays a role as many sites utilise the copper ore found within it. Even in times of conflict such as in the 19th century people did not leave the landscape but just relocated to a more secluded and defensive position but still within in a close enough proximity to utilise the same resources as they were previously utilising.

7.8 vulnerability's resilience and adaptation

By identifying what resources within the landscape communities are most reliant on, you are able to identify where some vulnerabilities might lie and where resilience strategies and adaptations are most likely to occur. We can see that these communities within the study area are utilising multiple environmental resources simultaneously throughout the year to meet a sustainable living. Specific Niche environments are being exploited and settlements do display a spatial pattern relating to these resources such as majority of the settlements with kraals are located within proximity to vegetation type Sclerocarya birrea and settlements with copper ore are located in close proximity to geological formations with copper reserves. Communities seem to be living near these resources as it makes utilization of them more efficient. This does seem to change in times of conflict as settlements move to more secluded defendable positions within the landscape seen during the 18th and 19th centuries. These niche environments are also possibly utilised seasonally as identified by the isotopic

analysis showing seasonality as an adaptation. Different crops are being farmed simultaneously showing evidence of intercropping while soils with specific textures specifically suited to crop preferences are being utilised. Which could also be a reason for seasonal sites as settlements might be in a region suited to one crop but not another. There is also evidence not only for domestic flora being utilised for consumption but also wild. Faunal assemblages also match environmental potential as there are more goat remains than cattle which is in relation to the environmental carrying capacity which can support more browsers than grazers showing that these communities were utilising their environments to their full potential

7.9 Future research

Areas within the reserve which have not yet been surveyed or where not intensively surveyed should be survey. All identified sites should be revisited and recorded within the same methodological parameters. More site-specific environmental recordings should be taken in regards to soil types and depth to get a better understanding of soil properties preferred by these farming communities. Soil chemical and phytolith analysis should be done to determine the types of crops being farmed by communities as well as identify site level activities taking place. While a better understanding of the spatial distribution of mineral deposits and their properties could help identify small scale mining activities and possible trade in ores while chemical analysis of slags and metals will provide a better insight in smelting and smithing practices within sites

More in-depth studies of all eleven Mapungubwe sites should take place in the form of ceramic technology studies which should provide enough data to determine clay procurement and production over the broader landscape. Isotope analysis of faunal and human skeletal remains will contribute to a better understanding of mobility, varying types of nutritional intake of humans and animals and seasonality within the landscape.

7.10 Relevance of study

The relevance of this study in regard to the usable past lies in its ability to identify niche environments and the activities leading to their exploitation and potential to sustain small communities' nutritional and economic needs.

Semi-arid regions such as the Limpopo valley generally have a low agricultural and animal husbandry potential and are not always considered suitable for farming. By identifying site locations within an ecological setting over time, one can draw relationships between various environmental variables to determine the possible reason for site location choices (soil types, geology, vegetation, land types, proximity to water).

Analysis of botanical remains found on the sites aid in identifying crops which are resilient to regional climatic conditions and provide enough substance to meet the nutritional needs of a community. While analysis of faunal and vegetation data in relation to kraals one can identify which areas were preferred for grazing for past communities and which animals are best suited to these environments. The data then generated on these exploitable niche environments can be used to assess the current farming potential of the land and how to insure current sustainable farming practices through low-cost traditional farming techniques.

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APPENDIX A

Plant communities

1. Croton gratissimus - Danthoniopsis dinteri rocky outcrops (Lavender feverberry - Mountain grass rocky outcrops)

1.1 Entandrophragma caudatum - Portulacaria afra mountain bushveld (Mountain mahogany - Porkbush mountain bushveld)

2. Androstachys johnsonii - Terminalia sericea sandstone hills (Lebombo iron wood - Silver cluster-leaf sandstone hills)

3. Combretum apiculatum - Danthoniopsis dinteri - Tricholaena monachne rocky outcrops (Red bushwillow - Mountain grass - Blue-seed grass rocky outcrops)

4. Colophospermum mopane - Xerophyta viscosa open to dense bushveld on low hills and rocky outcrops (Mopane - Xerophyta viscosa open to dense bushveld and low hills and rocky outcrops)

5. Colophospermum mopane - Terminalia prunioides - Psiadia punctulata bushveld (Mopane - Lowveld cluster-leaf - Psiadia bushveld

