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Eating Inequality: Food, animals, and people at Bosutswe

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Eating Inequality: Food, animals and people at Bosutswe

by

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Dedication

I would like to thank Jim Denbow for his unending support and helpful insights. This study would not have been possible without his help. I would also like to thank Jason for being there for me.

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I would like to thank Shaw Badenhorst and Karin Scott for identifying the 2001-2002 Bosutswe faunal collections.

Eating Inequality: Food, animals and people at Bosutswe

Kirsten Marie Atwood, Doctor of Philosophy

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This study addresses the use of wild and domestic animals at the Iron Age site of Bosutswe, Botswana. I argue that that the Western (commoner) inhabitants consumed more wild game than Central (elite) inhabitants. The overall roll that wild animals played in the diet decreased radically over time, perhaps due to environmental degradation, a change in hunting practices, or due to a combination of both factors. The importance of domestic animals increased over time. Both commoners and elites had access to cattle and small stock, but elites consumed a greater amount of these species. During the Early and Middle Lose, Bosutswe elites were able to preferentially consume young and aged domestic animals rather than consuming mainly adult animals. This may have been a form of conspicuous consumption. Despite the differences in what was eaten, how meat was cooked appears to be similar amongst both commoners and elites. Meat appears to have largely been boiled, as much meat is in Botswana today. The elite inhabitants of Bosutswe retained much of the favored cuts of meat- upper limbs- for themselves. Less-favored cuts of meat, especially lower limbs and craniums, were distributed to the commoners of Bosutswe. This redistribution of resources may have provided the commoners of Bosutswe with tangible material benefits, but also served to emphasize their non-elite status and reinforce the social hierarchy. Likewise, herding cattle may have provided commoners with access to their labor and milk, but also served to codify and increase social hierarchy by enabling elites to maintain large cattle herds.

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Chapter 1: The Context of Archaeological Research

BRIEF HISTORICAL BACKGROUND OF SOUTHERN AFRICA

Africa is the "birthplace of humanity," and has the longest history of human and pre-human occupation. Yet, apart from Egypt, the continent often only receives a cursory mention in American introductory archaeological texts, creating a void where Africa should be located in the minds of beginning archaeological students and the general public. Some of this ignorance is due to difficult research conditions in some areas of Africa due to insufficient economic development and/or political instability (Mitchell 2005). Colonial-era myths that southern Africa was an "empty land," or that Bantu-speaking farmers arrived in the area only shortly before white settlers have not entirely disappeared, further contributing to this lack of knowledge.

In colonial and Apartheid era Africa, people were made to feel that they did not have a past as a way to disempower them and make them hate themselves and their way of life. This was a way to encourage the populace to accept white rule and to change their lifestyles. Sir Seretse Khama[1], Botswana's first president and a popular and influential public figure, famously articulated these thoughts in a speech to graduates from the University of Botswana, Lesotho and Swaziland in 1970 when he said, "We were made to believe that we had no past to speak of, no history to boast of." and, "A nation without a past is a lost nation, and a people without a past is a people without a soul." (Amanze 2002; Derricourt 2011; Khama May 1970). This realization that perceptions of the past support select ideologies is now a common belief (Shanks and Tilley 1992; University 2008; Wilmsen 1989; Wolf 1997). In Botswana, re-discovery of the past is very much seen as a way to disprove colonial ideologies arguing that Africans do not have a past or accomplishments worthy of study (Amanze 2002; Denbow, et al. 2009).

[1] Also spelt Kgama

Without participating in colonial ideologies any more than I as a white American non-Batswana can help, I hope to explore the development and codification of increased inequality in prehistoric southern Africa, especially as it was naturalized and expressed through the meat-based portion of the diet. I will be using fauna data from the 2001 and 2002 excavations of Bosutswe, carried out by James Denbow. These faunal remains were identified by Shaw Badenhors and Karin Scott at the Ditsong National Museum of Natural History. Faunal data were recorded on 4"x6" paper cards. When the museum temporarily lost funding, lead analyst Shaw Badenhorst sent the cards to James Denbow, who suggested that I us the data to complete my Master's thesis (Atwood 2005). This involved entering the data- over 12,500 specimens- into Microsoft Excel®. In that study, I was only able to analyze a portion of the Western precinct; in this study, I have included the entire useable data set. The Central precinct assemblage does not extend past the Lose period (1200 CE-1700 CE) because of the thickness of the deposit in this area. In contrast, the Western precinct covers the Taukome and Zhizo period (700-900CE), Toutswe period (900-1200 CE) and Lose periods (1200-1700 CE). Because of this I cannot directly compare the Central and Western Precincts during the Taukome/Zhizo and Toutswe periods, but I can compare them during the Lose period.

Food is the end product of many varieties of labor- herding, farming, hunting cooking, et cetera- that are gendered and classed. As such, I hope to demonstrate at Bosutswe what was consumed- species and cut of meat- was used as a way to express difference and social/economic inequality, but how food was cooked- using similar cooking methods in both elite and commoner areas- was used as a way to counter this divisive social ideology by emphasizing common identity and needs. As environmental degradation in hunting areas around Bosutswe became more pronounced due to human-induced changes in the habitat and animal species composition-the ability to express identity and inequality through animal use lessened, but was still present.

HISTORY OF SOUTHERN AFRICAN HISTORICAL AND ARCHAEOLOGICAL RESEARCH

South Africa is noteworthy for its creation of politically and socially expedient history, especially in justification of Apartheid and social inequality. A 1964 book intended to explain Apartheid to Americans states:

"This book will assume knowledge of the fact that South African nation is not a "settler nation," …It will assume knowledge of the fact that Southern Africa…was never the traditional home of any black race. Indeed black Africans entered what is today South Africa at the same time as the original white newcomers started pushing inland" (Information Service of South Africa 1964).

This myth of an empty land (inhabited mostly by so-called Bushmen, who came to be conveniently regarded as little more than animals, and therefore not valid inhabitants) allowed the justification of white settlement in South Africa, and the rule of the minority over the majority. In Botswana, myth states that the Kalahari was empty, or only inhabited by foraging peoples prior to Tswana peoples being thrust into the land by the social upheaval of the *Mfecane* (Denbow, Mosothwane, et al. 2008). Early missionaries pictured an empty land, but discovered a population of various classes of whites and a sizeable African and mixed race population in South Africa (Comaroff and Comaroff 1991). The smallpox epidemics of 1713 and 1755 did, however, result in substantial population loss among native southern Africans, as well as social disruptions (termed "detribalization[2]") (Preston 1938; Hepple 1966); this provides at least some justification for the myth of an empty land, albeit a superficial and suspiciously opportune one.

As can be expected, many, although not all, South African histories published by South African historians during Apartheid continued to conform to blatantly biased versions of history concerning early and contemporary white-African relations (i.e. Information Service of South Africa 1964, Preston 1938). Some of this bias stems from

[2] "Those who remained alive wandered off into the hinterland to join other groups or slowly became detribalized and attached themselves to settlers' families, accepting the employment they had spurned before." Hepple pp. 46

strategic omission of fact, such as the omission of non-white death and suffering in British-run concentration camps during the Boer Wars (Heppel 1966). In addition to disdain for non-whites, actual contemporary ignorance by some whites over the daily conditions of non-whites may have been an important factor in the design of history as well (Hatch 1952); not only did whites not concern themselves with the rest of the South African population, they did not want to concern themselves with the rest of the population. Certain writers of South African history (Hepple 1966; Hatch 1952) did not feel as constrained by popular or state-sanctioned views of history and society, and provided a more balanced point of view that acknowledges the transgressions of all parties and do not overlook or excuse the abuses of the white colonialists. These authors perform an essential service in removing some of the "silences" of historical knowledge (Trouillot 1995).

Early anthropology and archaeology played an important role in perpetuating politically and socially expedient versions of the southern African past. Early physical anthropology is infamous for its perpetuation of scientific racism. In a society as interested in separating, classifying and controlling racial groups as South Africa, physical anthropology was a useful scientific tool that emphasized racial difference and the "primitive" features of the African subjects being studied. The San or Basarwa, referred to as Bushmen, were an especially popular subject for physical anthropologists, as they were believed to represent Stone Age human populations and a missing link between apes and modern humans. Since the colonial myth stated that southern Africa was populated by Basarwa ("Bushmen") rather than dark-skinned Africans, the dehumanization of this particular population served to legitimize the land rights of European colonizers (Dubow 1995).

Later, anthropologists and archaeologists were complicit in the perpetuation of racial hierarchies and stereotypes and the idea of ahistorial, isolated African populations; some of these ideas are still in circulation. An exhibit in the South African National

Gallery that opened in 1996 used archaeological metaphors such as artifact storage techniques to make archaeologists, as well as the public, confront their participation in this system of classification and unequal power relations. An archaeologist reviewing the exhibit states that it "endeavours to expose…European claims to 'know the Bushman'. [The exhibit also recognizes the] complicity of archaeology in the transformation of Khoisan from human subjects to museum objects." (Lane 1996).

Hall's (Hall 1984a, b), as well as other's (Chami 2009; Denbow, et al. 2009; Schmidt 2009; Schmidt and Karega-Munene 2010; Segobye 2009) attempts to understand and dispel colonial myths, and to address the status and praxis of post-colonial archaeology should allow for a more self-aware and socially responsible southern African archaeology. Many archaeologists have consciously or unconsciously conformed to colonial ideas about African society, rather than subverting them. As Hall (1984b) has emphasized, an essential deconstruction of archaeology's origins and influences in southern Africa is necessary for archaeologists to fully understand their field. Early researchers adhered to models of social evolution in which societies pass through successive stages of development, and relied upon diffusionist models of change. This may be politically related to models that placed emphasis upon the role of whites as a superior "civilizing" race (Hall ibid).

Despite the dissent of some archaeologists, early archaeological efforts within southern Africa suffered from the methodological deficiencies of the time, and also from the racial viewpoints that took it as a matter of course that native Africans could not have constructed such sophisticated and long-lasting features as the buildings and walls of Great Zimbabwe (Preston 1938; Derricourt 2011). With the archaeological overturning of the "settler paradigm" arguing that the land at the time of European intrusion was nearly uninhabited and the establishment of the antiquity of Bantu speaking people's presence in Southern Africa came an increase in the study of ethnicity and ethnic diversity in southern Africa. In some ways this reflected the continued emphasis on

racial and ethnic classification and control in southern Africa. This role of archaeology and archaeologists to contradict inaccurate and politically expedient versions of history is one of the essential and most important intellectual and social roles of the discipline. However, despite the potent challenge archaeology has offered to colonial-influenced views of ethnicity and ethnohistory, it has also been deeply influenced by colonial belief systems and practices.

Archaeological studies in Botswana had a relatively late start. To some extent this has limited archaeological knowledge of the region, but it has also allowed archaeology to partially avoid earlier explicitly colonial models of the African past and allows archaeologists to use more modern archaeological techniques from the start (Lane, et al. 1998). Africanists are currently making efforts to be more self-reflexive and to deconstruct the effects of colonialism on archaeological interpretation (Schmidt and Karga-Munene 2010 (Denbow, et al. 2009; Denbow, Mosothwane, et al. 2008; Schmidt and Karega-Munene 2010), and to ensure that archaeological research satisfies the needs of local communities (Denbow 2002; Ndoro 2005). Like the archaeology of other regions, African archaeology does not take place in a vacuum; it is often burdened by the conscious and unconscious biases and goals of its practitioners.

BRIEF HISTORY OF BOTSWANA

Botswana is roughly the size of Texas, but has a relatively low population of just over two million people. Much of the population (~60 percent) live in or within 50 miles of the capital city (Gaborone), while another 30 percent reside in the larger towns located on the eastern side of the country (Denbow and Thebe 2006). While Tswana speakers are the majority (Reader 1997), Botswana is made up of a mixture of peoples and customs (Denbow and Thebe 2006). There is a certain amount of dissatisfaction with Tswana hegemony within Botswana (Segobye 2009; Smith 1998; Wilmsen 1989).

Botswana is in many ways an exceptionally successful country, escaping or ameliorating many of the grim problems that have beset many other African nations. Botswana has a long tradition of democracy, which has helped it to be one of the most stable democracies in Africa. Freedom of speech is a highly respected right in Botswana The *kgotla*, or traditional Tswana court, continues to be an important institution today. The *kgotla* was located at the local leader's kraal (cattle pen), and was where men traditionally went to settle disputes and air grievances. This provided a somewhat democratic basis for decisions impacting the community (Peters 1994; Amanze 2002, Denbow and Thebe 2006).

Botswana, previously named Bechuanaland by the British, was declared to be a Protectorate of the British Empire in 1885, with the boundaries of Bechuanaland Protectorate reaching the political boundaries Botswana still has today in 1890 (Denbow and Thebe 2006). Botswana gained independence from Britain in 1966, when it established itself as a republic with separate parliamentary, judicial, and executive branches. All of its Presidents have been democratically elected, and in 1999 a term limit of two five-year terms was voted in.

The discovery of diamonds in the Central District in 1967 and the partnership with DeBeers Mining Company drastically changed the economy. The diamond mines bring a large amount of income into the country, and the most prominent wealth-generating sector of the economy is no longer agropastoralism, but mining (Denbow and Thebe 2006). Diamond exports have contributed substantially to the economy, but many Tswana live below the poverty line, as well as ethnic minorities such as the Basarwa (Good 1993, 1999). Amanze (2002) argues that is a new level of destitution that was unknown in the past, and is a result of the introduction of Western individualism and a modern cash economy.

CLIMATE AND GEOGRAPHY

The landscape is dominated by the Kalahari Desert, which covers two-thirds of the country, as well as parts of the surrounding countries. Rainfall levels vary from year to year, and droughts do occur. Generally speaking, the northern and eastern areas receive more rainfall than the areas to the south and the west.

The Okavango Delta dominates the northwestern area of Botswana. In contrast to the semi-arid environment of the rest of the country, the Okavango Delta is a lush environment with plentiful water. The Okavango Delta is the world's largest inland delta, and is home to water-adapted species, such as the hippopotamus and lechwe. The area is a popular tourist destination today.

Botswana has dry winters with cool to cold nights, sometimes below freezing (Amanze 2002). It can get warm during the day. Rainfall mainly occurs during the summer months, from October to April, but especially in January and February. Proper timing of rainfall is essential for successful crop production, and high summer temperatures (~32C/89.6°F during the day and ~20°C/68°F at night) reduce the water available for crops (Smith 2005). Currently, the area surrounding Bosutswe receives around 400-450 mm of rainfall per year (Smithers 1971). Crops need at least 400 millimeters of rain for sustainable agriculture (Denbow and Thebe 2006). Rainfall can be highly erratic and localized, with some areas receiving rainfall, while nearby areas do not. Because rainfall is unpredictable and Botswana as a whole is a semi-arid country, livestock herding been an increasingly important component of the economic system since about 350 CE. Livestock are better able to withstand drought than crops (Denbow and Thebe 2006). Keeping cattle and going to take care of livestock at the cattle post remain an important part of many people's lives to this day.

The climate of southern Africa has switched between periods of cool and dry weather, and wet and warmer weather. Botswana is undergoing a period of cool and dry weather today (Huffman 1996; van Waarden 1998). Farmers may take advantage of

different climatic conditions during wet and warm phases by utilizing areas that would otherwise be unsuitable for non-irrigated farming. The ranges of wild animals today may have changed over time (Campbell and Child 1971; Smithers 1971). Despite the use of livestock herding as a way to circumvent the vagaries of rainfall, rain, or the lack of it, is a focus of many people's thoughts. Rainfall levels are a fundamental factor in what crops are grown and how successful those crops are in sub-Saharan Africa (Newman 2008; Smith 2005). The national currency is the pula, which translates to "rain". Pula is also used as a toast, and "*pula pula*" is used to end public meetings (Denbow and Thebe 2006). In the past, rainmaking was an important responsibility of leaders or specialized doctors in southern Africa (Amanze 2002; Aukema 1989; Huffman 2009a, b; Shapera 1971) Because of the Christian influence, rainmaking activities no longer take place in much of Botswana today, but during periods of drought the Batswapong of Moremi Village still practice pre-Christian rainmaking rituals that originated in Zimbabwe (Amanze 2002) or in South Africa (Denbow, personal communication 12/12/13). The importance that the ancestors play in everyday life cannot be overestimated, nor can the importance of carrying out the proper rituals be overstated. Without the ancestors and proper religious rituals it is impossible to be prosperous. Ancestors are considered to be responsible for rain, which makes agriculture, pastoralism, as well as the bounty of nature possible.

SOILS, VEGETATION AND TOPOGRAPHY

Botswana is generally flat, with some hilly areas, but no mountains. The average altitude is 3,300 feet/1006 meters (Smithers 1971). Ancient lakebeds, or pans, are scattered throughout the country. They can be important, but temporary, sources of water (Walker 1998), as well as salt. The majority of the country is dominated by sandveld soils that are dry and sandy. Wild vegetation growing in the sandveld region is likely to be grassland and open grassland. Farming and human settlement is more challenging in

areas with sandveld soils, which are dry and low in nutrients (Campbell 1998; Hitchcock 1978). The Okavango Delta region is covered by alluvial soils, with lacustrine soils lying southeast of the Delta. Bosutswe is situated in a region of transition between two biological communities based on soil type.

The sandveld of the Kalahari lies to the west, while hardveld lies to the east (see Figure 1-1 below). Hardveld soils retain moisture better than sandveld soils, and are higher in nutrients (Hitchcock 1978). Hardveld soils tend to support bushes and trees, such as acacia and mopane better than sandveld soils, which tend to support grasslands. "Black cotton" soil, a type of hardveld soil, is more fertile than sandveld, and supports mopane (*Cholophospermum mopane*) scrub well. Mopane is highly valued by humans because it can provide high-protein browse (Hitchcock 1978) for cattle at the end of the dry season and during droughts. (Denbow, Smith, et al. 2008). Wild animals such as kudu are also avid consumers of mopane (Hitchcock 1978). Farmers attempt to find a balance between the good drainage but poor fertility of the sandveld, and the poor drainage but higher fertility of the hardveld (Denbow 1984; Smith 2005). Mopane also provides a home for mopane worms, which are collected by humans as food (Denbow and Thebe 2006; Grivetti 1976; Hitchcock 1978).

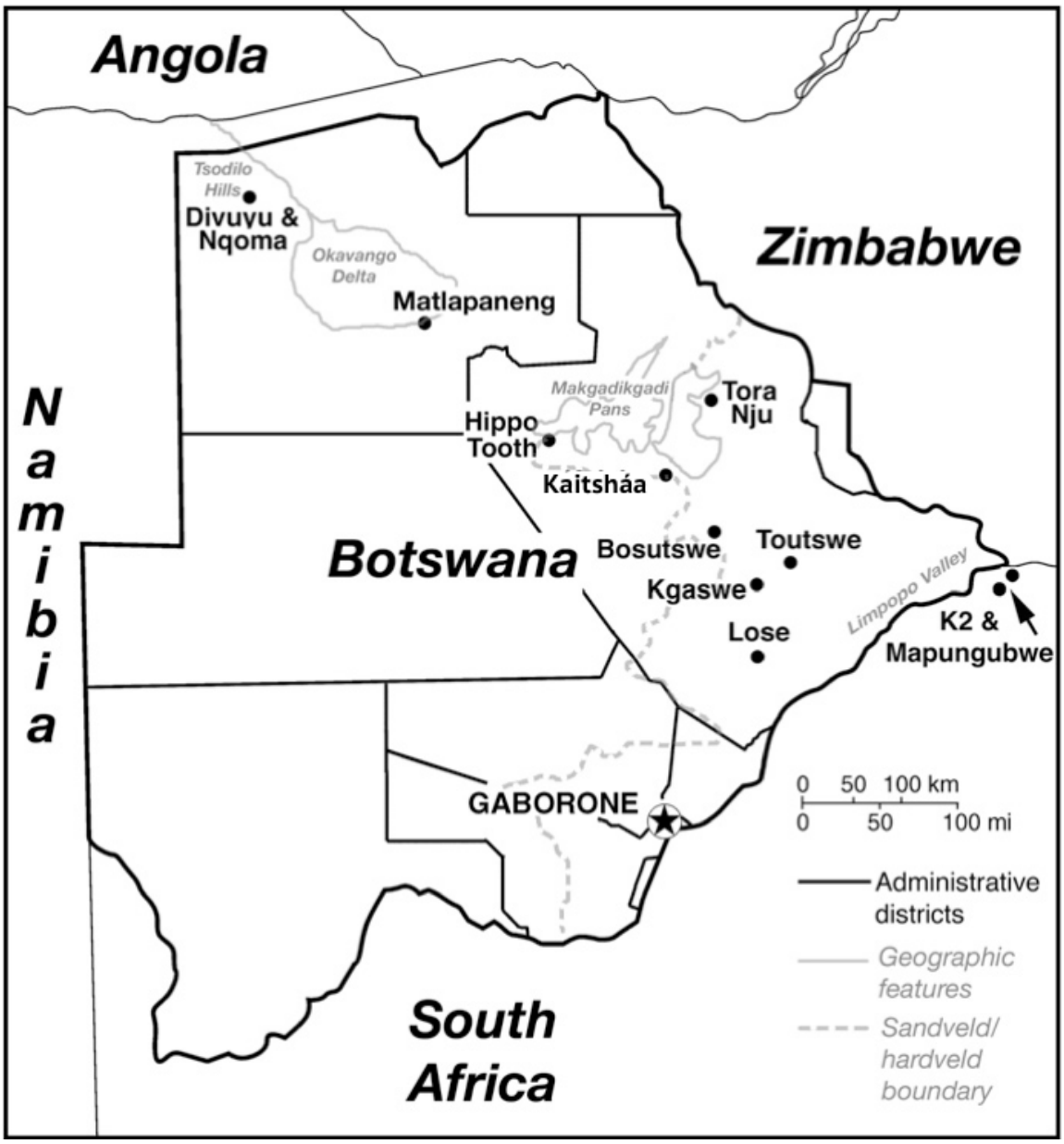


Figure 1-1. Map of Botswana with significant archaeological sites and modern capital of Gaborone labeled. Note the sandveld/hardveld boundary.

ARCHAEOLOGICAL BACKGROUND

Early Farming and Herding Communities

Prior to the introduction of domestic plants and animals from the north around 2000 years ago (Reid et al. 1998) the inhabitants of southern Africa were hunter-gatherers. The introduction of domestic animals, plant cultivation, and metal working in Southern Africa is associated with the movement of Bantu-speakers from the north to the south, although not all of these lifestyle elements were simultaneously present at all sites. Sheep (*Ovis aries*) were introduced prior to cattle (*Bos taurus*) and goat (*Capra hircus*) in some areas (Mitchell and Whitelaw 2005). The interpretation of the movement of Bantu peoples, along with iron-making technology and domestic plants and animals, focuses on the identification of people through ceramic typologies.

The early ceramic using peoples of eastern and southern Africa show connections to people from the northwest formed the Chifumbaze complex (Huffman 1989; Philipson 1993). The very earliest pottery in southern Africa pre-dates the introduction of farming and iron working, and may have been independently invented (Sadr and Sampson 2006). Philipson's early studies of the Bantu migration into southern Africa have been criticized for encouraging the myth that the land was empty until about 1650, but he has revised these early beliefs in favor of the more widely accepted view of an earlier arrival (Kiyaga-Mulindwa 1995).

The Toutswe ceramic tradition (Denbow 1983) stems from the Chifumbaze ceramic tradition (Philipson 2005), via Gokomere (600-ca. 775 CE; Huffman 2009b) and Zhizo. The Taukome/Zhizo and Toutswe tradition at Bosutswe lasted from ca. 700- 1200 CE. The Lose ceramic tradition at Bosutswe lasted from 1200-1700 CE (Denbow et al. 2008).

Generally speaking, Early Iron Age people with origins in the northwest used iron, made ceramics, and practiced herding and farming, although Philipson feels that in

southern Africa, these lifestyle elements should not be considered a "package," and instead represent separate processes of cultural change (2005).

Within Botswana, Bambata ware is associated with the earliest evidence for herdig and the beginning of the Iron Age. Bambata ware is thin-walled and densely decorated with comb-stamping, especially around rims, and was in use from around 215-650 CE (Huffman 2005). Huffman (Huffman 2005) has argued that the earliest permutation of Bambata (Bambata A, 215-555 CE), which is found throughout a wide area of southern Africa, was likely acquired by stone-tool using hunter-gatherers through trade. Optical petrogaphy has confirmed the long-distance trade of pots within southern Africa during this time (Wilmsen, et al. 2009). Some hunter-gatherer groups may have acquired small numbers of domestic animals through trade. Bambata B (350-650 CE) is stylistically similar to Bambata A, but has thicker walls. It is associated with mixed farmers and likely indicates the beginning of the Iron Age and the arrival of Bantu-speaking peoples in southern Africa from the northwest (Huffman 2005).

In addition to keeping livestock, Early Iron Age communities grew sorghum, millet, and legumes. Early Iron Age mixed farming communities were established alongside rivers and streams in low-lying grassy areas. In contrast to later settlements, animal dung deposits at these sites are not deep, and there is little evidence for marked social stratification (Segobye 1998b). Iron Age people continued to exploit wild plant and game resources. During this time, villages became more permanent. Pole-and-daga (mud mixed with dung) houses are found, as well as middens, some of them deep. Some middens contain evidence of domesticated plants and animals (Denbow 1986). The earliest true Iron Age sites date to between 350-600 CE. Happy Rest pottery is associated with these Early Iron Age sites (Huffman 1996), as is increased numbers of livestock. Early Iron Age mixed agriculturalist communities established themselves in the hardveld (relatively hard soil with less sand than the "sandveld" soil area) areas of northern and eastern Botswana along river systems at this time (Denbow1986). The difficult growing

conditions of the sandveld soil areas that cover much of central and western Botswana may have made settlement and farming in these areas difficult compared to the hardveld soils (Cambell 1998).

Changing Settlement Patterns and Increasing Social Hierarchy

The archaeological record shows a dramatic increase in the size of cattle herds, as well as the human population, in southern Africa around 900 CE. At this time, human settlements became more numerous, as well as larger. The climate may have become wetter and warmer, allowing farmers to move westward into the eastern parts of the Kalahari Desert, and expanded along the Limpopo Valley (van Doornum 2005). Recent work by Smith (2005) contradicts this long-held belief that the 10th century CE was characterized by moister climatic conditions; there is currently a strong debate over the climatic conditions of Iron Age southern Africa.

There was a major shift in the settlement patterns of southern Africa around 700-900 CE. Low-lying areas had been preferentially chosen for settlements, but around this time hilltop sites became popular. Hilltop sites came to be associated with elites. By choosing to live at hilltop settlements, leaders were literally and symbolically placing themselves above commoners. These hilltop settlements may have also been easier to defend.

Chiefdoms first developed in southern Africa during 900-1200 CE. There was a marked increase in social hierarchy after 1300. Denbow (1983,1985, 1986) has argued that polities were structured according to a three-tier settlement hierarchy, based on the size of sites and their length of occupation. Class 1 sites are the smallest and most numerous sites. Class 1 sites represent small, temporary farmsteads. Class 2 sites are less numerous than Class 1 sites were occupied for 200 years or less, and are medium-size sites. Class 3 sites were occupied for the longest time. They are the largest and least numerous sites, and are often on hilltops. They may represent key sites of paramount

chiefdoms. Placing these sites on hills gave the inhabitants less ease of access to agricultural land, but provided protection from raids, and helped protect any livestock kept on the site. Bosutswe, like Toutswe, was a Class 3 site; it is located about 100km from Toutswe (See Figure 1-1); the sites overlap in occupation time, Toutswe was occupied from 1000-1500 CE, perhaps sporadically, and Bosutswe was occupied from 700-1700 CE.

In contrast to the important role of trade in other southern African civilizations, the development of complex, hierarchically organized society in the Toutswe region may have been due to the economic and social organization that developed around cattle husbandry (Denbow 1982, 1983, 19841986); the economic focus later shifted to trade. Bosutswe originally was built according to the Central Cattle Complex pattern (see below for discussion); however, around the time of Mapungubwe (1220 CE), the livestock that were previously kept in the center of the settlement were moved off of the site; this is a general trend among populous, important sites during this time period. Alternatively, dung deposits in kraals suggest that livestock at Bosutswe could have been moved off the site earlier than this, during the Late Toutswe period. This was before the arrival households with distinctive Lose ceramics (Denbow et al. 2008).

This new settlement layout is referred to as the Zimbabwe Culture Pattern. The court/assembly area was now placed in center of the settlement, which Huffman interprets as an increased importance of and focus on sacred leadership (Huffman 1986b); or, it may be a response to deteriorating environmental conditions closer to the site (Denbow et al. 2008). Despite the fact that cattle were moved off-site, beef consumption continued to be an important part of the regional diet.

Settlement Layout: Layered Meanings

The Central Cattle Pattern and the Zimbabwe Culture pattern are normative models of settlement layout and societal meanings and values, that are not meant to account for variation over time (Mitchel and Whitelaw 2005).

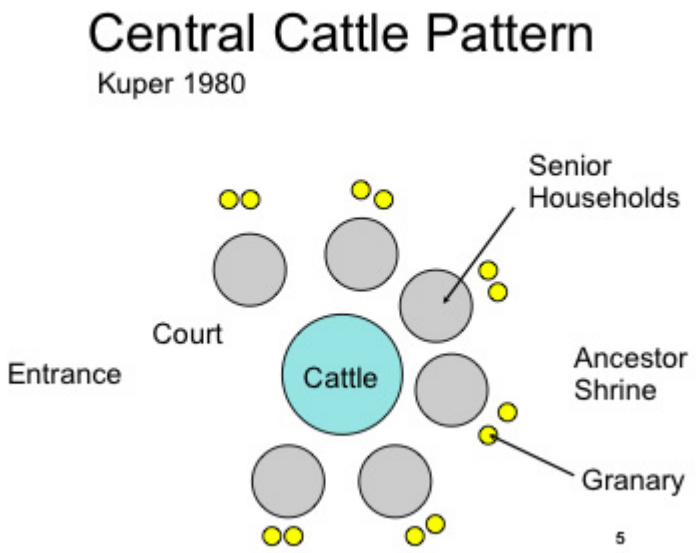


Figure 1-2. Central Cattle Pattern settlement layout.

The Central Cattle Pattern (CCP) (Figures 1-2 and 1-3) emphasized the economic and social importance of cattle in society, as well as gender divisions. Cattle were kept in the center of the site in the kraal. The court and assembly area were located next to the kraal. An arc of houses surrounded this central area. Granaries and women's grinding stones were located on the outer perimeter of this configuration. Men were buried in the kraal, while women and children were buries in houses. Buffalo grass (*Cenchrus ciliaris*) grows preferentially on these old deposits of vitrified cow dung, making these sites easy to recognize archaeologically(Denbow 1979). The Central Cattle Pattern emphasizes the opposition of male and female, ancestors and descendants, rulers and subjects, and

pastoralism and agriculture. (See Kuper 1980; Huffman 1986; Lane 1998,van Waarden 1998).

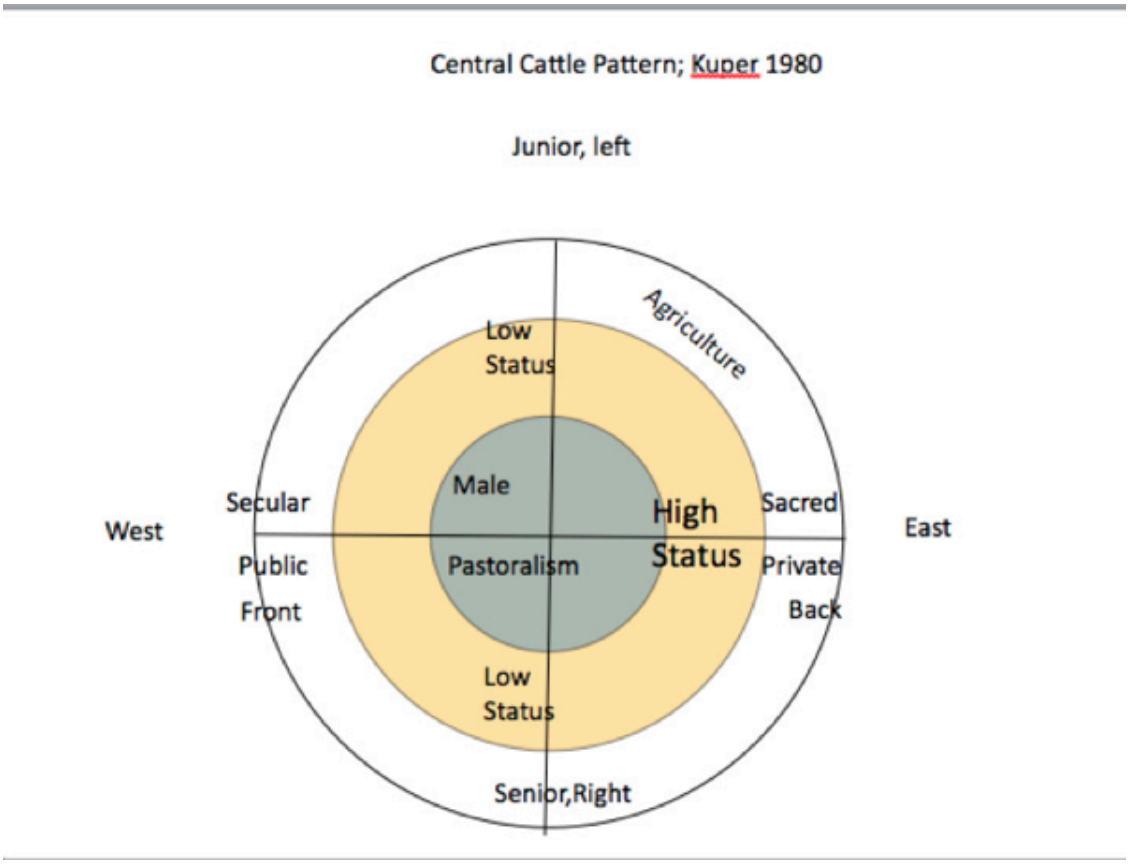


Figure 1-3. Central Cattle Pattern ideology.

There was another major restructuring of some settlement layouts around 1200 to 1300. Around this time, herds were moved off the site, in what is called the Zimbabwe Culture Pattern (Figure 1-4). The court and men's assembly area came to occupy the central area that was previously occupied by the cattle kraal.

The tops of hills were settled more exclusively by elites during this post-1300 time period. Commoners lived around the elite-occupied centers of sites, often separated by stone walls that served to delimit elite and non-elite areas. According to Huffman (1986, 2009b), the Zimbabwe Culture Pattern emphasized the importance of the court and assembly area, and therefore the importance of the ruler and the decision making process.

The Zimbabwe Culture Pattern (Figure 1-4) has been linked by Huffman (Huffman 2000) to societal change emphasizing increased social distance between elites and commoners.

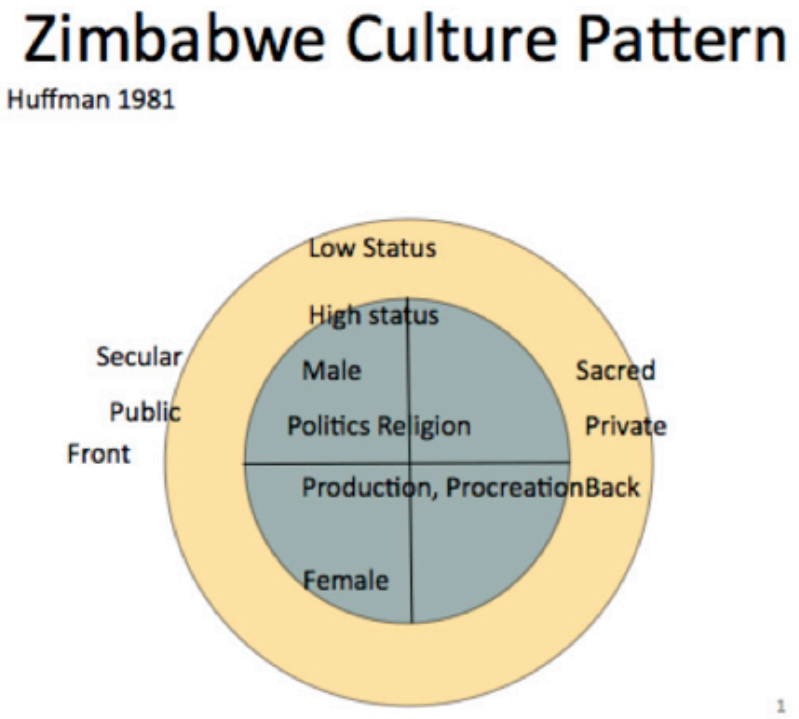


Figure 1-4. Zimbabwe Culture pattern.

The Zimbabwe Culture Pattern settlement layout served to separate the sacred and secular and show their opposition. The division between the elites and commoners was emphasized, and the symbolic importance of cattle was lessened and placed outside of the settlement. Smaller sites often continued to use the earlier Central Cattle Pattern.

The cognitive significance of these settlement patterns is not universally accepted and is a subject of ongoing debate among Africanists (Huffman 2010, Hall 1986, Denbow et al. 2008). Influenced by Hodder (Hodder 1989) archaeologists are exploring the multiple meanings of the archaeological record. The male/female senior/junior high status divisions of the Central Cattle Pattern and the Zimbabwe Culture Pattern are

informative, but can inflict uniformity on ancient society that flattens the topography of social variation. Lane (1998a) has emphasized the changing nature of human bodies and social identity, which is an especially important consideration if the focus on age and age-sets held true in the past. He has also focused on Bourdieu's (Bourdieu 1977) practice theory, and the role of daily life in making and re-making the physical world and its meanings.

The Role of Trade

In the past, households produced most of the materials, goods, and comestibles they needed for themselves. Craft specialization, especially metal working, was socially restricted. Craft specialists participated in other necessary activities, such as food production. Metalworking was a restricted activity that was conducted away from main activity areas and other people, due to its connection with the supernatural and birth/procreation (Calabrese 2000). At Bosutswe, high-status trade goods, such as imported glass beads, marine shells, and metal jewelry were more highly concentrated in the Central Precinct compared to the Western Precinct, indicating that the inhabitants of this precinct were of comparably higher status (Denbow and Miller 2007).

Trade in limited-availability goods provided a crucial stimulus for increased social complexity, and social and economic inequality within southern Africa. Trade took place within Africa, and African societies also participated with the trade networks of the Indian Ocean via the Swahili/East coast of Africa (Mitchell and Whitelaw 2005; Sheriff 2002; Wood 2000, 2005). It was often the case that site location along trade routes or in areas with access to scarce goods, such as ivory or gold, allowed certain sites to come to dominate others, and to increase social complexity in the region.

Trade was an important factor in the development of most southern African civilizations, especially the chiefdoms and states that developed after the beginning of the

second millennium CE. Goods were traded across the Indian Ocean via the east coast. K2 engaged in the ivory trade, while Mapungubwe, Great Zimbabwe, and Khami traded gold. Trade within Africa, with powerful kingdoms, small settlements, and stone tool users also took place (Connah 1987; Denbow 1999; Plug 1996). There is evidence for trade in wild animal products as well (Kiyaga-Mulindwa 1995; Plug 1996). Exotic, highly water-dependent animals such as waterbuck and sitatunga were directly or indirectly imported from the northeast to Bosutswe.

Long-distance trade provided a crucial economic and social input that stimulated the development of complex societies in southern Africa. Trade goods allowed significant displays of wealth and class distinction (Huffman 2009b). High-status goods and materials, such as imported glass beads (Wood 2005), were only available in restricted amounts and provided one of the materials used to display and naturalize status differences in the population at large, along with other rare goods such as metal jewelry. Artifact analysis, especially ceramic analysis, suggests that there was a clear spatial pattern of class stratification in the layout of Bosutswe: Mapungbwe-style ceramics and bronze beads and bangles are localized in the Central Precinct of Bosutswe, suggesting that this area was occupied by elites (Denbow and Miller 2007; Denbow, Smith, et al. 2008). The Western precinct was occupied by commoners.

INTRODUCTION TO BOSUTSWE

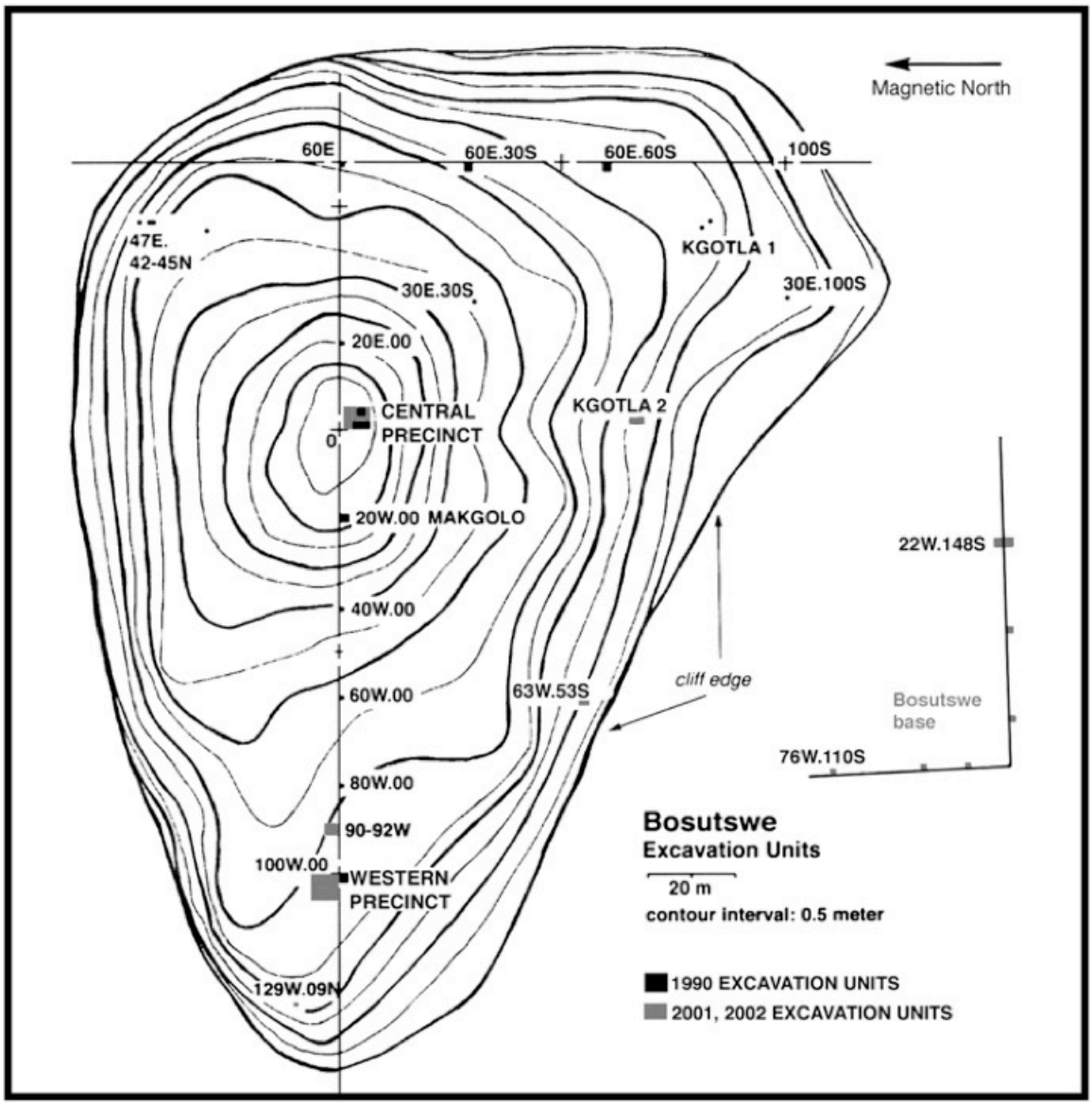


Figure 1-5. Excavation map of Bosutswe.

Bosutswe is located on top of a hill around 85 kilometers northwest of the modern town of Serowe. Hills have special significance in modern Botswana, as well as other parts of Africa. It is believed that hills are associated with religious and spiritual significance, and that ancestral spirits inhabit them. Bosutswe means "The place you must not point at [or you will be bewitched and die] (Raffle 1981). Older records refer to

it as Galesupiwe (Denbow and Miller 2007; Denbow, Mosothwane, et al. 2008; Denbow, Smith, et al. 2008).

Bosutswe was occupied from around CE 700-1700, which is an unusually long occupation period for southern Africa. Bosutswe was thus occupied during part of the Early Iron Age (200-900 CE), Middle Iron Age (900-1300 CD), and Late Iron Age (post-1300 CE). The settlement spans the time from prior to the formation of more well-defined social stratification, political complexity, and multiple-tiered chiefdoms (starting around 900 CE), past the demise of other academically well-known and more powerful, but shorter-lived polities such as Great Zimbabwe (1300-1450 CE), Butua (1450- 1680 CE) and K2-Mapungubwe (1030-1250/1300 CE). The inhabitants of Bosutswe were agropastorialists, but also engaged in hunting and foraging for wild foods.

Bosutswe sits on an ecological ecotone, with the sandveld of the Kalahari to the west, and the more agriculturally productive hardveld soils to the north and east. Native C4 grasses in the sandveld support many wild animal species, as do the C3 Mopane and bush scrub of the hardveld. The Taukome/Zhizo and Toutswe phases last between approximately 700 to 1200 CE. The Lose component of the site spans from 1200-1650/1700 CE, and is concentrated in the Central Precinct. The last occupation phase consists of seven semi-circular windbreaks or courtyards erected by households around the periphery of the site. In the Western Precinct, levels 18-12 are Taukome/Zhizo, levels 11-5 are Toutswe (Early and Middle Toutswe levels 11-8, Late Toutswe levels 7-5), and levels 4-1 are Lose. In the Central Precinct, levels 20-1 are Lose. In the Central Precinct, levels 20-11 represent 1150-1300 CE, levels 10-6 represent 1300-1450 CE, and levels 5-1 represent 1450-1650 CE (Denbow et al. 2008). Areasoutside of the Central and Western precinct were dated contextually based on artifact data.

ORGANIZING INEQUALITY: AGE, SEX AND LABOR

Tswana society was, and continues to be, largely organized according to age, sex and social status (Amanze 2002; Denbow and Thebe 2006; Schapera 1984; Segobye, 1998a). In the past, chiefs would call for the initiation of a new age set every four to seven years. In order to be initiated, young adults had to pass an initiation school, where they learned adult responsibilities and underwent physical hardships. People did not gain access to adult privileges, such as the right to marry, until they had been initiated. Age regiments bind different classes together, helping Tswana society as a whole to function despite class differences (Setiloane1976; Schapera 1984). There is strong solidarity between members of an age set. Age regiments are also used to organize labor; age regiments could be called upon to fight in wars, build huts for the chief, and various other activities (Schapera 1984).

In addition to age, sex also serves as way to organize activities in traditional Tswana society; men and boys were charged with taking care of livestock and hunting, while women and girls were charged with building and maintaining homes, granaries, growing gardens and cooking.

GOALS OF THIS STUDY

I will address the animal-based portion of the diet and other animal related activities at the Iron Age site of Bosutswe, Botswana. I will explore the ways that inequality at Bosutswe was negotiated through food and the labor surrounding it. I hope to show that that the Western (commoner) inhabitants consumed more wild game than the Central (elite) inhabitants during the Lose period. While the Central inhabitants did consume wild animals, they seem to have focused more on the very large "special" or spiritual animals. The Western inhabitants focused on the dietary aspects of wild game, but also could have used many animals to participate in religious and spiritual activities, likely practicing some ethnographically documented ritual traditions.

Despite the differences in what was eaten, how meat was cooked appears to be similar amongst both commoners and elites. Meat appears to have largely been boiled, as much meat is in Botswana today. The reproductive capacity of cattle was likely an important consideration when choosing which bovine to slaughter. Differential access to cattle and small stock due to economic and social differences between the elites and commoners, and perhaps the ability of elites to extract tribute and engage in conspicuous consumption may be apparent. At Bosutswe, what was eaten was used as a way to emphasize social divisions, while group hunting and how food was cooked were used to emphasize social cohesiveness.

Chapter 2 Methodology

INTRODUCTION

An understanding of how animals were used by past societies can help us to gain a fuller understanding of their economies and culture. Zimmerman-Holt (1996) advocates considering ethnohistoric uses of animals and a structural approach, rather than just utilizing optimization theory to achieve a more nuanced and meaningful understanding of why some animals were chosen for exploitation over others. Zimmerman-Holt considers animals to be not simple economic resources that are exploited for food, labor and secondary animal products, but to be part of a cognitive mindscape. This is true for modern Batswana, and was likely true in the past as well. Modern Batswana have very definite thoughts and feelings about animals and what animals are appropriate for what uses. Cattle are very highly valued, and their care structures the lives of members of society at large; men and boys go out to cattle posts to care for them, while women and girls tend to agricultural tasks closer to home. Cattle are used as bride payment. Like most aspects of life for Batswana, the care of cattle is tied up with religious feeling and observances (Amanze 2002).

Other animals besides cattle make up a part of the cognitive mindscape of Batswana as well. Certain animals, such as owls, are associated with ominous future events or witchcraft, and lizards are scorned for foolishly or evilly bringing human death into the world (Amanze 2002). Others are valued for being tasty animals that are small enough to use as sacrificial animals that will not result in large amounts of meat that must be processed and distributed (or eaten) quickly (chickens) (Denbow and Thebe 2006). Animals are not simple material resources to be exploited and then forgotten; they are tied up with many practices and beliefs of modern and past Batswana.

Bone assemblages go through innumerable changes on their journey from being living animals to archaeological specimens (O'Connor 2000; Reitz and Wing 1999;

Thomas 1996). As with other sources of archaeological information, faunal assemblages are altered from those of the living community, and present "an incomplete and distorted view of past economies" (Reitz and Wing 1999: 115) that the archaeologist must attempt to decipher and extract social meaning from. A brief summary of the practice and challenges of zooarchaeology will be enlightening.

Taphonomy

Taphonomic processes are the processes that affect bone assemblages. Reitz and Wing (1999) divide taphonomic changes into two types: first-order changes, which occur independently of archaeological action, and second-order changes, which occur as a result of archaeological action. First-order changes consist of abiotic effects, such as acidic soil conditions that result in bone dissolution, erosion due to weather conditions and other factors (Uerpmann 1973; Wing 2000).

Factors intrinsic to bone also affect the ultimate state of the faunal assemblage; harder, denser bone has greater survival rates than softer, less dense bone (Reitz and Wing 1999). The inorganic portion of bone by weight is 65 percent, while the inorganic portion of teeth is 99.5% (Wing 2000). For this reason, teeth have some of the best survival rates (Gordon and Buikstra 1981; Wing 2000). Uerpmann (1973) has noted that animal remains are not found in their natural bodily proportions; even particular parts of bones are more likely to be preserved than others, such as the distal extremity of the humerus and tibia, and the proximal extremity of the radius of ungulates. Bone density is key to bone survival (Lyman 1994; Stahl 1996). However, statements about bone survival based on a set of given conditions are likely to be inaccurate and overly naïve (O'Connor 1996).

Excavation techniques and the size of holes used to sieve archaeological deposits will affect what animals and size bone fragments are recovered. Smaller animals are especially likely to be missed if screen size is too big (Wing 2000). These second-order

changes can have large effects on the eventual makeup of bone assemblages, and therefore their eventual analysis.

Analytical Methods

Many analytical methods are imperfect and ambiguous (Crabtree 1990; Grant 2002; O'Connor 2000) and there is no clear consensus about what analytical method is best. The techniques used in zooarchaeology owe much to paleontology and biology (Reitz and Wing 1999). They are often strongly rooted in positivism and functionalism (O'Connor 1996). Researchers attempt to be as precise and detailed as possible when documenting bone assemblages, recording species, body part represented, size, and weight, but it is impractical to take exact measurements of each specimen in a large assemblage (O'Connor 2000).

The exacting methods used in zooarchaeology are not followed by all other archaeological subfields. Researchers in some other archaeological fields, such as paleobotany, do not necessarily find it necessary or useful to go to such great lengths to count and record every plant fragment. Instead, they use semi-quantitative categories; for instance, a particular plant species might be classified as occurring commonly, frequently, or only occasionally (O'Connor 2000).

Reitz and Wing (1990) argue that support for each hypothesis should come from several lines of evidence. Not only the data set, but other lines of evidence, such as cultural context, et cetera, should contribute towards accepting or disproving a faunal hypothesis. Botswana has a fair amount of recent and older ethnographic or descriptive research to draw on for the study of animal exploitation and foodways, so researchers are not limited to strictly economical or environmental interpretations. This study draws extensively on these ethnographies.

Species Identification

Species identification is one of the primary goals of zooarchaeological researchers. Species identification is based on the presence or absence of specific morphological traits. Bone size is also a helpful indicator of the size of the animal represented by the bone, helping to narrow down the range of possible species it may belong to. The specimens in this study have been identified with as much detail as they possibly can. Some specimens cannot responsibly be identified beyond a certain level, making their place in the assemblage somewhat ambiguous. For instance, some specimens are identified as "Chicken/Guinea Fowl," and cannot be firmly designated as a domestic fowl or as a wild bird.

O'Connor (2000) argues that species designations are best viewed as well-educated taxonomic attributions, rather than definitive designations that cannot be disputed. Independent researchers may use personal definitions of different taxa. It is an accepted fact that some specimens will be unable to be positively identified (O'Connor2000). Some species are morphologically similar, and can be difficult to distinguish when only bones are present; the problem of differentiating *Ovis* from *Capra* (sheep from goat) is a subject of continuing controversy (Badenhorst 2006; Noddle 1974). Sheep and goat are treated as one category in my analysis.

It can be difficult to identify vertebrae, ribs and sesamoids down to the species level, even when these skeletal elements are complete (Davis 1987; Klein and Cruz-Uribe 1984). They can still reveal important information about how the site was used when it was occupied, as well as site formation processes. A large number of vertebrae can indicate that animals were killed on the site, and a high proportion of sesamoids can indicate post-depositional destructive pressure that destroyed more delicate bones (Klein and Cruz-Uribe 1984).

It may be productive to view species identification of bone elements as a continuum of "levels of identifiability" (Klein and Cruz-Uribe 1984; Lyman 1979) rather

than as a simple dichotomy of bones that can or cannot be identified. Many bones of the Bosutswe assemblage could not be identified down to the species level, but could be identified to a certain level, such as a bovid or carnivore of a particular size class (ie, "Bovid III" or "medium-sized carnivore"); this is common, especially among African assemblages (Cruz-Uribe 1988).

Meat Value

Analysis of the meat value represented by faunal assemblages is an elementary way of assessing the availability of primary animal products in ancient diets. The estimation of meat value is based on the amount of meat that is present on different bones. The study of the distribution of bones across an archaeological site can be used to investigate if inhabitants of particular areas were consuming particular cuts of meat (Uerpmann 1973). This is useful as a base assessment of nutrition, but the culinary preferences of the society being studied should also be taken into account. Modern Batswana prefer chewy meat, and "meat with bones" so that the bones can be chewed (Denbow and Thebe 2006).

Minimum Number of Individuals (MNI)

Estimating the minimum number of individuals involves assessing what bones actually come, or could have come, from the same individual; this figure is used to estimate the minimum number of individuals of a species represented in a archaeological bone assemblage. Counting only the most frequently represented bones may be helpful. The minimum number of individuals should not be considered to be an actual number of individuals, and comparison of MNI between sites is only possible if the assemblages are of similar size. The MNI of different species is not comparable (Uerpmann 1973: 311).

Number of Identifiable Specimens (NISP) and Quantity (QNT)

The Number of Identifiable Specimens (NISP) is a simple count of the identified faunal specimens for a given species. It is also referred to as Total Number of Fragments (TNF). Faunal analysts frequently calculate the minimum number of individuals (MNI) in an assemblage, which is derived from the NISP by comparing the age-at-death and side (left or right) of elements assemblage and comparing this to that of a living animal. I.e., if you have 72 left bovine femurs, you much have a minimum of 72 individual bovines in your assemblage). Marshall and Pilgrim (Marshall and Pilgram 1993) argue that NISP is a more accurate indicator of relative bone part frequency than MNI to MNI when assemblages are highly fragmented. The Bosutswe assemblage is highly fragmented (881.1%-93.2% fragmented depending on what time period is being analyzed), suggesting that MNI may not the best method of analysis in this case. Many researchers object to NISP on the grounds that it is not useful for describing the death assemblage or the living assemblage from which it is derived. Others argue that NISP is useful for describing the rank order of taxa (O'Connor 2000). The relative validity of MNI verses NISP, and the uses that these techniques can best be used for, continues to be debated. Greyson and Frey (2004) argue that the NISP based body part analyses mirror the results of results derived from the NISP. With Marshall and Pilgrim's (ibid.) and Greyson's and Frey's theories in mind, I will be focusing on NISP and quantity (QNT) based analyses, not MNI.

