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An Archaeozoological and Ethnographic investigation into animal utilisation practices of the Ndzundza Ndebele of the Steelpoort River Valley, South Africa, 1700 AD – 1900 AD

by

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Summary and Key terms

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Summary

Focussing on Archaeozoological faunal analysis, this dissertation aims to investigate the animal food utilization practices of the Ndzundza Ndebele by combining archaeozoologcial methods, archaeological data, ethnographic and historic information. The Ndzundza Ndebele inhabited three different sites in the Steelpoort River Valley during c. 1700 AD – 1900 AD. They were forced to relocate from KwaMaza and Esikhunjini to KoNomtjarhelo as a result of continual fighting between themselves and contemporary Iron Age/Historic communities, the British and the Boers during this period. I aim to identify the animal species utilized by the Ndzundza Ndebele in addition to whether or not the hostile and politically unstable period had any effect on Ndzundza animal food procurement, use and discard. Additionally I investigate whether the faunal remains recovered from the three sites can be used to identify ethnic affiliations, gender roles and ritual use with regards to animals and/or animal parts. Ultimately, I aim to demonstrate that faunal remains cannot be fully understood and interpreted without incorporating relevant ethnographic and/or historic information and as comprehensive an archaeological context as possible.

Key terms

Animal food subsistence; Archaeozoology; Esikhunjini; Faunal analysis; KoNomtjarhelo; KwaMaza; Late Iron Age; Minimum Number of Individuals (MNI); Mpumalanga; Ndzundza Ndebele; Number of Identified Specimens (NISP); Quantifiable Skeletal Parts (QSP); South Africa; Steelpoort River Valley.

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Chapter 1

Introduction and objectives of Archaeozoological research on the Ndzundza Ndebele of South Africa, 1700 AD – 1900 AD

“*For in the seemingly little and insignificant things that accumulate to create a lifetime, the essence of our existence is captured*” (Deetz, 1996: 259).

History often neglects to account for the actions of ‘common’ people and focuses instead on elites and ‘notable’ events. “*Simple people doing simple things, the normal, everyday routine of life and how these people thought about it, are not the kinds of things anyone thought worthy of noting*” (Deetz, 1996: 8). Through the use of archaeology, especially an anthropologically inflected enquiry that bridges traditional borders between ‘history’ and ‘archaeology’, we can construct a more holistic understanding of past communities, addressing issues of daily life and common concerns such as acquiring food resources. Not all artefacts survive however, and surviving artefacts are seldom representative of a specific period or its people (Deetz, 1996: 8). “*The past is not a three-dimensional jigsaw puzzle buried beneath the archaeologist, or a palimpsest*” (Shanks and Tilley, 1987: 95). Each archaeological artefact has a multitude of possible descriptions and explanations (Shanks and Tilley, 1987: 109). This multiplicity of possible explanations is not, however, infinite and by examining artefacts in their physical and conceptual contexts, archaeologists can more precisely interpret and imagine the material residues left behind by past human activities (Deetz, 1996: 4).

Artefacts and their physical contexts are also not the sole sources of archaeological information. The information they provide can be enhanced and supported with the use of other evidentiary sources such as written documentation and oral histories (Delius, 1983: 4-8; Deetz, 1996: 7). Southern African archaeology draws from the many text-literate European travellers, missionaries, hunters, overseers, writers and the like who observed indigenous southern African communities in the past (Rasmussen 1977: 96; Mary-Louise Pratt, 1992: 39-41, 49). The Ndebele of southern Africa are one such group who have been the focus of this Western gaze, and who have an interesting but under-researched archaeology (but see Fourie, 1921; Loubser, 1981; Schoeman, 1997; Delius, 2007; Huffman, 2007). Of course, much of this external writing and imagining was complicit with the governments of empire and colony and often led to the artificial construction of 'ethnic' groups (Mafeje, 1971: 253-254; Rasmussen, 1977: 96). Yet the European travellers did not document or report on an altogether fictitious 'Ndebele' construction (see for example Chanaiwa, 1976: 50; Rasmussen, 1977: 96). Rather, a common language, customs, choice of place of residence, beliefs and so forth do seem to have pertained and it is possible to, with due caution, speak of historically specific constructions of Ndebele-ness.

In this study I focus on one such group, the Ndzundza Ndebele (hereafter Ndzundza), during the tumultuous two centuries 1700 AD - 1900 AD. While ethnographies and travel accounts are useful pointers to past communal organisation patterns, customs, beliefs, subsistence strategies and food getting behaviours I propose to temper and even 'ground truth' this textual and colonial imaginary by examining a collection of the most everyday of artefacts - animal food remains. I argue that what people do with their food in terms of procurement, processing and disposal may be a good indicator of change and continuity in social, economic, political and even spiritual contexts.

1.1 Aims and objectives of Ndzundza archaeozoological research

I propose an archaeozoological focus on the Ndzundza who occupied the Steelpoort River Valley, in South Africa's Mpumalanga province (Figure 1) during c. 1700 AD – 1900 AD. I shall examine their subsistence behaviours in terms of the procurement, use and discard of animal food. I intend to identify what species, sex and age of animals were utilized and whether the Ndzundza changed their animal food subsistence strategies as circumstances forced them to relocate to three different sites (Figure 2; KwaMaza, Esikhunjini and KoNomtjarhelo) before being defeated militarily at their last stronghold in 1883 AD by the Z.A.R. ("*Zuid Afrikaansch Republiek*"/South African Republic) (Jonas, 1989: 20). I suggest the utility of this type of study of people living in a period of marked social stress and their associated material culture 'signatures' to other parts of southern Africa during the last 500 years. My research aims, therefore, within material and theoretical constraints, to imagine the world in which the Ndzundza lived and to investigate their beliefs and practices regarding animal food.

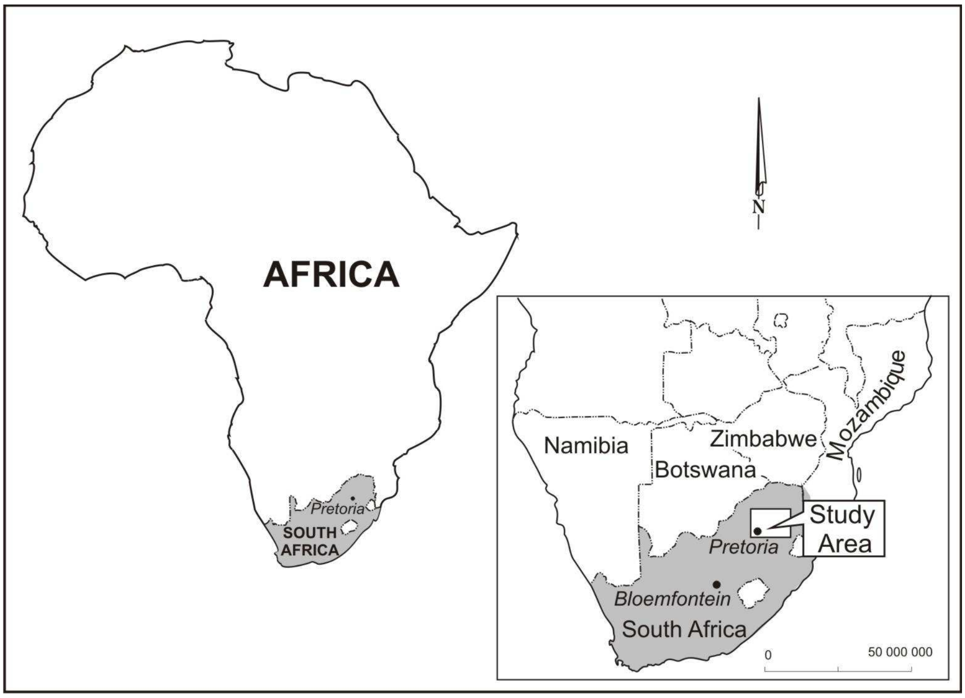


Figure 1. Location of study area, Steelpoort River Valley, Mpumalanga, South Africa (Map courtesy Me. L. Steyn)

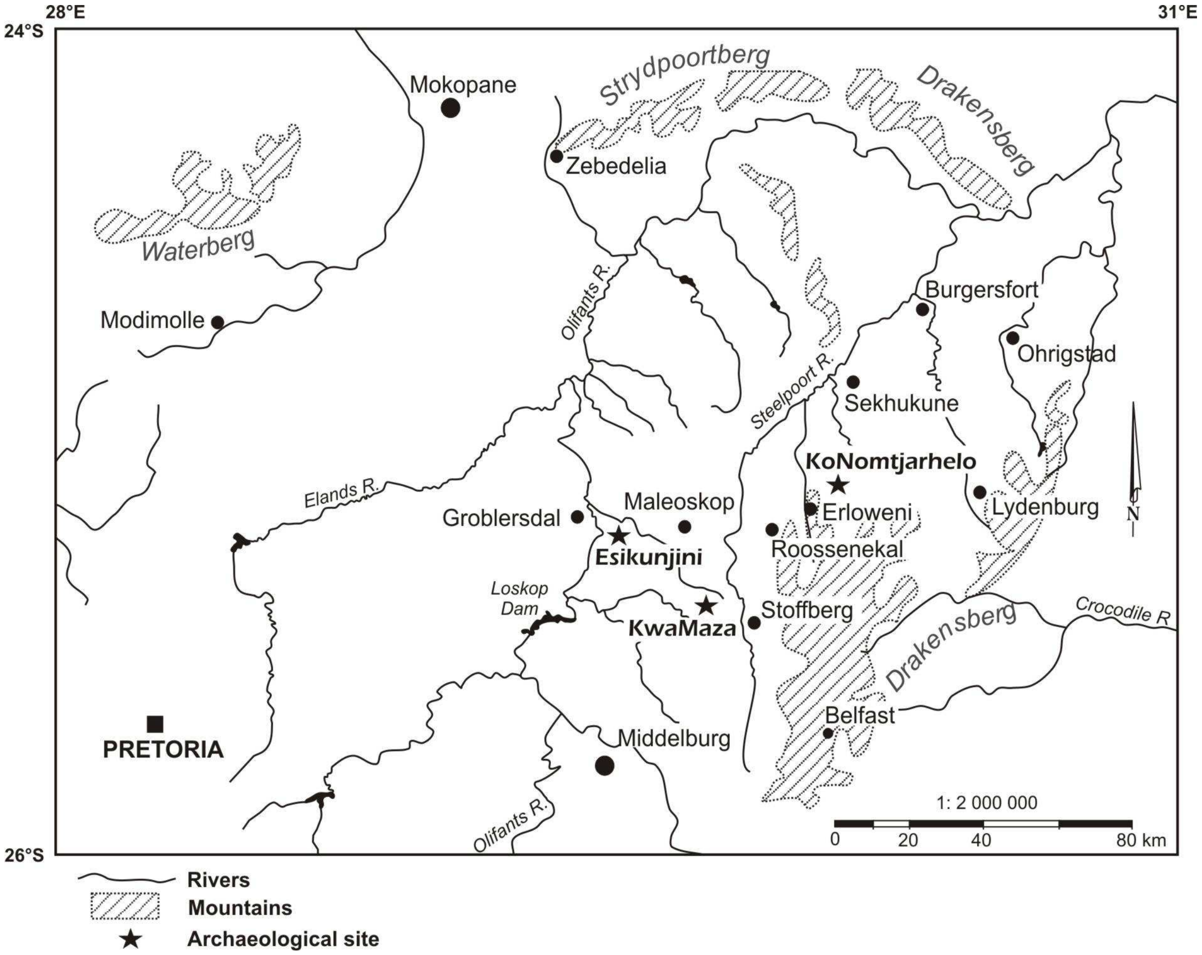


Figure 2. Locations of Ndzundza archaeological sites; KwaMaza, Esikhunjini and KoNomtjarhelo, in the Steelpoort River Valley (Map Courtesy Me. L. Steyn)

In order to re-construct this Ndzundza world via animal food remains I need to answer seven questions:

1) which species were eaten/utilized regularly;
2) which particular age group or sex of animal was preferred;
3) how particular species were procured;
4) how the community processed and disposed of faunal remains;
5) whether any significant modifications occurred in the procurement, use, processing and consumption of animals by the Ndzundza as a result of changing social and political circumstances in the period c. 1700 AD – 1900 AD;
6) whether such modifications had any impact on Ndzundza identity and gender relations;
7) and finally I attempt to identify evidence of ritual use of animals, animal parts or by-products.

Using Archaeozoological research, I aim to construct the environment and behaviour of the Ndzundza via the surviving and excavated faunal assemblages. These faunal assemblages consist of bone, teeth and other animal by-products such as hair, hide, hooves, horns and shells (Thomas, 1996: 2). This evidence, modified by taphonomic factors and excavation strategies, enables researchers to examine aspects of animal-centric subsistence strategies such as hunting and herding. Additionally, archaeozoology may aid in determining the relative dietary importance of different species to particular communities or sub-sections of communities (Lyman, 1979: 536). In order to amplify the archaeozoological work, I utilise ethnographic and historic information on the Ndzundza provided by Massie (1905), Smith (1969), Van Warmelo (1974), Coertze (1983), Van Jaarsveld (1985), Jonas (1989), Fourie (1921) and Fourie (1999) and supplemental ethnographic information on food practices of contemporaneous communities such as the Pedi, Vena and Tswana provided by Quin (1959), Stayt (1968), Grivetti (1976) and Mönnig (1976). The primary field data for this dissertation derives from archaeological research done by Schoeman (Schoeman, 1997) who excavated the three Ndzundza sites and provided the archaeozoological sample.

The c. 1700 AD – 1900 AD period was tumultuous and violent for the Ndzundza and other communities who were subjected to pressures such as internal conflict, war and political and physical relocation (Van Warmelo, 1974; Jonas, 1989). These pressures may have led to the acceleration of change in behaviour patterns or, alternatively, people might have become more conservative in their behaviours. Evidence of this range of behaviour may be discernable in people's food remains. Food acquisition, preparation, consumption and disposal usually leave archaeological traces. Animal food can be obtained in numerous ways and reflects part of the economic basis of a community (Voigt, 1983: 34). Herding, hunting, snaring, gathering, fishing and trading are the principle economic animal food-getting activities, all requiring different techniques and degrees of participation from a specific community (*ibid.*) and perhaps their neighbours or clients/masters. These activities are dependent on the social and political circumstances of the community. Thus, the largely hostile political and socio-economic relations the Ndzundza had with the 'Boers' (settlers of Dutch descent also known as '*voortrekkers*') during c. 1850 AD – 1883 AD, could have forced them to alter their subsistence patterns as both groups competed for similar resources on the same landscape.

With the aid of ethnoarchaeological data, I bring to the discussion issues of human agency, particularly ritual use of animals or animal parts and how we may identify such ritual use in archaeological contexts. For example, to ensure victory over enemies during war, the Zimbabwe Ndebele would hold a 'service' in the King's cattle kraal in which the 'high priest' would order the most aggressive bull to be brought forth (*ibid.*: 47). Whilst the priest 'offers prayers and praises' to the 'forefathers' asking to bless and protect the regiment, members of the regiment "*skin alive one front leg of the bull*" (*ibid.*). The bull is left to 'stagger' around in the kraal until it 'falls down' and then killed (*ibid.*). The meat is sprinkled with herbs, roasted and eaten by the regiment (*ibid.*). No information on how the animal bone remains were discarded was recorded. I shall examine whether the Ndzundza utilized a subsistence strategy with an optimal economic and nutritional outcome or followed food ways that are not determined solely by economic factors. Both strategies contain information about a communities' sense of self. Although specific subsistence strategies are not invariably linked to particular ethnic communities, some correspondences are known (Plug, 1988: 8). For instance, among the Ndzundza totem animals such as baboons (*Papio hamadryas*) and quails (*Coturnix coturnix*) may not be eaten by Mtsweni and the Mabona Ndzundza kin groups (Jonas, 1989: 112) despite being an easily exploited resource. The Ndzundza believe that ancestral spirits are incarnated into totem animals and that eating the flesh of these animals may cause 'untold hardship' (Bozongwana, 1983: 3; Jonas 1980: 112). There may thus be an under-representation of economically viable species in archaeological deposits because of beliefs associated with these animals. The converse may also apply.

Ethnographic and historic information is crucial to understanding Ndzundza use of animals and whether their food practices shifted in response to changing political and social contexts. Known subsistence strategies of southern African 'Late Iron Age' communities (c. 1 000 AD – Historic times), of which the Ndzundza form part, were diverse and include: agriculture, herding, gathering, trading and hunting which, in turn, included snaring, trapping, gathering and fishing (Plug, 1988: 9). I am aware that terms such as the 'Early Iron Age' c. 200-900 AD, 'Middle Iron Age' c. 900-1300 AD and the 'Late Iron Age' c. 1300-1840 AD (Huffman, 2007: xi) are merely etic archaeological constructions and that the Ndzundza were both contained in these periods and transgressed them by living in the 'Historic' or 'Colonial' periods. Present day observations indicate that subsistence strategies and food getting behaviours amongst indigenous southern African communities are influenced by aspects such as 'ethnic' identity, convenience, availability and health of the people (Viljoen *et al*, 2005: 56–59). I use 'ethnic' in terms of communities whose members identify with each other based on ancestry and/or groups who are also united by common cultural, behavioural, linguistic or religious practices (Abizadeh, 2001: 23–34). In addition to the food practices of the Ndzundza, harvesting information about food ways from contemporaneous communities of such as the Pedi, Venda and Tswana, may aid in understanding the range of subsistence strategies employed by communities on a particular landscape. Past (before 1900) and modern (since 1900) food ways seem very different and stress the need to be alert to the shifting contexts surrounding food, which nonetheless tends to be an area resistant to change and is often culturally 'conservative' and tends to foster the continuation of cultural norms (Franklin, 2001: 104-106).

With this dissertation I shall combine a series of data sets: faunal analysis; with ethnographic and historic information; archaeological data; and information on the environment, vegetation and animal distribution in the region to try and more accurately construct the Ndzundza animal food getting behaviour and subsistence patterns. In the following chapter (Chapter 2), I discuss the environment of the Steelpoort River Valley and describe the geological and climatic characteristics of the study area as this provides a limit or set of determining constraints with respect to the flora of the study area. The plant species in turn determine the distribution of animal species that affect people's choices of animal food sources. Having established the environmental context however does not explain people's subsistence behaviours – it simply sets up basic parameters. It is therefore necessary to consider the historical and political context in which the Ndzundza found themselves between c. 1700 AD – 1900 AD.

The theoretical framework discussed in Chapter 3 outlines the origin, growth and the recent developments within Archaeozoology internationally and locally. Chapter 3 also stresses the need for the further development of Archaeozoologcial training and resources in Southern Africa. More studies need to be done on, for example, taphonomic processes affecting deposits. Furthermore, research needs to be done on the methods used in excavating archaeological sites, the screening and cleaning of the materials, packaging and the storage of faunal material as there seems to be a technical deficiency amongst excavators and/or archaeologist in ensuring the recovery of a representative faunal sample when animal bones do not fall into the immediate aims of their research or projects. In Chapter 4, I explain the methods used in sorting, identifying, aging, sexing and quantifying the Ndzundza faunal samples and the results of this analysis are presented in Chapter 5. The results are interpreted in Chapter 6 with emphasis on bringing together the diverse data sets of environmental, ethnographic and archaeological data discussed in the preceding chapters in order to understand the worldview of the Ndzundza during an exceptionally difficult and interesting period in their history.

Chapter 2

Environment, history and archaeology of the Ndzundza

Understanding ecological data and historical context are essential to interpreting archaeological deposits left behind by people of the recent past - in this case the last 300 years of Ndzundza history. Individuals participating in cultural traditions that produce material residues are part of the natural world, interacting with one another, other species and the ecosystem (Renfrew and Bahn, 1996: 211). Environmental conditions influence animal distribution that ultimately affects human behaviour in terms of animal food procurement. This information combined with historical data and what is recovered from archaeological excavations further aids in the process of understanding Ndzundza subsistence strategies.

2.1 Environmental context of the Ndzundza study area

2.1.1 Geology, soils and climate

Situated 900 – 1700 m above sea level in South Africa’s Mpumalanga Province (Figure 1), the main physical features of the Steelpoort River Valley in which the three Ndzundza sites are located (Figure 2) are the north-flowing Steelpoort River, the Sekhukhune plateau to the north-west, the Bothasberg and Stoffberg to the south-west and the Steenkampsberg to the east (see also Groeneveld, 1968: 4; Myburgh, 2000: 17). The valley itself consists of an irregular chain of rugged gabbro hills, which are considered a south-west continuation of the Leolo Mountains (Groeneveld, 1968: 4). Whilst the Highveld is made up of Magaliesberg quartzite (Hiemstra, 1950: 3; Groeneveld, 1968: 4; Verster, 1974: 9) the Lowveld consists of numerous altered sediments, volcanic rocks and rock types of the Bushveld Igneous complex such as: hypersthene gabbro, magnetite gabbro, olivniehypersthene gabbro, andesite, hyperite, norite, diorite, olivine diorite and fayalite diorite with various dolerite dykes within the magnetite gabbro (Hiemstra, 1950: 55; Hammerbeck, 1965: 7; Groeneveld, 1968: ii; Verster, 1974: 17; Myburgh, 2000: 25).

The three Ndzundza sites - KwaMaza, Esikhunjini and KoNomtjarhelo (Figure 2) - are located on a broad strip of elevated country 1350 – 1700 m above sea level known as the Bankeveld, which forms part of the 'Transvaal Drakensberg belt' (Verster, 1974: 36; Low and Rebelo, 1998: 28; Schoeman, 1997: 70). KwaMaza and Esikhunjini are separated by the Steelpoort river from the Steenkampsberg on which KoNomtjarhelo is located. Other important rivers affecting Mpumalanga and the surrounding provinces are: the Limpopo river, draining water from North West and Limpopo Provinces, connecting with the Marico-, Crocodile-, Matlabas-, Mogol-, Palala-, Magalakwena-, Sand- and Pafuri rivers (Hammerbeck, 1965: 4 and Verster, 1974: 7). The Olifant River system from the Witbank area drains the central Lowveld region in which KwaMaza and Esikhunjini are located, whilst the Crocodile river in the north-east of Mpumalanga and the Usutu river in the south-east of Mpumalanga drain the high rainfall region (Verster, 1974: 7). Indicating that the three Ndzundza sites are located in a well-watered area.

The soils in the region belong to the Hutton form and are broadly described as porous red and brown soils with good drainage capabilities (Verster, 1974: 110-111). The soil type is characterised as loam and clay whist soil in the surroundings regions are characterised as mesotrophic and dystrophic clay and loam with red, yellow and grey colouration (*ibid.*). According to Verster (1974: 111), the ground depth does not pose a limiting factor and, combined with sufficient rainfall, the region is suitable for agriculture. This would not, however, necessarily have been suitable for the type of crops the Ndzundza would be growing such as sorghum, millet and legumes.

Climatic conditions in Mpumalanga are described as semi arid with rainfall varying between 300 – 400 mm (Verster, 1974: 30; Myburgh, 2000: 44). However, the central region, in which the three Ndzundza sites fall, are classified as sub-humid and the Highveld and mountain areas are classified as humid with annual rainfalls of up to 800 mm (Verster, 1974: 30-33). Specifically, the study area is located in a summer rainfall region (from October to March) with annual rainfall ranges between 600 to 750 mm (Verster, 1974: 30; Schoeman, 1997: 70). Winter lasts from April to August, the coldest months being June and July with minimum temperatures range from 2 – 15 C° (Verster, 1974: 31-32). The summer months run from September to March with the warmest months being December and January with temperatures raging between 23 – 35 C° (*ibid.*). Schoeman (2006: pers. comm.) has indicated that this modern climatic regime may have differed from the climate in the

Steelpoort during the Ndzundza occupation at KwaMaza due to drought during the *mfecane* period. The *mfecane* is the period during the Zulu wars of the late 1810s and 1820s when the Ndebele kingdom, under the leadership of Mzilikazi, grew rapidly to spread across the Transvaal absorbing and conquering Nguni refugees in addition to a general period of instability caused by conflict, environmental conditions and external factors such as slaving and raiding (Rasmussen, 1978: 1; Mitchell, 2002: 360). According to Tyson and Lindesay (1992), South Africa has experienced warm and cold episodes alternated with wet and dry periods over the last 2000 years. Further evidence of climatic fluctuations between warmer, wetter periods and colder, drier periods over the last 80 years can be seen in Holmgren and Oberg (2006: 186-187). According to Holmgren and Oberg (2006: 189), towards the end of the 18th century South Africa experienced improving climatic conditions such as increased humidity, whilst the early 19th century experienced drier colder conditions with a prolonged drought. This is substantiated with ethnographic sources indicating that Ndzundza experienced droughts during their occupation in the Steelpoort River Valley (i.e. Fourie, 1999: 40; Lye, 1968: 89).

2.1.2 Flora and fauna of the research area

Research on southern African Late Iron age communities shows that they cultivated plant foods from the time they arrived around c. 2200 years ago (Mitchell, 2002: 275–278). Faunal assemblages recovered from excavations further indicate that southern African Iron Age communities practiced both herding and hunting to various degrees (*ibid.*). In order to more accurately construct the subsistence of the Ndzundza I draw extensively on ethnographic sources relating to Bantu-speaking communities in South Africa, in particular the Pedi and Venda and other contemporary communities that are known to have been spatially and culturally close to and had interactions with the Ndzundza during their occupation at the three sites under investigation. *"…considering a wide range of ethnographic precedents can help one to avoid too limited and Eurocentric an interpretation; the extraordinary diversity presented by ethnography is a warning against jumping to simple conclusions."* (Lewis-Williams, 1991: 151). Using ethnographic analogy that correspond with the archaeological context may aid in establishing possible links between different communities (*ibid.*: 160; Wylie, 2002: 147) – thus assist in determining what animals the Ndzundza may have utilized.

2.1.2.1 Flora

The vegetation of the research region is influenced by the Bankeveld geomorphology, and consists of 'false grassveld' with a combination of mixed Bushveld to sour mixed Bushveld near the riverbanks with generally sour grass becoming sweeter in the valley between the Roossenekal and Lydenburg area (Verster, 1974: 36; Myburgh, 2000: 34–35). The various plant species occurring in the study area are summarized in Table 1 (page 12). According to Botha (1953: 6), the vegetation in the region is generally sweeter in the Lowveld next to the dolerite hills and water sources, becoming sour in the higher hilly outcrops, were the sites are located. Schoeman (1997: 71) notes that seasonal grazing patterns would have been encouraged by the occurrence of sour grassveld in the Steelpoort River Valley and sweet grassveld in the valleys north of the Steenkampsberg. Sourveld, generally occurring in high rainfall regions are termed ‘sour’ due to the grass’s ‘unpalatability’ when mature (Botha, 1953: 6; Chippindall, 1955: 602). Providing good grazing in spring and early summer months (being the growing season), domestic grazers (cattle, sheep and goats) would therefore almost certainly be left on the sourveld to save the more nutritious sweetveld for the harsh winter months (Botha, 1953: 8–11; Chippindall, 1955: 602). The sweetveld in turn is termed ‘sweet’ as a result of being palatable throughout the growing season and winter months, and would require protective herding management strategies to prevent overgrazing (Chippindall, 1955: 602).

Recovery of plant food remains at South African Late Iron Age sites is uncommon both due to a combination of poor preservation of organic plant remains and recovery techniques not attuned to identifying and recovering plant food because of insufficient archaeobotanical training and sensitivity. Nonetheless, archaeological evidence for millet, maize, sorghum and peaches has been found at Esikhunjini and KoNomtjarhelo (Schoeman, 1997: 71). This short list of utilised flora, however, provides a bare minimum insight into the plant foods used by the Ndzundza. Ethnographic sources indicate that contemporaneous communities to the Ndzundza such as the Pedi also utilized ‘kaffir-corn’ (*Andropogon sorghum*), pearl-millet (*Pennisetum spicatum*), maize (*Zea mays*), sweet-reed (*Sorghum vulgare Pers. var Saccharatus Korn*), ‘kaffir-bean’ (*Vigna sinensis*), *njugo* bean or bambarra nut (*Voandzeia subterranean*), mung bean or ‘kafferertjie’ (*Phaseolus aureus*), stock melon or ‘kaffir-melon’ (*Citrullus vulgaris*), watermelon (*Citrullus vulgaris*), gourd or ‘kalbaspatat’ (*Lagenaria vulgaris*) and pumpkin (*Cucurbita pepo*) (Quin, 1959: 24–61). The Venda utilized maize,

Table 1. Trees, shrubs, grasses and herbs occurring in the study area
(adapted from Acocks, 1975: 99; Myburgh, 2000: 220-224)

Trees	Grasses	Herbs
Flame thorn (*Acacia ataxacantha*)	Black seed grass (*Alloteropsis semialata*)	Yellow stars/African potato (*Hypoxis rigidula*)
Black monkey thorn (*Acacia burkei*)	Purple plume grass (*Bothriochloa bladhii*)	Pink evening primrose (*Oenothera rosea*)
Common hook-thorn (*Acacia caffra*)	Guinea millet (*Brachiaria deflexa*)	Pale persicaria (*Persicaria lapathifolia*)
Sweet thorn (*Acacia karroo*)	Red top grass/velvet signal grass (*Brachiaria serrata*)	Curled dock (*Rumex crispus*)
Knob-thorn (*Acacia nigrescens*)	Bermuda/devil's grass (*Cynodon dactylon*)	
Paper bark thorn (*Acacia sieberiana ver. Woodii*)	Lemon grass (*Elionurus argeneteus*)	**Shrubs**
Umbrella thorn (*Acacia tortilis*)	Wire lemongrass (*Elionurus muticus*)	White-berry bush (*Flueggea virosa subsp. Virosa*)
Red ivorywood (*Berchemia zeyheri*)	Gum grass (*Eragrostis gummiflua*)	Raisin bush (*Grewia flava*)
Shepherd's tree (*Boscia albitrunca*)	Fan love grass (*Eragrostis plana*)	Giant raisin bush (*Grewia hexamita*)
Matumi/mingerhout (*Breonadia salicina*)	Footpath love grass (*Eragrostis pseudosclerantha*)	Mallow raisin (*Grewia villosa var. villosa*)
Velvet sweetberry (*Bridelia mollis*)	Narrow heart love grass (*Eragrostis racemosa*)	Corkbush (*Mundulea sericea*)
River bush willow (*Combretum erythorphyllum*)	Golden velvet grass (*Eulalia villosa*)	
Leadwood (*Combretum imberbe*)	Red vlei grass (*Hemarthria altissima*)	
Velvet bushwillow (*Combretum molle*)	Black spear grass (*Heteropogon contortus)*	
Large fever berry (*Croton megalobotrys*)	Thatching grass (*Hyparrhenia hirta*)	
Jackal berry tree (*Diospyros mespiliformis*)	Pincushion grass (*Microchloa caffra*)	
Wild pear (*Dombeya rotundifolia*)	Wireleaf daba grass (*Miscanthus junceus*)	
Ana tree (*Faidherbia albida*)	Golden bristle grass (*Themeda triandra*)	

Sandpaper fig (*Ficus capreifolia*)	Broadleaf bluestem (*Trachypogon spicatus*)	
White-berry bush (*Flueggea virosea subsp virosa*)	Hairy trident grass (*Trystachya hispida*)	
False marula (*Lannea discolor*)	Trident grass (*Trystachya leucothrix*	
Apple-leaf (*Lonchocarpus capassa*)	Hooked bristlegrass (*Setaria verticillata*)	
Common spike thorn (*Maytenus heterophylla*)	Pan dropseed (*Sporobolus ioclados*)	
Koko tree (*Maytenus undata*)	Giant rat's tail grass (*Sporobolus pyramidalis*)	
Weeping bride's bush (*Pavetta lanceolata*)		
Jacket-plum/bushveld cherry (*Pappea capensis*)		
Weeping wattle (*Peltophorum africanun*)		
Common wild current (*Rhus pyroides var. pyroides*)		
Marula (*Sclerocarya birrea subsp. Caffra*)		
Natal mahogany (*Trichilia emetica*)		
Buffalo thorn (*Ziziphus mucraonata subsp. Mucraonata*)		

millet, beans, pumpkins, water-melon, nuts, potatoes, sugar cane and in more recent times dates, whilst Grivetti (1976: 135-191) indicates that the Tswana made use of mushrooms in addition to sorghum, maize, sweet reed, millet, various bean, squash and melon varieties, sweet potato, apples, mulberries, peaches, onions and sunflowers. Boshoff (2008: pers. comm.) has recovered large quantities of carbonised sorghum by the Kopa at Boleu, a 19th century Kopa village near Groblersdal, Mpumalanga, on the other side of the Olifants River from KwaMaza and Esikhunjini.

In addition to the plant species already mentioned, the region supports trees and shrubs with edible fruits, bulbs and roots. The list of edible plant food from the veld however is too varied to be mentioned, detailed information can be obtained from Fox and Norwood (1982). It must also be noted that plants were not only used for consumption but for medicinal and magical needs in addition to the manufacturing of dye and glue whilst fibres, poles and timbers were used in construction and the manufacturing of other utensils (Grivetti, 1976: 38).

2.1.2.2 Fauna

Non-domestic fauna found in the study area

With the aid of Du Plessis (1969), Rautenbach (1982), Sinclair and Davidson (1995), Carruthers (2000), Smithers (2002) and Skinner and Chimimba (2005), investigations into the faunal variety occurring in the region indicate a variety of bats, insectivores, elephant shrews, rodents, rabbits and hares, hyrax, elephants, odd-toed ungulates, even-toed ungulates, carnivores, primates, aardvark and pangolins. These species are listed according to Order, Family and species as listed in Skinner and Chimimba (2005) here and throughout. See Appendix A (page 140) for the complete species list. I do not include reptiles, birds and molluscs in the species list as their remains are seldom recovered archaeologically and even then are very difficult to identify to species level. However, known reptilian food contributors such as Leopard tortoise (*Geochelone pardalis*), Bell's Hinged tortoise (*Kinixys belliana*), Marsh or helmeted terrapin (*Pelomedeusa subrufa*) and the Serrated Hinged terrapin (*Pelusios sinuatus*), Nile or water monitor (*Varanus niloticus*), Rock or white-throated monitor (*Varanus exanthematicus*) and the Nile crocodile (*Crocodylus niloticus*) does occur in the region (Branch, 1988). The latter two species are sometimes used for ritual purposes. Furthermore, including all these species inhabiting the region both permanently and seasonally will overextend the Appendix list (Plug, 2007: pers. comm.) and invalidate focused archaeozoological analysis.

Use of non-domestic fauna by Iron Age communities

Hunting played an important role as both ritual and recreational activity in addition to supplying important protein to the diet (Gelfand, 1971: 143; Shaw, 1974: 97-98). Spears, shields, throwing sticks, pits, snares, hunting nets and dogs were used to different degrees by communities such as the Tswana, Shona, Zulu, Venda and Ndebele (Stayt, 1968: 79; Gelfand, 1971: 135). Although it is not always possible to distinguish between hunted and snared animals, Plug (1988: 328) has noted that birds, rodents and lagomorphs are more likely to have been snared whilst larger animals such as antelope and carnivores would have been hunted. Due to the lack of ethnographic research done on Ndzundza animal food use, what follows is a brief and generalised description of the meaning and use of selected animals most likely to have been primary contributors of animal food to Iron Age communities known to have been in contact with the Ndzundza. Thus providing a reference point as to what animals might have been used for by the Ndzundza.

Small and Large mammals

Amongst many small mammals utilized, the Pedi consider the pangolin especially significant. According to Quin (1959: 125–136), the ‘finder’ of the animal was not allowed to kill it but had to deliver it alive to the chief (*ibid.*). The chief then released the animal in his cattle kraal where it was left to run around and ‘propagate’ calves, after which it was killed and skinned (*ibid.*). Both the meat and skin was then used by the chief for ‘private reasons’ (*ibid.*). Similarly, amongst the Venda and Shona, pangolins were seen as the property of the chief but not necessarily always killed (Stayt, 1968: 80; Gelfand, 1971: 136). The Pedi also consumed hyraxes whilst their skins were sewn together for blankets and their urine and faeces used for medicinal purposes (Quin, 1959: 126). Springhare skins were used by boys to wear as clothing (*ibid.*: 127). The Pedi also utilized most rodents, though rats and mice were only eaten by young herd boys and men whilst their tails were used as headdress decorations (*ibid.*). Amongst the Tswana, rodents are eaten by children (Grivetti, 1976: 98) and Shona diviners used porcupine quills to cure nose bleeds (Gelfand *et al*, 1985: 310).

Larger animals such as elephants were eaten by all members of the family amongst the Pedi (Quin, 1959: 125). Shona diviners used the skin and dung for a variety of ailments (Gelfand *et al*, 1985: 307) and the Venda regarded elephant tusks as the exclusive property of the chief who traded it for other items (Stayt, 1968: 77). Hippopotamus meat was consumed by both the Pedi and Shona, though Zulu warriors were not allowed to consume the flesh, the hooves and teeth were considered the property of the chief (Gelfand, 1971; Quin, 1959: 126).

Bovids and Carnivores

Most bovid species – bovids being cloven-hoofed mammals such as buffalo, antelopes and gazelles belonging to the family Bovidae - were consumed by Bantu-speaking communities but not all individuals or groups ate all bovid species due their belief in totem animals (see page 5-6). The animals were either tracked by dogs until they were exhausted and then killed by the hunters (Stayt, 1968: 77), or obtained through communal hunts, individuals, snares or traps. The tali (astragalus) and horns of some species were used in divining sets whilst the skins were sewn together as blankets (Quin, 1959: 126). Kudu horns were also used as trumpets at certain ceremonies whilst bushbuck skins were used as ornamental dress and their horns used as head decorations or medicine phials (*ibid.*).

Carnivores, though not eaten regularly, were eaten by men and boys. Mongooses in particular were acquired for their skins to be used as blankets or containers for divining sets (Quin, 1959: 124). Amongst certain Pedi tribes, the spotted hyena was regarded as a totem animal and therefore not consumed whilst its skin was used as ceremonial dress for the chief and some skeletal elements as items in divining sets. On the other hand, brown hyena were eaten and the skin used as floor mats (Quin, 1959:

125). Leopards were not usually eaten by the Pedi but the whole animal was given to the chief and the skin used for a 'regal robe' whilst the skull was implanted at the entrance of the chief's enclosure (*ibid.*). Gelfand (1971: 137–138) notes that amongst the Shona, the meat of leopards was only eaten by the hunters. Lions were also not eaten but when killed by the Pedi, they were skinned in the veld and the skins were given to the chief whilst the fat and diaphragm were used by diviners when making medicine (Quin, 1959: 125). The claws and tali were included in divining sets (*ibid.*). The Shona also did not consume lion meat but did eat the heart and liver as they believed these gave strength to individuals (Gelfand 1971: 137–138). Amongst the Venda, both lions and leopards were rarely hunted but capturing these animals was regarded as an occasion for great rejoicing, the skins were also given to the chief (Stayt, 1968: 77).