6. Sclerocarya birrea - Aristida stipitata - Eragrostis lehmanniana open grass and bushveld (Marula - Long-awned three-awn - Lehmann's love grass open grass and bushveld)

7. Colophospermum mopane - Kirkia acuminata - Acacia erubescens plains bushveld and woodland (Mopane - White syringa - Blue thorn plains bushveld and woodland)

8. Colophospermum mopane - Boscia albitrunca - Terminalia prunioides open to dense bushveld on plains and low rocky hills (Mopane - Shepherd's tree - Lowveld cluster-leaf open to dense bushveld on plains and low rocky hills)

9. Colophospermum mopane - Catophractes alexandri - Vernonia cinarescens low and dense bushveld (Mopane - Trumpet thorn - Vernonia low and dense bushveld)

10. Colophospermum mopane - Sesamothamnus lugardii - Acacia tortilis open to dense low bushveld (Mopane - Transvaal sesame bush - Umbrella thorn open

to dense low bushveld) 11. Colophospermum mopane - Gardenia resiniflua - Tetrapogon tenellus low thicket (Mopane - Resin gardenia - Tetrapogon low thicket)

12. Colophospermum mopane - Aristida adscensionis bushveld (Mopane - Nine-awned grass bushveld
13. Colophospermum mopane - Acacia tortilis - Eragrostis lehmanniana low dense bushveld (Mopane - Umbrella thorn - Lehmann's love grass low dense bushveld)
14. Acacia tortilis - Eragrostis lehmanniana old fields (Umbrella thorn - Lehmann's love grass old fields) 14
15. Pechuel-loeschia leubnitziae - Urochloa mosambicensis open grassland to dense bushveld (Wild sage - Common signal grass open grassland to dense bushveld)
16. Combretum imberbe - Philenoptera violacea stream community (Leadwood - Apple-leaf stream community)
17. Xanthocercis zambeziaca - Acacia robusta - Cyperus sexangularis riparian community (Nyala tree - Brack thorn - Cyperus riparian community)

APPENDIX B

Recording sheets

Site Form

Date: Co-ordinates: N E Area:

Waypoints:

Site no: Altitude: Site Sketch:

Site name: Photo no: Transect no:

Site

Soils ( ) Erosion ( ) location ( ) Habitat type/Plant communities (/)

Animal activity ( ) Occupation period ( )

Artefacts/Features

ESA ( ) MSA ( ) LSA ( ) Kraal ( ) Midden ( ) Walls ( ) Terracing ( )

Platform ( ) Monolith ( ) Mine ( ) Burial ( ) GBB ( ) UGS ( ) LGS ( )

Slag (Fe/Cu,) Ore (Fe/ Cu,) Metal (Fe/Cu,) Daga ( ) Charcoal ( ) Bone ( ) Shell ( ) Glass ( )Historical Items( ) Beads ( ) (Form no:) Other ( )

Ceramics

Undiagnostic ( ) Diagnostic ( ) – (Rim, Decoration, burnish Br/R/B)

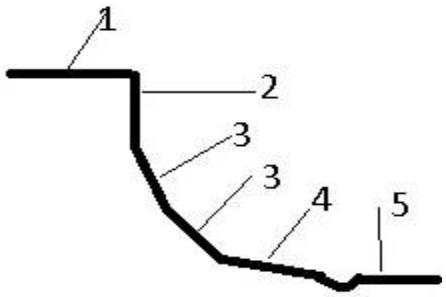
Amount: Un ( ) DI ( ) photo no: Sketch no:

Description:

Site sketch

Figure B-1: Recording sheet used during survey

Table B-1: Key for recording sheet

Soils	**Erosion**	**Animal Activity**
1 IB314 2 AH88 3 AH89 4 AH91 5 FC482 6 FC483 7 FC 484 8 AE 265 9 AE266	1 No erosion 2 Depositional 3 Stable 4 Slight erosion 5 Considerable erosion 6 Extensive erosion 7 Wash 8 Gully formation 9 Rill Erosion	1 None 2 Little 3 Trampling 4 Smalll animal burrowing 5 Large animal burrowing
Habitat type 1 Rocky outcrops 2 Mopane veld A Mopane Bushveld on undulating low rocky Hills B Mopane woodland on plains 3 Low mopane bushveld and thickets 4 Poor Mopane thickets and forest 5 Disturbed Areas 6 Riverine bush	**Settlement Period** 1 Early Stone Age 2 Middle Stone Age 3 Late Stone Age 4 Early Iron Age 5 Middle Iron Age 6 Late Iron Age 7 Historical 8 Present	
Location 1 Flats 2 Between koppies 3 Koppie base 4 Koppie top 5 Rock outcrop 6 Boulder 7 Hilltop 8 Hill base 9 Shelter 10 Escarpment Edge 11 Drainage area 12 Valley 13 River side/bed 14 Pan side 15 Cave	**Terrain form** 1 Crest 2 Scarp 3 Midslope 4 Footslope 5 valley bottom 	Plant communities 1 9 2 10 3 11 4 12 5 13 6 14 7 15 8 16 17