The Bosutswe faunal data were recorded on 4"x6" cards. Each card was limited to a single species, and included the total number of skeletal elements, as well as the quantity of each element (i.e. 2 left proximal femurs). Some specimens consist of multiple elements- such as a fused radius and ulna or a left mandible containing teeth). In these cases, the researchers who identified the specimens used QNT to indicate the total number of a particular bone element using the nomenclature "number of elements when together (number of elements when separated)" and NISP in the same format when

necessary. Some cards contain more than one skeletal element. QNT for each bone element is equal to the total NISP of each card. For instance, a single card might list a number of *Bos taurus* bones: one mandible containing two molars (QNT 1(3)), and a proximal left femur (QNT 1), amounting to a NISP of 4. Because Excel cannot use numbers such as 1(3) in its calculations, I have calculated the QNT2 and NISP2 using unaltered digits and used those numbers in my analysis. See appendix for the raw data numbers and QNT2 and NISP2. Because much of my analysis depends on comparing body part percentages rather than only species comparisons, I have used QNT in this study, rather than NISP. These numbers are closely correlated. There were a very small number of discrepancies between QNT and NISP calculations when multiple element specimens were analyzed, which I have corrected.

Chapter 3: Taukome and Zhizo Results

The 2001 and 2002 Taukome and Zhizo data are limited to the Western precinct, because the thickness of deposits in the Central precinct did not allow excavation during the 2001 and 2002 fieldwork to extend beyond the Lose period. The Taukome and Zhizo period lasted from about 700 to 1000 CE and are located in layers 19-12. This period represents the earliest Iron Age settlement of Bosutswe. Starting around 900 CE, human and animal populations increase in southern Africa. Status hierarchies began to be more pronounced during this time period. Sites to the east of Bosutswe began to participate in the Indian Ocean trade during the 800's (Denbow 1983).

WILD ANIMALS

As has been mentioned in Chapter 2, not all specimens can be identified down to the species level. When this is the case, specimens are classified to the highest taxonomic rank possible (i.e., Bovid I or medium-sized carnivore, et cetera). Among the Bosutswe faunal assemblage, Bovid II specimens could be sheep or goat, but could also represent a variety of wild species. Similarly Bovid III could be cattle, or any of the many wild bovids that fall into the Bovid III size class. In the interests of full academic analysis, I will present data sets with and without these unspecified bovids. Although they are equines rather than bovids, zebras have been placed in size Class III based on weight (male: 220-322 kg (485-709 lbs), female: 170-250 kg (374-551 lbs) (Smithers 1971) for ease of analysis. Likewise, spring hares are placed in the general "Hare" category because they are small and mainly herbivious non-ungulates.

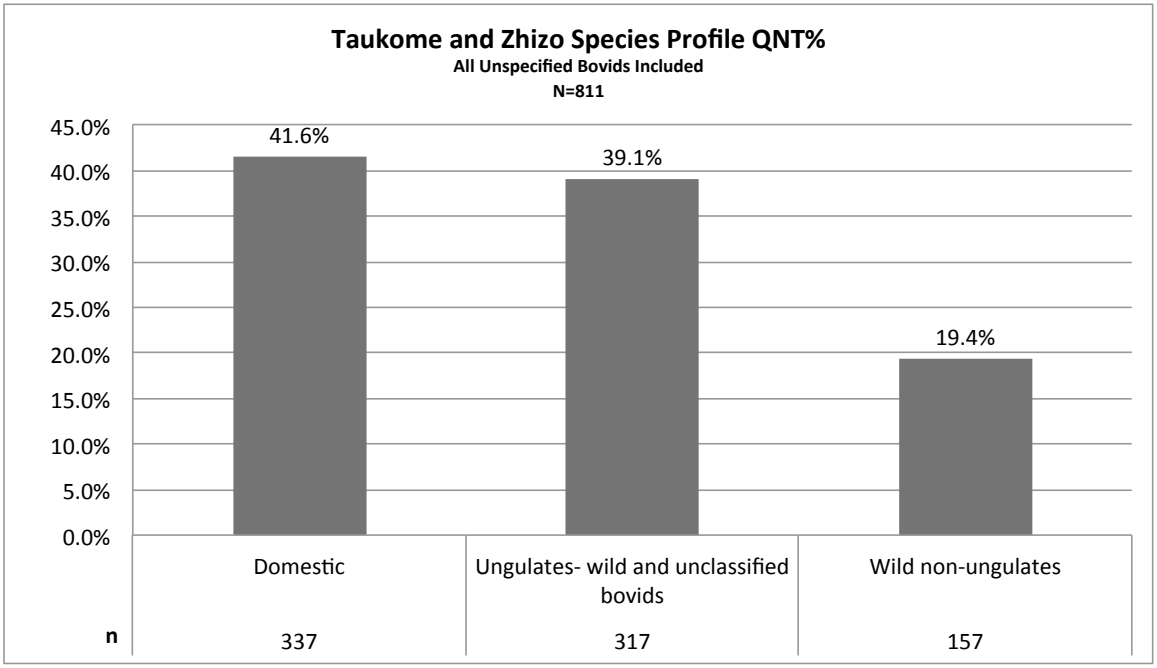


Figure 3-1. Taukome and Zhizo Species QNT%, including all wild and unclassified bovids.

As Figure 3-1 demonstrates, domestic species were a central component of the diet of the inhabitants of Bosutswe from the time of its earliest occupation. Although some cattle, sheep and goats may be unavoidably classified as Bov. II and Bov. III and subsequently placed in the "wild and unclassified" category, domestic species constitute a full 41.6% (n=337) of the assemblage. Hunting and trapping provided a substantial component of meat resources as well (59.5%, n=474).

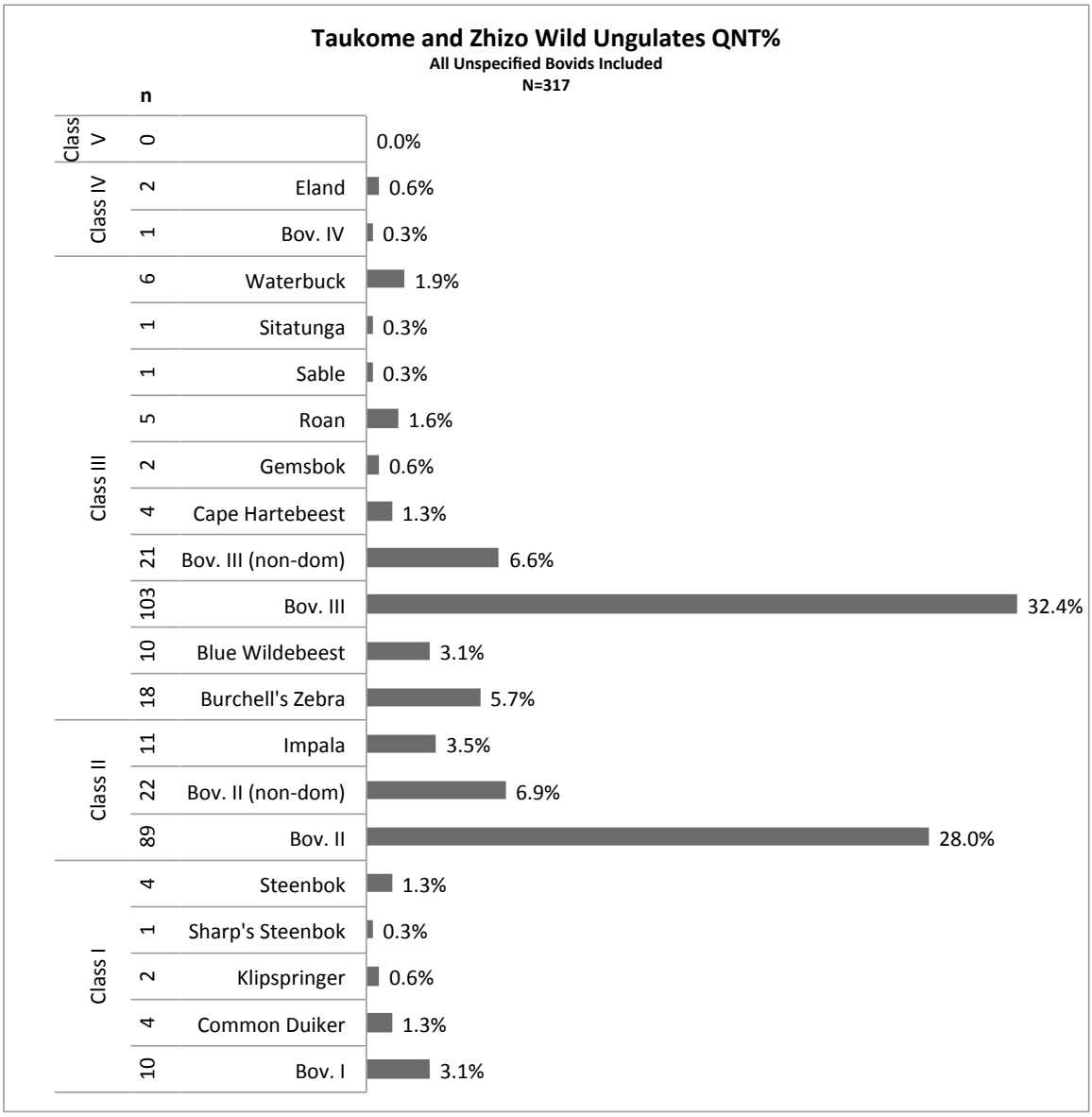


Figure 3-2. Taukome and Zhizo Wild Ungulates QNT%. All unspecified Bovids included.

Using Figure 3-2 to examine the wild animal exploitation that took place in the Western precinct at Bosutswe during the Taukome and Zhizo periods, it is clear that the people of Bosutswe hunted, trapped and collected a wide variety of ungulates and non-ungulates; Brain's (1981) bovid size class definitions have been used to categorize wild ungulates according to size; Smithers (1971) and Estes (1991) have been used to provide animal weight ranges. For ease of analysis, zebra have been incorporated into size Class

III. Excluding unspecified bovids, fourteen ungulate species are represented in the assemblage. As is not unexpected, Bovid II and Bovid III dominate the ungulate assemblage at 28.0 % (n=89) and 32.4% (n=103) respectively. Together, they constitute 60.4% (n=192) of the wild ungulate assemblage. Because there are a large number of southern African wild bovids in these size classes, as well as domestic sheep, goats and cattle, it was expected that these size classes would constitute a large proportion of the assemblage.

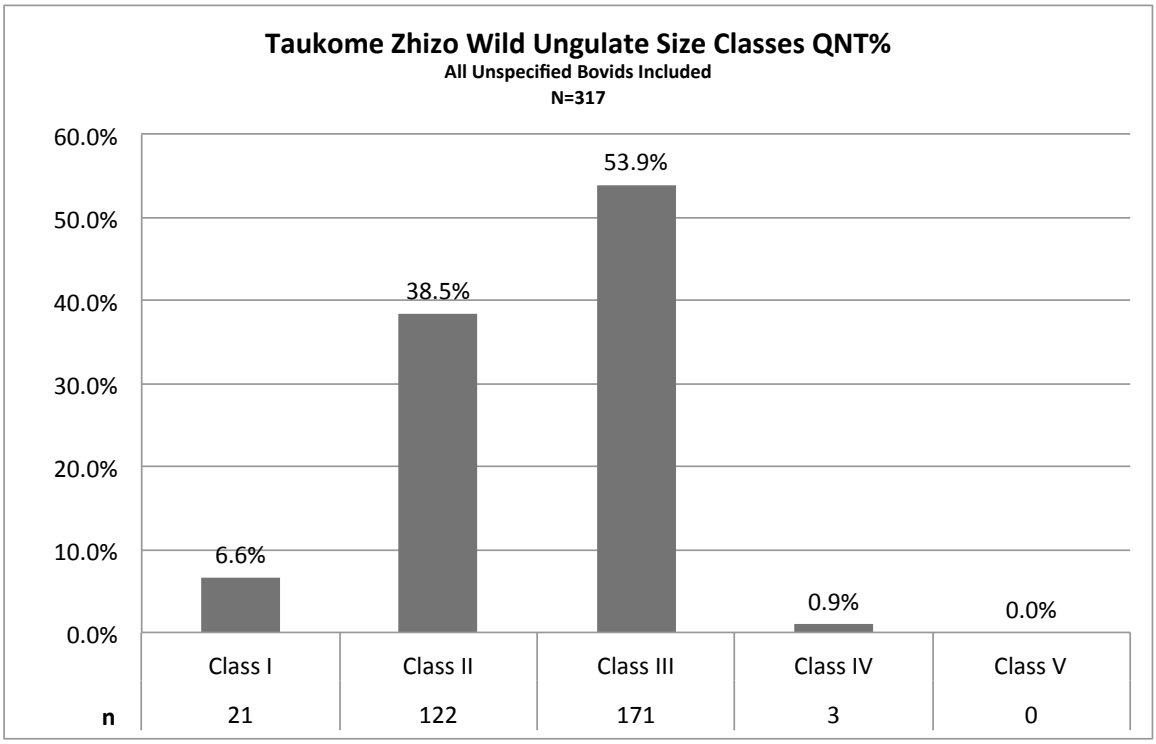


Figure 3-3. Taukome and Zhizo Ungulate size classes, all unspecified bovids included.

Figure 3-3 illustrates the patterns of ungulate exploitation when all ungulates are aggregated into their respective size classes, including unspecified Bovid II and Bovid III specimens. For ease of analysis, zBovid III strongly dominates the assemblage, making up 53.9% (n=171) of it. Class II makes up 38.5% (n=122) of the assemblage, followed by the relatively small 6.6% contributed by Class I specimens, and the very small 0.9% contributed by Class IV species. Class V species are not represented.

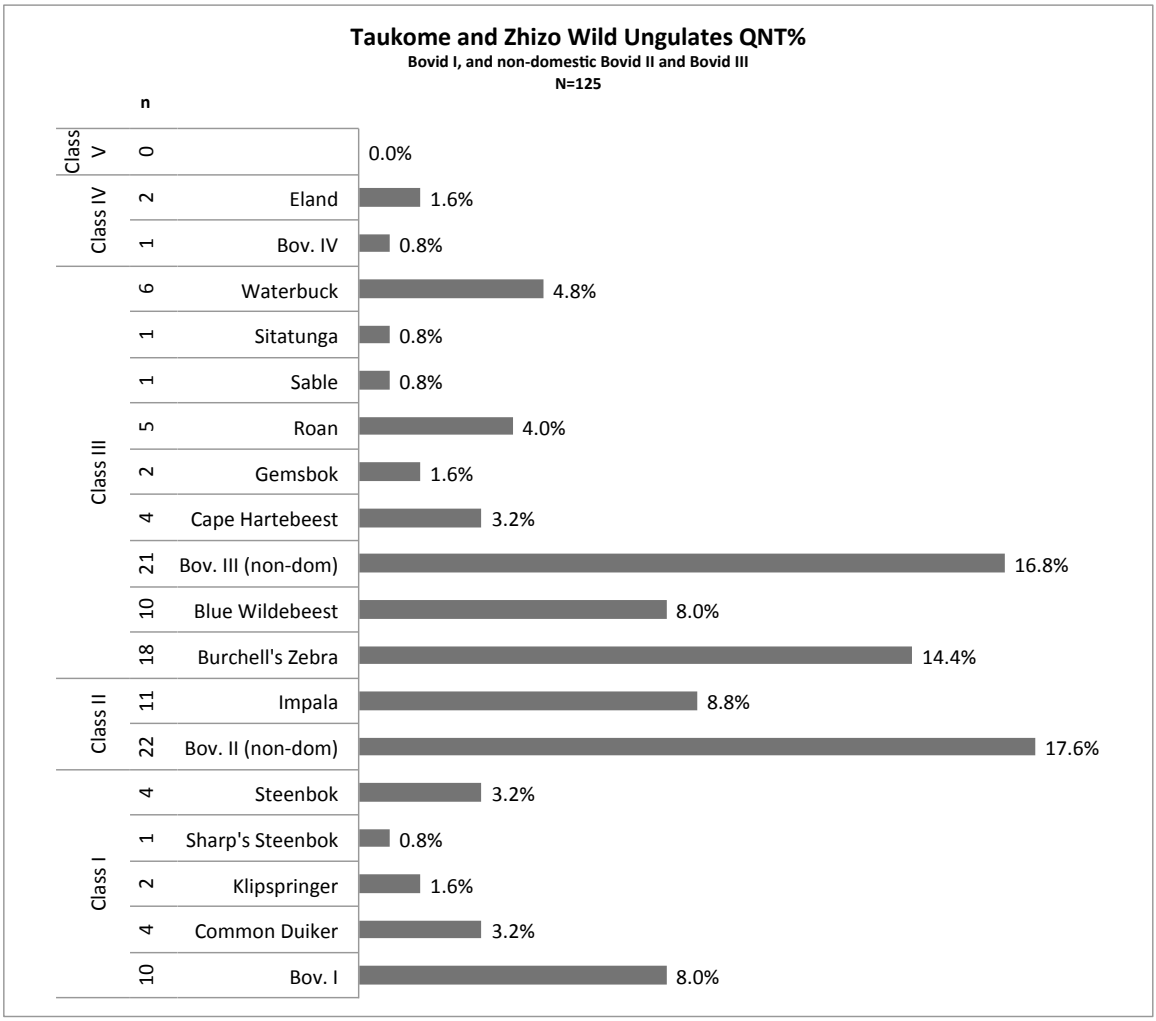


Figure 3-4. Taukome and Zhizo wild ungulates. Bovid I and non-domestic Bovid II and Bovid III included.

In Figure 3-4, the unspecified Bovid II and Bovid III have been removed, leaving only the bovids that can be identified as non-domestic. The assemblage continues to be dominated by Class III and Class II ungulates.

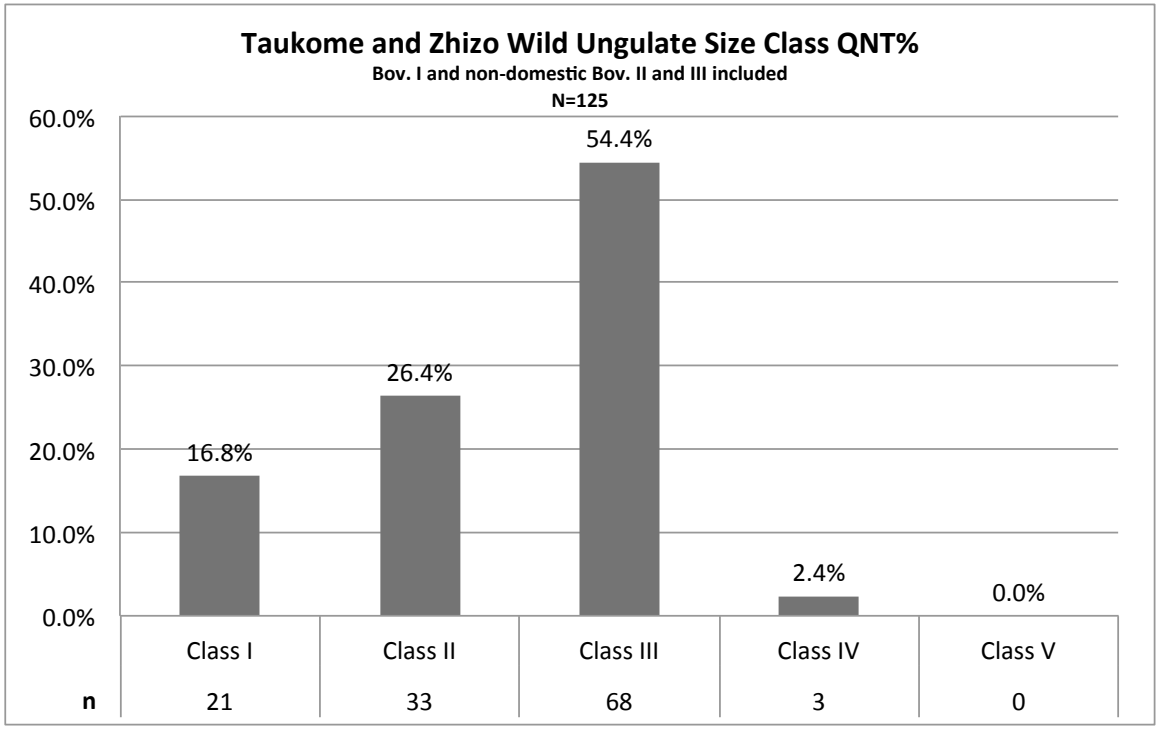


Figure 3-5. Taukome and Zhizo Wild Ungulate Size Classes. Bovid I and non-domestic Bovid II and Bovid III included.

Figure 3-5 illustrates the dominance that known wild size class III species have in the assemblage when unspecified Bovid II and Bovid III's are removed. With the possible cattle, sheep and goats removed, it is clear that the dominance that Class III ungulates have in the wild ungulate assemblage represents actual wild animal exploitation patterns. Class III ungulates constitute 54.4% of the sample (n=68). Class II ungulates contribute 26.4% (n=33). Small antelopes such as steenbok, klipspringer and duiker contribute a not-insignificant 16.8% of the assemblage (n=21), although the small size of these species should be remembered when considering food value. Large ungulates- represented by two eland bones forming the hock (distal calcaneum fragment) and front lower leg (proximal metacarpal articulation and shaft), as well as a Bovid IV, which could be an eland, a buffalo, or perhaps a very large cow.

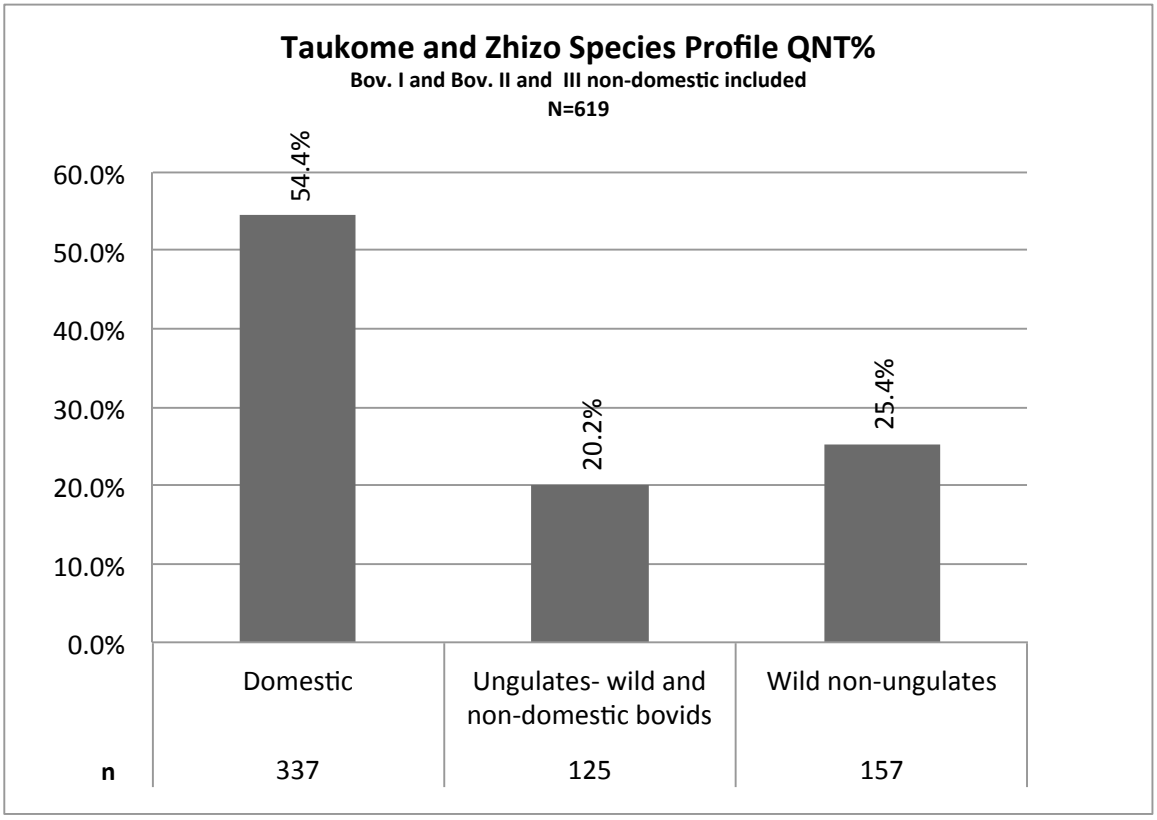


Figure 3-6. Taukome and Zhizo species profile. Bovid I and non-domestic Bovid II and Bovid. III included.

Figure 3-6 depicts overall species composition of identified specimens at Bosutswe during the Taukome and Zhizo time periods with the unclassifiable Bovid II and Bovid III specimens removed. This allows a more conservative comparison of species composition. Domestic animals were very important during this time, forming 54.4% (n=337) of the identified specimens. Known wild ungulates contributed a substantial amount to the meat diet, contributing 20.2% (n=125) of the identified specimens. Wild ungulates are, however, outnumbered by wild non-ungulates (Figure 3-7), which contributed 25.4% of the assemblage (n=157). This is an impressive amount, but it should be remembered that most of the wild ungulates are much larger than the non-ungulates, and thus likely contributed more mass to the diet.

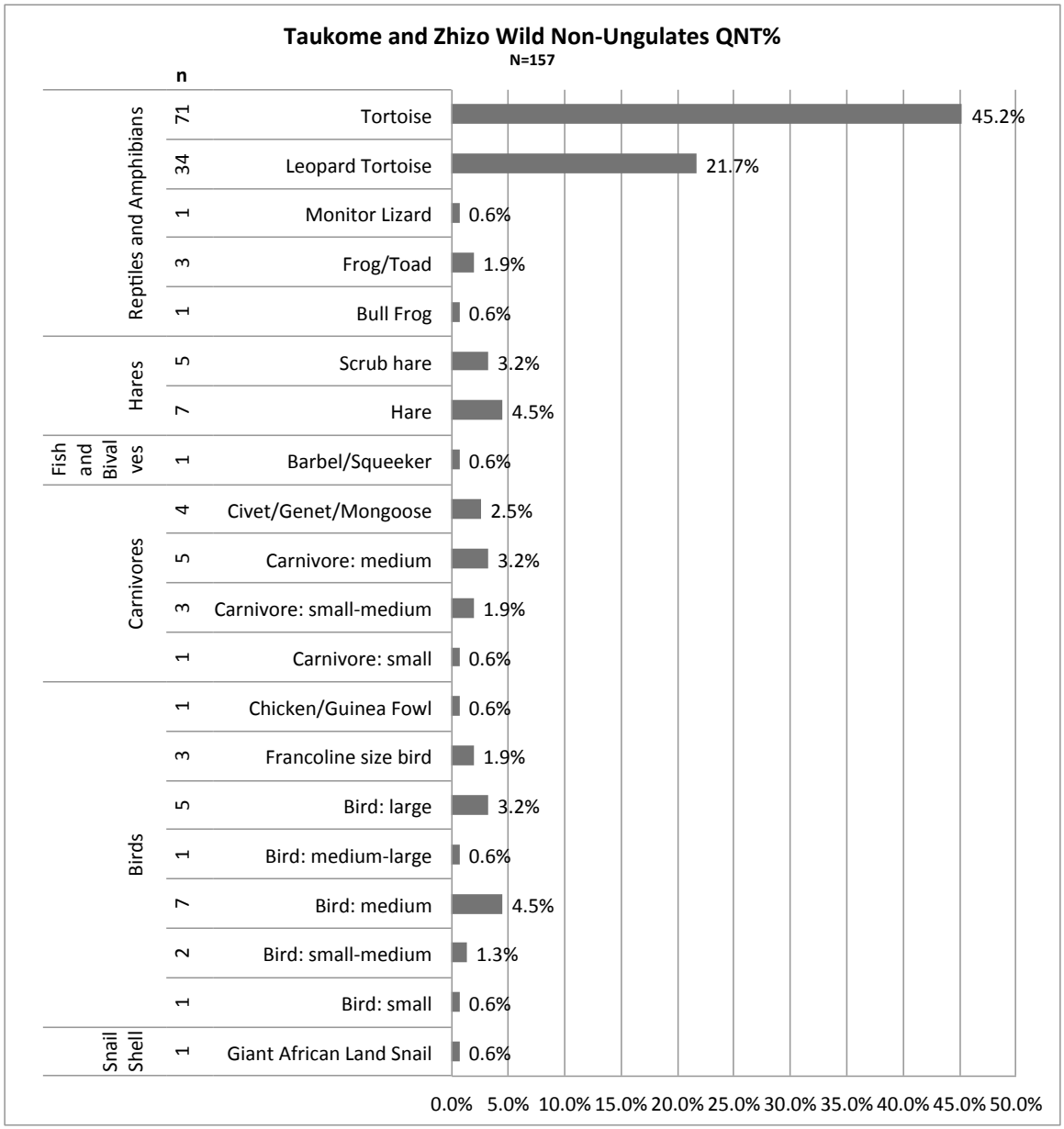


Figure 3-7. Taukome and Zhizo wild non-ungulate QNT%.

The non-ungulate specimens represent a wide variety of species; assuming there is no species overlap between size or biological categories such as "hare" and "scrub hare," 21 species are represented. The non-ungulate assemblage is strongly dominated by tortoises (66.9%, n=105), represented mostly by shell fragments, as well as a 2 ulna and 3 humeri fragments. Hares were also exploited. One fish is present, a barbel, squeeker or a red tail synodont. At least one fur-bearing carnivore is represented, a civet cat, genet, or

mongoose represented by a radius, proximal femur fragment, lower molar and a calcaneum. A wide range of bird sizes are represented. Ostrich are not represented in the assemblage directly by bones, but their eggs were exploited, especially for making ostrich eggshell beads (DuBroc 2010). These beads remain popular today (Denbow and Thebe 2006). See Dubroc 2010 for a discussion of ostrich eggshell beads.

DOMESTICATES

The Cattle Index (CI)

Badenhorst (2011) has devised a standardized method to measure the ratio of cattle to small stock, termed the Cattle Index (CI), calculated using NISP as:

$$CI = \frac{Cattle}{Cattle + Caprines}$$

CI values closer to 0 indicate that small stock outnumber cattle, while CI values nearer to 1 indicate that cattle significantly outnumber small stock. The ratio of cattle to small stock (goats and sheep) is used by researchers as a way to gauge the socioeconomic status of southern African archaeological sites. Cattle are more highly valued than small stock today (Denbow and Thebe 2006; Hitchcock 1978; Peters 1994) and in the ethnographic literature; sites with more cattle than small stock are very often higher status sites (Plug and Roodt 1990; Voight 1983). The Cattle Index is intended to provide researchers with a consistent method of comparing cattle to small stock ratios.

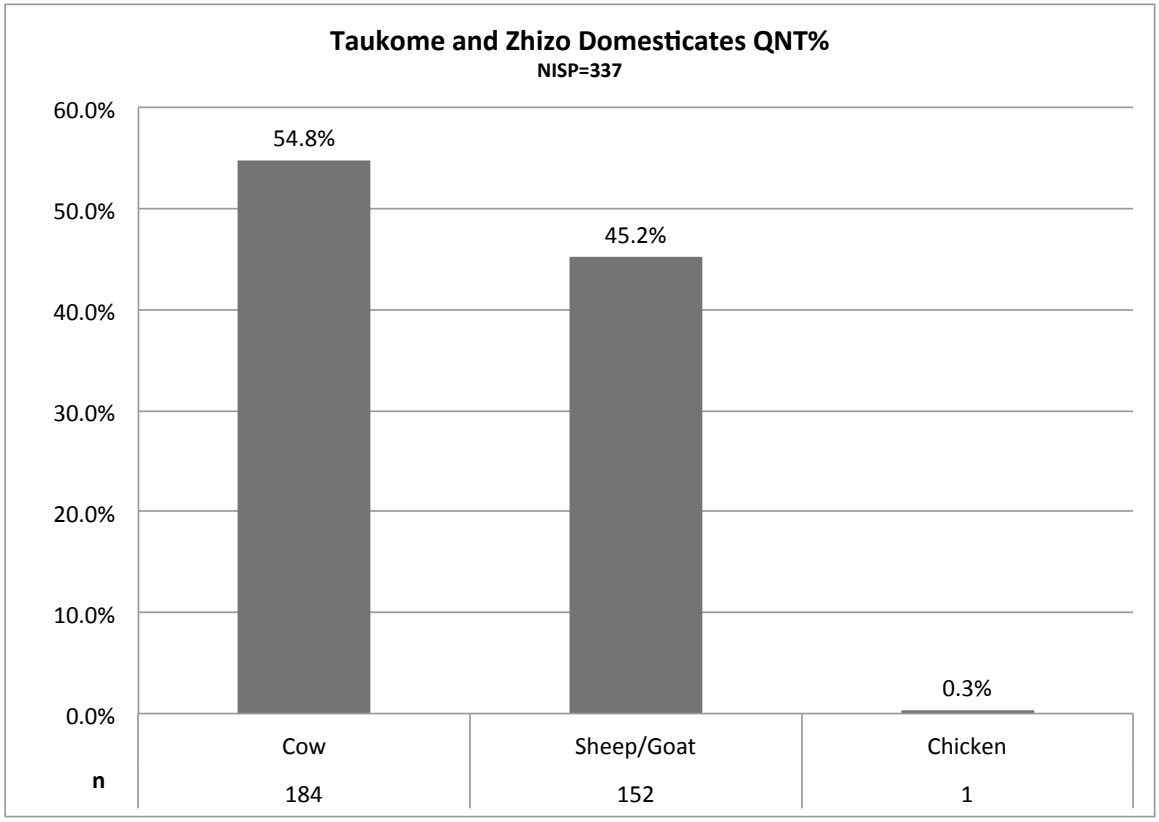


Figure 3-8. Taukome and Zhizo domestic animal assemblage. QNT%.

Analysis of the domestic species as depicted in Figure 3-8 shows that cattle likely outnumbered smallstock during the earliest habitation of Bosutswe. Cattle make up 54.8% (n=184) of the domestic assemblage, while sheep and goat make up a still-substantial 45.2% (n=152) of the domestic assemblage. The CI value is 0.54. As noted by Plug (1996), chicken were present from the earliest occupation of Bosutswe. Here, the presence of chicken is documented by a distal phalanx fragment.

Summary

The Taukome/Zhizo period (700-900 CE) represents the earliest occupation of Bosutswe. Domesticates were an important part of the diet for the inhabitants of Bosutswe during this early time period, with about 50% of the assemblage consisting of domesticates. Cattle were more prevalent than goats. Chicken were present in low numbers. Large wild mammals (Class III) were commonly exploited. Tortoises seem to

have been plentiful in that area surrounding Bosutswe. The presence of sitatunga and waterbuck attest to long-distance trading contacts with the Okavango Delta, because these animals require wetland habitats (Smithers 1971).

These domesticate results were expected based on Bosutswe's status as a known elite site. The early dominance of cattle is significant, and may speak to the issue of the antiquity of the high value placed upon cattle (see Badenhorst 2001); the greater number of cattle compared to small stock at this early date may indicate that cattle were already more highly valued than small stock. The wide use of wild animal resources was also expected based on enthographic and historic accounts indicating the frequent inclusion of wild plants and animals in the diet (Cummings 1979, Schapera 1939, Denbow and Thebe 2006).

Chapter: 4 Toutswe

EARLY TOUTSWE

The Toutswe period lasts from around 1000 CE to around 1200 CE at Bosutswe, and is represented by layers 11-8 (Early and Middle Toutswe) and 7-5 (Late Toutswe) in the Western Precinct. Excavations during the 2001 and 2002 field seasons did not reach the Toutswe component in the Central precinct. More complex and stratified cultures arose in southern Africa during this time, vying for power based on participation in the Indian Ocean trade network. Schroda was abandoned before 1033 CE, and K2 rose to prominence, continuing to gain power and wealth through its participation in the in the Indian Ocean trade network. The site of K2 was moved to Mapungubwe Hill around 1220 CE (Huffman 2007). Exotic ceramics from the Okavango Delta region to the west and the Limpopo Valley to the east made their way to Bosutswe during this time period (Denbow et al. 2008; Wilmsen et al 2009).

Wild Animals

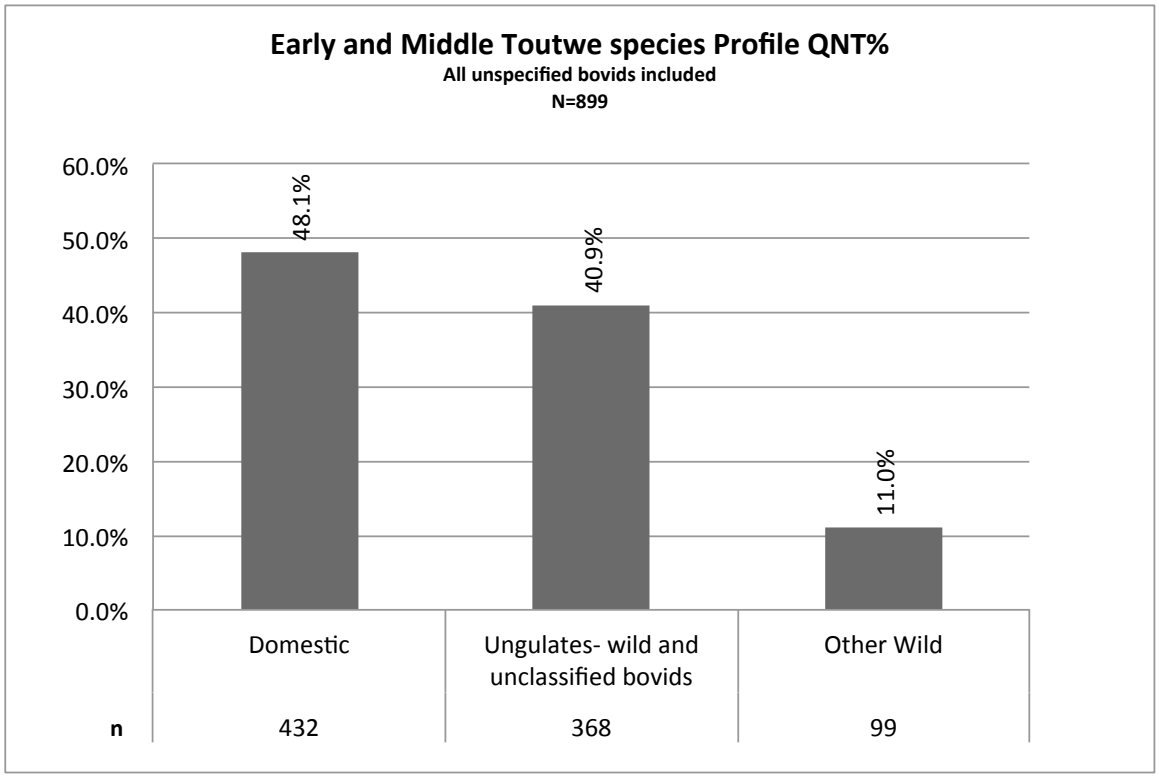


Figure 4-1. Early and Middle Toutswe species profile. QNT%. All unspecified bovids included.

As Figure 4-1 shows, domestic species continued to form a large part of the meat diet of the inhabitants of Bosutswe during the Early and Middle Toutswe period. When unclassifiable bovids are considered as part of the species profile, domestic species form 48.1% (n=432) of the assemblage. This is a significant increase (X^2=7.2787; p=0.007) compared to the earlier Taukome and Zhizo period, when specimens that could be identified as domestic formed 41.6% (n=337) of the assemblage. Wild and unclassified ungulates have increased by a very small and insignificant (X^2=0.6056; p=0.4364) amount, now forming 40.9% of the assemblage, compared to an earlier 39.1%. What is more remarkable is the notable decrease in wild non-ungulates, now contributing 11.0% (n=99) of the identified specimens to the assemblage. During the Taukome and Zhizo

period, wild non-ungulates contributed 19.4%(n=157) of the identified specimens of the food assemblage; this is a substantial and significant change (X^2=23.334; p=<0.0001).

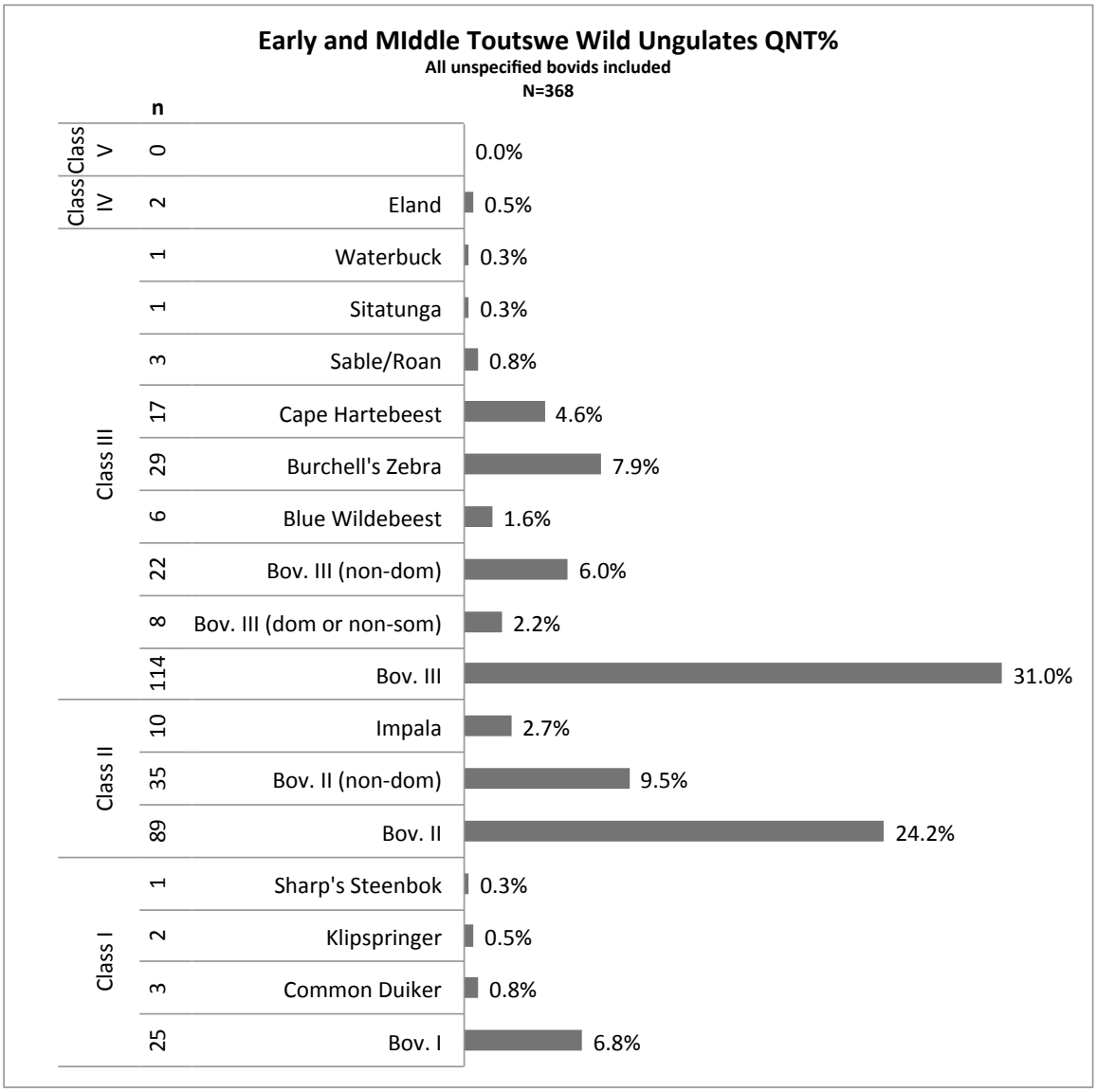


Figure 4-2. Early and Middle Toutswe Wild Ungulates QNT%. All unspecified bovids included.

Figure 4-2 details the wild ungulates that could be identified from the Early and Middle Toutswe period. Again, unspecified Bovid III and Bovid II dominate the assemblage, at 31.0% (n=114) and 24.2% (n=89) respectively, together forming 55.2%

(n=203) of the assemblage. This is a slight decrease compared to 60.4% (n=192) compared to the Taukome and Zhizo period, but they continue to dominate the assemblage. Sitatunga and waterbuck are both present, representing long-distance hunting excursions, likely by men who lived at Bosutswe, or these could have been acquired through long-distance trade. In either case, ties to other parts of southern Africa are represented. See Chapter 9 for further discussion of animals with ritual or spiritual significance. Two eland (size class IV) bone fragments were identified; a left lower third molar and a right proximal humerus head and shaft.

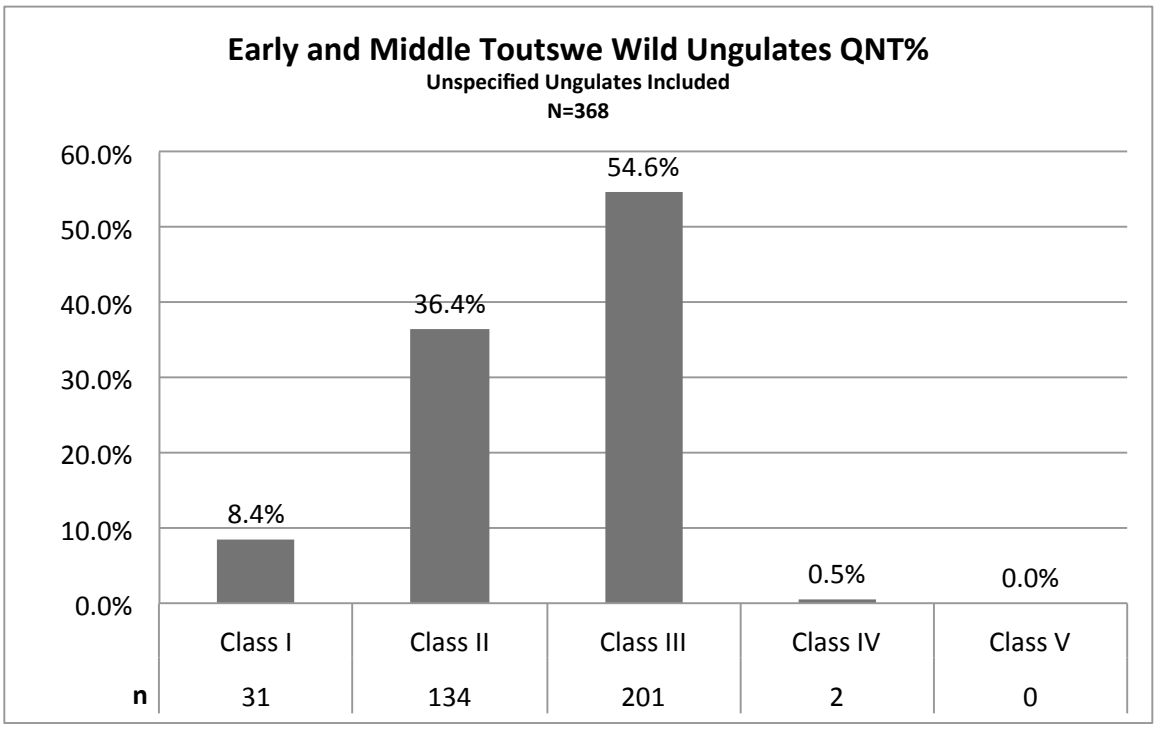


Figure 4-3. Early and Middle Toutswe wild ungulate size classes QNT%. Unspecified bovids included.

As shown in Figure 4-3, the aggregate ungulate size class proportions have not changed substantially from the Taukome and Zhizo period to the Early and Middle Lose period when unclassified Bovid II and Bovid III specimens are included in the aggregate proportions. Class I ungulates have increased slightly from 6.6% (n=21) to 8.4% (n=31).

Class II ungulates decreased slightly from 38.5% (n=122) to 36.4% (n=134). Class III ungulates increased slightly from 53.9 (n=171) to 54.6% (n=201). Likewise, the change in Class IV wild ungulates is represented by a very small decrease; in the Taukome and Zhizo period, 0.9% (n=3) of the wild ungulate assemblage was identified as size class IV ungulates; here, 0.5% (n=2) of the wild assemblage was identified as size class IV ungulates. These changes are minor and not statistically significant.

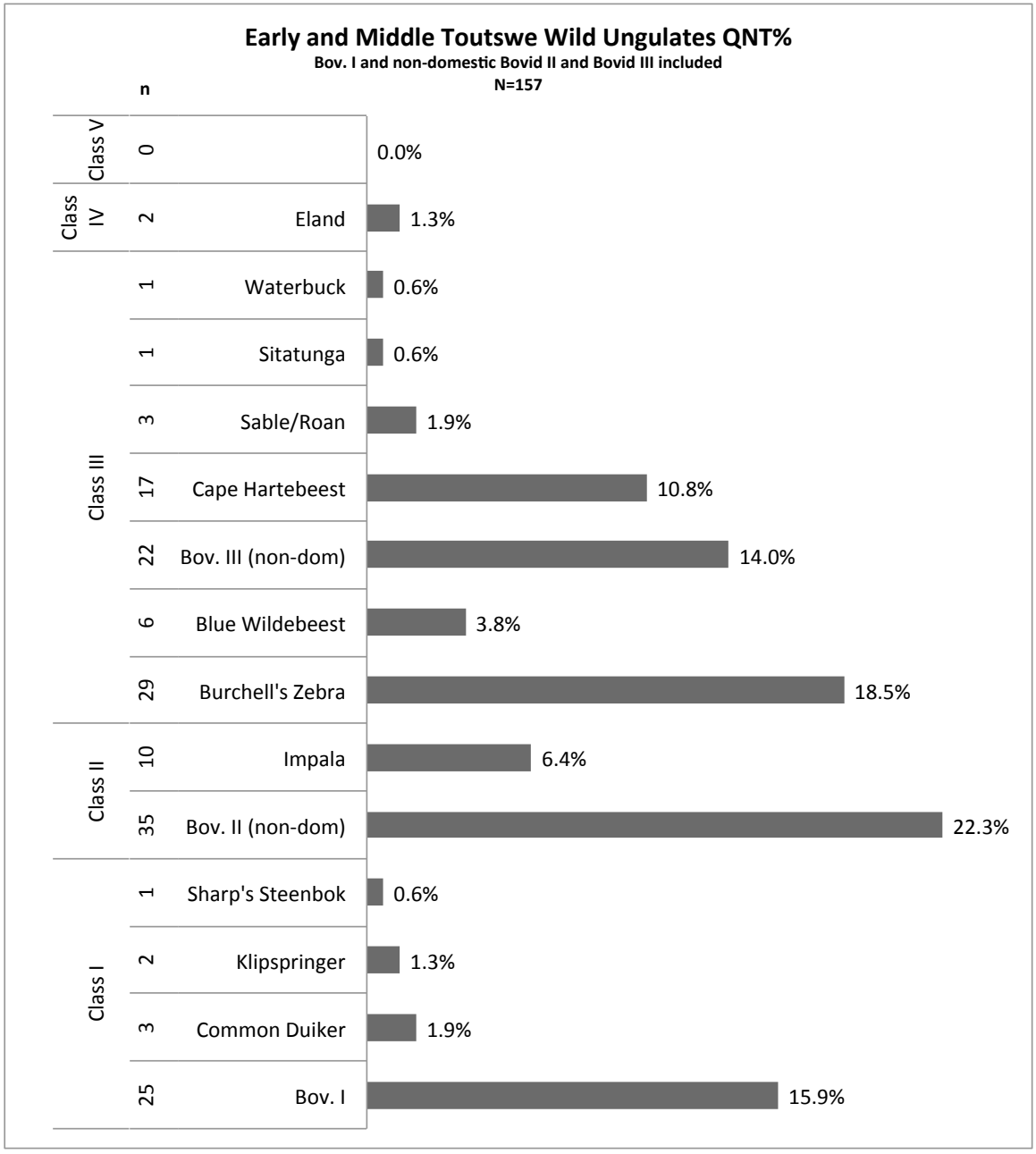


Figure 4-4. Early and Middle Toutswe Wild Ungulates QNT%. Unspecified bovids excluded.

Figure 4-4 details the wild ungulate composition during the Early and Middle Toutswe. At least 11 species are represented here. Eland and waterbuck are both present, although the number of waterbuck specimens has decreased compared to the Taukome and Zhizo period; since the 6 waterbuck specimens from the Taukome and

Zhizo period could represent a single individual, this may not be significant. Zebra continue to dominate the assemblage, forming 18.5% (n=29) of the identified specimens; this is a slight but insignificant increase over the 14.4% (n=18) during the Taukome and Zhizo period . Unclassified Bovid I specimens have increased substantially, from 8.0% (n=10) to 16.9% (n=25), but this change is not significant (X^2=3.6236; p=0.056967).

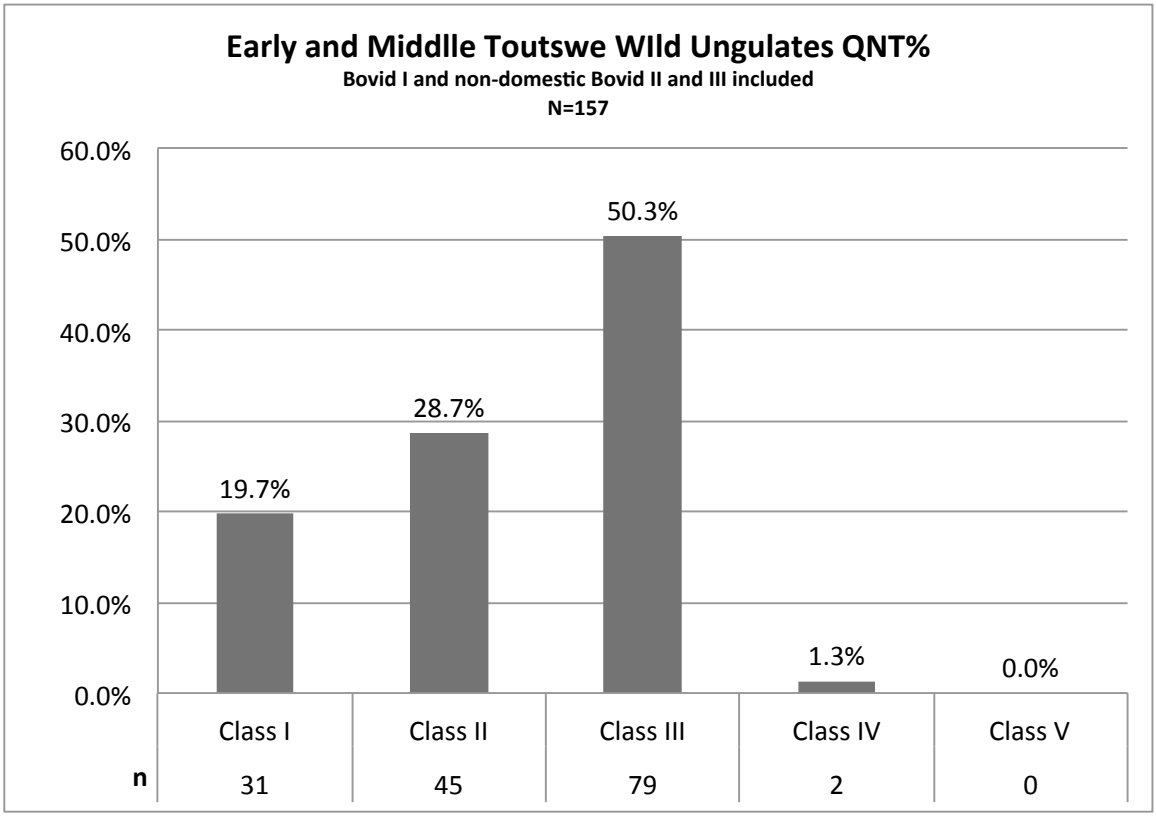


Figure 4-5. Early and Middle Toutswe Wild Ungulates QNT%. All unspecified bovids included.