Primates and Pigs

Primates, particularly vervet monkeys, were hunted as food sources by Pedi men and boys and the skins used for ornamental dress (Quin, 1959: 124). According to Bryant (1929), Zulu's were not allowed to eat primates but used the skins of vervet monkeys as highly prized girdles. Baboon urine was used by the Shona as an aphrodisiac whilst the fontanel was tied around infant's necks as a talisman to prevent the depressing of the infant's fontanel (Gelfand *et al*, 1985: 308). Both the Pedi and Shona ate warthogs, though the animals were not skinned and only the bristles were scorched off on a fire (Quin, 1959: 126; Gelfand, 1971: 136). The tali were included in divining sets. Stayt (1968: 78) notes that the Venda caught bushpigs only by driving them into noose traps. Zulu warriors and girls were not allowed to consume bushpigs as it was believed by diviners that the animals were too fatty (Gelfand, 1971: 136; Grivetti, 1976: 99).

Reptiles, Molluscs and Birds

Although reptiles were important in folklore they were seldom used as food sources except tortoises and rock monitors. Quin (1959: 127) and Grivetti (1976: 107) indicate that tortoises were eaten and their shells used as food receptacles but that turtles were not consumed as it was believed that they emit foul odours that terrify cattle. Snakes were not eaten because it was believed that ancestral spirits frequently incarnated in the form of snakes, however sometimes snake skins, meat, fat and poison glands were used by diviners in potions (*ibid*). Crocodiles and water monitors were not consumed by the Pedi though their brains and fat are used by diviners for medicinal purposes (Quin, 1959: 127). Amongst the Venda and Shona, the brains of crocodiles are believed to contain poison and the stones recovered from crocodile stomachs are swallowed by chiefs to prolong their life (Stayt, 1968: 81; Gelfand, 1971: 138). Bullfrogs were consumed by the Pedi and regarded as a delicacy but were available infrequently (Quin, 1959: 127). According to Quin (1959: 127) the "*common green frog*" – most likely referring to the common river frog (*Rana angolensis*) or river frog (*Rana vertebralis*) – was collected in great numbers during the rainy season, cooked and consumed by Shona families (*ibid.*).

According to Plug (1988: 327) and Gelfand (*et al*, 1985: 311), molluscs, particularly *Achatina* (the giant African land snail) and freshwater mussels, were a good source of protein and their shells were used as clay rubbers, scoops, to work skins and as beads. *Achatina* was considered a delicacy amongst Bantu speakers whilst Shona diviners use the powder of ground shell to cure tropical ulcers (Gelfand *et al*, 1985: 311). It must be noted that not all land snails identified from archaeological deposits are necessarily part of the refuse left behind by human behaviour and may be late intrusions since these animals aestivate during dry seasons and could therefore have buried themselves in the archaeological deposit. Most bird species are eaten by Bantu-speaking communities except where taboos prohibited their consumption. For example, vultures were never eaten but their feathers, legs and hearts were used by diviners (Gelfand *et al*, 1985: 311). Shaw (1974: 97–98) notes that birds were killed by throwing sticks and using bows and arrows. It is also noted by Grivetti (1976: 102) and Quin (1959: 122-124) that herd boys and men caught and ate smaller birds frequently. Larger birds such as ostriches were eaten by the Pedi and their feathers used in headdresses (Quin, 1959: 122).

Domestic animals utilized by Iron Age communities

Most Bantu-speaking communities kept cattle, sheep, goats, chickens and dogs (used for hunting) (Mönnig, 1967: 163-174) and in more recent times (c. 1600 AD) some communities obtained horses, donkeys and pigs. Hall (1987) suggests that domestic animals may have protected communities against food shortages and were used to establish wealth and create clientship obligations between different individuals and even beyond the group with, for example, hunter-gatherers. Domestic animals were not only used for their meat but also for their by-products in addition to being used as drought and track animals and in rituals and ceremonies (Bozongwana, 1983). The earliest evidence of animal herding found in faunal deposits in South Africa are from Broederstroom (360 – 600 AD; in the North West Province), Happy Rest (350 – 470 AD; on the foothills of the Soutpansberg), KwaGandaganda (620 – 1030 AD; in the Mngeni valley of Natal) and Spoegrivier (2100 – 2400 BP; in the Northern Cape) (Mason, 1981; Voigt and Plug, 1984; Whitelaw, 1994; Vogel *et al,* 1997; Beukes, 2000; Marshall, 2000).

Cattle, Sheep and Goats

Amongst all Bantu-speaking communities cattle are thought to have constituted the basis of wealth (Quin, 1959: 94; Mönnig, 1967: 164, Grivetti, 1976: 224; Bozongwana, 1983). Cattle were used for the payment of marriage, known as *lebola* (the exchange of a specified number of cattle to the father of the bride in exchange for the productive and reproductive capacities of the daughter - Kuper, 1982: 167) and therefore crucial for men to attain adult status (Quin, 1959: 94; Stayt, 1968: 37). The Pedi, Venda and Tswana also used cattle as payment in the settling of fines and for compensation in the case of accidental homicide to the deceased's family (Quin, 1959: 95; Stayt, 1968: 37; Grivetti, 1976: 225). Cattle were not usually used as a regular food source but were slaughtered on special occasions and for rituals and ceremonies such as circumcision, weddings and funerals (Quin, 1959: 96; Bozongwana, 1983; Plug, 1988: 16). However, sick animals would be slaughtered and the meat of cattle that died of natural causes would readily be eaten (Quin, 1959: 96; Mönnig, 1967: 164-166). In addition to their meat, cattle hides, manure, blood and milk was also utilized by communities. Woman regularly smeared a thick paste of dung and water on floors whilst cattle hides were used as clothing (Quin, 1959: 98). The Venda also used cattle for riding (Voigt, 1983: 65).

Pedi sheep were of long tailed and fat tailed varieties (Quin, 1959: 99; Mönnig, 1967: 170). The Pedi regarded sheep as second to cattle, referring to them as 'small cattle' "*kgongwana-ye-mnyane*" (Quin, 1959: 100). Sheep alone could not be used as payment of fines or *lebola*, but when sufficient numbers of cattle were not available, sheep could be used to make up the missing cattle numbers (*ibid.*). Sheep were also not regularly slaughtered for food but used for rituals and ceremonies. However, as with cattle, sick animals would be killed and eaten and their by-products utilized (*ibid.*). Goats were not regarded by the Pedi as wealth on their own, but when owned in addition to cattle they acquire more value (Quin, 1959: 101; Mönnig, 1967: 171). Quin's (1959: 101) research amongst the Pedi revealed that they evaluate goats and sheep as follows; one ox equalled five sheep or ten goats, whilst one cow equalled seven sheep or 14 goats (*ibid.*). Goats were killed for food in addition to rituals and ceremonies and their skins used for women's aprons. Their milk was used to drink and in the preparation of other foods by the Pedi and the Manala-Ndebele (Hambrock, 1981; Quin, 1959: 102). Goats amongst the Venda were documented as being "*long-haired type and very hardy*" (Stayt, 1968: 44). In addition to meat they were used for their skins, milk and serving as sacrificial animals (*ibid.*). Diviners used both sheep and goat skeletal parts in their divining sets (Mönnig, 1976: 171). According to Bryant (1929: 341), Zulu used young goats and sheep sometimes for their skins as young animals had glossy skins that disappear as they age.

Central and Western Europe archaeozoological studies has revealed that a large percentage of young slaughtered animals could be due to scarcity of other meat sources or over-abundance of that particular species (Uerpmann, 1973: 316). Large numbers of older animals could indicate that the animals were kept for their secondary products such as milk, for labour or items of social or cultural significance (*ibid.*). According to Plug (1988: 52), amongst South African faunal assemblages, a high mortality rate amongst young individuals may indicate disease or malnutrition rather than animals being slaughtered for their food and limiting the reproductive potential of a herd. A high mortality rate amongst juvenile non-domestic bovids may indicate seasonal hunting practices (*ibid.*).

Dogs, Horses, Chickens and Pigs

According to Grivetti (1976: 224), all animals raised by the Tswana were used as food except domestic dogs. Dogs were used in hunting to track and follow game until it was exhausted (Shaw, 1974: 98). Dogs were not however regarded as pets, they were not allowed in 'huts' and roamed freely amongst homestead to fend and scavenge for themselves as they were not fed regularly (Mönnig, 1967: 164; Pistorius and Plug, 2001: 36). Horses amongst the Pedi did not acquire any 'tribal significance' however by the 18th century AD the use of horses for riding amongst the Pedi was noted by the Boers (Quin, 1959: 102). The Tswana used horses and donkeys as either labour or transport. The meat of animals that died of natural causes was consumed (Grivetti, 1976: 228). The Venda, in particularly chiefs, also used horses and donkeys as transport (Stayt, 1968: 45).

All Bantu-speaking communities kept chickens as food but their eggs were not gathered by the Pedi as they believed that this would lead to minimal breeding (Mönnig, 1967: 164). Plug (1996: 517) notes that chickens were already utilized by Early Iron Age communities. According to Gelfand (1971: 117; 150), chickens were killed occasionally for food amongst the Shona. Women were not allowed to eat the eggs as they believed that this would cause them to become sterile. The Manala-Ndebele also prohibited young brides from eating eggs until certain ceremonies such as hut building ("*hut bou*") ceremonies have been preformed (Hambrock, 1981: 48). The Tswana prohibited girls and woman of childbearing age to eat eggs (Grivetti, 1976: 229). In addition to chickens, the Tswana also raised pigeons (Grivetti, 1976: 229). Chickens were also commonly used in cock-fighting (Quin, 1959: 105).

Although pigs became common commodities in historical times amongst the Pedi, they do not hold any special significance (Quin, 1959: 104). Pigs, in contrast to cattle, sheep and goats, are also the property of women who are solely responsible for their care (*ibid.*). Furthermore, pigs are reared for food, but when an animal dies of natural causes it will not be eaten (*ibid.*). The Tswana used pigs not only for food but also as scavengers to keep down the accumulation of trash (Grivetti, 1976: 226). Amongst the Venda pigs are considered a great delicacy (Stayt, 1968: 44).

2.2 Ethnographic and historic background of the Ndzundza

Having discussed the wider environmental context of the study area I shall now focus on the history and ethnography of the Ndzundza in order to create a general context that will help understand the specific archaeozoological context of the three Ndzundza Steelpoort Valley sites discussed in Chapters 3-6.

2.2.1 Origins of the Ndzundza

The Ndzundza form part of the ‘Transvaal Ndebele’ linguistic group that divided into the Northern Transvaal Ndebele and the Southern Transvaal Ndebele (Jonas, 1989: 5; Schoeman, 1997: 2). The Transvaal Ndebele are viewed as a branch of the Natal Nguni and separated from the Nguni (c. 1500s AD) when they moved southwards to settle in the Transvaal - now Mpumalanga (Coertze, 1983: 33; Jonas, 1989: 5). The term ‘Transvaal Ndebele’ is an anthropological construction from the 1920s to distinguish this group from ‘Mzilikazi’s Ndebele’ in Zimbabwe (Le kgoathi, 2003: 72). According to Fourie (1999: 18), Ndebele oral traditions indicate that they moved to Emhlangeni (in the Randfontein district in Gauteng) from Lundini, their settlement in Drakensberg (Table 2). Jonas (1989:5) does however caution that some of his informants believe that they originated from the Karanga, who resided in Zimbabwe, whereas other informants believe that the Ndebele derive from ‘Zoeloeland’ and originated from the Hlubi in present-day KwaZulu-Natal, South Africa (see also Fourie, 1921; Huffman, 1986: 280).

The Ndzundza form part of three kin groups of the Southern Transvaal Ndebele, namely the Ndzundza, the Manala and the Hwaduba, with the Ndzundza being the largest of these three groups (Jonas, 1989: 5). The first two well-known Southern Transvaal Ndebele chiefs that dwelt at Emhlangeni were Mafana and Mhlanga and ruled for less than thirty years (c. 1557 AD – 1587 AD) (Coertze, 1983: 33; Jonas, 1989:20; Fourie, 1999: 28). According to Jonas (1989:20) and Fourie (1999: 28) the Ndebele, under the leadership of Mhlanga, moved to KwaMnyamana or Emarula, near the Bon Accord dam in the region of Wonderboompoort northeast Pretoria, where Mhlanga was succeeded by Musi (c. 1666 AD) [c.1523 AD (Van Jaarsveld, 1985: 8)]. Fourie (1999: 25) and Coertze (1983: 33) further indicate that under the

Table 2. Origins and settlement of the Ndzundza

(Adapted from Massie 1905; Smith 1969; Coertze 1983; Van Jaarsveld 1985; Jonas 1989; Fourie 1999; Schoeman 1997)

Estimated date	Related groups	Main groups	Neighbours	Place of residence
c. 1480s-500s AD	Sotho, Tswana and Tsonga	Nguni, Mafana and Mhlanga	Khoisan	Crossing Zambezi from central Africa
	Southern Nguni	Nguni	Khoisan	East coast of South Africa
	Tonga Nguni	eMbó	Khoisan and Tsonga	uBombo
c. 1600s-1630 AD	Ndwandwe, Tonga, Ngwane, Mkize and Dlamini	Hlubi	Khoisan and Sotho	Lundini/Drakensberg
c. 1648–1666 AD	N.Tvl. Ndebele and Hlubi	S.Tvl. Ndebele, Mhlanga and Musi	Hurutse, Kwena and kgatla	Emhlangeni and Wonderboom area
c. 1670s AD	Manala, Hwaduba and Kekaan	Ndzundza (sons: Mrhetsha, Magobholi and Bongwe	Pedi, Koni, baTau, Mongatane, baPai, baKopa, Kutswe, Pulane, maTebele and Ndwandwe	Lower Steelpoort river (Stofberg)
c. 1675 AD		Bongwe (sons: Sindeni, Mahlangu, Phaswana and Maridili)		KwaMaza (Bothasberg)
c. 1819 AD		Somdeyi		Esikhunjini (Bothasberg)
c. 1835 AD		Mabhogo	Pedi, Swazi, Missionaries, British and Boers	KoNomtjarhelo (Steenkampsberg)
c. 1883–1923 AD		Mahlangu	Sotho, Pedi, Boers/farmers and city dwellers	Boer farms, KwaNdebele and Weltevreden farm
c. 1930s AD		Mayisha Cornelis Mapog		Scattered throughout Mpumalanga and Gauteng

leadership of Musi a splinter group migrated from 'Maponong' in the Drakensberg to the Highveld, heading into the Gauteng province. Musi had five or perhaps six sons; Manala, Masombuka, Ndzundza, Mathombeni [alias Yahalala or Kekaan (Massie, 1905: 330)] and Dhlomu (Jonas, 1989: 20; Fourie, 1999: 24).

Fourie (1999: 29) notes that by the end of the 17th century, oral tradition relates a war between Manala and Ndzundza. As a result of the dubious nature in which Ndzundza came to power - he allegedly deceived his blind father when representing himself as his brother Manala in 1607 AD - Ndzundza had to flee eastward and was joined by other kin groups as he moved through what is today Bronkhorstspruit, Witbank, Middelburg and settled at Stoffberg among local Tswana-speakers (Jonas, 1989: 23; Fourie, 1999: 29). Massie (1905: 33) however, maintains that as a result of quarrels between Musi's sons, the tribe split into four groups; Manala (settling in the Pretoria district), Kekaan (settling in the Soutpansberg, Waterberg and Pretoria district), M'Hwaduba (settling in the Pretoria district) and Ndzundza (also known as the Mapoch tribe settling in eastern Transvaal [now Mpumalanga] and Pretoria districts). Jonas (1989: 46) concludes that his work on kin names indicates that the Ndzundza incorporated kin names derived from northern Ndebele, Tswana, Swazi, Pedi, Manala and Shangaan groups and that the Ndzundza were therefore a heterogeneous group who absorbed peoples from many different ethnicities. This situation parallels that of Moshoeshoe I, a Kwena chief, and his founding of today's Sotho nation out of the scattered remnants of the *mfecane* on the Highveld (Mitchell, 2002: 376 – 378). Identities, especially 'ethnic' ones, should therefore not be essentialised since hybrid groups can be expected to have more variability in terms of their material culture signatures, indicating a similar diversity of daily practices, even within one 'ethnic' group.

2.2.2 Ndzundza settlement History

Prior to the dispersal of the Ndzundza Ndebele to the surrounding areas of Steelpoort and KwaNdebele in 1883 AD after the war with the Z.A.R., the Ndzundza experienced disruptive changes in their political and socio-economic circumstances.

Moving into Koni country in c. 1630s AD, the Ndzundza, under the leadership of Ndzundza himself, settled at KwaSimhulu, the first Ndzundza settlement, located at the source of the Steelpoort River (Fourie, 1999: 39). Living in relative harmony with the Koni in the sparsely populated country, their occupation spanned 56 years (c. 1631 – 1681) under the leadership of Ndzundza's successor Mrhetsha, followed by Magobholi and Bongwe (Coertze, 1983: 33; Van Jaarsveld, 1985: 20; Fourie, 1999: 39). However, the arrival of the Pedi in the eastern Transvaal from the west in c. 1650s AD set in motion a period of continuous conflict (Fourie, 1999: 35). In c. 1681 AD, Bongwe moved the Ndzundza to KwaMaza (Figure 2), located in the Stoffberg district. (*ibid.*: 40). During their occupation of approximately one hundred and fifty years (1670 AD – 1820 AD) under the leadership of nine different leaders over five generations, the Ndzundza were joined by people of Swazi and Sotho origins (Schoeman, 1997: 45). Bongwe was succeeded by his brother Sindeni who was succeed in succession by his sons Mahlangu, Phaswana and Maridili (Van Jaarsveld, 1985: 21). Maridili in turn was succeeded by his four sons Mdlanyana, Mgwezana, Dzele and Mrhabule, whilst Mrhabule was succeeded by his brother Mgwezana's son namely Magodongo (Van Jaarsveld, 1985: 21). During this time the Ndzundza's neighbours were the Kopa to the west (settled at the foot of Thabantšho – Black Mountain – known as Maleoskop [Boshoff and Steyn, 2008]). the Koni and Venda to the northeast, the Ndwandwe to the southeast, and the Phuting to the southwest (Fourie, 1999: 30; Schoeman, 1997: 45).

By the mid 17th century AD, Portuguese and other European traders settled at Delagoa Bay exchanging beads, cloth, copper and later guns and ammunition for ivory and horns (Fourie, 1999: 38). The Ndzundza established trading links between themselves, the Pedi and Delagoa Bay with the aid of Tsonga intermediaries (Jonas, 1989: 46). From the 18th century, increased European residence and competition led to substantial growth in ivory trading (Fourie, 1999: 38). This also resulted in the spread of English amongst local communities and some headman and chiefs began to wear European clothes (Massie, 1905: 30). During the first half of the 18th century the Ndzundza grew prosperous by incorporating other peoples through cross-cultural marriages (Fourie, 1999: 40). However, the arrival of three 'eastern baSotho peoples' in the region namely the 'baPai', 'baPulane' and the 'baKutswe', who distinguished themselves from other groups based on totemic affiliation, led to intensified conflicts and competition for limited natural resources (*ibid.*: 31). By the mid 18th century the Ndzundza had to acknowledge the rule of the emergent and dominant Pedi power. At the end of the century the stability in the region ended and the Ndzundza found themselves stuck between two great powers, the raiding Nguni to the east and the dominant Pedi to the north (*ibid.*: 41). As a result of droughts, famine and attacks by Mzilikazi (c. 1825 AD) during the *mfecane*, Magodongo moved the Ndzundza from KwaMaza to settle at Esikhunjini (Figure 2) in the early 1820s AD (Fourie, 1999: 40; Schoeman, 1997: 47-50).

According to Fourie (1999: 43) and Lye (1969: 89), the Ndzundza were 'completely' destroyed by Mzilikazi and droughts in 1825 AD. The defensive location of the Esikhunjini stronghold also did not prevent further attacks by Mzilikazi. Hence, the remnants of the Ndzundza moved under the leadership of Mabhogo from Esikhunjini to KoNomtjarhelo (Figure 2), which was well established by the time the Boers arrived in c. 1840s AD (Massie, 1905: 9; Fourie, 1999: 40). The Boers, under the leadership of Andries Hendrik Potgieter moved to Mpumalanga in 1845 AD, settling in Ohrigstad, east of the Steelpoort River (Smith, 1969: 237). The Bushveld harboured diseases that made the area ill suited for stock keeping on a year-round basis that forced the Boers to seek other subsistence resources. As a result of joint Boer and Pedi hunting parties in which the Pedi were accused of taking more than their allotted share of game, the Boers attacked the Pedi in c. 1847 AD (Smith, 1969: 238). More importantly, the Boers realized during this time that the Ndzundza in particular had many firearms (Van Jaarsveld, 1985: 36). This led to increased hostilities between the Boers and the Ndzundza. In c. 1847 malaria and stock diseases compelled the Boers to move to Lagersdrift, the heartland of Ndzundza country, and this occupation led to intensified conflict (Fourie, 1999: 52).

Nonetheless, in c. 1848 AD, the Boers attempted to establish messengers ("*post kaffers*") to deliver official documents ("*raadspapiere*") and wanted to include Mabhogo in this process, but he refused (Van Jaarsveld, 1985: 37). On 10 September 1849 AD, L. Steyn and 33 Boer farmers in the region complained to the "*Volksraad*" about Mabhogo's cattle raids and their (the Boer's) farm workers leaving Boer farms to join Mabhogo before the end of their contracts (Van Jaarsveld, 1985: 40). This resulted in a decision by the Boers on 7 October 1848 AD to confiscate all ammunition, guns and horses in the possession of 'black people' and that no Boers were allowed to trade with local communities in the future (*ibid.*). This combination of factors meant that the Ndzundza depended on hunting and agricultural resources more than ever before (*ibid.*: 37). Massie (1905: 30) notes that whilst wheat, “*mielies*” and “*kaffer corn*” thrived, cattle herds were severely affected by ‘Rhodesian red water’ and rinderpest. The situation deteriorated further with the introduction of migrant labour from the 1840s AD onwards, in which the Ndzundza and other local communities participated due to their desire to accumulate guns (*ibid.*: 53).

After the development of Lydenburg (c. 1849 AD), a ”*Volksraad*” resolution by anxious Boers in c. 1852 AD, stipulated that all land on which native kraals were situated should be inspected and considered as ‘quitrent farms’ (Fourie, 1999: 46). Potgieter, concerned about ammunitions acquired by the Ndzundza and Pedi, further barred all Africans from crossing the Vaal River (*ibid.*: 57). In c. 1855 AD, Marinus Pretorius established Pretoria and the Z.A.R. (Fourie, 1999: 47). In November 1857 AD the Boers signed an agreement with the Swazi who recognized the Steelpoort River as the boundary between European and Pedi territory (Smith, 1969: 239). By 1861 AD the Z.A.R. made tentative arrangements with the Pedi and Swazi to provide them with military assistance in the case of an attack on the Ndzundza and Kopa (Fourie, 1999: 47). According to Van Jaarsveld (1985: 73) the relationship between the Boers and the Ndzundza deteriorated significantly as a result of Mabhogo’s refusal to comply with the agreement signed with the Z.A.R. in April 1860 AD, in which Mabhogo had agreed to comply with white (“*blanke*”) laws and pay taxes. Later that same year, Mabhogo apparently also insulted the Boers by declaring the Ndzundza as independent and not under the rule of the Z.A.R. (Van Jaarsveld, 1985: 73). As a result of this and continual attacks from the Ndzundza on the Pedi, the Pedi accompanied by three representatives of the Z.A.R. launched a failed attack on the Ndzundza at KoNomtjarhelo on 3 November 1863 AD (Fourie, 1999: 47). By c. 1864 AD continuing warfare led to serious food and land shortages amongst the Ndzundza, the situation was further compounded by the replacement of traditional crops by less drought-resistant maize introduced in c. 1860s AD (Fourie, 1999: 54). During this period, c. 1865 AD, Mabhogo was succeeded by his son Cornelis I, also known as Mkhephuli, Soqaleni, Soyingelela, Cornelis Mabhogo or as Cornelis Kok by the Boers (*ibid.*: 24).

The discovery of gold in 1871 AD brought a great number of miners into the region in the area of Pilgrim’s Rest (Smith, 1969: 241; Fourie, 1999: 47). During this period, Cornelis I, who was still settled at KoNomtjarhelo, was succeeded by his brother Rhobongo in c. 1873 AD (Van Jaarsveld, 1985: 24). By c. 1875 AD the mining industry was failing and President Burgers of the Z.A.R. concluded the presence of the Pedi and Ndzundza were barriers to the progress of the Z.A.R. (Fourie, 1999: 48). Later the same year, the Boers attacked the Ndzundza and attempted to surround the Pedi capital (*ibid.*: 50). The Pedi retaliated and by July 1876 AD, the Boers under order of President Burgers, assisted by 2500 Swazi warriors, declared war on the Pedi (*ibid.*). The Boers erected Fort Burgers on the east of the Lulu Mountains and Fort Weeber on the western side to protect the Lydenburg and Middleburg districts (Smith, 1969: 242). Fighting amongst the Boers, the British, Pedi and the Ndzundza continued in the region until a successful attack on the Pedi was launched on 28 November 1879 AD by 3500 British troops accompanied by 800 Swazi warriors in what become known as the Sekhukhune war ("S*ekhuhune-oorlog*" - Coertze, 1983: 34; Fourie, 1999: 50). During this period, Rhobongo was succeeded by his younger brother Nyabela in c. 1879 (Van Jaarsveld, 1985: 25).

Sekhukhune, the paramount chief of the Pedi, surrendered on 2 December 1879 AD and was imprisoned in Pretoria (Smith, 1969: 240; Fourie, 1999: 50-52). All Sekhukhune's sons were killed and the British acknowledged Mampuru (Sekhukhune's half brother) as new leader of the remaining Pedi (Van Jaarsveld, 1985: 147). By the end of the decade, the Pedi faced critical land shortage, droughts and starvation as a result of locust swarms that devastated their maize fields (Fourie, 1999: 51). In c. 1881 AD Sekhukhune was released by the Boer government and returned to the Pedi people. On 13 August 1882 AD, however, the rally between the brothers, Sekhukhune and Mampuru, led to the assassination of Sekhukhune, who was stabbed to death on Mampuru's orders (Coertze, 1983: 34; Fourie, 1999: 52). Mampuru, now wanted by the Z.A.R., sought refuge amongst the Ndzundza. After several unheeded warnings by the Boers to the Ndzundza to hand over Mampuru, the Boers, under the command of commandant-general ("*kommandant-generaal*") Piet Joubert, declared war against the Ndzundza in November 1882 AD, this became know as the '*Mapochsoorlog*' (Mapoch war - Coertze, 1983: 34; Fourie, 1999: 57).

The Ndzundza prepared for this siege by adding additional fortifications, storing food and relocating gardens to strategic areas (Massie, 1905: 110; Fourie 1999: 57). The natural geography of the region consisting of ravines and fissures covered by thorny shrubs and bushes also served as additional shelter for the Ndzundza (Van Jaarsveld, 1985: 211). The Boers, with 2000 men, guns, horses, cannons, rockets, dynamite and their forts could not displace the Ndzundza from KoNomtjarhelo and enlisted the help of some treacherous Pedi (Van Jaarsveld, 1985: 210). A plan was set in action to destroy Ndzundza agricultural fields and raid their cattle. In addition, on 28 February 1883 AD, the Boers started digging a trench in the direction of KoNomtjarhelo planning to fill it with dynamite to blow-up the hill but in June they reached an impenetrable layer of rock and the trench was abandoned (*ibid.*: 224). Cattle raiding proved more successful. On 2 May 1883 AD, 278 cattle and 21 goats were taken from Ndzundza herders, at the end of May another 50 cattle were seized (*ibid.*: 230). Eight months after the war started, on 8 July 1883 AD (11 July 1881 AD [(Massie, 1905: 110]), the Ndzundza (approximately 10 000 individuals) under the leadership of Nyabela surrendered as a result of starvation (Massie, 1905: 110; Coertze, 1983: 36; Fourie 1999: 56).

Mampuru, the Pedi chief, was hanged on 22 November 1883 AD and Nyabela was put on trial on 17 September 1883 AD in Pretoria were he received a death sentence, later commuted to life imprisonment (Coertze, 1983: 36; Jonas, 1989: 127). After the Anglo-Boer war (c. 1899 - 1902 AD) Nyabela was given amnesty and settled in Derdepoort, northeast of Pretoria, until his death on 19 December 1903 AD (Coertze, 1983: 36; Van Jaarsveld, 1985: 25; Jonas, 1989: 128). Despite his imprisonment, Nyabela made great efforts to perpetuate his influence by sending messages to his subject from prison and dispatching an emissary to oversee his chiefly functions in addition to supervise male initiation that was re-established on farms during 1886 AD (James, 1990: 44). According to a proclamation made on 31 August 1883 AD, after the Ndzundza surrender, the region was divided into small farms ("*klein plaasies")* and given to the Boers as a reward for contributing to the war effort (Jonas, 1989: 127). In this manner the Ndzundza were indentured ("*ingeboek*") for five years to white farms on which they had to work for food, clothes and a yearly salary of "£3" (Jonas, 1989: 127; Fourie, 1999: 57). In 1888 AD the period of indenture came to an end but by 1914 AD the Ndzundza still appeared to be a 'trapped labour force' (James, 1990: 40). Fene Mahlangu, Nyabela's successor resided from c. 1903 AD until his death in December 1961 AD on the farm Welgelegen, located in KwaNdebele (60 km north-east of Pretoria in the Mpumalanga province) were he constructed KwaHlanga (Coertze, 1983: 37; Jonas, 1989: 127-128; Fourie, 1999: 58). Mahlangu's son and successor Mayisha Cornelis Mapog and the Ndzundza clan bought the farm Welgelegen in 1923 AD (Jonas, 1989: 128). Mayisha died in December 1961 AD en was succeeded by Mabusa David (Coertze, 1983: 38).

According to Jonas (1989:128), after the surrender to the Boers the Ndzundza dispersed and by 1935 AD they were settled on white-owned farms in the then 'Transvaal' (now Gauteng, Limpopo and Mpumalanga Provinces) such as Betal, Belfast, Breyten, Carolina, Ermelo, Germiston, Groblersdal, Hendrina, Johannesburg, Kameelrivier, Kwaggafontein, Middelburg, Pokwani, Pretoria, Rayton, Siyabuswa, Springs, Vlaklaagte, Waterval and Witbank (*ibid.*:57). Coertze (1983: 38) maintains that the Ndzundza people retained a strong sense of identity. With the enactment of Act 46 of 1956 'the Promotion of Black Self-government', the southern Ndebele, including the Ndzundza and Manala, were not designated as a separate ethnic group (Coertze, 1983: 38). Being unsatisfied with this development, the Ndzundza and Manala leaders started negotiations with the state and on 22 August 1972 AD, the Ndzundza and Manala were given a separate Ndebele ethnicity in their homeland KwaNdebele (*ibid.*). On 14 September 1979 AD they established their own Legislative Assembly for their new state of KwaNdebele (*ibid.*). The Ndzundza still gather annually on 19 December at the foot of KoNomtjarhelo were a statue of Nyabela was unveiled in 1970 AD, in remembrance and to commemorate Nyabela's death on 19 December 1903 AD (Coertze, 1983; Schoeman, 2008: pers. comm.).

2.3 The Ndzundza archaeological sites

Three sites were identified through recorded oral histories and subsequently excavated by Schoeman for her MA dissertation (1997). They are: KwaMaza located at the base of the Bothasberg, Esikhunjini located on the northern slopes of the Bothasberg and KoNomtjarhelo located on the scattered hills of the Steenkampsberg (Figure 2; page 3). Excavations at KoNomtjarhelo, also known as Spitskop, focused on the outlier known as UmKlaarmaak located one kilometre southwest of the Ndzundza capital Erloweni (Schoeman, 1997: 157).

2.3.1 KwaMaza

KwaMaza (Figure 3), known as '*KwaMaza emlothini*', meaning "*KwaMaza on the ashes*", is located at the base of the Bothasberg on the western margin of the Steelpoort River Valley. A perennial stream, *Sakazana*, flows 500m to the south of KwaMaza (Schoeman, 1997: 77). Excavations at the site focused on two stonewalled and midden clusters; KwaMaza A and KwaMaza B, located 80m apart (Schoeman, 1997: 77).

Figure 3. KwaMaza archaeological site
(Image courtesy and copyright of M.A. Schoeman, 1994)

KwaMaza A, positioned at the highest point of the site consists of three homesteads around a large central enclosure and is characterised by nine prominent middens and soil mounds (Schoeman, 1997: 81). The middens (Figure 4) were excavated in trenches ranging in depth from 0.2 m to 1.18 m (Schoeman, 1997: 64-87). Of the 1019 pottery shards recovered at KwaMaza, only 17 could be identified on the basis of motifs as Early Iron Age Eiland ceramics (c. 1000 – 1300 AD). The majority of the Ndzundza ceramics were undecorated and fall into Schoeman's ceramic types 1, 4 and 5 (*ibid*.: 83). Other finds include a metal spear shaft, a clay spoon, grinding stones, stone flakes, iron wire, three pieces of a ceramic spoon, an ostrich eggshell piece, 70 glass beads and two copper bangles (*ibid*.: 84).

Figure 4. KwaMaza B: Midden 1, notice bones embedded in profile wall.
(Image courtesy and copyright of M.A. Schoeman, 1994)

KwaMaza B, located to the north of KwaMaza A, consists of two stone walled enclosures, terrace walling and nine large clearly identifiable middens and another five possible middens (*ibid*.: 85; 87). Midden 1 was excavated in a 2 x 1 m trench reaching a depth of 1.18 m with distinct stratigraphy and smaller ash lenses observed (*ibid*.: 87). The finds included 239 ceramic shards, five Middle Stone Age tools, slag, one ostrich eggshell bead, an upper grinding stone, worked clay pieces, a copper spiral and copper beads. The faunal sample recovered from the excavations consists of 680 fragments of bone from KwaMaza A and 2313 fragments from KwaMaza B (Figure 5 and 6).

Schoeman (1997: 69) concluded that the site was occupied by a ruling elite and is dated by oral tradition to the reign of headman Bongwe after his 1675 AD Dlowu initiation school. The end of the KwaMaza occupation is dated to the *mfecane* period in the 1820s AD (*ibid.*). Length of occupation at KwaMaza is approximated to 150 years (*ibid*.: 77). Schoeman (1997: 95) concluded that the dense clustering and location of ash heaps in front of homesteads at both KwaMaza A and KwaMaza B

Figure 5. KwaMaza A: 25 % of the total identified faunal sample (scale in cm)

Figure 6. KwaMaza B: 5 % of the total identified faunal sample (scale in cm)

expressed the Ndzundza's concern over the protection of ash middens. Ash is believed to be used in maleficent magic against homesteads (Mitchell, 2002: 378). Sterile red soil is used to cap and contain ash layers protecting the household from witchcraft (Schoeman, 1997: 96; Mitchell, 2002: 378). By placing middens in front of homestead they were under constant watch, though a more expected positioning (based on hygiene, aesthetics, practicality and 'normal' Iron Age spatial patterning) would be behind the homesteads. According to Schoeman (1997: 97), capping appeared to have been done more extensively at KwaMaza A than at KwaMaza B. Schoeman (*ibid.*: 67) also noted that the middens at KwaMaza are relatively large and related this not only to a long occupation period but to it symbolically reflecting the high status and wealth of the occupants.

2.3.2 Esikhunjini

Esikhunjini (Figure 7), located on the northern slopes of the Bothasberg (Figure 2; page 3), translates as "*under the animal skin/place under cover*", pointing to the defensive position of the site during the *mfecane* (Schoeman, 1997: 64). The site is located approximately 10 km from the Steelpoort River across the valley to the northeast (*ibid.*: 121). The three middens (Figure 8) excavated at Esikhunjini were near the front entrances of the homesteads and consisted of shallow deposits, reaching a depth of 0.73 m in the deepest sections of the trench at midden 1, homestead 3. The middens exhibited similar stratigraphy each with alternate layers of ash and sterile red soils (*ibid.*: 127). A radiocarbon date of AD 1760 ± 70 (Wits-2408) was established for this midden and calibrated to 1656 AD, 1738 AD, **1810 AD** or 1945 AD (*ibid.*: 128). Midden 1, homestead 3, reached a depth of 0.21 m and was dated to AD 1920 ± 70 (Wits 2409) and calibrated to 1689 AD, 1732 AD, **1812 AD** and 1934 AD (*ibid.*). Midden 2, Homestead 3, reached a depth of 0.4m and was dated to AD 1770 ± 70 (Wits 2410) and calibrated to 1689 AD, 1733 AD, **1813 AD** and 1937 AD (*ibid.*: 129).

Eiland phase ceramics and one possible Letaba vessel shard (produced since the late 1400s AD and still made today by Venda-speakers (Mitchell, 2002: 341) were recovered from the middens. Other finds include ostrich eggshell pieces, 10 glass beads, two copper spirals, two copper bangles, an iron

Figure 7. Esikhunjini archaeological site
(Image courtesy and copyright of M.A. Schoeman, 1994.)

Figure 8. Esikhunjini: Midden 1, homestead 3
(Image courtesy and copyright of M.A. Schoeman, 1994)

spearhead, grinding stones and a broken clay figurine (Schoeman, 1997: 131). The faunal sample recovered from the middens consists of 1535 fragments (Figure 9). Plant remains excavated include grass silica, millet, carbonised sorghum and carbonised maize cobs (*ibid.*). The start of Esikhunjini was dated using oral traditions to c. 1819s AD after headman Somdeyi's 1819 AD Thula initiation school (*ibid.*: 69). The end of occupation dates to the period after Mabhogo's 1835 AD Sinya initiation school (*ibid.*: 70), indicating a possible occupation period of less than 20 years. Similar to KwaMaza, the Esikhunjini layout consists of ‘bi-lobial’ constructed stone enclosures with up slope facing entrances (*ibid.*: 132). The Esikhunjini middens are also located in front of homesteads with red soil capping over ash layers (*ibid.*: 127). Capping, however, appeared to have been done more regularly and thoroughly than at KwaMaza (*ibid.*: 137). Slight differences between the shape of house forms (i.e. KwaMaza homesteads consist of thatch beehives whereas Esikhunjini homesteads are believed to be thatched grass and dhaka beehives), is attributed by Schoeman (1997: 135) to be because of the *mfecane* disruption.