APPENDIX C

Ceramic drawings

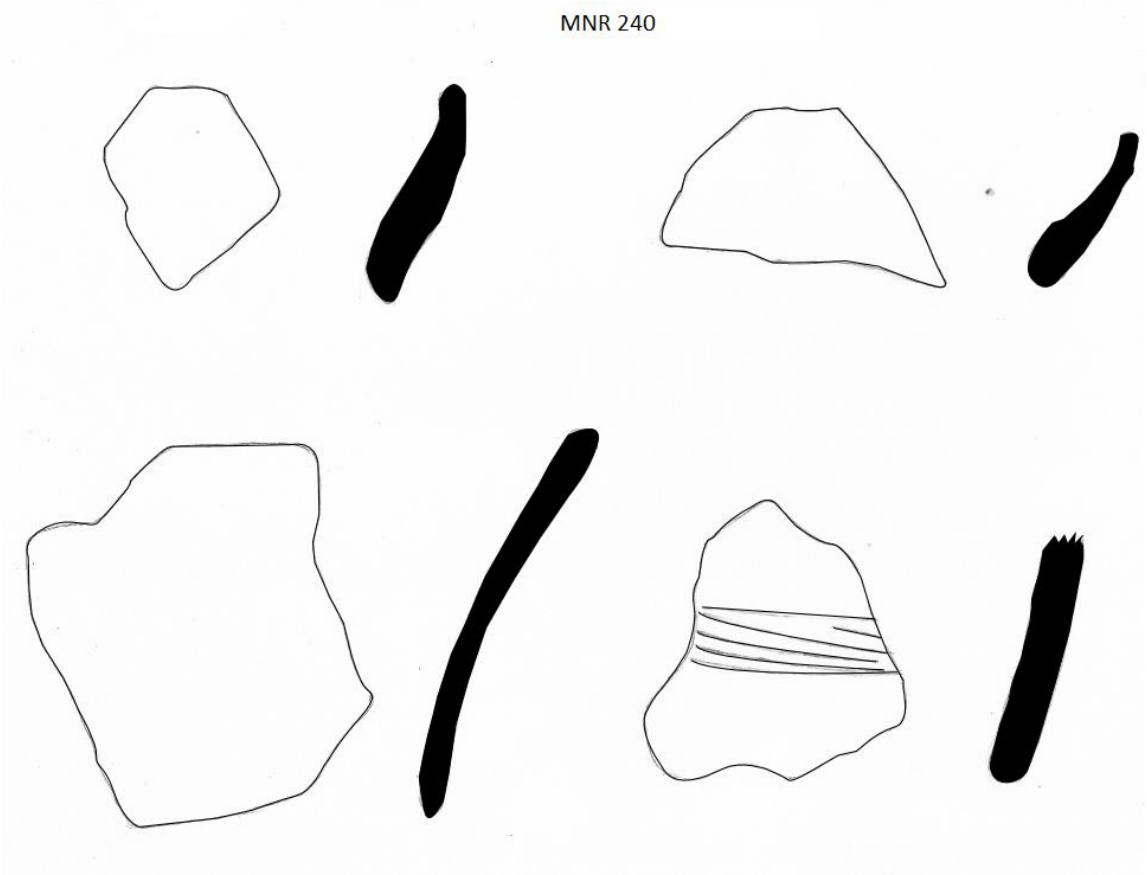


Figure C-1: Ceramic drawings of MNR240