As figure 4-5 shows, the aggregate wild bovid composition has not changed substantially from the Taukome and Zhizo period when unspecified Bovid II and Bovid III specimens are removed from the analysis. Class I ungulates have increased slightly from 16.8 (n=21) to 19.7% (n=31). Class II specimens now represent 28.7% (n=79) of the wild ungulate assemblage. Class III specimens have decreased from 54% (n=68) to 50.3% (n=79). Class V specimens have decreased slightly from 2.4% (n=3) to 1.3%

(n=3). Despite a slight change in the Class III specimens, the overall wild ungulate size class composition has not changed substantially or significantly compared to the Taukome and Zhizo period.

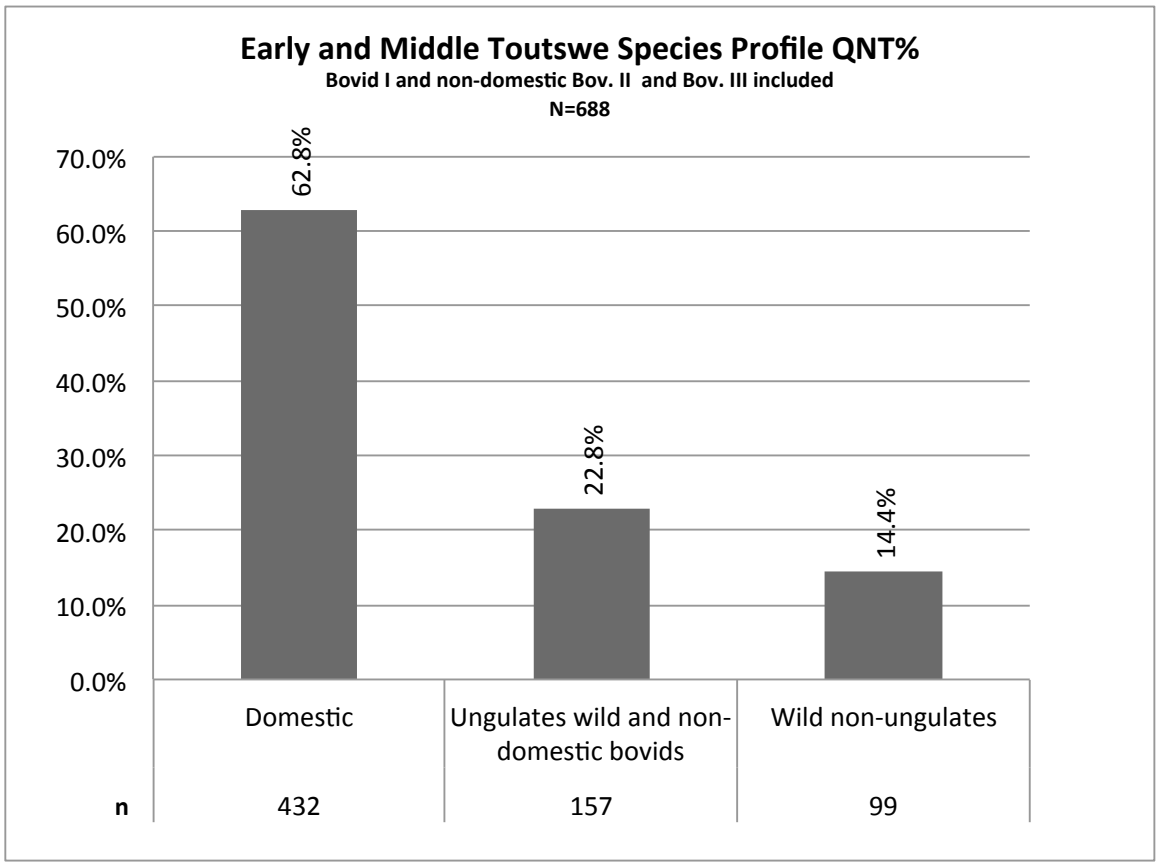


Figure 4-6. Early and Middle Toutswe Species Profile QNT%. Unspecified bovids omitted.

The overall species composition when unclassified Bovid II and Bovid III specimens are omitted (Figure 4-6) shows an increased reliance on domesticates and a decrease in wild non-ungulate exploitation. Wild ungulate exploitation does not appear to have changed substantially. The number of domestic specimens has risen to 62.8% (n=432) of the assemblage, compared to an earlier 53.6% (n=337); this is significant X^2=9.376; p=0.022. The wild non-ungulates have decreased noticeably and significantly, from 25.4% (n=157) to 14.4% (n=99) (X^2=24.9137; p=<0.0001). Wild ungulate

specimens now outnumber wild non-ungulate specimens, which was not the case during the Taukome and Zhizo period. This suggests an increase in the importance of hunting and trapping ungulates compared to non-ungulates. Wild ungulates and non-domestic bovids have not changed appreciably compared to the Taukome and Zhizo period; they now represent 22.8% (n=157) of the assemblage, compared to an earlier 20.2% (n=125); this change is not significant.

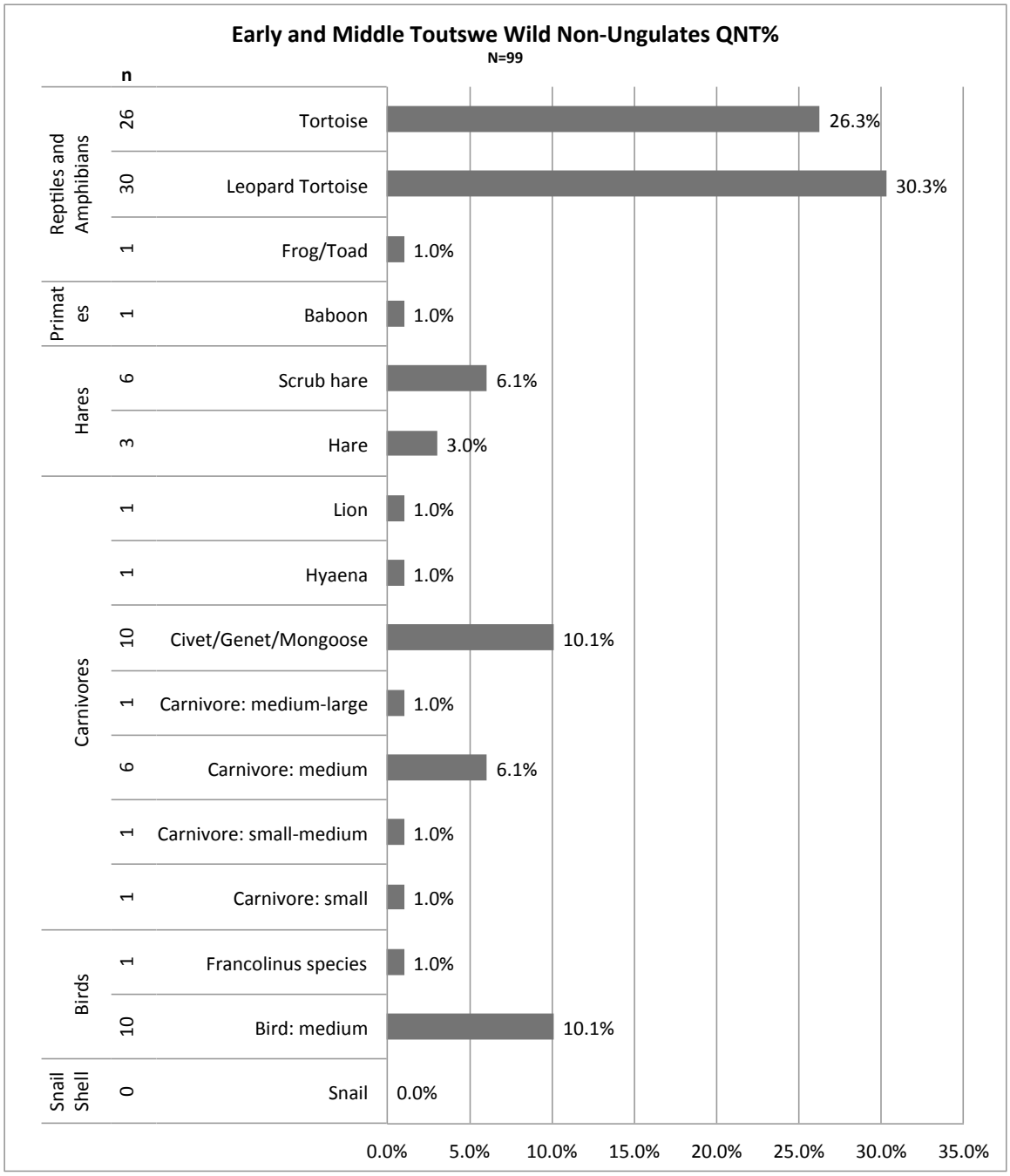


Figure 4-7. Early and Middle Toutswe wild non-ungulates QNT%.

The wild non-ungulates (Figure 4-7) continue to be dominated by tortoises during the Early and Middle Toutswe period, contributing a total of 56.6% of the assemblage (n=56); see Chapter 10 for a discussion of their ecological significance through time. This is an insignificant decrease from the Taukome and Zhizo period, when tortoises

constituted 66.9%(n=105) of the identified wild non-ungulates. Medium sized birds show an insignificant increase. It is possible that fewer bird species were exploited in general. In the Taukome/Zhizo time period, small, small-medium, medium, medium-large and large bird species specimens, as well as possible francolin and chicken/guinea fowl were identified; here, only medium birds and francolin are present.

Carnivores also show a substantial change: both lion and hyaena are represented, indicating an increase in hunting dangerous animals. One baboon specimen is also present. See Chapter 9 for details on ritually significant remains.

Domesticates

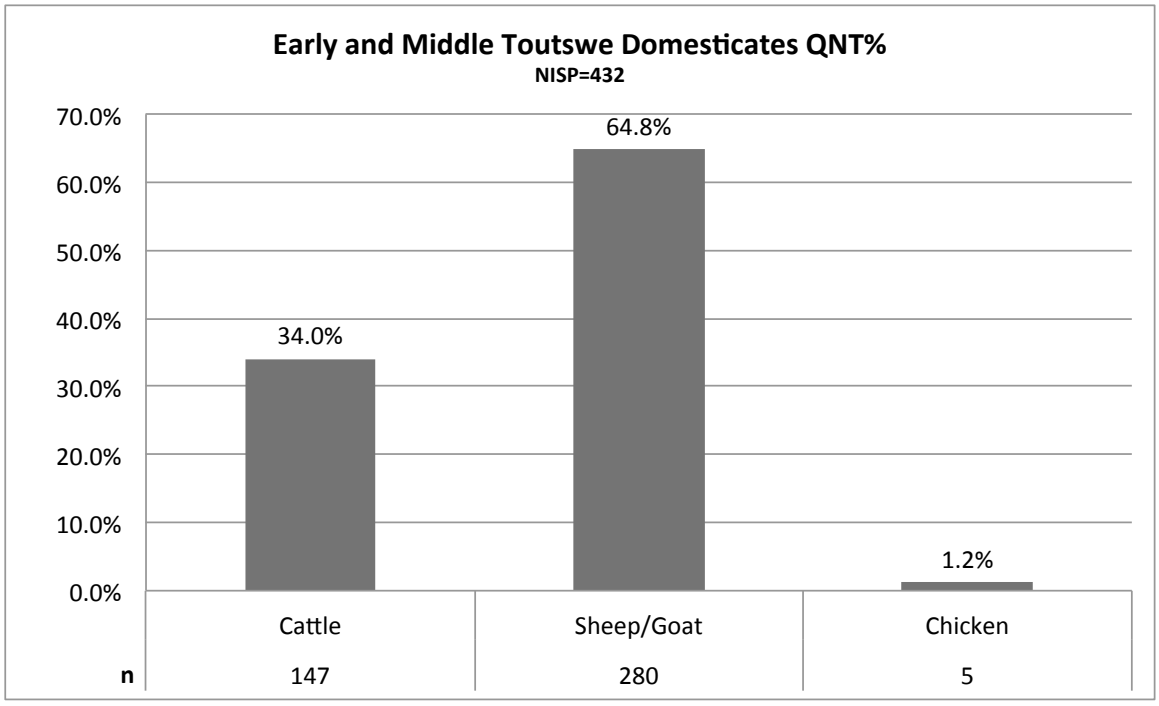


Figure 4-8. Early and Middle Toutswe Domesticates QNT%

The domestic species composition during the Early and Middle Toutswe period illustrated in Figure 4.8 is especially noteworthy because this is the only time period at Bosutswe in which sheep and goats outnumber cattle (CI=0.34). There is a strong and

significant difference in the percentage of cattle and sheep/goats; cattle make up 34.2% of the domestic assemblage (n=147), while sheep make up 65.3% of the domestic assemblage (n=280) (X^2=31.659; p=< 0.0001). The proportion of wild ungulates, wild non-ungulates and domestic species still strongly favors domestic species over wild species.

Summary

Domesticates increased slightly in importance during the Early and Middle Toutswe. This time period is notable for being the only time at Bosutswe when sheep outnumbered cattle. The significance of this change in the domestic assemblage is not know. Wild animals continued to form an important part of the diet, especially Class III species. Tortoises continue to be very well represented. Potentially fur-bearing carnivores are also well represented. Exotic riverine species from the Okavango Delta, Boteti River and/or Lake Xau are also present. These specimens are noteworthy because they attest to the importance of long-distance trade within southern Africa.

LATE TOUTSWE

Wild Animals

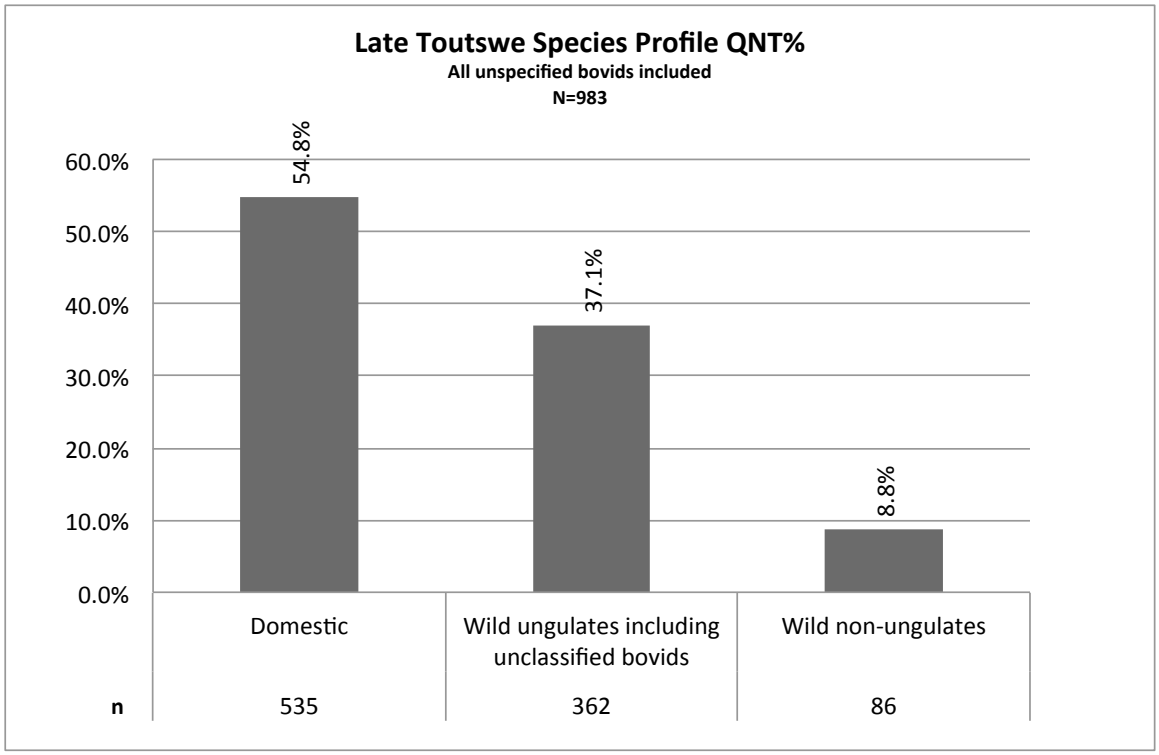


Figure 4-9. Late Toutswe Species Profile QNT%. All unspecified bovids included.

The Late Toutswe species profile when all unspecified bovids are considered (Figure 4-9) continues the trend of increasing domesticates, comparatively steady wild ungulates, and decreasing wild non-ungulates. These trends are gentle, rather than radical, so that the overall species profile is broadly comparable to the Early and Middle Toutswe. Domesticates have increased significantly to 54.8% (n=535) from 48.1% (n=432) during the Early and Middle Toutswe (X^2=7.6316; p=0.0057). Wild ungulates have decreased slightly to 37.1% (n=362), down slightly from 40.9% (n=368). Wild non-ungulates have also decreased slightly to 8.8% (n=86) from 11.0% (n=99), but this is not significant (X^2=2.714; p=0.99458). Domesticates have increased at the expense of wild animals, but wild animal resources continue to be an important part of the domestic

economy at Bosutswe, the and inhabitants would have had to dedicate mental and physical energy to obtain them.

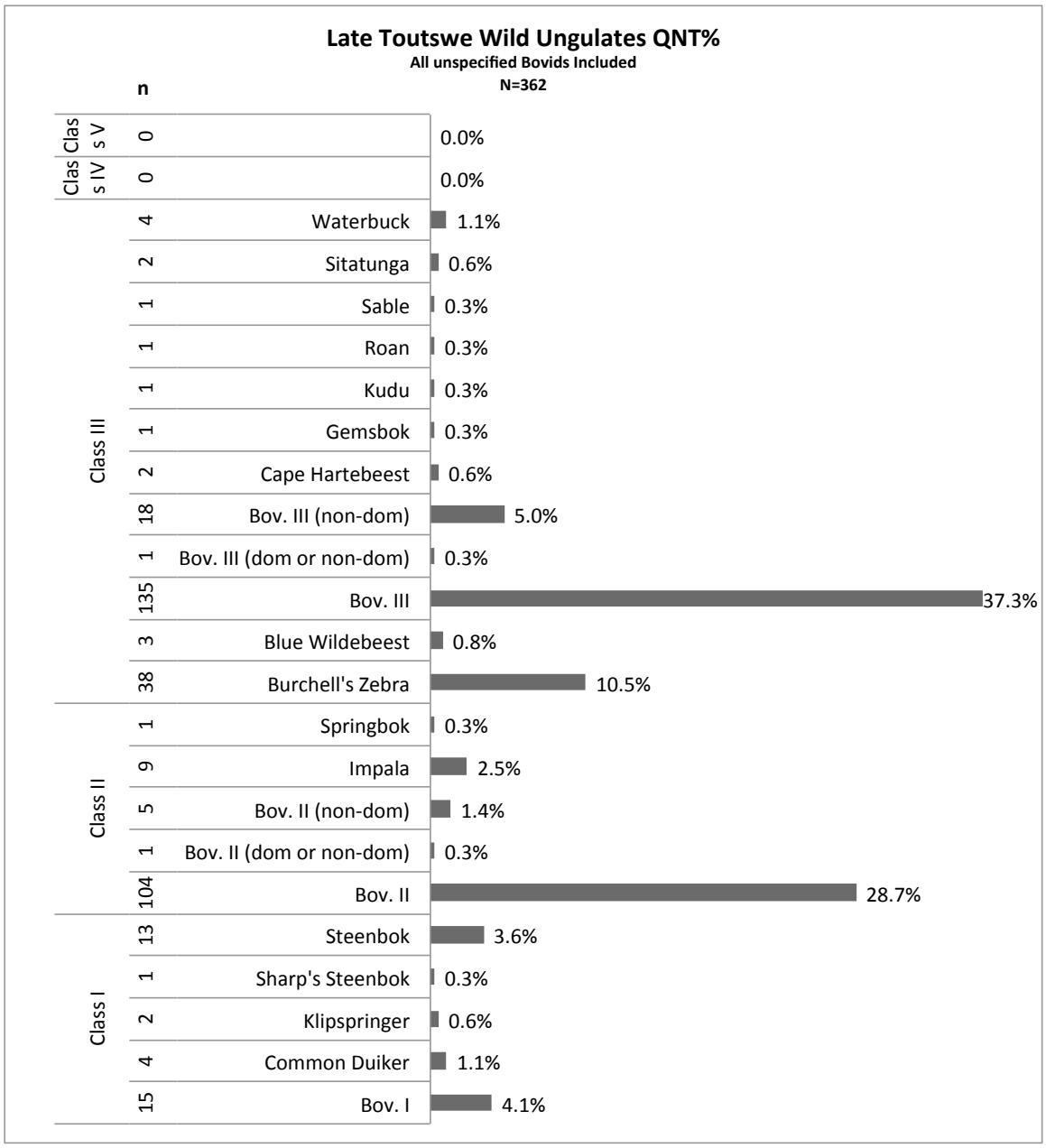


Figure 4-10. Late Toutswe wild ungulate QNT%. All unspecified bovids included.

The detailed breakdown of identified specimens shown in Figure 4.4 shows an increase of unspecified Bov. II and Bov. III; together; they make up 66.0% (n=239) of the wild assemblage, a strong and significant ($X2$=9.0084; p=0.0027) increase over their

earlier combined total of 55.2% (n=203) during the Early and Middle Toutswe; this is the highest proportion of unclassified Bov. II and Bov. III to date, overtaking the Taukome and Zhizo proportion of 60.4% (n=192).

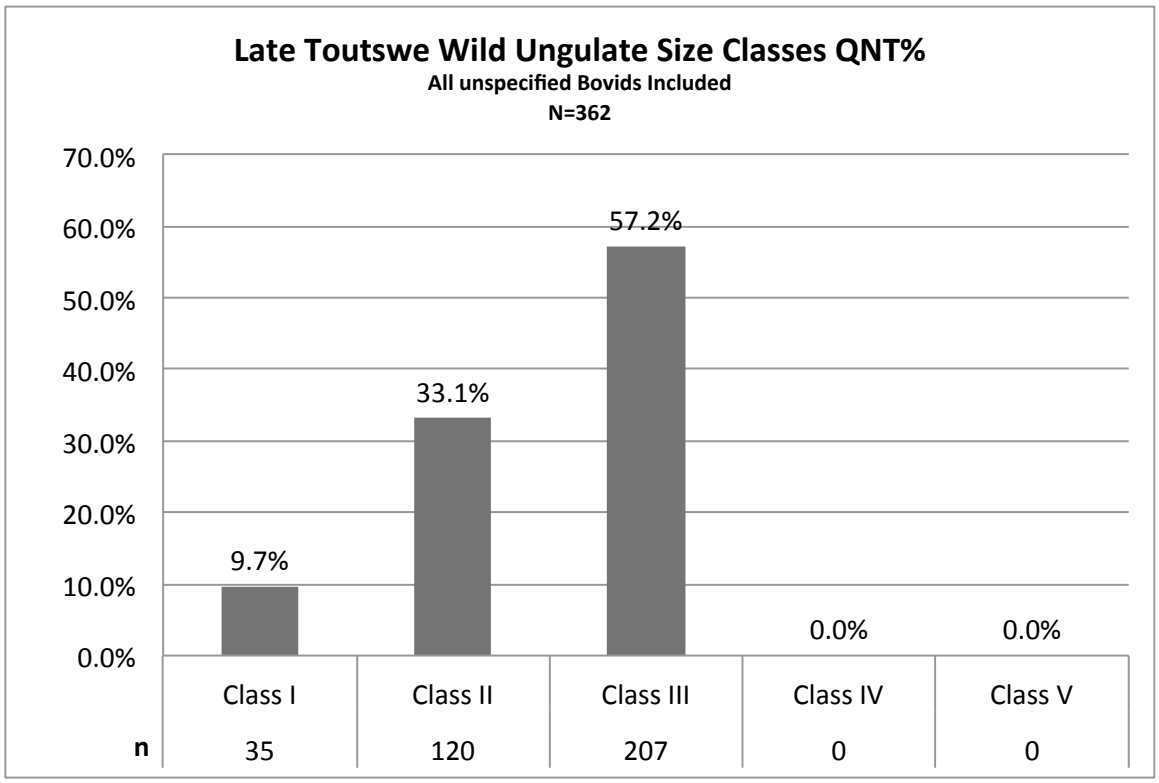


Figure 4-11. Late Toutswe wild ungulate size classes QNT%. All unspecified bovids included.

Despite the increase in unclassified Bovid II and Bovid III specimens, the overall wild ungulate size class proportions strongly resemble the Early and Middle Toutswe proportions. Size class I specimens show the least change, increasing to 9.7% (n=35) from 8.4% (n=31). Class II specimens have decreased slightly to 33.1% (n=120) from 36.4% (n=134). Class II specimens have increased to 57.2% (n=207) from 54.6% (n=210.) These changes are minor and not statistically significant.

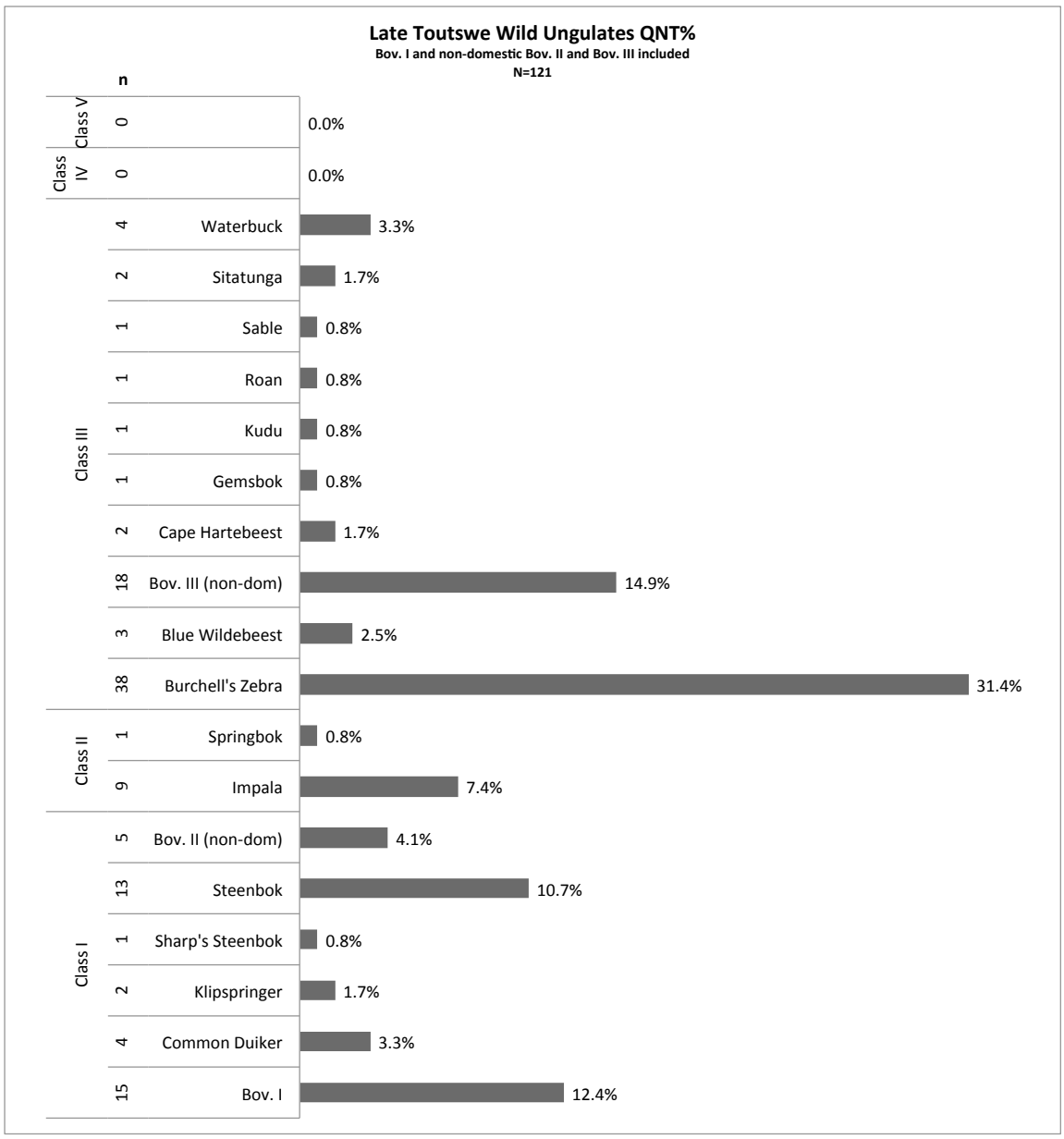


Figure 4-12. Late Toutswe Wild Ungulates QNT%. All unspecified bovids excluded.

With the removal of unclassified Bovid II and II specimens as depicted in Figure 4-12, a clear change in wild ungulate exploitation patterns becomes apparent. Zebras have always been the most intensively exploited ungulate, but they have increased sharply and significantly, rising to 31.4% (n=38) from 18.5% (n=29) during the Early and Middle Toutswe (X^2=6.249; p=0.0124). Non-domestic Bovid II specimens have decreased substantially, from 22.3% (n=35) to 4.1% (n=5). Bovid I specimens have

increased; steenbok now make up 10.7% (n=13) of the wild ungulate assemblage, whereas they were not present during the Early and Middle Toutswe. Cape hartebeest have decreased from 10.8% (n=17) during the Early and Middle Toutswe to 1.7% (n=2). The overall picture is increasing zebra exploitation at the expense of Class III and Class II wild ungulates, and an increase in Bov. I exploitation. Communal game drives may have increased as a way to obtain these wild animals.

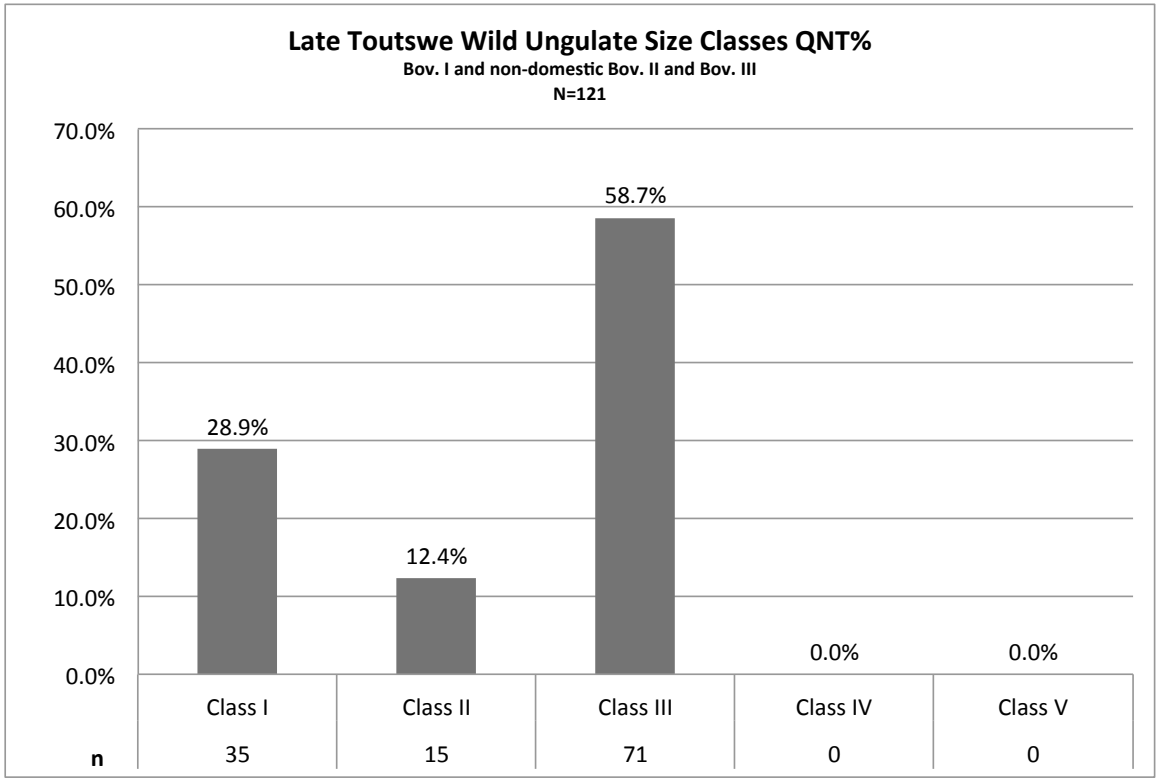


Figure 4-13. Late Toutswe Wild Ungulate Size Classes QNT%. All unspecified bovids omitted.

The aggregate wild species composition without unclassified Bov. II and Bov. III as presented in Figure 4-13 verifies the interpretations suggested by Figure 4.11. During the Early and Middle Toutswe, Class I specimens constituted 19.7% (n=31) of the wild ungulate assemblage; they now constitute 28.9% (n=35) of the assemblage, a significant change (X^2=3.1811; p=0.0745). Class II species have undergone a dramatic and significant decline; they are now 12.4% (n=15) of the assemblage, compared to 28.7%

(n=45) during the Early and Middle Toutswe (X^2=10.6824; p=0.0011). This marks the first time that Class II specimens are outnumbered by Class I specimens as well as Class III specimens. It is also apparent that the increase in zebra exploitation at the expense of other Class III species has been more than sufficient to maintain the contribution of larger ungulates to the diet of the inhabitants of Bosutswe; Class III ungulates have now risen to 58.7% (n=71), compared to 50.3% (n=79) during the Early and Middle Toutswe, an insignificant change (X^2=1.922; p=0.1656). Wild ungulate exploitation patterns seem to have undergone a dramatic change during the Late Toutswe period.

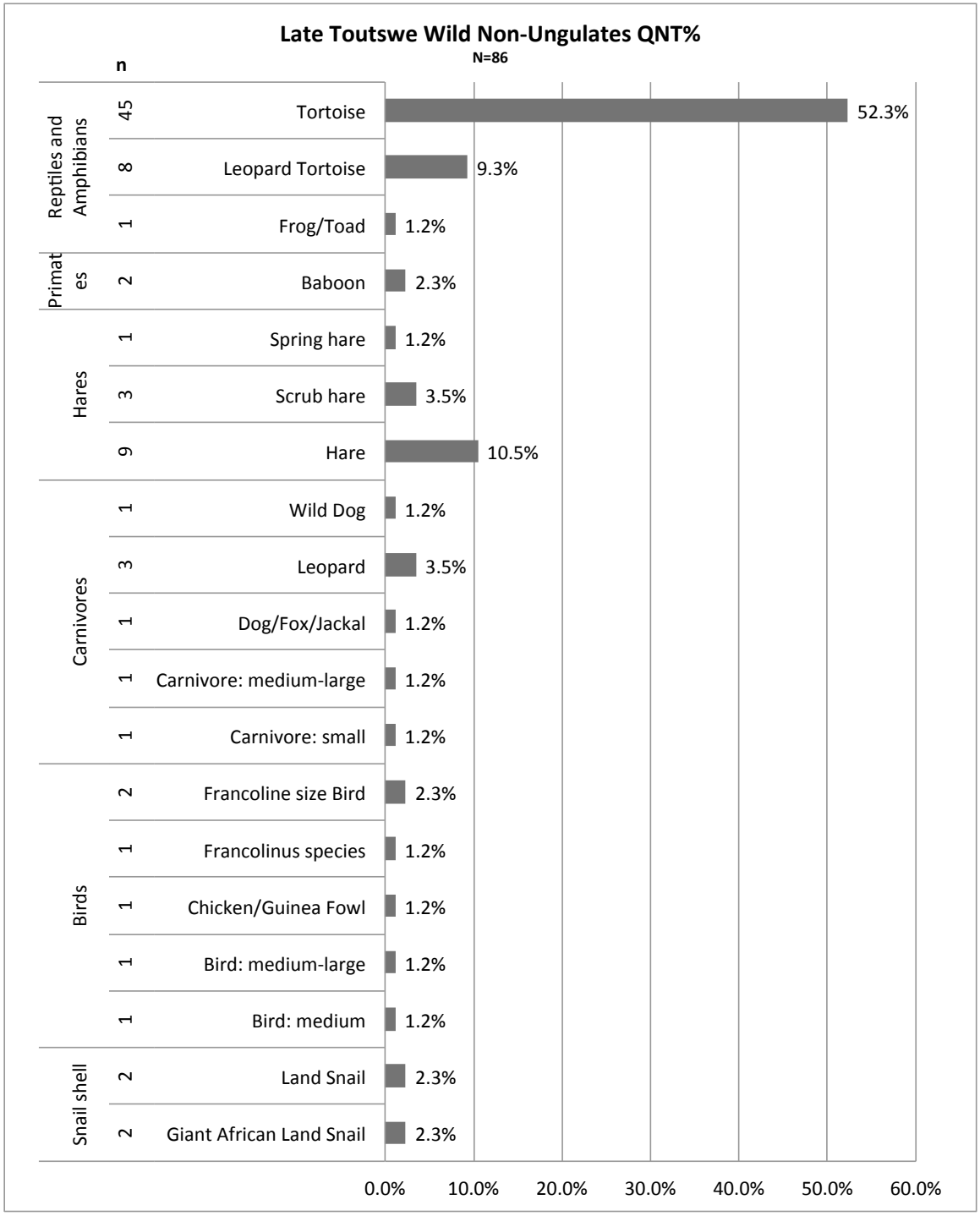


Figure 4-14. Late Toutswe Wild Non-Ungulates QNT%.

Figure 4-14 illustrates the exploitation of wild non-ungulates during the Late Toutswe period. Several patterns seem to have continuity with the Early and Middle

Toutswe. As has been the case in all time periods so far, the wild non-ungulate assemblage is dominated by tortoise specimens, forming 61.6% (n=53) of the assemblage, continuing the pattern of consistently forming at least 50% of the wild non-ungulate assemblage. During the Early and Middle Toutswe, tortoises comprised 56.6% (n=56) of the assemblage. This is not a significant change. Hares continue to be an important small animal resource as well. Carnivores continue to be exploited. No lion or hyaena specimens were recovered, but 3 leopard phalange fragments, as well as a left femur shaft and a right proximal tibia articulation from at least one baboon were recorded. Modern ethnography indicates that leopard skins can only be worn by elites (Watson and Watson 1990).

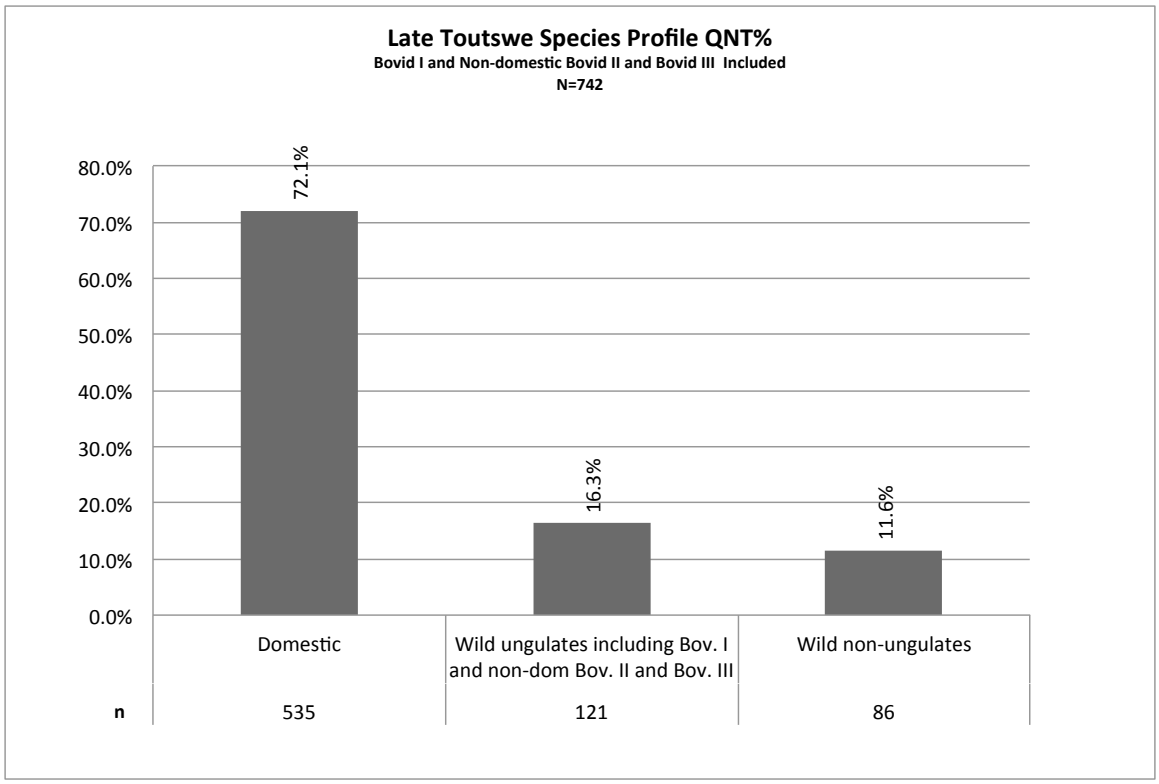


Figure 4-15. Late Toutswe Species Profile QNT%. Unspecified bovids omitted.

When unspecified Bovid II and Bovid III specimens are eliminated from the aggregate assemblage (Figure 4-15), the significant increase in domestic animal

exploitation and the significant decrease in wild animal exploitation becomes apparent (X^2=14.378; p=0.0002). Domestic specimens now constitute 72.1% (n=535), compared to 62.8% (n=432) during the Early and Middle Toutswe and 54.4% (n=337) during the Taukome and Zhizo period. As in the Early and Middle Toutswe, wild ungulates continue to outnumber wild non-ungulates, here, forming 16.3% (n=121) of the assemblage. This is a significant decrease from 22.8% (n=157) during the Early and Middle Toutswe period (X^2=9.6677; p=0.0019). Wild non-ungulates form 11.6 % (n=86) of the assemblage, down from 14.4% (n=99 during the previous time period. This is not a significant change (X^2=2.4835; p=0.115).

Domesticates

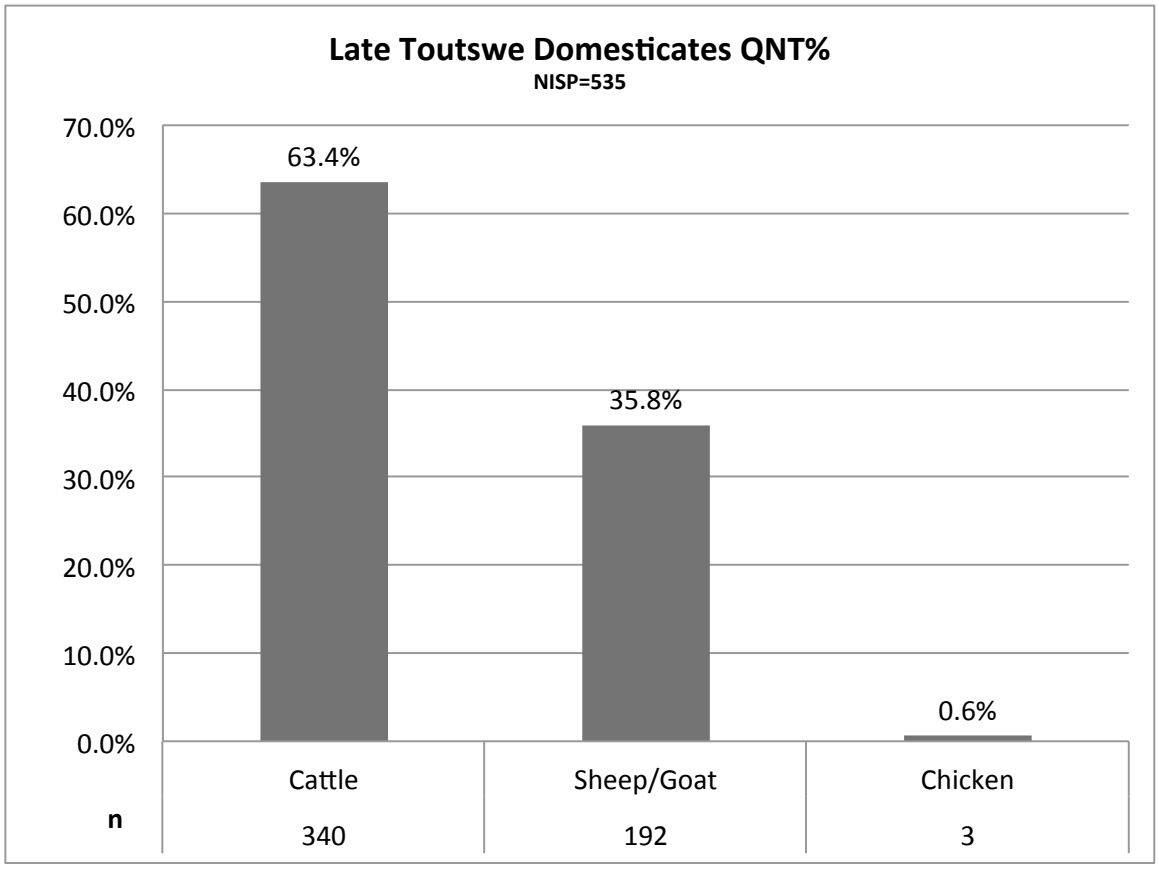


Figure 4-16. Late Toutswe domesticates QNT%.

Patterns of domestic animal exploitation (Figure 4-16) have also undergone a radical and significant change during the Late Toutswe compared to the Early and Middle Toutswe. Cattle and sheep/goat proportions changes significantly and have reverted back to the earlier pattern noted during the Taukome and Zhizo period, when cattle outnumbered goats and sheep. Cattle now form 63.4% (n=340) of the domestic assemblage, compared to 34.0% (n=147) (X^2=83.3361; p=<0.001) during the Early and Middle Toutswe, and 54.8% (n=184) during the Taukome and Zhizo period. Sheep and goats now constitute 35.8% (n=192) of the domestic assemblage, compared to 64.8% (n=280) during the Early and Middle Toutswe (X^2=80.0428; p=<0.0011), and 45.2% (n=152) during the Taukome and Zhizo period. The CI value of .79 confirms that cattle are more highly represented in the faunal assemblage than caprines during this time period. Chicken continue to be present in small numbers.

Summary

During the Late Toutswe period, cattle once again become more numerous than sheep and goats, despite the probable adoption of a dispersed herding strategy sometime during the late Toutswe (Denbow et al. 2008). Domesticates continue to increase in importance. It was expected that the Bosutswe assemblage would contain more cattle than small stock as it was a regionally important settlement. Class III wild ungulates are still important, but Class II species seem to have decreased in importance, while Class I species seem to have increased. These changes in the wild animal assemblage were anticipated, and may indicate changing hunting methods, local wild animal habitat degradation, or both. Zebra exploitation seems to have increased. Tortoises continue to be well represented in the faunal assemblage. Carnivores are well represented, perhaps indicating fur processing.

Chapter 5: Lose

The Lose period lasts from around 1200 CE to around 1650 or 1700 CE, when Bosutswe was abandoned. Faunal data is available from both the Western and the Central precinct during the Lose period. Lose is divided into three time periods: Early Lose (ca. 1200-1300; layers 20-11 in the Central precinct, layer 4 in the Western precinct), Middle Lose (1300 to 1450; layers 10-6 in the Central Precicnt, layers 3 and 2 in the Western Precicnt) and Late Lose (1450 to 1700; layers 5-1 in the Central precinct, layer 1 in the Western precinct) (Denbow et al. 2008; Denbow and Miller 2007). Bosutswe was locally powerful, but lived on the margins of three powerful sites to the east: Mapungubwe (1220-1300), Great Zimbambwe (1300-1450 CE) and Khami (1450-1680).

The most important and powerful site during the Early Lose period was Mapungubwe (1220-1300). The Mapungubwe settlement was physically laid out around the highest-status houses rather than a cattle kraal. Stone-walling and luxury good such as gold-foil covered objects, glass beads and ivory were found in Mapungubwe, as well as evidence of cotton spinning. Mapungubwe was abandoned around the time that Great Zimbabwe rose to prominence (1300 CE).

There was a sudden shift in ceramics in the Central precinct of Bosutswe were around 1200 CE, when locally made Lose-type ceramics rather than Toutswe ceramics came into use. These Lose ceramics were designed to look like the ceramics used by the elites at Mapungubwe, suggesting that the inhabitants of Bosutswe, especially the local elites, emulated their more powerful and prestigious neighbors at Mapungubwe to the east (Denbow et al. 2008; Denbow and Miller 2007). There is a distinct spatial distribution of high-status artifacts such as glass bead and copper and bronze jewelry at Bosutswe' these goods are concentrated in the Central Precinct at the site. This seems to indicate class differences, in which elites occupied the center of Bosutswe, and

commoners occupied the periphery. In the Western Precinct, inhabitants continued to use Toutswe pottery until well into the 1200's, perhaps even until 1295 (Denbow et al 2007).

Around 1300 CE, the site was burned in a major conflagration. After a short abandonment, it was reoccupied and the Middle Lose period begins. The significance of this burning has not been determined. Recent work by Klehm (2013) indicates that some Lose elite likely took up refuge in smaller settlements defended by stone walling during this period of unexplained social upheaval.

Chapter 5 will address the total faunal assemblage for both the Western and the Central precinct in order to elucidate site-wide trends in animal exploitation during the Lose period. Chapter 6 will compare the use of wild animals in the Central and Western precinct in order to explore possible social status-based differences in diet. For a comparison of domestic animals in the two precincts, see Chapter 7.

EARLY LOSE

Wild Animals

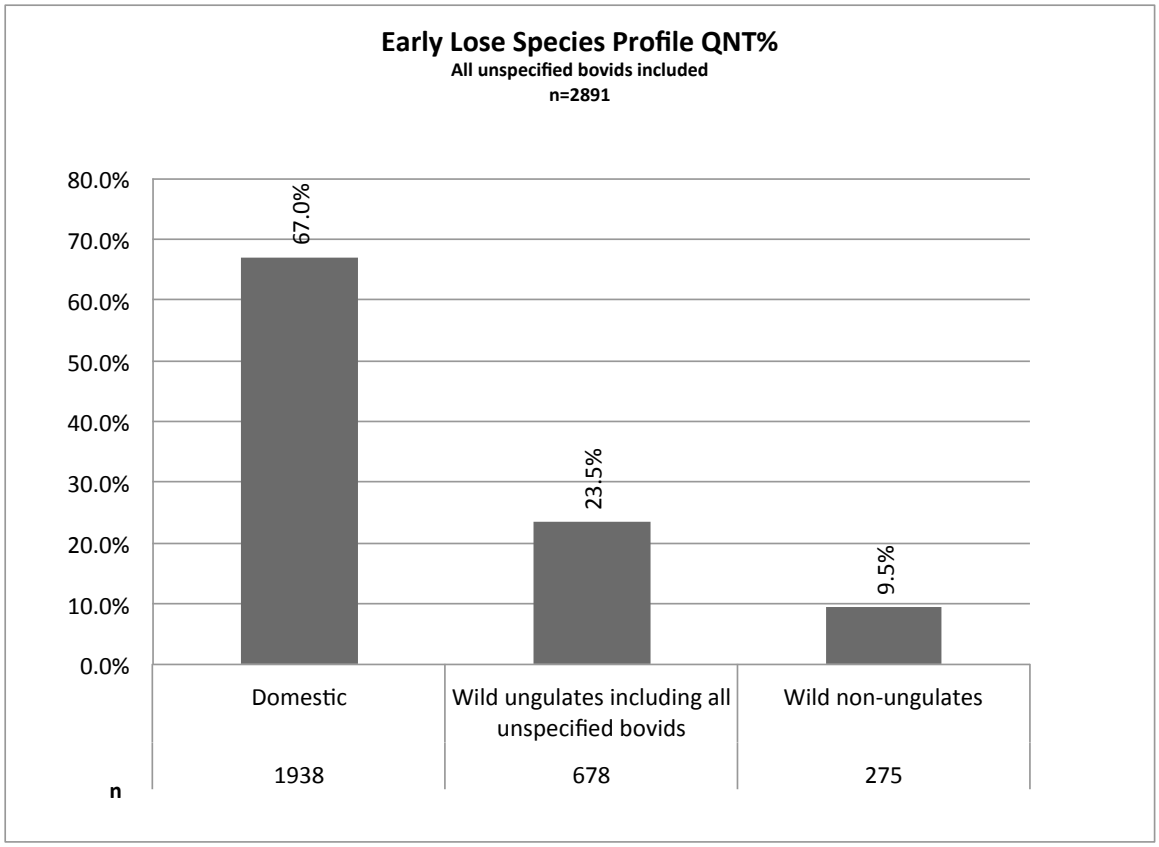


Figure 5-1. Early Lose Species Profile QNT%.

The Early Lose species profile including all unspecified bovids (Figure 5-1) strongly favors domesticates. Compared to the Late Toutswe species profile, domesticates have increased significantly (X^2=166.4565; p=<0.0001), wild ungulates and unspecified bovids have decreased significantly (X^2=68.5773; p=<0.0001) and wild non-ungulates have not changed substantially. Domestic specimens now make up 67.0% (n=1938) of the assemblage, compared to 54.8% (n=535) during the Late Toutswe. Wild ungulates and unspecified Bovid II's and Bovid III's have decreased substantially, from 37.1% (n=362) during the Late Toutswe to 23.5% (n=678). Wild non-ungulates have

increased slightly but not significantly, to 9.5% (n=275) from 8.8% (n=86) (X^2=0.3073; p=0.5793).

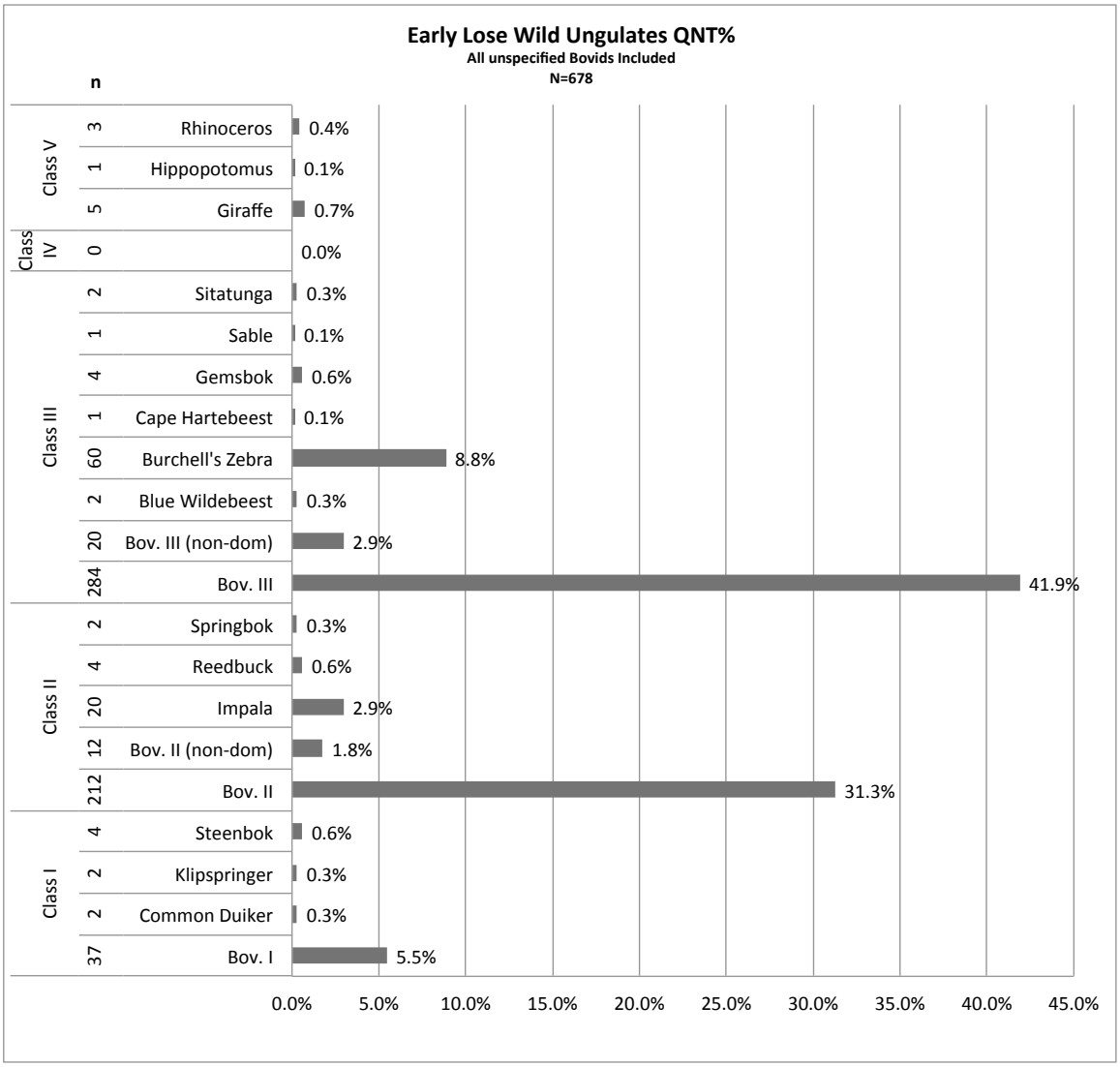


Figure 5-2. Early Lose Wild Ungulates QNT%. All unspecified bovids included.