Figure 9. Esikhunjini: 9 % of the total identified sample (scale in cm)

2.3.3 KoNomtjarhelo

KoNomtjarhelo (Figure 10), also known as Spitskop and the Mapoch caves (Coertze, 1983: 33), was the 19th century Ndzundza stronghold and the most recently occupied Ndzundza site in my study. KoNomtjarhelo’s prominent features are the huge granite boulders with overhangs and shelters (Schoeman, 1997: 163). Schoeman (*ibid.*) points out that the defensive spatial layout of KoNomtjarhelo indicates that the site was constructed as a response to the constant conflict between the Ndzundza, the Boers and the neighbouring Pedi and Swazi during the 17th to 19th century (see also Fourie, 1999: 52).

Figure 10. KoNomtjarhelo excavation (red arrow) against hill
(Image courtesy and copyright of M.A. Schoeman, 1994)

Schoeman focused her research on the outlier UmKlaarmaak. 'UmKlaarmaak' stems from the Afrikaans word '*klaarmaak'*, and points to the belief that the 1883 AD war between the Z.A.R. and Ndzundza was ended at this hill (*ibid*.: 65). UmKlaarmaak is located on a steep hill 2 km southwest of Erloweni (Coertze, 1983: 33), the capital of the Ndzundza, and was dated using oral tradition to 1835 AD after headman Mabhogo's 1835 Sinya initiation school (*ibid*.: 70), signifying an approximate occupation period of 48 years. The site is extensively terraced and fortified (Figure 11) with prominent granite boulders crowning the summit with small overhangs and shelters (Schoeman, 1997: 157). A number of small streams provide water to the area (ibid.).

Figure 11. Example of fortification at KoNomtjarhelo
(Image courtesy and copyright of M.A. Schoeman, 1994)

The two middens excavated (Figure 12) were very shallow (less than 0.2 m deep) and located underneath overhanging boulders (*ibid.*: 160). Ceramics, a 'gun visor', two worked metal pieces, broken worked clay figures, a button, one glass bead, a metal pipe, grinding stones, a metal Consol bottle top, cannon ball shrapnel and one metal button were recovered during the excavations (*ibid.*: 162). Plant remains consist of peach pips and carbonised maize cobs (*ibid.*). The faunal sample recovered consists mostly of 305 poorly preserved bone fragments (Figure 13). Schoeman (*ibid.*: 165) notes that terrain constrained choice with regards to midden placements, which are located under boulders. Schoeman (*ibid.*) ascribes this unusual location and the practice of capping middens with rocks to a conceptual and physical relationship regarding 'protecting' household ash and believes that this practice might have been intensified during the period of constant conflict when the Ndzundza inhabited the site.

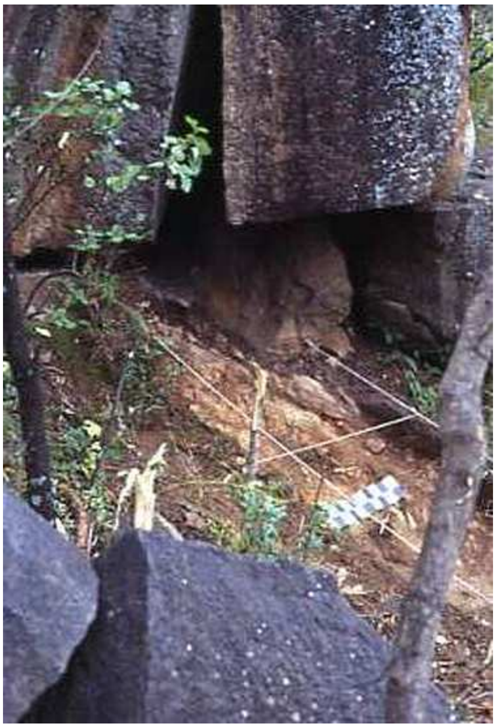


Figure 12. KoNomtjarhelo: Midden 1. Notice the unusual location of the midden on a steep slope under overhanging boulders.
(Image courtesy and copyright M.A. Schoeman, 1994.)

Figure 13. KoNomtjarhelo: 100 % of the total identified sample (scale in cm)

Summary

In this chapter I have discussed the archaeological environmental, social and political contexts of three Ndzundza sites in the Steelpoort River Valley in c. 1700 AD – 1900 AD. In the next chapter (Chapter 3), I hope to illustrate that subsistence strategies employed by communities such as the Ndzundza are complex and dependent on various different combinations of the above mentioned factors. Environmental conditions affect the distribution of plant and animals that will affect people's choices in settlement placement. Human behaviour also affects the environment with the introduction of agriculture and the clearing of fields, the introduction of domestic animals, overgrazing, and over exploitation of wild game resources. Impinging on this human modification of the environment are social and political situations that dictate cultural traditions, rituals and ceremonies. These situations affect people's choices in animal food utilization. Each faunal assemblage recovered from archaeological sites is thus unique.

In the following chapters I combine the environmental data, ethnographic and historic information, archaeological record and the faunal results from the Ndzundza sites to construct Ndzundza animal utilization. More importantly a clear understanding of archaeozoology and its origins and methodology is required to correctly identify, analyse, quantify and interpret the Ndzundza faunal results, this is discussed in the next chapter.

Chapter 3

Theoretical framework of Archaeozoological research into the Ndzundza

Archaeozoology focuses on interpreting human and animal behaviour, ecology and evolution based on faunal studies (Baker *et al* 1997: 298). I shall use archaeozoology to give empirical substance to the historical events surrounding the Ndzundza between 1700 AD – 1900 AD and consider what the animal remains tell us about these events. The results may confirm or question the validity of ethnographic and historic information.

3.1 A history of World Archaeozoology

Internationally, archaeozoology evolved gradually to include many aspects of faunal utilisation by past communities (Voigt, 1983: ix). Throughout the 19th century and into the early 20th century, people with palaeo-anthropological and biological interests conducted faunal studies (Reitz and Wing, 1999: 16) to provided researchers with a link between humans and extinct animals and how human behaviour influenced animal populations and also to indicate changes in the geographical distribution of animal species (Eaton, 1989; Loomis and Young, 1912). In the early 1900s archaeozoological studies began to focus on modified and unmodified faunal remains in archaeological contexts, dietary contributions and the different animal procurement and preparation methods of past human communities. In the 1940s, research on cultural behaviour and ecology increased, with attention on cultural food-getting behaviours (Steward, 1955), followed by studies on cultural and natural formation processes that affect faunal deposits such as human processing of animal remains and non-human processes such as animal burrowing (Byers, 1951; Binford, 1977, 1980; Thomas, 1986; Gifford-Gonzales, 1991; Thomas, 1996). 'Cultures' were (and to some degree still are) seen as systems of interrelated components that have aspects of their ideological and social organization preserved via archaeological deposits. Human behaviour exhibits patterning, which can be discerned through regularities and disjunctions in artefact and faunal assemblages (Schiffer, 1983: 675), albeit that such patterns are numerous, multi-faceted and there are often exceptions to the norm.

According to Thomas (1996: 1), the success of archaeozoology can be linked to the development of 'processual archaeology' in the 1960s and 1970s, which placed an increased emphasis on explanatory frameworks based on subsistence and the physical environment. Processual archaeology used ethnoarchaeological information to create models to link patterns of material culture to larger issues of socio-economic and political processes. Increased attention was also paid to human and environmental relationships (Barker and Gamble, 1985; Lyman, 1994). Processual archaeology relied heavily on analogy, experimental archaeology and on the assumed continuity between the past and present. However, the societies targeted for ethnoarchaeological research such as the Nunamiut 'Eskimo' and !Kung San did not live in an eternal 'ethnographic present'. They lived in specific socio-historic contexts and were influenced by the surrounding world, in which they adapted and diversified their behaviours (Binford, 1978: 451, 453, 496). The distances people are prepared to travel and the amount of energy they are willing to expend in addition to the climate, geological features and the physical condition of the people will influence what animal food procurement strategies are employed (i.e. setting snares and traps for smaller animals or actively pursuing and hunting bigger game - Plug, 1988: 10).

Watson (1979: 277, 289) also cautions against the use of analogies derived from present observations to aid in interpreting past events such as the formation of archaeological deposits because "*accepting knowledge claims always involves a leap of faith*". Nonetheless, analogical inferences establish links of 'partial similarity' that includes considering differences of time, space and locale (Wylie, 2002: 147). Inferences are both explanatory and descriptive (*ibid*). Explaining archaeological deposits and how particular materials such as faunal remains could have been acquired, produced, processed and discarded constructs a putative past scenario (*ibid*,: 84). Analogies based on ethnographic information are therefore a necessary but inevitably flawed means of imagining a past – one of Archaeology's principal conundrums. This imaginary is, however, constrained by some material 'evidence', preferably drawn from several fields of enquiry allowing "*…multiple sources to constrain one another and to suggest both what can and what cannot be assumed about a quite distant and unfamiliar subject. They are strategies for eliminating error and assessing likelihood, improving credibility and delimiting uncertainty…*" (Wylie, 2002: 153)

The processual call for clarity was continued in the 1980s with the development of studies on animal domestication (Clason, 1986; Stahl and Norton, 1987; Voigt, 1977) and the importance of the recovery and curation of faunal remains (Weigelt, 1989 and Lyman, 1994). With the development of quantification methods such as Minimum Number of Individuals (MNI) and Number of Identified Specimens (NISP – see explanations, below on pages 65-67), in addition to criticisms on variable results due to taphonomic processes acting on faunal remains, new analytical controls for taphonomic processes were developed to establish consistency in the methods used by different analysts (Willey and Sabloff, 1974; Daniel, 1981; Gilbert and Singer, 1982; Klein and Cruz-Uribe, 1984; Grayson, 1984; Dunnell, 1986). Since the 1970s there has been debate about the merits of different quantification techniques, especially NISP and MNI counts (Plug and Plug, 1990; Marshall and Pilgram, 1993: 262). Casteel and Grayson's 1977 publication highlighted the ambiguous nature of definitions and quantitative terms used by Archaeozoologist. Terms were (and to some extent still are) vague and may have multiple meanings. One of the numerous examples illustrated by Casteel and Grayson (1977: 237) relates to the use of abbreviations - Minimum Number of Individuals has, for example, been abbreviated as MNID (Payne, 1972), MIZ (Von den Driesch, 1976) and MNI (Perkins, 1972; Uerpmann, 1973). Additionally, quantitative terminology has expanded and led to further ambiguity, though work is being done to more precisely define terms and methods, and to better understand complex taphonomic processes (Enloe, 2003: 591).

Archaeozoological remains have also increasingly being used to infer social behaviour and economic structures (Schiffer, 1983: 675). For example, Binford (1980) illustrated that hunter-gatherer subsistence-settlement strategies are responsive to environmental factors and that a detailed examination of all the environmental factors affecting hunter-gatherers is needed to develop comprehensive theories regarding hunter-gatherer subsistence-settlement behaviour. The 1990s saw an increase in theoretical studies on human and animals relationships (Plug, 1987b; Brewer, 1992) in addition to the symbolic role of animals (Levy, 1995). More recent studies have begun to focus on human impacts on the environment (Amorosi *et al.* 1996; Grayson, 2001) along with providing environmental data for contemporary ecosystem management programs (Lyman, 1996; Jackson *et al.* 2001). For example, domesticated cattle in South Africa brought from Northern Africa brought with them parasites spreading tick-borne diseases such as heart water that damaged wild game populations whilst endemic diseases such as foot and mouth resulted in cattle deaths (Plug, 1988: 14-15). Additionally, cattle struggle to survive in tsetse fly infested regions and the clearing of veld for agricultural land lead to the destruction of tsetse fly and related habitats that enabled the spread of cattle into those areas (*ibid.*)

3.2 A history of Archaeozoology in South Africa

Unfortunately, the history and development of archaeozoology in South Africa has not been adequately documented. According to Voigt (1977: 1), the earliest publications concerned with faunal studies in Southern Africa were undertaken by L.H. Wells (i.e. Wells and Cooke, 1957) and H.B.S. Cooke (1958) on fossilised bovid remains and quaternary environments. Voigt (*ibid.*) shows that faunal analysis during the 1950s was undertaken by palaeontologists to reconstruct past environmental conditions. In the 1960s researchers like C.K. Brain (1969) conducted faunal studies for archaeologists in an attempt to interpret faunal remains in terms of natural taphonomic processes and human activities. In the 1970s the number of faunal reports increased due to research done by archaeologists specialising in Archaeozoology (i.e. Klein, 1975). The establishment of the Department of Archaeozoology at the Transvaal Museum in Pretoria in 1975 further facilitated the development of the discipline. Regrettably, as of 2004 this Department has been disbanded (Plug, 2007: pers. comm.). The lack of archaeozoological courses offered at South African universities means trained specialists are scarce and those qualified to do faunal analysis are usually not locally trained or are trained locally by specialists on an *ad hoc* basis.

There are individual researchers such as: Dr. Elizabeth De Wet –Bronner (i.e. 1994) and Dr. Margaret Avery, a palaeoecologist who specialises in paleoenvironmental reconstruction based on micro mammal (mouse and rats) remains (i.e. Cruz-Uribe *et al*, 2003). In addition to Dr. Simon Hall (i.e. 1990) at the University of Cape Town who focuses largely on marine fishes and institutions such as the National Museum in Bloemfontein which has a Quaternary Research unit with a strong archaeozoological element and researchers such as James Brink (i.e. Brink, 1987). In Pretoria, Dr. Ina Plug (i.e. Plug, 2003), Research Fellow at the University of South Africa (UNISA) analyses fresh water fish remains and mammals. Due to the lack of specialised training in South Africa, theoretical developments in faunal studies have largely been 'imported' from the international community (Voigt, 1977: 1). Consequently, my theoretical assumptions are largely based on research conducted by international scholars albeit nuanced by local publications.

When interpreting faunal remains developments in international research need to be married to local conditions. A faunal specimen is just that, a piece of bone. After securely identifying the bone to both species and anatomical part (where possible), the analyst must interpret what that piece of bone means zoologically, ecologically and socially. At its broadest level, a faunal assemblage recovered from an archaeological context is primarily, but not exclusively, determined by environmental conditions. The environment a human community occupies imposes a set of constraints and possibilities on animal food procurement. Latitudes, altitudes, landforms and climate determine the distribution of plants, which in turn condition the distribution of animals (Reitz and Wing, 1999: 114), which pose choices and constraints to humans. The choices people make via hunting, herding, farming and burning of indigenous fauna and flora impact again the natural environment. These interactions and interconnections make the notion of a distinct 'nature' and 'culture' unsupportable, with both categories impacting on and modifying the other and thus affecting archaeological samples and our interpretations of people's past life ways. Analysts must try to determine which combination of 'natural' and 'cultural' factors account for a specific faunal assemblage.

3.3 Natural factors impacting faunal assemblages

With regards to 'natural' factors that affect faunal remains there are many - bioturbation, porcupine bone accumulation, owl pellet droppings and digging and scavenging by animals to name but a few (Reitz and Wing, 1999: 114–118). Furthermore, natural weathering probably has the greatest impact because bones will deteriorate rapidly but not uniformly as soon as their inter-laminar bonds are broken (Uerpmann, 1973: 319). Other non-human factors that also affect faunal samples are, for example, domestic dogs that have been found in association with many southern African Iron Age sites (Plug, 1988: 17). Binford (*et al*, 1988) and Marean (*et al*, 1991: 646) have shown that carnivore modification of faunal material has an enormous impact on bone survival because limb epiphyses have a high bone grease content and are selected for by bone-gnawing carnivores. Due to the small Ndzundza faunal sample, determining what natural processes affected the bones is difficult to determine. Apart from the few remains that showed evidence of carnivore and rodent gnawing and the greater soil acidity at KoNomtjarhelo, the natural factors are relatively minimal, therefore I focus on the human factors affecting the Ndzundza faunal assemblage.

3.4 Human factors impacting faunal assemblages

When it comes to considering past human impacts on faunal samples, analysts must consider whether bone counts of faunal remains found within archaeological deposits represent the actual quantity of meat consumed by communities or simply the meat that was available but not necessarily consumed because of rituals for example. Available meat includes all edible portions of animals such as marrow, muscle tissue, viscera, fat, brains, eyes, blood etc. (Lyman, 1979: 536) that may or may not be consumed, and which often leaves little to no trace. Amongst the Ndzundza for example, when a widow marries her deceased husband's brother or a suitable related male relative a goat is slaughtered at the home of the widow and some of its blood drunk by the couple (Jonas, 1989: 85). Sometime the marrow of the animal is mixed with medicines and rubbed into cuts made on the arms, legs and hips of the couple, the carcass is discarded (*ibid.*). The dilemma analysts' face is determining what different cultural groups consider consumable versus available meat, cultural preference, rituals and taboos may delineate what portions of an animal may or may not be consumed. In my culture, for example, it was often a necessity after the 1929 New York Stock Exchange crash and subsequent Depression in South Africa (Ross, 1999: 106) to eat what Afrikaans-speaking South Africans call "*afval*" (tripe) – a cheap and low status meat source. Today, tripe is not only very expensive but also considered by many a delicacy and luxury. Meat, both consumed and available, has thus acquired new meanings and status in a few short years because of changing economic circumstances.

3.4.1 Status and gender

Status and gendered conceptions also influence meat consumption. For example, Huffman (1996: 118) has used Venda ethnography to illustrate that the division of meat followed a formal set of rules in which higher valued meat went to individuals with higher-rankings. In this manner, the front half of the animal went to public figures or to those that stayed outside the palace (*ibid.*). The chief's head counsellor (*Negota*) received the neck, the brother of the chief, who is a legal expert (*Khotsimunene*) received the leg, and the court official (*Nefhasi*) received the soft part underneath the front leg (*ibid.*). The back half of the animal belonged to those people attached to the palace. The ritual sister of the chief (*Makhadzi*) received the 'dainties portion' of the upper part of the hip and thigh, while the chief received the hind leg (*ibid.*). The chief's headman (court official) in charge of his household (*Mukhoma*) received the part just above the hind leg (*ibid.*). Amongst the Manala-Ndebele the meat of either goat or cattle slaughter at funeral ceremonies are divided according to gender. The head, front half, the right front leg and both hind legs are given to men whilst the woman received the meat from the back half of the animal and the left front leg (Hambrock, 1981: 19). Faunal specimens, or the lack thereof, may represent consumption patterns from which we can infer the economic status or gender of different sections of a community (Mullins, 1999: 22–26). To validate status, a person should behave appropriately and display markers of status, for example preparing food in the correct manner and eating appropriate foods at the right time, all of which will be dictated by cultural traditions (Reitz and Wing, 1999: 274; Franklin, 2001: 88). Deviance from this 'norm' could be an early indicator of changing socio-historic circumstances.

The use of terms such as 'status' and 'luxury' in subsistence studies however have pitfalls. "*Definitions are rarely fully comprehensive and vary in the degree to which emphasis is placed on economic rather that social aspects*" (Van der Veen, 2003: 405). Elites use luxury food items to mark social status, such as using meat desired by many but available only to a few (*ibid.*: 405-406). In South African Later Iron Age communities such as the Pedi, the heart, spleen, liver, tripe, lung, intestines, blood and the diaphragms of either cattle, sheep or goats are prepared into a dish called "*Bobêtê*" (Blood-stew) that is prepared only on great ceremonial occasions by those who could afford to do so and served only to men (*ibid.*: 222-224). Juxtaposed against this is famine food, such as the gathering of molluscs, small mammals, rodents and reptiles that often leave little but insightful archaeological traces (Plug, 1988: 12). Furthermore, as access to luxury foods changes, so does the status of the food. In contemporary African communities the virtual extinction of wild game and their protection and conservation in game parks has resulted in communities being almost entirely dependent on domesticated animals for meat. Unlike Iron Age societies, beef is today commonplace and game a prestige food. Luxury and ritual foods are thus relative concepts and culturally specific. Meanings attached to these concepts are not specific to foods *per se* but to changing social, economic and ritual conditions (Van der Veen, 2003: 410).

3.4.2 Interaction

Communities also do not live in isolation but interact with neighbours. We know that farming communities and hunter-gatherers contemporary with them shared many of the same resources leading to complex exchange networks and to either increased competition or increased co-operation (Mitchell, 2002: 288). Farmers may have provided cereals, milk and perhaps livestock while hunter-gatherers could have provided skins, hunted meat, ochre and honey (*ibid.*: 293). Such trading relationships demonstrate that people’s decisions about which animals to acquire and consume may be established through ‘cost and benefit behaviours’ in economic, political, social and ritualised ways. However, successful generalised subsistence strategies and diet patterns may also be resisted, leading to the establishment of distinct dietary regimes in a small area. According to David and Kramer (2001: 135), such 'subsistence specialisations' may even be ‘ethnic’ in character - for example, the use of totem animals and kin names to differentiate between Ndebele kin groups (Jonas, 1989: 3). By comparing the Ndzundza faunal specimens to subsistence behaviours of communities such as the Venda and Pedi who occupied the surrounding areas at the same time, it may be possible to establish whether or not there was a transmission of innovation to the Ndzundza with regards to animal utilisation patterns from other communities or whether they generated their own innovations, retained, or even intensified traditional practices. According to Chase (1989: 44), ‘tradition’ usually dictates rules and daily life by underwriting an orthodox continuity of practices. Tradition can, however, be replaced or altered since ‘tradition’ consists of funds of knowledge and practices that can be modified to adapt to new circumstances and are therefore not conservative or unchanging (Hobsbawm, 1983: 1-14). "'Invented tradition' is taken to mean a set of practises, normally governed by overtly or tacitly accepted rules and of a ritual or symbolic nature, which seek to inculcate certain values and norms of behaviour by repetition, which automatically implies continuity with the past" (Hobsbawm, 1983: 1).

3.4.3 Ritual

A vital part of 'tradition' is ritual, a crucial but often difficult to discern factor affecting faunal assemblages. Animal food's status often depends on how it is embedded or excluded from ritual contexts. Food may, for example, be used to mark a journey, placate gods or honour ancestors (Van der Veen, 2003: 406). Many ceremonies use animals symbolically to express social organisation and values (Reitz and Wing, 1999: 8). Among the Ndzundza an ox (*Bos taurus*) is slaughtered each year after the death and before the subsequent burial of a person to provide the deceased with a 'big blanket' made from the animal's skin so that the deceased can rest in peace ("*om still te gaan slaap*") (Jonas, 1989: 105). Food has social meanings and in terms of subsistence or consumption can act as a system of signs to indicate rank, rivalry, solidarity, identity and exclusion (Van der Veen, 2003: 413). In this manner, food can be used to convert economic capital into symbolic power or cultural capital independent of nutritional value or 'taste' (*ibid.*: 414). Therefore, the focus should not always be on what was consumed but on the signal this consumption gave to those who were not consuming it (*ibid.*). Van der Veen's (2003: 412) research in Goa (West Africa) has shown that feasts were a time of plenty but not of difference *per se*. Food used in rituals is often the same food used in everyday life and is a matter of more meat rather than different meat. Therefore, the focus should also be on quantity as well as the qualitative and contextual aspects of archaeozoological finds (*ibid.*: 411). Unfortunately, distinguishing whether food had ritual connotations via the archaeological record is notoriously difficult.

3.4.4 Gender Bias

Focusing on animal remains can also lead to a bias toward males since men are usually seen as the meat providers. It is argued, based on a blend of ethnography and archaeology, that during the Late Iron Age men worked with animal products, wood and stone, whereas women worked with agricultural products and ceramics (Hambrock, 1981: 11–13; Bozongwana, 1983: 7-9; Mitchell, 2002: 360-361). Available ethnography suggests there are strong avoidance rules between Ndzundza men and women regarding meat. When a woman's father-in-law or one of his brothers dies, she may not eat the meat from cattle slaughtered at the funeral but will receive meat that has been specifically acquired from another slaughtered animal (Jonas 1989: 69-70). Gender separation is also carried through into rituals. For example, at funerals goats, sheep or cattle are slaughtered when the grave is dug. Male animals are slaughtered when the deceased is male and female animals are slaughtered when the deceased is female (*ibid*.: 101).

One should, however, consider the possibility that different stages in the processing of animal and plant species may have involved the participation of different genders, age and social classes at different times, rendering a binary gender 'opposition' and valuation of foods untenable and largely unsupported by the material record. Animal species such as scrub hare (*Lepus saxatilis*), rock hyrax (*Procavia capensis*) and solitary antelope such as common duiker (*Sylvicapra grimmia*) in addition to molluscs and other small animal species could have been obtained by opportunistic hunting or even been gathered by community members such as young children, the elderly and women while they attended to other tasks. These less prestigious small game and small meat packages could make up significant percentages of excavated animal food remains. Plug (1988: 327) for example identified the use of gathered food such as tortoises, ostrich eggs, freshwater mussels and land snails as important protein food sources from archaeological sites in the Kruger National Park situated in Mpumalanga. Beukes' (2000: 119) research on the KwaGandaganda Late Iron Age sites in KwaZulu-Natal notes that the abundant remains of *Achatina* (giant African land snail) recovered from the deposits suggest that they were important protein sources. Hutten (2005: 256) noted the presence of opportunistic gathering of tortoise, lizards and molluscs at the Middle/Late Iron Age sites of Mapungubwe and K2 in Limpopo province.

One must also keep in mind that plants played an important, and sometimes dominant, part in the subsistence of communities; "*people have exploited plant resources on a large scale on every* *continent*" (Harlan, 1989: 81). Grass silica, millet, carbonized sorghum, carbonized maize and peach pips are known Iron Age (Plug, 1988: 11) and Ndzundza crops (Schoeman, 1997: 132; 162). Plants also supply medicinal and cosmetic needs that animal remains cannot and legumes, roots, nuts and fruits are reliable and plentiful sources of carbohydrate and protein. My focus is, however, on faunal remains as the available samples of plant remains from the Ndzundza sites is very small and not interpretively or statistically sufficient.

To interpret faunal material, one must understand ecology, taphonomy, cultural beliefs, rituals and gender roles regarding animal food sources and how the faunal material came to be integrated into a specific archaeological context (David and Kramer, 2001: 117). Within this theoretical and methodological matrix, it has become apparent that in an attempt to construct the possible animal utilisation pattern of the Ndzundza, one cannot rely on artefactual or faunal evidence alone. The Ndzundza were forced to cope with migration, conquest and the rapid incorporation and assimilation of other indigenous groups as they met the evolving challenges of 18th and 19th century southern Africa. In understanding the faunal material recovered from the three Ndzundza sites, it is crucial to understand the political and social situation and the relationship the Ndzundza had with contemporaneous communities. This context informs on the meaning attached to different animal species and/or animal parts as the Ndzundza relocated to three different sites in the Steelpoort River Valley. To interpret the material however it must first be analyzed in a methodologically sound manner, which I now discuss in Chapter 4.

Chapter 4

Methodology used in analysis of the KwaMaza, Esikhunjini and KoNomtjarhelo Ndzundza faunal assemblages

4.1 Excavation and sample retrieval

To understand and interpret faunal material from archaeological sites properly, analysts need to understand exactly how the material was excavated. Ideally, an Archaeozoologist should be on site to excavate or supervise the excavation of fauna. Techniques used in the excavation and collection of faunal samples can have substantial impacts on the interpretive results of archaeozoological studies. Ideally, Archaeozoologist prefer detailed textual and graphic information that includes (Baker *et al*, 1997: 301–304):

a) the site name(s), its location and map co-ordinates;
b) when the site was excavated, by whom and the intended purpose of the excavation and/or research;
c) surrounding geographic and geological features, soil chemistry and hydrological systems;
d) site formation processes, whether it is a single or multi-component site and the type of site i.e. a kill or habitation site;
e) excavation techniques i.e. sampling strategies, recovery methods, screen size, cleaning and storage procedures;
f) a site plan, stratigraphic profiles, provenance and feature description and the location of faunal material;
g) and correlations of dates, where possible, with specific levels, units and/or features.

An especially crucial aspect of excavation is the effect of screen size on the recovery rates of fauna (Cannon, 1999: 205; Shaffer, 1992: 129). Larger screen fractions (i.e. 1.27 cm and 0.64 cm) may not recover skeletal fragments of smaller species such as fish and rodents (Gordon, 1993: 453). Furthermore, smaller skeletal specimens such as carpals and tarsals, vertebrae, ribs, sternae, patellae, sesamoids, phalanges and otoliths might not be recovered (Gordon, 1993: 453; Shaffer, 1992: 131). Shaffer (1992: 130) established that the use of 0.64 cm screening resulted in the loss of 74 – 100 % of species weighing less than 100 g (i.e. pouched mouse [*Saccostomus campestris*] males 33 – 68 g, females 30 – 54 g [Smithers, 2002: 83]), whilst species weighing between 100 to 700 g (i.e. slender mongoose [*Galerella sanguinea*] males 523 – 789 g, females 373 – 565 g [Smithers, 2002: 303]) showed a loss of 39 – 100 %. The representivity and subsequent interpretation of faunal remains recovered by larger screens are thus questionable. Ideally, a 1 mm^2 mesh screen size should be used during excavations to collect most of the faunal specimens (James, 1997: 386). Baker (*et al*, 1997: 302) suggest the use of fine screening, water screening and flotation methods to further reduce the loss of specimens. Water screening however may lead to the disintegration of fragile and brittle material (Plug, 2007: pers. comm.). One should also consider the use of graded sieves to prevent crushing smaller skeletal specimens by larger bones.

Fine screening, however, can be expensive and time-consuming and conditions of recovery at each site differ. Perfect sampling strategies and samples do not exist. Additionally materials such as plant remains may clog screens, which might either aid in detecting small specimens or burden the recognition and recovery process. Rocks may break bones and the lack of competence or training of the person operating the screen might lead to additional losses (Shafer, 1992: 130). Plug (2007: pers. comm.) suggests that if there is no time during excavation for thorough screening that as much of the unscreened material – or at least representatives samples thereof - should be boxed for screening at a later stage in a controlled environment. One should also consider re-sieving spoil heaps. Unless an Archaeozoologist is present at the site or consulted before excavations commence, the sample size and sample quality will be determined by the archaeologist based on their choice of excavation techniques, which is based on the purpose of their study, available funds, personnel and time. It is thus vital that from student level archaeologists are sensitized to the importance of recovering as representative a faunal sample as possible from each excavation.

4.1.1 Excavation at the Ndzundza sites

Through the use of memory and oral testimony, Schoeman (1997: 72) identified the general locations of the three Ndzundza sites and then combined aerial photography and ground survey to define the extent of each site, focusing on mapping the settlement layout (Chapter 2: page 30-39). According to Schoeman (1997: 71) "standard Iron Age excavation procedures were followed" - all three sites were excavated following natural stratigraphy or in 10 cm spits where there was no visible differentiation in the stratigraphy (Schoeman, 2007: pers. comm.). The excavations were conducted in 1 x 1 m squares and all deposits were sieved using 3 mm and 5 mm sieves (*ibid*). Ash was sieved with kitchen flour sieves to extract beads. All the material was sorted in the sieves and not on sorting trays (*ibid*.). The excavations focused on obtaining information on house form and recovering "*representative ceramic samples from the middens*" (Schoeman, 1997: 72). The middens excavated at KwaMaza A and KwaMaza B were chosen to avoid rodent activity (Schoeman, 2007: pers. comm.). At KoNomtjarhelo, all the middens were dug due to the small number of middens (*ibid*).

Although faunal material was recovered it was not analyzed at the time of Schoeman's research since is did not fall into the immediate aims of the project (*ibid*.: 73). Schoeman (2007: pers. comm.) further noted that although her supervisor at the time of her research was Simon Hall, a fish remains specialist, a faunal specialist was not formally consulted. The faunal material recovered during the excavations was sorted, labelled and packaged in the field for later analysis by Schoeman accompanied by second year and graduate students from the Archaeology Department of the University of the Witwatersrand (South Africa). The lack of student training in archaeozoology resulted in many non-faunal materials being put in the faunal sample, i.e. wood, stones, charcoal, iron nails, dhaka and ceramic shards. Incorrect packaging also led to further fragmentation and damage to the faunal material as large heavy faunal fragments were placed into paper bags with small and fragile ones. Additionally, the material was not always labelled correctly and some of the packaged material was placed in the wrong boxes, requiring a time consuming re-examination and sorting process before commencing with the analysis. The faunal sample recovered from the three Ndzundza sites should, therefore, not be viewed as a representative sample of all the faunal remains discarded by the Ndzundza. The sample is small and results derived from my analysis should be treated as specific instances that may, with caution, be extrapolated to similar context.

4.2 Analysis of the Ndzundza faunal sample

4.2.1 Sorting

Before commencing with the analysis of the faunal material recovered from the Ndzundza sites, I compiled a species list (Appendix A: page 140) of the fauna in the research region both past and present with the aid of Du Plessis (1969), Rautenbach (1982), Sinclair and Davidson (1995), Carruthers (2000), Smithers (2002) and Skinner and Chimimba (2005). When analyzing the faunal material, I considered Reitz and Wing's (1999) remarks on sample recovery and data gathering. They caution that any sample is just that and does not reflect the total biodiversity of the region but only the ones utilized by the community or that natural process incorporated into an archaeological deposit and preserved to be excavated (Reitz and Wing 1999: 122). The Ndzundza faunal sample consists of 4833 bone fragment, distributed as follows:

- KwaMaza A: 690 fragments weighing 1401.26 g;
- KwaMaza B: 2313 fragments weighing 10353.21 g;
- Esikhunjini: 1535 fragments weighing 2094.50 g and
- KoNomtjarhelo: 305 fragments weighing 276.92 g.

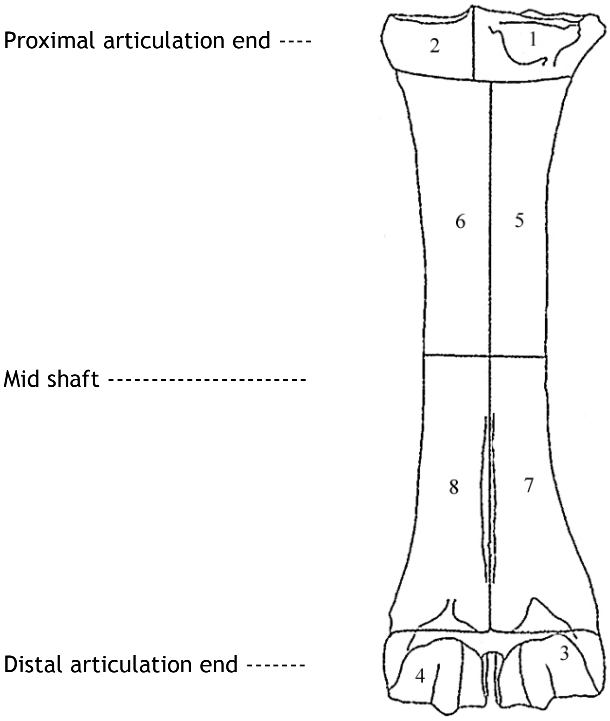
I sorted this sample into identifiable and unidentified remains and cleaned the bones by dry brushing them. Unidentified remains are bone fragments that are incomplete to a degree that makes identification into distinct animal species, sizes, group classes or morphological zones unattainable. This dissertation's aim is to compare the three Ndzundza sites, each site's faunal sample was, therefore, analyzed separately and will be compared with one another in the following chapters. The KwaMaza faunal sample, excavated from KwaMaza A and KwaMaza B - situated 80 m apart - are considered separate units and also analyzed separately. The unidentified fragments were further divided into skull, enamel, rib, miscellaneous, vertebra and bone flake fragments to aid in determining skeletal part distribution patterns. Since vertebrae (except for the atlas and axis) and rib specimens are problematic to identify to species, they are grouped into the unidentified cluster. The unidentified samples were then counted, weighed and recorded. Attention was also paid to taphonomy (see page 58-

60) by observing and recording the number of burned, damaged and modified fragments due to either human or ecological activities.

4.2.2 Identification

Identification of faunal specimens is based on: morphological features; bony landmarks (i.e. vascular grooves and nutrient foramens); bone texture; and the curvature of bone. To measure and record anatomical variables comprehensively I followed international standards through the use of Dobney and Reilly's (1988) methods on classifying the different diagnostic portions of bones. Diagnostic zones on bones rely on the fact that skeletal specimens are divided into morphologically distinct zones that are species-specific (*ibid.*: 78). Each zone is defined by a precise anatomical description (e.g., Figure 14). Using Schmid (1972), Boessneck (1969), Dobney and Rielly (1988), Peters (1988) and Macdonald (1992), in addition to known taxa from the Transvaal Museum's comparative collection (South Africa) and input from Dr. Ina Plug, the identifiable Ndzundza remains were further identified to species, bovid size and family classes. This identification was complemented by paying attention to articulation surfaces, their proportions and morphological landmarks. In addition, teeth were used to age species when possible. The identified remains were classified according to Order, Family, genus, species and/or animal size classes (Table 3) where possible. Bovid size classes rather than more "*proscriptive classifications*" are used since there is a high species diversity of bovids within a single body-size category amongst African bovid species making it difficult to identify very fragmented pieces to a particular species (Marean and Spencer, 1991: 656).

The fragmented nature of the faunal sample meant it was not always possible to distinguish between sheep and goat. These specimens are therefore grouped together as *Ovis/Capra* (sheep/goat) and will be referred to as sheep/goat in the text. For the same reason non-bovid specimens that could not be identified to species level were placed into broad categories such as primates, lagomorphs, carnivores, equids, molluscs and rodents. Specimens that are not regarded as a food source are referred to as non-contributors. For example, small rodents such as the pouched mouse (*Saccostomus campestris*) may have intruded into the deposit on their own and died in burrows, or could have been deposited via carnivore droppings and raptor pellets (Schmitt and Lupo, 1995: 497). These rodents and other non-contributors may also have been hunted or captured by the inhabitants for reason other than eating them such as pest control or children's play.



1. Lateral portion of proximal articulation
2. Medial portion of proximal articulation
3. Lateral condyle
4. Medial condyle

5-6. Proximal half of shaft divided by vascular groove
7-8. Distal half of shaft divided by vascular groove

Figure 14. Example of skeletal specimen (Bovid Metapodial) with diagnostic morphological zones (Adapted from Dobney and Rielly, 1988: 92)

Table 3. Example of Bovid size classes

Bovid class	Mass	Species
Bov I	4 - 19 kg	Dikdik (*Madoqua kirkii*) – Oribi (*Ourebia ourebi*)
Bov II	18 – 80 kg	Springbok (*Antidorcas marsupialis*) and sheep/goat (*Ovis capra*) – Puku (*Kobus vardonii*)
Bov III	70 – 300 kg	Lechwe (*Kobus lechwe*) and cattle (*Bos taurus*) – Roan (*Hippotragus equinus*)
Bov IV	350 kg upwards	Buffalo (*Syncerus caffer*) – Eland (*Tragelaphus oryx*)

4.2.3 Taphonomy

Taphonomy comprises natural and cultural processes by which bones of once living organisms become part of the bone assemblage excavated from an archaeological site (Baker *et al*, 1997: 311; Hutten, 2005: 89). Cultural processes that modify bone include cutting (Figure 15), chopping (Figure 16) and burning by humans during food acquisition and preparation or tool manufacture. Burnt fragments identified from the Ndzundza sample were described as white, black or blueish black. Non-cultural bone transformation include agents such as bacteria, fungi, earthworm bioturbation, animal burrowing, deposit pressures, carnivore and rodent gnawing, weathering, plant roots and chemical processes (Baker *et al*, 1997: 312; Needham and Spence, 1997: 77). These processes may distort the distribution of skeletal parts (Gilbert and Singer, 1982: 21). Faunal remains are thus at best a partial representation of the animals utilized. To interpret faunal data knowledge of these processes are vital for archaeozoologists to construct accurately past animal utilization patterns. In addition to weathering, butchering marks and gnawing by rodents and carnivores, attention was also paid to visible pathologic lesions on the faunal material such as extra bone growth caused by diseases such as arthritis, ankylosis, osteoexostosis, osteomyelitis, osteoporosis, tuberculosis and cancer (Plug, 1988: 58) in addition to abscesses, injuries and fractures that provide information about animal health and herding practices (Miles and Grigson, 1990).