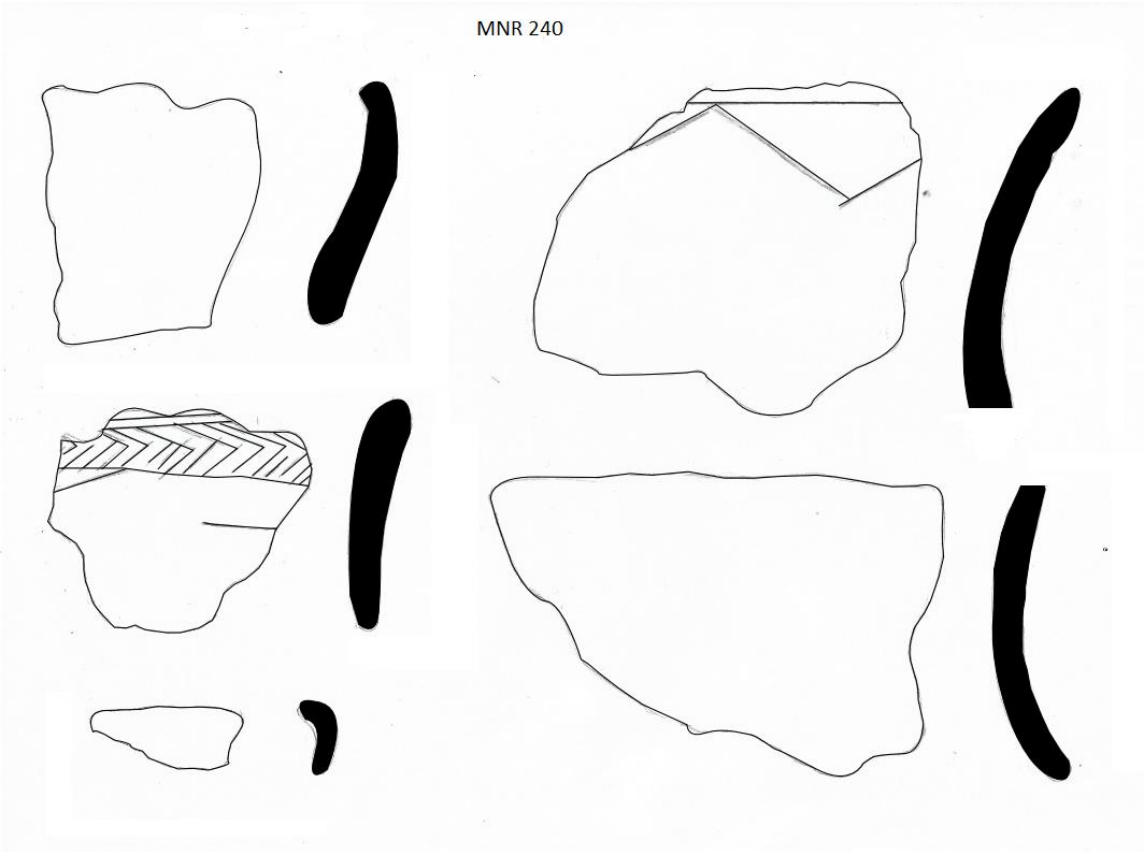


Figure B-2: Ceramic drawings of MNR240

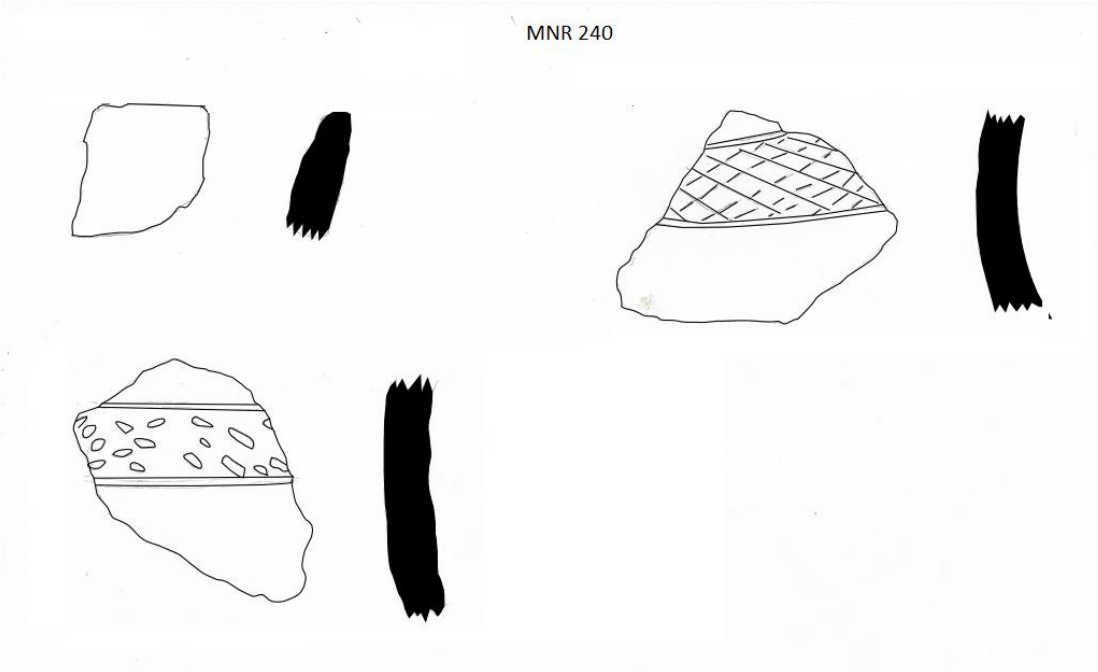


Figure B-3: Ceramic drawings of MNR240