The breakdown of wild ungulates as shown in Figure 5-2 indicates the continued importance of unspecified Bovid II's and Bovid IIIs; combined, they constitute 73.2% (n=496) of the wild and unspecified assemblage. This trend continues the increases in the proportions of Bovid II's and Bovid III's indicated by the assemblages during earlier time periods.

While exotic species such as sitatunga continue to be represented, the Early Lose is remarkable for the inclusion of large mammals such as giraffe, hippopotamus, and rhinoceros. One elephant rib is also present; see chapter 10 for discussion. The inclusion of these very large mammals may indicate an important change in the way the inhabitants of Bosutswe viewed and utilized animals. They are not present in large numbers, but may indicate new animal exploitation patterns. The inhabitants of Bosutswe were able to acquire these exotic goods, here portions of large wild animals, through trade or hunting.

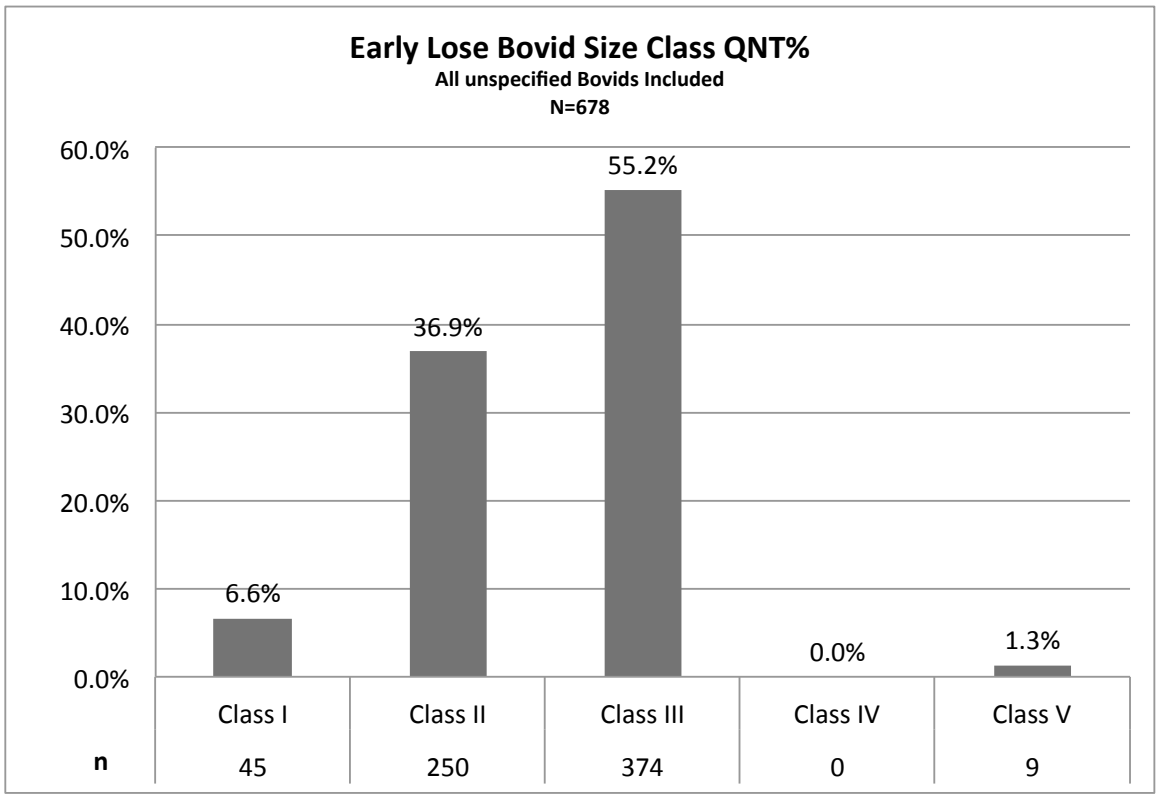


Figure 5-3. Early Lose Bovid Size Class QNT%. All unspecified bovids included.

Aggregate totals of wild ungulates and unspecified bovids (Figure 5-3) do not show any strong discrepancies when compared to the Late Toutswe period. Class I specimens have decreased slightly to 6.6% (n=45) from 9.7% (n=35). Class II species have increased slightly to 36.9 (n=250) from 33.1% (n=120). Class III specimens have

decreased to 55.2% (n=374) from 57.2% (n=207). These changes are not statistically significant, and do not indicate major shifts.

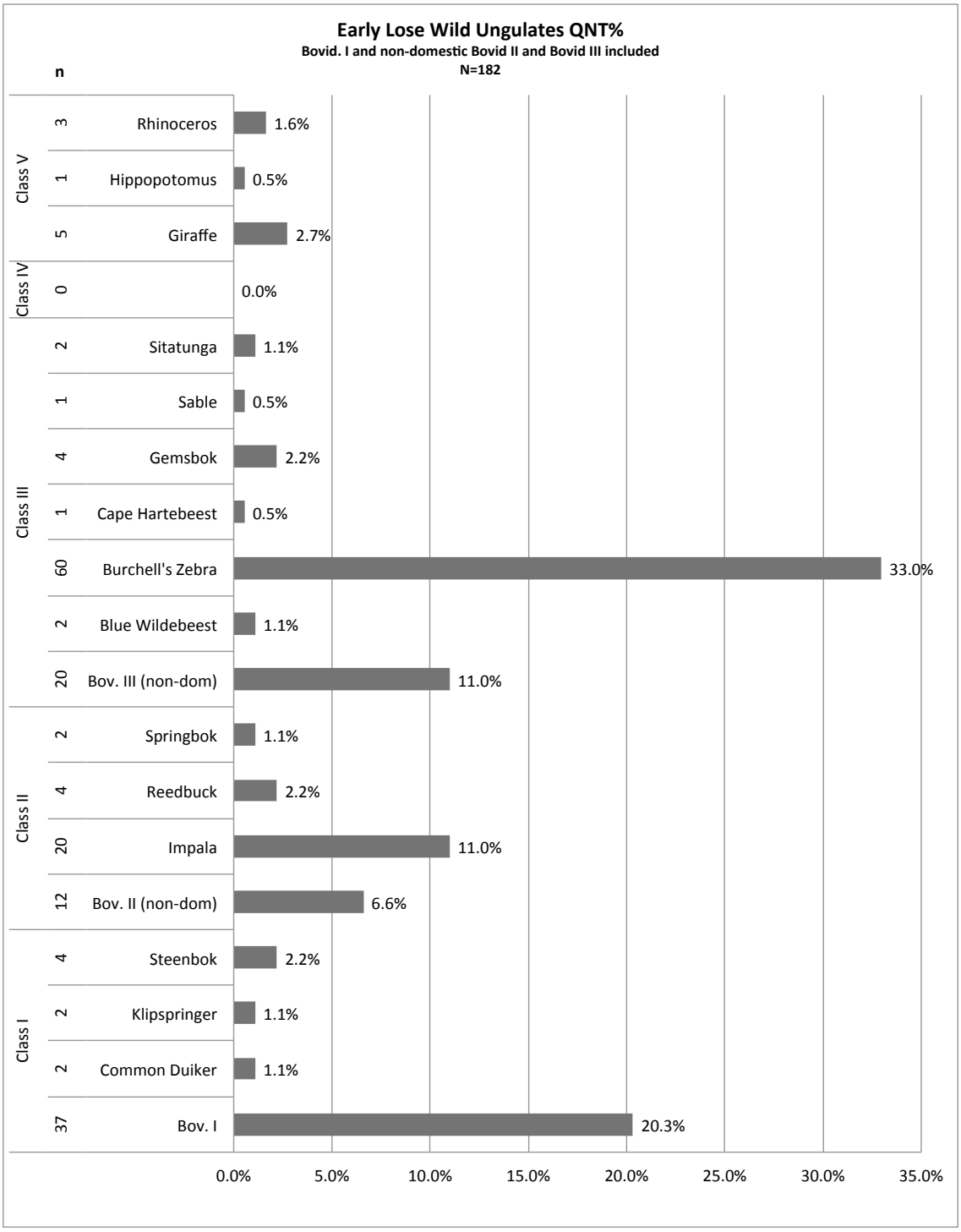


Figure 5-4. Early Lose Wild Ungulates QNT%. Unspecified bovids omitted.

The removal of unspecified bovids from the wild ungulate allows the continued dominance of zebra specimens to show more clearly (Figure 5-4). The percentage of zebra specimens during the Early Lose closely resembles that of the Late Toutswe period; it is now 33.0% (n=60), compared to 31.4% during the earlier phase. This is not a significant change ($X2$=0.081; p=0.7759). Unspecified Bovid I specimens have increased to 20.3% (n=37) from 12.4% (n=15), but this change is not significant ($X2$=3.2173; p=0.0729).

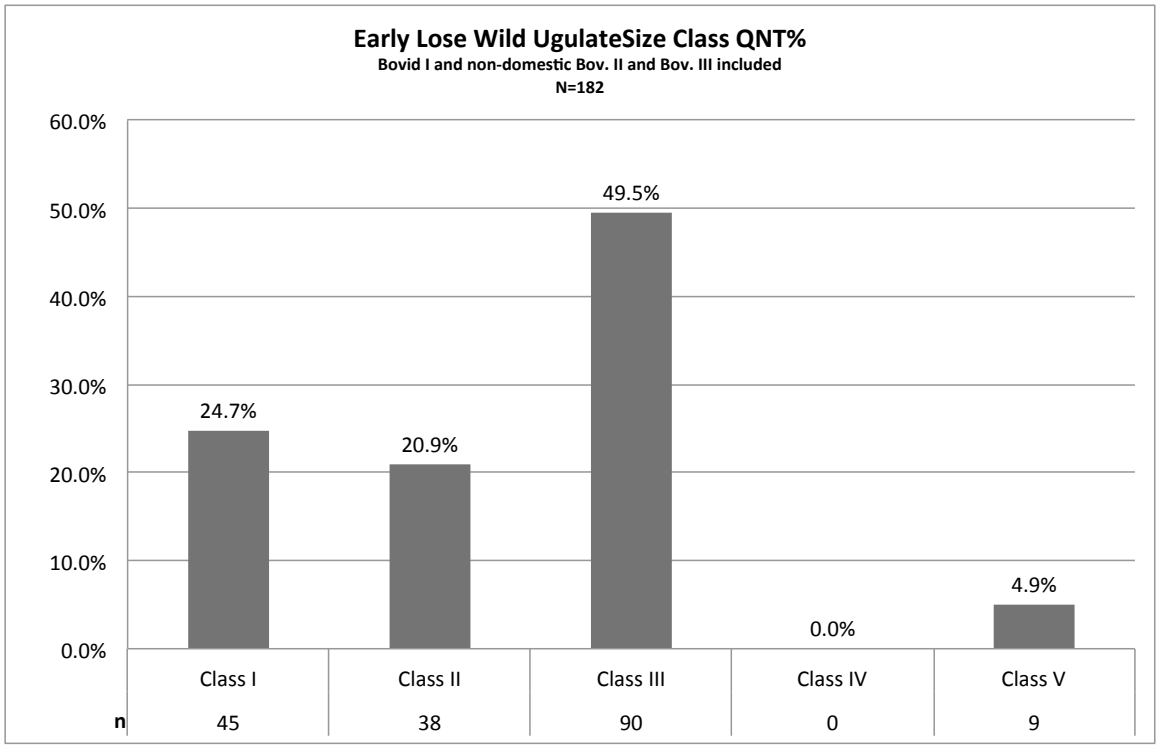


Figure 5 -5. Early Lose Wild Ungulate Size Classes QNT%.

Figure 5-5 depicts the aggregate wild ungulates without unspecified Bovid II and Bovid III specimens. The presence of Class V specimens has already been mentioned. Class V specimens are small in number (4.9% n=9), but their inclusion is noteworthy because it may indicate an altered use of wild animals at Bosutswe, and is significant (X^2=5.8709; p=0.0154). The individual changes in Classes I-IV are not significant and

represent a continuation of the Late Toutswe patterns of Bovid III outnumbering Bovid I, and Bovid I outnumbering Bovid II. This trend may be somewhat attenuated.

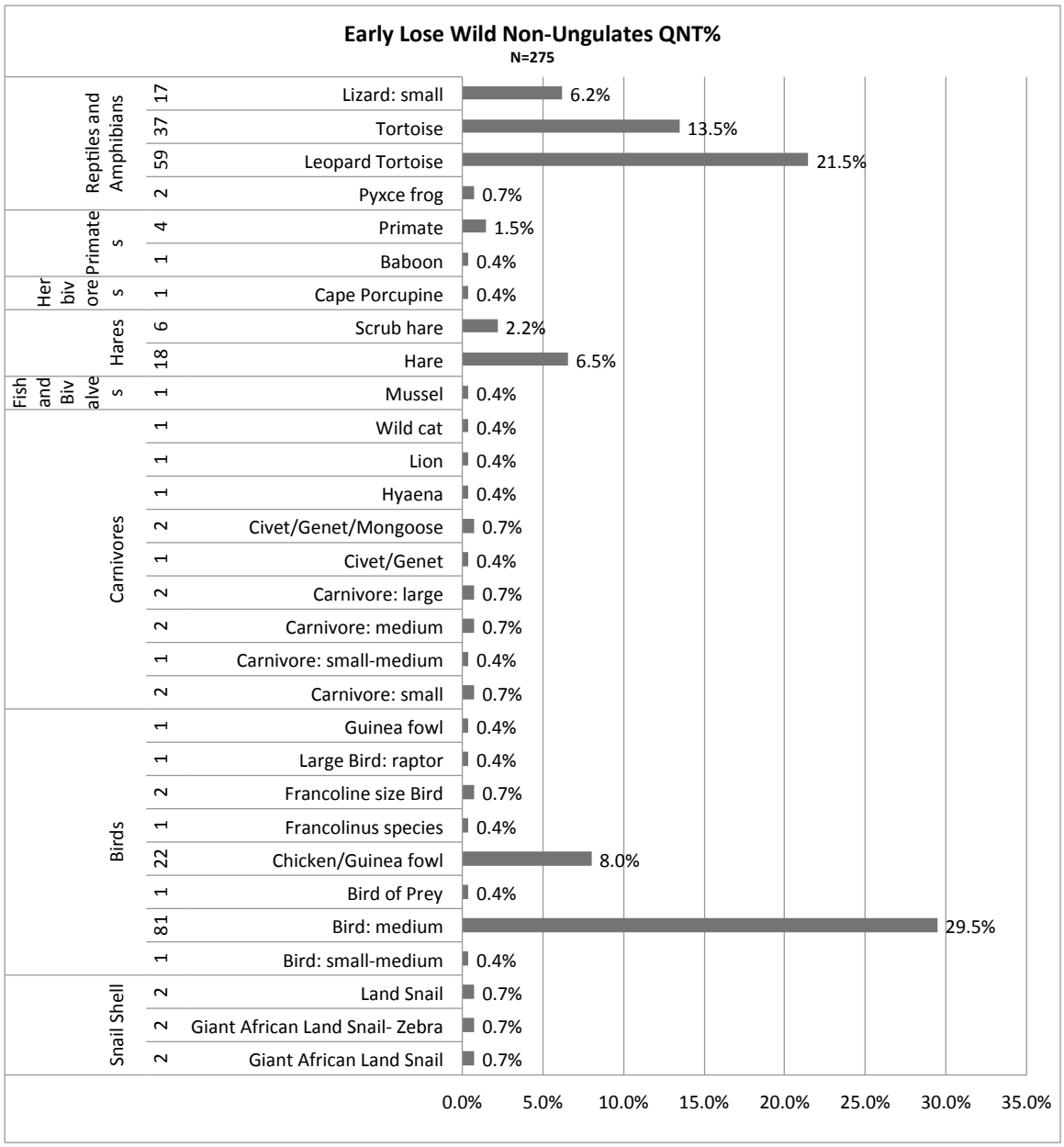


Figure 5-6. Early Lose Wild Non-ungulates QNT%.

A wide variety of non-ungulates were exploited during the Early Lose period (Figure 5-6), and several shifts in exploitation patterns are apparent. The Early Lose marks the first time period that tortoises do not dominate the non-ungulate assemblage.

Here, they constitute 35.0% (n=96), a radical departure from earlier times, when tortoise constituted from 56.6% to 66.9% of the wild non-ungulate assemblage. Compared to the Late Toutswe period, this is a significant change (X^2=19.2953; p=<0.0001). Birds have undergone a strong change; chicken/guinea fowl make up 8.0% (n=22) of the assemblage, and medium birds make up 29.5% of the assemblage (n=81), compared to 1.2% (n=1) and 1.2% (n=1) for each of these during the Late Toutswe period. Hares continue to be an importance resource, constituting 8.7% (n=24) of the assemblage, albeit a reduced one compared to the Late Toutswe period (15.1% (n=13). This is a significant change (X^2=2.9071; p=0.0882). Carnivores continue to increase in importance, as do more idiosyncratic species such as primates and baboons.

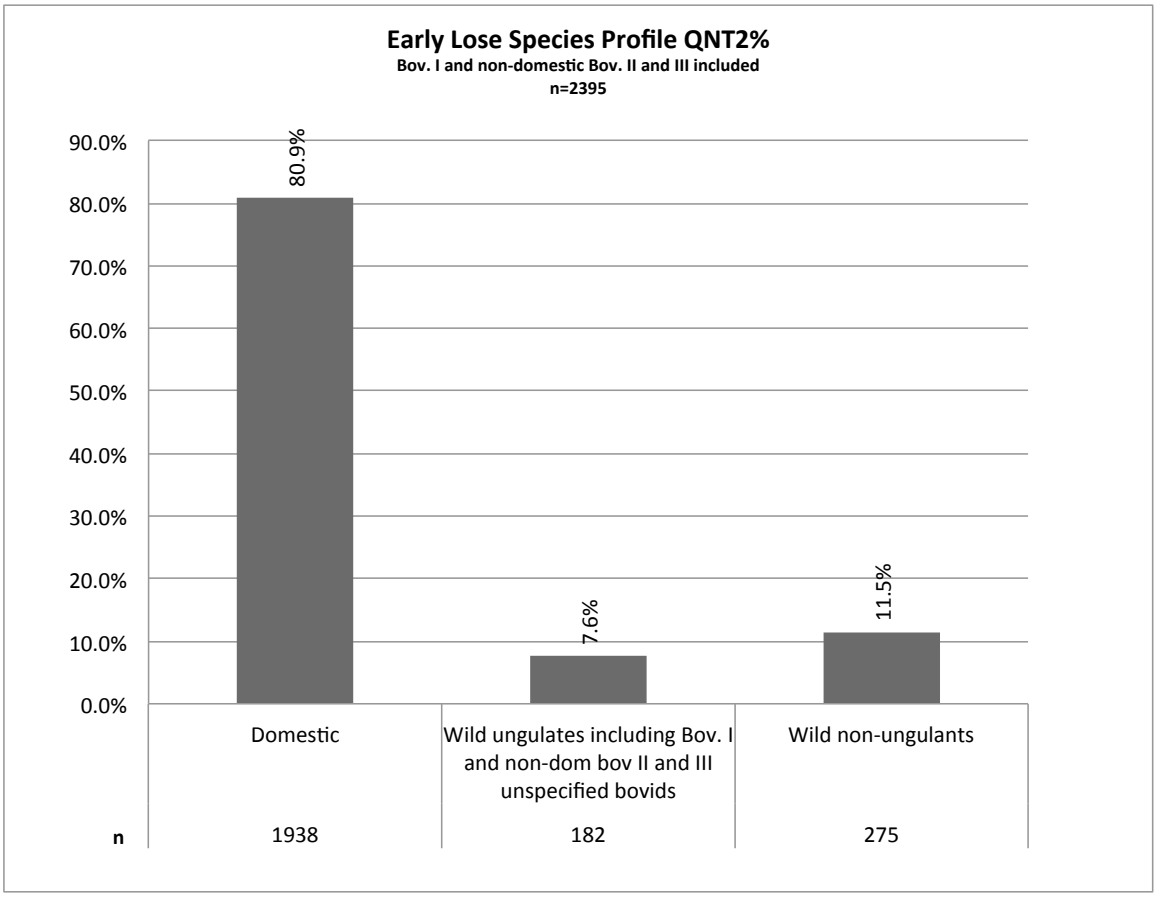


Figure 5-7. Early Lose species Profile QNT%, unspecified Bovid II and III omitted.

When unspecified Bovid II and Bovid III specimens are not considered as part of the assemblage (Figure 5-7), domestic specimens appear to be more prevalent than during the Late Toutswe period, wild ungulates seem to have decreased, and wild non-ungulates do not appear to have changed significantly. During the Early Lose period, domestic specimens make up 80.9% (n=1938) of the assemblage, a significant change compared to the Late Toutswe period, when they comprised 72.1% (n=535) of the assemblage (X^2=26.387; p=<0.0001). Wild ungulates make up 7.6% (n=182) of the assemblage, a substantial and significant decline from 16.3% (n=121) during the preceding period (X^2=49.23; p=<0.0001). Wild non-ungulates make up 11.5% (n=275) of the assemblage, a small and insignificant increase from the 11.6% (n=86) they contributed during the Late Toutswe period. These changes suggest that wild ungulate hunting and trapping was becoming less common or successful, while domesticates were increasing in importance.

Domesticates

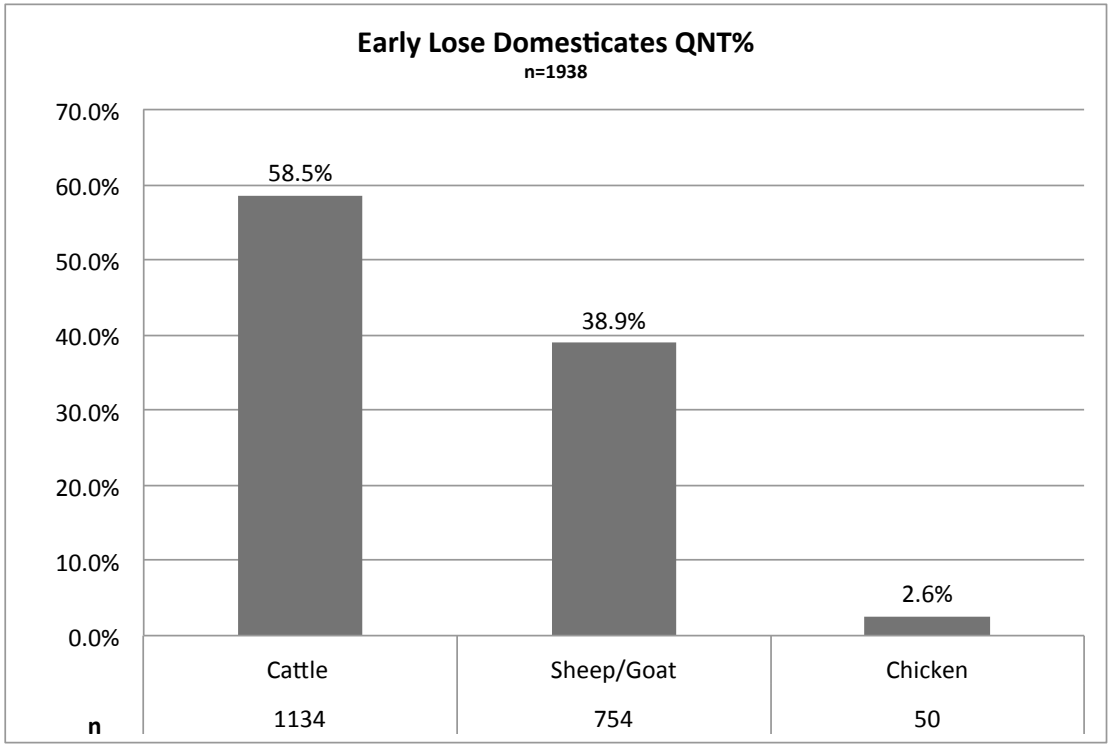


Figure 5-8. Early Lose Domesticates QNT%

The basic proportions of cattle, sheep/goat and chicken resemble those of Late Toutswe (Figure 5-8). Chicken seem to have increased in importance; they now form 2.6% (n=50) of the domestic assemblage, a significant increase of 2% (X^2=8.151; p=0.0043). Cattle have decreased somewhat; they now represent 58.5% (n=1134), compared to 63.4% (n=340) during the Late Toutswe. This is significant (X^2=4.4187; p=0.0355), but cattle continue to strongly outnumber sheep and goats, which have increased slightly and insignificantly in importance, now representing 38.9% (n=754) of the domestic assemblage, compared to an earlier 35.8% (n=192) (X^2=1.617; p=0.2035). The CI is 0.60.

Summary

During the Early Lose, domesticates became much more important to the residents of Bosutswe. Cattle outnumber small stock. Exotic Okavango Delta species continue to be represented. Megafauna make their first appearance, perhaps indicating a new or changed social use for communal hunting. Wild ungulates, especially zebra, were still important, but seem to have decreased in importance. Tortoises are still well represented, but seem to be becoming less numerous. Carnivores continue to increase, as do less common species such a baboons.

MIDDLE LOSE

Wild Animals

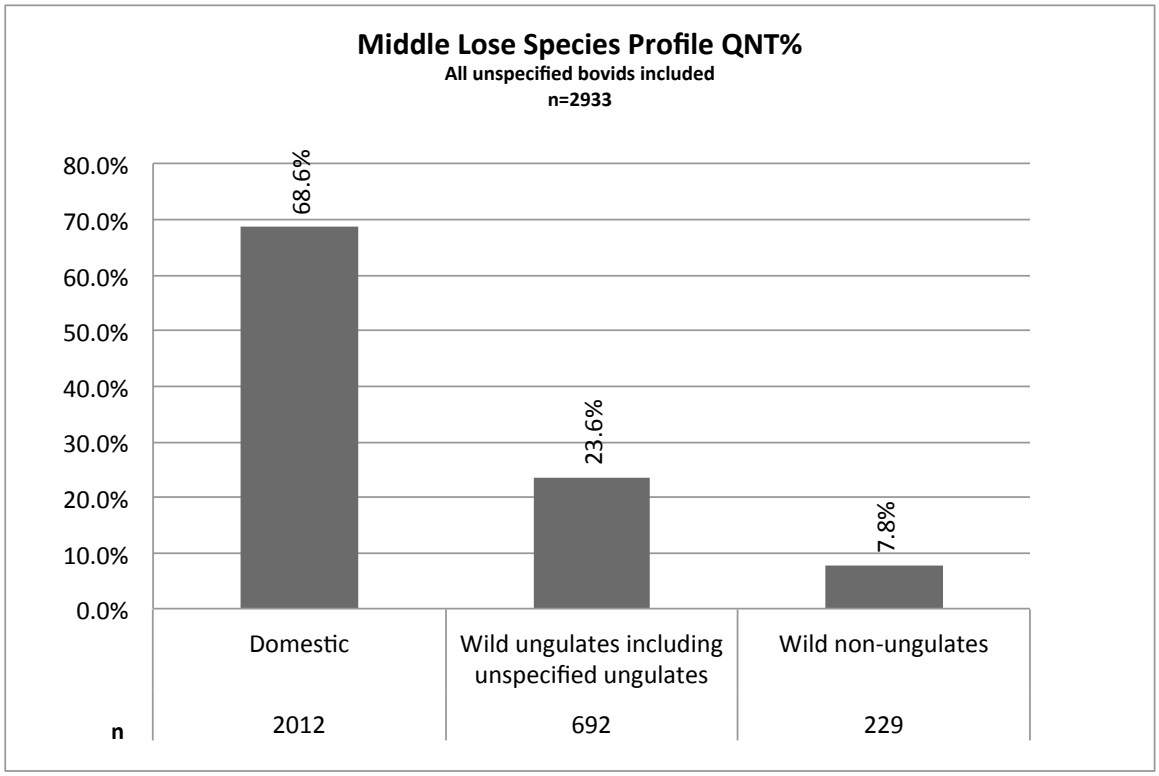


Figure 5-9. Middle Lose Species Profile QNT%. All unspecified bovids included.

The species composition when unspecified ungulates are included in the overall assemblage strongly resembles that of the Early Lose (Figure 5-9). Domesticates constitute 68.6% (n=2012) of the assemblage, compared to 67.0% (n=1938) during the Early Lose. Wild and unspecified ungulates contribute 23.6% (n=692)%, nearly unchanged from the 23.5% (n=678) of the assemblage they contributed during the Early Lose. Wild non-ungulates have also undergone a small but significant change; they have decreased to 7.8% (n=229) from 9.5% (n=275) (X^2=4.8026; p=0.0284).

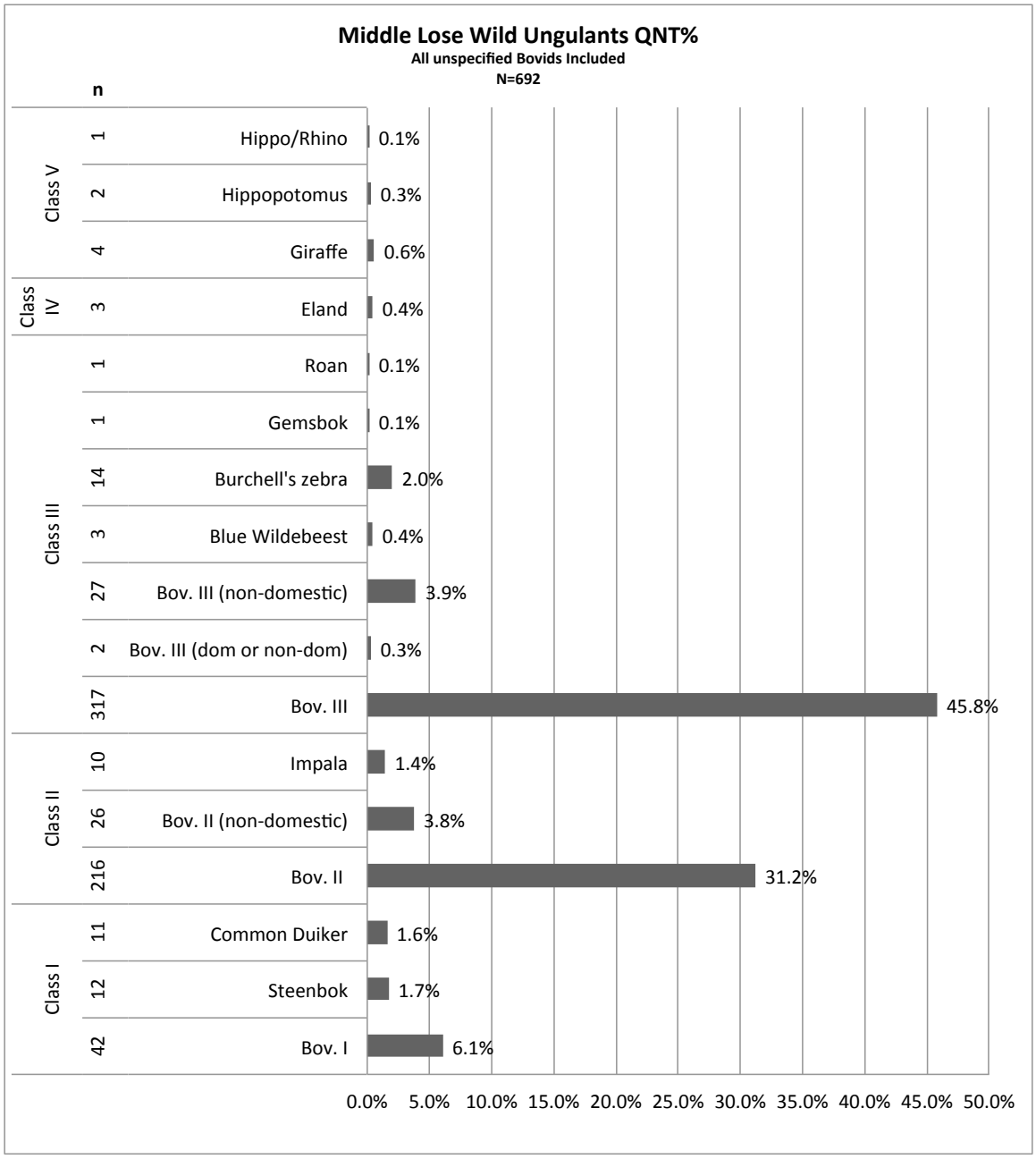


Figure 5-10. Middle Lose Wild Ungulates QNT%. All unspecified bovids included.

Figure 5-10 demonstrates the continued dominance of unclassified Bovid. II and Bovid III; in the Middle Lose, they contribute 77.0% (n=533) to the wild and unclassified assemblage, a small and insignificant increase over the 73.2% (n=496) they contributed during the Early Lose (X^2=2.739; p=0.0979). A wide variety of classifiable specimens are represented, including Class V species.

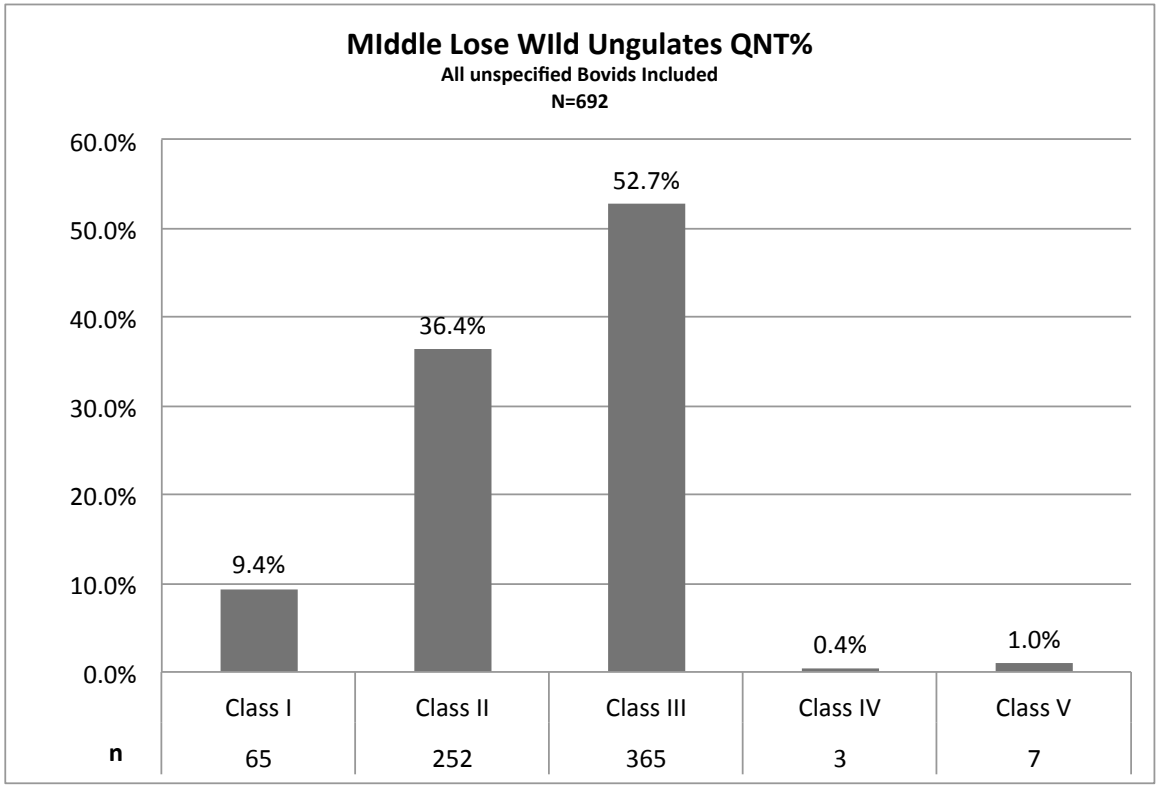


Figure 5-11. Middle Lose Wild Ungulates QNT%. All unspecified bovids included.

As the aggregate wild and unclassified ungulates show (Figure 5-11), Bovid III specimens continue to be prevalent at 52.5% (n=52.7), representing only a small decrease from the 55.2% (n=374) these specimens contributed during the Early Lose. Class II specimens remain nearly unchanged, here contributing 36.4% compared to and earlier 36.9% during the Early Lose. Class I specimens have increased slightly to 9.4% (n=65) from 6.6% (n=45). The overall wild species profile strongly resembles that of the previous Early Lose period. These changes are not statistically significant.

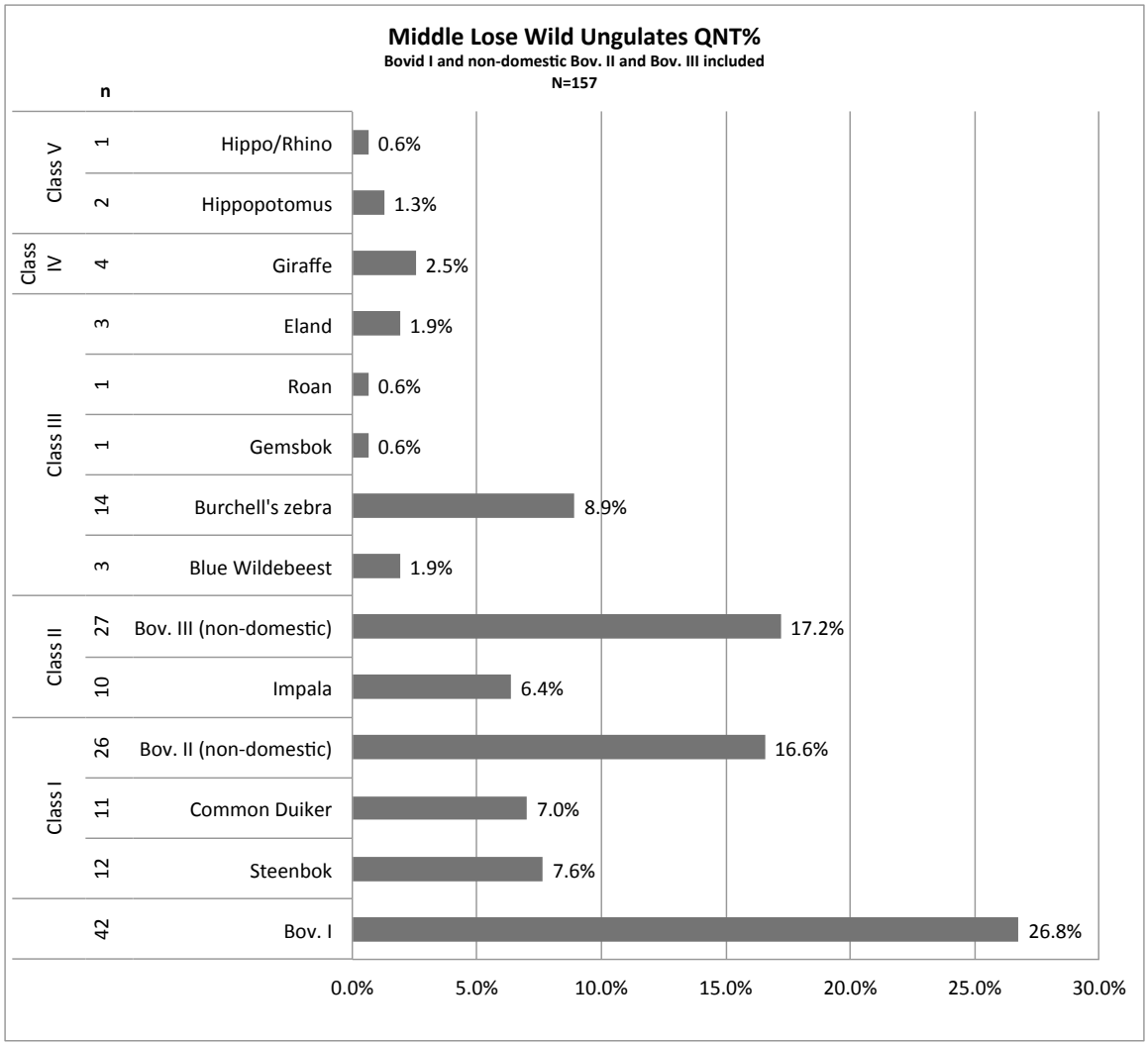


Figure 5-12. Middle Lose Wild Ungulates QNT%. All unspecified bovids excluded.

Removing the unclassified Bovid II and Bovid III specimens (Figure 5-12) allows the changes in known wild ungulate specimen numbers to become apparent. Zebra are still the most prevalent identifiable wild ungulate, but their dominance has been strongly and significantly reduced; they now constitute 8.9% of the wild ungulate assemblage compared to formerly making up 33% (n=60) of the assemblage (X^2=28.5705; p=< 0.0001), and their numbers are closely followed by numerous other wild ungulates. Effectively, their strong importance to the inhabitants of Bosutswe has come to an end.

Bovid I specimens continue to rise in importance. Class V specimens continue to be represented in small numbers.

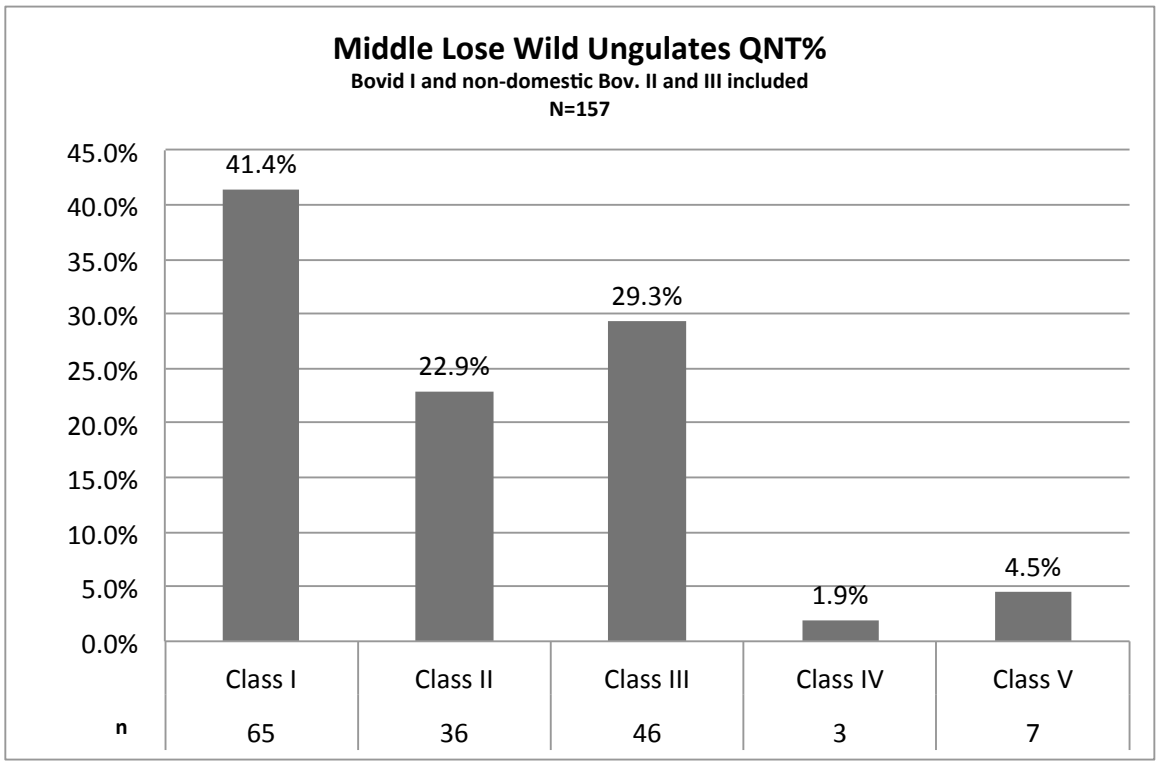


Figure 5-13. Middle Lose Wild Ungulates QNT%. Unspecified bovids omitted.

The drastic changes in hunting and trapping patterns that occurred during the Middle Lose period become apparent when wild ungulates are grouped together according to size class as depicted in Figure 5-13 and unspecified bovids are removed from the analysis. Class III specimens are now outnumbered by Class I specimens for the first time in Bosutswe's history. This marks an important change in hunting patterns. Compared to the Early Lose period, Class I species have increased remarkably; they now constitute 41.4% (n=65) of the assemblage, whereas formerly they constituted 24.7% (n=45) of the assemblage. This is a significant change (X^2=10.6937; p=0.0011). Class II specimens remain nearly unchanged, contributing 22.9% (n=36) of the assemblage, compared to an earlier 20.9% (n=38). This is not a significant change (X^2=0.2078;

p=0.6485). Class III specimens have undergone a dramatic decline; they now form 29.3% (n=46) of the assemblage, whereas in former times they consistently formed close to or more than 50% of the assemblage. This is a remarkable and significant change (X^2=14.2474; p=0.0002) that may be due to a change in hunting strategies, a change in habitat and available animal populations, or to a combination of both.

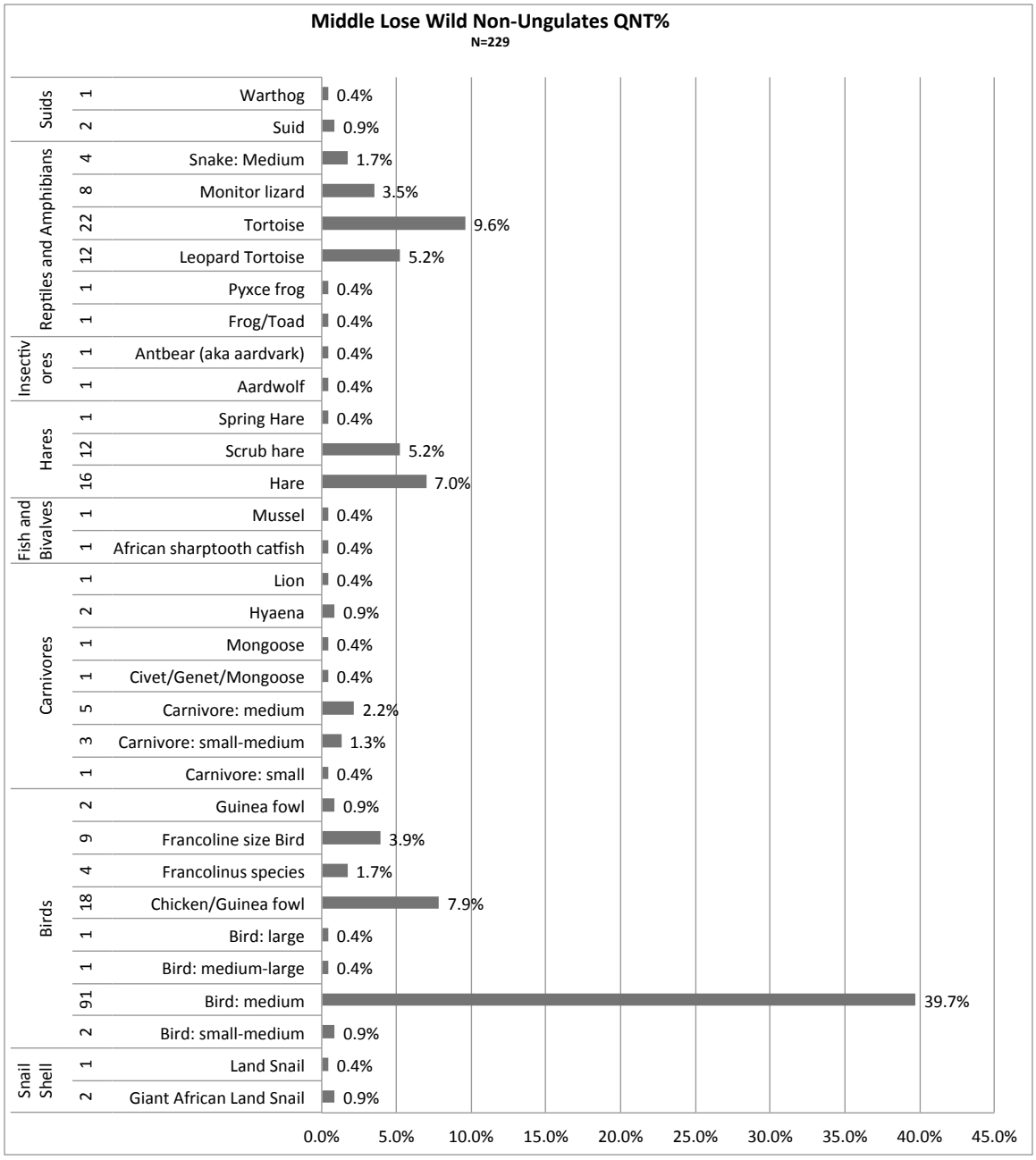


Figure 5-14. Middle Lose wild non-ungulates QNT%.

Despite the change in wild ungulate hunting patterns, a wider variety of non-ungulates were exploited during the Middle Lose. As shown in Figure 5-14, non-ungulate animal exploitation also underwent a radical change during the Middle Lose; a wide variety of wild non-ungulates were exploited, but medium birds, many of which may be domestic chickens (see below) form an increasingly large portion of the assemblage. The

previous supremacy of tortoises during the Early Lose (35.0% (n=96)) has not been re-established; instead, they have declined to form only 14.8% (n=34)% of the assemblage; this change is significant (X^2=26.2742; p=<0.0001). Tortoises are nearly matched by hares and springhares at 12.6% (n=29), which have consistently been an important part of the wild non-ungulate assemblage. Hares have not changed significantly compared to the Early Lose Period (X^2=2.0578; p=0.1514). Medium birds now dominate the assemblage at 39.7% (n=91); this mirrored by an increase in chicken/guinea fowl (7.9%, n=18), and in a general increase in bird exploitation. As will be discussed in Chapter 10, the increase in carnivore and more idiosyncratic species may relate to ritual practices and/or serve as indicators of social status at Bosutswe.

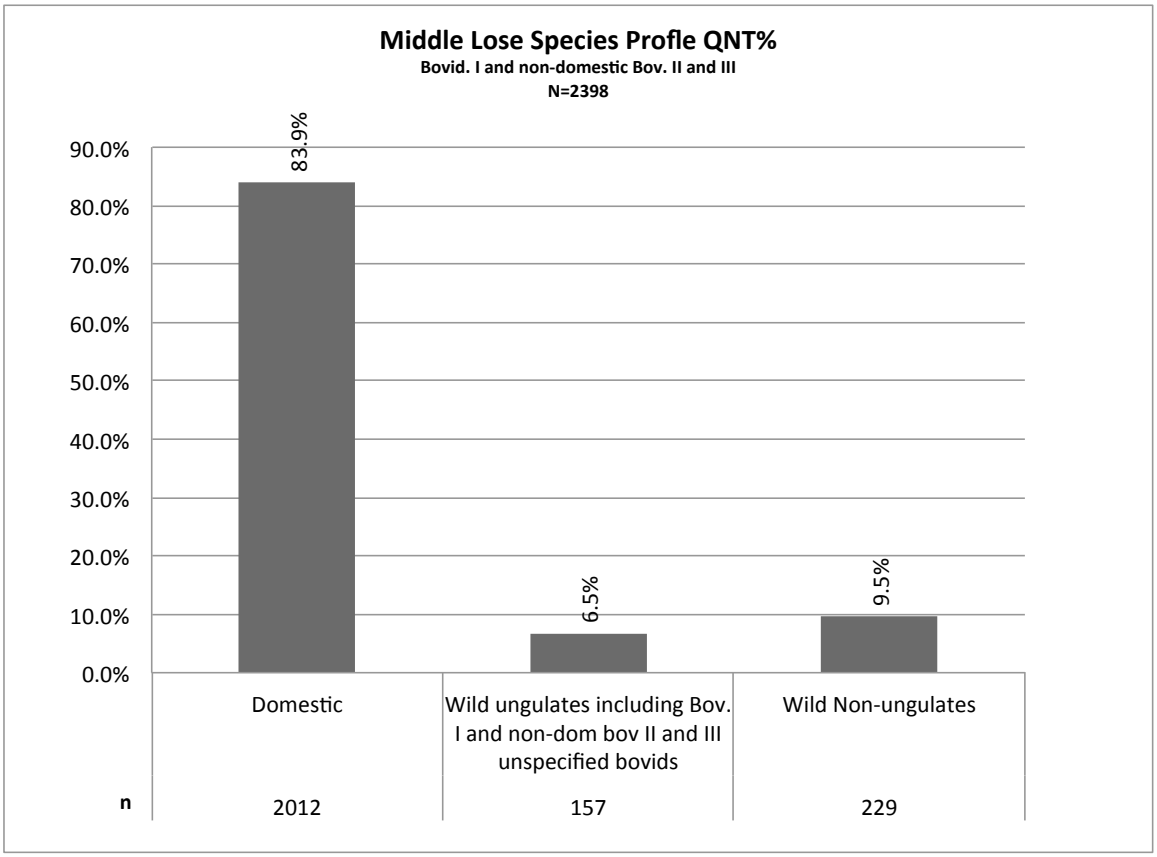


Figure 5-15. Middle Lose species profile. Unspecified bovids omitted.

As Figure 5-15 illustrates, the Middle Lose species profile resembles that of same assemblage during the Early Lose. Domestic species continue to dominate the assemblage at 82.7% (n=2012) compared to 79.9% (n=1938) during the Early Lose. Wild ungulates continue to be outnumbered by wild non-ungulates.

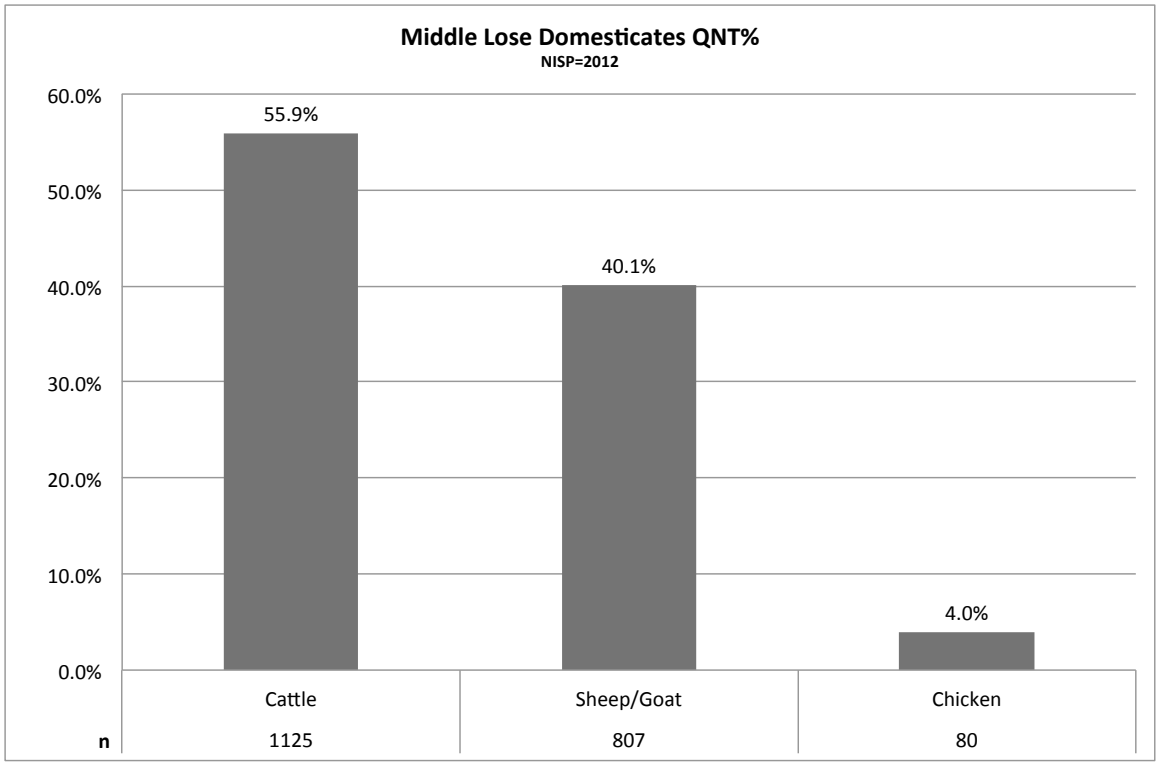


Figure 5-16. Middle Lose Domesticates QNT%.