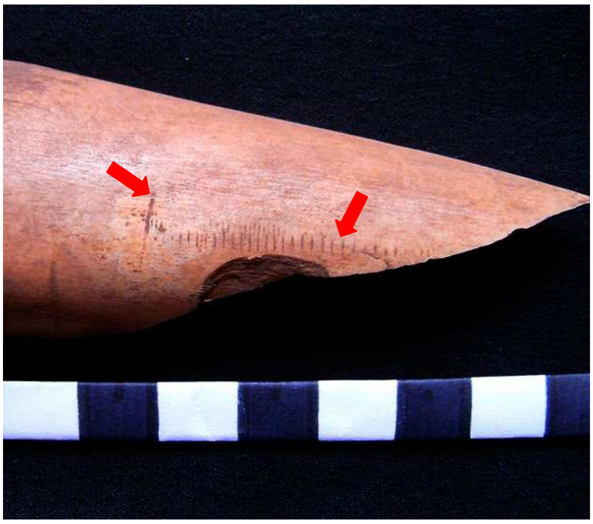


Figure 15. Example of cutting damage on faunal fragment (scale in cm)

Figure 16. Example of chopping damage of faunal fragment (scale in cm)

The faunal material recovered also depends on the amount of processing done at the kill/collection site by the hunter-collectors before they returned home (Rogers, 2000: 709). The overall return rate from the food collected is based on considering the weight and volume of the meat that can be carried home and how much energy is expended doing so (Kelly, 2000: 67). In order to minimise the transportation of waste products, people often locate activity and refuse areas optimally in order to minimize effort or 'schlepping' (Gilbert and Singer, 1982: 27; Schiffer, 1996: 60, 69; see also Binford [1978] on the Nunamiut Eskimo). Primary processing of animals might therefore be done at the kill site and a single faunal unit (animal) is thus located in two or more different places – kill/collection site and home base. One must also keep in mind that bone contains nutritious marrow. Not all bone will, therefore, endure the same processing and discard processes. Skeletal parts with high grease content, such as humerus shafts, are likely to undergo more intensive processing than other parts such as ribs that have lower grease contents (Gilbert and Singer, 1982: 27; Marshall and Pilgram, 1993: 266; Baker *et al*, 1997:313).

Binford (1981: 3) also refers to what he termed "*riders*". These are bones that may not be wanted but which are transported to the home base because they are attached to something that is wanted. For example, the hind leg of a cow (*Bos taurus*) includes the femur, patella, tibia, calcaneum, astragalus, metatarsal and phalanges. The metatarsals and phalanges may have been included into the deposit purely because the entire hind leg was transported to the home base and that only the meat from the 'hind shank' (butchering unit defined by Lyman [979: 541] as encompassing the distal femur, patella and tibia) was consumed and not the foot. This may affect accurate interpretations made from faunal results and analyst should always consider whether all the skeletal parts' meat was used for consumption. Finally, the number of animals killed, the means of transportation and the need for bones to make tools and be put to other uses will also determine which parts are transported and which ones are abandoned (Gilbert and Singer, 1982: 27). In extreme cases such as kills made at pitfall traps, people may relocate to a kill/collection site rather than bringing the meat to the home base.

4.2.4 Ageing

When possible the age of faunal specimens is determined on the basis of tooth wear and eruption rates in addition to epiphyseal fusion rates. In young animals the ends (epiphyses) of long bones are attached to their shafts by cartilage that converts into to bone over a known time period (Rackham, 1994: 10). Fusion of the articulation ends to the shafts is complete when the bone stops growing (*ibid.*). This is known as ossification and takes place at different stages in different joints from after birth to adulthood. The Ndzundza faunal samples did not yield sufficient numbers of recognisable fused or unfused material to be used in age estimates. However, I did identify 131 bovid teeth and used tooth wear and eruption rates to establish age profiles - see Table 4 for cattle, sheep, impala and non-domestic bovid species age categories. Teeth also monitor age continuously throughout an individual's life and permit clear distinctions between juveniles, adults and aged individuals (Bökönyi, 1970: 291). Determining the age of the animals at their death could provide information on possible herding management strategies and socio-cultural factors in addition to the hunting skills of the community and the mortality rates of animals utilized by the communities.

Table 4. Age categories used for the Ndzundza faunal samples
(adapted from Child, 1964: 133; Smith, 1969: 3; Voigt, 1983: 43; 47-48 and Plug, 1988: 55; 56)

Status	Class	Age	Description
Cattle (*Bos taurus*) (Voigt, 1983)			
Juvenile	Class I	0-6 months	Deciduous teeth erupted and in wear

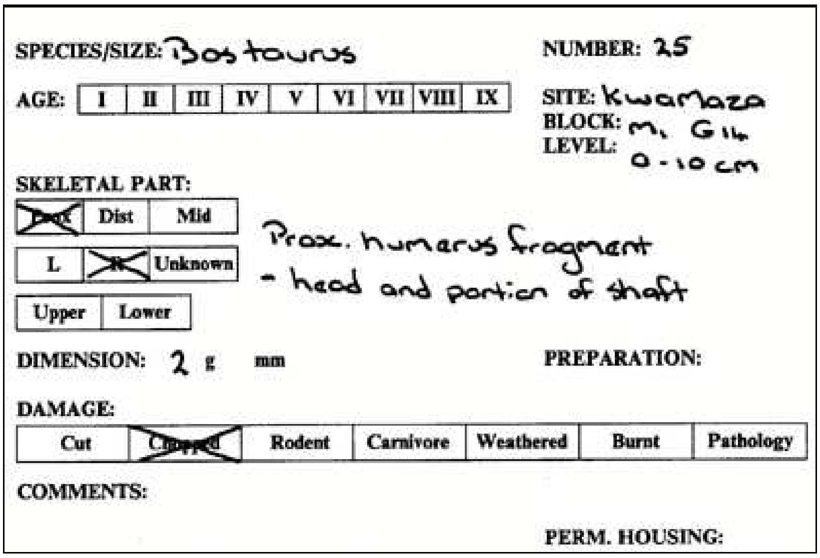
	Class II	6-15 months	M1 erupted
	Class III	15-18 months	M2 erupted
Sub adult	Class IV	18-24 months	M3 erupted, I1 erupting with loss of premolars
Young adult	Class V	24-30 months	P2, P3 and I2 erupting
Adult	Class VI	30-42 months	P4 and I3 erupting
	Class VII	Over 42 months	I4/C erupting
Mature	Class VIII		Full adult dentition, heavy wear on M1 and M2
Aged	Class IX		Heavy wear on all teeth, central islands disappearing
Sheep/goat (*Ovis/capra*) (Voigt, 1983)			
Juvenile	Class I	0-3 months	Deciduous teeth erupted and in wear
	Class II	3-10 months	M1 and I1 erupting
	Class III	10-16 months	M2 erupted and in wear
Sub / young adult	Class IV	16-30 months	M3 and I2 erupted
Mature / aged	Class V	30-60 months	Permanent dentition in wear
Mature / aged	Class VI	Over 60 months	Heavy wear on all teeth, central island disappearing
Impala (*Aepyceros melampus*) (Child, 1964; Smith, 1975)			
Juvenile	Class I	0-7 months	Deciduous dentition erupted, M1 erupting
	Class II	6-13 months	M1 in wear, M2 erupting
	Class III	14-22 months	Permanent incisor and canines erupting
Sub / young adult	Class IV	17-28 months	P2, P3, P4 and M3 erupting
	Class V	c. 29 months	Adult dentition in wear
Mature / aged	Class VI	c. 30 months – 6 years	Age dependent on crown wear
	Class VII	c. 6 years	M1 central island disappearing
	Class VIII	10 years	M2 central island disappearing
Categories for non-domestic bovids if reliable information on age determination is not available (Plug, 1988)			
Neonate	Class I	Deciduous teeth not in wear	
Juvenile	Class II	M1 in wear, M2 erupting	
Sub adult	Class III	Loss of deciduous incisors and premolars, M3 erupting	
Adult	Class IV	Full permanent dentition present and in wear	
Aged	Class V	Central islands on all teeth disappearing	

4.2.5 Sexing

Sexing of bovid skeletal elements can be done mainly on horn cores and pelvis fragments. Horn cores are useful if only the male of a species has horns, i.e. male reedbuck (*Redunca arundinum*). Pelvis fragments are used since the female bovid pelvis differs from the male pelvis in most bovine species - the pubis is flatter and more slender in females and rounder and heavier in males. In other animals one can also use canine specimens when the male of a species has larger canines than females, i.e. baboons (*Papio hamadryas*) and vervet monkeys (*Ceropithecus pygerythrus*). Male skeletal parts also tend to be more robust than female ones, one must not, however, exclude individual growth rates and the introduction of castrated bovids in faunal samples (Klein and Cruz-Uribe, 1984: 41). Unfortunately, the parts most useful in distinguishing the sexes, such as the pelvis and horn cores are usually rare in faunal assemblages (*ibid.*: 39). Post-depositional destructive pressures also remove parts of one sex more easily than the other. For example, male bovine horn-cores are more durable than those of females. Determining sex ratios in faunal assemblages is therefore problematic. The information sex ratios and age profiles provide are, however, crucial for understanding animal husbandry, seasonality and herd management strategies, which contribute to our understanding of resource exploitation by the communities (Renfrew and Bahn, 1996: 274). Regrettably, the Ndzundza samples did not yield any skeletal parts that could be used in sex determination, though such negative information, deriving largely from the very fragmented nature of the sample, does provides hints as to the social, economic and political conditions that existed at the time of disposal of the faunal remains.

4.2.6 Recording and storage

Once a faunal specimen has been identified, it is numbered and recorded on identification cards (i.e. Figure 17) in addition to any information worth noting. This information is subsequently converted into Microsoft Excel tables and graphs and used when quantifying the material. Hereafter the faunal material was packaged and sealed in plastics bags, with careful consideration not to place small fragile material with large heavy fragments. The bags were labelled according to the box in which it is stored in addition to the site name, midden number and level it was excavated from. The bags were then layered in cardboard boxes pacing the large heavy fragments on the bottom. The identification cards relating to the material from the sites were sealed separately and placed into the boxes. The 12 boxes containing the faunal sample from all three Ndzundza sites are currently stored at the archaeology storeroom of the Department of Anthropology and Archaeology at the University of Pretoria (South Africa), and will be returned to the University of the Witwatersrand, from whose collection they are on loan, at the completion of my study.



SPECIES/SIZE: Bos taurus
NUMBER: 25

AGE: I | II | III | IV | V | VI | VII | VIII | IX

SITE: KwaMaza
BLOCK: m, G14
LEVEL: 0-10 cm

SKELETAL PART:

[✓ Prox] | Dist | Mid
L | [✓ R] | Unknown
Upper | Lower

Prox. humerus fragment
- head and portion of shaft

DIMENSION: 2 g mm
PREPARATION:

DAMAGE:

Cut | [✓ Chopped] | Rodent | Carnivore | Weathered | Burnt | Pathology

COMMENTS:

PERM. HOUSING:

Figure 17. Example of identification cards used to record faunal data

4.2.7 Quantification

Quantification of faunal material enables researchers to examine the economic importance of different animal species to the site's inhabitants (Uerpmann, 1973: 310), assuming that the archaeologist has recovered a representative sample of the site's fauna. By comparing species' bone counts derived from mathematical quantification formulas it is assumed that the most economically important species will be represented by the greatest number of bones relative to numbers similarly calculated for other species (Lyman, 1979: 536; Gilbert and Singer, 1982: 22). Therefore, the 'find frequency' of species is often equated with the economic importance of those species (Uerpmann, 1973: 311). The value of bone counts per species is, however, limited by the degree of fragmentation of the bones and the different meat quantities represented by each species (*ibid.*). In addition, due to the different meat quantities of different species the relative economic and dietary importance of species is not the same as the frequency of its slaughter or finds (*ibid.*). Quantifying faunal material merely aids in identifying the find frequency of specific species and specimens and "*we cannot reconstruct direct counts of ancient stock whatever our method of quantification*" (Amarosi *et al*, 1996: 138). However, this information does help to determine herding practice as well as hunting, gathering and other animal procurement strategies (Hutten, 2005: 83). The general goal is to investigate the behaviour of the "*accumulators*" (Marean *et al*. 2001: 333), i.e. the Ndzundza, and the taphonomic history of the assemblage they accumulated. One must be cautious when equating bone counts with the economic importance of particular species and bear in mind that some animals utilized by past communities may not always leave bone remains – such as insects and the use of animal by-products such as milk, hair and manure.

Archaeozoologists have numerous quantification methods and computer-based programs to aid in quantifying the faunal material. Each method has its strengths and weaknesses. No single technique exists to do everything for every research question on every site (Amarosi *et al*, 1996: 135). Since the faunal samples from the three Ndzundza sites are relatively small, I chose to observe the Ndzundza faunal remains manually and count overlapping features and zones of all the specimens in each limb, animal size or species category to determine:

- Number of Identified Skeletal Parts (NISP);
- Quantifiable Skeletal Parts (QSP);
- and Minimum Number of Individual (MNI) counts.

The observational units (MNI and NISP counts) are "*empirical and easily observed general properties*" (Marean *et al*, 2001: 334) that are experienced with one's senses and directly measured (Lyman, 1994: 37). From these observational units, 'derived units' (QSP counts) are extrapolated, derived units being "*manipulations of observational units that reflect some unobservable property*" (Marean *et al*, 2001: 334). Derived units are, therefore, more complex since they are defined by "*specific mathematical* *relations between fundamental measurements and require analytical decisions in the hope of discovering some hidden pattern within the units measured*" (Lyman, 1994: 37).

4.2.7.1 Number of Identified Skeletal Parts (NISP)

According to Lyman (1994: 38), NISP is defined as the number of identified specimens per taxon. The taxon can be a species, subspecies, genus, family or higher taxonomic category. There has been much confusion over the use and definition of different terms in quantification methods since the development of quantitative terminology in archaeozoological research. Grayson (1984: 16) defined 'specimen' as a bone or tooth fragment and 'element' as a single complete bone or tooth from an animal skeleton. Lyman (1994: 39) concludes that a skeletal element is a "*discrete, natural anatomical unit of a skeleton, such as a humerus, a tibia, a tooth or a carpa*l". Shipman (1981: 200) defined 'distinctive skeletal elements' as skeletal elements that are recognizable even when fragmentary due to distinctive shapes, textures and markings and that the term 'element' is synonymous with 'specimen'. I define NISP as the calculation of the number of identified skeletal parts. Identified skeletal parts being any fragmentary skeletal element, specimen or complete anatomical unit that can be identified to either: Order, Family, genus, species and/or animal size classes. NISP, therefore, represents a simple count of the number of faunal specimens identified for each taxonomic group (Orchard, 2005: 352). NISP counts for the Ndzundza faunal specimens were determined by counting all the identified fragments or complete anatomical units of a particular species present in the sample. The NISP method treats each recorded specimen as a separate entity; hence NISP counts can be calculated at the same time as the basic bone identification is done (Klein and Cruz-Uribe, 1984: 25).

One crucial weakness of NISP estimates is that easily identifiable bone and bone fragments of large mammals such as cattle may be overestimated at the expense of smaller animals whose parts are less easily identifiable because they are more susceptible to destructive taphonomic processes (Marshall and Pilgram, 1993: 262; Baker *et al*, 1997: 309; Manyanga, 2001: 47). Plug's research on sites in Lesotho and Kwazulu Natal and numerous Iron Age sites throughout South Africa has shown that the greater the degree of fragmentation, the less frequently larger animals tend to be identified (Plug 2007: pers.

comm.). For example, a 5 cm long bone shaft fragment of a large bovid can almost never be identified to species whilst a 5 cm shaft fragments from a small bovid, carnivore, hare or tortoise almost always can (*ibid.*). Nonetheless, NISP calculation does not take into account that the skeletons of some species have more skeletal parts than the skeleton of other species (Marshall and Pilgram, 1993: 262). Therefore, NISP counts may exaggerate the abundance of one particular species over another, for example, an animal with 150 skeletal parts may contribute more bone fragments to the sample than an animal with 100 skeletal parts.

4.2.7.2 Minimum Number of Individuals (MNI)

MNI counts gives the smallest number of individuals necessary to account for all the skeletal specimens of a particular species found in the deposit (Baker *et al*, 1997: 311; Reitz and Wing, 1999: 194). MNI counts thus indicate what the absolute lower limit for the original number of individuals may have been at a site (Wild and Nichol, 1983: 344; Orchard, 2005: 352). MNI quantification should, therefore, avoid multiple counting as found with using NISP quantifications (Marshall and Pilgram, 1993: 267). With this technique the researcher’s experience and subjectivity, aided by a suitable reference collection such as I used at Transvaal Museum, is crucial in deciding which bones belong to which animal (Uerpmann, 1973: 311). According to Uerpmann (1973: 311) and Marshall and Pilgram (1993: 262), the smaller the sample size, the more closely this will approach the ‘true minimum number of individuals’. The difference between the number of faunal finds and the minimum number of individuals increases as the size of the samples increase (*ibid.*). However, most faunal samples are a mix of species represented by many individuals and other species represented by few or even single finds. MNI calculations for the various species within the sample are therefore not comparable (Uerpmann, 1973: 311). Furthermore, according to Plug and Plug (1990: 53), the method of calculating MNI counts exaggerates the abundance of species represented by small NISP counts. Small samples produce high MNI counts because “*each bone in small samples carries more weight then the bones in the larger samples*” (Plug, 1988: 78). MNI counts are thus less accurate or at least more variable than other species abundance estimates when quantifying small samples. In addition, MNI estimates may not be comparable among analysts depending on the criteria they used to determine whether particular bones could come from the same animal and the way they treat fragmentary bones. Nonetheless, MNI calculations were done on the Ndzundza sample to be compared with NISP and QSP methods to illustrate the ineffectiveness of MNI calculations on the small samples. To calculate individuals from the Ndzundza sample I used teeth, in addition to post-cranial material.

4.2.7.3 Quantifiable Skeletal Parts (QSP)

Due to the limitations of MNI counts, a more recent quantification method - QSP - is used in order to make species more comparable by compensating for skeletal complexity and fragmentation by assessing the "*relative animal's abundance, the contribution of meat to the diet, skeletal abundance and the relative preservation of the skeletal parts*" (De Wet-Bronner, 1994: 34). With QSP counts it is possible to correct varying skeletal complexity between species or animal classes by dividing the number of skeletal parts retrieved during the excavation by the skeletal parts in the living animal worth quantifying. Bones such as ribs and most of the vertebrae except the atlas and axis that are usually unidentifiable to species and are therefore left out (Plug, 1988: 75). Additionally, since bones are seldom found complete in archaeological excavations the distal and proximal ends of long bones are regarded as separate elements (*ibid.*). This however depends on the nature of the faunal sample and each site may require its own QSP list (*ibid.*; see also O'Connor, 1996). The fragmented nature of the Ndzundza faunal sample compelled me to count the proximal and distal ends of long bones and the phalanges as separate entities. I did not divide them further into lateral and medial entities as most of the fragments were complete in that sense. To calculate the QSP fraction of a particular bovid species such as cattle, the identified bones are counted and then divided with the QSP number of bovids (see Table 5). For example, the KwaMaza B cattle sample consisted of 102 identified bones worth quantifying, this is then divided by the QSP number for bovids, which Table 5 states should be 180. The resultant fraction equals 0.5667 (i.e. 102 ÷ 180 = 0.5667).

Table 5. Calculated bovid QSP number (expected skeletal part[s] number)

Skeletal part	Number	Skeletal part	Number	Skeletal part	Number
occipital	2	pre-maxilla	2	os petrosum	2
hyoid	2	mandible ramus/condyle	2	mandible diastema	2
I1 lower	2	I2 lower	2	I3 lower	2
I4 or canine lower	2	P2/dp2 upper and lower	4	P3/dp3 upper and lower	4
P4/dp4 upper and lower	4	M1 upper and lower	4	M2 upper and lower	4
M3 upper and lower	4	Atlas	1	axis	1
scapula glenoid	2	humerus proximal	2	humerus distal	2
radius proximal	2	radius distal	2	ulna proximal	2
ulna distal	2	radial carpal	2	intermediate carpal	2
ulnar carpal	2	accessory carpal	2	2nd + 3rd carpal	2
4th carpal	2	metacarpal proximal	2	metacarpal distal	2
pelvis acetabulum	2	pelvis ischium	2	pelvis illium	2
pelvis pubis	2	femur proximal	2	femur distal	2
patella	2	tibia proximal	2	tibia distal	2
lateral malleolus	2	sesamoids	24	calcaneum	2
astragalus/talus	2	2nd + 3rd tarsal	2	central + 4th tarsal	2
metatarsal proximal	2	metatarsal distal	2	phalanx 1 proximal	8
phalanx 1 distal	8	phalanx 2 proximal	8	phalanx 2 distal	8
phalanx 3 proximal	8	phalanx 3 distal	8		
Total Ndzundza bovid QSP number calculated to 180 skeletal parts					

The same method is used to establish the QSP list (expected skeletal part[s] numbers) of all the species identified at the Ndzundza sites (see Table 6), which is then used to calculate the QSP fraction of each species, allowing different species and species between different sites to be compared. This comparative process evens out advantages gained by species with relatively more recognizable parts. Differences in species counts then represent differences in the relative abundance of species and not their skeletal complexity (Plug, 1988: 75; Plug, 2007: pers. comm.).

Table 6. QSP numbers established for animals identified at the Ndzundza sites

Animal	QSP number	Animal	QSP Number
bovids	180	shrews	19
primates	260	antbears	216
canids	254	felids	212
mongoose	196	equids	152
rodents	204	lagomorphs	216
hyrax	204	birds	101
tortoise	197	lizards	184
frogs	122	gastropods (1 apex and 1 columella)	2
Bivalves (2 umbo and 2 ventral marging)	4		

4.2.8 Meat contribution

Having calculated the QSP fraction of each species it is also possible to calculate the potential meat contribution of each species to the Ndzundza diet. In other words, this calculation provides me with available meat values and not necessarily the actual quantity of consumed meat. Nonetheless, calculating possible meat contributions greatly assists with interpreting the nutritional importance of particular species to the Ndzundza. The relative meat contribution is calculated by multiplying the QSP fraction (see above; page 67) of a particular species with the meat mass of that species. For example the QSP fraction of cattle, from KwaMaza B, was calculated to 0.5667. This is then multiplied with the meat mass of cattle (as presented in Table 7), being 250 kg. This equals to 141.7 (i.e. 0.5667 x 250 = 141.7). The relative meat contribution of cattle at KwaMaza B is thus calculated to 141.7 kg. These calculations are based on a meat yield of 50 % of an animal's live mass (Plug, 1988: 82). 'Live weight/mass' is defined as the total weight of an animal while alive (Lyman, 1979: 536). Due to the great mass differential between the specimens identified as indeterminate primates, felids, carnivores, mongoose, rodents, lagomorphs, birds and lizards their 50 % live mass could not be established and therefore their meat contribution to the sample can not be determined. The live mass can only be determined if the species is identified.

Table 7. 50 % live meat mass of species, bovid size and animal groups identified from the Ndzundza sites (adapted from Plug, 1988: 90-50; Smithers 2002)

Species, bovid size and family classes	50% live mass (kg)	Species, bovid size and family classes	50% live mass (kg)
Shrew indeterminate	0.01	cf. *Connochaetes taurinus* (blue wildebeest)	100
cf. *Caracal caracal* (caracal)	6.5	*Raphicerus campestris* (steenbok)	5.5
Genetta genetta (small spotted genet)	1.0	cf. *Aepyceros melampus* (impala)	24
Equus sp.	160	*Syncerus caffer* (African buffalo)	390
Capra hircus (goat)	16	*Tragelaphus strepsiceros* (kudu)	97
Ovis aries (sheep)	16	cf. *Tragelaphus oryx* (eland)	290
Ovis/Capra (sheep/goat)	16	cf. *Redunca arundinum* (reedbuck	22
Bos taurus (cattle)	250	Small rodents	0.01
Bov I	10	*Pedetes capensis* (springhare)	1.5
Bov II	16	*Lepus saxatilis* (scrub hare)	1.2
Bov II non-domestic	24	*Gallus domesticus* (chicken)	0.8
Bov III	110	*Pyxicephalus adspersus/ edulis* (bullfrog)	0.3
Bov III non-domestic	100	*Achatina* (giant African land snail)	0.02
Bov IV	390	*Unio caffer* (fresh water mussel)	0.02

In the next chapter (Chapter 5) the results of the identification and quantification methods discussed thus far will be presented in addition to the relative meat contributions calculated for the animals identified from each Ndzundza archaeological site. These results will be interpreted in Chapter 6.

Chapter 5

Results of the Ndzundza KwaMaza, Esikhunjini and KoNomtjarhelo faunal samples

In this chapter, the analysis of the faunal material from all three Ndzundza sites will be presented. The total Ndzundza faunal sample comprises 4833 fragments of which 469 were identified. The results of the four individual sites are presented in Figure 18. Due to the fragmented nature of the sample, 4364 fragments could not be identified to species, animal group or animal size classes. The KwaMaza sites combined contained the largest sample whilst the sample from KoNomtjarhelo was the smallest.

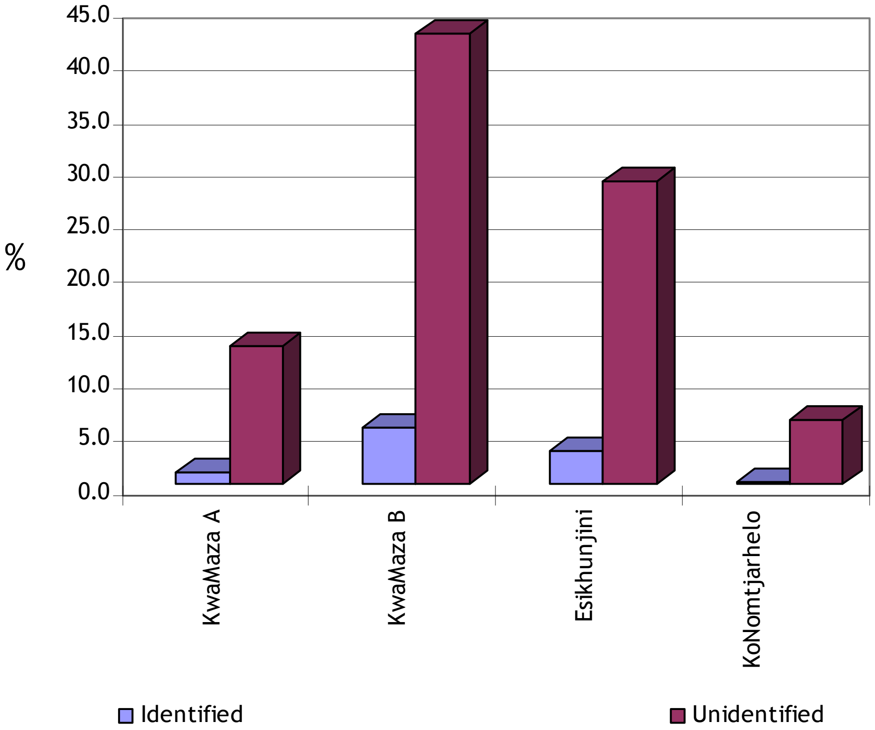


Figure 18. Identified and unidentified percentages of bone fragments from the Ndzundza sites

5.1 KwaMaza

5.1.1 KwaMaza A faunal results

Although Schoeman (1997: 11-12) noted the abundant presence of ash at the middens, which may indicate an alkaline environment that constituted a favourable taphonomy and resultant well-preserved faunal sample, little evidence of ash was visible on the bones. Of the 680 fragments recovered 629 were unidentified. The unidentified sample consists mostly of miscellaneous and bone flake fragments. The identified faunal sample from KwaMaza A consists of 51 fragments and is dominated by 46 bovid fragments. Four species (caracal, sheep/goat, cattle and impala), five bovid size classes (Bov I, Bov II, Bov II non-domestic, Bov III and Bov III non-domestic) and two family classes (felid and equid) were identified (Table 8). All the animals identified are considered to be food contributors on the basis of known Iron Age meat preferences. Visible taphonomy includes six burnt, four gnawed, one cut and seven weathered fragments (see Figure 46; page 112).

Table 8. KwaMaza A: Total faunal sample

Skeletal parts	Numbers based on NISP	Percentages based on NISP *
Identified sample		
Bovid teeth	20	*
Bovid skeletal parts	26	*
Other identified remains	5	*
Unidentified sample		
Enamel fragments	8	1.3
Skull fragments	19	3
Vertebra fragments	3	0.5
Rib fragments	57	9.1
Miscellaneous fragments	331	52.6
Bone flake fragments	211	33.5
Total identified sample	51	7.5
Total unidentified sample	629	92.5

Total sample combined	680	
Mass of identified sample	734.15g	52
Mass of unidentified sample	667.11g	48
Total mass of sample	1401.26g	
Burnt identified fragments	6	*
Burnt unidentified fragments	18	*
Total of sample burnt	24	*

* Due to the small samples recovered at the sites, calculating percentages of less than 100 specimens was not done to ensure the integrity of the statistical analysis and will be indicated in the tables with an asterisk (*)

MNI values (Figure 19) indicate a greater reliance on cattle (7 individuals) than on any other animal. As discussed in Chapter 4 (page 66-67) MNI values tend to overestimate the contribution of the equid and carnivore species in the small sample. When comparing MNI and NISP values (Figure 20) it becomes evident that bovids contributed most of the skeletal parts to the Ndzundza sample at KwaMaza A, i.e. Cattle (20 fragments) and Bov III (12 fragments) dominate the sample. The Bov III sample could be argued to consist mostly of cattle remains though the presence of non-domestic bovid fragments makes this assumption open to debate. The same argument can be made to counter the assumption that the Bov II remains represent sheep/goat.

KwaMaza A QSP percentages (Figure 21) substantiate both the MNI and NISP values with regards to the skeletal part contribution by cattle, followed by Bov III, equids, sheep/goat and Bov II. From the equid sample I could not distinguish between zebra, horse or donkey. Nonetheless, when identifying the equid fragments, being smallish and quite fragmented, they resembled skeletal features more closely related to zebra than to horses. I could not establish this with confidence or eliminate donkey as a possible source.

Table 9. Species, size and family classes identified at KwaMaza A

Species, size and family classes	NISP	QSP	MNI	MASS(g)	Teeth			Skeletal Part				
					D	U	P	C	P-C	SCF	SAC	O
cf. *Caracal caracal* (caracal)	1	0.0094	1	1.33					1			
Felidae sp. indeterminate	2	0.0094	1	4.47					2			
Equus sp.	2	0.0197	1	111.71					1			
Ovis/*Capra* (sheep/goat)	3	0.0167	2	8.25			2		1			
Bos taurus (cattle)	20	0.1056	7	371.21	2		14		4			
Bov I	1	0.0056	1	1.04					1			
Bov II	4	0.0167	1	5.28			1		3			
Bov II non-domestic	1	0.0111	1	0.64					1			
Bov III	12	0.0333	2	149.5			1		11			
Bov III non-domestic	3	0.0111	1	51.06					3			
cf. *Aepyceros melampus* (impala)	2	0.0111	1	20.66					2			
Total	51	0.2497	19	734.15	2		18		31			

D = deciduous; U = unerupted; P = permanent; P-C = post-cranial; SCF = shell/carapace fragments; O = other

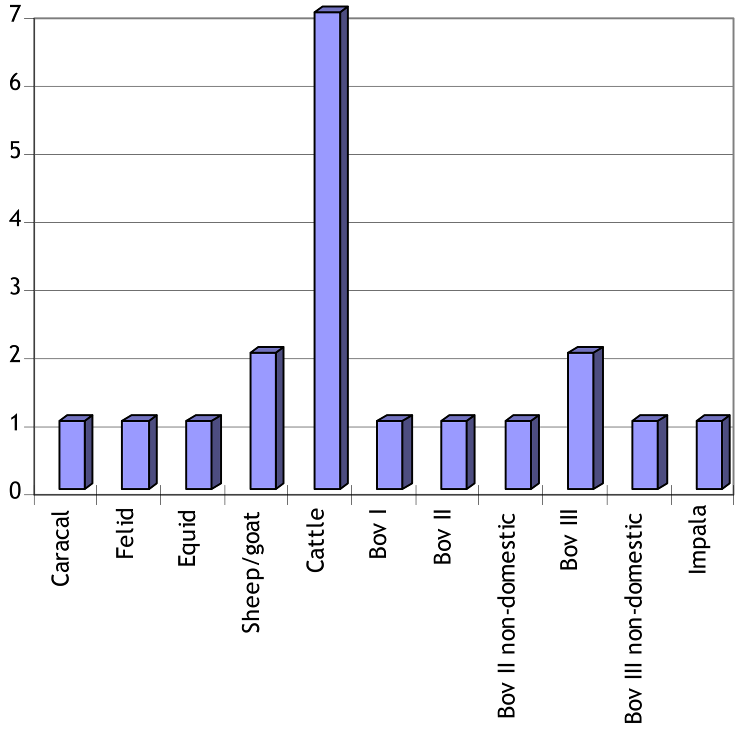


Figure 19. KwaMaza A: Minimum Number of identified animals (MNI)

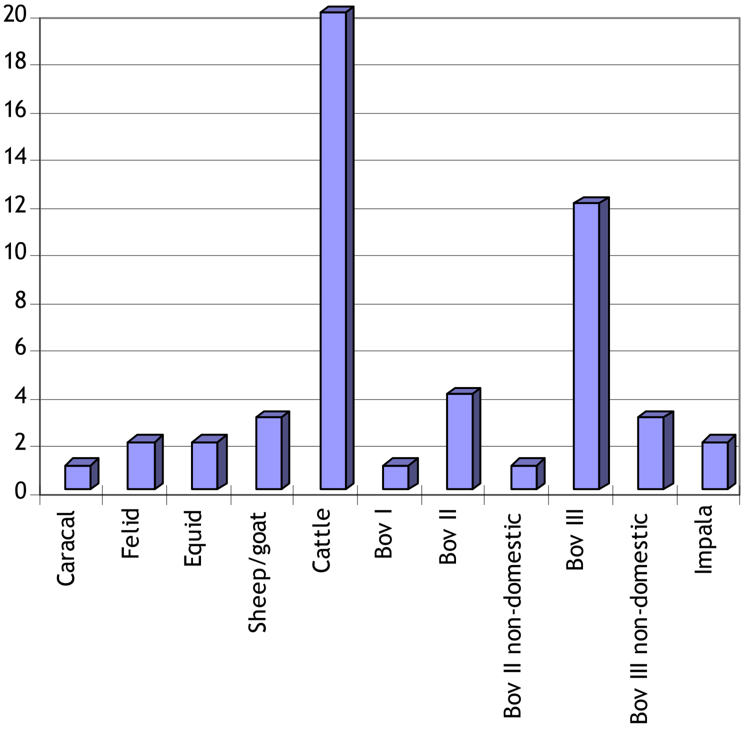


Figure 20. KwaMaza A: Number of Identified Specimens (NISP)

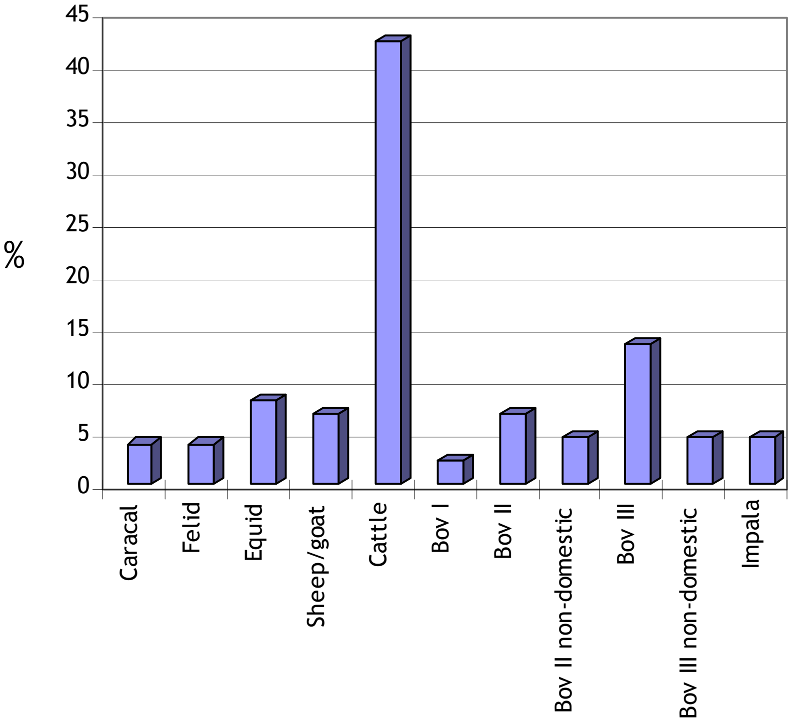


Figure 21. KwaMaza A: QSP percentages of identified animals

Due to the small sample size, the skeletal part distribution is given for bovids only. Note that all figures presenting skeletal parts distributions are based on QSP numbers from each species (see Table 6: page 69). The skeletal part distribution of KwaMaza A (Figure 22) indicates that the sample is dominated by cattle teeth followed by cattle pelvis fragments, sheep/goat teeth, Bov II pelvis fragments, Bov III proximal femur fragments and non-domestic bovid calcaneum fragments. One must keep in mind that bovids generally have 32 teeth, 24 sesamoids, 12 carpals and eight each of the three phalanges. In contrast, there are only two proximal and two distal ends of all long bones. Long bone shafts (mid shaft fragments) could not be used in quantification due to the very fragmented nature of the Ndzundza sample. To correct for skeletal part numbers, I divided the number of identified specimens of each skeletal part with the expected equivalent of that part. For example, from the KwaMaza A sample, 15 cattle teeth were identified. Based on the expected number of bovid teeth being 32 (see Chapter 4: page 68), I divided the 15 teeth specimens with the expected number of cattle teeth. This equalled to 0.47 (i.e. 15 ÷ 32 = 0.47). The same procedure was followed with the remaining bovid specimens from KwaMaza A, the results of this is presented in Figure 23.