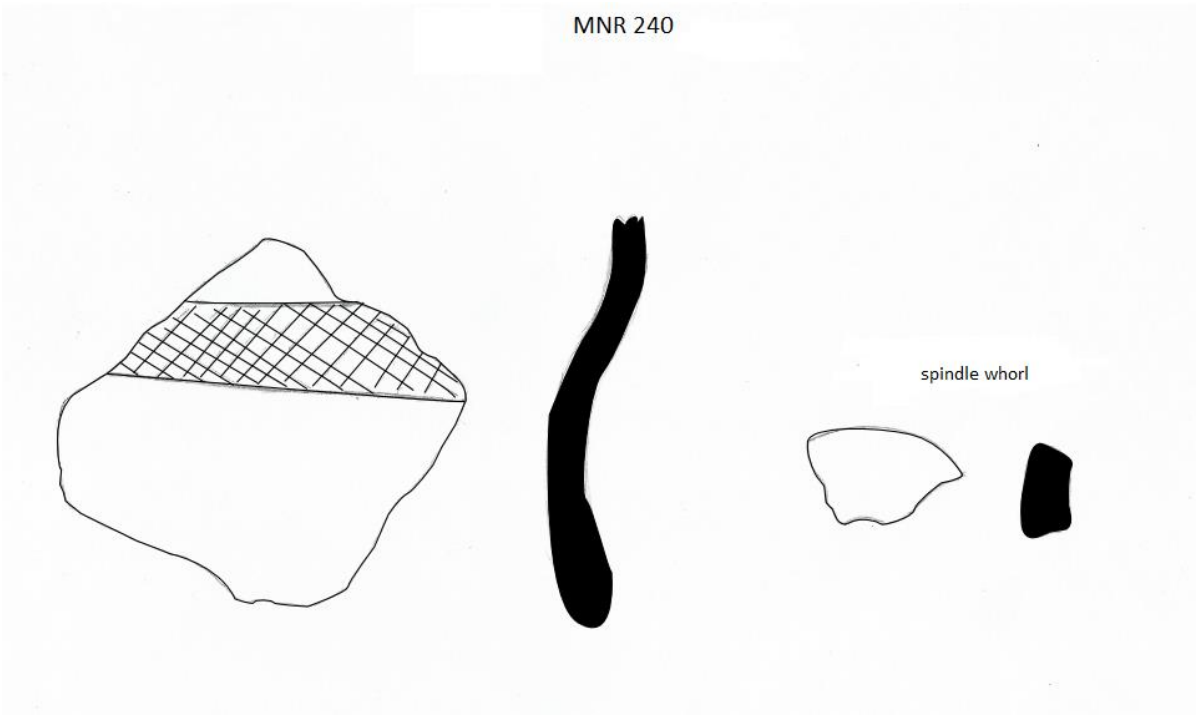


Figure B-4: Ceramic drawings of MNR240

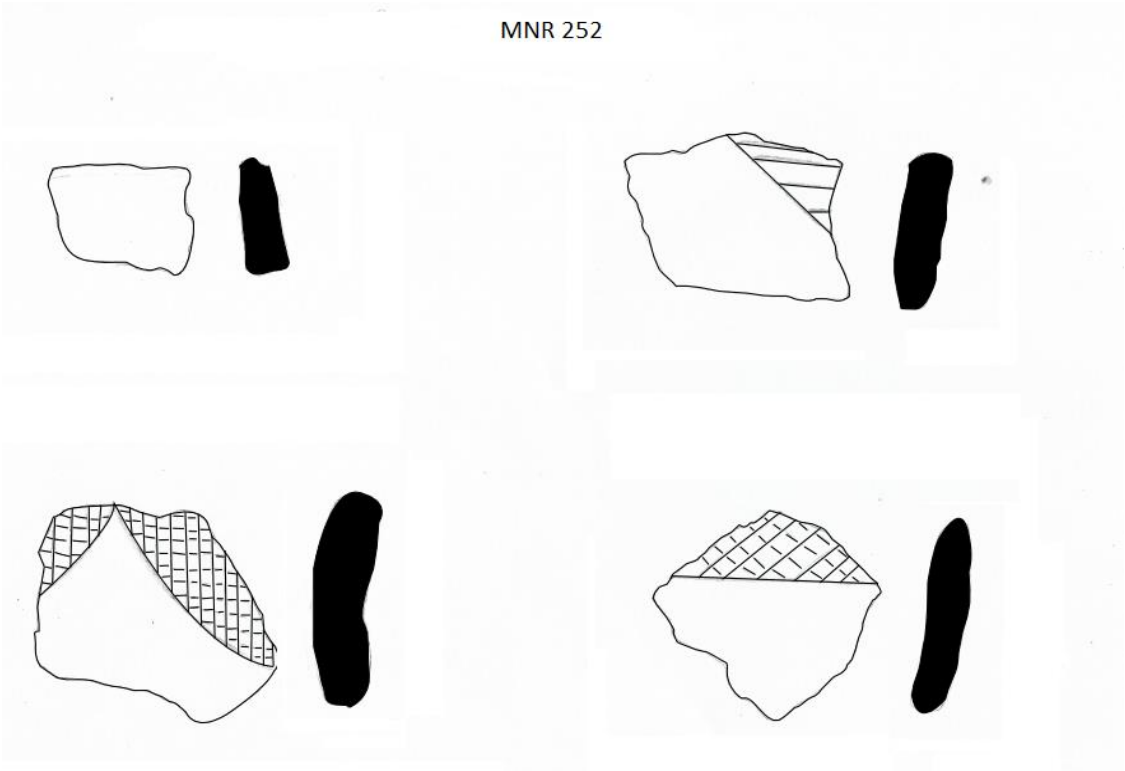