The domestic species profile during the Middle Lose (Figure 5-16) is similar to the domestic species profile during the Early Lose. Chicken specimens have increased somewhat, now constituting 4.0% (n=80) of the assemblage, a modest but significant (X^2=6.0457; p=0.0139) increase over their previous 2.6% (n=50) during the Early Lose. Cattle specimens constitute 55.9% (n=1125) of the assemblage, and sheep/goats constitute 40.1% (n=807) of the assemblage; these results resemble those of the Early Lose, when cattle specimens made up 58.5% (n=1134), sheep/goat made up 38.9% (n=754) of the domestic assemblage, and chickens made up 2.6% (n=50) of the

assemblage. Cattle have undergone a small but significant decline (X^2=30.3777; p=<0.0001), while the change in small stock numbers is not significant. The CI value is 0.58, further supporting the idea that cattle were more important than goats.

Summary

Trends that began in the Early Lose continued into the Middle Lose. Domesticates continued to rise in importance, while wild animals continued to decrease. Class V specimens are still represented. Class I species are better represented than Class II and Class III species, suggesting a change in wild animal exploitation or in the availability of larger species. Tortoises have continued their decline. Carnivores are also well represented. Medium birds are more common. They may be chickens (see The Case for Chickens below).

LATE LOSE

Wild Animals

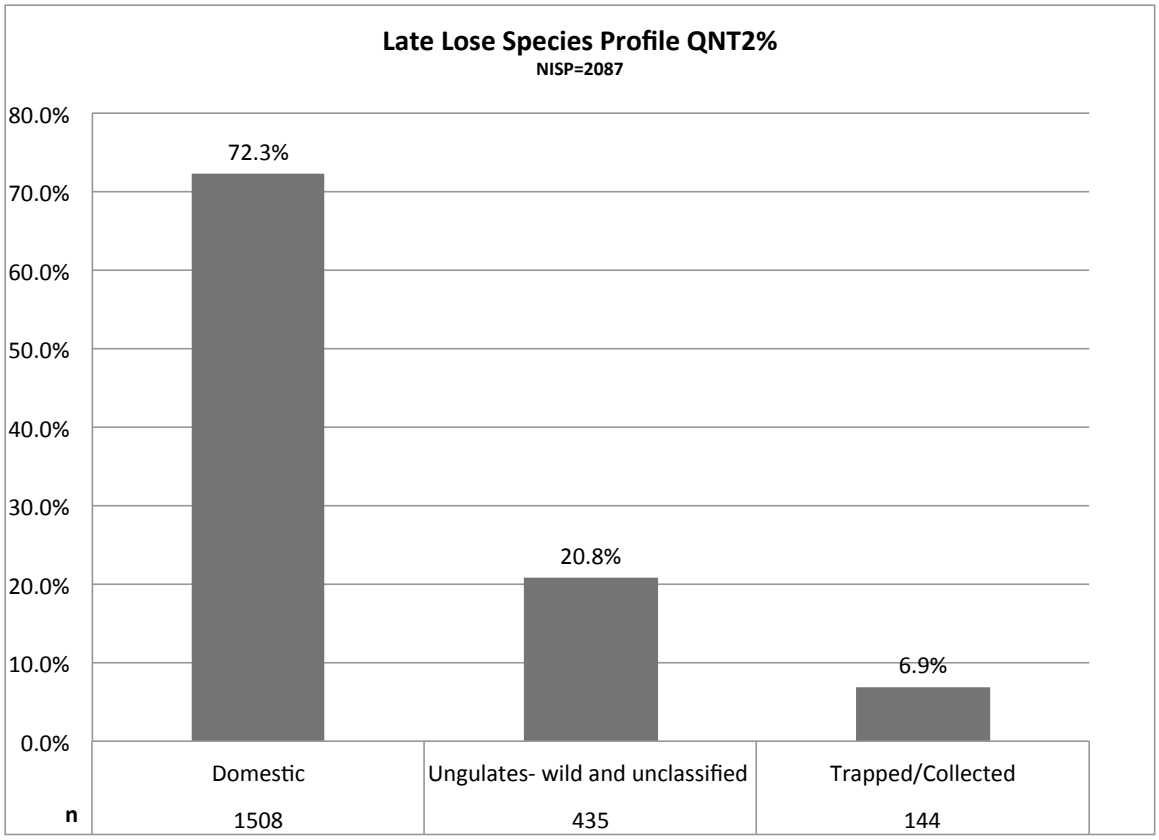


Figure 5-17. Late Lose species profile QNT%.

The overall species profile during the final occupation phase of Bosutswe (Figure 5-17) resembles that of the Middle Lose period. Domesticates are still dominant; they now represent 72.3% (n=1508) of the assemblage, whereas in the previous periods they constituted 68.6% (n=2012) of the assemblage; this is a small but significant increase (X^2=7.7879; p=0.0053), Wild and unclassified ungulates have decreased slightly but significantly (X^2=5.2976; p=0.0214) to 20.8% (n=435) compared to 23.6% (n=692) and non-ungulates have decreased slightly to 6.9% (n=144) compared to an earlier 7.8% (n=229). This change is significant (X^2=1.4611; p=0.2268).

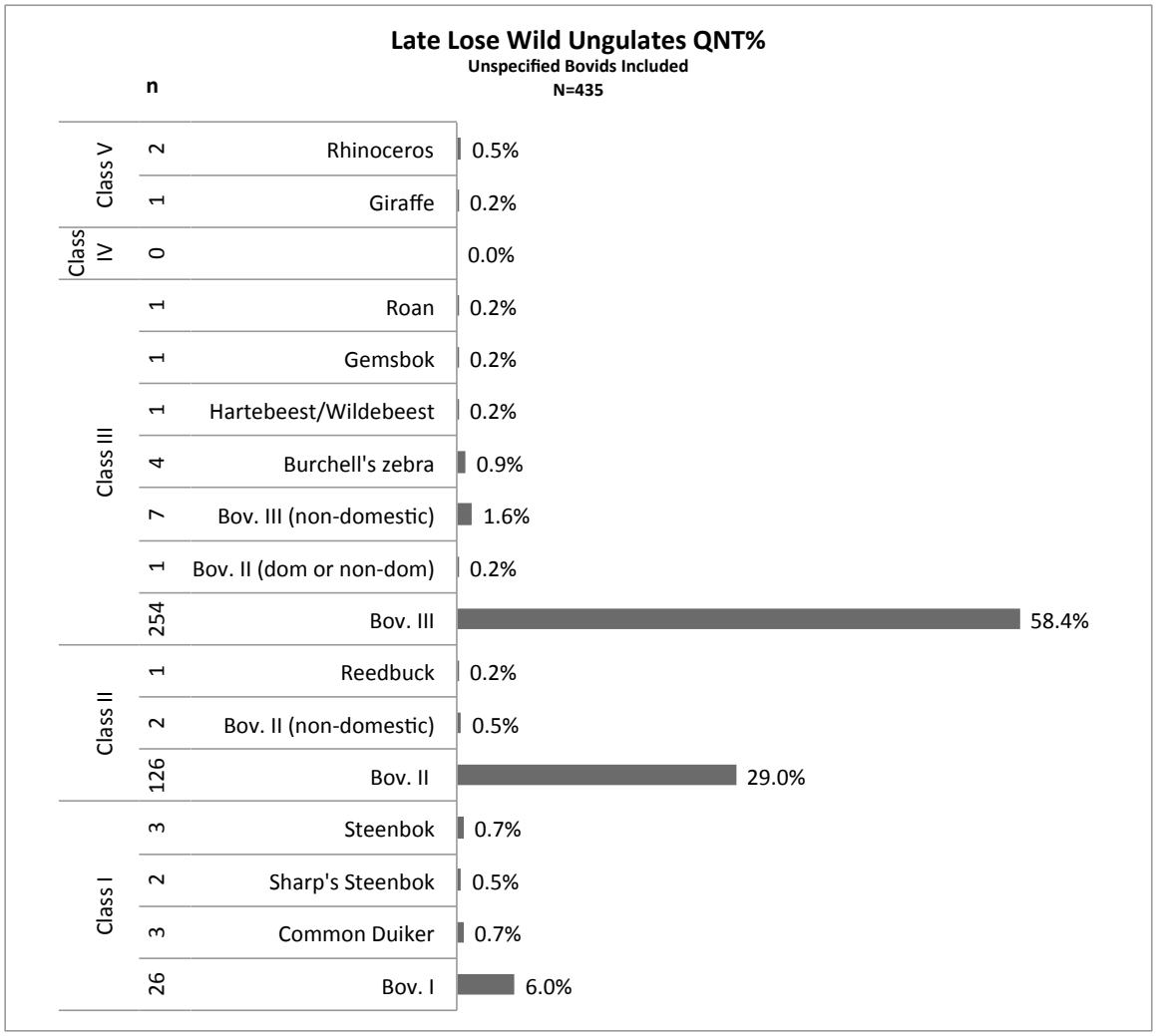


Figure 5-18. Late Lose wild ungulates QNT%. All unspecified bovids included.

It is apparent in Figure 5-18 that unclassified Bovid II and Bovid III specimens have continued to increase; they now make up an astounding 87.4% (n=380) of the wild and unclassified assemblage, a significant increase (X^2=18.5398; p=<0.0001). While a wide variety of wild ungulate species are represented here, including Class V specimens, the assemblages suggests that hunting during the Late Lose period became much less important. Burchell's Zebra are still the most common wild ungulate that could be identified to the species level, but their numbers are low.

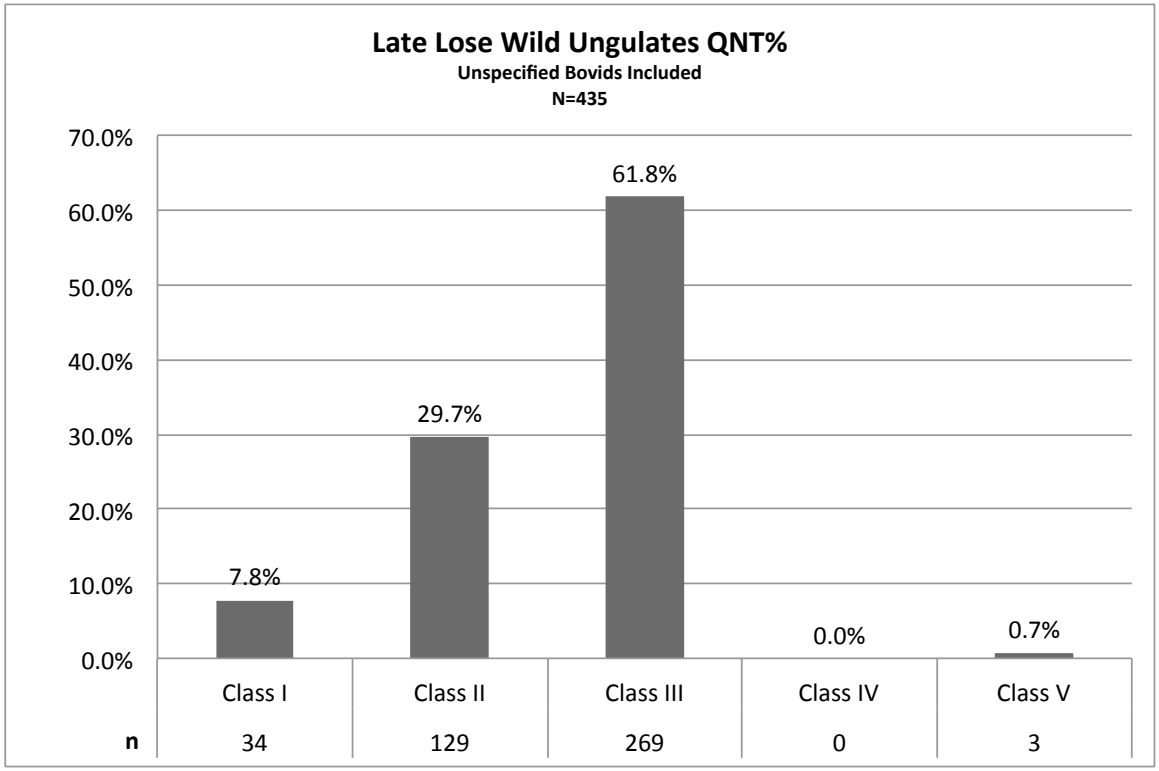


Figure 5-19. Late Lose wild ungulates QNT%. All unspecified bovids included.

The Late Lose wild ungulate assemblage when unspecified Bovid II and Bovid III specimens are included illustrates that Class III specimens have increased compared to the identical assemblage during the Middle Lose. Class III specimens now make up 61.8% (n=269), a substantial and significant increase over the 52.7% (n=365) that they made up during the Middle Lose period (X^2=8.9751; p=0.0027). This change seems to be paralleled by a significant decrease in Class II ungulates, which now make up 29.7% (n=129) of the Late Lose assemblage, compared to 36.4% (n=252) of the assemblage (X^2=5.4561; p=0.0195). Bovid I has not changed significantly (X^2=0.829; p=0.3626).

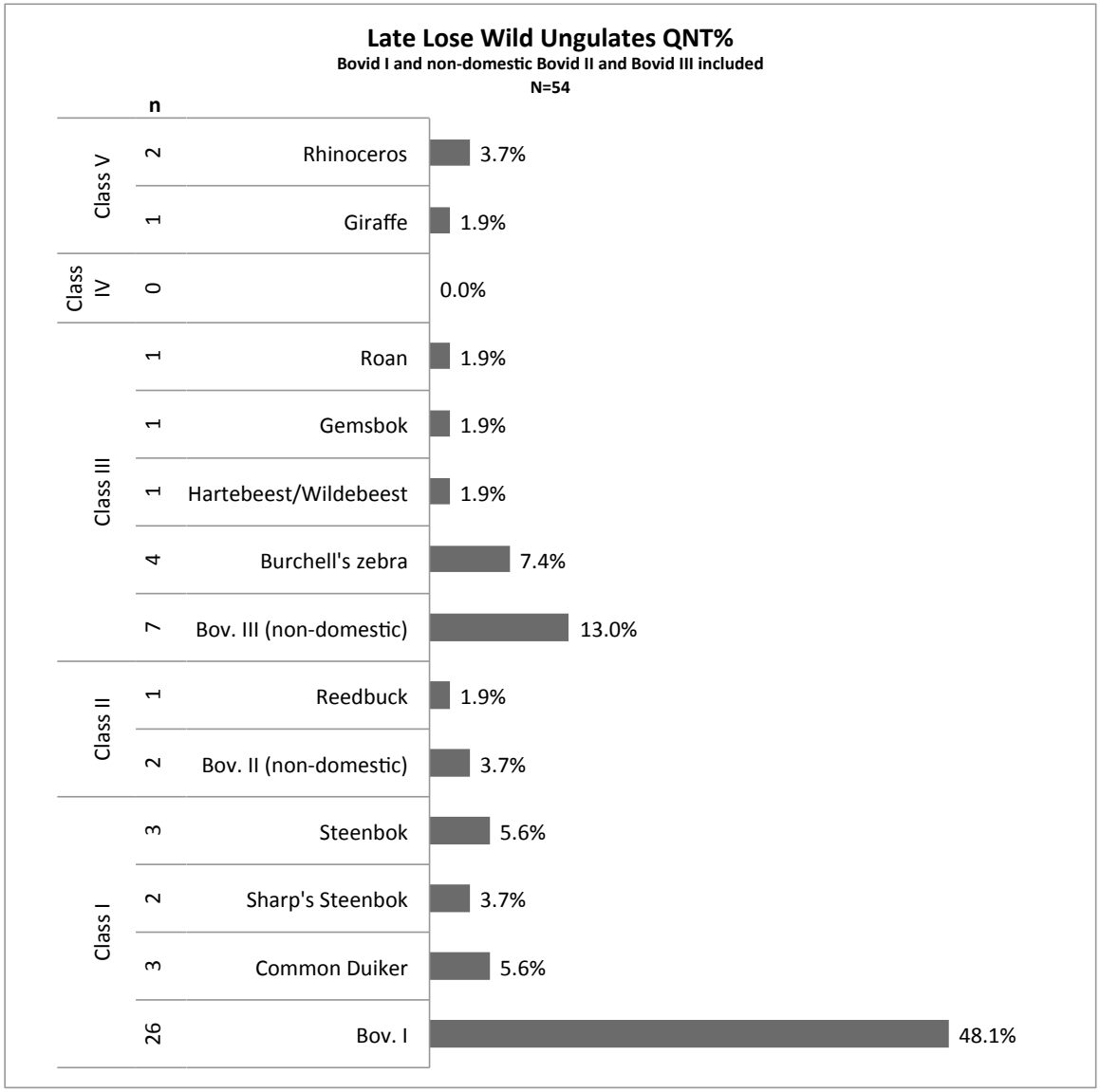


Figure 5-19. Late Lose wild ungulates QNT%. Unspecified bovids omitted.

When unclassifiable Bovid II and Bovid III specimens are removed from the wild ungulate assemblage as in Figure 5-19, the prevalence of Bovid I specimens becomes clear; they now contribute 48.1% (n=26) to the wild non-ungulate assemblage. This is a significant increase compared to the 26.8% (n=42) Bovid I contributed during the Middle Lose (X^2=8.4221; p=0.0037). The very low number of identifiable specimens (54) should also be noted. It appears that hunting and trapping wild ungulates decreased in importance. Zebra remain the most common identifiable species of wild ungulate at

7.4% (n=4), but as in the Middle Lose, they do not have the numerical dominance that they did during the Early Lose and Late Toutswe periods.

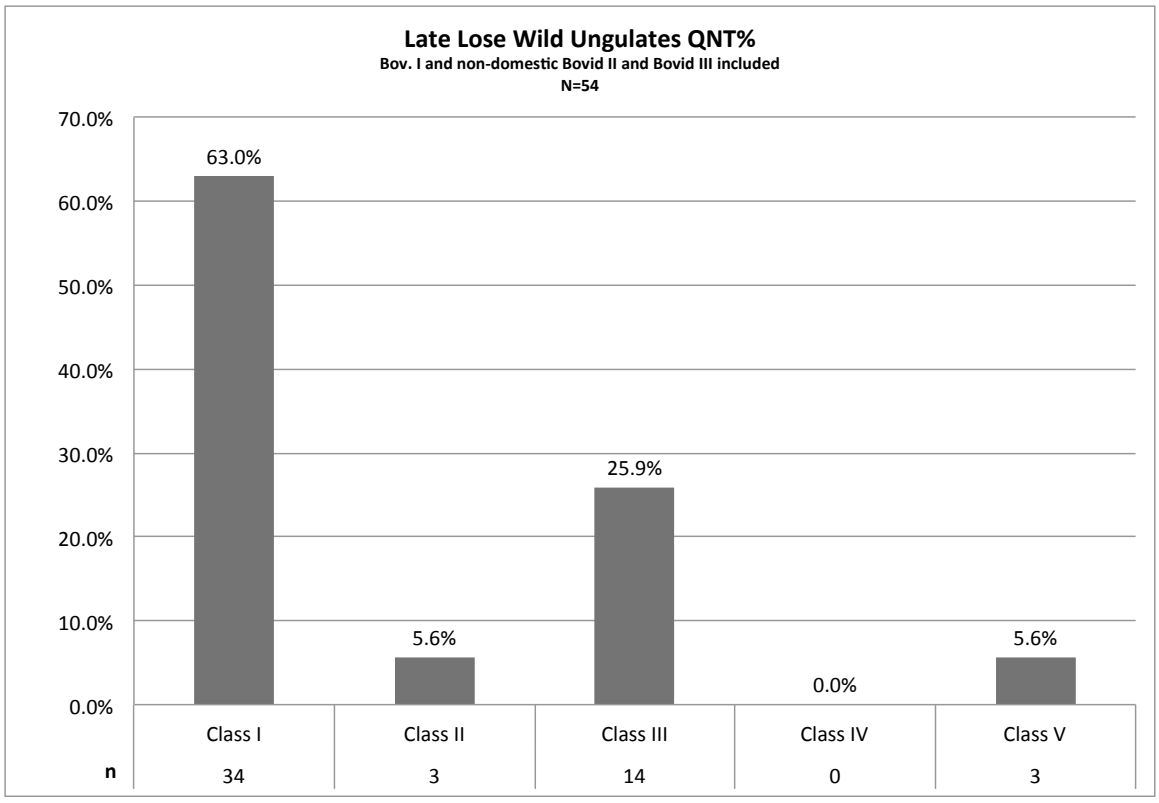


Figure 5-20. Late Lose wild ungulate size class QNT%. Unspecified bovids omitted.

When the small numbers of wild ungulates are combined according to size class as illustrated in figure 5-20, the radical change in hunting patterns during the Late Lose period becomes evident. Class I specimens have increased significantly (X^2=7.5005; p=0.0062), Class II specimens have decreased strongly and significantly (X^2=8.0501; p=0.0046), and Class III specimens have not decreased significantly. Class I specimens now make up 63.0% (n=34) of the assemblage compared to 41.4% (n=65) during the Middle Lose. Class II specimens have reached their nadir, now only contributing 5.6% (n=3) to the wild ungulate assemblage. Class III specimens make up 25.9% (n=14) of the wild ungulate assemblage, compared to 29.3% (n=14). Despite the decrease in ungulate

exploitation, Class V species continue to be exploited, contributing 5.6% (n=3) to the assemblage.

There seems to have been a remarkable change in hunting strategies by the Late Lose period. Inhabitants of Bosutswe focused on smaller non-gregarious ungulates. These species tend to have smaller territories and were likely acquired closer to the site. Because of their small size, they could have been caught in traps or snares, rather than in communal hunting drives. Class V species exploitation likely relates to prestige displays and participation in long-distance trading systems.

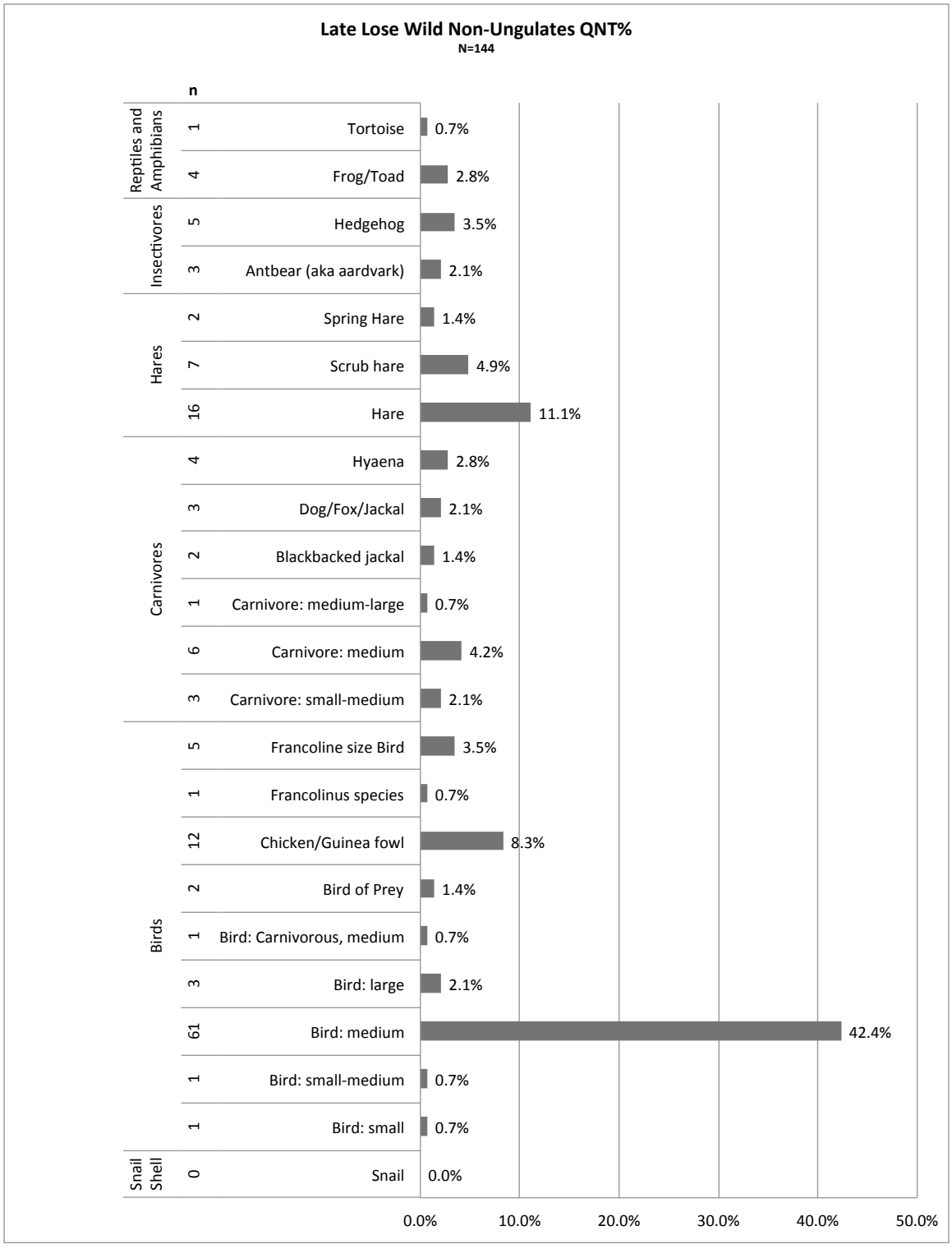


Figure 5-21. Late Lose wild non-ungulate QNT%

As illustrated in Figure 5-21, the decrease in wild animal exploitation that has been demonstrated in the wild ungulate assemblage is not the only radical change that occurred at Bosutswe during the Late Lose; the wild non-ungulate assemblage has also undergone an essential transformation; it is likely that wild non-ungulates contributed much less to the diet than in previous times. Medium birds make up 42.4 % (n=61) of the assemblage; many medium birds may in fact be chickens (Plug 2000). Tortoises have continued their decline first noted in the Early and Middle Lose; they have been almost completely expunged from the diet, in marked contrast to their dietary contribution during the Early Lose and Toutswe periods preceding it. Hares are the second most common wild non-ungulate, comprising 17.4% (n=25) of this portion of the assemblage; their contribution to the assemblage has not changed significantly. Carnivores and idiosyncratic species continue to be represented in the assemblage.

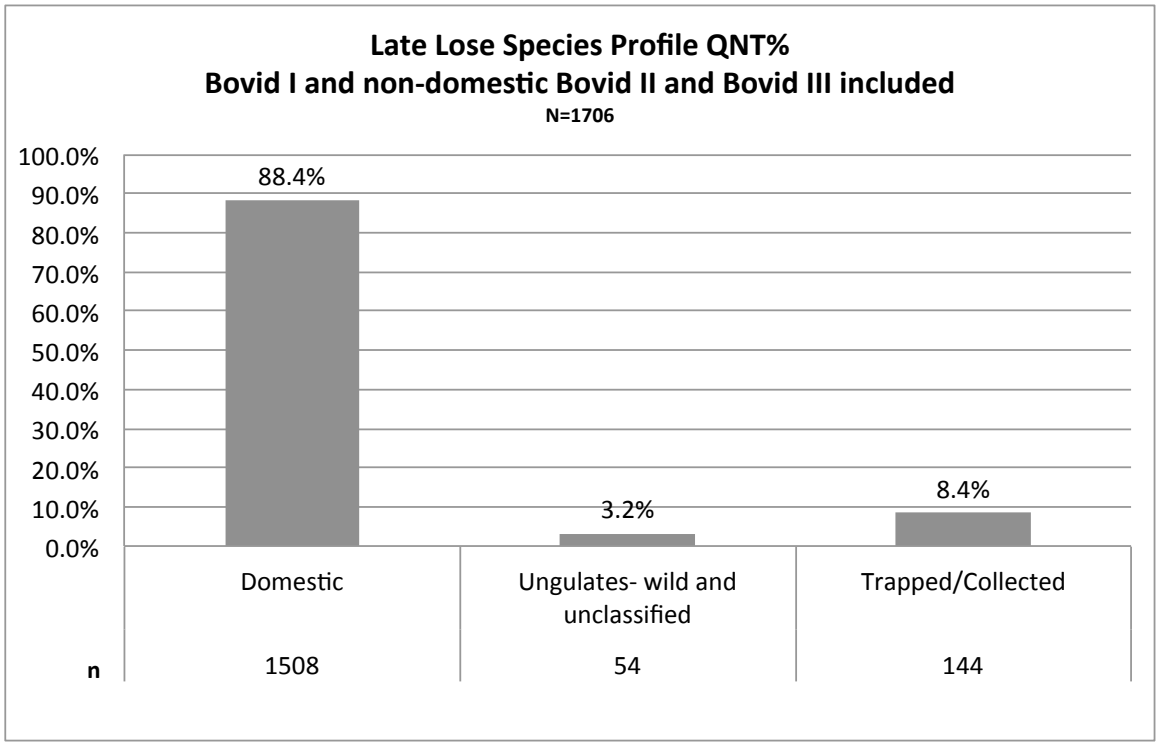


Figure 5-22. Late Lose species profile QNT%.

Figure 5-22 demonstrates that the species composition during the Late Lose was a continuation the Middle Lose trend of decreasing importance of wild species. Wild ungulates including non-domestic Bovid II and Bovid III make up only 23.2% (n=54) of the assemblage, a significant change from 6.5% (n=157) during the Middle Lose (X^2=23.376; p=<0.0001). Wild non-ungulates have not changed significantly; they now make up 8.3% of the assemblage, compared to 9.5% (n=229) during the Early Lose (X^2=1.2253; p=0.2683). Medium birds contribute substantially to the wild non-ungulate assemblage; if many of them are in fact chickens, the contribution of wild non-ungulates would be less than is apparent here. See below for discussion (The Case for Chickens). Domestic species seem to become significantly more important during the Late Lose period (X^2=16.4702; p=<0.0001), now contributing 88.4% (n=1508) to the assemblage, compared to 83.9% (n=2012) during the Late Lose.

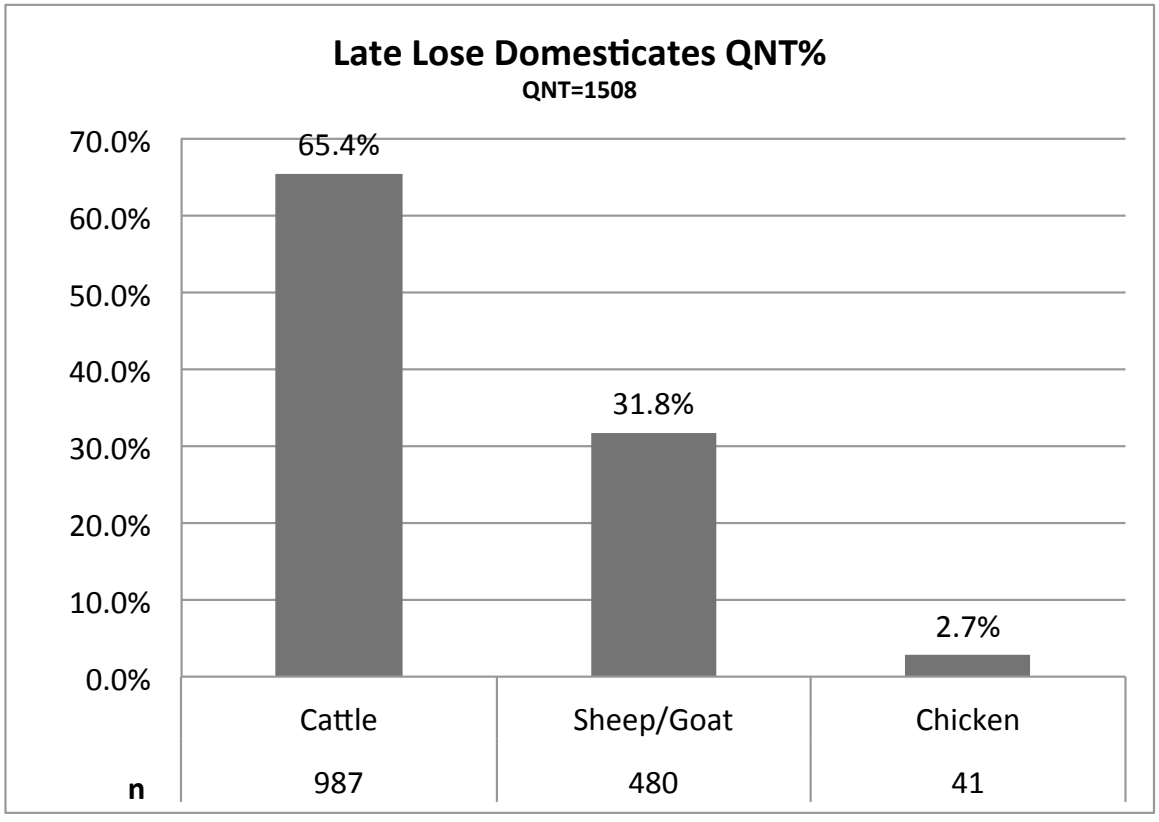


Figure 5-23. Late Lose domesticates QNT%.

As Figure 5-23 indicates, there seems to be a strong and significant increase in cattle (X^2=32.6622; p=<0.0001) during the Late Lose period; cattle now make 65.4% (n=987) of the assemblage, compared to 55.9% (n=1125) of the domestic assemblage during the Middle Lose. Sheep and goats make up 31.8% (n=480) of the assemblage, compared to 40.1% (n=807) during the previous time period. This is a significant decrease (X^2=50.2389; p=<0.0001). Chicken specimens undergo a small but significant decline, reaching 2.7% (n=41), compared to 4.0% (n=80) during the Middle Lose period (X^2=.4.1051; p=0.0428) The CI value is 0.67, supporting the conclusion that cattle were strongly preferred over caprines.

THE CASE FOR CHICKENS

The use of birds at Bosutswe underwent a radical change through time. Chickens and medium size birds become more common during the Lose period. Chickens were present from the earliest occupation of Bosutswe, but seem to become much more common starting in the Lose period. Medium birds become more common as well. While chickens never become a central part of the meat diet in the way that cattle and small stock were, they represent an important auxiliary component of the domestic meat diet. Many of the medium birds in the faunal assemblage may, in fact, be chickens (Plug 2000). In addition to being valued as a food item, chickens have an additional role as being used for sacrifice (Nelson 2008). If so, this indicates a strong contrast in spiritual practices among the people of the Central and the Western precincts; inhabitants of the Central precinct sacrificed chickens at a much higher rate than inhabitants of the Western precinct.

Medium-sized birds are noteworthy for several reasons: in contrast to other wild non-ungulates, they increase in importance through time. Medium birds do decrease in the Late Lose compared to the Middle Lose, but they remain the most numerous wild non-ungulate. As will be discussed in Chapter 7 medium birds, along with chicken/guinea

fowl (ie, specimens that could be either chicken or guinea fowl), are proportionately more numerous in the Central as opposed to the Western precinct. This contrasts with the general usage of wild non-ungulates in the Central precinct, whose inhabitants tended to utilize wild resources less than in the Western precinct.

The stratigraphic distribution of specimens that are more concentrated in the center of Bosutswe than in the periphery, and fact that they are one of the only wild non-ungulates to increase in number through time suggests that many medium-sized birds may, in fact, be chicken specimens. These unclassified medium-sized birds cannot be identified as chickens using standard archaeozoological techniques, but genetic testing could be used to provide firm answers on their identity. It could be that wild medium-sized birds were highly valued in the Lose period, and that the elites in the Central precinct used these wild birds at higher levels than inhabitants of the Western precinct.

Summary

During the Late Lose, wild specimens decreased in importance. Most of the diet consisted of domestic animals. Wild non-ungulates are more common than wild ungulates, but many of these wild non-ungulate specimens may be domestic chickens. Cattle outnumbered small stock. Ivory and megafauna are reasonably well represented at Bosutswe.

It was expected that there would be a decline in the prevalence of domesticates during the Lose period, either through cultural forces emphasizing the social and economic importance of domesticates, wild animal habitat destruction, or both. The reversal of the relative ranking of bovid size classes, in which Bovid I specimens became the most common wild ungulate, was unexpected. Unlike larger ungulates, these animals would likely have been obtained using snares and traps, indicating a significant change in everyday hunting strategies.

Chapter 6: Wild Animals

Ethnographic information suggests that in Botswana, people may have been allowed to hunt small game wherever it occurred, but may have had to ask the chief permission to hunt big game (Amanze 2002). This practice may have been in part ecological as well as economical; Chief Isang temporarily banned the hunting of big game animals that were in danger of extinction (Amanze 2002) however, this also points to the unequal power relations at play in society and to the social requirement that people obey elders and higher status individuals. The ability to circumscribe people's actions, even to preserve the long-term ecological and economical well being of the community at large, is a notable exercise of power over others.

Bergstrom and Skarpe (1999) note that in modern southwestern Botswana, wildlife tends to be found at least 10 to 20 kilometers away from villages. Steenbok, hartebeest and ostriches were found to be located closer to villages compared to wildebeest and duiker. Large herd animals such as gemsbok were located at least 66-76 kilometers away from villages.

Southern African Hunting Practices

There were a wide variety of hunting practices in Botswana before the introduction of firearms, each applicable to obtaining certain types of animals; traditionally, some practices were only carried out by men or boys. Throwing sticks and assegai (spears) were used in traditional hunting. Traps and snares may have provided much of the wild meat consumed in the past. Traditional traps and snares used by the Tswana include camouflaged pits, deadfalls, spring-release snares and birdlime (Grivetti 1981). Pits and deadfalls were placed across game trails. Sometimes animals were corralled into pits through the construction of brush fences. Camouflaged pits were used

for medium-sized game. Spring-released snares could be used for lighter game such as francolin, but also for relatively larger same such as scrub hare. Boys used birdlime in various forms to catch birds. Dogs were also used to flush birds and run down smaller game (Grivetti ibid.). It is likely that some animals were dug out of their burrows, such as spring hare. Spring hare are important in modern Botswana, supplying 80% of meat in some areas (McGlothlen, et al. 1986). Spring hare are caught by inserting a stick with a hook on the end of it unto a spring hare burrow, hooking the animal, then digging the animal out (Hitchcock 1978).

Certain animals can simply be collected while walking in the bush, such as tortoises. Some animals were caught in snares, such as small territorial antelopes, small carnivores, hares and birds (Plug 1996). Women and children may have contributed to the wild assemblage by collecting these relatively easy to obtain animals.Snares are more likely to catch smaller animals such as steenbok or duiker than larger species such as hartebeest (Kent 1993).

Hitchcock (1978) identifies three types of active hunting: pursuit hunting, expedition hunting, and communal hunting. Pursuit hunting is carried out by one or two people, using poisoned arrows or guns. Expedition hunting involves several people leaving the settlement for several days. These people used spears and dogs for hunting. In communal hunting, some hunters drive animals to a waiting group of hunters or a trap. Communal hunting may have involved driving game into a pit with sharpened stakes at the bottom (Plug 1996). Plug (ibid) indicates that big game animals and herd animals such as zebra, wildebeest and impala were obtained through communal hunting carried out by men. Game was butchered near the trap (Plug ibid). Harris (1852) indicates that elands and giraffes were subject to communal hunting. Wildebeest, quagga (a now-extinct type of zebra) and other unspecified animals could easily be funneled into pit falls by constructing crescent-shaped thorn fences on either side of the pit (Cummings 1879; Harris 1852). Harris also indicates that some butchering was done close to these pitfalls,

evidenced by "heaps of whitened bones (ibid.: 49) near these pitfalls. In addition to providing food, communal hunting served social purposes as well, helping to draw hunters together into a more united social groups. In the 19th century, hunting was organized according to age regiments (Schapera 1938).

It is also possible that the inhabitants of Bosutswe did not do all their own hunting. Wild animal resources may also have been obtained through trade or long-distance travel. Exotic water-reliant species such as sitatunga and hippopotamus are present in the Bosutswe assemblage, indicating contact with the Okavango Delta and Linyanti River, Shashe and Limpopo Rivers and/or the closer Boteti River/Lake Dow area. Hunter-gatherer groups may have also engaged with agricultural populations by trading wild animal resources for (Smith and Lee 1997; Voight 1985).

Letsholo- special communal hunt and meeting

The importance of the democratic process as recorded by historical and modern ethnography in Tswana society (Schapera 1984; Amanze 2002; Denbow and Thebe 2006) has been discussed. Normal meetings are held in the *kgotla* and allow people to express their opinions, but there is a special meeting called a *letsholo* that may affect the faunal record. A *letsholo* is a place, a meeting and a communal hunt (Schapera 1938). A *letsholo* is called during times of severe crisis, including significant internal disputes, raids, and announcing or calling for war (Jackson 1997; Peters 1994). A *letsholo* is the physical and ideological opposite of the *kgotla*; not only is it held in the bush and weapons are allowed, but, in contrast to the consensual decision making made manifest in the *kgotla*, the *letsholo* can be characterized by open and antagonistic confrontation. A *letsholo* may be held to announce treason or war (Peters 1994). In addition to the men residing in the chief's town, non-resident men are required to attend this meeting, which is held out in the veld instead of at the settlement. The *letsholo* is preceded or followed by a collective hunt; the term for this hunt is also *letsholo* (Schapera 1984). A *letsholo*

hunt could also be held at the start of the boy's initiation cycle; this hunt was meant to symbolize a battle (Peters 1994).

Grivetti (Grivetti 1976) does not focus on the political aspects of letsholo, which he calls *lesholo*, but he does relate the cessation of regimental hunts to the reduction in chiefly power since Botswana obtained independence. Instead he focuses on the social importance of regimentals hunts, such as the role of food distribution and hunting methods employed. In Grivetti's interpretation, *letsholo* are held when meat is in low supply. *Letsholo* were held with the goal of catching big game so that meat could be distributed to all members of the community, and have the potential to have the archaeological correlates of a single-episode feast (Dietler and Brian 2001). In Grivetti's description, men would form a circle around the game, then walk forward to dive the game to the center of the circle. The game would be killed with guns (presumably, assegai would have been used in the past) and wooden throwing sticks. Killed game was taken back to the chief's home, where it was skinned, butchered, cooked and consumed by all the villagers. Meat had to be consumed at the ruler's ward; taking meat home for later consumption was not permitted. People received portions based on their place in the local hierarchy.

COMPARISON OF WESTERN AND CENTRAL LOSE ASSEMBLAGES

Early Lose

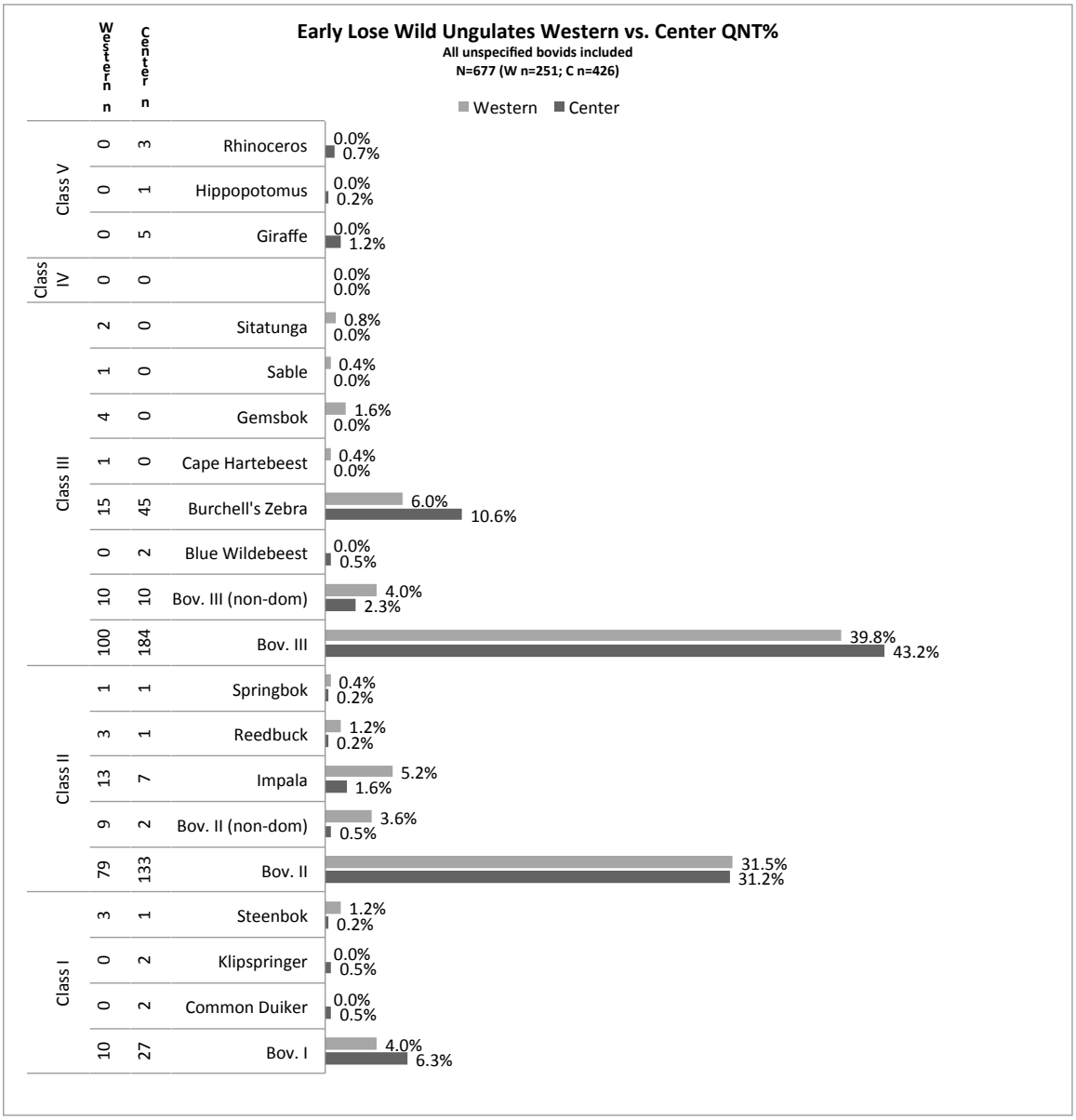


Figure 6-1. Early Lose Wild Ungulates. Western vs. Center QNT%. Unspecified bovids included.

When comparing the Central and Western precincts in Figure 6-1, several differences and similarities become apparent. Bovid II specimens are strongly similar, while Bov. I and Bov III. are broadly similar; both are more prevalent in the Central

precinct. More striking is differential distribution of several species. Numbers may be small, but Figure 6.1 indicates that some species are only present in the Western precinct, while others are only present in the Central precinct.

Examining unusual species such as Class V species and exotic, non-local species, a pattern is evident; Class V species such as rhinoceros, hippopotamus and giraffe are all found at Bosutswe during the Early Lose time period, and these specimens are localized to the Central precinct. In contrast, the two sitatunga bones (a proximal right metatarsal articulation and shaft, and a left tibia distal articulation and shaft, both chopped through) are located in the Western precinct. This raises the possibility that older patterns of spiritual or cultural beliefs about "special" animals persisted in the periphery of the site, while new ones were developed by or accessible to the inhabitants of the Central precinct. If sitatunga signify divination or other spiritual practices, it is possible that the Western inhabitants (commoners) were able to participate in these spiritual practices. See chapter 10 for discussion.

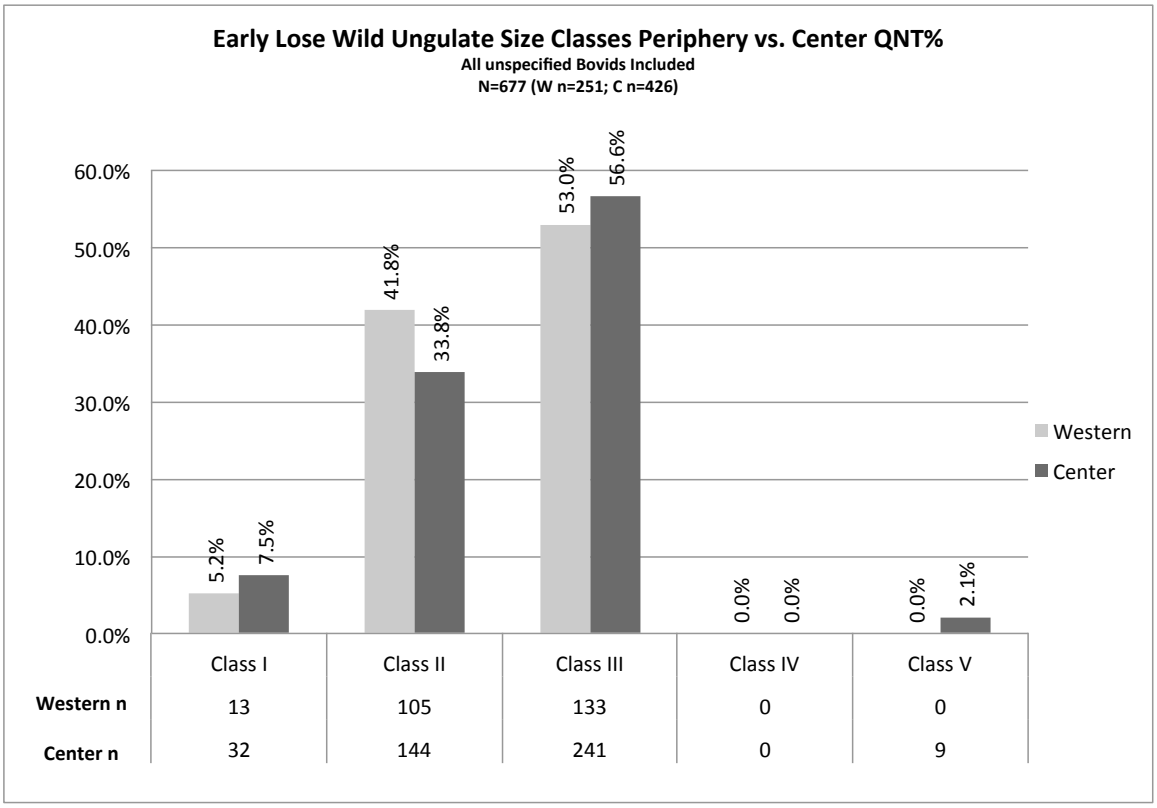


Figure 6-2. Early Lose Wild Ungulate Size Classes. Western vs. Center QNT%,

The significantly larger proportion of Class II animals in the Western precinct during the Early Lose period (X^2=4.3797; p=0.0364) illustrated in Figure 6-2 (W 41.7%, n=105; C 33.8%, n=144) may or may not represent a higher prevalence of sheep and goats (ie, a portion of the unspecified Bovid II specimens) in the Western precinct, but this cannot be ascertained examining the bones visually. The differences between Class I and Class III specimens in the Central and the Western Precincts are not significant.

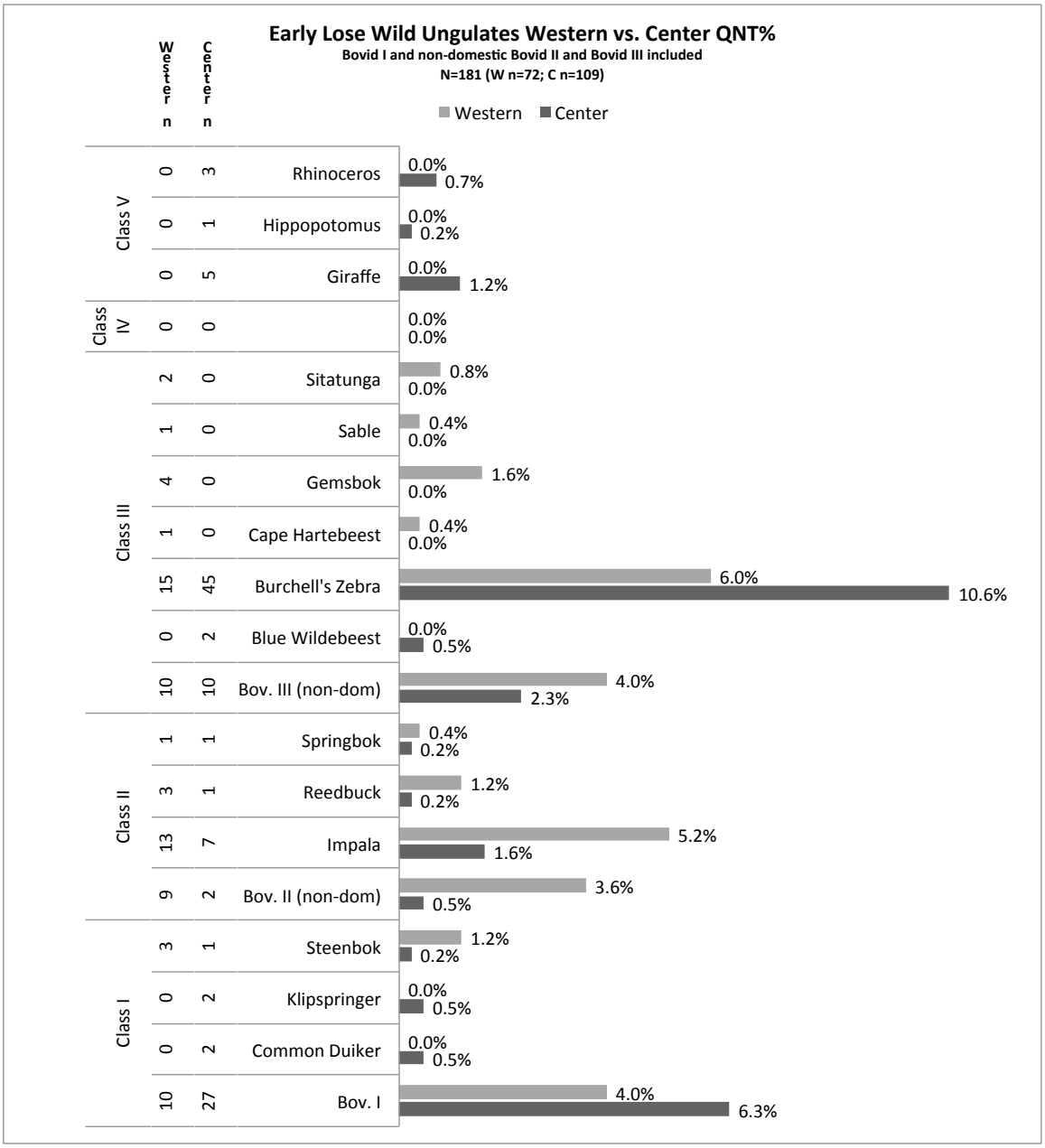


Figure 6-3. Early Lose Wild Ungulates Western vs. Center QNT%.

As discussed in Chapter 5, zebra dominate the wild ungulate assemblage when specimens identified down to the species level are considered (Figure 5-5), contributing 16.6% (n=60) of the assemblage. As displayed in Figure 6-3, despite the greater importance of hunting to the Western inhabitants of Bosutswe, zebra remains are more common in the Central precincts, forming 10.3% (n=45) of the Central wild ungulate

assemblage), while zebra specimens form 6.0% (n=15) of the Western wild ungulate assemblage. This difference is significant (X^2=8.1834; p=0.0042). This suggests that during the Early Lose period, zebra were highly valued by the Central precinct inhabitants, along with Class V species. Zebra and Class V species may have held a unique place among the inhabitants of the Central precinct.