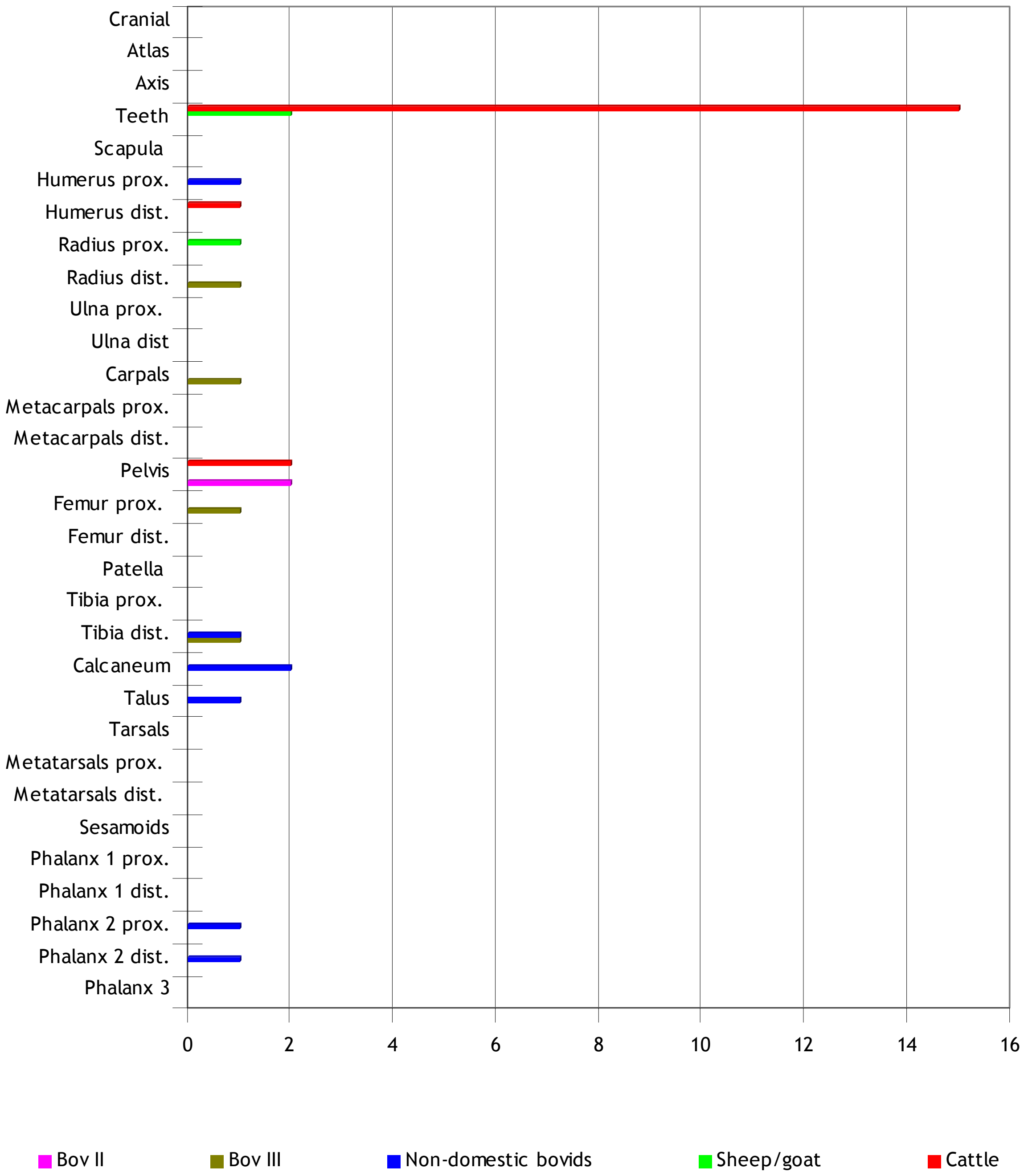


Figure 22. KwaMaza A: Bovid skeletal part representation based on QSP numbers (not corrected for expected values)

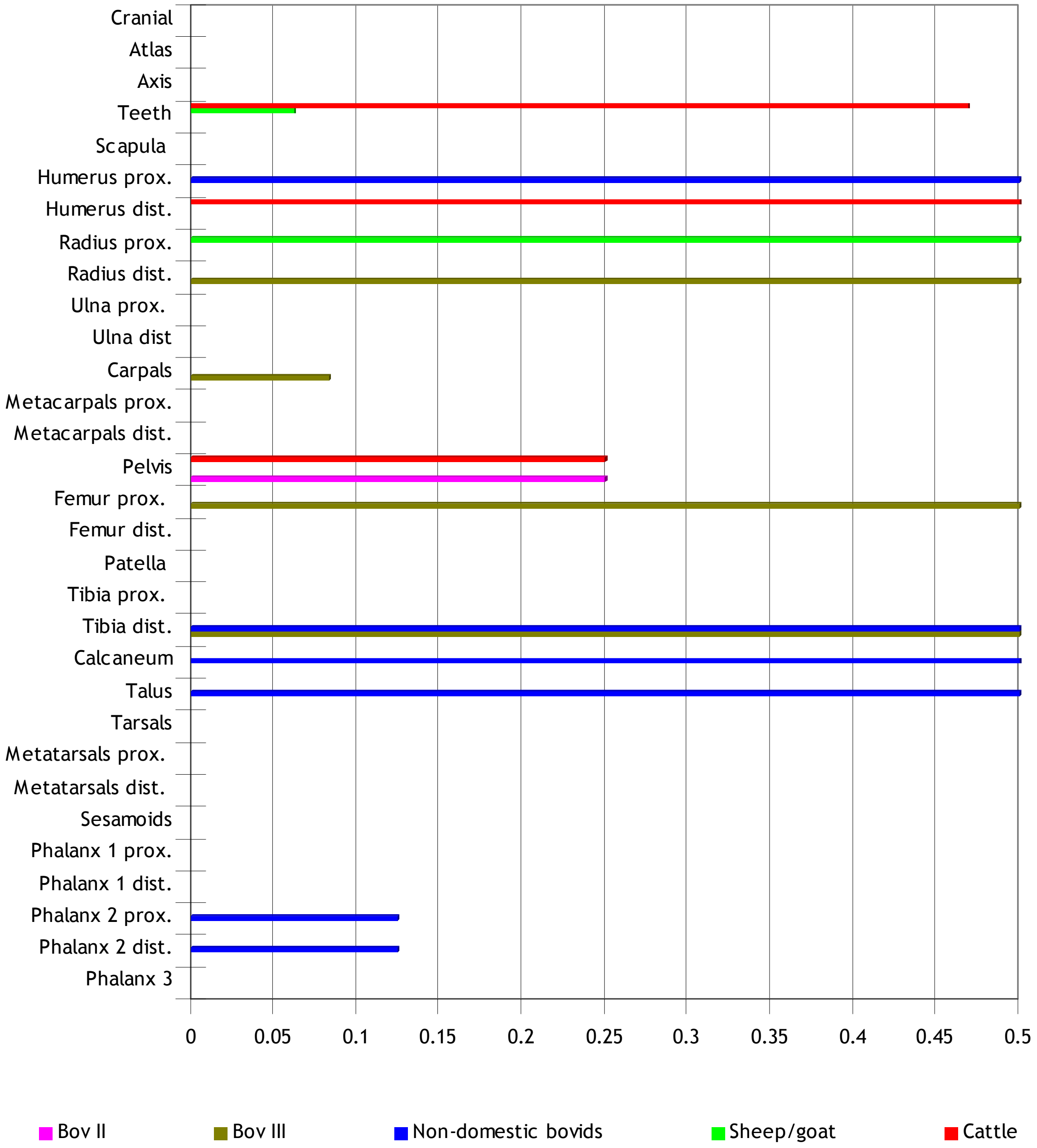


Figure 23. KwaMaza A: Bovid skeletal part representation based on QSP numbers (corrected for expected values)

When comparing different skeletal parts with one another this method proved crucial for removing biases against skeletal parts small in number such as humerus fragments (i.e. two proximal and two distal fragments) against skeletal parts such as teeth (i.e. 32). According to Figure 21, Bov III proximal femur and non-domestic calcaneum ('foot bone') fragments contributed most to the sample followed by cattle teeth, Bov III distal radial, non-domestic proximal humerus, distal tibia and talus fragments, cattle distal humerus, pelvis and sheep/goat proximal radius and teeth fragments.

The calculated meat contribution of the animals identified (Table 9) indicates that cattle contributed the most followed by Bov III and equids, non-domestic bovids and caracals. The age profile of the KwaMaza A bovid sample is based on teeth (Table 10) as no unfused skeletal material was recovered. The sheep/goat sample includes both juvenile and sub adult individuals each represented by a single tooth. Although juvenile individuals were identified from the cattle sample, there seems to be more sub adult (Class IV), adult (Class VII) and mature (Class VIII) individuals. Regrettably, none of the fragments in the faunal sample could be used to establish sex ratios.

Table 10. Calculated meat contribution of animals identified at KwaMaza A

Species, size and family classes	**QSP**	**Meat mass contribution (kg)**
cf. *Caracal caracal* (caracal)	0.0094	0.1
Equus sp.	0.0197	3.2
Ovis/*Capra* (sheep/goat)	0.0167	0.3
Bos taurus (cattle)	0.1056	26.4
Bov I	0.0056	0.1
Bov II	0.0167	0.3
Bov II non-domestic	0.0111	0.3
Bov III	0.0333	3.7
Bov III non-domestic	0.0111	1.1
cf. *Aepyceros melampus* (impala)	0.0111	0.3
Total	0.2497	35.8

Table 11. KwaMaza A: Age profile of bovids based on tooth wear and eruption

Species			I1	I2	I3	I4	P2	dp2	P3	dp3	P4	dp4	M1	M2	M3
Sheep/goat	Juvenile	Class III												1	
	Sub adult	Class IV							1						
Cattle	Juvenile	Class II											1	1	
		Class III												1	
	Sub adult	**Class IV**							1	**2**			1		
		Class V							1						
	Adult	Class VI												1	
		Class VII											**3**		
	Mature	**Class VIII**											**3**		

5.1.2 KwaMaza B faunal results

The faunal sample from KwaMaza B comprises 77.2% of the total KwaMaza sample (Figure 24). From the 2313 fragments recovered 2055 were unidentified (Table 11). The majority of the unidentified sample consists of miscellaneous and bone flake (12.8%) fragments. Taphonomy visible on the unidentified sample included 139 burnt, three weathered and two damaged fragments due to butchering activities, specifically cut and chop marks. The identified remains from KwaMaza B consist mostly of well-preserved large fragments dominated by bovid specimens. Nine taxa (genet, mongoose, sheep, sheep/goat, cattle, impala, buffalo, eland and *Achatina*), five bovid size classes (Bov II, Bov II non-domestic, Bov III, Bov III non-domestic and Bov IV) and seven family classes (shrew, felid, carnivore, equid, rodent, lagomorph and lizard) were identified (Table 12).

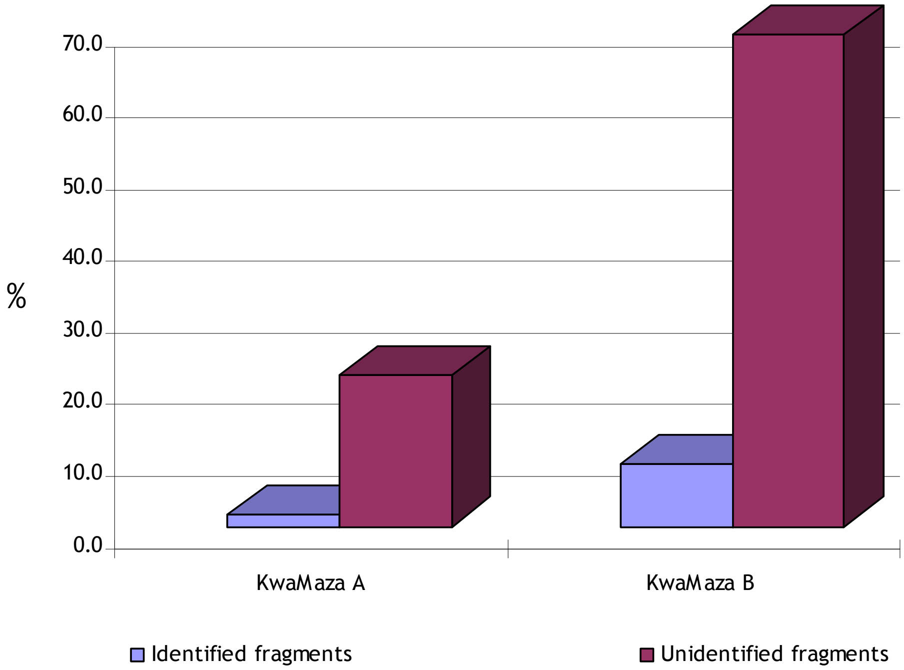


Figure 24. KwaMaza A and KwaMaza B identified and unidentified bone fragment percentages

Table 12. KwaMaza B: Total faunal sample

Skeletal parts	Numbers based on NISP	Percentages based on NISP
Identified sample		
Bovid teeth	59	22.9
Bovid skeletal parts	187	72.5
Other identified remains	12	4.7
Unidentified sample		
Enamel fragments	35	1.7
Skull fragments	147	7.2
Vertebra fragments	30	1.5
Rib fragments	262	12.7
Miscellaneous fragments	1317	64.1
Bone flake fragments	264	12.8
Total identified sample	258	11.2
Total unidentified sample	2055	88.9

Total sample combined	2313	
Mass of identified sample	7244.34g	70
Mass of unidentified sample	3108.87g	30
Total mass of sample	10353.21g	
Burnt identified fragments	6	2 of identified sample
Burnt unidentified fragments	193	9 of unidentified sample
Total of sample burnt	199	8.6

Table 13. Species, size and family classes identified at KwaMaza B

Species, size and family classes	NISP	QSP	MNI	MASS(g)	Teeth			Skeletal Part				
					D	U	P	C	P-C	SCF	SAC	O
Shrew indeterminate	1	0.0051	1	0.08				1				
Genetta genetta (small spotted genet)	1	0.0047	1	0.44					1			
Felidae sp. indeterminate	1	0.0047	1	0.98					1			
Mongoose	1	0.0102	1	0.44					1			
Carnivore indeterminate	1	0.004	1	1					1			
Equus sp.	1	0.0066	1	83.18					1			
Ovis aries (sheep)	20	0.1222	4	89.69	5		7	3	5			
Ovis/capra (sheep/goat)	22	0.1167	3	64.2	10		4	4	4			
Bos taurus (cattle)	121	0.5667	5	5550.37	1		20	25	75			
Bov II	20	0.667	2	83.18	1		2	2	15			
Bov II non-domestic	3	0.0333	1	5.74					3			
Bov III	40	0.0667	2	668.65	1		2	2	35			
Bov III non-domestic	5	0.0167	2	73.28					5			
Bov IV	1	0.0056	1	159.3					1			
cf. *Aepyceros melampus* (impala)	9	0.0444	2	65.78	3		3	1	2			
Syncerus caffer (African buffalo)	1	0.0056	1	14.11					1			
cf. *Tragelaphus oryx* (eland)	3	0.0111	1	382.46					3			
Small rodent	2	0.1078	1	1.07				1	1			
Lagomorph	1	0.0093	1	0.25					1			
Lizard	1	0.0054	1	0.06				1				
Achatina (giant African land snail)	1	1	1	0.04							1	

Unio caffer (freshwater mussel)	1	1	1	0.04							1	
Total	257	3.2188	35	7244.34	21		38	40	156		2	

D = deciduous; U = unerupted; P = permanent; P-C = post-cranial; SCF = shell/carapace fragments; O = other

The lizard, small rodents, shrew and two mollusc remains are equivocal and may not represent food remains. All other identified specimens are considered to be food contributors. Of the identified sample, 12 bone fragments have cut marks whilst five fragments have chop marks, six fragments are burnt and rodent damage is visible on two fragments. Two fragments have visible pathological lesions. The first such fragment is from midden 1, level 0 – 10 cm, and consists of one cattle (*Bos taurus*) left maxilla fragment with displacement of P4 (Figure 25) - possibly due to injury in early life (Plug, 2007: pers. comm.). The tooth (P4) was already formed when the injury occurred.

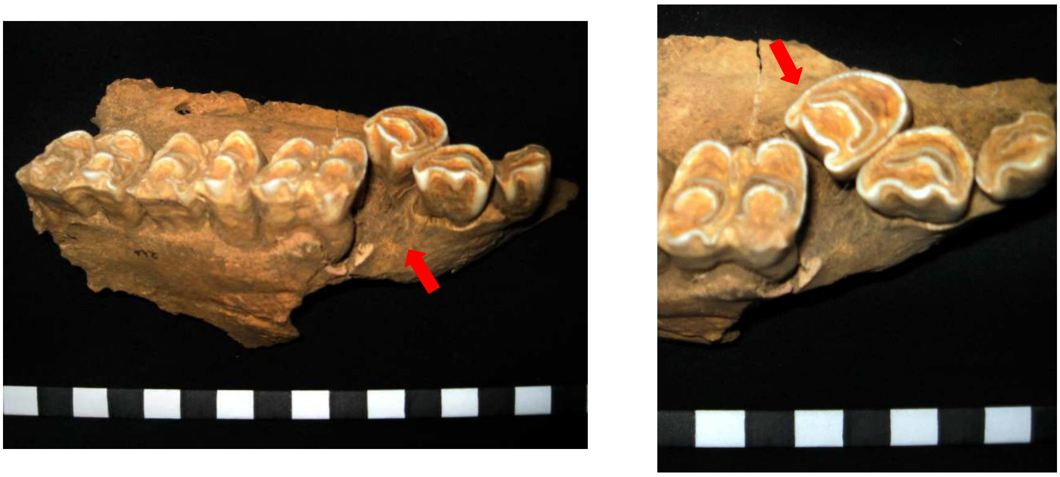


Figure 25. Cattle left maxilla fragment with P2, P3 and displaced P4 (red arrow), M1, M2 and M3 (scale in cm)

The second fragment is a cattle (*Bos taurus*) lower left M1 tooth from midden 1, level 20 – 30 cm, and exhibits evidence of possible periodontal disease and abscessed tissue around the roots leading to a granular surface in response to bacterial interaction (Figure 26; Plug, 2007: pers. comm.). Periodontal disease refers to inflammation of the gum margin beside the tooth - also known as gingivitis. This condition could, if left untreated, spread to the bone at the crest of the tooth socket leading to re-absorption of the bone and eventual bone and tooth loss (Miles and Grigson, 1990: 521-522).

Figure 26. Cattle lower left M1 tooth with deformed roots (red arrow) possibly due to periodontal disease (scale in cm)

The MNI numbers from KwaMaza B (Figure 27) indicate five cattle, four sheep and three sheep/goat as well as non-domesticated individuals such as lagomorphs, mongoose, equids, carnivores, rodents and lizards. Comparing MNI numbers with NISP values (Figure 28) indicate that cattle contributed the most skeletal parts to the sample followed by Bov III, sheep/goat, Bov II, sheep and impala, with equids, lagomorphs, carnivores, mongoose and lizards contributing equally to the sample.

QSP percentages (Figure 29) of all the animals identified indicate that cattle, sheep and sheep/goat were the largest contributors to the faunal sample. Molluscs however, appear to be a large food contributor. One must keep in mind that the molluscs recovered from KwaMaza B were complete and easily identified. The QSP number of two (Chapter 4, page 68) and QSP percentage is formally correct, but grossly overestimates their element contribution to the sample. In view of this methodological bias I chose to remove the mollusc value from QSP quantification and the corrected results are present in Figure 30, which confirm the dominance of cattle, sheep and sheep/goat elements, in addition to a relatively high number of small rodent skeletal parts.

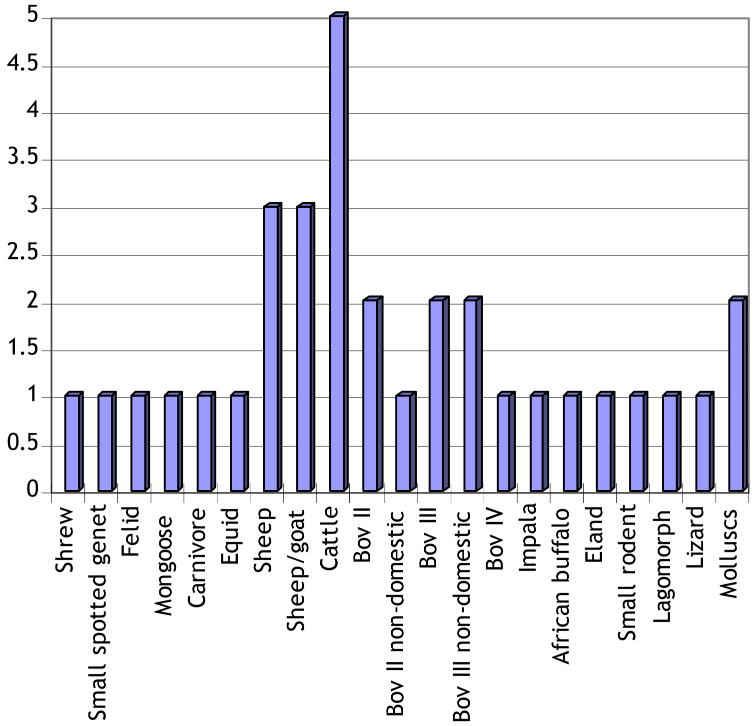


Figure 27. KwaMaza B: Minimum Number of animals identified (MNI)

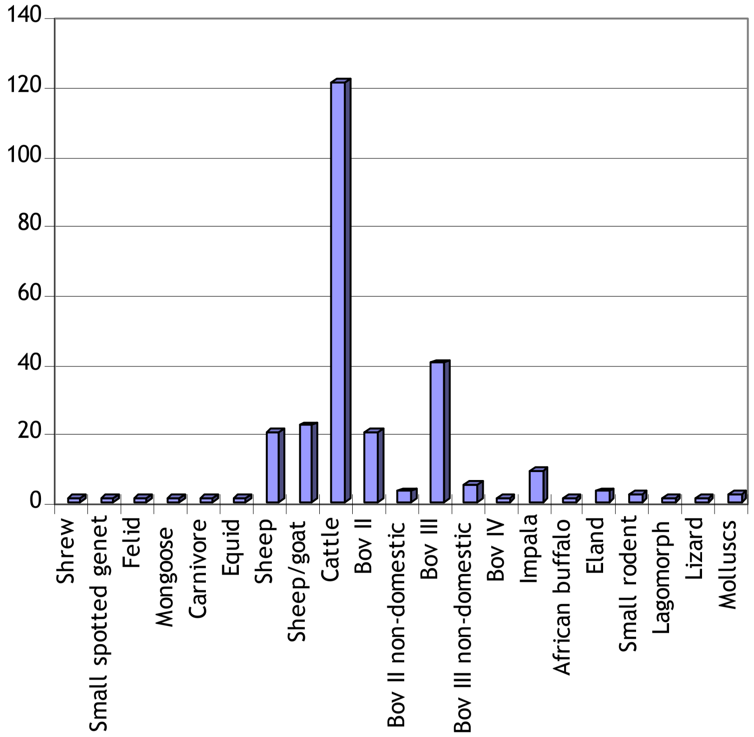


Figure 28. KwaMaza B: Number of identified skeletal parts (NISP)

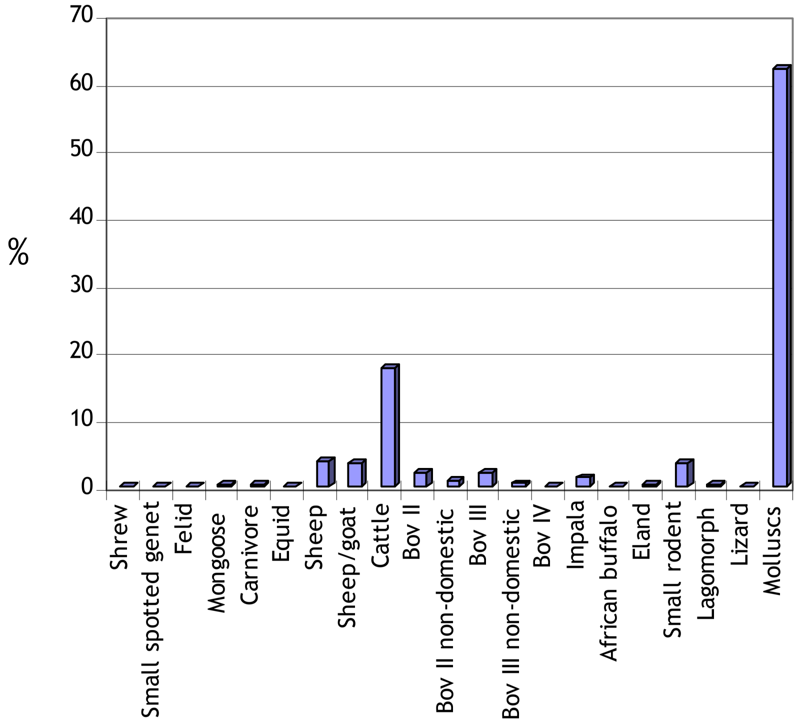


Figure 29. KwaMaza B: QSP percentages of identified animals, including molluscs

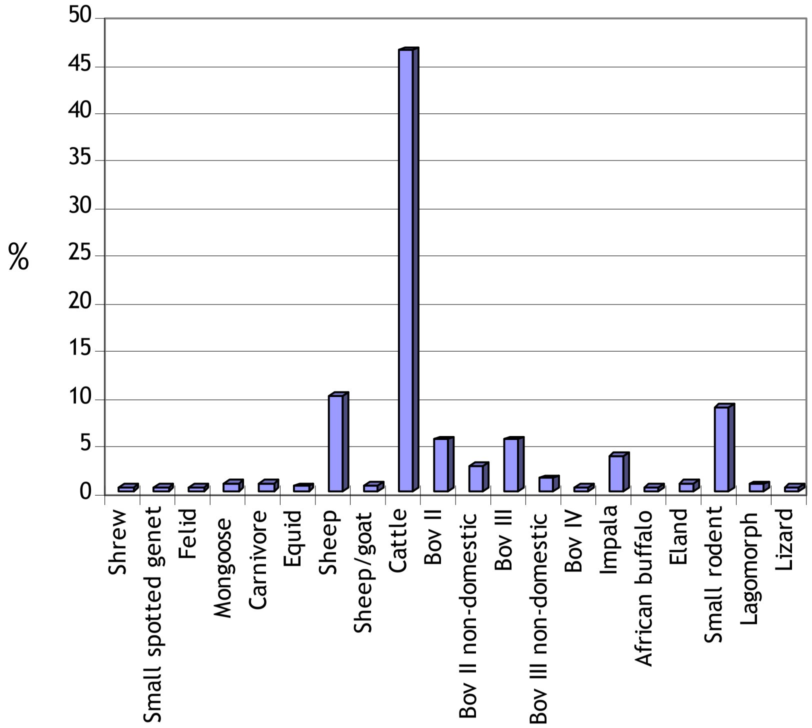


Figure 30. KwaMaza B: QSP percentage of identified animals, excluding molluscs

The bovid skeletal part distribution (Figure 31) for KwaMaza B was calculated for bovids only due to the small sample size and then corrected for the expected values (Figure 32). Figure 31 indicates that cattle teeth, cranial, proximal radius, carpal, proximal metatarsal and proximal and distal phalanx 1 fragments contributed most to the sample. The next most numerous contributors were sheep/goat and non-domestic bovid teeth. Figure 32, corrected for the expected values, confirm the dominance of cattle teeth, cranial, proximal humerus, proximal radius, proximal and distal tibia, proximal metacarpals, calcaneum, talus and proximal metatarsal fragments. The next greatest value is represented by Bov III distal metacarpal fragments; then Bov II proximal metacarpal fragments, and finally sheep carpals and sheep/goat teeth, non-domestic bovid distal humerus and scapula fragments.

The calculated meat contribution of the animals identified at KwaMaza B indicates cattle contributed most followed by Bov II, Bov III, eland, buffalo, Bov IV, equids, sheep, Bov III non-domestic animals, Bov II non-domestic, molluscs, shrews and small rodents (Table 13). Age estimates of the bovid sample indicate the presence of Bov II sub-adult (Class IV) and mature (Class V) individuals (Table 14). Bov III individuals are represented by sub-adult (Class V) individuals. The sheep/goat sample shows a preference for juvenile (Class III) individuals in addition to sub-adult (Class IV) individuals. Sheep are represented by both juvenile and sub-adult specimens. The cattle sample show a preference for sub-adults (Class V) but is also represented by adult (Class VI and VII) and mature (Class VIII) individuals. The non-domestic bovid sample consists of impala juvenile (Class II and III) individuals. Due to the fragmented nature of the faunal sample, no skeletal elements were identified to allow sex determination.

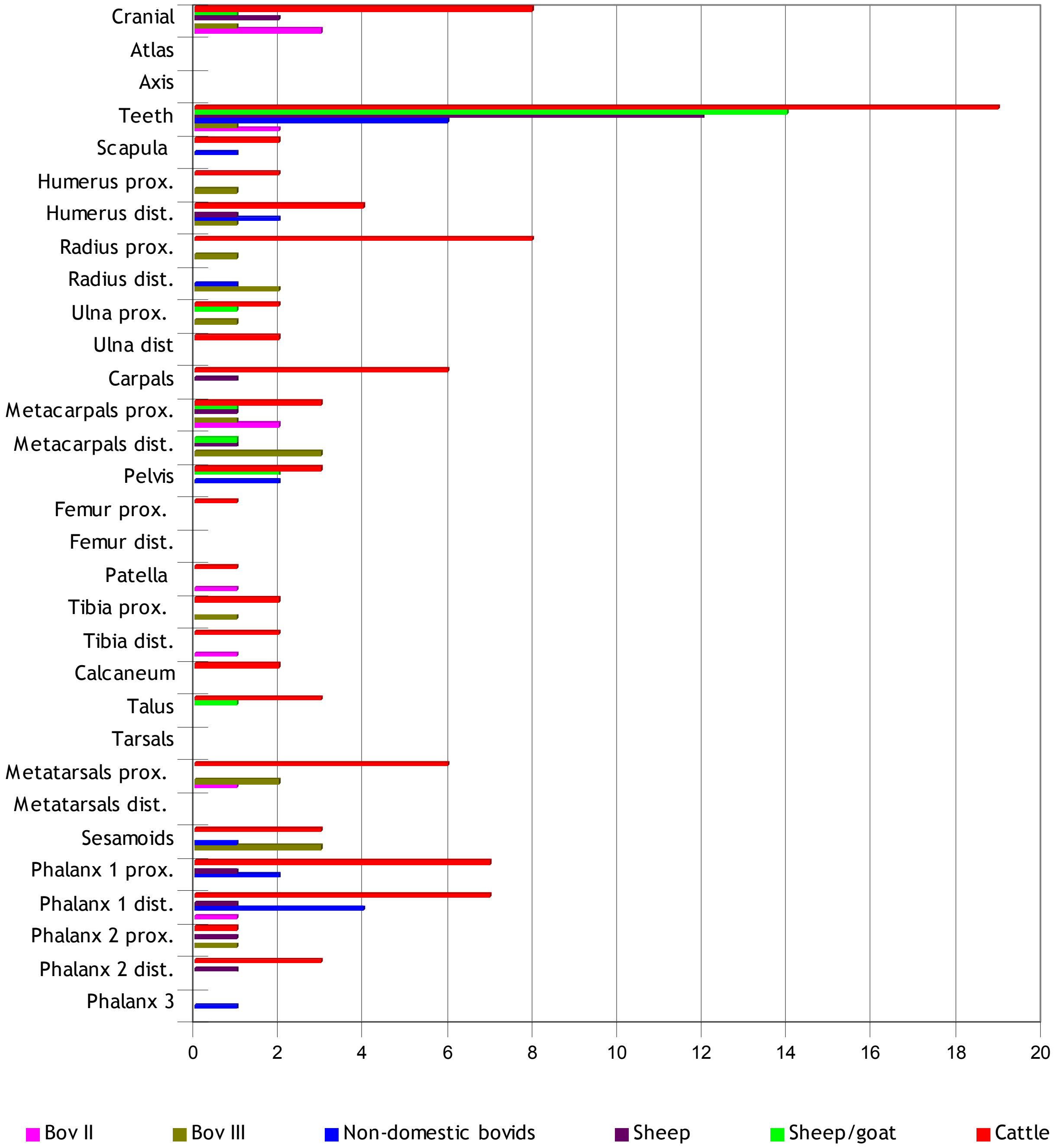


Figure 31. KwaMaza B: Bovid skeletal part representation based on QSP numbers (not corrected for expected values)

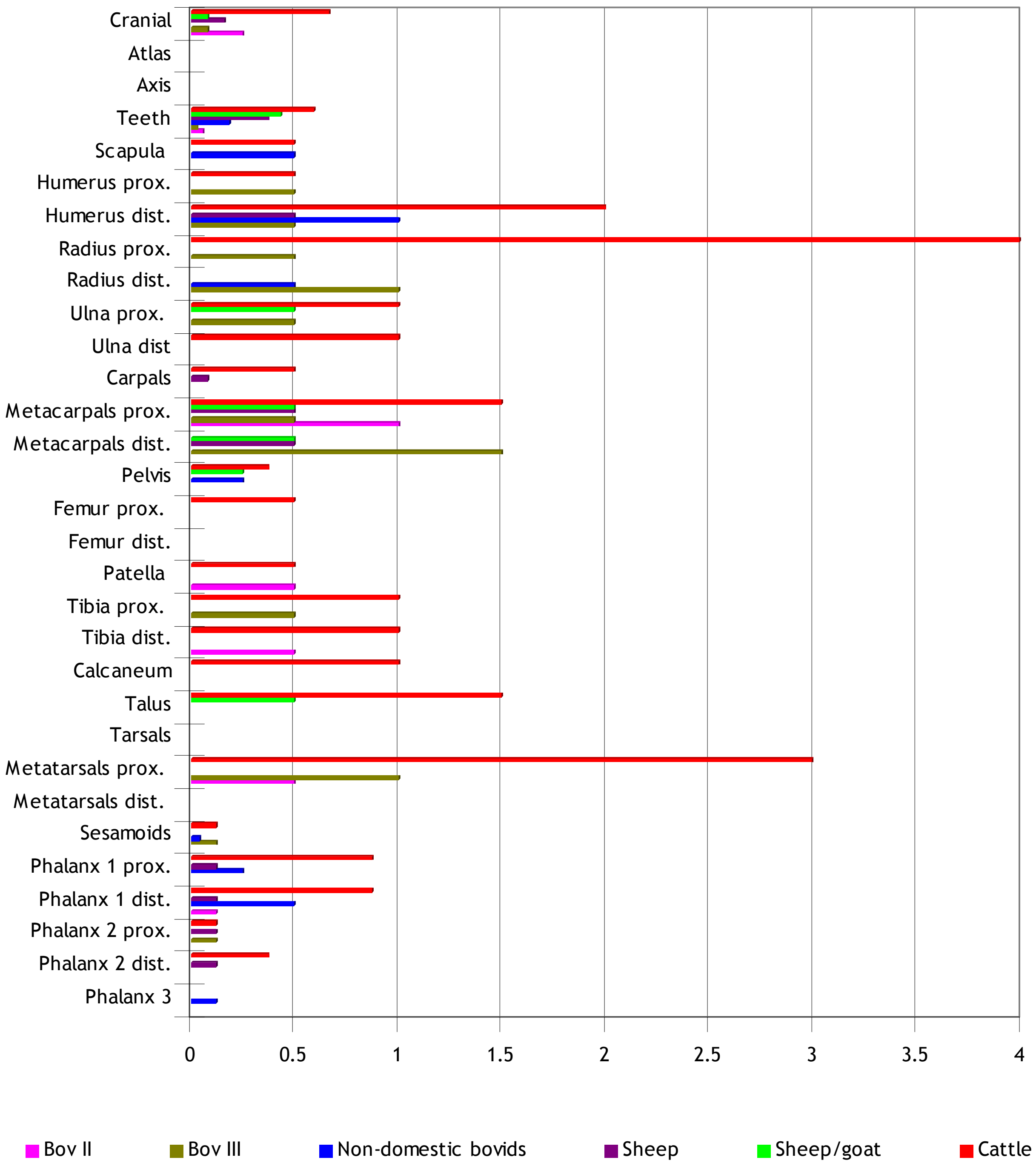


Figure 32. KwaMaza B: Bovid skeletal part representation based on QSP numbers (corrected for expected values)

Table 14. Calculated meat contribution at KwaMaza B

Species, size and family classes	QSP	Meat mass contribution (kg)
Shrew indeterminate	0.0051	0.0001
Genetta genetta (small spotted genet)	0.0047	0.01
Equus sp.	0.0066	1.1
Ovis aries (sheep)	0.1222	0.11
Ovis/capra (sheep/goat)	0.1167	1.9
Bos taurus (cattle)	0.5667	141.7
Bov II	0.667	10.7
Bov II non-domestic	0.0333	0.8
Bov III	0.0667	7.34
Bov III non-domestic	0.0167	1.7
Bov IV	0.0056	2.2
cf. *Aepyceros melampus* (impala)	0.0444	1.1
Syncerus caffer (African buffalo)	0.0056	2.2
cf. *Tragelaphus oryx* (eland)	0.0111	3.22
Small rodent	0.1078	0.0011
Achatina (giant African land snail)	1	0.02
Unio caffer (freshwater mussel)	1	0.02
Total	3.2188	174

Table 15. KwaMaza B: Age profile of bovids based on tooth wear and eruption

Species			I1	I2	I3	I4	P2	Dp2	P3	Dp3	P4	Dp4	M1	M2	M3
Bov II	Sub adult	Class IV										1			
	Mature	Class V					1								
Bov III	Sub adults	Class IV								1					
Sheep/goat	Juvenile	**Class III**						**2**		**3**		**2**			**2**
	Sub adult	Class IV					1		1			1	1	1	
Sheep	Juvenile	Class II						1		1		1	1	1	
		Class III								1		1	1	1	1

	Sub adult	Class IV								1		1	1	1	1
		Class V					1								
Cattle	Sub adult	Class IV								1		1	1		
		Class V	**1**	**3**				**2**							
	Adult	Class VI											1		
		Class VII					1		1		1		1	1	1
	Mature	Class VIII											1		
Impala	Juvenile	Class II						1		1		1	1	1	
		Class III	**1**												

5.2 Esikhunjini faunal results

The faunal sample retrieved from Esikhunjini consists of 1535 fragments of which 1386 were unidentified (Table 15). The unidentifiable sample consists mostly of miscellaneous and bone flake fragments. Two fragments have visible butchering damage, three fragments have gnaw marks and 418 fragments are burnt. From the identified remains 16 species (human, antbear, sheep, sheep/goat, cattle, wildebeest, steenbok, impala, kudu, eland, reedbuck, springhare, scrub hare, chicken, bullfrog and the giant African land snail), five bovid size classes (Bov I, Bov II, Bov II non-domestic, Bov III, Bov IV) and seven animal family classes (primate, felid, equid, rodent and small rodent, Lagamorph and bird) were identified (Table 16). The identified faunal material, although very fragmented, is in a good condition with very few burnt remains (Figure 46; page 112).