Figure B-5: Ceramic drawings of MNR 252

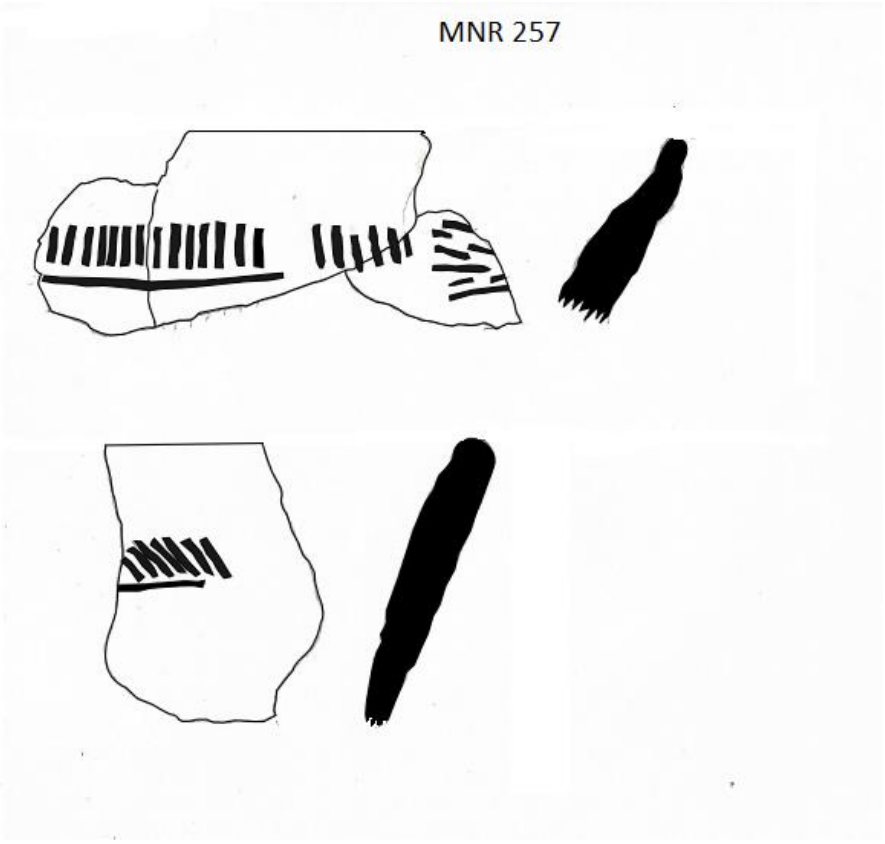


Figure B-6: Ceramic drawings of MNR 257