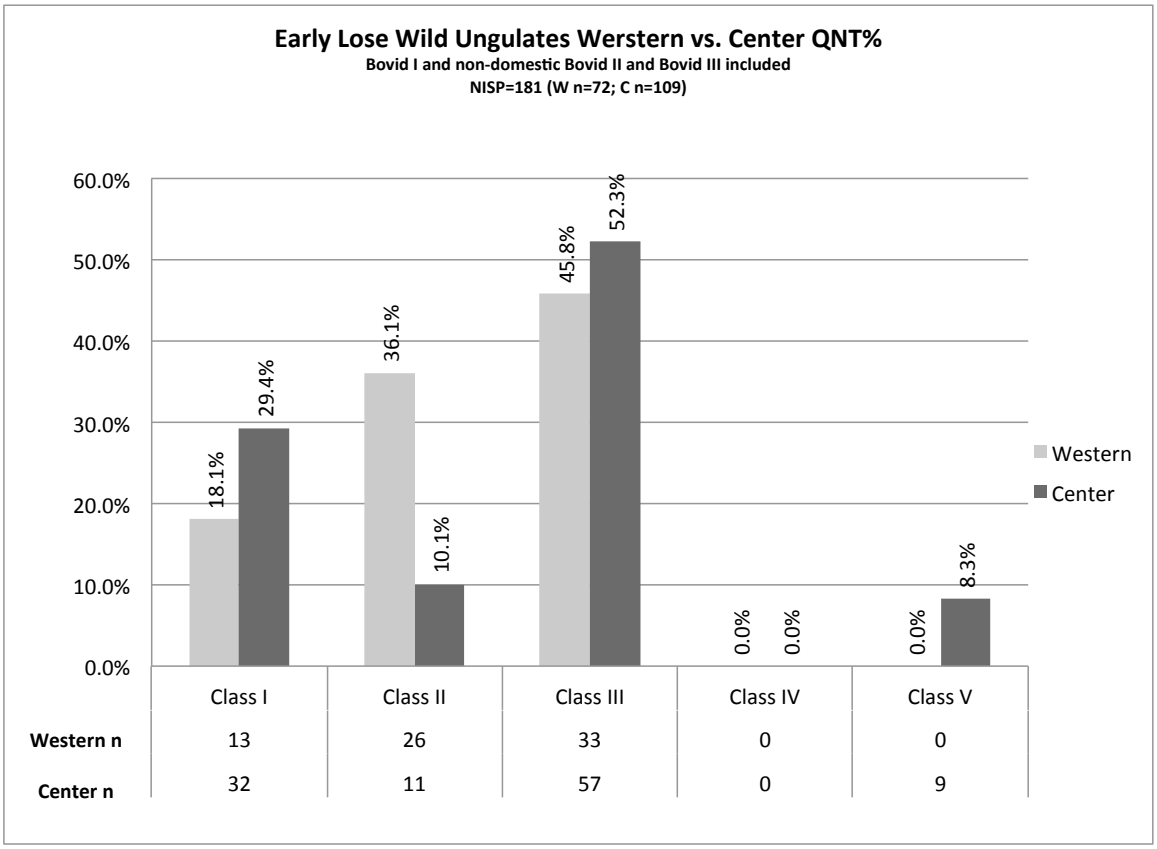


Figure 6-4. Early Lose Wild Ungulates Western vs. Center QNT%.

As Figure 6-4 shows, the people of the Western precinct consumed a considerable proportion of Class I, II and III species. The people of the Central precinct consumed a considerable proportion of Class I species, and somewhat more Class III species. Class I species could have also been used for ritual purposes. The exclusive location of Class V remains in the Central precinct has already been mentioned, but the strong difference in

Class II specimens warrants discussion; 36.1% (n=26) of the Western wild ungulate assemblage consists of Class II specimens, while only 10.1% (n=11) of the comparable Central assemblage does. This difference is significant (X^2=5.8745; p=0.0154), as is the concentration of Class V specimens in the Central precinct (X^2=6.256; p=0.0124). The differences in Class I and Class II distribution are not significant.

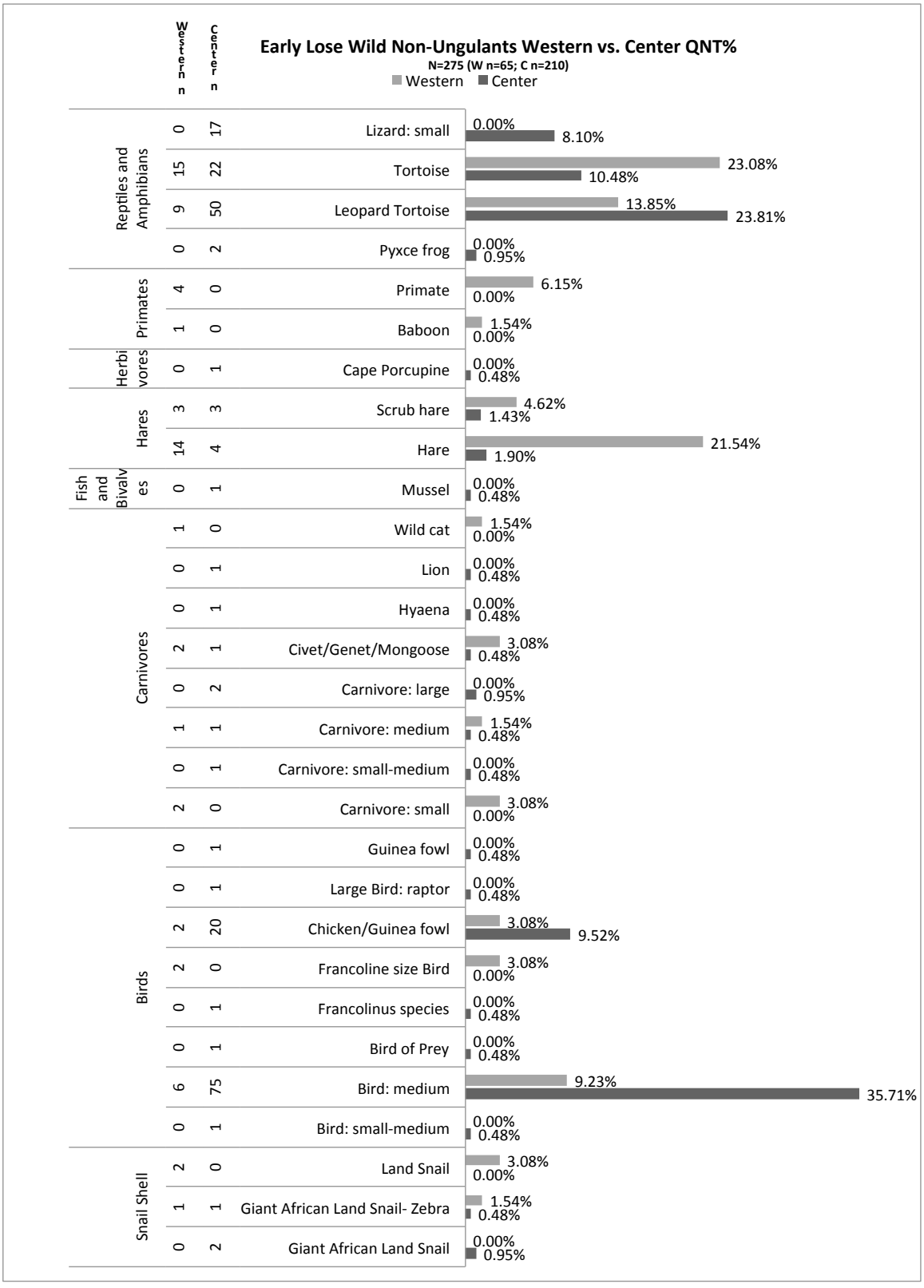


Figure 6-5. Early Lose Wild Non-Ungulates Western vs. Center QNT%.

Strong differential consumption patterns are apparent during the Early Lose wild non-ungulate assemblage as well (figure 6-5). 17 lizard specimens are located in the Central precinct, but this number likely represents only one individual that could not be identified down to the species level, and likely does not indicate intense focus on lizards in the Central precinct. Medium birds are significantly better represented in the Central precinct compared to the Western precinct (X^2=8.0094; p=0047). Hares and scrub hares are especially well represented in the Western precinct compared to the Central precinct (X^2=32.4512; p=<0.0001)

It may be notable that idiosyncratic species are not limited to one area of the site; an elephant rib head, lion metatarsal proximal articulation and shaft, hyaena scapula, porcupine upper molar, and large carnivore fibula and phalange fragments are found in the Central precinct. Baboons and unspecified primates, as well as a wild cat specimen are found in the Western precinct. Both areas have remains of civet/genet/wildcat, and other unidentified fur-bearing carnivores.

Tortoises are well represented in both the Central and the Western precinct, and there is not a significant difference between the precincts in their values (X^2=0.1519; p=0.6967). In terms of meat resources, it appears that hares were more widely exploited in the Western precinct, while medium size birds and chicken/guinea fowl were more widely exploited in the Central precinct.

Middle Lose

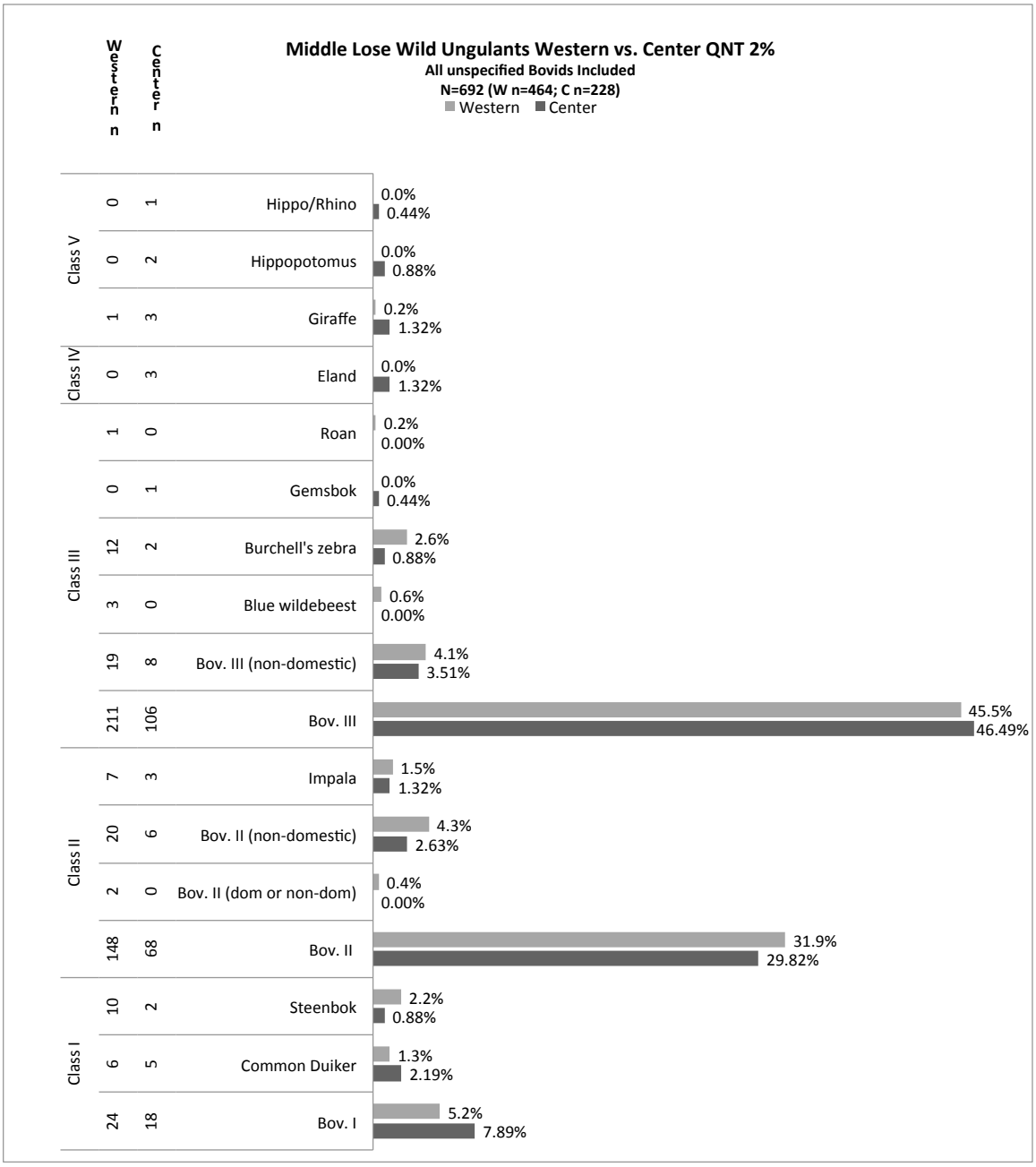


Figure 6-6. Middle Lose Wild Ungulates Western vs. Center QNT2%.

As Figure 6-6 illustrates, both the Central and the Western precinct contain roughly the same proportions of unclassified Bovid II and Bovid III specimens, and to a lesser extent Bovid I specimens when unclassified bovids are included in the analysis.

Class V specimens during the Middle Lose continue to be concentrated in the Central precinct, but one proximal giraffe tibia shaft with chop marks is present in the Western precinct.

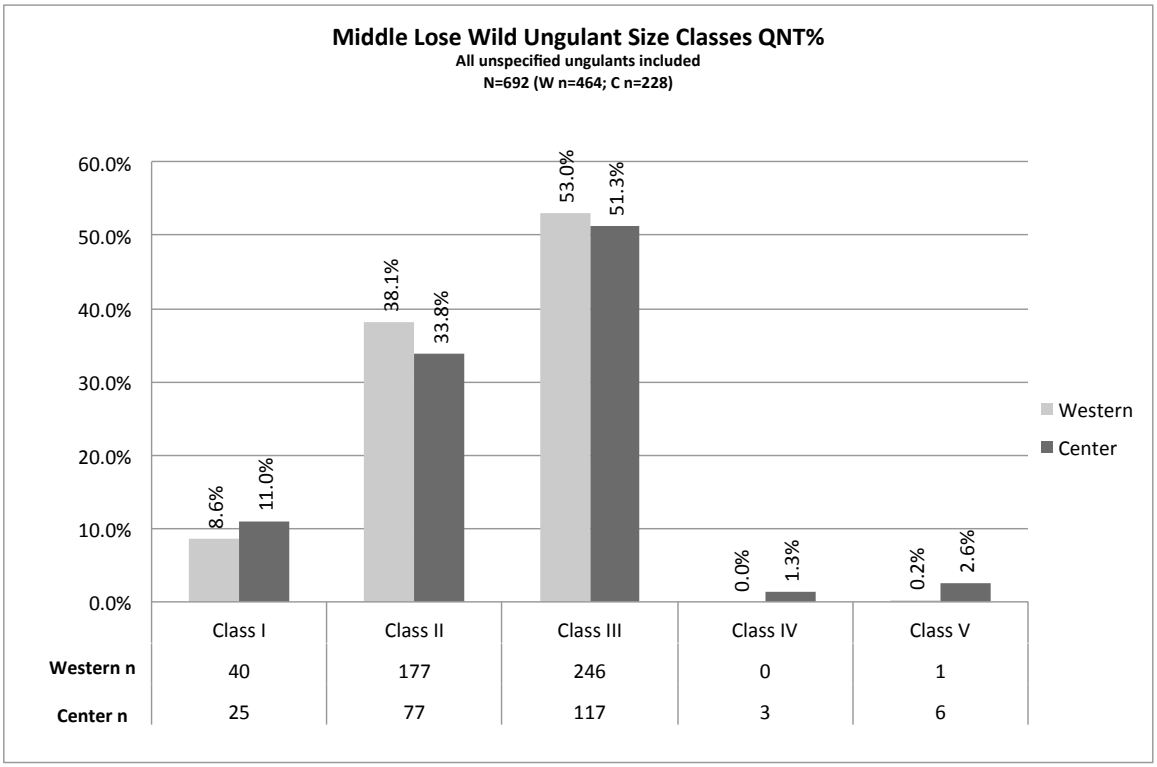


Figure 6-7. Middle Lose wild Ungulate Size Classes QNT%.

Some slight changes are apparent in the aggregate Middle Lose wild ungulate assemblage that includes unspecified Bovid II and Bovid II specimens (Figure 6-7) compared to the Early Lose period; Class II specimens from the Western precinct have overtaken those from the Central precinct, but this difference is not large and is not significant. Class II specimens continue to be proportionally more prevalent in the Western precinct than in the Central precinct. Class I specimens continue to be slightly more important in the central precinct compared to the Western precinct. Class IV specimens are almost exclusively found in the in the Central rather than the Western

precinct. Aside from a significant difference in Class V species (X^2=8.9122; p=0.0028) and Class IV species (X^2=6.1318; p=0.0133), which are present in very low numbers, these differences are not significant.

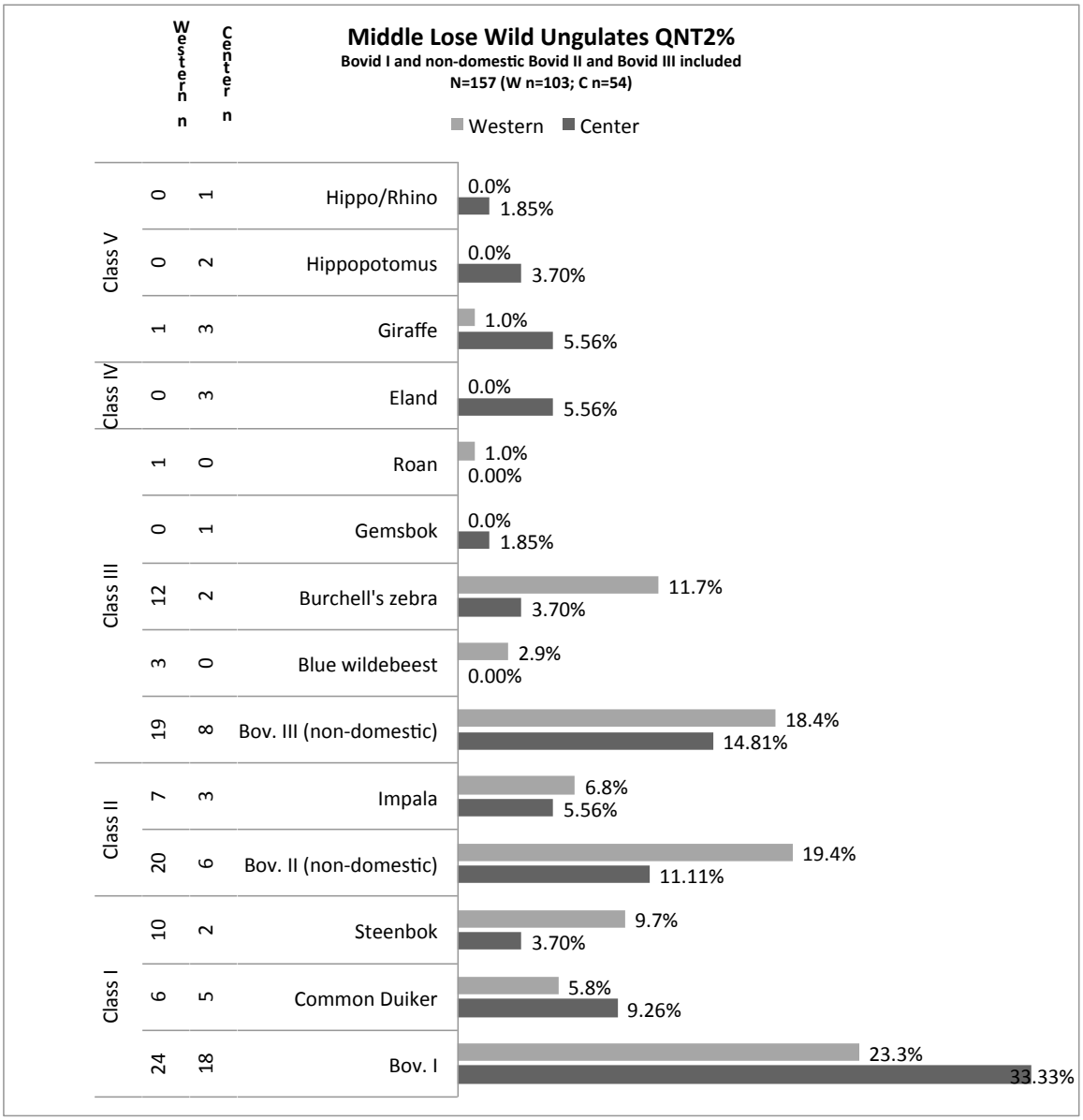


Figure 6-8. Middle Lose wild ungulates. Western vs. Center QNT2%.

When unspecified Bovid II and Bovid III specimens are removed from the Middle Lose as shown in Figure 6-8, a strong change can be noted in zebra exploitation patterns; in the Early Lose, zebra seemed to be a very important wild resource at Bosutswe,

constituting 33% (n=60) of the wild ungulate assemblage; in the Middle Toutswe, zebra remained the most common firmly identifiable wild ungulate, but fell to only 8.9% (n=14) of the total wild ungulate assemblage, being nearly equaled by firmly identifiable bovids, and becoming less common than unspecifiable non-domestic bovids. Zebra remain the most common identifiable species in the Western precinct (W 11.7%, n=12; C 3.7%, n=2), suggesting a continuation of zebra consumption patterns in the Western precinct. But, the differences in zebra distribution are not significant (X^2=27545; p=0.097). The Western precinct continues to rely more on hunting overall compared to the Central precinct, and persists in having a greater proportion of non-domestic Bovid II and Bovid III specimens, although the number of impala specimens have more or less equalized and are no longer strongly more numerous in the Western precinct. Unspecified Bovid I specimens continue to be more numerous in the Central precinct compared to the Western.

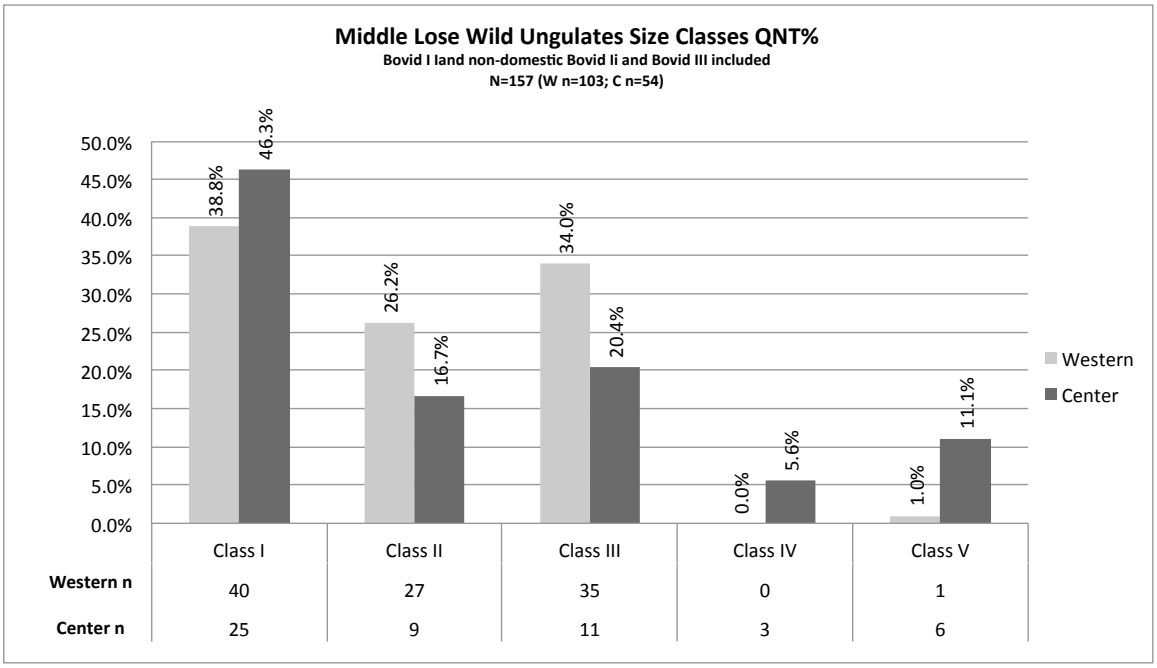


Figure 6-9. Middle Lose Wild Ungulate Size Classes QNT%.

As was discussed in Chapter 5, hunting patterns underwent a strong change during the Middle Lose; as Figure 6-9 illustrates, the distribution of wild ungulate size classes between the Western and Central Precinct has also changed. During the Early Lose (Figure 6-4), there were significant differences between Class II species between the precincts, with the Western precinct consuming significantly more Class II speciess than the Central precinct. Both precincts consumed a considerable portion of Class I and III species, but the Central inhabitants consumed only small amount of class II species. Class III species were the most common, and Class V species were limited to the Central precinct. During the Middle Lose, the distribution of Classes I-III has equalized, and each precinct consumed more Class I specimens than Class III, and more Class III specimens than Class II species. Class IV and V specimens continue to be hunted, and most of these specimens are located in the Central area of the site. Class V species are significantly better represented in the Central precinct compared to the Western (X^2=8.5514; p=0.0035). The other differences are not significant.

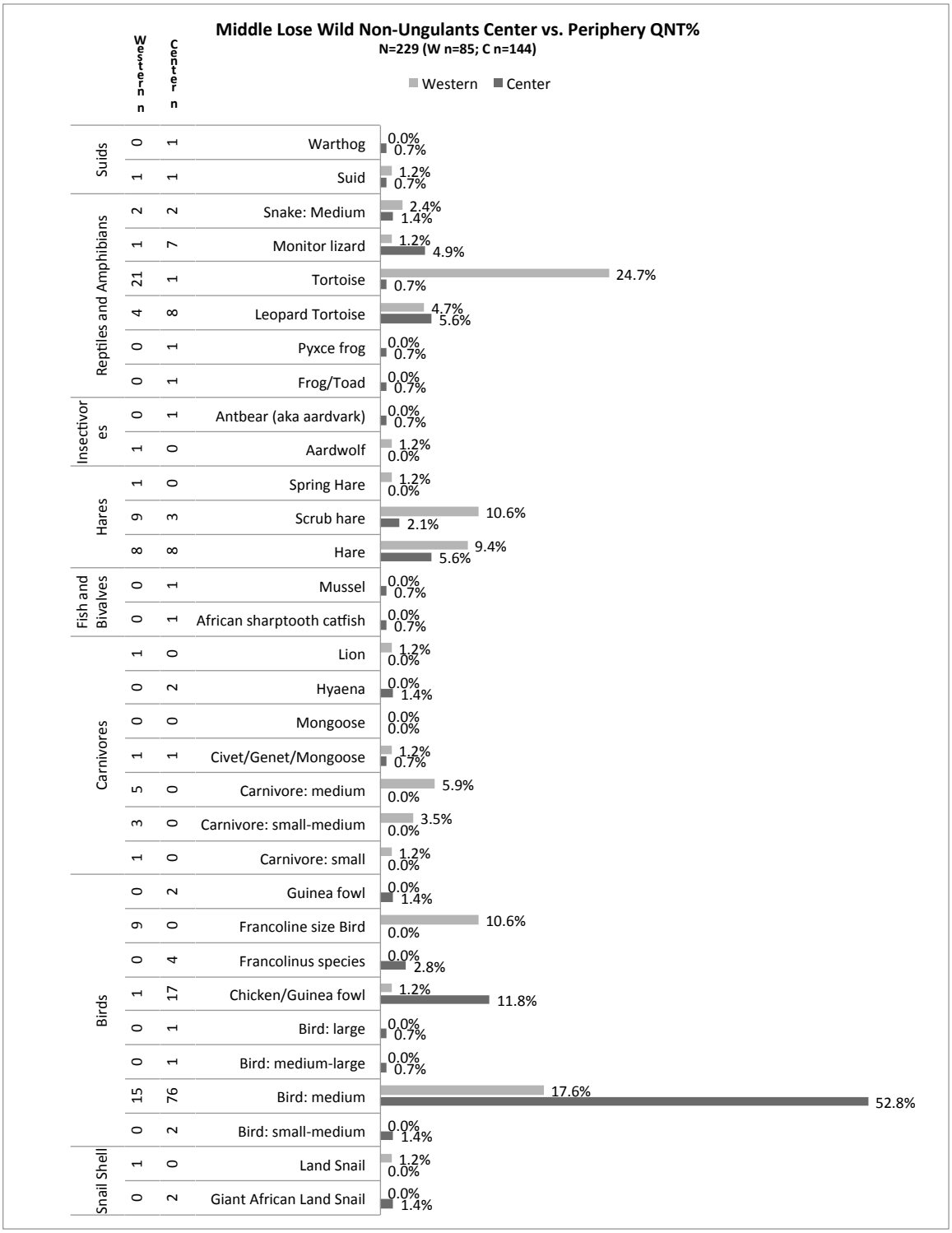


Figure 6-10. Middle Lose Wild Non-ungulate QNT%.

The Middle Lose wild non-ungulate specimens as represented in Figure 6-10 indicate that patterns of tortoise consumption changed during the Middle Lose period; while leopard tortoise has equalized, tortoise consumption in general can be said to be significantly concentrated in the Western precinct (X^2=22.6802; p=<0.0001), perhaps reflecting dietary preference. Hares are significantly more common in the Western precinct as well (X^2=8.8567; p=0.0029). There is a significant difference (X^2=27.5468; p=<0.0001) in the distribution of medium sized birds: 52.8% (n=76) of the Central non-ungulate assemblage is represented by medium sized birds, and 17.6% (n=15) of the Western wild non-ungulate assemblage is represented by medium-sized birds. Many medium birds may be chickens, making the consumption of wild animals in the Central precinct even less common than it appears to be. See "The Case for Chickens" below for discussion.

Late Lose

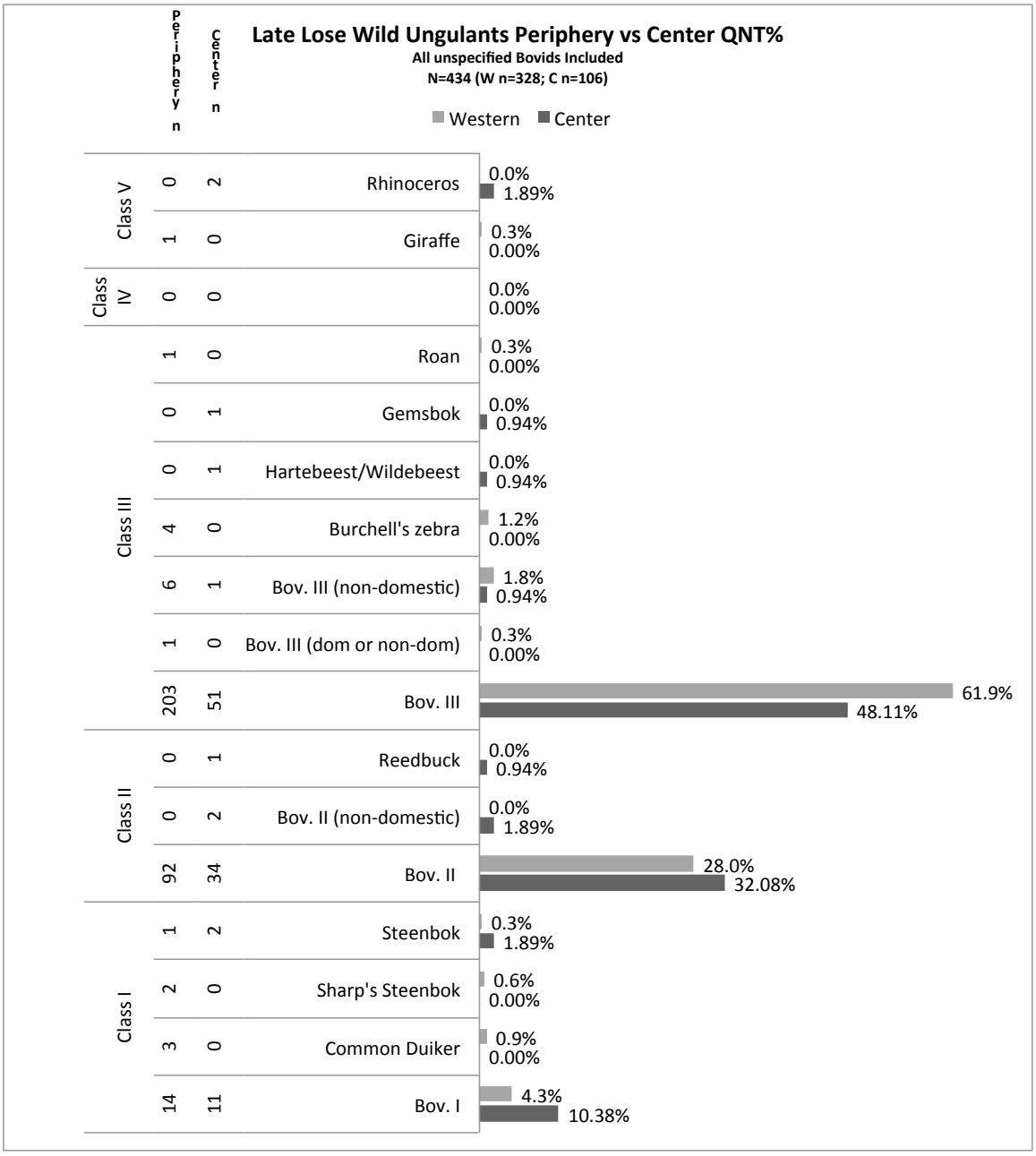


Figure 6-11. Late Lose Wild Ungulates. Western vs. Center QNT%

As shown in Figure 6-11, during the Late Lose period, the number of identified wild specimens declined by 37.3% compared to the Middle Lose Period. Several notable contrasts between the Western and the Central Precinct are apparent during the Late Lose Period. Specimens that could be firmly identified as non-domestic Bovid III are rare,

declining to only 1.8% (n=6) in the Western Precinct and to .94% (n=1) in the Central Precinct. There was no strong difference in the proportion of unspecified Bovid III specimens from the Western and the Central precinct during the Middle Lose (W= 45.5%, n=211; C=46.5%, n=106); there is now a significant difference (X^2=6.2343; p=0.0123) in the proportion of unspecified Bovid III specimens in the two precincts, with the Western Precinct having more unspecified Bovid III specimens than the Central Precinct (W= 61.9%, n=203; C= 48.1%, n=51). A significantly greater (X^2=5.5075; =0.0189) percentage of Bovid I specimens are found in the Central Precinct (10.38% (n=11) than in the Western precinct (4.3% n=14). Class V mammals continue to be represented in small numbers; two rhinoceros longbone fragments were recovered from the Central Precinct, and one giraffe sesamoid was recovered from the Western Precinct.

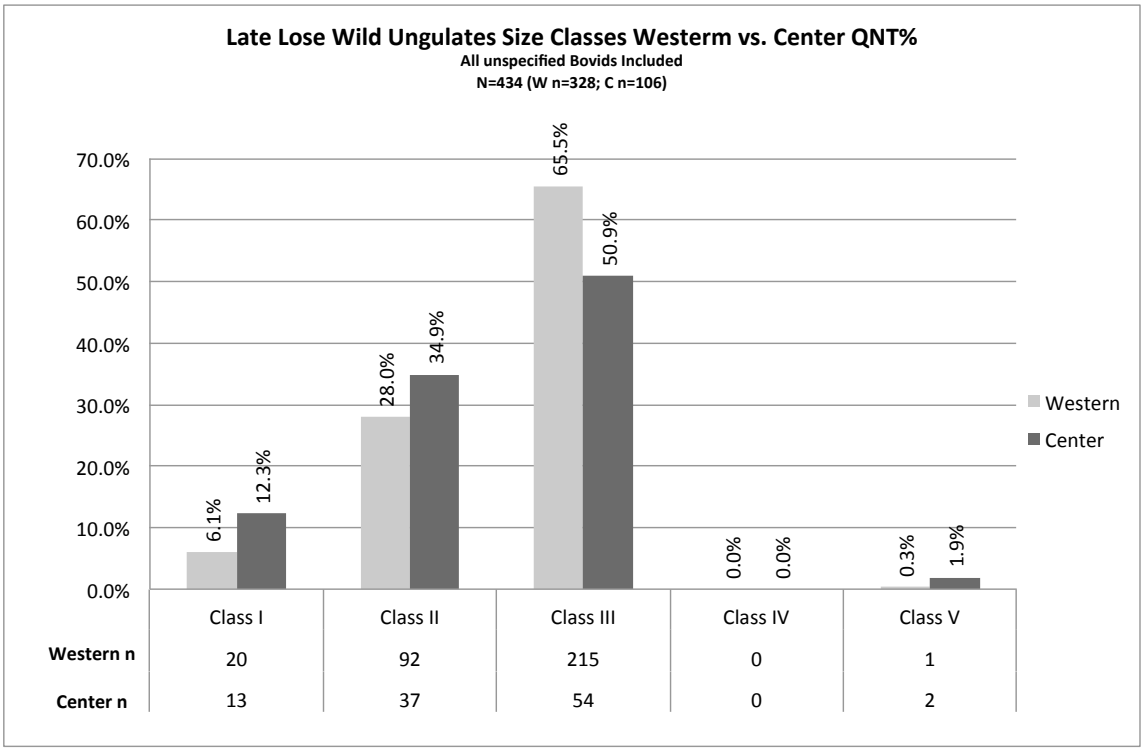


Figure 6-12. Late Lose Wild Ungulate Size Classes Western vs. Center QNT%.

Figure 6-12 compares the proportion of different ungulate size classes during the Late Lose with all unspecified bovids included. It is apparent that the Western precinct

contains more significantly more (X^2=7.252; p=0.0071) Class III specimens (65.6%, n= 215) compared to the Central precinct (50.9% n=54), and significantly fewer (X^2=4.3361; p=0.0373) Class I specimens (W 12.3%, n=20; C 23.3%, n=13). The Central precinct contains slightly more Class II specimens compared to the Western precinct, but this difference is not significant (X^2=1.8032; p=0.1793).

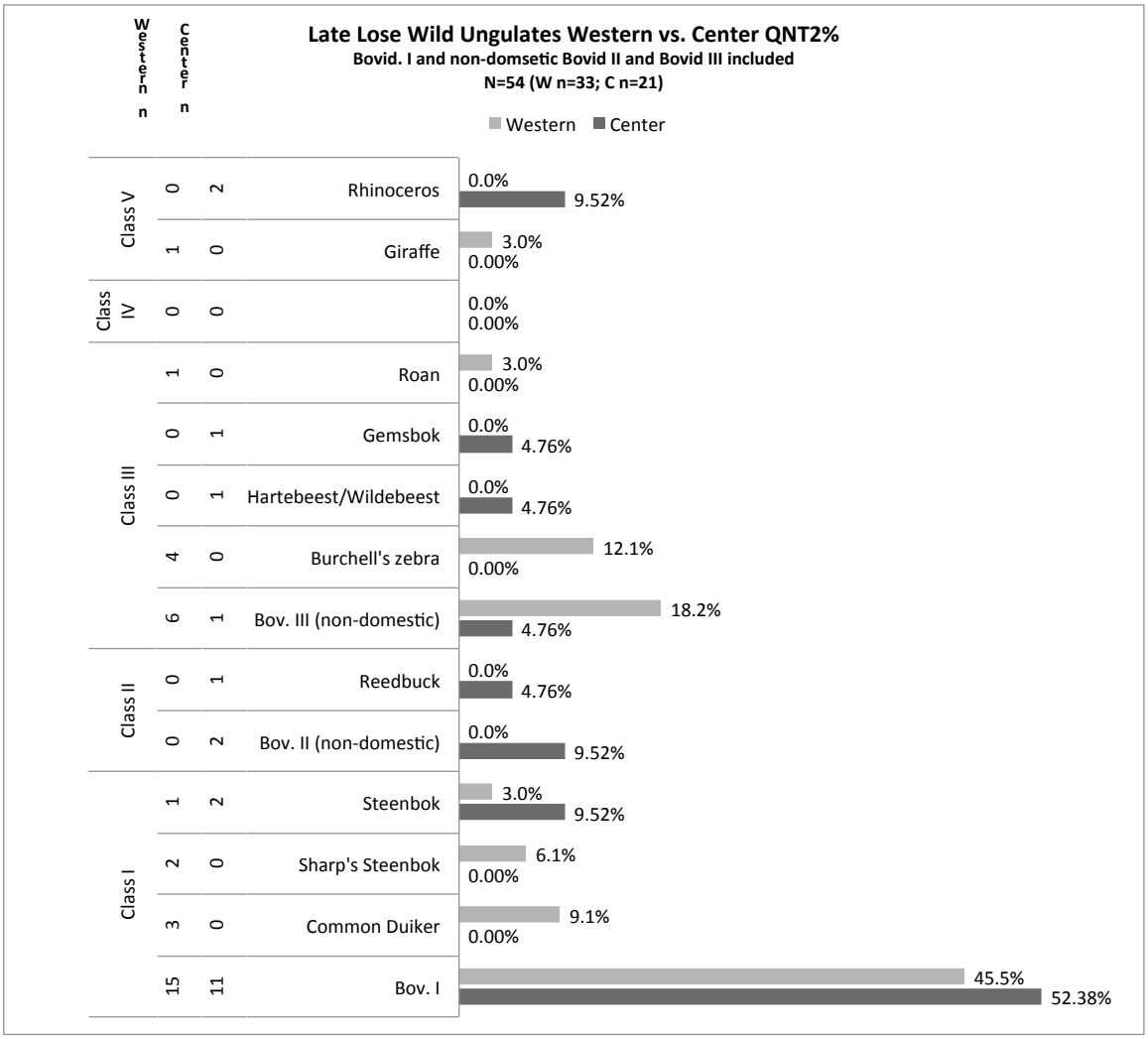


Figure 6-13. Late Lose Wild Ungulates Western vs. Center QNT%. Unspecified bovids omitted.

As Figure 6-13 shows, with unspecified Bovid II and Bovid III specimens removed, a strong decline in hunting activity is apparent; only 54 specimens remain.

Bovid I specimens dominate the both the Central and the Western ungulate assemblage. Zebra specimens continue to be the most well represented ungulate species that can be identified to the species level, but their numbers are small; (12.1% n=4).

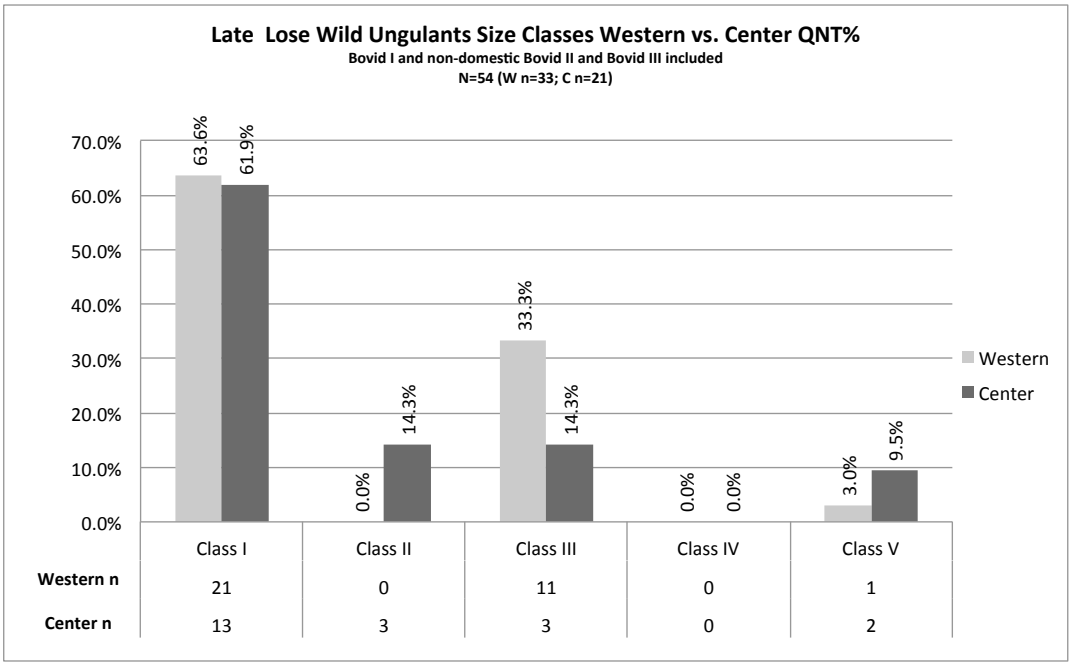


Figure 6-14. Late Lose Wild Ungulate Size Classes Western vs. Central QNT%. Unspecified bovids omitted.

As depicted in Figure 6-14, there is no strong difference in size Class I ungulate consumption in the Western and Central Precincts, with both assemblages containing a little more than 60% Class I specimens. Class II specimens may have been more strongly preferred by the inhabitants of the Central Precinct, while Class III species were more strongly preferred by inhabitants of the Western precinct. Class V species are few in number, but are more numerous in the Central precinct, although they are also found in the Western Precinct. Despite the lower overall numbers of specimens recovered from the Western precinct, more wild ungulates were recovered from this area, indicating that wild animals were more commonly eaten in this area compared to the Central precinct. The differential distribution of size classes seems to have lost its significance, signifying

an equalization of what wild ungulate size classes were eaten most often in separate areas of the site.

Figure 6-14 hints at a radical contrast in the makeup of wild animals available to the inhabitants of Bosutswe, perhaps hinting at habitat destruction and overexploitation of natural resources, or to a change in hunting patterns. Compared to the Taukome/Zhizo period, when animal populations were least impacted by human activities, the exploitation of Size Class I and Size Class III have reversed; Class III is now strongly outnumbered by Class I.

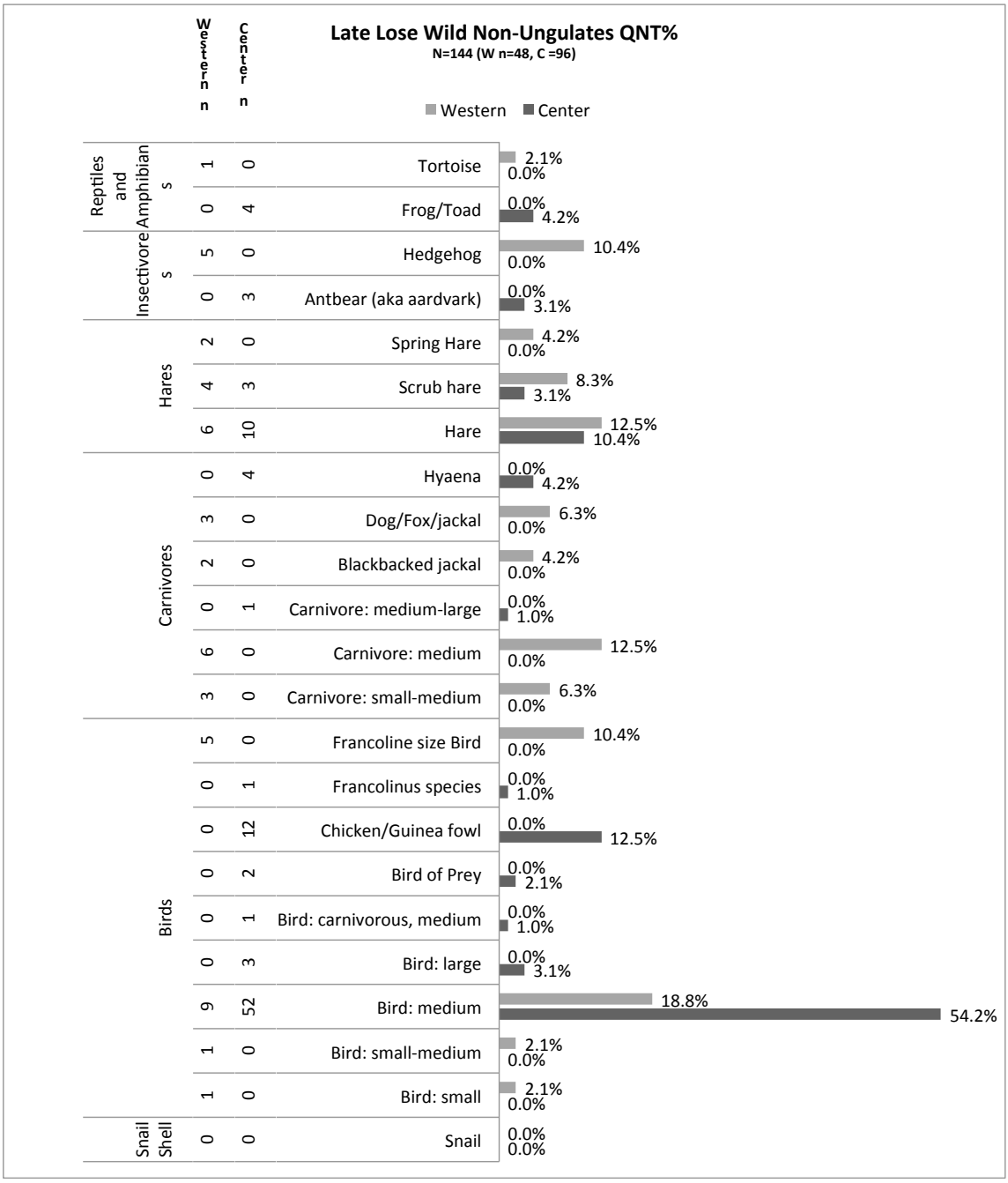


Figure 6-15. Late Lose Wild Non-ungulates Western vs. Center QNT%.

Like the ungulate assemblage, the non-ungulate assemblage has continued to decline at Bosutswe (Figure 6-15). Hares and spring hares continue to be consumed. There is no strong difference in unspecified hare consumption between the two precincts, but spring hares and scrub hares are more common in the Western Precinct. Only one

tortoise specimen was recovered, indicating a strong contrast with earlier periods: perhaps there was a consistent and strong decline in local tortoise populations, or a change in cultural preferences. Medium birds continue to be significantly (X^2=16.4393; p=<0.0001) better represented in the Central precinct compared to the Western. A wide variety of carnivores are present, largely localized in the Western precinct. The Central precinct did contain at least one hyaena, consisting of a phalanx, partial left ulna, complete right carpal, and a claw from the third phalanx.

AGAINST THE FOOD UTILITY INDEX

The Food Utility Index (FUI)

If researchers are considering the caloric or nutritional value of meat cuts, it should be remembered that not all bones represent cuts of meat that were desired or intentionally chosen. Metcalf and Jones (Metcalfe and Jones 1988) developed the Food Utility Index (FUI) to help understand "riders," which are bones that become a part of the bone assemblage not because they were intentionally chosen, but because they lie in close proximity to a desired body part. The patella lies close to the femur (which has a high meat value), so may be included as a rider if a thigh is chosen for consumption. The health and condition of individual animals will affect their nutritional value, but the relative FUI values of animal species with similar body configurations will be similar

Analysis of wild animal remains a Bosutswe does not support the idea that all "low utility" body parts, such as lower legs and feet, will be removed and discarded in the bush in order to make the animal lighter for transportation back to the site. Studying a group of sedentary Kalahari foragers, Kent (1993: 364) noted that "…a majority of the animals killed had the majority of their bones brought back to camp," and that only larger animals, such as hartebeest and gemsbok, did note receive this treatment. Other hunter-gatherer groups always brought bones from larger animals back to camp. Size and

dietary choice seems to influence what body parts of hunted animals are brought back to settlements (Haynes 1990).

Only Class V species (elephant, giraffe, hippopotamus and rhinoceros) are limited to larger bones at Bosutswe. Other wild animals were not limited to high meat value body parts such as upper front and back legs. As figure 6-16 illustrates, cranial and lower limb elements from wild animals, here impala, are well represented at Bosutswe.

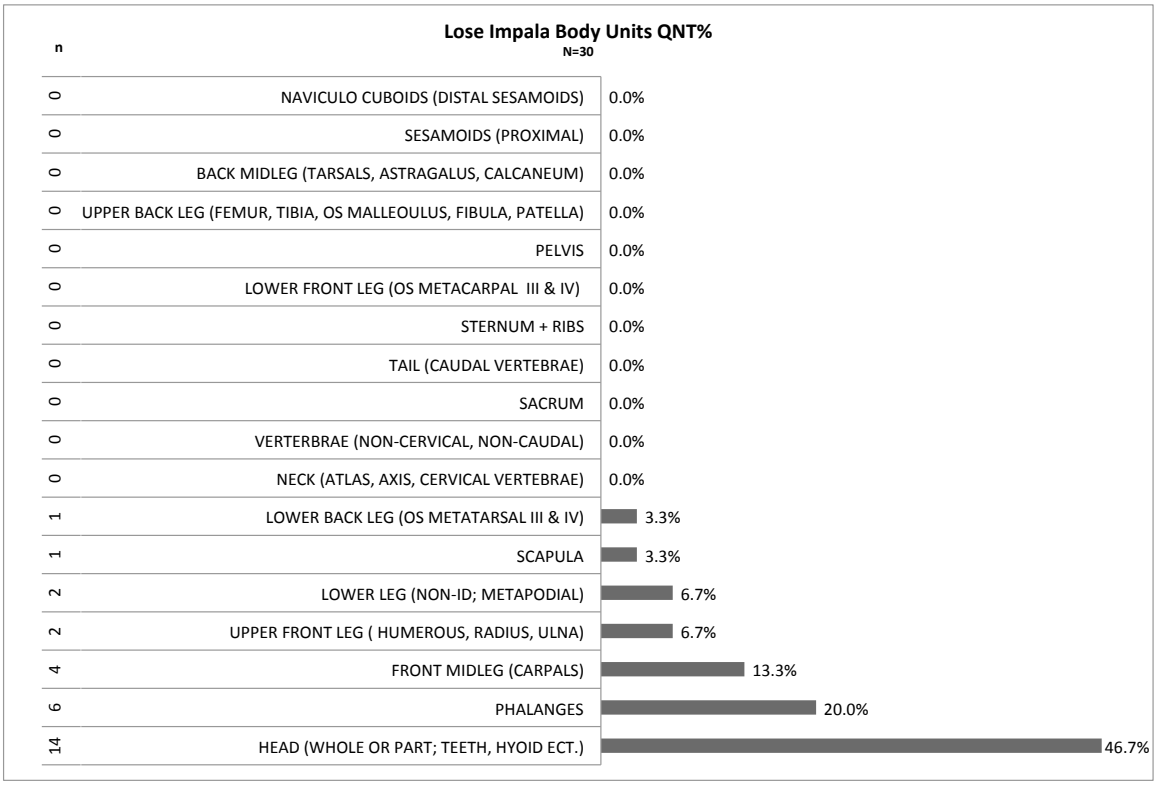


Figure 6-16. Lose Impala Body Units QNT%.

Limiting consideration of body part utility to meat value ignores the common use of marrow in many cuisines and the wide variety of culinary choices that people make. Russell (2012) notes that hunters often bring bones back to their homes so that marrow can be extracted and consumed instead of leaving them at kill sites. Likewise, Kent

(1993) notes that among Kalahari hunter-gather, marrow from hunted animal bones, including metapodials and craniums, was a valued resource.

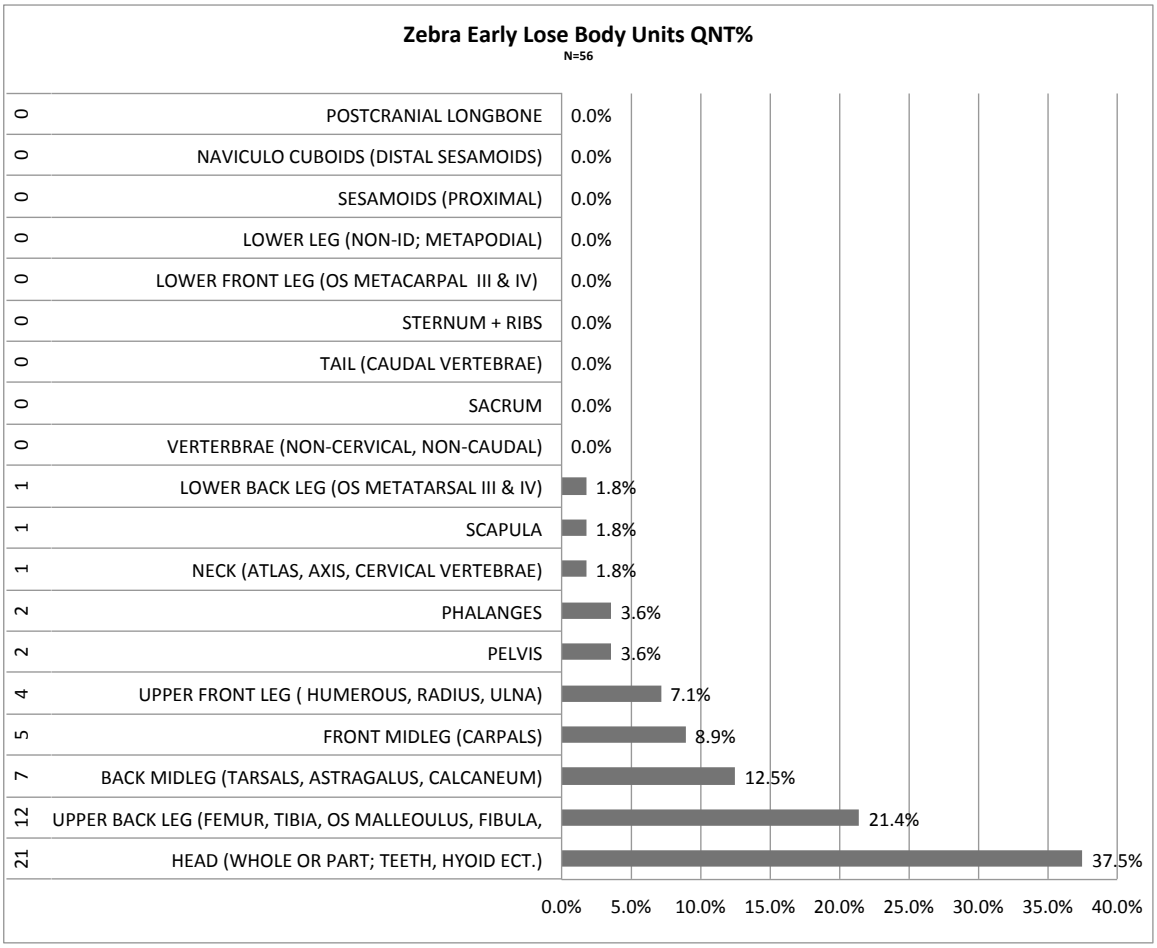


Figure 6-17. Early Lose Zebra body units QNT%.