Table 16. Esikhunjini: Total faunal sample

Skeletal parts	Numbers based on NISP	Percentages based on NISP
Identified sample		
Bovid teeth	52	34.9
Bovid skeletal parts	78	52.3
Other identified remains	19	12.8
Unidentified sample		

Enamel fragments	47	3.4
Skull fragments	31	2.2
Vertebra fragments	17	1.2
Rib fragments	72	5.2
Miscellaneous fragments	1063	76.7
Bone flake fragments	156	11.3
Total identified sample	149	10
Total unidentified sample	1386	90
Total sample combined	1535	
Mass of identified sample	1187.14g	57
Mass of unidentified sample	906.91g	43
Total mass of sample	2094.05g	
Burnt identified fragments	33	22 of identified sample
Burnt unidentified fragments	418	30 of unidentified sample
Total of sample burnt	451	30

Table 17. Species, size and family classes identified at Esikhunjini

Species, size and family classes	NISP	QSP	MNI	MASS(g)	Teeth			Skeletal Part				
					D	U	P	C	P-C	SCF	SAC	O
Homo sapiens sapiens (human)	1	0.004	1	0.36				1				
Primate	1	0.0038	1	2.23					1			
cf. *Orycteropus afer* (antbear)	1	0.0046	1	3.27					1			
Felidae sp. indent	2	0.0047	1	8.09					2			
Equus sp.	3	0.0132	1	21.95			2		1			
Ovis aries (sheep)	9	0.0889	4	35.11			8	1				
Ovis/capra (sheep/goat)	34	0.1778	5	105.08	1		28	1	4			
Bos taurus (cattle)	5	0.0278	1	337.63	2		1		2			
Bov I	18	0.0611	3	38.52			4	1	13			
Bov II	42	0.1444	3	191.38			7	1	34			
Bov II non-domestic	3	0.0167	1	15.04					3			
Bov III	4	0.0167	1	48.61					4			
Bov IV	4	0.0222	1	66.73				1	3			
cf. *Connochaetes taurinus* (blue wildebeest)	1	0.0056	1	13.84					1			
Raphicerus campestris (steenbok)	1	0.0056	1	0.27			1					
cf. *Aepyceros melampus* (impala)	2	0.0111	1	36.01					2			
Tragelaphus strepsiceros (kudu)	1	0.0111	1	8.81					1			
cf. *Tragelaphus oryx* (eland)	2	0.0167	1	188.74					2			
cf. *Redunca arundinum* (reedbuck)	3	0.0167	1	60.83					3			
Rodent indeterminate	1	0.0049	1	0.64					1			
Small rodent	2	0.001	1	0.42				1	1			
Pedetes capensis (springhare)	1	0.0093	1	0.43					1			

Lepus saxatilis (scrub hare)	1	0.0139	1	0.48					1			
Lagomorph	2	0.0093	1	0.98					2			
Gallus domesticus (chicken)	2	0.0297	1	0.34					2			
Bird indeterminate	1	0.0198	1	0.44					1			
Pyxicephalus adspersus / edulis (bullfrog)	1	0.0082	1	0.08					1			
Achatina (giant African land snail)	1	1	1	0.47							1	
Total	149	1.7486	39	1187.14	3		51	7	87		1	

D = deciduous; U = unerupted; P = permanent; P-C = post-cranial; SCF = shell/carapace fragments; O = other

From the identified sample, rodent gnawing is visible on seven fragments and carnivore gnawing on five fragments. Three fragments have cut marks and one fragment has chop marks. Five fragments are weathered and one fragment has signs of pathology - from midden 1, level 20 – 30 cm, an eland's phalanx 1 was recovered with evidence of extra bone growth on the distal end, possibly caused by abscessed tissue (Figure 33; Plug, 2007: pers. comm.).

Figure 33. Eland phalanx 1 with evidence extra bone growth (nodules; red arrow) as a result of abscessed tissue (scale in cm)

According to MNI numbers (Figure 34), five sheep/goat, three Bov I and Bov II individuals, four sheep and one individual each of the remaining species were identified. MNI calculation again over-estimated the importance of species with small NISP values i.e. the human, frog, antbear, primate, mollusc, rodent, lagomorph and some of the bovid remains. NISP values (Figure 35) indicate that bovids contributed most to the sample, with Bov II species dominating the sample. The Bov II specimens can belong to either domestic or non-domestic bovids, the number of sheep/goats however may well indicate that most of the Bov II sample belongs to domesticated sheep or goats.

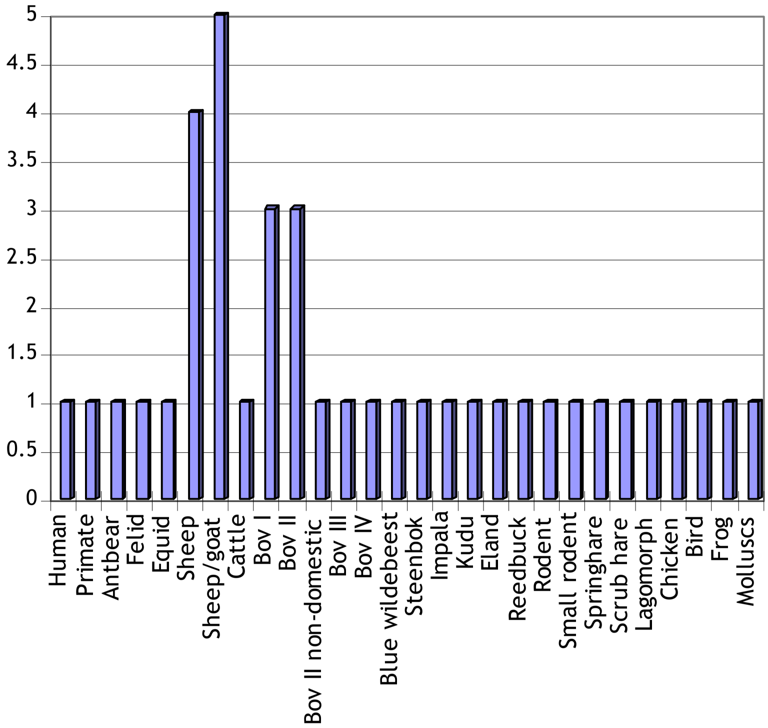


Figure 34. Esikhunjini: Minimum Number of identified animals (MNI)

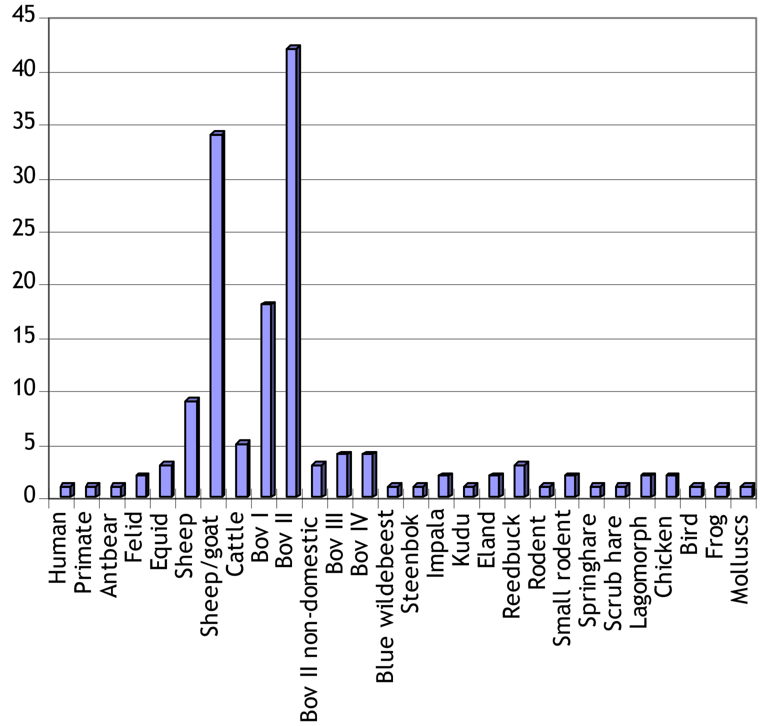


Figure 35. Esikhunjini: Number of identified skeletal parts (NISP)

Esikhunjini QSP percentages (Figure 36 and 37) confirm the dominant contribution of sheep/goat elements to the sample. I have included the mollusc value in Figure 36 to illustrate the QSP tendency to over-estimate a small, identifiable animal's element contribution to the faunal sample. In Figure 37 I omitted the mollusc sample and the human specimen. I do not believe that one human molar provides enough evidence to the possibility of cannibalism amongst the Ndzundza. I am aware of reports of cannibalism in Lesotho during a similar period and similarly stressful conditions that included starvation as a result of war and social disruption (Mofolo, 1981: 137; see also Coplan 1994: 1-3). However, there are no recorded or inferred instances of cannibalism among or by the Ndzundza. Figure 37 illustrates that sheep/goat and Bov II contributed most to the faunal sample followed by sheep, Bov I, cattle, Bov IV and the remaining non-domesticated bovids, small rodents, chicken and birds.

The skeletal part distribution numbers not corrected for expected values (Figure 38) indicate the dominance of sheep/goat and cattle teeth in the sample. Figure 39, corrected for expected skeletal elements, indicate that the Esikhunjini bovid sample consists mostly of Bov II distal humerus and scapula fragments followed by sheep/goat teeth fragments and non-domestic bovid distal humerus proximal and distal radius, proximal and distal tibia, talus, proximal metatarsal and phalanx 1 proximal and distal fragments.

The calculated meat contribution for the animals identified indicate that Bov IV contributed the most meat followed by cattle, eland, Bov II, sheep/goat, equids, Bov III, sheep, kudu. Bov I, Bov II non-domestic, steenbok, impala, blue wildebeest, reedbuck, scrub hare, springhare, chicken, antbear, small rodents and bullfrog (Table 17).

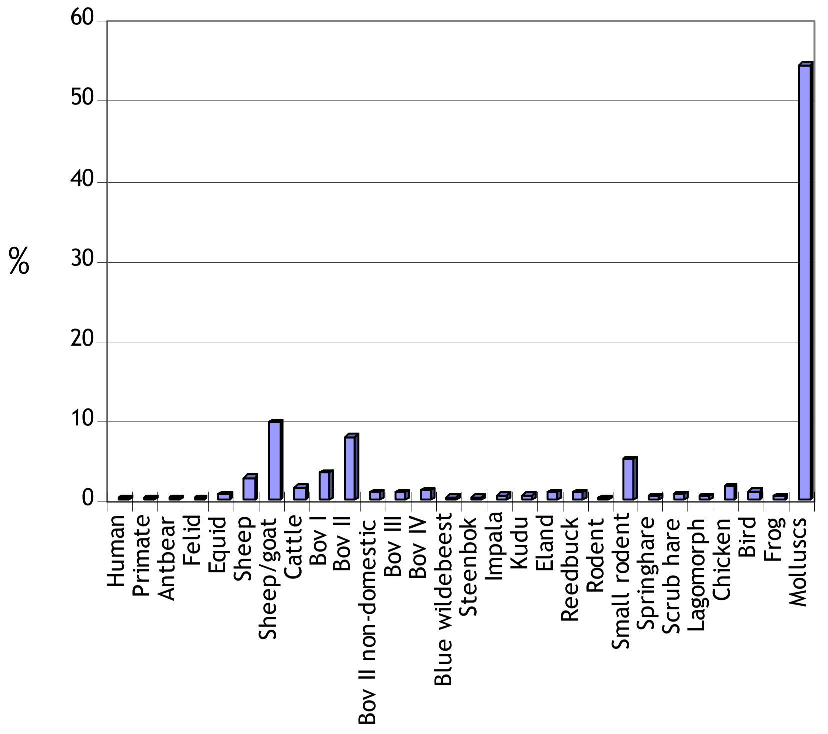


Figure 36. Esikhunjini: QSP percentages of identified animals including human and mollusc value

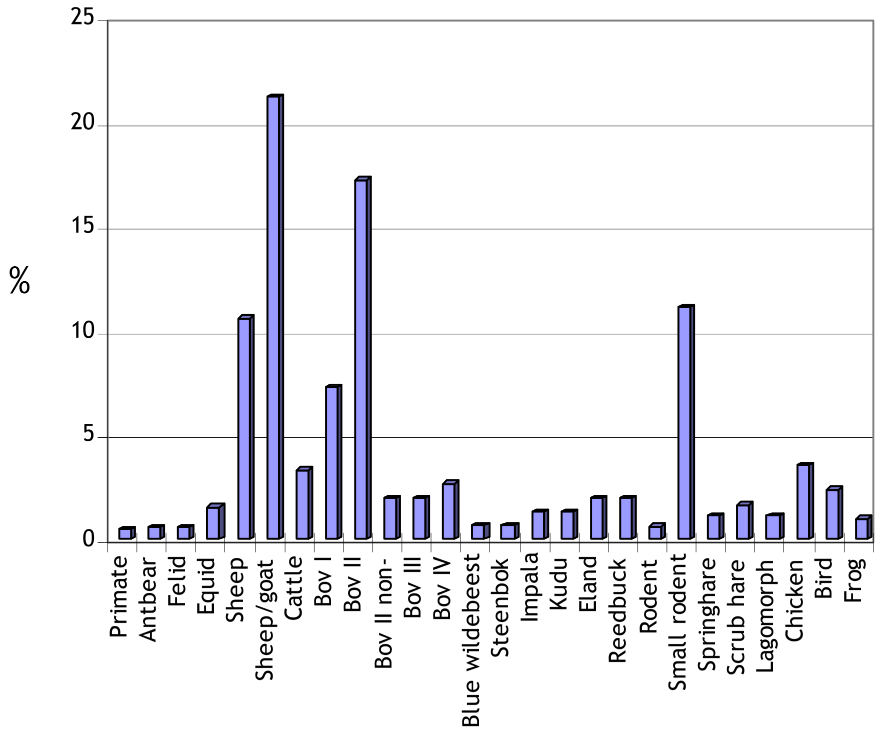


Figure 37. Esikhunjini: QSP percentage of identified animals excluding human and molluscs value

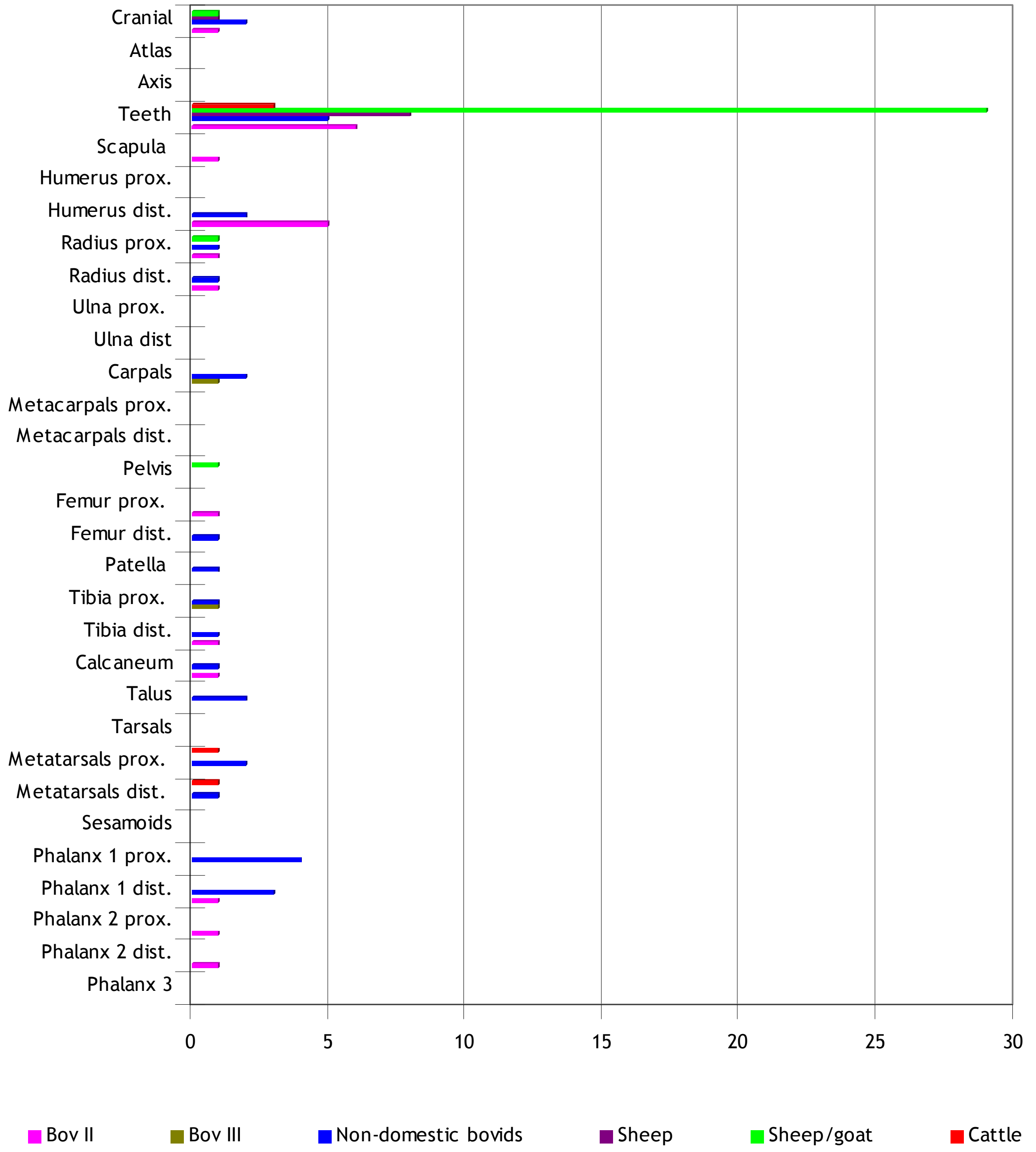


Figure 38. Esikhunjini: Bovid skeletal part representation based on QSP numbers (not corrected for expected values)

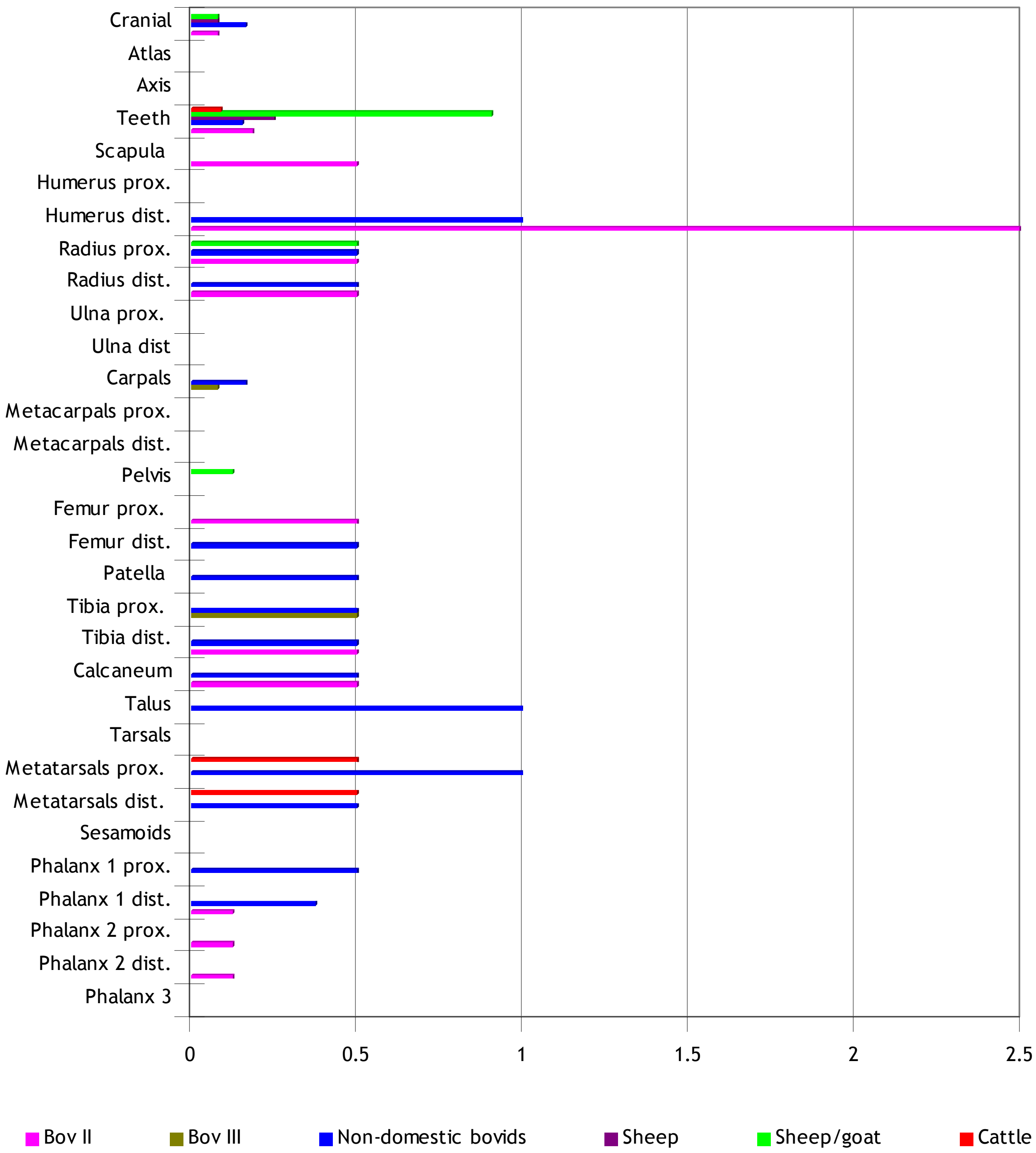


Figure 39. Esikhunjini: Bovid skeletal part representation based on QSP numbers (corrected for expected values)

Table 18. Calculated meat contribution at Esikhunjini

Species, size and family classes	QSP	Meat mass contribution (kg)
cf. *Orycteropus afer* (antbear)	0.0046	0.11
Equus sp.	0.0132	2.11
Ovis aries (sheep)	0.0889	1.42
Ovis/capra (sheep/goat)	0.1778	2.84
Bos taurus (cattle)	0.0278	6.95
Bov I	0.0611	0.61
Bov II	0.1444	2.31
Bov II non-domestic	0.0167	0.4
Bov III	0.0167	1.84
Bov IV	0.0222	8.7
cf. *Connochaetes taurinus* (blue wildebeest)	0.0056	0.6
Raphicerus campestris (steenbok)	0.0056	0.03
cf. *Aepyceros melampus* (impala)	0.0111	0.3
Tragelaphus strepsiceros (kudu)	0.0111	1.1
cf. *Tragelaphus oryx* (eland)	0.0167	4.84
cf. *Redunca arundinum* (reedbuck)	0.0167	0.4
Small rodent	0.001	0.00001
Pedetes capensis (springhare)	0.0093	0.014
Lepus saxatilis (scrub hare)	0.0139	0.1
Gallus domesticus (chicken)	0.0297	0.024
Pyxicephalus adspersus / edulis (bullfrog)	0.0082	0.003
Achatina (giant African land snail)	1	0.02
Total	1.7486	34.6

The age profile of the Esikhunjini sample is based on tooth eruption rates (Table 18). From the Bov I sample there seems to be a preference for sub adults (Class IV and V) in addition to juvenile (Class III) specimens. Bov II is represented by juveniles (Class III), sub adults (Class IV) and adults (Class V). The sheep/goat sample shows a preference for juvenile (Class II and III) individuals in addition to sub adult (Class IV), mature (Class V) and aged (Class VI) individuals. The sheep sample consists of mostly juvenile (Class II and III) individuals in addition to the sub adult (Class IV) and mature (Class V) individuals. The cattle and Impala samples are each represented by a single juvenile (Class III). As with the KwaMaza samples, the Esikhunjini sample is too fragmented to identify specimens that could be used to establish sex ratios.

Table 19. Esikhunjini: Age profile of bovids bases on tooth wear and eruption

Species			I1	I2	I3	I4	P2	Dp2	P3	Dp3	P4	Dp4	M1	M2	M3
Bov I	Juvenile	Class III					1		1						
	Sub adult	Class IV													1
		Class V	**1**												
Bov II	Juvenile	Class III												1	
	Sub adult	Class IV											1		
	Mature	**Class V**												**4**	
Sheep/goat	Juvenile	Class II										1			
		Class III	1			1			1				1	1	
	Sub adult	**Class IV**							1		2		1	**2**	1
	Mature	**Class V**	**2**		1				2				**6**		
	Aged	Class VI							2				1		
Sheep	Juvenile	Class II												1	
		Class III					1		1				1	1	
	Sub adult	Class IV				1									
	Mature	Class V											1		1
Cattle	Juvenile	Class III								1		1		1	
Steenbok	Juvenile	Class III							1						

5.3 KoNomtjarhelo faunal results

The faunal sample from KoNomtjarhelo consisted of 305 poorly preserved bone fragments of which only 11 were identified (Table 19). The 294 unidentified fragments, of which 88 are burned, consist mostly of small miscellaneous fragments.

Table 20. KoNomtjarhelo: Total faunal sample

Skeletal parts	Numbers based on NISP	Percentages based on NISP
Identified sample		
Bovid teeth	0	*
Bovid skeletal parts	9	*
Other identified remains	2	*
Unidentified sample		
Enamel fragments	2	0.7
Skull fragments	31	10.5
Vertebra fragments	3	1
Rib fragments	83	28.2
Miscellaneous fragments	131	44.6
Bone flake fragments	44	15
Total identified sample	11	4
Total unidentified sample	294	96
Total sample combined	305	
Mass of identified sample	31.04g	11
Mass of unidentified sample	245.88g	89
Total mass of sample	276.92g	
Burnt identified fragments	3	*
Burnt unidentified fragments	88	*
Total of sample burnt	91	*

The identified sample includes goat, sheep and sheep/goat, Bov II, *Lepus sp.* and molluscs fragments (Table 20). On account of all the bovid fragments belonging to either sheep or goats, in addition to no wild bovid species being identified, the five Bov II fragments could be grouped into the sheep/goat sample. From the identified fauna, three fragments are burnt and one fragment has butchering damage in the form of chop marks (Figure 46; page 112).

MNI numbers (Figure 40) indicate an equal distribution of all the specimens identified. In this manner the KoNomtjarhelo sample confirms the ineffectiveness of this quantification method when dealing with small samples. NISP numbers indicate that Bov II fragments contributed most to the sample followed by sheep/goat, goats, sheep, *Lepus* species and terrestrial gastropods (Figure 41). Given that the QSP value of the molluscs sample substantiate that one whole individual was recovered (Figure 42), thus grossly over representing its element contribution to the sample (see page 86), I chose to remove the mollusc sample and the corrected QSP values are presented in Figure 43 – indicating that Bov II contributed most to the sample followed by sheep/goat, goat, sheep, and *Lepus* species. The bovid skeletal part distribution not corrected for the expected values (Figure 44) indicates that the KoNomtjarhelo sample consists mostly of Bov II distal femur fragments followed by Bov II cranial and sheep/goat cranial and pelvis fragments, goat proximal metacarpal and sheep proximal metacarpal fragments. Figure 45, corrected for expected skeletal part values, indicate that Bov II distal femur fragments contributed most to the sample followed by goat proximal metacarpal, sheep proximal metacarpal, sheep/goat cranial, pelvis and Bov II cranial fragments.

The calculated meat contribution for the identified animals (Table 21) indicates that Bov II contributed the most meat followed by sheep/goat, sheep and goats. Given that no teeth specimens were identified an age profile could not be established, additionally the sample is too fragmented to identify skeletal parts for sex determination.

Table 21. Species, size and family classes identified at KoNomtjarhelo

Species, size and family classes	NISP	QSP	MNI	MASS(g)	Teeth			Skeletal Part				
					D	U	P	C	P-C	SCF	SAC	O
Capra hircus (goat)	1	0.0056	1	1.13					1			
Ovis aries (sheep)	1	0.0056	1	0.78					1			
Ovis/capra (sheep/goat)	2	0.0111	1	6.58				1	1			
Bov II	5	0.0278	1	21.38				3	2			
Lepus sp.	1	0.0046	1	2.91				1				
Terrestrial gastropod not *Achatina*	1	1	1	0.26							1	
Total	11	1.0546	6	33.04				5	5		1	
D = deciduous; U = unerupted; P = permanent; P-C = post-cranial; SCF = shell/carapace fragments; O = other												

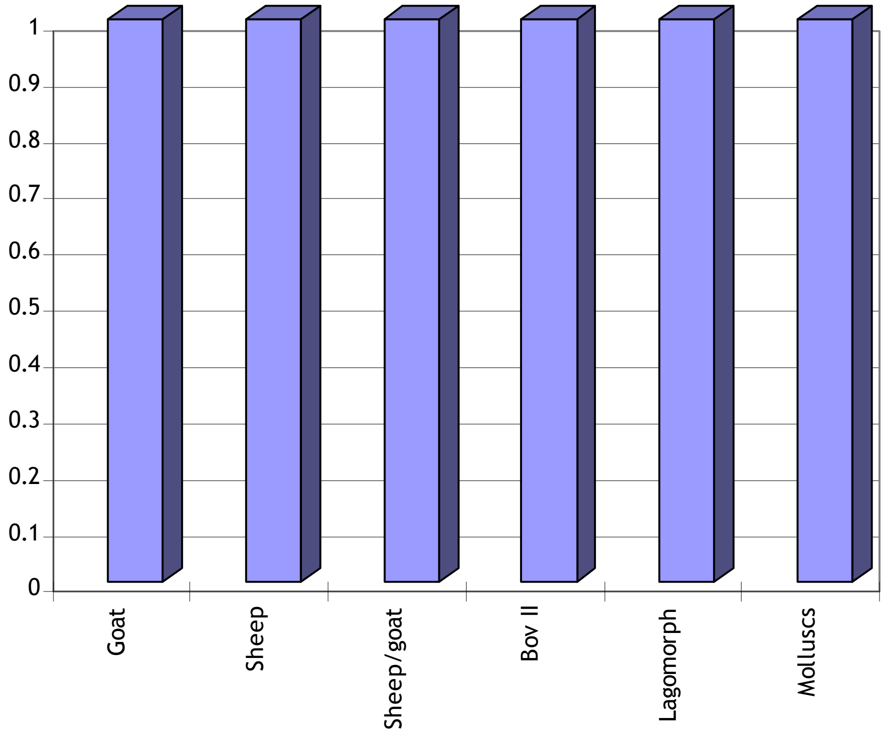


Figure 40. KoNomtjarhelo: Minimum Number of identified animals (MNI)

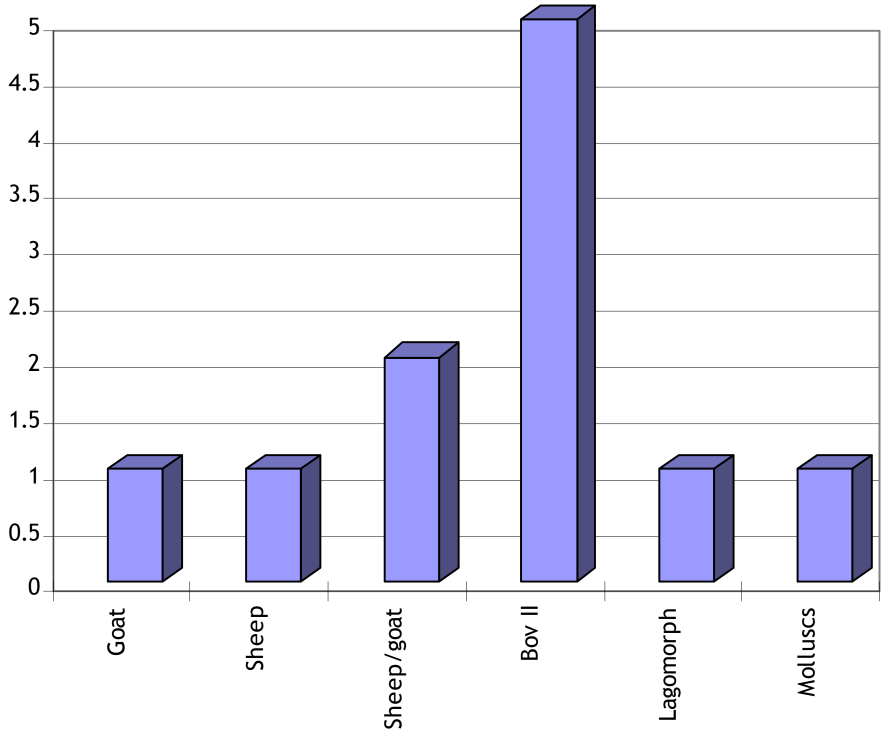


Figure 41. KoNomtjarhelo: Number of identified skeletal parts (NISP)

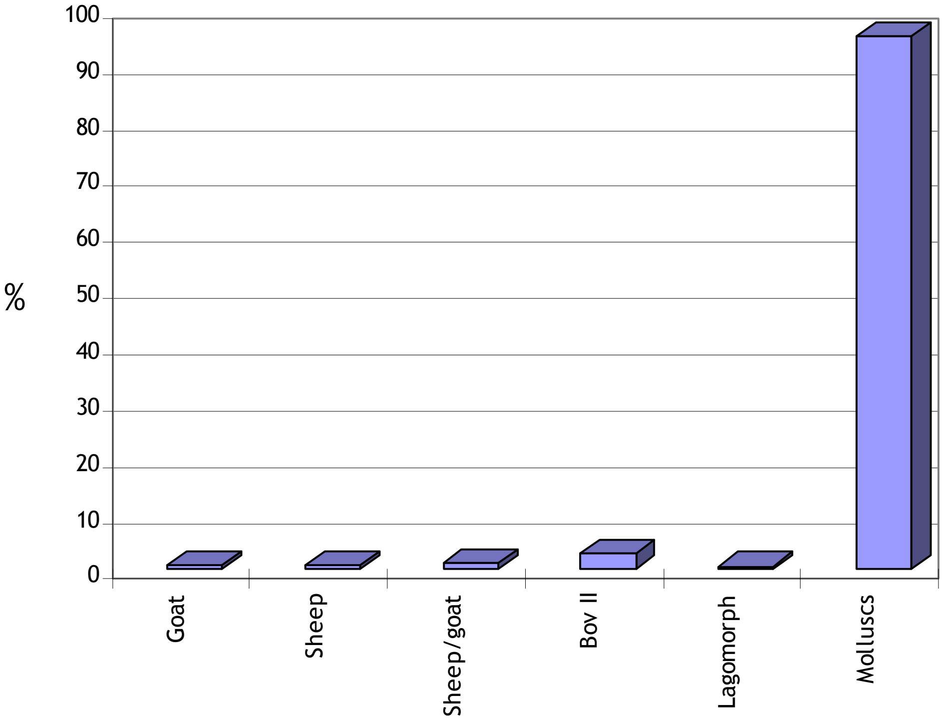


Figure 42. KoNomtjarhelo: QSP percentages of identified animals including molluscs

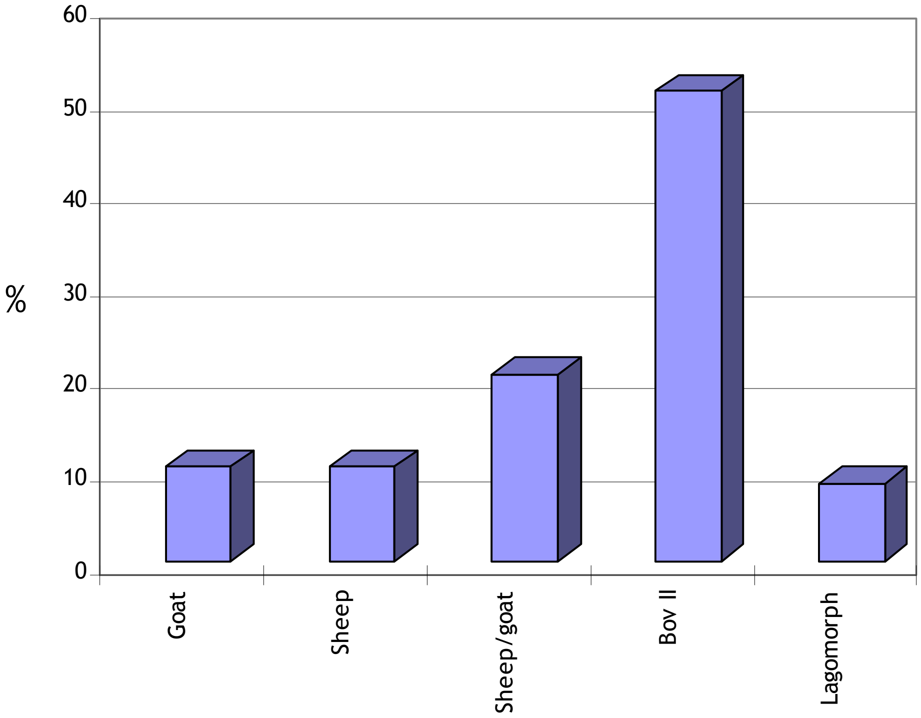


Figure 43: KoNomtjarhelo: QSP percentages of identified animals excluding molluscs