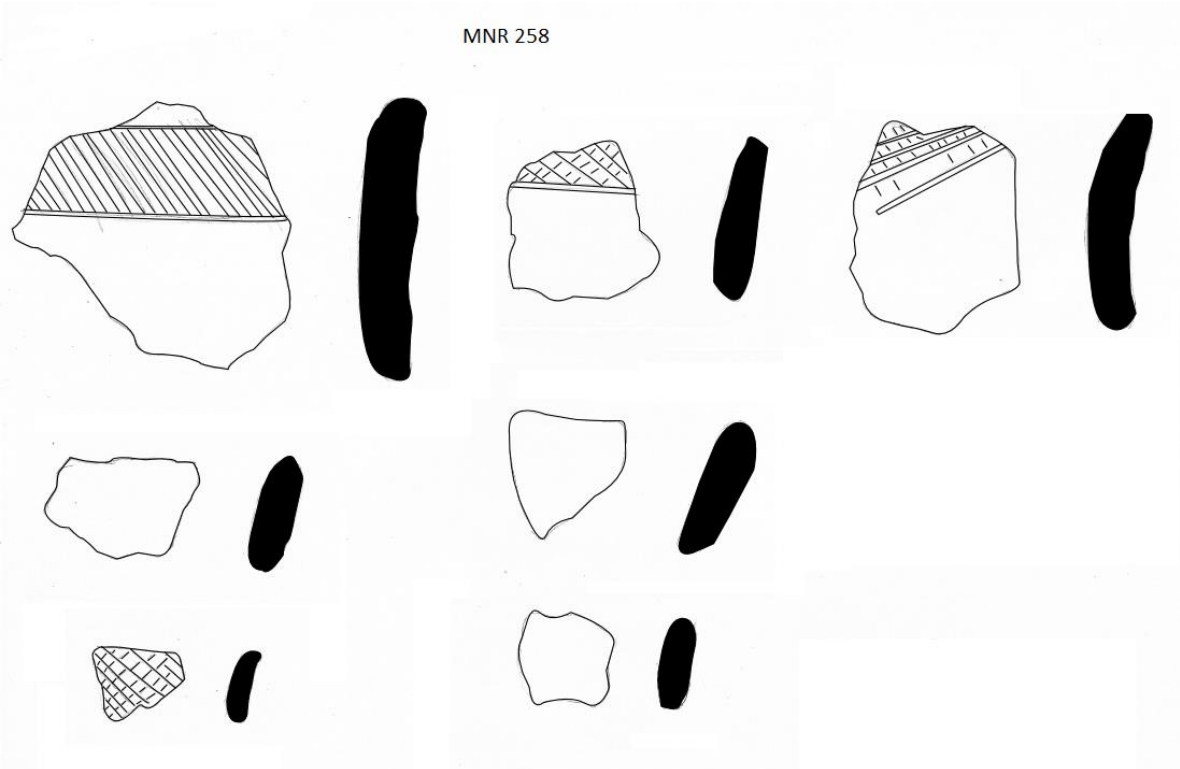


Figure B-7: Ceramic drawings of MNR 258

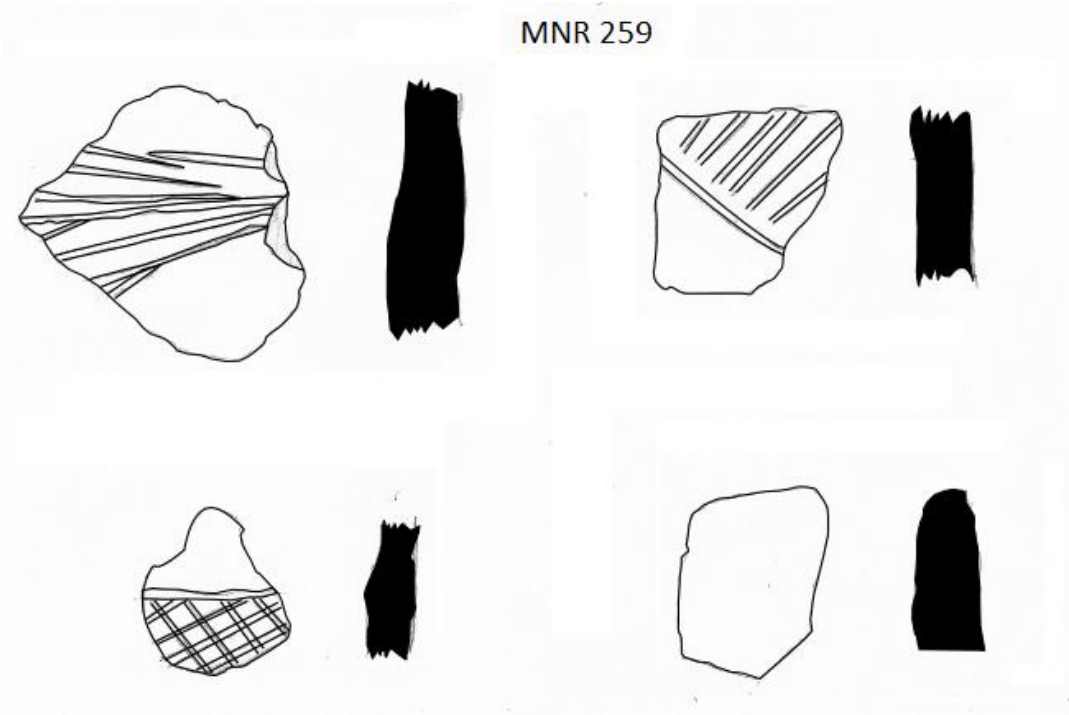