As the sample above (Figure 6-17) shows, low-utility body parts from wild animals, here zebra, were brought back to Bosutswe. Cranial elements are well represented. Some elements are less well represented than the definite "local use" element representation profile provided by cattle and small stock.

Summary

The wild animal assemblage undergoes profound change throughout the Lose period. There is a noticeable decrease in wild animals at Bosutswe as time progresses.

By the Late Lose, hunting and trapping provide only a minimal amount of sustenance. Various sized carnivores are well represented. Carnivores are especially well represented in the Western precinct during the Late Lose period. Denbow et al. (2008) argue on the basis of stable carbon isotope evidence and the disappearance of vitrified kraal deposits that cattle were moved off the site around the start of the Lose period or during the Late Toutswe period, presumably creating a need for some of the men to leave the site in favor of cattle posts at least some of the time. This could have resulted in an increase in trapped and collected game, as men may have had less time to carry out long or medium distance hunting activities (Plug and Badenhorst 2006).

Economic and social differences between the Western and the Central precinct become apparent through examining their use of wild resources. Medium-sized birds and Class V mammals are more common in the Western precinct. Wild animals seem to have been more heavily exploited in the Western precinct, where there are often a greater number and/or variety of wild of species represented, despite the smaller sample size of the Western precinct.

Chapter 7:Animal Husbandry at Iron Age Bosutswe

The importance of cattle in Tswana society is well documented. Cattle are valued as social and economic wealth; cattle ownership is indicative of both economic and political power (Comaroff and Comaroff 1990; Denbow 1983; Hall 1986). Impoverished people tend to not own livestock (Hitchcock 1978). They are used for bride payments, paying fines, and sacrificed for important occasions such as funerals. Cattle become increasingly common at elite southern African sites during the Iron Age; at Bosutswe, the only time period in which small stock outnumber cattle is the Early and Middle Toutswe.

During the Taukome/Zhizo and Toutswe periods, cattle were kept in kraals in the Central precinct. This spatial layout of settlements is called the Central Cattle Pattern (Kuper 1980); at least by the Early Lose at Bosutswe herding practices underwent a radical change, and cattle were moved off-site (Denbow et al 2007), in what is termed the Zimbabwe culture pattern (Huffman 1986). Stable isotope analysis indicates that Bosutswe sheep and goats continued to feed on both grasses and bushes, perhaps close to the site, while cattle were fed either tropical wild or domestic grasses (Denbow 2007), both of which use the C4 photosynthesis pathway. Traditionally, boys and young men spent much of their time at cattle posts away from the village, taking care of cattle (Schapera 1938, 1984).

INFERRING ANIMAL HUSBANDRY PRACTICES

If zooarchaeologists have a basic understanding of the age and sex profiles of the bone assemblage, they may be able to investigate the goals of animal husbandry practices of the society being studied. Uerpmann (1973) argues against any hard-and-fast rules concerning bone assemblage and animal husbandry practices. A high proportion of animals that were slaughtered at the juvenile to sub-adult phase may indicate that meat was a primary goal of the animal husbandry system. Sub-adult males have optimal meat weight, so there is no need to keep them for years if meat is the goals. Sub-adult males

are capable of breeding. A high proportion of adult or aged females can indicate a high use of dairy products. A high proportion of adult or aged male and female animals can indicate that animals were valued for secondary products, such as milk or wool, labor, and/or cult or social status (Uerpmann 1973: 316).

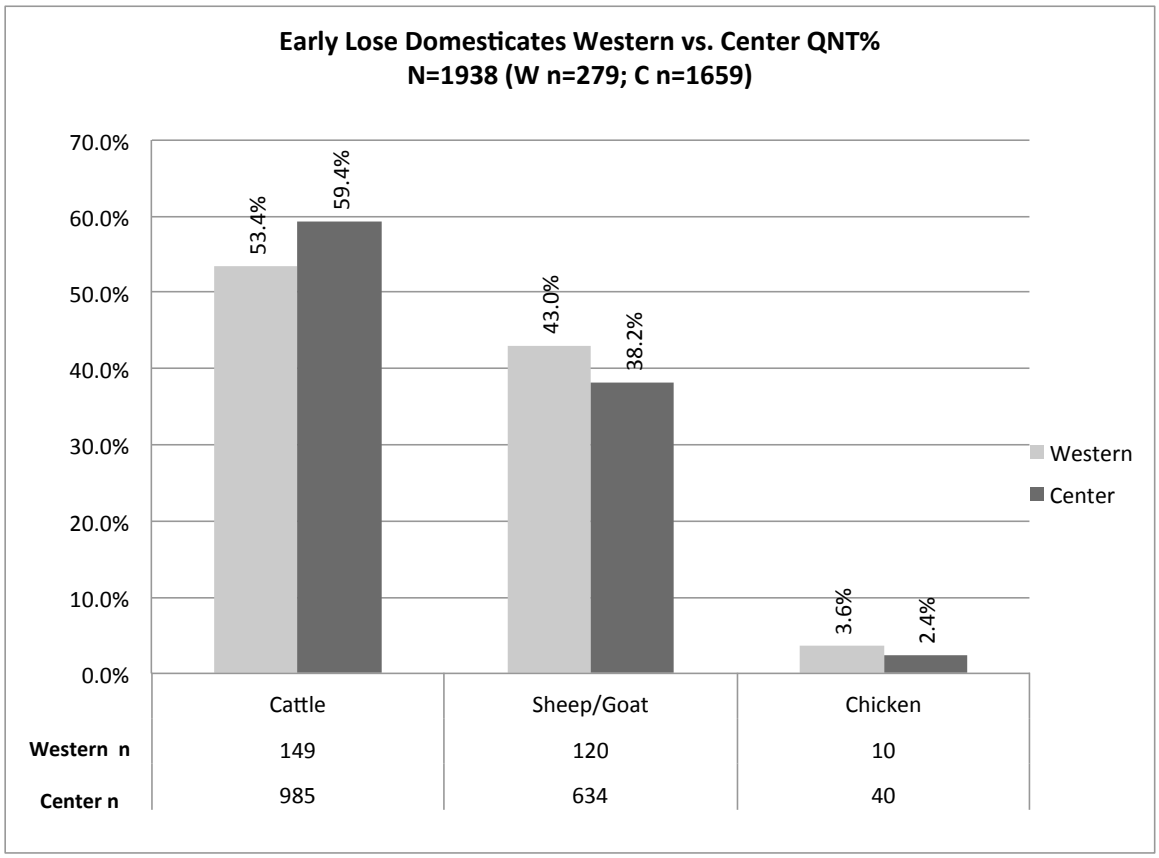


Figure 7-1. Early Lose Domesticates Western vs. Center QNT%.

As shown in Figure 7-1, there are no radical differences in livestock frequency when comparing the Central and Western precincts during the Early Lose periods. The Central precinct has a slightly larger proportion of cattle, chickens, and a slightly smaller proportion of small stock when compared to the Western precinct, but these differences are not statistically significant (X^2= 3.504, P=0.061208). While strong differences seem to exist in the amount of wild and domestic game consumed, and in the type of wild game

consumed, when domestic animals were consumed, strong differences are not apparent in the proportions of cattle, sheep/goat, and chicken. It should be noted that the CI value is higher in the Central precinct (0.61) than in the Western precinct (0.55).

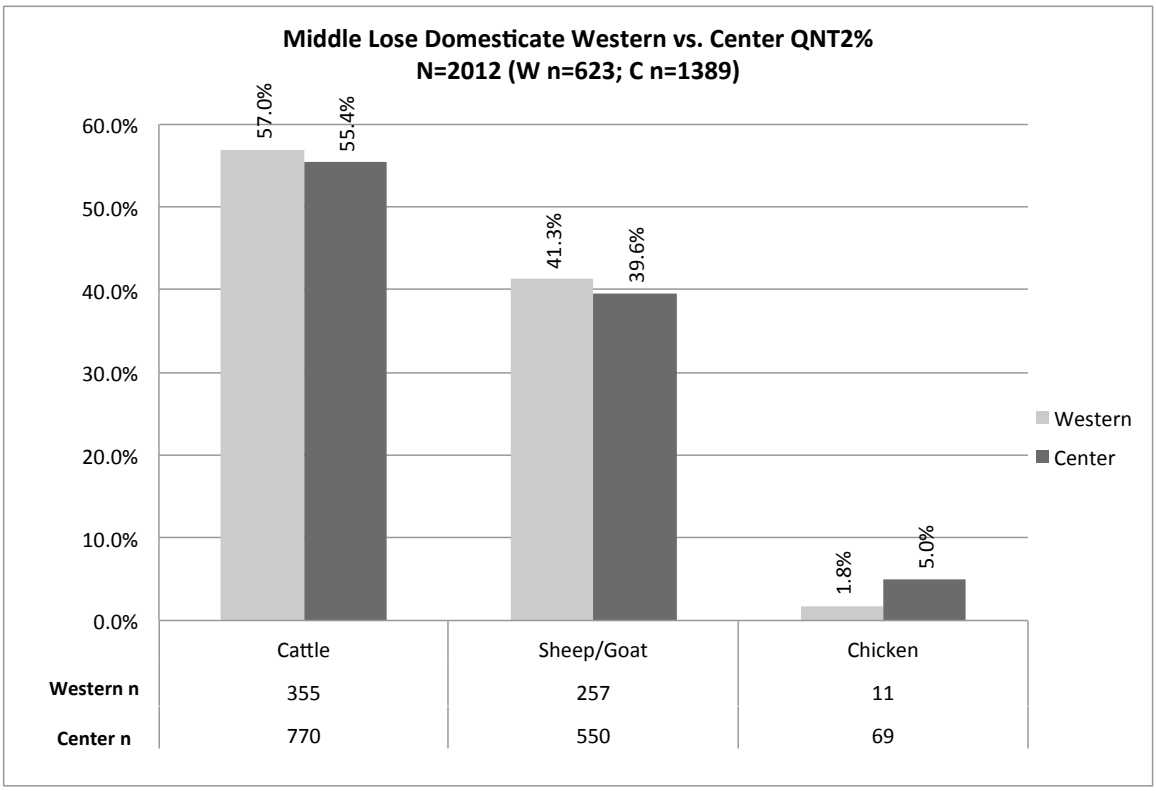


Figure 7-2. Middle Lose domesticates Western vs. Center QNT2%.

In contrast to the equitable domestic consumption pattern observed during the Early Lose, significant differences are observable in the Middle Lose period. Chicken does seem to be statistically more highly consumed in the Central precinct compared to the Western (C 5.0%, n=69; W 1.8%, n=11; X^2=10.7946; p=0.001018). The difference in cattle and small stock proportions is not significant. Cattle in the Western Precinct represent a slightly higher percentage of their respective assemblage compared to the Central precinct. This may be related to the much higher consumption of chickens in the Central precinct compared to the western, suggesting chickens held special significance

during the Middle Lose. The inhabitants of the Central Precinct seem to have had greater access to chickens during this time period.

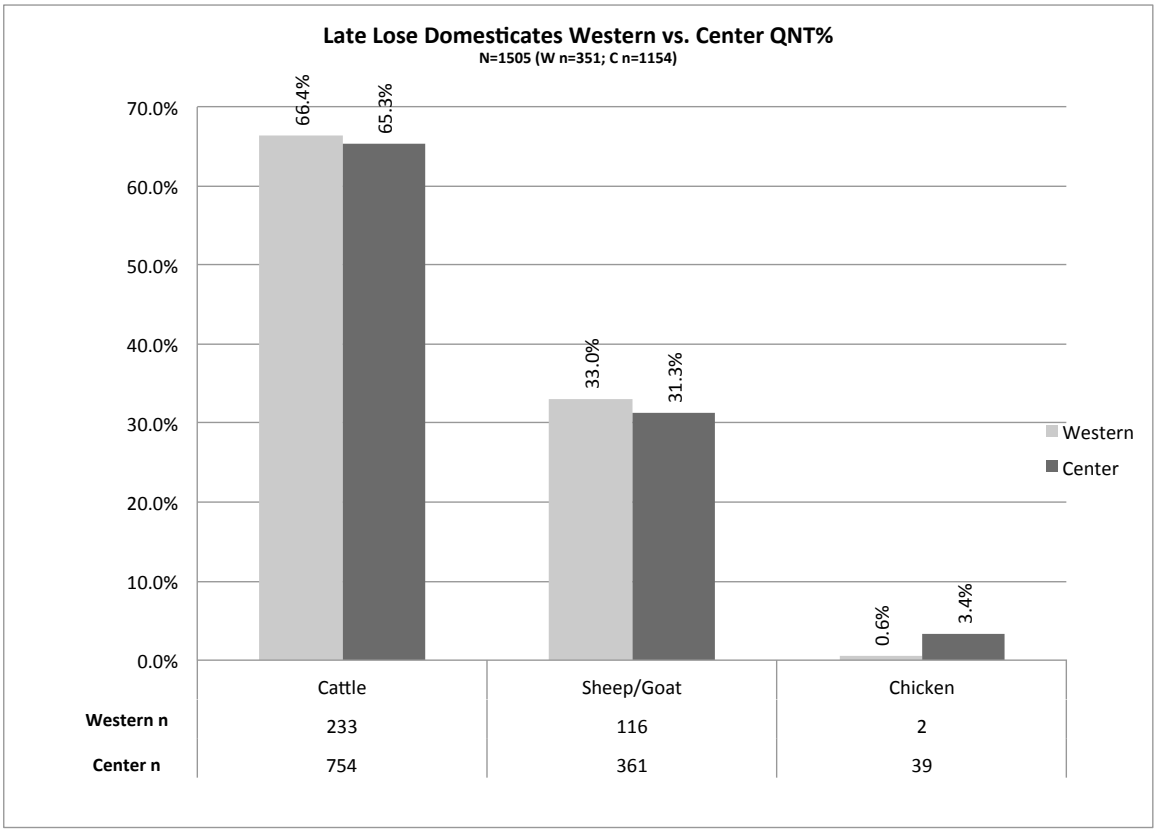


Figure 7-3. Late Lose Domesticates Western vs. Center QNT%

The consumption rate of cattle compared to small stock seems to have risen during the Late Lose period, with cattle now representing approximately 66% of the domestic assemblage, and small stock 32%. The pattern of elites and commoners consuming roughly equal proportions of beef and small stock has continued unabated. Elites in the Central precinct continue to consume significantly more chicken than commoners (X^2=8.2198; p=0.0041), suggesting that this bird was used in a socially significant way to delineate status differences.

ESTIMATING AGE OF SPECIMENS

Studies of modern animals have influenced archaeological estimates of age at death (O'Connor 2000). Ideally, data used for age estimates should be based on modern animals situated as close to the archaeological site under investigation as possible (Reitz and Wing 1999). This assumes that paleoenvironmental conditions resemble modern environmental conditions. Dental studies have been especially useful for developing a way to estimate the age of animals at death.

The age at death was estimated based on Voigt's (Voigt 1983) tooth eruption and wear research as well as known ages of epiphysis fusion. By examining which teeth have erupted and how much those teeth have worn down, archaeologists can estimate age at death. This is complicated by the presence of soft tissue in living or recently deceased animals that obscures teeth that have erupted from the bone, but are not yet fully visible above the gums. In an archaeological specimen, these teeth are visible, but in living mammals tooth eruption is taken to mean teeth that are visible above the gum line.

Cattle Age Profiles

While it is not possible to reliably analyze the sex ratio of domestic herds at Bosutswe, it is possible to construct age profiles of domestic animals. Age profiles may provide insight as to what the goals of animal husbandry were- meat or secondary products, such as milk or wool. (Payne 1973; Uerpmann 1973).

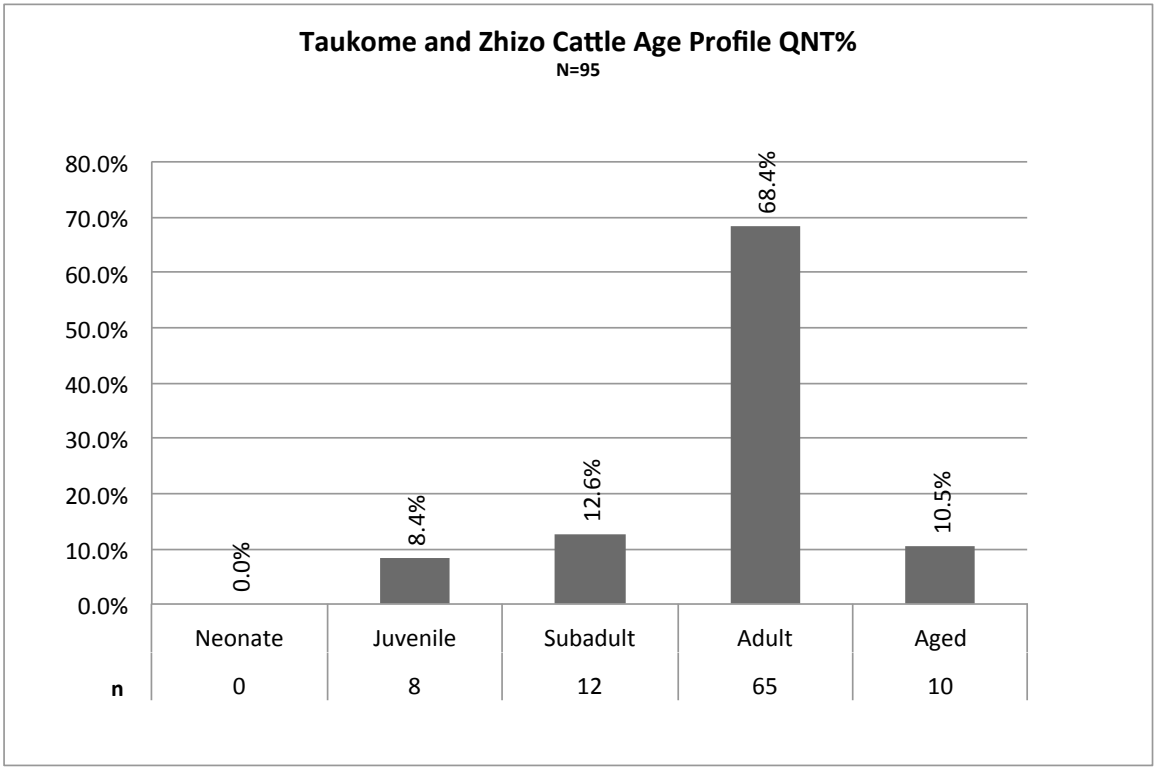


Figure 7-4. Taukome and Zhizo cattle age profile QNT%.

The cattle age profile during the Taukome and Zhizo, Early and Middle Toutswe, and the Late Toutswe follows the expected profile of a milk producing economy: The majority (68.4%, n=65) of identified specimens come from adult specimens, while other age groups are not as well represented in the archaeological assemblage. Few specimens from the Bosutswe assemblage could be sexed, so the sex composition of domestic herds is unknown. This age profile suggests that the people of Bosutswe were focused on herd growth rather than herd maintenance (Denbow and Cambell 1986). While some male domesticates were allowed to mature in order to become breeders, most males would have been slaughtered before reaching sexual maturity. Most females would be allowed to mature in order to provide milk, as well as more cattle. Cattle serve as economic wealth and social capital in southern Africa and it seems as if the inhabitants of Bosutswe

were invested in increasing their numbers from the time of the earliest Iron Age habitation of Botswana.

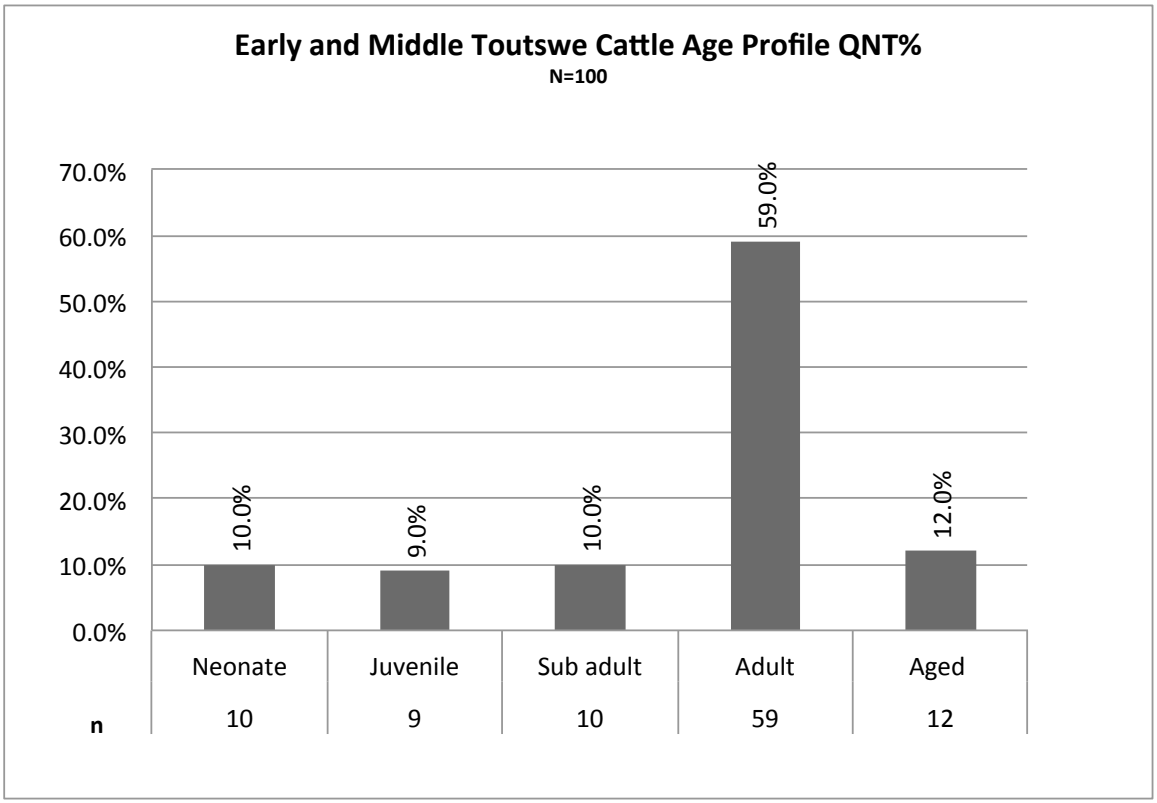


Figure 7-5. Early and Middle Toutswe Cattle Age Profile QNT%.

As shown in Figure 7-5, the cattle age profile during the Early and Middle Toutswe continues to suggest that adult cattle were preferred by the inhabitants of Bosutswe. The percentage of adult specimens has declined somewhat to 59.0% (n=59) from 68.4%(n=65) during the Taukome and Zhizo period, and Neonates are now present (10.0%, n=10), but the overall age profile continues to focus on adult cattle for breeding.

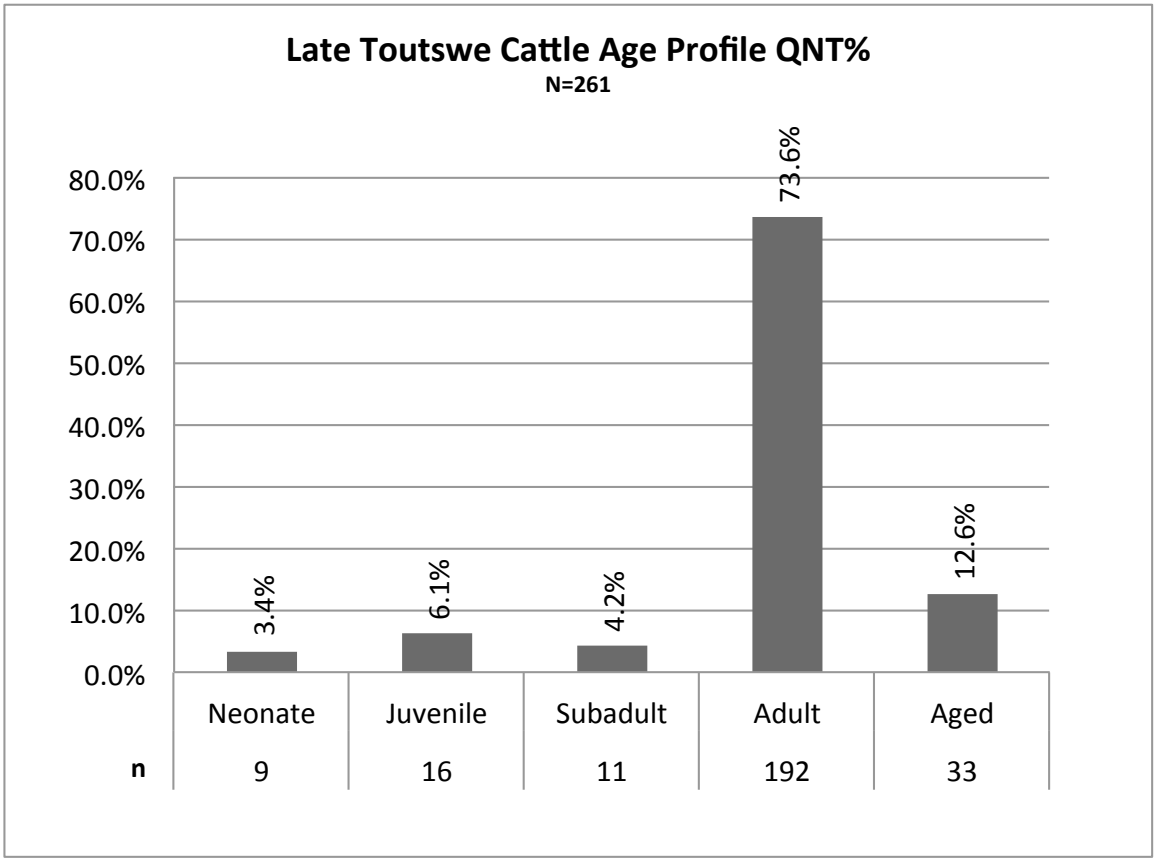


Figure 7-6. Late Toutswe Cattle Age Profile QNT%.

Evidence from the Late Toutswe period (Figure 7-6) continues to indicate that adult cattle were preferred above other age classes, with adult animals forming 73.6% of the sample population. Non-adult animals make up only a small percentage (13.7%, n=36), which is slightly more than aged animals, which make op 12.6% (n=33) of the assemblage. This age profile strongly suggests that the Late Toutswe people concentrated their herding efforts on adult cattle for breeding, and, possibly for milk as well as meat production.

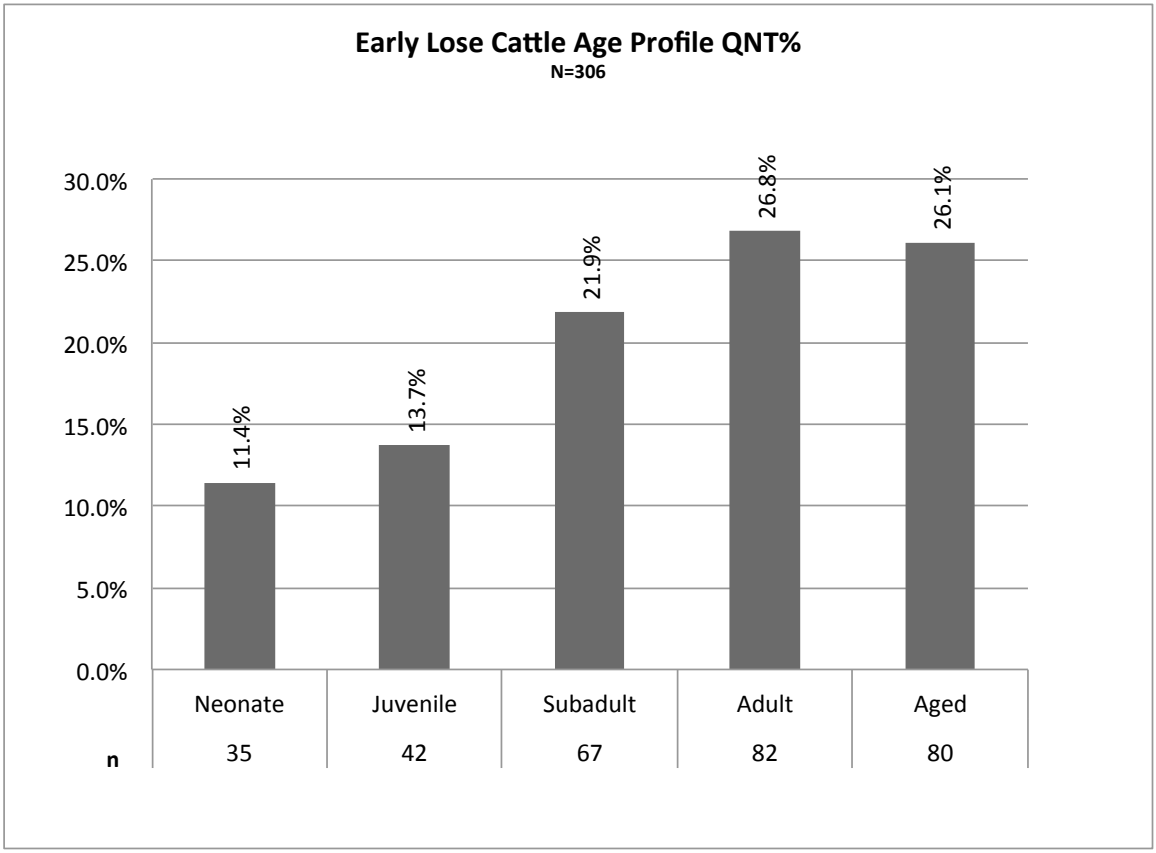


Figure 7-7. Early Lose Cattle Age Profile QNT%.

When the aggregate cattle age profile of the Early Lose is examined as in Figure 7-7, a dramatic change is apparent: the age profile is no longer heavily concentrated in the adult age class; instead the age profile is tilted towards subadult and aged categories. The non-adult portion of the assemblage is now 47% (n= 144) of the population. The aged portion of the assemblage is now 26.1% (n=80). This suggests a substantial shift in the goals of cattle herding and noticeable change in dietary habits; the consumption of young animals is linked to meat rather than milk production. Some animals were allowed to reach old age, but many were consumed young, because the Bosutswe elites were able to extract these animals from others. Cattle in southern Africa are used to pay fines (Reid 1996; Schapera 1978; Schapera 1938, 1984) and in the past were extracted as tribute paid to rulers. This age profile suggests that the inhabitants of Bosutswe were powerful

enough to engage in these extractive practices, obtaining cattle from commoners at Bosutswe and/or from people living in the surrounding area.

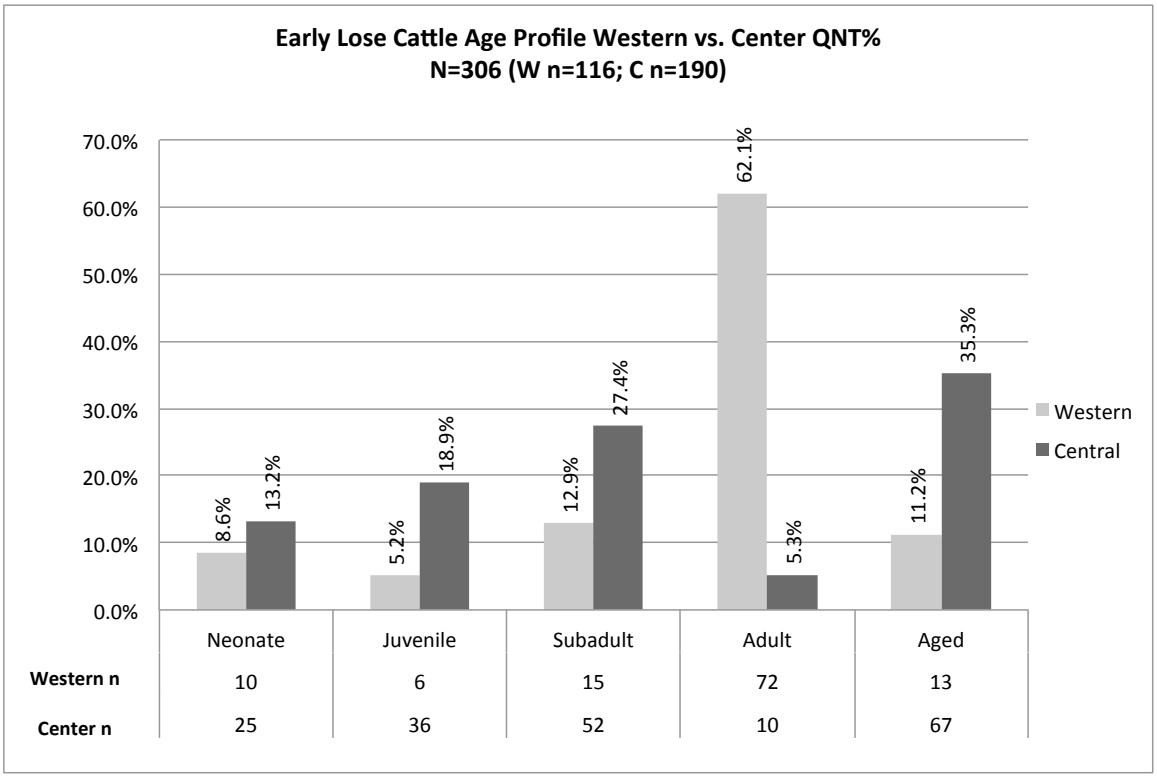


Figure 7-8. Early Lose Cattle age profile Western vs. Center QNT%.

When specimens are divided according to provenience as illustrated in Figure 7-8, a profound difference is observable in the cattle age profiles of the Western and the Central precinct. The age profile of the cattle in the Western precinct has remain unchanged compared to earlier times, indicating stasis in terms of an economic strategy geared towards increasing the number of cattle, but the age profile of cattle in the Central departed from this pattern radically. Adult cattle are now the least numerous, ranking even below neonates (5.3% adult (n=10), verses 8.6% neonate (n=25). Aged cattle are the most prevalent at 35.3% (n=67) and immature cattle of various ages are all surprisingly well represented.

The age profile in the Central precinct may suggest that rather than focusing on the milk-producing and reproductive capabilities of cattle, inhabitants of this precinct were able to focus on conspicuous consumption rather than production. The Central inhabitants were able to consume what others produced. Diary products could have been obtained from their female adult and aged animals, but neonate, juvenile, and subadult cattle would have only been useful in terms of meat and leather products. In contrast, the commoners in the Western precinct continued the herding goals of earlier time periods, focusing on increasing the number of their breeding stock. This suggests substantial culinary and economic differences between elites and commoners at Bosutswe that can be related to differences in status and differential access to material culture.

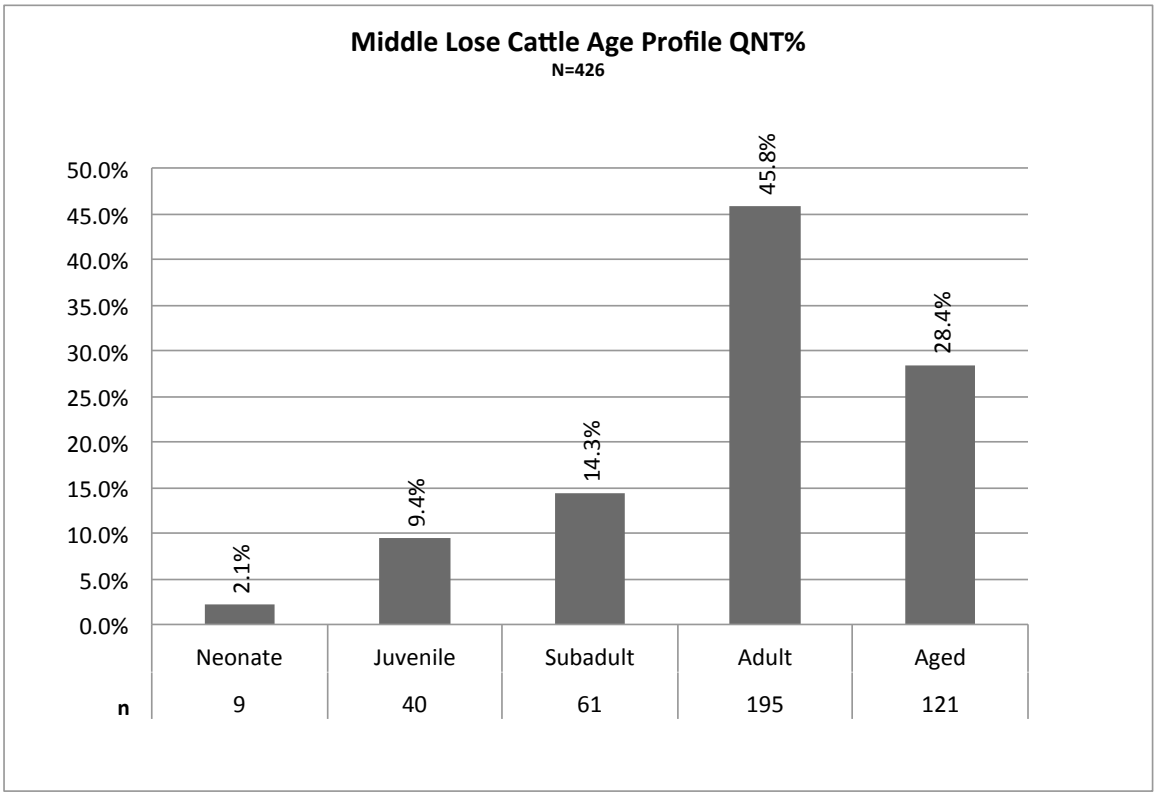


Figure 7-9. Middle Lose Cattle age profile QNT2%.

The aggregate cattle age profile during the Middle Lose (Figure 7-9) is not as highly tilted towards subadult cattle (14.3%, n=61) compared to the Early Lose, when

sub-adult cattle form 21.9% (n=67) of the assemblage. The total non-adult proportion of the assemblage is 25.8% (n=110). Adult cattle seem top have increased in importance (45.8%, n=195, compared to 26.8%, n=82 during the Early Lose). Aged cattle continue to be an important component of the age profile, remaining largely unchanged at 28.4% (n=121), compared to 26.1% (n=80) during the Early Lose. The Bosutswe elite were able to consume beef with little concern for the negative effects that slaughtering cattle would have on the reproductive capabilities of the herds, because they had the ability to obtain new cattle not through natural reproduction of existing animals, but through extracting animals from other people's herds.

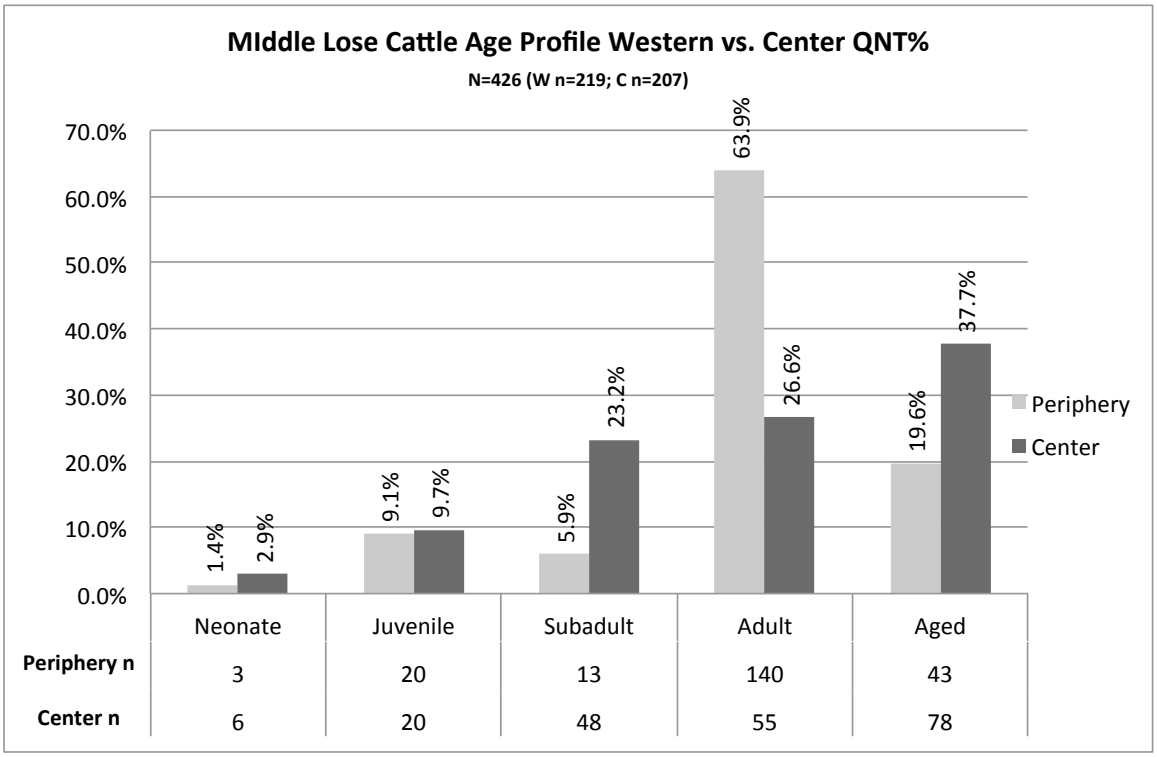


Figure 7-10. Middle Lose Cattle Age Profile Western vs. Center QNT%.

When the assemblage is divided according to provenience, it becomes apparent that the Western precinct has continued to follow the same pastoral strategy that has been practiced at Bosutswe since its initial occupation. Aged animals have increased to 19.6%

(n=43) a not inconsiderable increase compared to the Early Lose 11.2% (n=13) of the assemblage made up of aged cattle; but adult cattle have remained essentially unchanged, continuing to make up 68.9% (n=140) of the Western cattle assemblage that could be aged, compared to 62.1% (n=72) during the Early Lose period.

The Central precinct has experienced a weakening of the elite pastoral pattern focusing on non-adult cattle; instead of the comparatively minuscule proportion of the Center assemblage made up of adult animals during the Early Lose period (5.3%, n=10), adult animals have now risen in importance to comprise 26.6% (n=55) of the Central assemblage. This is nearly even with the proportion of the assemblage made up of juvenile specimens (23.2%, n=48), which is slightly smaller than the Early Lose central assemblage. Aged specimens continue to be the most numerous during the Middle Lose in the Central Precinct at 37.7% (n=78), very close to Center aged specimens during the Early Lose (35.3%, n=67).

These changes may suggest a weakening of the socio-political processes spurring the differential uses of cattle among the Central and Western precincts that were present starting in the Early Lose.

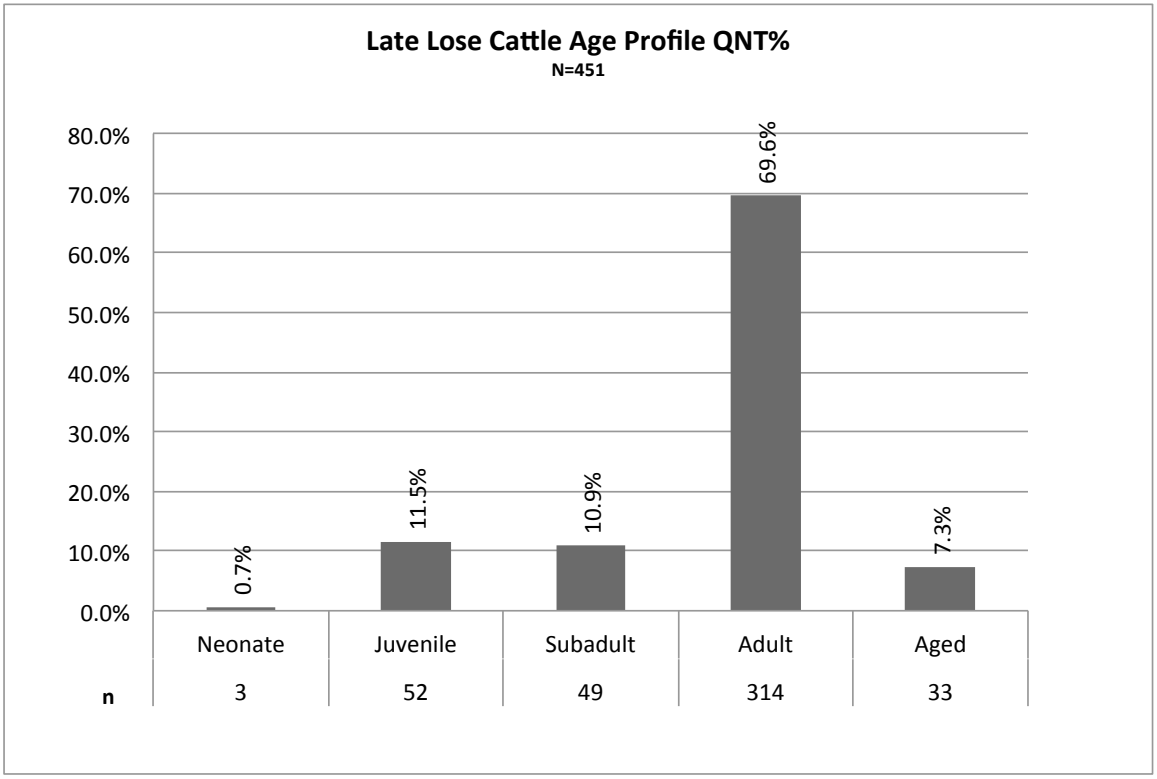


Figure 7-11. Late Lose Cattle Age Profile QNT%.

The aggregate depiction of the cattle age profile during the Late Lose (Figure 7-11) immediately suggests another change in the pastoral strategies practiced at Bosutswe; the overall profile is no longer tilted towards subadult, adult, and aged specimens; The profile is heavily dominated by adult specimens (69.6% (n=314), to the exclusion of other age groups. The Late Lose cattle age profile resembles those of the pre-Lose time periods, when herding strategies focused on the reproductive ability of cattle. The Bosutswe elites may have lost the ability to extract cattle from others.

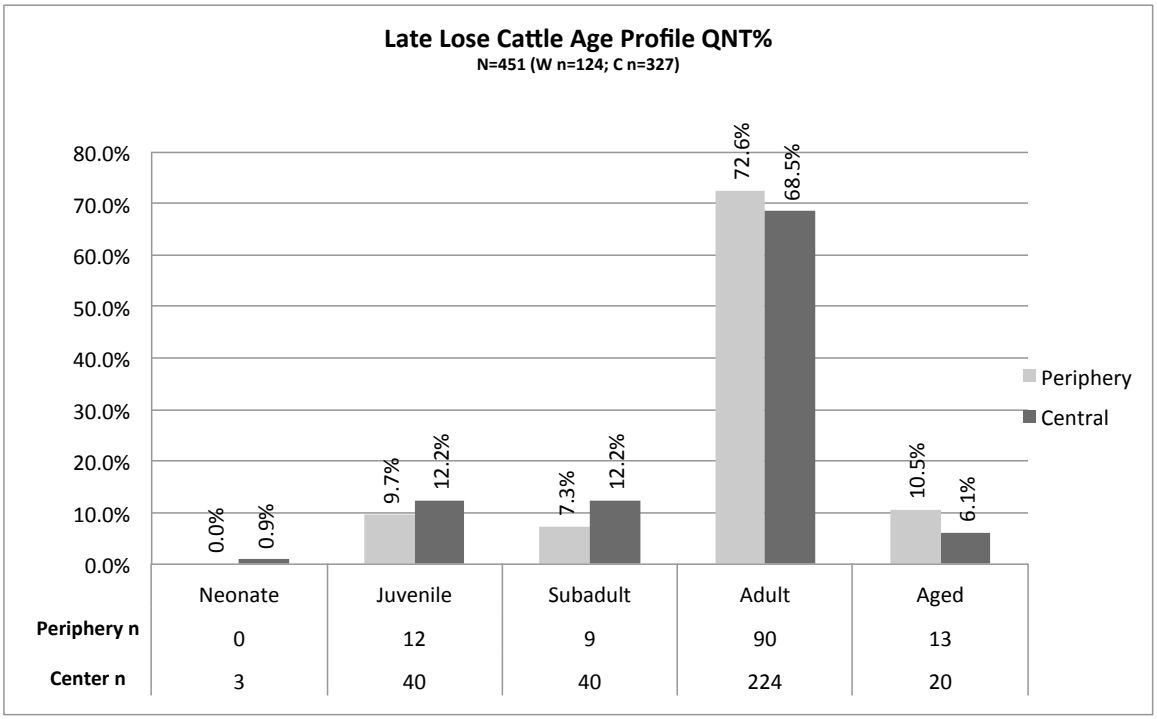


Figure 7-12. Late Lose Cattle Age Profile QNT2%.

The non-aggregate Late Lose cattle age profile validates suspicions concerning another change in cattle husbandry practices. The age profile of cattle has returned to pre-Lose pattern, focusing on adult cattle and their reproductive abilities. There are only minor differences in the proportion of age groups in the Central and Western precinct, and both precincts have chosen to focus on adult cattle.

Small stock

The age profiles of sheep and goats mirror that of cattle, although the differences between the Western and Central precincts are not as strong. During the Taukome/Zhizo and Toutswe period, age profiles indicate that adult small stock were strongly preferred, likely because they are able to reproduce and increase the size of herds. During the Early and Middle Lose, culling patterns of elites and commoners diverged. Elites consumed a greater proportion of non-adult animals, which they likely extracted from commoners, while commoners consumed a greater proportion of adult animals. Neither group

consumed a large number of aged animals; this may relate to the comparatively low status of sheep and goats compared to cattle.

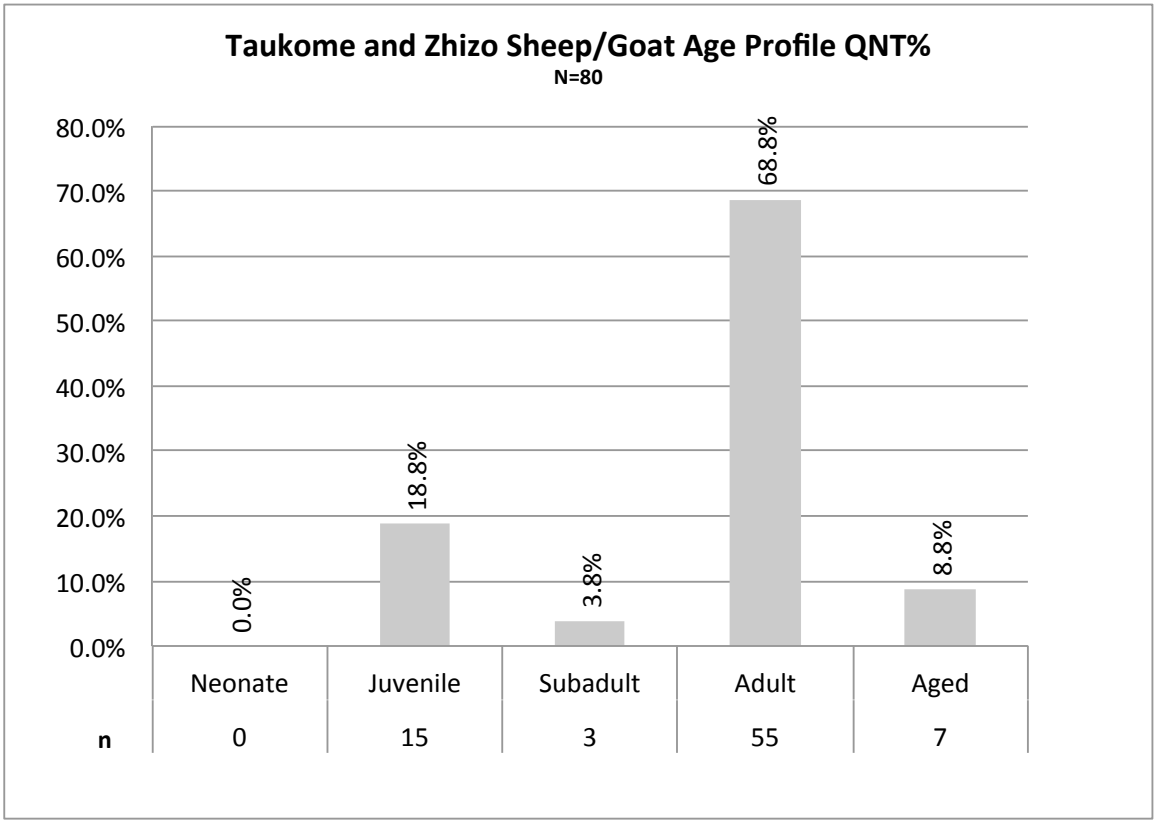


Figure 7-13. Taukome/Zhizo Sheep/Goat Age Profile QNT%.

As illustrated in Figure 7-13, the proportion of aged small stock is highest during the Taukome/Zhizo period at 8.8% (n=7). Because sheep and goats are much smaller than cattle, they are much easier to consume without the possibility of a large amount of meat going to waste. They also reach full size faster than cattle, so raising them to full size is not as long or as arduous process as raising cattle to full size is. Because they are less prestigious than cattle, slaughtering and eating small stock does not represent the same loss as slaughtering and eating a cow does.

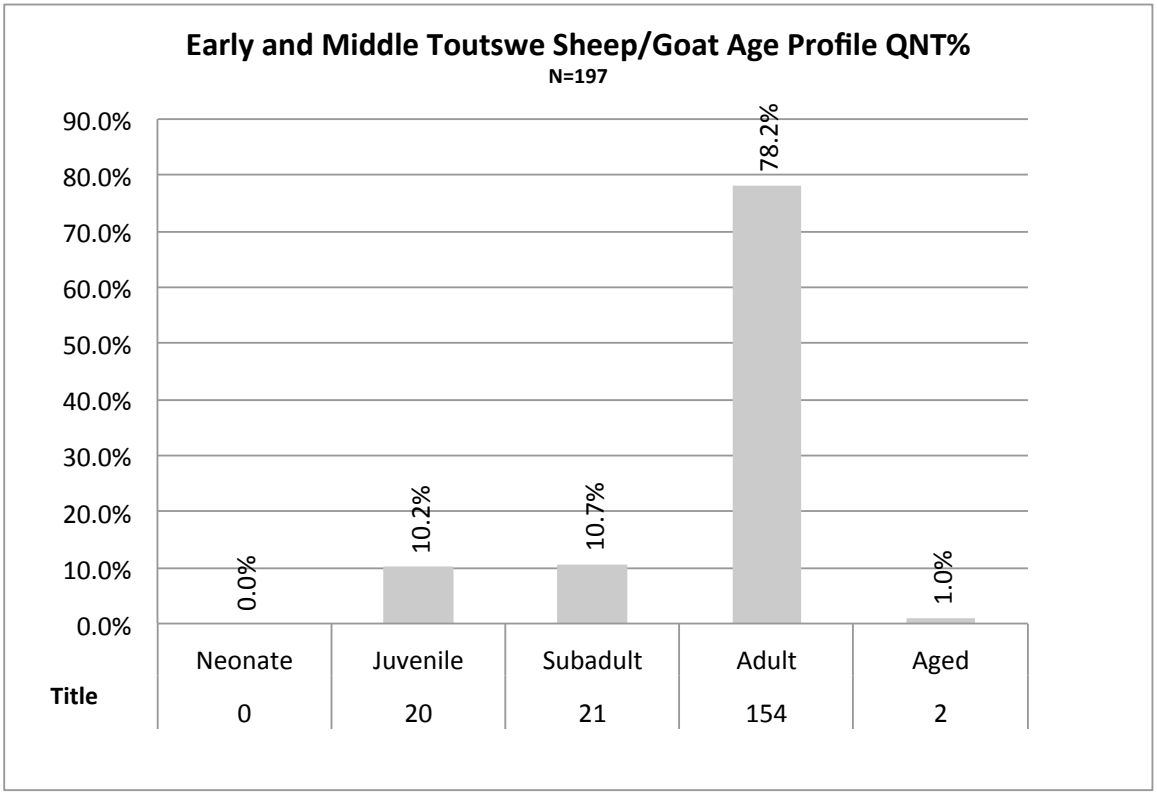


Figure 7-14. Early and Middle Toutswe sheep/goat age profile QNT%.