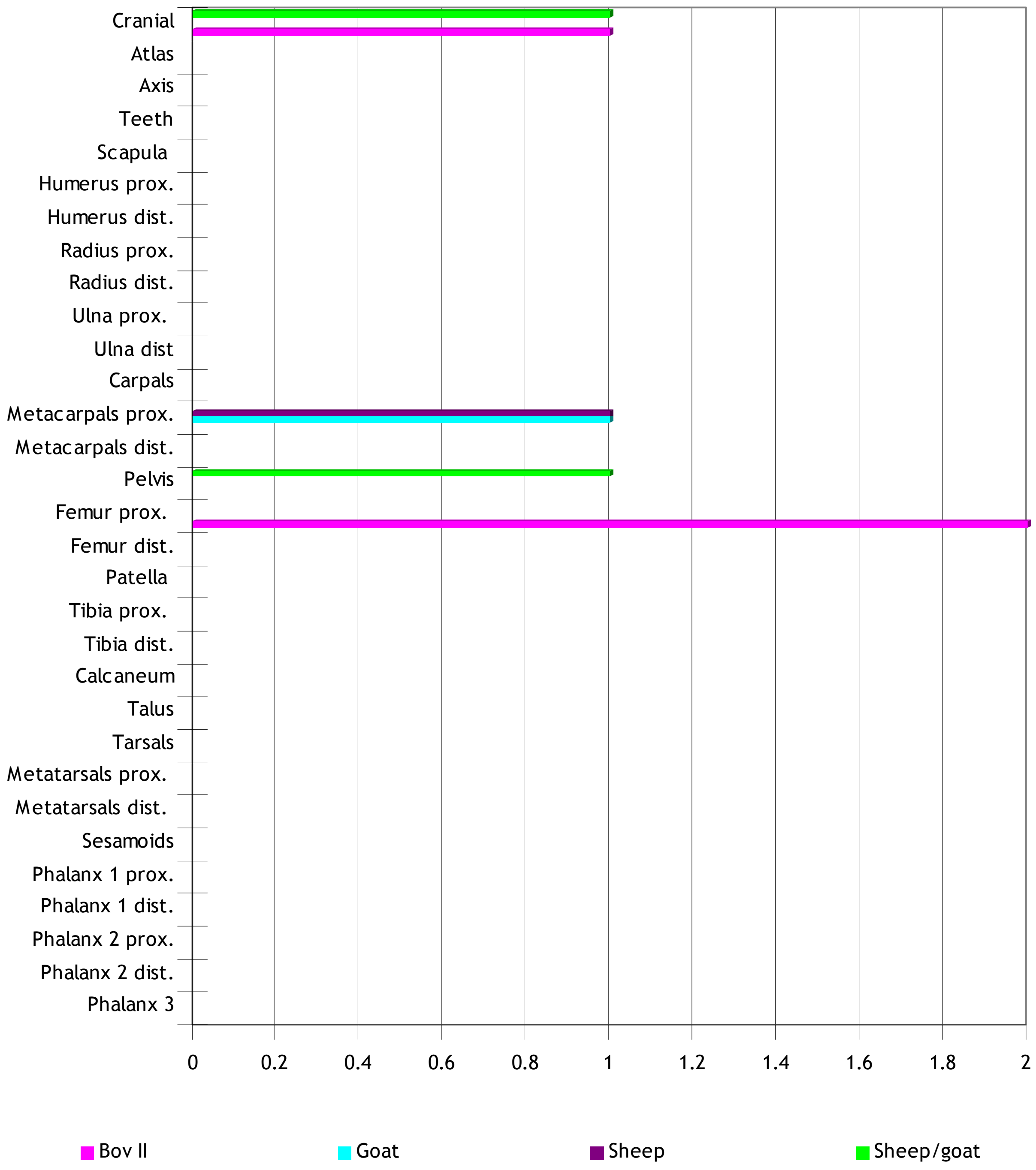


Figure 44. KoNomtjarhelo: Bovid skeletal part representation based on QSP numbers (not corrected for expected values)

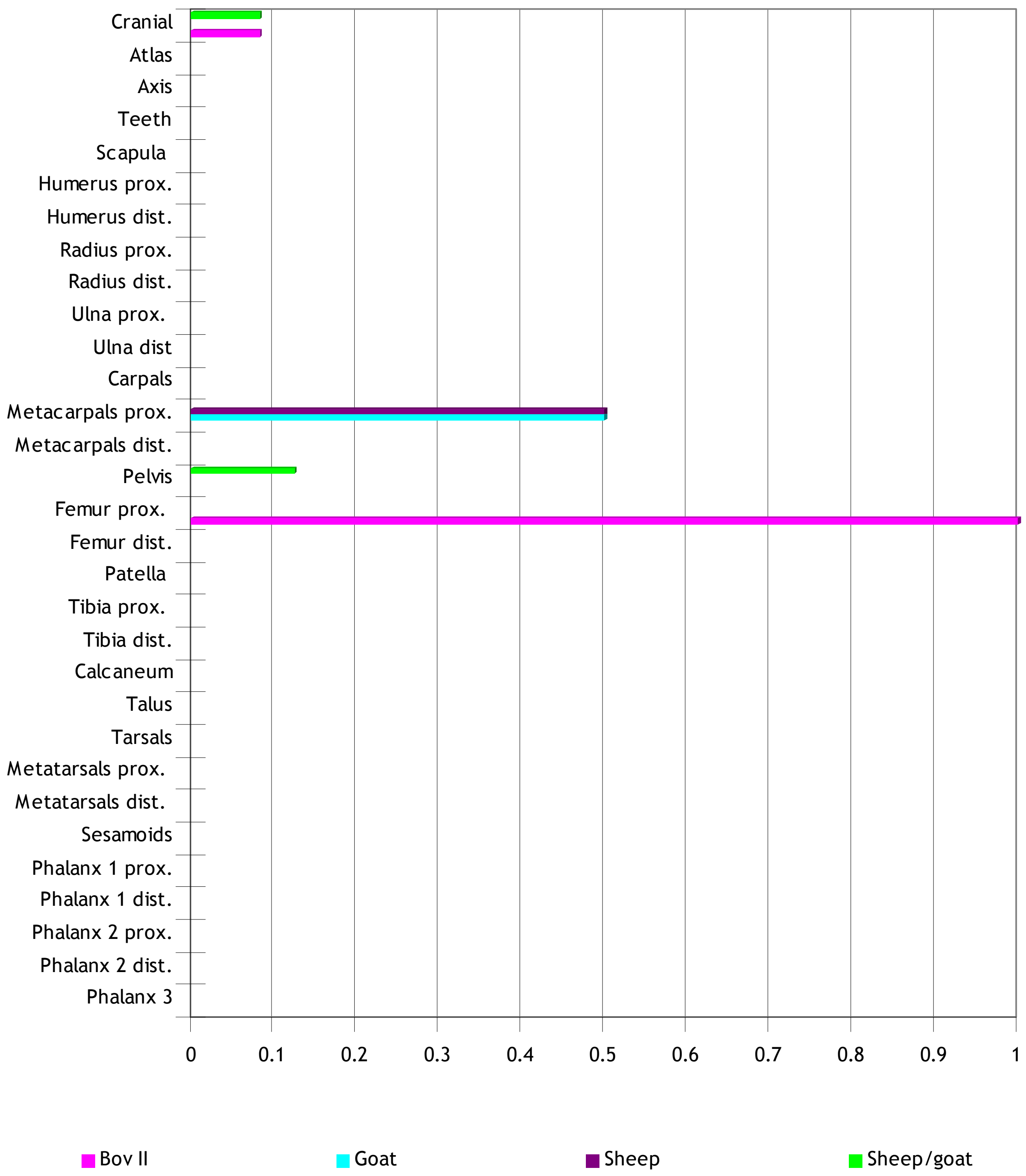


Figure 45 KoNomtjarhelo: Bovid skeletal part representation based on QSP numbers (corrected for expected vales)

Table 22. Calculated meat contribution at KoNomtjarhelo

Species, size and family classes	QSP	Meat mass contribution (kg)
Capra hircus (goat)	0.0056	0.1
Ovis aries (sheep)	0.0056	0.1
Ovis/*capra* (sheep/goat)	0.0111	0.2
Bov II	0.0278	0.44
Total	1.0546	0.84

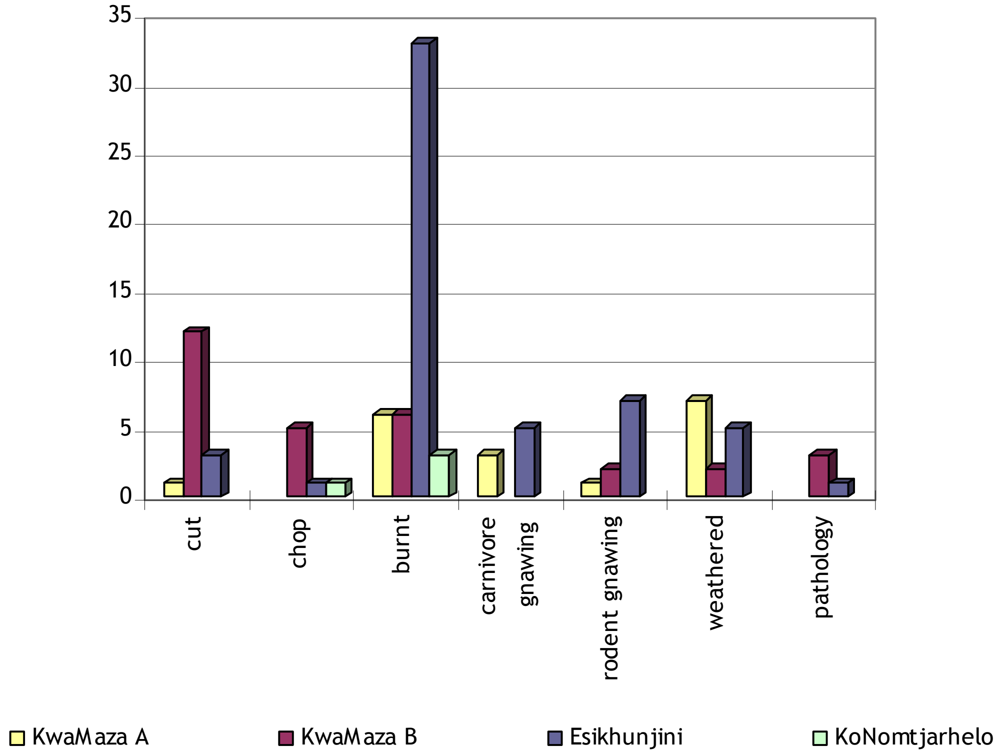


Figure 46. Taphonomy numbers of the identified faunal remains from all the Ndzundza sites

To avoid repetition of what has been already stated in this chapter, the faunal results from the three Ndzundza sites presented above will be interpreted in the following and final chapter (Chapter 6). The faunal material from the three sites will be compared and discussed to construct the animal utilisation pattern of the Ndzundza as they relocated from KwaMaza to Esikhunjini before being defeated at KoNomtjarhelo. Based on the strengths and weaknesses of the various quantification methods (see Chapter 4), their results and the calculated meat contribution of the animals identified, I will establish the contribution of particular animals to the Ndzundza subsistence. In addition, I investigate possible ritual use, gender roles and ethnic affiliations with regards to animal food behaviour amongst the Ndzundza. It should be noted that the Ndzundza faunal sample is small and all inferences and conclusions made should be considered carefully. My interpretation of this Chapter’s analysis is thus informed by the surrounding environmental, social and political context, archaeological sites, excavation techniques, quantification methods and ethnographic and historic information.

Chapter 6

Discussion of the Ndzundza faunal assemblage and thoughts on Archaeozoology in Southern Africa

In this chapter, I interpret and compare the faunal data from each of the Ndzundza sites. To remind the reader of the social and political context of the sites, the faunal interpretation will link to a very brief outline of Ndzundza history (fully discussed in Chapter 2: page 22-39) at each site. In addition, I compare the Ndzundza results with faunal material from other Iron Age sites in the northern parts of South Africa known to have been occupied during the 11th to 19th centuries AD and primarily associated with the Venda (De Wet-Bronner, 1994, 1995a; 1995b), Tswana (Badenhorst and Plug, 2006), Sotho-Tswana (Pistorius and Plug, 2001), Kopa (Badenhorst and Plug, 2004/2005) and industrial metal producing Iron Age communities in Phalaborwa (Plug and Pistorius, 1999). This comparison establishes whether trends perceived in the Ndzundza sites are also presented in other Late Iron Age sites. I will then consider whether the Ndzundza samples are sufficient to mirror the political and social situations as seen in the ethnographic information discussed in earlier chapters. Though the research aims, excavation methods and identification techniques of the faunal material associated with these other Late Iron Age sites differed to the Ndzundza samples, they do provide a baseline for 'Iron Age' and 'Historic' period human behaviour and human-animal interactions in the region during the same time period.

Interpretations and discussion

KwaMaza

Settling at KwaMaza in c. 1681 AD under the leadership of Bongwe, the Ndzundza came into contact with the Kopa to the West, the Koni and Venda to the Northeast, Ndwandwe to the southeast and the Phuting to the southwest as well as Portuguese and other European traders and missionaries. Situated at the base of Bothasberg, on the Bankeveld in mixed sour Bushveld vegetation, the Ndzundza would have been able to maintain large herds of cattle, sheep and goats if seasonal grazing patterns were practiced. The two KwaMaza sites (KwaMaza A and KwaMaza B), situated 80m apart, yielded ceramics, metal tools and slag, stone tools, iron wire, ostrich eggshell pieces, glass beads, copper bangle, spirals and beads in addition to worked clay pieces. This wide range of artefact types supports Schoeman's conclusion (1997) that the site was occupied by ruling elite for approximately 150 years. The settlement layout is not a 'normal' Iron Age one as middens were placed in front of homesteads with extensive capping – almost certainly to protect households from the maleficent magic practiced during this increasingly violent time, with regular raids by Mzilikazi's army.

KwaMaza A

The faunal material recovered from KwaMaza A consists of 680 well-preserved bone fragments with a total mass of 1401.26 g, of which 7.5 % were identified. The taxon identified include: caracal, cattle, impala, felid, equid, sheep/goat, Bov I, Bov II, Bov II non-domestic, Bov III and Bov III non-domestic remains. All these animals are considered to be part of 'normal' Iron Age faunal compositions (e.g., De Wet-Bronner, 1994; 1995a; 1995b; Pistorius and Plug, 2001; Badenhorst and Plug: 2004/2005). Quantifying the faunal material (MNI, NISP and QSP [Figures 19, 20 and 21: page 74-76]) indicates that whilst occupying KwaMaza A, the Ndzundza relied heavily on bovids, in particular domesticated cattle. The relatively higher counts of the domestic sample further support the assumption that herding contributed most to the meat supply of the Ndzundza. Hunting was also practiced and verified by the presence of Bov I, Bov II non-domestic, Bov III non-domestic, caracal, felid, equid and impala remains. The Bov I specimen might have been snared or trapped whilst the caracal and felid specimens may have been lead to a decoy carcass and then killed (Plug, 2007: pers. comm.) and used for ritual purposes.

Due to the small sample size, no definitive skeletal part distribution patterns are discernable. A general observation about the bovid skeletal part distributions (Figure 23: page 78) is that no cranial, scapula, ulna, metacarpal, distal femur, proximal tibia, tarsal, metatarsal, sesamoids, phalanx 1 and phalanx 3 fragments were recovered. The cattle remains consisted of teeth, upper front leg (distal humerus) and hindquarter specimens whilst the sheep/goat sample consists of teeth and lower front leg (proximal radius) specimens. If this trend persisted within a larger sample it could have indicated a preference for the utilization of the front half of domesticated animals. The Bov III sample consists of upper front leg (distal radius), lower front leg (carpals), upper hind leg (proximal femur) and lower hind leg (distal tibia) specimens, which could have indicated, in a larger sample, that the front and back half of animals, excluding the skull of Bov III species where utilized. The Bov II sample consists only of pelvis specimens, whilst the non-domestic sample consists of upper front leg (proximal humerus), lower hind leg (distal tibia, calcaneum and talus) and feet (phalanx 2) fragments. This could have indicated that both the front and back half of wild bovid species were utilized. One should not forget, however, that the front half of animals consist of more bones than the hind quarter, i.e. the skull, horns, teeth, ribs and carpals contribute more skeletal parts than, for example, the pelvis, hind legs and tarsals. Additionally the distal humerus preserves best of all the long bones whilst the proximal humerus does not (Plug, 2007: pers. comm.). The domestic skeletal part distribution from KwaMaza A might, thus, be the result of natural attrition to some extend as well as the normal skeletal composition of the animals and can therefore not be used to ascertain the status of the community.

The un-identified sample is dominated by miscellaneous (331) fragments followed by bone flake (221), rib (57), skull (19), enamel (8) and vertebra (3) fragments (Table 8: page 72). This is similar to the Tavhatshena site, associated with the Venda, where miscellaneous, and rib fragments were more numerous then skull and vertebra fragments (De Wet-Bronner, 1994: 37). One should keep in mind that the numbers of unidentified fragments will be exaggerated due to extreme fragmentation. Regrettably, with the KwaMaza A sample, no preferential consumption patterns with regards to animal parts can be demonstrated.

The cut and chop marks noted on some of the skeletal specimens are solid evidence of skinning and butchering procedures. The bulk of the sample is, however, unmodified. The calculated meat contribution of the KwaMaza A sample (Table 10: page 70) points to the possibility that cattle provided the bulk of the meat supply (26.4 kg). The combined Bov III (3.7 kg), Equid (3.2 kg) and other non-domestic bovid (1.8 kg) samples (equalled to 8.7 kg) show that the Ndzundza preferred wild game to the utilization of sheep/goats (0.3 kg). The sheep/goat contribution to the diet is therefore low. Similar patterns were observed at Tavhatshena (mentioned above) by De Wet-Bronner (1994: 34). Caracals, contributed the least amount of meat (0.1 kg), though they would not necessarily have been eaten but possibly used ritualistically - for their skins or in medicines (Plug, 2007: pers. comm.; Chapter 2: page 16). The cattle sample is represented by juvenile, sub adult, adult and mature individuals whilst the sheep/goat sample is represented by juvenile and sub adult individuals (Table 11: page 80). The sample is, however, too small to make any definitive statements regarding the age profile of domestic animals utilized by the Ndzundza.

It seems, thus, that at KwaMaza A the Ndzundza relied on herding, in particularly cattle, for the bulk of their meat supply though well supplemented by hunting wild bovid species - a 'normal' Iron Age animal utilization pattern. This pattern is repeated at Tshitheme and Dzata, two Late Iron age Venda sites of the 15th to 18th century in the Soutpansberg (De Wet-Bronner 1995a). Neither sex determination nor age profiling could be done due to the fragmented nature of the faunal sample. Furthermore, no indications of an 'ethnic' identity or gender roles with regards to the use of animal parts could be identified. The sample is also too small to make conclusive statement regarding skeletal part distributions.

KwaMaza B

The faunal sample recovered from KwaMaza B was the largest sample of all the excavated sites and consist of 2313 bone fragments, weighing 10353.21 g, of which 11.2% could be identified. As with KwaMaza A, ash residue on the faunal sample could not be detected, though sterile red soil capping was reported over ash layers (Schoeman, 1997: 96; Chapter 2: page 31-34). The taxa identified include: the small spotted genet, sheep, cattle, impala, buffalo, eland, giant African land snail, freshwater mussel, shrews, felids, mongoose, carnivores, equids, sheep/goat, small rodents, lagomorphs, lizards, Bov II, Bov II non-domestic, Bov III, Bov III non-domestic and Bov IV individuals (Table 13: page 83).

Apart from the felids, mongoose, carnivores, small rodents, shrews, lizards and molluscs, all other animals are considered to be definite food contributors to the Ndzundza animal subsistence at KwaMaza B. Although small rodents, shrews and lizards are possible food sources to Iron Age communities

(Chapter 2: page 17) and would have been utilized as famine foods - the small number of identified fragments (NISP) suggests that these specimens (Table 13: page 83 and Figure 28: page 87) entered the deposit on their own seeking, possibly to eat midden waste. Corroborating evidence of this are rodent gnaw marks or some of the faunal remains. The freshwater mussel (*Unio caffer*) however, must have been carried to the site by the Ndzundza. Determining the significance on the basis of a single specimen (weighing 0.04 g) is not possible other than indicating exploitation of riparian resources. No fish bones were recovered, perhaps because of the large 3 and 5 mm mesh sizes used in the original excavation, which may also account for the low number of rodent remains. The felid, mongoose and carnivore specimens are more likely to have been used for their skins or medicinal purposes (Chapter 2: page 16) than for eating.

Figure 46 (page 112) indicates butchering damage (cutting and chopping) on more specimens at KwaMaza B than any of the other sites, but as this site has the largest faunal sample this is to be expected. The cattle maxilla fragment with a displaced P4 (Figure 25: page 85), pointing to injury in early life, suggests that the individual received a blow to the jaw. This might be due to cattle being crowded together in kraals. The cattle M1 tooth with evidence of periodontal disease (Figure 26: page 86), possibly due to a bacterial infection, does not point to malnutrition as no evidence of this is visible in the otherwise healthy tooth enamel. The pathologies identified would not have been fatal to the individuals, expect when periodontal disease lead to the loss of dentition (Miles and Grigson, 1990: 521-522), which would ultimately lead to starvation.

MNI numbers (Figure 27: page 87) indicate the dominance of domesticated bovids in the sample, nevertheless the identification of Bov I, Bov II non-domestic and Bov III remains indicates that hunting was also practiced. Due to the small sample size, MNI numbers overestimate the contribution of the genet, lagomorph, mongoose, equid, carnivore, rodent and lizard sample. They are each represented by a single individual, MNI therefore creates the methodological fiction that these animals contributed equally to the sample. NISP numbers (Figure 28: page 87) however, shows that their contribution to the sample was significantly less than the sheep, sheep/goat, cattle, Bov II and Bov III sample. QSP percentages excluding molluscs (Figure 30: page 88) confirm the dominance of cattle, sheep and sheep/goat specimens pointing to a reliance on domestic animals to the Ndzundza animal subsistence at KwaMaza B. Although the Ndzundza mollusc sample comprising two elements of a single individual is omitted in QSP quantification (Chapter 5: page 86), it may have been an important food source (Gelfand *et al*, 1985: 311; Plug, 1988: 327; Chapter 2: page 17), perhaps deposited in an area not excavated.

At KwaMaza B the skeletal part distribution, corrected for expected values (Figure 32: page 91), indicates the dominance of cattle skull (cranial and teeth fragments), front leg (humerus, radius, ulna, carpal and metacarpal fragments), hind leg (femur, tibia, calcaneum, talus and metatarsal fragments) and feet (Phalanx 1 and 2) fragments. Sheep contributed skulls (cranial and teeth fragment), front legs (humerus, carpals and metacarpals) and feet (phalanx 1 and 2). Sheep/goat specimens included skull (cranial and teeth fragments), lower front legs (ulna and carpal fragments) and lower hind legs (talus fragments). The non-domestic bovid sample contributed the front half (cranial, teeth, scapula, humerus and radius fragments) of animals and their feet (phalanx 1, 2 and 3). Similar patterns of preservation were observed by De Wet-Bronner (1994: 40) at the Venda site of Tavhatshena. De Wet-Bronner (*ibid.*) cautions that one should not forget that elements such as humerus, femur, tibia, calcanei and metapodials have higher densities, thus preserving better and that this might lead to a bias against smaller and less dense elements. The recovery of so few phalanges at the KwaMaza sites could suggest that they may have remained in the hides after skinning (*ibid.*: 39). The unidentified sample from KwaMaza B indicates a similar pattern to the KwaMaza A unidentified sample – with miscellaneous (1317) fragments dominating the sample followed by bone flake (264), rib (262), skull (147), enamel (35) and vertebra (30) fragments (Table 11: 87). It must be noted, however, that both the KwaMaza A and B samples are too small to compare the KwaMaza samples and make any meaningful statements regarding animal part utilization by the Ndzundza.

When one considers the meat values (Table 14: page 92) - cattle (141.7 kg) contributed most to the subsistence of the Ndzundza at KwaMaza B in addition to Bov III (7.34 kg), Bov IV (2.2 kg) and large game such as buffalo (2.2 kg) and eland (3.22 kg). This is followed by smaller bovids such as sheep/goats (1.9 kg), sheep (0.11 kg), Bov II non-domestics (0.8 kg) and Equids (1.1 kg) with negligible meat contribution from the small rodents (0.0011 kg) and molluscs (0.04 kg). Sheep/goat still contributed little to the diet, suggesting established cattle herds and well-established hunting cohorts or partners. The negligible meat contribution from the rodent and mollusc sample mitigates against them being acquired as food sources, unless large-meshed sieving has significantly skewed the sample. The genets (0.01 kg) were probably acquired for their skins or medicinal uses (Chapter 2: page 16).

The age profile for Bov II, Bov III and cattle indicate a possible preference for sub-adults, whilst the sheep/goat and impala sample is dominated by juveniles (Table 15: page 92). At the three Iron Age mega sites in the North West province, founded in the 17th century and associated with the Tswana, the identification of juveniles, in particular age class II, points to the possibly of natural deaths since class II and younger individuals are not usually utilized as a food sources until they are more mature (Badenhorst and Plug, 2006: 65). A large number of juveniles may thus indicate disease under young animals or stress situations where people were induced to kill young animals (Plug, 2007: pers. comm.). The Ndzundza KwaMaza B sample though small does accord with the ethnographic information on the unstable political and social period of the region (see Chapter 2: page 22-29). I suggest, therefore, that the age profiles of the KwaMaza B sample may indicate that circumstances were less than optimal ecologically and politically, forcing people to utilize younger animals that would normally be allowed to mature into a breeding herd, from which the off take would be older and sick animals.

In conclusion, it seems that at KwaMaza A and B, the Ndzundza relied on herding, in particular cattle for the bulk of their meat supply supplemented to a significant degree by hunting, trapping or snaring wild game. This is viewed as commonly found Iron Age animal food consumption patterns in the region and elsewhere in the Northern parts of South Africa such as the Venda sites of Tavhatshena, Tshitheme, Dzata and Tshirululuni (De Wet-Bronner, 1994; 1995a; 1995b). The use of cattle for the bulk of the meat supply at the KwaMaza sites may indicate the high social status of the community. This kind of conspicuous consumption of a prized resource is seen at uMgungundlovu, the military headquarters of the Zulu king Dingane, built in c. 1829 AD (Plug and Roodt, 1990: 47; 52; see also Pistorius and Plug, 2001: 38). Similarly high numbers of cattle remains were also excavated from Molokwane – the 17th century Late Iron Age mega site associated with the Tswana – and associated with the wealth of the king (Badenhorst and Plug, 2006). Ethnography and historic sources confirms KwaMaza as the headquarters of a ruling Ndzundza elite (Chapter 2: page 31-33). Though the samples are small I suggest that at KwaMaza B the Ndzundza utilized more variety of species including larger bovids than at KwaMaza A, thus exploiting a wider range of animal food resources. Unfortunately, the samples are too small to compare the two sites' skeletal part distribution patterns or age profiles. No indication of ethnic identity or gender roles with regards to animal use could be identified. Ritual use is suggested by the use of midden capping and the identification of carnivores such as caracals, genet, felids and mongoose that are very likely to have been utilised for ritual and medicinal purposes and for their skins.

Esikhunjini

As a result of attacks by Mzilikazi, the emerging power of the Pedi, famine and drought, the Ndzundza under the leadership of Magodongo, moved from KwaMaza to Esikhunjini in c. 1819 AD and occupied the site for less than 20 years. Esikhunjini is situated on the northern slopes of Bothasberg 10 km from the Steelpoort River Valley. The excavated middens consisted of shallow deposits with alternative layers of ash and sterile red soils. Archaeological finds include ceramics, ostrich eggshell, glass beads, a spearhead, grinding stone, broken clay figurines and copper spirals and bangles. In contrast to KwaMaza, plant remains - which consisted of grass silica, millet, sorghum and maize - was recovered at Esikhunjini. Ethnographic and historic information indicated that during their occupation at Esikhunjini the Ndzundza were in constant conflict with the Pedi, Sotho and Swazi.

The faunal sample from Esikhunjini consists of 1535 faunal fragments weighing 2094.05 g of which 10 % were identified. Though the Esikhunjini faunal sample is smaller than the KwaMaza B sample, and despite the occupation of less than 20 years at Esikhunjini versus an occupation of 150 years at KwaMaza, there was more variety in the animals utilized by the Ndzundza at Esikhunjini. Located in a similar environment and geological surroundings to KwaMaza, the quantity and variety of faunal remains recovered from Esikhunjini cannot be explained as simply due to better preservation than at KwaMaza. The possibility of differing excavation and recovery techniques used at the sites should not however be ignored, though Schoeman's methodology and field technique was uniform at all three sites (Schoeman, 2008: pers. comm.).

The taxa identified includes: human, antbear, sheep, cattle, wildebeest, steenbok, impala, kudu, eland, reedbuck, springhare, scrub hare, chicken, bullfrog, giant African land snail, primates, felids, equids, sheep/goat, rodents, lagomorphs, birds, Bov I, Bov II, Bov II non-domestic, Bov III and Bov IV fragments (Table 17: page 95). This indicates that the Ndzundza continued their practice of a mixture of herding and hunting. Although primates are a possible food source to Iron Age communities (Quin, 1959: 124; Stayt, 1968; 78; see also Chapter 2; page 17), only one humerus fragment was identified and it is not possible to determine the use of the animal from an isolated find. However, in combination with the recovery of a human molar, antbear and bullfrog fragments, the primate specimen could possibly point to apotropaic ritual use to ward off the malevolent physical and magical presence of Ndzundza enemies. The Ndzundza and other Iron Age communities believed that they had to appease their ancestors with regular sacrifices of cattle, sheep, chickens, wild game and fruits (Massie, 1905: 124). Many communities had totem animals and familiars, which come from the belief that the ancestors visit their decedents via animal familiars (*ibid.*). Communities believed in diviners ('witch doctors') who were specialists in rainmaking, had knowledge of herbal remedies and poisons and owned divining sets (Massie, 1905: 124; Plug, 1987a: 50).

Divining sets varied with many including unique items preferred by the diviner (Plug, 1987a: 50). The Sotho, Tswana, Venda and Shona generally included four main divining dice often made of ivory and bone (*ibid.*). The Venda in particularly used elephant and pig tusks or the ribs of large animals whilst the Shona also utilized wooden dice (*ibid.*) in addition to other structured, idiosyncratic choices that often included stones, botanical material (such as bark, twigs and seeds), seashells, tortoise shells and skeletal parts such as talus (*ibid.*; 50-55). Bones of each animal used in divining sets carried specific meaning. When wild animals were not available they were substituted with other animals' bones, usually domestics (*ibid.*; 51). For example, pig bones were used in place of elephant bone whilst porcupine was replaced by sheep (*ibid.*). Other skeletal elements used in divination includes horn-sheaths, hoof-sheaths, 1st phalanges, carpals and tali (astragali) (*ibid.*; 57).

What is important about bones used in divination with regards to the Ndzundza faunal sample, is that in addition to animals such as lion, dog, hyena, equid, pig, warthog, cattle, sheep/goat, impala, duiker, steenbok and klipspringer, diviner's sets also included bones from animals such as aardvark, baboons, bullfrogs and chickens (*ibid.*; 57). Having identified the bullfrog, antbear, chicken, primate and human molar fragments from a single layer at Esikhunjini, I suggest that this could possibly point to some form of ritual activity rather than food contribution or accidental enclosure. Plug and Pistorius (1999: 180) identified the remains of one aardvark individual and human remains from Serotwe Hill, an Industrial metal producing Iron Age site in the Phalaborwa district, and indicate that these remains were most likely associated with ritual practices. The recovery of isolated human skeletal elements from South African archaeological sites is also not uncommon and usually associated with ritual and/or healing ceremonies (Pistorius and Plug, 2001: 37). For example, Badenhorst and Plug (2004/2005: 14) identified a human deciduous premolar from the 19th century AD Kopa village in Mpumalanga whilst Badenhorst and Plug (2006: 58; 65) identified human tooth fragments and a 1st phalanx from Boitsemagano, a Tswana Iron Age mega site of the 17th century in the Northwest Province, though it was not clear whether these specimens held any ritual importance.

The faunal sample from Esikhunjini shows the most varied taphonomy of all the sites - in particular a high percentage of burnt fragments (Figure 46; page 112). Of the identified sample, 33 fragments are burnt, seven fragments showed evidence of rodent gnawing, five fragments have carnivore gnaw marks, five fragments are weathered, three fragments have chop marks, one fragment has cut marks and one fragment has pathological lesions. The cut and chop marks are the results of skinning and butchering practices, whilst the rodent gnawing suggests that rodents may have co-inhabited the site with the Ndzundza and were therefore self-introduced. Nonetheless, rodents may also have been used as a food source by the Ndzundza if they were pursuing a wide range of increasingly scarce food resources.

The carnivore gnawing evident on some remains is most probably due to scavenging by wild animals when the site was abandoned by the Ndzundza. It is questionable whether wild carnivores – a source of many negative supernatural beliefs - would have entered a site of human occupation, unless they also were desperate for food due to overexploitation of game by Iron Age communities, the Boers, hunters and traders and possible downturn in environmental conditions. No dog remains were identified although the Ndzundza may have owned domestic dogs like other Iron Age communities (Chapter 2: page 20; see also Badenhorst and Plug, 2004/2005; Badenhorst and Plug 2006; 65). The carnivore gnaw marks could then be attributed to domesticated dogs. Not finding the remains of domestic dog in middens is expected - injured and dying animals seek out quiet and secluded spots to die. Furthermore, dogs killed in the hunt would probably have been left in the veld (Plug, 2007: pers. comm.). The carnivore damage on the few faunal remains was not sufficient to cause preferential destruction of limb-bone ends (Chapter 3: page 58-60; see also Marean and Spencer, 1991). The eland phalanx 1 fragment (Figure 33: page 97) with evidence of extra bone growth (exostosis) caused by abscessed tissue may be due to ageing or possible trauma to the lower limb. Similar finds of exotsosis were identified on buffalo phalanges by De Wet-Bronner (1995a: 26; 1995b: 115) at Tshitheme, Dzata and Tshirululuni and are interesting but not debilitating to the animal. The number of pathologies observed on the Ndzundza faunal remains is however high with regards to the total number of specimens identified. This might be an indicator of negative environmental condition or the possibility that the Ndzundza were taking off sick or slower animals.

MNI numbers from the Esikhunjini sample (Figure 34; page 98) indicate the dominance of bovids, in particular Bov I and Bov II, sheep and sheep/goats. This differs slightly from the KwaMaza sites where cattle dominated the samples along with larger bovids such as buffalo and eland. Sheep/goat seems thus to have been utilized more frequently at Esikhunjini. According to Plug (1988: 33) the presence of more sheep/goat could be due to sheep and goats having a greater tolerance to Nagana (African sleeping sickness or Trypanosomiasis) and being less sensitive to grazing conditions than cattle. Nagana is caused by trypanosomes transmitted by tsetse flies that infect the blood of vertebrate animal and human hosts causing fever, weakness, lethargy, weight loss, anaemia and if left untreated death (Knight, 1971: 23; see Chapter 2: page 26). Sheep and goat could therefore have been herded in areas not suitable for cattle and would have the added benefit of not being as desirable as cattle to outside raiding parties.

NISP numbers (Figure 35; page 98) indicate a similar pattern in the use of smaller bovids and animal species at Esikhunjini. Furthermore, the Esikhunjini sample consists of the largest variety of species, size and family groups from all the excavated sites. Hunting smaller game might have allowed the Ndzundza to pursue game in smaller hunting parties during their occupation at Esikhunjini, possibly making them less visible to rival communities while exploiting a wider resource base. Setting snares and traps might also have been less labour intensive than full-scale hunts and intensive herd management, allowing the Ndzundza to spend more time on defending and protecting themselves, especially if they were under physical stress and in a weakened or less-than-optimal state. The larger variety of animals identified at Esikhunjini suggests that the Ndzundza had to utilize every possible animal food source during this stressful and volatile period – hence the presence of species such as frogs, antbear, primate and birds.

According to QSP percentages (Figure 37; page 100) sheep/goat and Bov II skeletal elements contributed most to the sample followed by sheep, Bov I, cattle and Bov IV remains. Next in order are the remaining non-domesticated bovids, small rodent and bird species. The small number of rodent remains may indicate that the Ndzundza might have relied on rodents as a food source, substantiating the hypothesis that the Ndzundza could have been engaged in broad-spectrum resource utilisation at Esikhunjini. The calculated meat contribution (Table 18; page 103), however, indicates that Bov IV (8.7 kg) supplied the bulk of the meat supply. This is followed by cattle (6.95 kg), eland (4.84 kg), sheep/goat (2.84 kg) and sheep (1.42 kg). This differs to what has been stated above - quantification results indicate that the Ndzundza utilized sheep/goats more frequently. Meat contributions of larger bovids such as cattle and eland, as with the KwaMaza sites indicate that the Ndzundza relied more heavily on larger bovids for their meat. The small rodent specimens contributed very little, if any, meat (0.00001 kg) and were probably not utilized as a food source. Unless the use of 3 and 5 mm sieves lead to the loss of small rodent remains during the excavation.

According to meat contributions the Ndzundza thus retained their reliance on domesticated bovids in particular cattle followed by sheep and sheep/goat meat. However the bulk of their meat supply was from wild bovids – their combined meat contribution was 16.98 kg. This demonstrates that although a particular species may contribute more skeletal elements to a sample that it does not necessarily mean that they provided the bulk of the meat. For example QSP quantifications (Figure 37: page100) indicated that sheep contributed more skeletal elements to the Esikhunjini faunal sample than for example cattle. However, when this is compared with meat contributions (Table 18: page 103) it is clear that although cattle are represented by fewer bones, they yielded a meat contribution of 6.95 kg versus the sheep contribution of 1.42 kg.

The skeletal part distribution of bovids, corrected for expected values (Figure 39: page 102), indicates that the Ndzundza at Esikhunjini utilized cattle skulls (teeth) and hind legs (metatarsals) whilst the sheet/goat sample shows the use of skull (cranial and teeth fragments), lower front leg (radius fragments) and the hindquarter. Sheep elements are represented by teeth and cranial fragments and the non-domestic bovids indicate the use of skulls (cranial and teeth fragments), the front leg (humerus, radius and carpal fragments), the hind leg (femur, patella, calcaneum, talus and metatarsal fragments) and feet (phalanx 1 remains). Again the few numbers of phalanges may indicate that they remained in the hides after skinning, as was suggested for KwaMaza (cf. Wet-Bronner, 1994: 39). Due to the small sample size, however, no distinctive pattern can be ascertained with regards to skeletal part utilization by the Ndzundza to compare with other Late Iron Age faunal samples. Nonetheless the general observations made points to a common pattern with post-cranial material dominating the sample with more long bone elements identified than smaller bones. Regrettably no ethnographic information on animal bone disposal patterns is available. The unidentified sample, like the KwaMaza sites, is dominated by miscellaneous (1063), bone flake (156) and rib (72) fragments. At Esikhunjini, however, a larger number of enamel (47) fragments were recovered followed by skull (31) and vertebra (17) fragments. Enamel fragments preserve well and this distribution might be due to the better preservation of the denser enamel fragments. The age profile of the Esikhunjini sample (Table 19: page 104) points to the possibility of a preference of mature Bov II and sheep/goats, whilst the cattle sample is represented by juveniles. The sample is however limited with regards to establishing definitive age profiles.