Figure B-8: Ceramic drawings of MNR 259

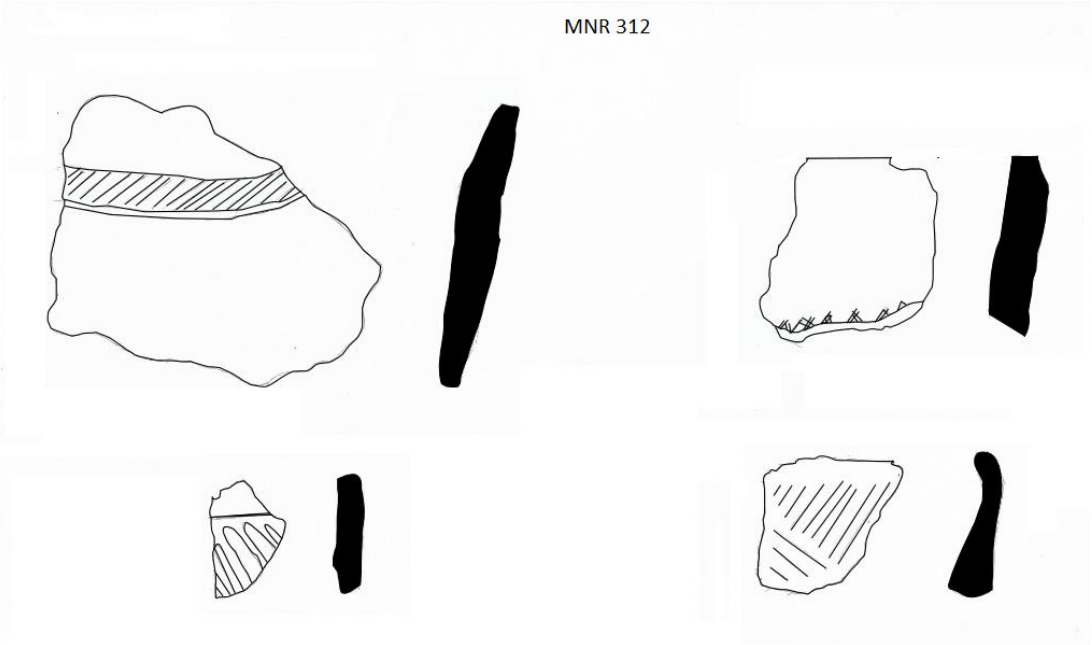


Figure B-9: Ceramic drawings of MNR 312