In conclusion, it seems that at Esikhunjini the Ndzundza continued their subsistence strategy of hunting and herding, though a greater variety of species of wild game was utilized than at KwaMaza - despite the Esikhunjini occupation lasting only 20 years compared to the 150-year KwaMaza occupation. Although Esikhunjini's faunal sample yielded more sheep/goat remains and less cattle material than at KwaMaza, the bulk of the meat supply at Esikhunjini was provided by wild animals followed by cattle and lastly sheep/goats. The lower numbers of cattle remains may indicate a lower status community (see for example Pistorius and Plug 2001: 37-38), however, it is known from ethnographic and historic evidence that the site was occupied by headman Magodongo (Fourie, 1999: 40; see also Chapter 2: page 34-36). Might the distribution of non-domestic animals vs. cattle be due to the sample size or excavation methods used? Or could people have been keeping and disposing of prized cattle in another location, even keeping the cattle hidden and off-site? Alternatively, herding might not have been a viable option at Esikhunjini due to drought, sickness, cattle raids and continual fighting with rival communities (Chapter 2: page 34-36). Yet animal protein was still important to Ndzundza diet, thus their greater reliance on non-domestic animals. This scenario parallels the industrial metal producing Iron Age communities in Phalaborwa where metalworkers could not sustain domestic herds as a result of historical depredation and ecological constraints in the region (Plug and Pistorius 1999: 181). Hunting thus, provided a reliable base of Ndzundza animal food subsistence at Esikhunjini. Due to the small samples, no definitive conclusions can be made with regards to age profiles and skeletal part distribution patterns of the animals identified.

The ritual use of animals at Esikhunjini is suggested by the identification of a human molar, antbear, primate, chicken and bullfrog specimens. Their presence might indicate that the Ndzundza may have engaged with their ancestors on a more intensified basis in order to protect and help them defeat the enemy. These findings, combined with the violent period and drought (Chapter 2; page 8-11), suggest the possibility that the Ndzundza had to utilize more animals possibly due to the lack of agricultural products and the need for animal protein to sustain fighters engaged in conflicts. All these factors may suggest a smaller-scale, more mobile and stressed group of people who sought to use as great a variety of means as possible to ensure food security.

KoNomtjarhelo

By c. 1825 AD the Ndzundza experienced severe droughts and food shortages and the defensive location of Esikhunjini did not prevent further attacks from Mzilikazi, neighbouring Boers, the Swazi, Pedi and the British. Therefore, the Ndzundza under the leadership of Mabhogo moved from Esikhunjini to settle at KoNomtjarhelo in c. 1835 AD - an occupation that was to last approximately 48 years. Additional pressures brought by Boer settlers, issues of migrant labour, trade in firearms and diminishing resources mounted and culminated in July 1883 AD when the Ndzundza surrendered to Boer and Pedi forces, mainly because they were so malnourished as to be no longer capable of putting up an effective resistance.

KoNomtjarhelo is located on a steep hill one kilometre to the south of Erloweni and extensively fortified. The excavated middens were shallow and located in unusual locations underneath overhanging boulders (Figure 12: page 39). Schoeman (1997: 165) also notes that the practice of capping middens continued – but in the absence of soil and ash, granite rock was used. This is a good example of continuity in a social practice that is nonetheless altered by changing political circumstances and available resources. Artefacts recovered from these middens include ceramics, a gun visor, metal pieces, worked clay figures, a button, a glass bead, metal pipes, grinding stones, a metal consol top and cannon ball shrapnel in addition to peach pips and carbonised maize cobs. The faunal sample recovered is small and its indexing of ritual is equivocal, its broader archaeological context is of more interest.

The faunal sample excavated from KoNomtjarhelo is the smallest sample of the four excavated sites and consists of 305 fragments weighing 276.92 kg of which only 11 fragments could be identified. The sample is extremely fragmented and poorly preserved. Of the identified material 27% of the fragments are burnt indicating a volatile period in which settlements might have been burned down (see also Boshoff and Steyn 2008 - burning of settlements at Maleoskop) or people were using cooking to extract the maximum nutritional value from animal remains, i.e. bone broths. The taxa identified include: goats, sheep, the giant African land snail, Bov II, sheep/goats and *Lepus sp*. KoNomtjarhelo is the only site were goat remains could be identified with certainty. As no non-domestic bovid specimens were identified, it is suggested that the Bov II remains most likely belongs to either sheep or goats. As indicated in the preceding chapters, cattle raids were actively carried out by the Pedi and others (Chapter 2; page 22-30). This might explain why no cattle remains were recovered as the Ndzundza might not have been able to keep cattle during this period, opting instead for more mobile, less desirable and more easily hidden small stock.

The fragmented nature of the sample suggests that the Ndzundza utilized every possible food source including shattering bones to access marrow. This is a common Iron Age practice even in affluent societies as marrow was a desirable and highly valued food source (Plug, 2008: pers. comm.), but seldom do you find a very fragmented overall bone sample – in affluent societies certain bones, such as long bones, had marrow extracted and other bones were left intact. The cut and chop marks visible on the sample are the result of skinning and butchering. The fragmented nature of the bones, the shallow middens and granitic soil contributed to the poor preservation of faunal material, which is also the most weathered of all the samples. Considering that KoNomtjarhelo was occupied for 48 years versus the occupation period of less than 20 years at Esikhunjini one would expect to find a greater abundance of faunal remains at KoNomtjarhelo, excavation bias notwithstanding. However, ethnographic and historic information (Chapter 2; page 22-30) indicates that the Ndzundza were encircled by the Boers and Pedi and ultimately surrendered due to starvation during the last months of the war, suggesting that they did not have sufficient access to food sources and this could explain why so few faunal remains were recovered. The faunal sample recovered from KoNomtjarhelo might, therefore, come the closest of all the sites to the approximated total available live animals to the Ndzundza.

All the animals identified are regarded as food contributors indicating a subsistence or ‘survival strategy’ of herding alone, in particular of sheep and goats. The single terrestrial gastropod (0.26g) more than likely intruded into the deposit on its own. MNI numbers (Figure 38; page 101) indicate an equal contribution of all the identified animals - this is a clear example of the ineffectiveness of MNI quantification when working with small samples. QSP quantification (Figure 43; page 109) and meat contributions (Table 22; page 112) confirms the Ndzundza’s reliance on sheep and goats. The single

Lepus sp. fragment does not provide enough evidence of actively pursuing these animals. The extreme fragmentation of the sample precluded age and sex profiles. In addition, no indication of ritual use (apart from the positioning and ironstone capping of the midden), gender roles or ethnic identity could be identified from the faunal remains alone. Although the skeletal part distribution pattern of the identified sample indicates the use of cranial, proximal metacarpal, pelvis and proximal femur fragments, the sample is too small to make any assumptions. The unidentified sample is dominated by miscellaneous fragments (131), followed by bone flake (44), rib (83), skull (31), vertebra (3) and enamel (2) fragments. The absence on non-domestic faunal remains could also be due to the Ndzundza's inability to hunt by being surrounded by enemy forces. One should also consider whether the use of firearms and sound of cannon fire and invading enemy scared animals away from the area.

In conclusion, the small and fragmented sample makes it clear that the Ndzundza occupying KoNomtjarhelo faced severe food shortages. This concord with ethnographic evidence of drought, cattle raids and the destruction of agricultural field by the Boers and Pedi during the war. The faunal sample from KoNomtjarhelo suggests a survivalist and even non-sustainable subsistence strategy that is in contrast to the more normal, albeit somewhat stressed herding and hunting practices at KwaMaza and Esikhunjini. This I suggest, is not due to choice but by being encircled by enemy forces preventing them from pursuing other food sources – especially from hunting and gathering - than what they could sustain and acquire within their small and besieged settlement.

Final thoughts on Ndzundza animal utilization

I hope to have demonstrated that faunal remains cannot be adequately interpreted without contextualising it with archaeological, ethnographic and/or historical information. I conclude that Ndzundza subsistence in the Steelpoort River Valley during c. 1700 – 1900 AD, though initially conforming to typical Iron Age animal food ways, was dictated to a large extent by external circumstances and the Ndzundza's responses to those circumstances. The Ndzundza constantly adapted their animal utilization behaviour in response to changing economic, political and social conditions, for the most part successfully until the world they lived in overwhelmed them in the mid to late 1800s AD.

In summary, during the 150 year KwaMaza settlement the Ndzundza employed a subsistence strategy of hunting and herding, with cattle contributing the bulk of the meat supply but with significant wild meat intake. This is normal for Iron Age faunal patterns found in the same general area over the same time period (see for example Plug and Pistorius, 1999; De Wet-Bronner, 1994, 1995a, 1995b; Badenhorst and Plug, 2004/2005; Badenhorst and Plug, 2006). There are slight differences between the KwaMaza A and KwaMaza B sites, with KwaMaza B showing a greater variety of utilized animal species. This is not uncommon amongst Iron Age sites, see for example Loubser (1981: 53-135) who identified cattle, sheep and goats at Iron Age Ndebele sites in the Pietersburg area, in addition to a considerable variety of non-domestic bovid and wild game species such as carnivores, mongoose, equids, lagomorphs, steenbok, blue wildebeest, impala and the giant African land snail (see also Gelfand, 1971; Grivetti, 1976; Mönnig, 1976; Voigt, 1983; Plug, 1988; De wet Bronner, 1994; Beukes, 2000 and Hutten, 2005; Plug and Pistorius 1999). Ritual use is suggested by the use of carnivores for their skins or medicinal uses based on ethnographic analogues discussed in Chapter 2 (page 16; see also Bryant 1929; Stayt, 1968; Gelfand, 1971; Grivetti, 1976; Mönnig, 1976; Gelfand *et al*, 1985). Archaeological evidence of midden placement and capping points to ritualistic behaviour and concerns over protecting household ash (Chapter 2: page 30-39). All these factors substantiate historical information of stressful conditions beginning to build in the Steelpoort River Valley during the Ndzundza occupation of KwaMaza.

Moving to Esikhunjini as a result of continual attacks and drought, the Ndzundza occupied the site for less than 20 years. This was not a ‘usual’ Iron Age site because it is located on the slopes of the Bothasberg rather than the valley floor as protection rather than production was becoming a primary concern. The faunal material indicates that the Ndzundza relied on a greater variety of animal species, and, unusually, the bulk of the meat now came from hunting non-domestic bovids. According to Badenhorst and Plug (2006: 66) cattle dominate almost all Later Iron Age societies in South Africa except where tsetse fly borne parasites occurred, which may explain this assemblage. Though I posit that the relative absence of cattle was due to the Ndzundza either hiding this valuable resource, or divesting themselves of it in order to become less attractive targets for marauders (i.e. Massie, 1905; Coertze 1983; Delius, 1983; Jonas, 1989; Fourie, 1999; see also Chapter 2: page 22-30).

The identification of possible ritual use in addition to the number of burnt fragments and the increase in midden capping imply that the Ndzundza had concerns about their physical and spiritual defence from outside malevolence and physical attack. The greater variety in animal taxa may reflect the need for additional food sources as cattle raiding intensified during this time and cattle may have been relatively scarcer than previously. The faunal material also indicates an increase in the utilization of sheep/goat and sheep, which are easier to herd, hide and distribute in smaller groups without the hindrance of taboos or ceremony. Moving to higher ground would also have made it more difficult to sustain large cattle herds.

Moving from Esikhunjini to KoNomtjarhelo, the faunal sample decreases dramatically - Esikhunjini: 1535 fragments [10 % identified]; KoNomtjarhelo: 305 fragments [4 % identified] - even though KoNomtjarhelo was occupied for approximately 48 years rather than the 20 years at Esikhunjini. Ethnographic and historic information on this unstable period is verified by archaeological data such as the fortified settlement with loopholes and cannonball shrapnel (see Chapter 2: page 36-39). Furthermore, hilltops in this region were not used for long-term habituation but for defence (Loubser, 1981: 160). The ironstone capping and location of middens underneath boulders points to increased concerns about protecting household ash as people became increasingly disillusioned with their physical capabilities, leadership etc, and turned towards extra-ordinary and supernatural sources for deliverance from a hostile world. The faunal sample, although small, indicates that the Ndzundza now only relied on domestic bovids, in particular sheep and goats. Though it has been mentioned previously that the usual Iron Age pattern is a reliance on cattle, with high status settlements having larger proportions of cattle I believe that the KoNomtjarhelo sample is n example of external circumstances forcing people to change their food habits. KoNomtjarhelo's defensive but spatially and ecologically limited location would make keeping large stock very difficult. Substituting small stock for cattle gave the people more flexible options as well as making them less visible and less desirable to their enemies. We know the site was occupied by headman Mabhogo so the lack of cattle is not an indicator of a commoner's outpost – people were simply no longer able to maintain the cultural norm of providing the chiefly class with choice cuts of cattle or, indeed, any cattle. Having had their agricultural fields destroyed, cattle herds stolen and surrounded by Pedi and Boer forces the Ndzundza would have had to utilize every possible food source which provides a plausible explanation for why the faunal material is so fragmented. The Ndzundza would have shattered the bones to obtain the marrow and may also have cooked the bones, hide, hooves etc (as indicated by the high percentage of burnt and fragmented bone) to extract all the available nutrition from their meagre animal food stocks. This fragmentation leads to poor preservation that may have contributed to the sample being small and relatively a-diagnostic – though this, in conjunction with associated archaeological context may be an indicator of stress and adaptation.

The small sample and bad preservation of the material does, however, prevent me from making any satisfactory assumptions with regard to animal part utilization, we can speculate that almost all the parts of animals were used at this site, especially during the latter part of its occupation. Being surrounded and trapped in their settlement the Ndzundza would also not have been able to hunt wild game. Restricted human mobility – especially of woman and children vulnerable to attack and capture if they ventured off alone or in small groups – meant that they could not go out to snare and collect abundant and otherwise available wild animal and plant food. This scenario accounts for the lack of non-domestic bovid and wild game skeletal parts. The small faunal sample and small midden sizes suggest the Ndzundza had very little animal stock to begin with. Being such a small sample, an age profile could not be established and no ritual use (aside from means of deposition and perhaps the extreme fragmentation), gender roles or ethnic identity could be identified with regards to animal use. No indication of bone tool use could be identified at any of the Ndzundza sites.

Thus, the picture glimpsed from the fauna is bleak. Nevertheless, the Ndzundza did survive, with little stock, for 48 years at KoNomtjarhelo and must thus have had access to other food sources. For example, the Ndzundza might also have exploited animal soft tissue such as intestines, stomachs, tongues and lips - products that cannot be measured from skeletal remains (Badenhorst and Plug, 2006: 65). In addition to animal by-products such as milk, fat and blood that would not normally leave remains (Brothwell and Brothwell, 1969: 19) but might have encouraged people to keep animals alive way beyond their culturally ‘normal’ slaughter time. Furthermore, the use of insects, small mammals and reptiles such as snakes and lizards might not have been detected due to poor preservation and/or their skeletal remains not being recovered during the excavation of the sites. The Ndzundza most certainly would also have utilized plant foods of which the research area has a great variety (Chapter 2: page 10-14). Plant foods would have provided a great deal if not the bulk of day-to-day food intake, albeit that this food was of low status. Hints of this pattern are provided by the recovery of maize, sorghum and peach pips at the Esikhunjini and KoNomtjarhelo sites, in addition to the recovery of grinding stones and ceramics (Chapter 2: page 34-39). This project, however, focused on animal food use by the Ndzundza.

Questions relating to animal utilization patterns cannot be properly addressed without environmental information on plant and animal species' distribution, in addition to related ethnography and historic information on what animals and animal parts meant to communities. Understanding these small and large insights into technique, method and theory are only useful when applied to archaeological samples with a specific and defined archaeological question or questions.

Archaeozoology in Southern Africa, the influence of excavation procedures, taphonomy and sample size

To understand fully the social, economic, political, and ritual histories and trajectories of past communities, their use of animals cannot be ignored (O'Connor, 1996: 12). With this archaeozoological project I aimed to construct the food procuring, utilisation and discard behaviour of the entire Ndzundza community as represented through archaeological recovery – and not just focus on elites or notable events. This examination of daily life, primarily animal procurement and subsistence strategies during a violent and unstable political period in South African history (c. 1700 AD – 1900 AD), has produced a 200 year trajectory that shows people trying to perpetuate cultural norms in ever more abnormal conditions until they break with tradition and follow necessity by, for example, abandoning cattle, hunting wild game on a large scale, and exclusively tending small herds of small stock.

Fragmentary evidence such as faunal remains cannot be used in isolation to inform on past communal activities (O'Connor, 1996: 11) but requires contextualisation by multiple evidentiary sources (Chapter

1; page 2-7). Consequently, I embarked on an interdisciplinary approach in an attempt to incorporate archaeological evidence, faunal analysis, historic archive and ethnographic information on the Ndzundza at KwaMaza, Esikhunjini and KoNomtjarhelo and their neighbours. During the Ndzundza occupation of the Steelpoort River Valley, they were subject to pressures such as internal conflict, war, physical and political relocation, discrimination, and environmental degradation (Chapter 2; page 22-30). This project, in addition to identifying which animal species and age groups were utilized, attempts to inform on whether or not this ecological, social and political turmoil had any affect on the Ndzundza's use, procurement and discard of animals. Finally, I used the faunal material and ethnographic data to investigate evidence of ritual use, gender roles or ethnic identity.

Archaeozoology has its own theoretical framework and methodology; "*animal anatomy, morphometrics nomenclature, foetal development, comparative osteology, problems in taphonomy and statistical procedures are but a few of the non-archaeological topics...*" (Plug, 1988: 354). Regrettably, however, there are no academic departments in South Africa that provide archaeozoology as a long-term undergraduate course (Chapter 3: page 44-45). Studying Archaeozoology at postgraduate level requires that students either enrol with or forge alliances with Zoology and Archaeology departments (Plug, 1988: 353). Such a networked approach does have the advantage of exposing students and researchers to a wider range of data than if they enrolled at a single department or entity. It can, however, lead to a dilution of expertise, increased administration time, face hurdles such as institutional boundaries and professional jealousies. Also, each department/entity focuses on specific fields of study – given that departments and entities have few full-time staff – and they are usually unfamiliar with the smaller details and theoretical developments of the other (*ibid.*). For example, cultures as ideological and social organizations whose actions are sometimes preserved in material deposits are not an insight of interest to most zoologists. However, both strands of study acknowledge that faunal material is at least a partial representation of possible past food sources and offers a glimpse into subsistence. To analyse and interpret faunal material raises questions such as where the faunal material comes from, what the material represents and how the material was recovered (O'Connor, 1996: 10). Reliable answers to these questions rely on using a combination of zoological, archaeological and where applicable ethnographic and/or historic knowledge.

Furthermore, faunal remains from most archaeological deposits represent a partial sample of the 'death assemblage' and it is not possible to recover all the skeletal 'bone debris' from sites (Uerpmann, 1973: 308; 318 and Gilbert and Singer, 1982: 29). Resultant statistical analysis based on small samples may not allow much confidence in inferences made and creates problems in quantification and interpretation (Lyman, 1994: 59; Amorosi *et al*, 1996: 129). Therefore one should not focus on 'ideal samples' but rate samples according to what they can contribute to a particular site and/or research question (Amarosi *et al*, 1996: 132). Working with the small Ndzundza sample required me to pay closer attention to the minutiae of the different methods used in faunal analysis and to use as many approaches as possible to extract information from these bones (see Chapter 4: page 55-70). With this project I hope to caution excavators that greater attention must be paid to faunal recovery methods used when sites are excavated and when material is sorted, cleaned, catalogued and stored.

There is a need in Southern African archaeology to revise and consider additional protocols to ensure that more representative samples are recovered. The most crucial aspect of faunal recovery is mesh size (see Chapter 4: page 52-55). Using large screen size fractions will lead to the loss of micro faunal material and small skeletal parts that ultimately affects the kinds of species, numbers of species and relative abundances of species recovered (Gordon, 1993: 453). As with the Molokwane faunal sample, the use of ¼ inch mesh resulted in the loss of more than 80% of the micro faunal and other small vertebrate and invertebrate skeletal specimens (Pistorius and Plug, 2001: 26). There is a strong possibility that the few molluscs and rodent specimens and lack of other micro faunal material from the Ndzundza samples are due to the excavation methods used when the sites were excavated. This in turn will have substantial impacts on the interpretation of faunal assemblages and possibly biased toward larger skeletal elements. Although fine screening is time consuming and expensive, procedures such as re-sieving spoil heaps and boxing excavated soils for sieving at a later stage should be in place to deal with this problem before archaeologists commence with fieldwork.

Furthermore, Archaeozoology in South Africa is in need of more educators (in and beyond Archaeology departments) in the different techniques and quantification methods used when determining species abundances and what factors should be taken into account that could affect interpretations of samples from South African archaeological sites. There are many different quantification methods, each with its own strengths and weaknesses. No single method of analysis and quantification answers all the questions of every site (Amarosi *et al*, 1996: 135). For this reason I chose the use Number of Identified Skeletal Parts (NISP - Chapter 4: page 65), Minimum Number of Individuals (MNI - Chapter 4: page 66) and Quantifiable Skeletal Parts (QSP - Chapter 4: page 67) quantification to illustrate the ineffectiveness of MNI counts on small samples and to establish the number of skeletal parts with NISP counts and the skeletal part contribution of species with QSP quantification. Another important factor relates to taphonomy and unfavourable burial conditions.

The cultural and natural taphonomic processes that affect faunal deposits (Chapter 4: page 58-60) are complex, numerous and often difficult to distinguish (Marshall and Pilgram, 1993: 261). Key factors that need to be considered are: the consumption of animal food beyond the limits of the archaeological site, removal of bones by carnivores, particularity domestic dogs (Uerpmann, 1973: 319). Natural soil chemistry also effects the preservation of bone, depending on skeletal elements' hardness and the pH composition of the archaeological matrix (Gilbert and singer, 1982: 29; Gordon, 1993: 454). Skeletal part representation is also affected by cultural processes such as the amount of processing done at the kill site, the number of animals killed, means of transport, need for bone tools and other uses that will impact on what hunters carry to their home base (Gilbert and Singer, 1982: 27). Communities may weigh their options when procuring food, opting for the most economically beneficial scenario (Kelly, 2000: 69). One should also consider that the nutritional benefits of different animals and/or animal parts is not constant and varies from season to season. This use of desirable or less desirable foods may vary according to the community's 'calendar', with high consumption during feasts and less consumption in taboo or winter periods (Nicholas and Kramer, 2001: 125). Different animals and animal parts may, thus, be brought back to the homestead at different seasons or for different purposes (*ibid*.).

Considering all the above-mentioned factors in relation to my research on the Ndzundza also brings another dimension of food use to the discussion - one of food use in times of war and whether or not cultural traditions and taboos with regards to animal food are maintained or modified in times of severe social stress and starvation. I suggest that the Ndzundza's choice of food initially conformed to known Iron Age animal food utilization patterns during their occupation at KwaMaza and Esikhunjini. However, during their occupation at KoNomtjarhelo, their last stronghold, their use of food was constrained by the war-inflicted period. I propose that the Ndzundza utilized what they could acquire and sustain. In this case they relied heavily on herding only sheep and goats, suggesting that the Ndzundza, whilst still clinging on to the familiar – sheep and goats – were inhibited from acquiring wild animal and non-domestic bovid food sources in addition to the elimination of cattle to their disposal by rival communities. Moreover, ethnographic and historic sources indicate that the Ndzundza's agricultural fields were destroyed by the Pedi and Boers, ultimately resulting in their (the Ndzundza's) surrender due to starvation during their final weeks as KoNomtjarhelo.

More studies on food use in stressful periods in South African history are, however, needed for comparison. Archaeozoological research on what to look for when studying other archaeological contexts that are thought to have been stressful is deficient. I suggest that more archaeozoological research should be done on war-inflicted periods. In addition, comparative osteomorphological research on southern African bovids and other animals is needed. This will enable researches to look more closely at meat procurement strategies and animal use by communities, in additional to animal health and husbandry.

During my research I found that ethnographic sources are problematic and seldom answer questions that directly address the needs of archaeozoological study. Insufficient documentation relating to slaughtering and butchering procedures, what animals are used for, animal part utilization, age preferences, cooking, waste disposal (of animal bones) and preferences of specific communities for comparison are but a few of the topics needed to better contextualise excavated faunal material. Additionally, the issue of small samples has received little attention. More research is needed on the merit of using small faunal samples in archaeozoologcial research along with the methods and techniques used by archaeologists when excavating and recovering faunal material. I hope to have illustrated that although the Ndzundza samples are small the information they provide can be used in conjunction with the archaeological, ethnographic and historic information to substantiate and even question each other. For example, the small number of identified animal remains and lack of cattle at KoNomtjarhelo, combined with the ethnographic and historic information on the social and political strife, cattle raids and war, combined with the archaeological evidence such as shrapnel, loopholes and ammunition all substantiate one another and create a focused, information-rich picture of a specific time, people and landscape.

In conclusion, I do not propose that the responsibility of revising archaeological excavation methods and ethnographic research on food use should fall outside the duties of archaeozoologist. Rather I suggest that faunal analysts should engage with different disciplines to improve our knowledge and understanding of what is expected by different researches that focus on specific research questions so that the best possible sample size can be determined, excavated, studied and stored. In addition, more dedicated post and scholarships are needed for Archaeozoological research, actively pursuing new students and sparking their interest in the fascinating world of communities' animal food consumption behaviours. Finally, the research potential of the Ndzundza sites is not exhausted. This project offers only a brief glimpse into the animal food use of the Ndzundza during a 200-year period, with further research and excavations focussing on recovering faunal material from the three – and other - Ndzundza sites, more questions relating to animal food use of the Ndzundza can be answered. This should be combined with Archaeobotanical studies on the plant material recovered from the Ndzundza sites and additional ethnographic and historical research on the Ndzundza people. It may then compared with subsistence behaviours of communities such as the Venda and Pedi who occupied the surrounding areas at the same time to further investigate food use of communities trying to survive in stressful war inflicted periods. In this manner, a more complete construction of Ndzundza subsistence can be created.

Appendix A

Species list of mammalian fauna present in the study area according to Du Plessis (1969), Rautenbach (1982), Sinclair and Davidson (1995), Carruthers (2000), Smithers (2002) and Skinner and Chimimba (2005)

ORDER: CHIROPTERA   Bats

Family: Pteropodidae Gray, 1821   Fruit bats

Epomophorus gambianus crypturus (Ogilby, 1835)   Peter's epauletted fruit bat

Epomophorus wahlbergi (Sundevall, 1856)   Wahlberg's epauletted fruit bat

Eidolon helvum (Kerr, 1792)   Straw-coloured fruit bat

Rausettus aegyptiacus (E. Geoffroy Saint-Hilaire, 1810)   Egyptian rousette

Family: Emballonuridae Gervais, 1856   Sheat-tailed bats

Taphozouz mauritianus E. Geoffroy Saint-Hilaire, 1818   Mauritian tomb bat

Family: Molossidae Gervais, 1856   Free-tailed bats

Chaerephon pumila (Cretzschmar, 1826)   Little free-tailed bat

Tadarida aegyptiaca (E. Geoffroy Saint-Hilaire, 1818)   Egyptian free-tailed bat

Mops condylurus (A. Smith, 1838)   Angolan free-tailed bat

Family: Vespertiloionidae Gray, 1821   Vesper bats

Miniopterus schreibersii (Kuhl, 1817)   Schreibers' long-fingered bat

Myotis tricolor (Temminck, 1832)   Temminck's hairy bar

Myotis welwitschii (Gray, 1866)   Welwitschs' hairy bat

Myotis bocagei (Peters, 1870)   Rufus mouse-eared bat

Pipistrellus hesperidus (Kuhl, 1817)   African pipistrelle

ORDER: HYRACOIDEA

Family: Procavidae Thomas, 1892   Hyraxes

Procavia capensis (Pallas, 1766)   Rock hyrax

ORDER: PROBOSCIDEA

Family: Eelephantidae Gray, 1821   Elephants

Loxodonta africana (Blumenback, 1797)   African elephant

ORDER: PERISSODACTYLA

Family: Equidae Gray, 1821   Zebras

Equus quagga Boddaert, 1785   Plains zebra

Family: Thinocerotidae Gray, 1821   Rhinoceroses

Ceratotherium simum (Burchell, 1817)   White rhinoceros

Diceros bicornis (Linnaeus, 1758)   Black rhinoceros

ORDER: ARTIODACTYLA

Family: Hippopotamidae Gray, 1821   Hippopotamus

Hippopotamus amphibius Linnaeus, 1758   Hippopotamus

Family: Suidae Gray, 1821   Pigs

Phacochoerus africanus (Gmelin, 1788)   Common warthog

Potamochoerus larvatus (F. Cuvier, 1822)   Bushpig

Neoromicia nanus (Peters, 1852)   Banana bat

Neoromicia capensis (A. Smith, 1829)   Cape serotine bat

Neoromicia sp. (Peters, 1852)   Kruger serotine bat

Neoromicia zulvensis Roberts, 1924   Aloe serotine bat

Scotophilus dinganii (A. Smith, 1833)   Yellow house bat

Scotohilus viridis (Peters, 1852)   Lesser yellow house bat

Family: Nycteridae von der Hoeven, 1855   Slit-faced bats

Nycteris thebaica E. Geoffroy Sain-Hilaire, 1813   Egyptian slit-faced bat

Family: Rhinolophidae Gray, 1825   Horseshoe bats

Rhinolophus clivosus Cretzschmar, 1828   Geoffroy's horseshoe bat

Rhinolophus darlingi K. Andersen, 1905   Darling's horseshoe bat

Rhinolophus simulator K. Andersen, 1904   Bushveld horseshoe bat

Rhinolophus hildebrandtii Peters, 1878   Hildebrandt's horseshoebat

ORDER: INSECTIVORA

Family: Soricidae G. Fischer, 1817   Shrews

Myosorex cafer (Sundevall, 1846)   Dark-footed forest shrew

Mysorex varius (Smuts, 1832)   Forest shrew

Crocidura mariquensis (A. Smith, 1844)   Swamp musk shrew

Crocidura flavescens (I. Geoggroy Sain-Hilaire, 1827)   Greater red musk shrew

Crocidura hirta Peters, 1852   Lesser red musk shrew

Crocidura cyanea (Duvernay, 1838)   Reddish-grey musk shrew

Crocidura fuscomurina (Heuglin, 1865)   Tiny musk shrew

Crocidura silacea Thomas, 1895   Lesser grey-brown shrew

Family: Giraffidae Gray, 1821   Giraffe

Giraffa camelopardalis (Linnaeus, 1758)   Giraffe

Family: Bovidae Gray, 1821   Antelope and Buffalo

Syncerus caffer (Sparrman, 1779)   African buffalo

Connochaetes taurinus (Burchell, 1823)   Blue wildebeest

Cephalphus natalensis A. Smith, 1834   Red duiker

Sylvicapra gimmia (Linnaeus, 1758)   Common grey duiker

Oreotragus oreotragus (Zimmermann, 1783)   Klipspringer

Ourebia ourebi (Zimmermann, 1783)   Oribi

Raphicerus campestirs (Thunberg, 1811)   Steenbok

Raphicerus sharpei Thomas, 1896   Sharpei's Grysbok

Aepyceros melampus (Lichtenstein, 1812)   Impala

Pelea capreolus (Forster, 1790)   Grey rhebok

Tragelaphus scriptus (Pallas, 1776)   Bushbuck

Tragelaphus strepsiceros (Pallas, 1766)   Greater Kudu

Tragelaphus angasii Angas, 1849   Nyala

Tragelaphus oryx (Pallas, 1766)   Eland

Alcelaphus lichtensteinii (Peters, 1849)   Lichtenstein's hartebees

Alcelaphus buselaphus (Pallas, 1766)   Red hartebees

Damaliscus lunatus (Burchell, 1823)   Tsessebe

Hippotragus equinus (E. Geoffroy Saint-Hilaire, 1803)   Roan

Hippotragus niger (Harris, 1838)   Sable

Kobus ellipsiprymnus (Ogilby, 1835)   Waterbuck

Family: Erinaceidae G. Fischer, 1817 Hedgehogs

Atelerix frontalis (A. Smith, 1831) Southern African hedgehog *distribution doubtful

ORDER: MACROSCELIDEA

Family: Chrysochloiridae Gray, 1825 Golden moles

Amblysomus hottentotus (A. Smith, 1836) Hottentot golden mole

Neamblysamus juliaae Meester, 1972 Julana's golden mole

Family: Macroscelididae Bonaparte, 1838 Elephant shrews

Elephantulus brachyrhynchus (A. Smith, 1836) Short-snouted elephant shrew

Elephantulus myurus Thomas and Schwann, 1906 Rock elphant shrew

ORDER: RODENTIA

Family: Cricetidae and Muridae Illiger, 1815 Rats, Mice and Gerbils

Otomys angoniensis Wraughton, 1906 Angoni vlei rat

Otomys irroratus (Brants, 1827) Vlei rat

Otomys laminatus Thomas and Schwann, 1905 Laminate vlei rat

Otomys slogetti Thomas, 1902 Sloggetti's vlei rat

Grammomys dolichurus (Smits, 1832) Woodland thicket rat

Lemniscomys rosalia (Thomas, 1904) Single-striped mouse

Rhabdomys pumilio (Spearman, 1784) Four-striped mouse

Dasymys incomtus (Sundevall, 1847) African marsh rat

Mus musculus Linnaeus, 1758 House mouse

Mus minutoides A. Smith, 1834 Pygmy mouse

Mastomuys natalensis (A. Smith, 1834) Natal multimammate mouse

Mastomys coucha (A. Smith, 1836) Southern multimamate mouse

Redunca arundinum (Boddaert, 1785) Southern reedbuck

Redunca fluvorufula (Afzelius, 1815) Mountain reedbuck

ORDER: CARNIVORA

Family: Protelidae Grey, 1821 Aardwolf

Proteles cristatus (Sparman, 1783) Aardwolf

Family: Hyaenidae Gray, 1821 Hyaenas

Parahyaena brunnea (Thunberg, 1820) Brown hyaena

Crocuta crocuta (Erxleben, 1777) Spotted hyaena

Family: Felidae G. Fischer, 1817 Cats

Panthera pardus (Linnaeus, 1758) Leopard

Panthera leo (Linnaeus, 1758) Lion

Caracal caracal (Von Schreber, 1776) Caracal

Felis silvestris Von Schreber, 1777 African wild cat

Leptailurus serval (Von Schreber, 1776) Serval

Acinonyx jubatus (Von Schreber, 1775) Cheetah

Family: Canidae G. Fischer, 1817 Jackals and Wild dogs

Canis mesomelas Von Schreber, 1775 Black-backed jackal

Canis adustus Sundevall, 1847 Side-striped jackal

Lycaon pictus (Temminck, 1820) African wild dog

Family: Mustelidae G. Fischer 1817 Mustelids

Aonyx capensis (Schinz, 1821) African clawless otter

Lutra maculicollis Lichtenstein, 1835 Spotted-necked otter

Mellivora capensis (Von Schreber, 1776) Honey badger

Thallomys paedulcus (Sundevall, 1846) Acacia mouse

Thallomys nigricouda (Thomas, 1882) Black-tailed tree rat

Micaelamus namaquensis (A. Smith, 1834) Namaqua rock mouse

Aethomys chrysophilus (De Winton, 1897) Red veld mouse

Aethomys ineptus (Thomas and Wroughton, 1908) Tete veld rat

Rattus rattus (Linnaeus, 1758) House rat

Tatera leucogaster (Peters, 1852) Bushveld gerbil

Tatera brantsii (A. Smith, 1836) Highveld gerbil

Saccostomus campestris Peters, 1846 Pouched mouse

Dendromus melanotis A. Smith, 1834 Grey climbing mouse

Dendromus mesomelas (Brants, 1827) Brant's climbing mouse

Dendromus mysticalis Heuglin, 1863 Chestnut climbing mouse

Steatomys pratensis Peters, 1846 Fat mouse

Family: Thryonomyidae Pocock, 1922 Canerats

Thryonomys swinderianus (Temminck, 1827) Greater canerat

Family: Myoxidae Gray, 1821 Dormice

Graphiurus murinus (Desmarest, 1822) Woodland dormouse

Family: Sciuridae Hemprich, 1820 Squirrels

Paraxerus cepapi (A. Smith, 1836) Tree squirrel

Family: Bathyegidae Waterhouse, 1841 Mole-rats

Cryptomys hottentotus (Lessen, 1826) African mole-rat

Georychus capensis (Pallas, 1778) Cape mole-rat

Family: Hystericidae G. Fischer, 1817 Porcupine

Poecilogale albinucha (Gray, 1864) African striped weasel

Ictonyx striatus (Perry, 1810) Striped polecat

Family: Viverridae Gray, 1821 Civets and Genets

Civettictis civetta (Von Schreber, 1776) African civet

Genetta genetta Linnaeus, 1758 Small-spotted genet

Genetta tigrina (Von Schreber, 1776) South African large-spotted genet

Family: Herpestidae Bonoparte, 1845 Mongooses

Paracynictis selousi (De Winton, 1896) Selous' mongoose

Galerella sanguinea (Rüppell, 1836) Slender mongoose

Ichneumia albicauda (G. Cuvier, 1829) White-tailed mongoose

Atilax paludinosus (G. Cuvier, 1829) Marsh mongoose

Mungos mungo (Gmelin, 1788) Banded mongoose

Helogale parvula (Sundevall, 1847) Dwarf mongoose

ORDER: PRIMATES

Family: Galagidae Gray, 1825 Bushbabies

Otolemur crassicaudatus E. Geoffory Saint-Hilaire, 1812 Greater galago

Galago moholi A. Smith, 1836 South African galago

Family: Cercopithecidae Gray, 1821 Monkeys and Baboons

Papio hamadryas (Linnaeus, 1758) Chacma baboon

Cercopithecus pygerythrus (Linnaeus, 1758) Vervet monkey

Cercopithecus albogularis (Sykes, 1831) Syke's monkey

ORDER: TUBILIDENTATA

Family: Orycteropodidae Grey, 1821 Aardvark

Hystrix africaeaustralis Peters, 1852 Porcupine	*Orycteropus afer* (Pallas, 1766) Aardvark
ORDER: LAGOMORPHA **Family: Leporidae** G. Fischer, 1817 Rabits and Hares *Lepus saxatilis* F. Cuvier, 1823 Scrub hare *Pronolagus rupestris* (A. Smith, 1834) Smith's red rock rabbit *Pronolagus rondensis* Jameson, 1907 Jameson's red-rock rabbit **Family: Pedetidae** Gray, 1825 Springhare *Pedetes capensis* (Forster, 1778) Springhare	**ORDER: PHOLIDOTA** **Family: Manidae** Grey, 1821 Pangolins *Manis temminckii* Smuts, 1832 Ground pangolin

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