During the Early and Middle Toutswe (Figure 7-14), the percentage of aged animals has decreased to a negligible 1% (n=2). Adults continue to dominate the assemblage at 78.2% (n=154). Juvenile and subadult animals continue to be present. Neonates continue to be absent.

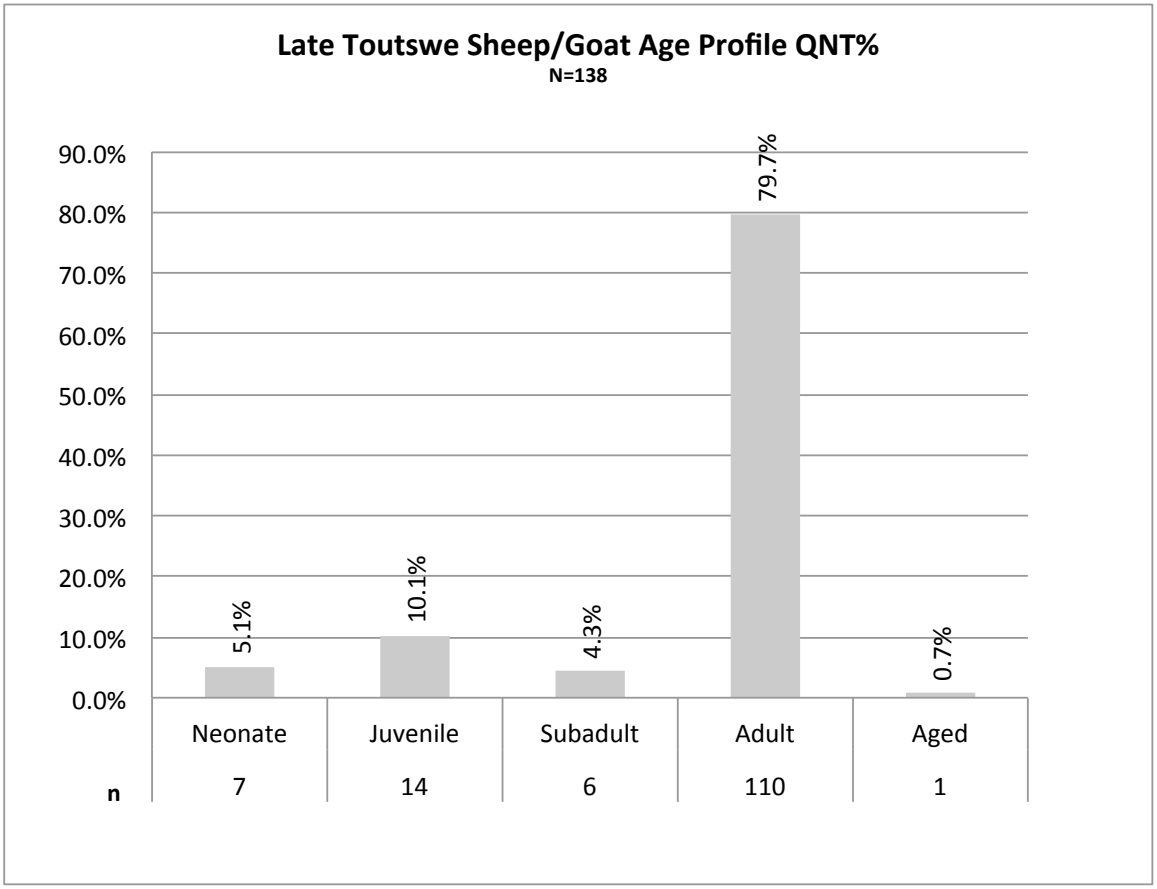


Figure 7-15. Late Toutswe sheep/goat age profile QNT%.

Neonate sheep and goats make their appearance during the Late Toutswe period (Figure 7-15). Adult small stock continue to dominate the assemblage at 79.7% (n=110). Aged animals were very few in number.

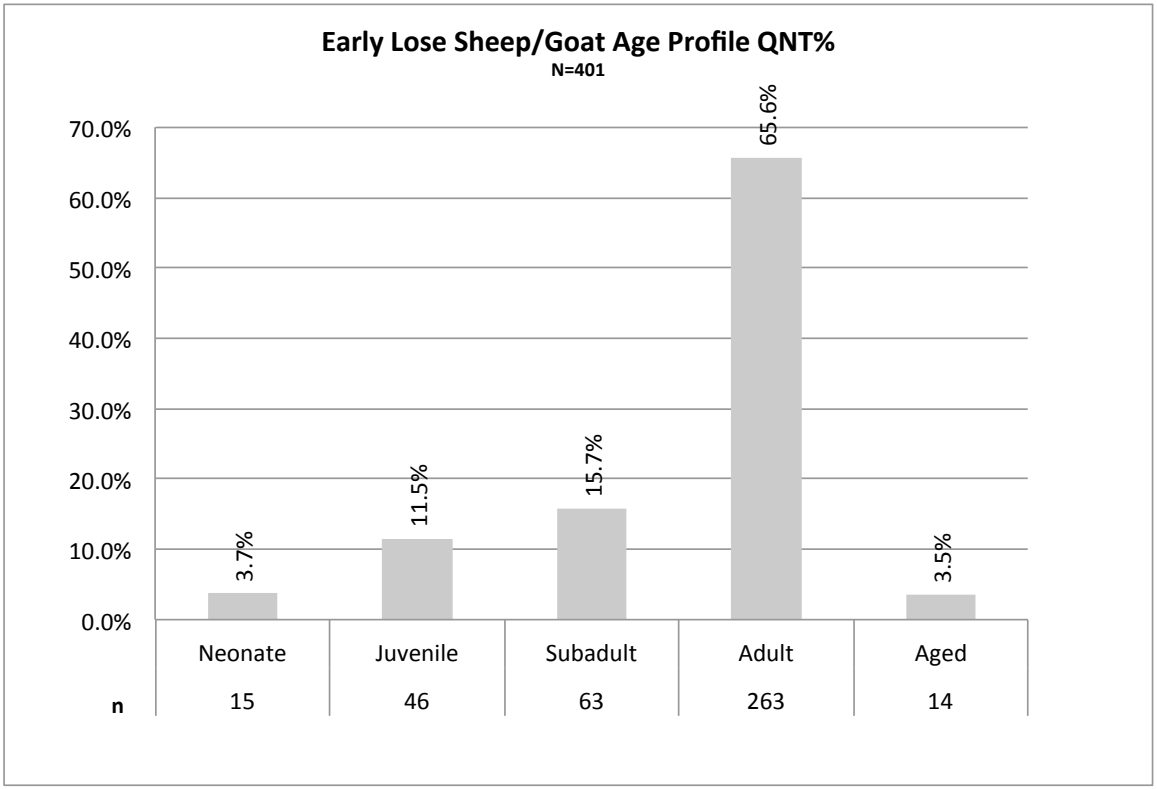


Figure 7-16. Early Lose sheep/goat age profile QNT%.

Like the cattle age profile, the small stock profile undergoes a transformation during the Early Lose period (Figure 7-16). Adult animals become less common, and it is apparent that non-adult and aged animals are slaughtered more often. Aged animals have decreased to 65.6%, compared to 79.7% during the Late Toutswe period. Subadult animals also show a significant change, up to 15.7% (n=63), compared to 4.3% (n=6) during the Late Toutswe period. Sheep and goats may have been used for their meat more often during the Early Lose period.

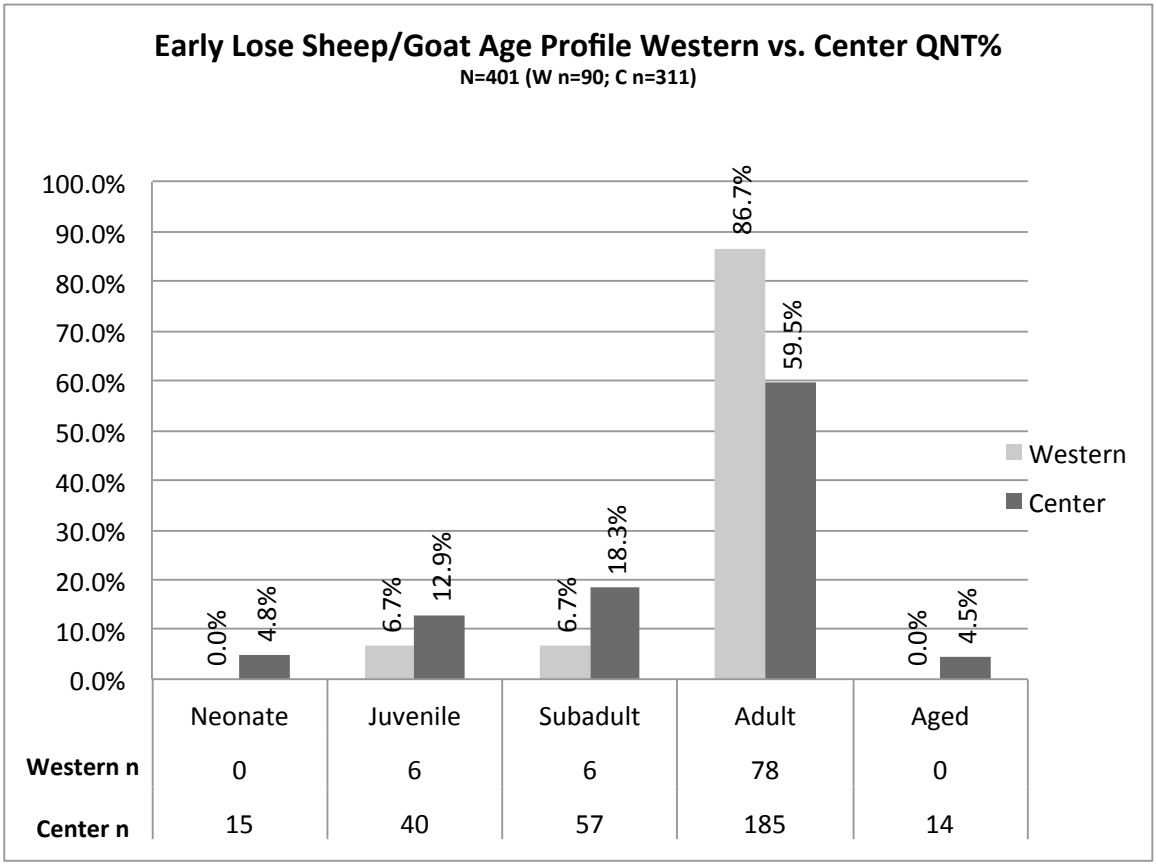


Figure 7-17. Early Lose Sheep/Goat Age Profile Western vs. Center QNT%.

It has been established that elites and commoners at Bosutswe consumed approximately equal proportions of cattle and small stock, but that they slaughtered their animals at different ages during the Early and Middle Lose periods. Elites in the Central precinct preferentially consumed young and aged animals, while commoners preferentially consumed more adult animals. These same phenomena are apparent in the small stock assemblage to a less profound degree (Figure 7.17). The only age category more prevalent in the diet of Western precinct inhabitants compared to Central precinct inhabitants is the adult category; Central inhabitants consumed a greater proportion of both juvenile and subadult small stock. Neonate and aged small stock were absent in the Western precinct, but present in the Central precinct.

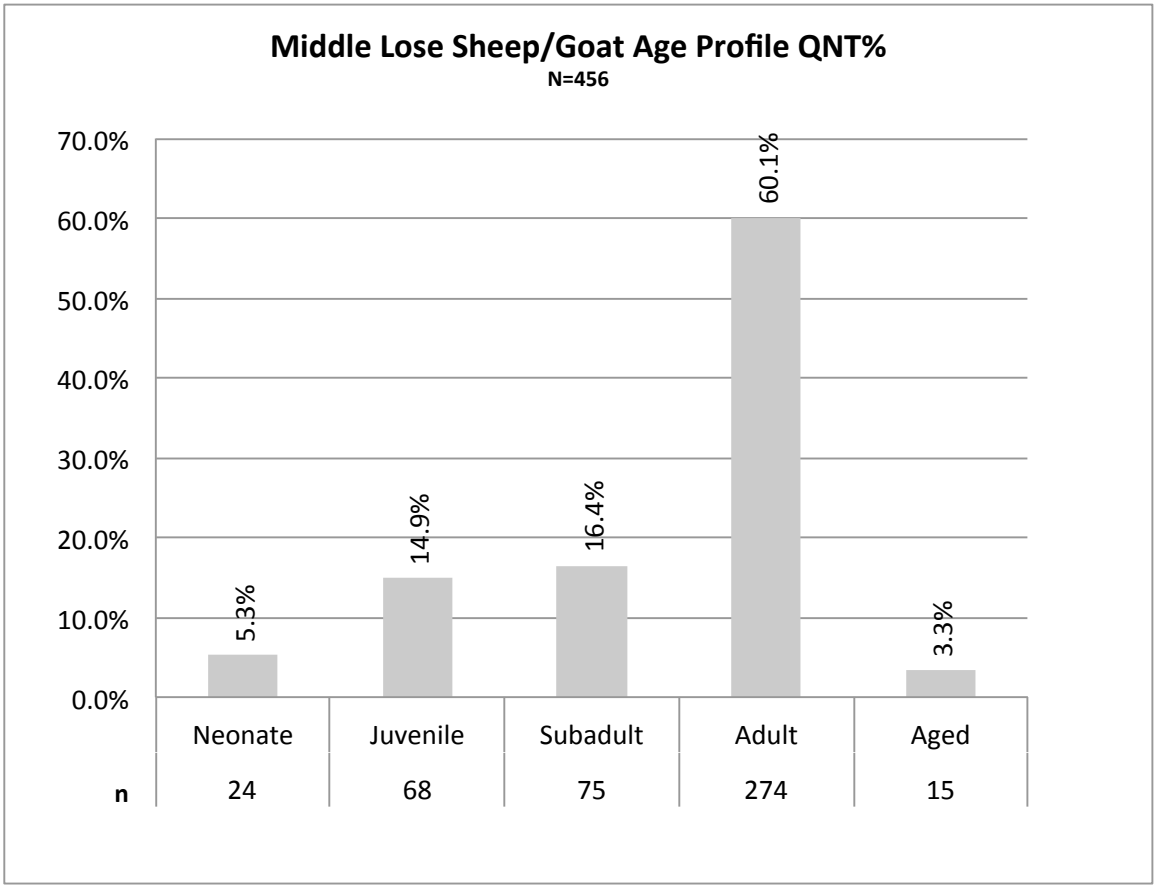


Figure 7-18. Middle Lose sheep/goat age profile QNT%.

The aggregate Middle Lose small stock assemblage (Figure 7-18) indicates continued presence of a variety of age categories. Adult sheep and goats have decreased further to 60.1% (n=274), down from 65.6% (n=263) during the Early Lose period. The percentage of aged animals has not changed a great amount. The percentage of non-adult animals has increased slightly. The aggregate age profile seems to indicate a continuation of processes that started in the Early Lose.

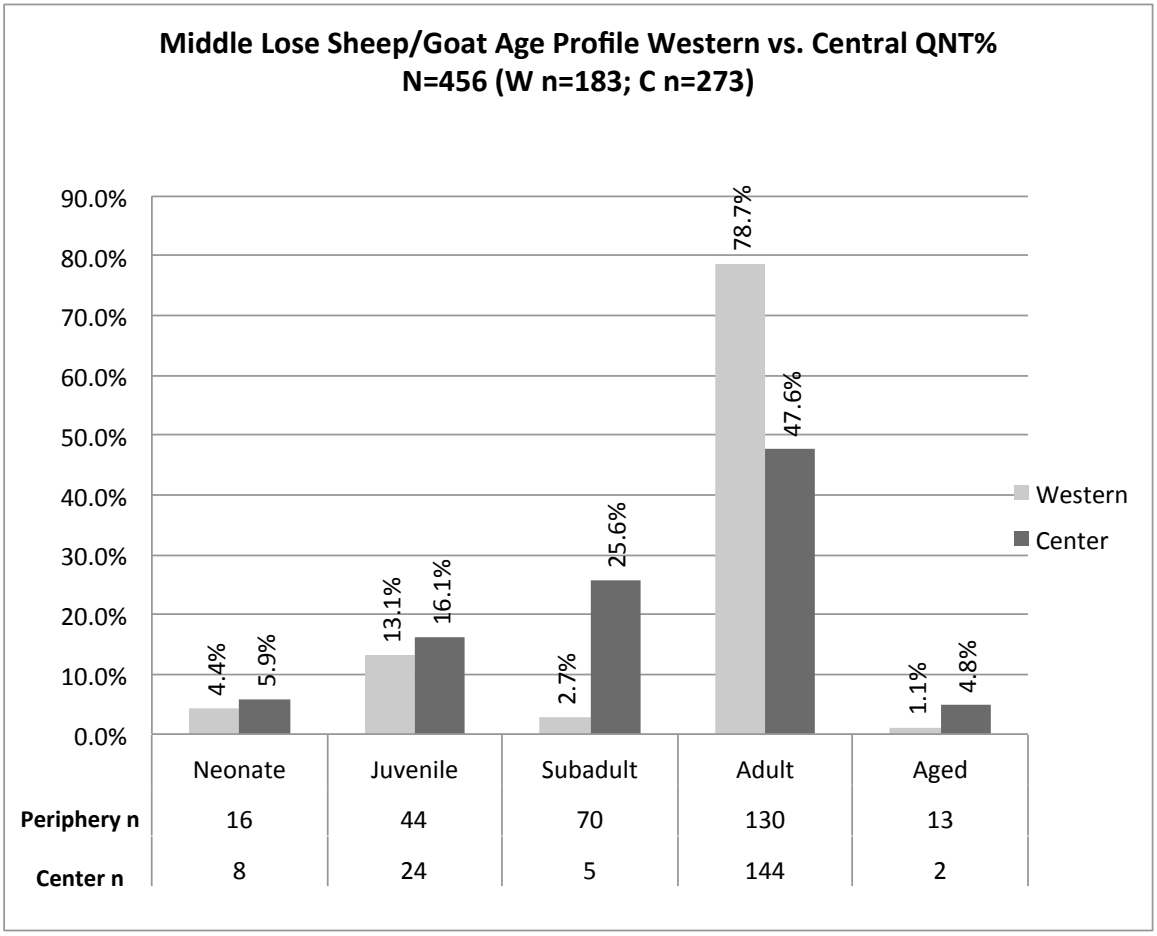


Figure 7-19. Middle Lose Sheep/Goat Age Profile Western vs. Central QNT%.

As illustrated in Figure 7-19, commoners continued to consume comparatively more adult small stock than elites during the Middle Lose. The consumption rates of neonates and juveniles is nearly equal in the two precincts, but there is a significant difference ($\chi 2 = 20.0725, ; p =< 0.0001$) in the rate of subadult small stock consumption; only 2.7% (n=5) of the Western small stock assemblage were identified as subadults, whole 25.6% (n=70) of the Central small stock assemblage were identified as subadults. The Central precinct also yielded a greater percentage of aged animals (C 14.8%, n=12; W 1.1%, n=2). This suggests that the inhabitants of the Central precinct consumed a greater proportion of subadult animals; since these animals were unable to reproduce, elites may have chosen to concentrate on meat consumption rather then on

animal and milk production. The elites were able to obtain animals, especially young animals, from others, but commoners could not. For this reason commoners followed a herding strategy designed to increase the size of their herds.

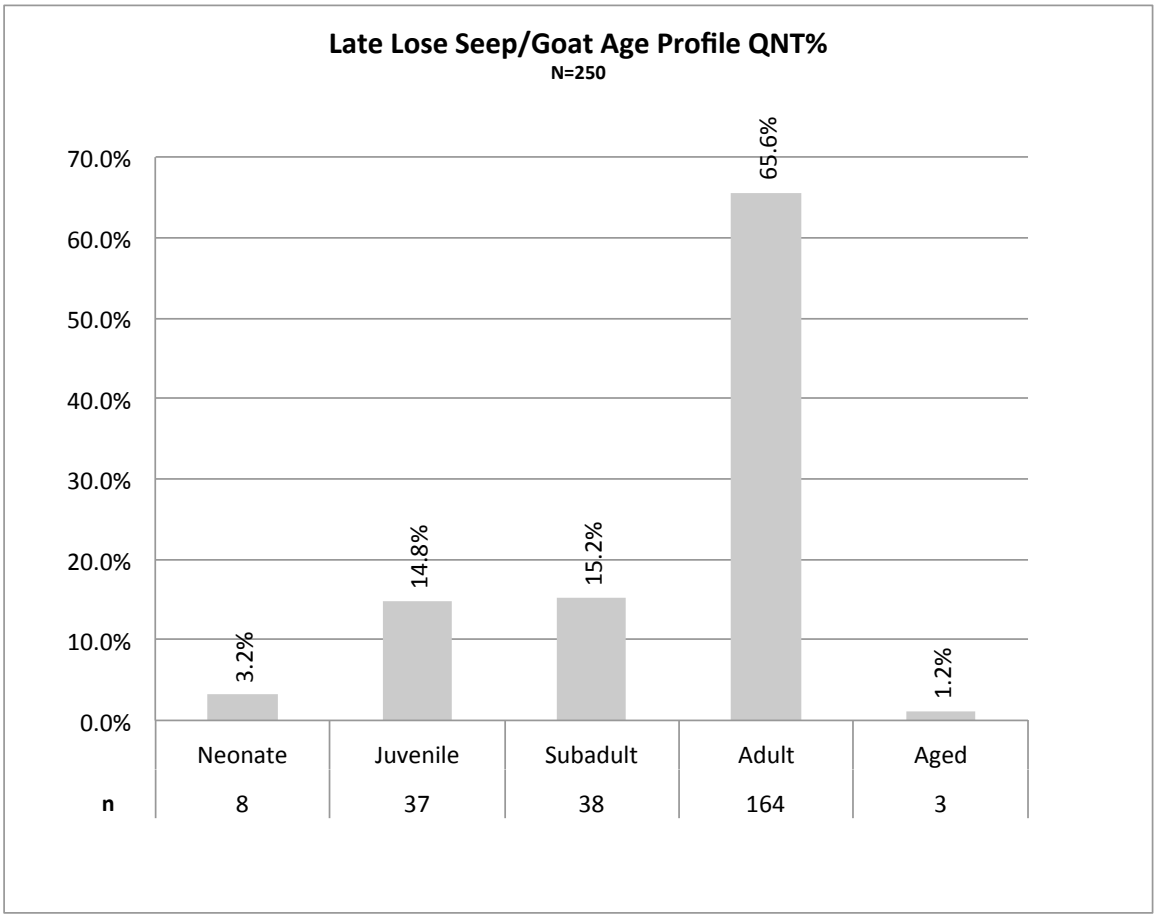


Figure 7-20. Late Lose Sheep/Goat Age Profile QNT%.

As illustrated in Figure 7-20, the aggregate small stock age profile resembles that of the Early and Middle Lose. Adult sheep and goats constitute the majority (65.6, n=164) of the assemblage. Juvenile and subadult specimens are nearly and well represented at 14.8% (n=37) and 15.2% (n=15.2) respectively. Neonates and aged specimens are less well represented at 3.2% (n=8) and 1.3% (n=3). The increased presence of young animals, perhaps males, may indicate that herd sizes were large enough to allow the consistent slaughtering of certain numbers of animals.

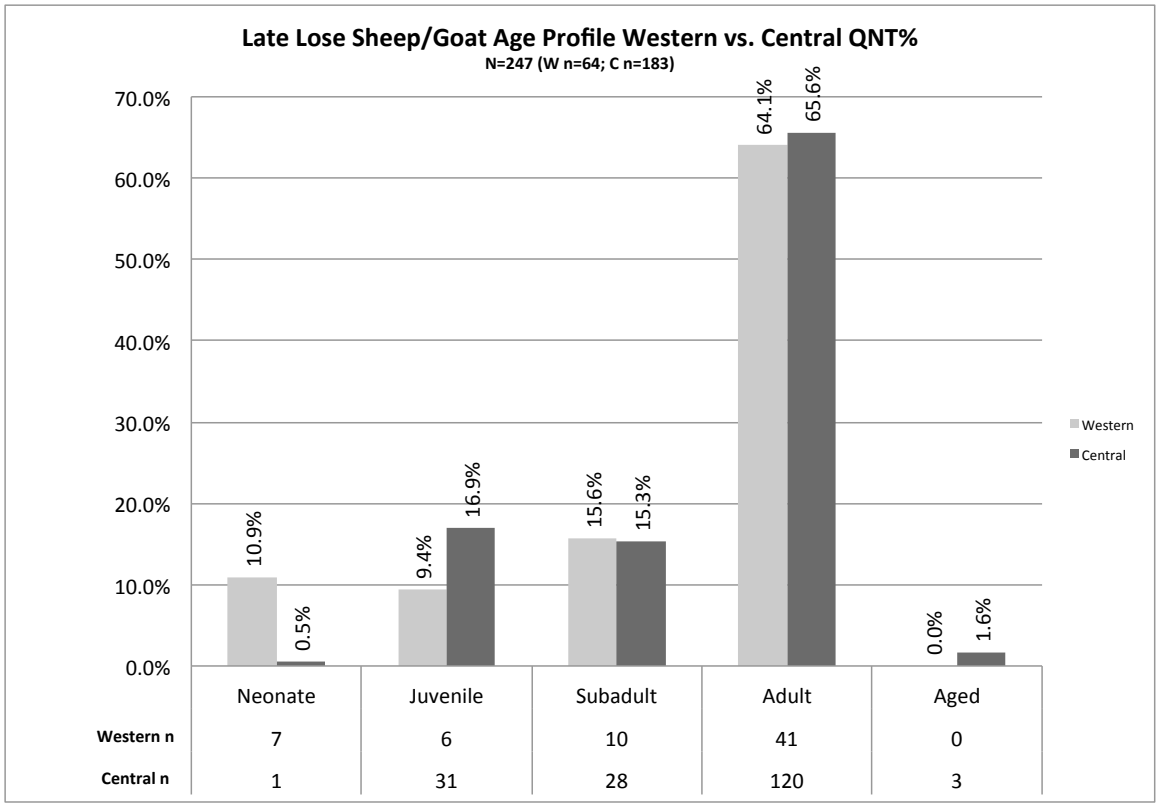


Figure 7-21. Late Lose Sheep/Goat Age Profile QNT%.

During the Late Lose, the differential age category consumption patterns of the Western and the Central precinct have somewhat normalized. The subadult and adult consumption rates are nearly equal in the Western and Central precincts, and it is apparent that both precincts chose to concentrate on adult animals. Elites have increased their consumption of adult animals. Neonates are surprisingly well represented in the Western precinct (10.9%, n=7).

Discussion: meat, milk and mafisa

Age profiles seem to indicate that the commoners of Bosutswe followed a herding strategy geared towards breeding during all time periods. In contrast, the elites of Bosutswe departed significantly from this pattern during the Early and Middle Lose periods, when their consumption of domesticates was heavily tilted towards the

consumption of non-adult and aged animals. During the Late Lose, elites of Bosutswe resumed a milk-and-breeding herding strategy.

While overall consumption rates of cattle compared to small stock among commoners and elites were about equal, elites expressed their different, separate identity through the consumption of special food- non-prime breeding age cattle. In a society where the provisioning of food through butchering and cooking was publically visible, this consumption of cattle obtained from others served as a strong expression of status and power.

Southern African elites at other sites are known to have developed domestic animal exploitation strategies that allow them to display their elite status and power. The faunal assemblage of uMungundlovu, the headquarters of the Zulu king Dingane, consisted almost entirely of older cattle. The few remains of young cattle were limited to the royal residence (Plug and Roodt 1990). The meat from these old cattle was boiled, and was known to be tough. The elites of Great Zimbabwe preferentially consumed young cattle that had achieved full meat weight and were brought to the site from elsewhere for consumption; more mature animals may have been slaughtered for the king's followers who did not reside in the kings's residence (Reid 1996).

Cattle are economic, political and social wealth in material form. They are used in bride payments to compensate the woman's family for her lost labor, and are also used to pay fees. In modern times and the recent past, cattle owners used others to watch their cattle, compensating them with access to milk and one or more animals as payment. This herding strategy is known as *mafisa*. In this system, less wealthy people benefit from the cattle's labor (plowing and pulling loads) and milk, and eventually gained direct access to milk by being gifted a calf, and or adult cattle (Amanze 2002; Schapera 1984), generating mutual bonds and obligation in different sectors of society (Mauss 1967). Cattle owners are able to own more cattle and are able to minimize risk by spreading their cattle out in the landscape instead of keeping them together in one place. Hitchcock (1978) argues that

patrons often manipulate the system by gifting their clients with male rather than female cattle, thus denying them access to the more advantageous reproductive and milk producing capabilities of female cows.

The strong differences in cattle age profiles during the Early and Middle Lose indicate that Bosutswe elites were able to exercise power over others and obtain cattle from them, rather only having access to their own hers. During the Late Lose, elites no longer had the ability to extract domestic animals from others, and had to focus on the reproductive capacity of their own herds.

It seems likely that the *mafisa* system, or a *mafisa*-like system, and the unequal access to material goods that it entails, developed by at least the Early Lose period. This would have allowed elites a way to maintain and increase their cattle herds. The promise of gaining cattle and becoming elite themselves may have given commoners a reason to acquiesce to the increasingly hierarchical economic and social situation at Bosutswe.

Chapter 8: Culinary Archaeology and the Cuisine of Botswana

"Food …has the potential, because of its abundant variations, to mirror the complexity of the human relationships that form the foundation of identity."

- German 2011: 141

Interest in the social and cultural importance of food, cooking, and eating increased during the 1970's (Messer, et al. 2008). Levi-Strauss's *The Raw and the Cooked* (1964) and *The Culinary Triangle* (1968) helped to increase the prominence of food in academia (Messer, et al. 2008; Schutkowski 2008). Food preparation and consumption can also be pleasurable and rewarding, but is also imbued with social and cultural meanings (Rozin 2008; Schutkowski 2008). What food choices we make and how we chose to prepare and serve our meals and snacks are actions that are filled with meaningful signals rooted in current social and economic circumstances and future aspirations, and can also signal our history or background. For example, I am a vegetarian who eats dairy and eggs. This signifies an interest in health and animal welfare, but also that I do not want to make food choices that I consider to be overly restricted and laborious. It also provides me a way to avoid being labeled a picky eater who cannot eat out at restaurants or at friend's houses; whether this self-perception of not being a picky eater carries over to others' perceptions is debatable. Ovo-lacto vegetarianism does remove the self from the direct need to kill and consume animals- but since egg-laying chickens and milk cows enter the food system in one way or another after their productivity declines, it still indirectly results in animal death.

What is edible and what is not edible cannot be assumed out of hand, which would project current beliefs onto the people of the past (Reitz and Wing 1999). Today, many middle-class white Americans avoid organ meat, referring to it as "offal" (Mennell 1996). Food companies more delicately refer to it as "variety meat". Most types of offal are treated by middle class white Americans as unfit for human consumption, although it can be used for pet food, or

disguised in hot dogs. In modern Botswana, nearly every part of the animal is used when an animal is slaughtered (Denbow and Thebe 2006), and muscle meat is not necessarily prized above organ meat (Grivetti 1976). Archaeolozoology is limited to studying the consumption of muscle meat through the study of body part distributions.

One can choose certain foods for reasons other than an actual liking for them (Rozin 2008). Ideational consumption or rejection, where food is consumed or rejected for reasons having to do with its origin or nature, is a uniquely human consumption pattern (Rosin 2008). Many Americans consume black-eyed peas and greens on New Year's Day in order to have luck and prosperity in the new year, regardless of actual liking of them. Likewise, it is unwise to unthinkingly assume that the most widely consumed food is the most preferred food; cost and availability are major factors in what is eaten (Counihan 2008).

CULINARY PREFERENCES IN MODERN BOTSWANA

Goody (1982) has written that Africa does not have an *haute* cuisine in the sense that Europe or other regions do. He emphasizes that for the most part, women are charged with the responsibility of cooking at home and at court, so that court cooking is an extension of the home cooking carried out by women, rather than a specialized field practiced by men; this lessens the possibility for the development of an elaborate, distinctive cuisine.

In modern Botswana, women carry out nearly all of the cooking duties (Amanze 2002; Denbow and Thebe 2006; Grivetti 1976; Osseo-Asare 2005). Men may cook at the cattle post, where few women are available. Men may occasionally help out with domestic duties, but if a man helps out too often, he may face the ridicule of other men; people would be alarmed and worry that the women has now become the head of the household (Amanze 2002). Some women are starting to resent the unequal partitioning of household duties (Amanze 2002; Denbow and Thebe 2006; Suggs 1987), especially because more women are have busier schedules than in the past since they are employed outside of the home, and have better access to education.

Batswana have a specific set of expectations and rules about that what constitutes a proper meal and diet. There is an expectation that a meal is not a "real" meal without at least a little meat (Denbow and Thebe 2006); this perception of what constitutes a proper meal is prevalent enough to have entered popular culture about modern Botswana in Smith's "Ladies No. 1 Detective Agency" book series (Brown 2009).

Batswana are not unique in their love for meat. Many cultures value the role that meat plays in the diet; this regard for meat often exceeds the actual nutrition that meat provides, assuming a role of central cultural importance (Kent 1989; Russell 2012). The emphasis that Batswana place on meat was present by at least the mid to late 1800's (Cummings 1879). In modern Botswana, most meat is fried or boiled; roasting is only carried out on very informal occasions (Denbow and Thebe 2006).

Currently, the common meal structure in Botswana consists mainly of stiff porridge, generally made from corn or sorghum, accompanied by "soups," such as vegetable-vased chakalaka, and ideally some meat. Americans perceive these soups as a relish or side dish (personal experience) that add additional flavor and nutrients to meals. Dietary monotony can be avoided through variations in texture and ingredients when making porridge (Grivetti 1976).

WHAT TYPE OF MEAT?

Sheep have higher meat yields than goats, but goats have a higher reproductive capacity than sheep (O'Connor 2000; Zeder 1991). In modern Botswana, goats and sheep are slaughtered more frequently that cattle, because they have lower meat yields than cattle, which is helpful when one cannot access a large freezer or refrigerator. Chickens are appreciated for the same reasons. Free-range village chickens are regarded as better tasting and chewier than commercially raised chickens; they are also more expensive (Denbow and Thebe 2006). There is a marked preference for chewy meat among many Batswana (Denbow, personal communication).

Beef is highly preferred by modern Batswana (Brown 2009; Denbow and Thebe 2006), but cattle are large animals, so meat storage in the absence of refrigeration presents a problem. Distributing the meat to relatives and friends helps solve this problem while reinforcing social ties, as does drying to meat into *biltong* or *segwapa* by cutting it into thin strips, coating it with salt and perhaps spices, then drying it in the sun. Cape buffalo are said to produce the best biltong, not cattle (Denbow and Thebe 2006), so beef is not seen as the best meat for every food item.

Milk and milk products like soured milk (*madila*) are also an important part of the Batswana diet (Hitchcock 1978; Grivetti 1976; Denbow and Thebe 2006), but may have only been available seasonally. Grivetti (1981) writes that blood used to be consumed among the Tswana, but Mosothwane (2010) argues that blood was not consumed in the past, at least not during the Early Iron Age.

DIFFERENTIAL ACCESS TO RESOURCES, AND THE SOCIAL SIGNIFICANCE OF SHARING

Differential access to types of resources, or to amount of resources, seems to be a fundamental aspect of human society and a basic marker of social status (Ames 2008). Directly or indirectly controlling or manipulating access to food, one of the most necessary resources, is one of the ways that these inequalities, differences, and commonalities are expressed and strengthened (Goody 1982; Crabtree 1990; Counihan 2008). These different eating patterns can be identified through studies of the stable isotopes of human remains (Larsen 2000; Mosothwane 2004, 2005; Steckel 2008; Steyne 1997). Even if nutritional levels as assessed through archaeological methods are equal among different classes or categories within a particular society, some nutritionally equivalent foods may be more highly valued than others, leading to increased possibilities for identity display and formation through the consumption of certain foods (Schutkowski 2008). It has been shown that elites and commoners consumed generally equal proportions of cattle to small stock, but elites had a distinctly different relationship with domestic animals during the Early and Middle Lose, and were able to obtain animals from others

during this time period, instead of having to consume only animals from their own herds. Alternatively, they may have been drawing animals from a common herd. Commoners consumed a greater amount of wild animals compared to elites.

Food sharing has been used to create or reaffirm community ties (Schutkowski 2008), and also to create or ensure indebtedness (Couniahn 2000). Elites can choose to consume luxury foods in order to express inequality and social distance (Grant 2002). In modern Botswana, there is a very strong emphasis on the importance of sharing as a way to strengthen and reaffirm community and family ties; it is expected that even small things will be shared among relatives. There is a saying that "a person is a person because of [the help] of others" ("*motho ke motho ka batho*") (Denbow and Thebe 2006 :114. Setiloane (Setiloane 1976) indicates that the daily ritual of a mother leaving some food in the pot from the evening meal overnight for *badimo* (the ancestors) to find helps impress the importance of *badimo* upon children; if visitors happen to come unexpectedly, they are served this food, since feeding hungry visitors also feeds *badimo*. The strong belief in sharing is very widespread among Batswana, and it is expected that this emphasis on sharing existed in the past as well.

This sharing takes characteristic forms among modern Batswana. If a large animal, such as a cow, is slaughtered the meat is distributed so that people receive parts of the animal based on their relationship with the owner of the cow (go gasa kgomo). This serves to bind society together by creating mutual bonds (Mauss 1967). These bonds establish and codify relationships of superiority and inferiority *à la* Dietler 2001, but also emphasize the importance that the community places in sharing as a way to ensure mutual support. People who refuse to share are criticized and ridiculed (Denbow and Thebe 2006).

A wide set of relatives receive specific body parts. Denbow and Thebe (2006) report that women receive the T-bones and filets, old men get the liver and kidneys, and the fetus if the cow was in an advanced stage of pregnancy. People who helped to skin the cow receive the ribs and other small pieces. The chest is given to the headman. The oldest brother receives a front leg and a shoulder, the younger brother receives a thigh, and the mother's brother receives the head

(Denbow and Thebe 2006). The paternal uncle receives the forelegs (Denbow and Thebe 2006). Alternatively, the chest and stomach may be reserved for the family that owns the slaughtered animal (Denbow and Thebe 2006). Distributing meat according to custom is said to make bodimo glad, and to result in prosperity for the givers (Setiloane 1976).

Food can also be used to codify gender and age identity; as Levi-Strauss (1964) argues, food taboos serve to codify in-group and out-group identity. A variety of dietary restrictions in Botswana are noted by Grivetti (1976) based on age and sex; dietary restrictions are lifted once one is past childbearing age, for both men and women, giving the elderly the widest variety of available foods. Cummings (1879) also indicated gender differences in the ideal Tswana cuisine, with women ideally eating grains and milk, and men consuming meat

Schapera (1932, 1984) indicates that the chief, as part of his tribute, was entitled to the brisket of big-game animals, the skin of any lion or leopard killed, and one tusk of every elephant. He indicates that many commoners focused on the reproductive capacity of domestic animals, and rarely slaughtered them. Instead, commoners preferred to save domestic animals for milk, and instead eat wild game that was hunted or trapped. Domestic animals were slaughtered on ceremonial occasions, and wealthy persons may have slaughtered animals more often. In general, Schapera argued that dietary differences were a matter of difference in quantity rather than a difference in kind. Among elites in non-state level societies, sharing resources may be a strategy to help rulers maintain power. Exceptionally strong differential access to resources would likely not be accepted by members of these societies (Danforth 1999).

BODY PART DISTRIBUTION AND SOCIAL INEQUALITY

Archaeologists have identified distinct differences in body part use and species distribution among people of the past (O'Connor 2000). The modern Batswana social requirement that food be shared among relatives in a specific manner, and that certain body parts or species be allocated to the chief, may have existed in the past as well. Although body part distribution analysis at Bosutswe failed to indicate a pattern consistent with ethnographic models

of meat distribution, in which kinship and the relationship of the giver to the receiver guide how body parts are distributed, it was successful in revealing consistent differences in body part distribution between the Central precinct and the Western precinct. This may give clues to what the preferred cuts of meat were at Bosutswe. Examination of a site occupied for a shorter period of time might reveal more distinct body-part distribution patterns.

When considering body part representation in this work, it should be remembered that ribs and vertebrae are difficult to identify down to the species level (David 1987), so they are often not analyzed in detail. Caudal vertebrae become weak when they are cooked (Voight 1983), making their inclusion in archaeozoological analyses even more unlikely. Ribs and vertebrae are present in the assemblage, but will not be discussed in detail here. They are included as categories in figures in the interest of presenting anatomy in a realistic manner.

Both individual bones and anatomical units (upper front leg, head, et cetera) will be used as units of analysis. The individual bones are listed in anatomical order, starting with the head and continuing down the spinal column, then the front leg and all phalanges, followed by the back leg, and finally listing more uncertain elelements (metapodials, postcranial longbone, et cetera). (See Figure 8-1 and Figure 8-3 for anatomical drawings). The analyses carried out according to body part unit are presented in descending order so that more common and less common elements can be easily identified. Cuts of meat and what foods are viewed as desirable are culturally determined and can change through time (Ervynck, et al. 2003; Grant 2002; Mullins 1999; Smith 2006). Examination of species and body part distribution as a way to assess social inequality and status differences is not a novel approach (Crabtree 1990; Mosugelo 1999; Schultz and Gust 1983; Scott 2001; Watson and Watson 1990).

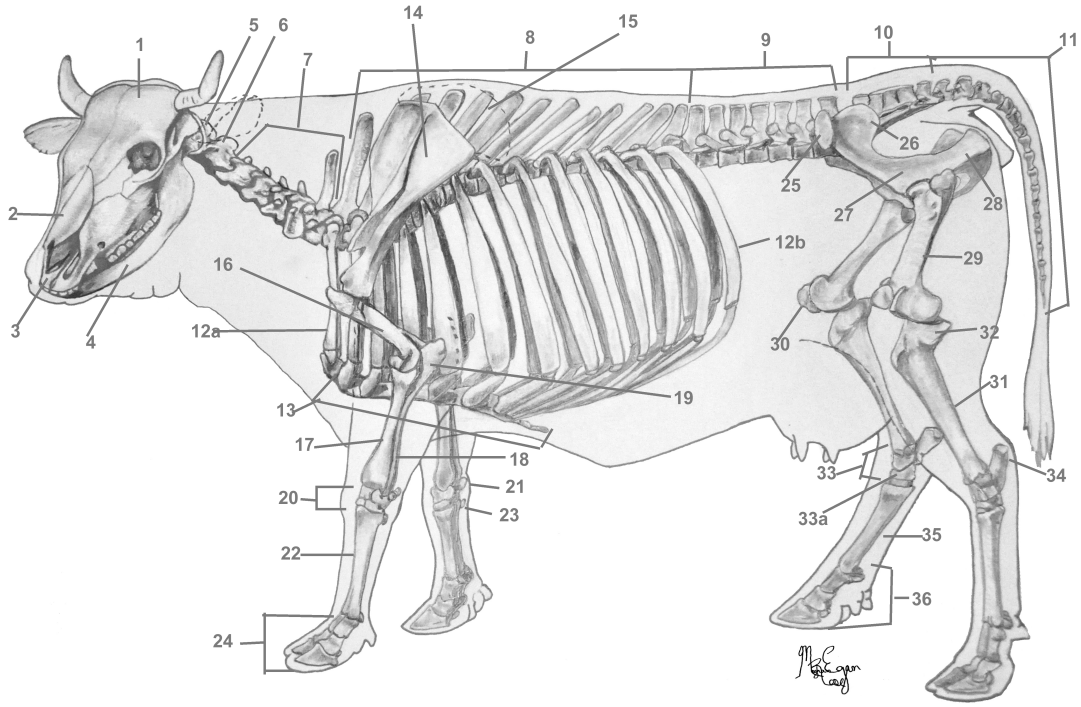


Illustration 8-1. Cow skeleton with flesh outline. Drawing by Meghan Egan, Spiral Sea Designs, spiralseadesigns@gmail.com

1. skull; 2. nasal bone; 3. body of premaxilla; 4. mandible;
5. atlas (first cervical vertebra); 6. axis (second cervical vertebra);
7. 3rd-7th vertebrae; 8. thoracic vertebrae (13); 9. lumbar vertebrae (6);
10. sacrum; 11. caudal or coccygeal vertebrae (15-20); 12a. first rib;
12b. thirteenth rib; 13. sternum; 14. scapula; 15. cartilage of scapula;
16. humerus; 17. radius; 18. ulna; 19. olecranon; 20. carpals;
21. accessory carpal; 22. metacarpal bone 3&4; 23. metacarpal bone 5;
24. phalanges & sesamoids; 25. tuber coxæ; 26. tuber sacrale; 27. ilium;
28. tuber ischii; 29. femur; 30. patella; 31. tibia; 32. lateral condyle of tibia;
33. tarsals; 33a. talus/astragalas/tarsal talus; 34. calcaneum/calcaneus;
35. metatarsal; 36. Phalanges/sesamoids

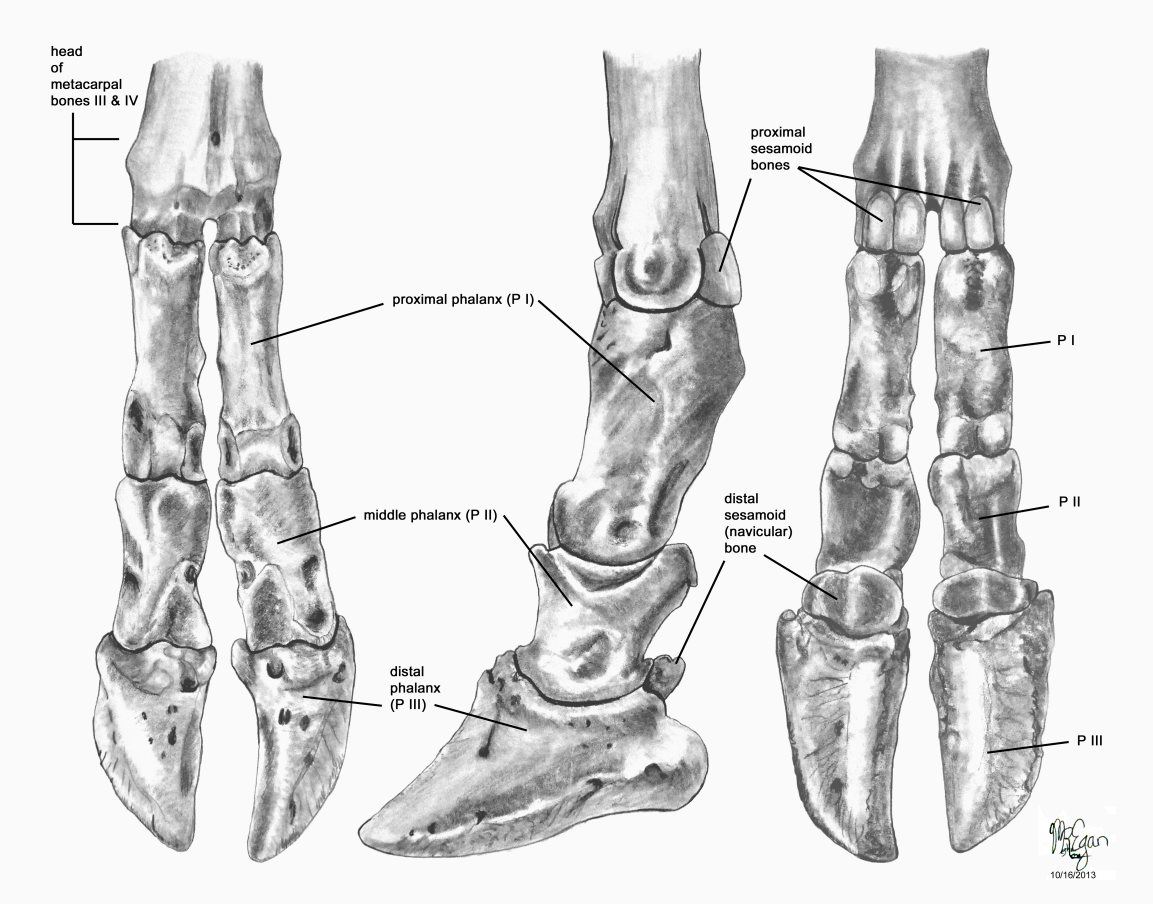


Illustration 8-2. Goat thoracic lower leg and digits. From left to right: front view, side view and back view. Drawing by Meghan Egan, Spiralsea Designs, spiralseadesigns@gmail.com.

TAUKOME/ZHIZO

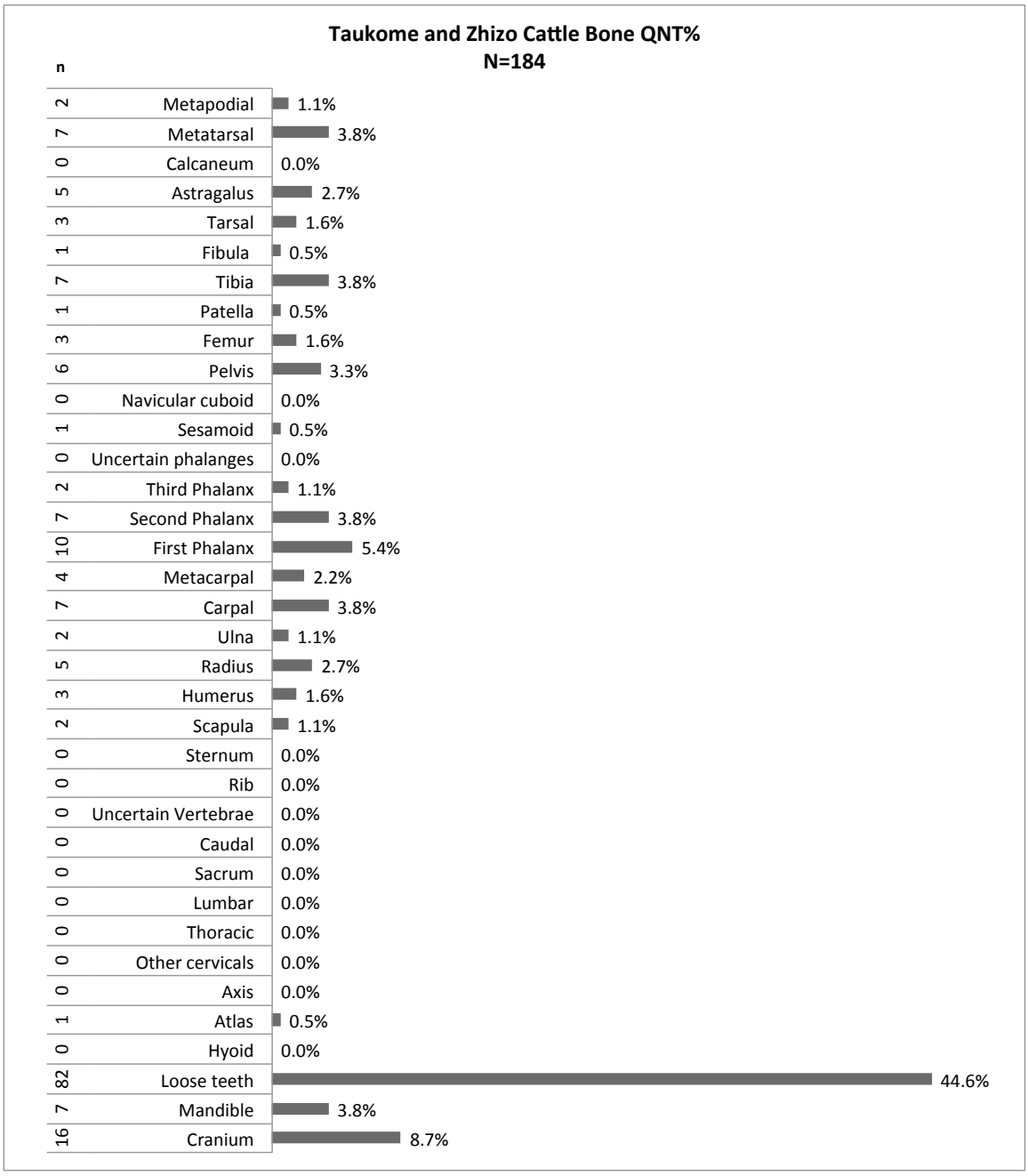


Figure 8-1. Taukome/Zhizo body part representation QNT%.

As discussed in Chapter 2, it is not surprising to find that cranial and foot elements are the best represented elements in a faunal assemblage; they are numerous, and preserve better than many other elements (Brain 1981). During the Taukome and Zhizo periods, cranial

elements and phalanges are the most numerous in the cattle assemblage. These elements do not rank high in terms of meat value in the current American value system, but their presence at Bosutswe could indicate that cattle were slaughtered at or near the site, and/or that these elements were deemed desirable or useful. Their presence at Bosutswe is not unexpected during this time period, because during the Taukome/Zhizo and Toutswe period, vitrified dung deposits at Bosutswe indicate that domesticates were penned in a kraal at the site.

During the Taukome/Zhizo period, head elements, specifically loose teeth, followed by cranium and mandible fragments, are the most common at Bosutswe, followed by phalanges. First phalanges are most common, followed by second and then third. This is in accordance with Plug's (1978) argument that first phalanges preserve best, and third phalanges preserve least often.

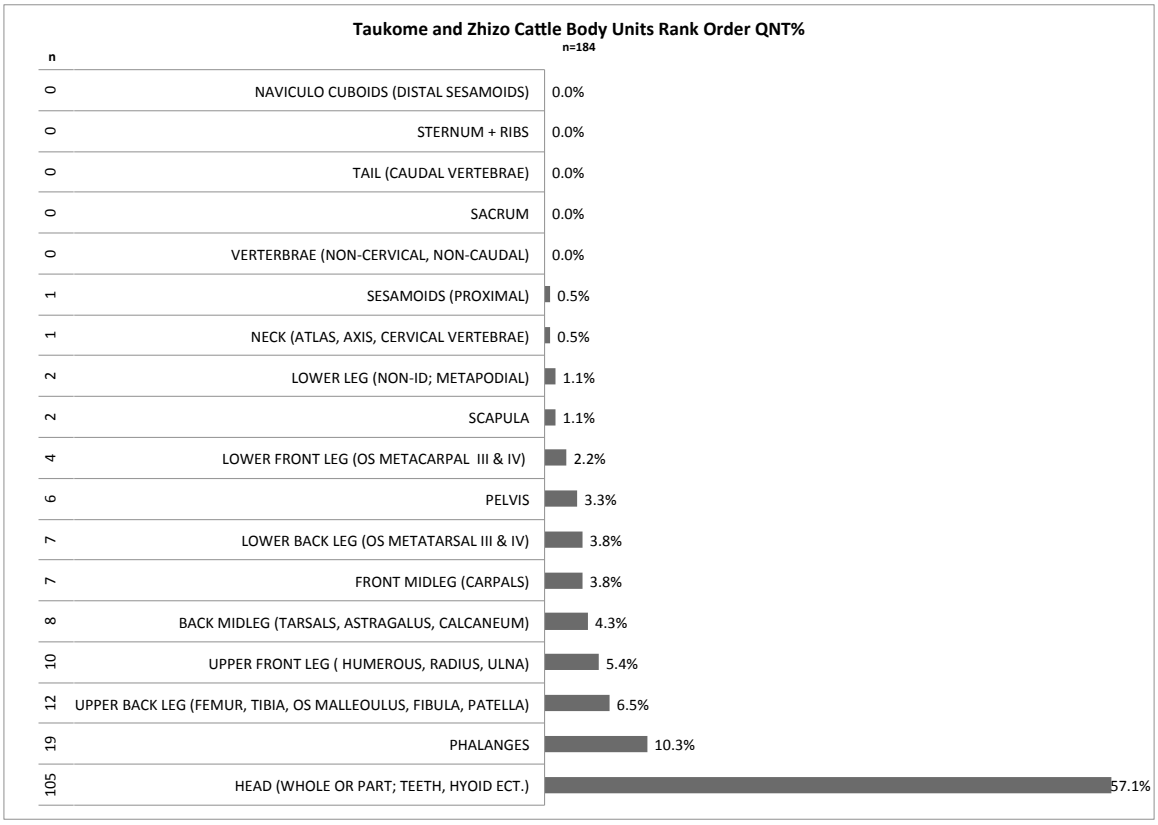


Figure 8-2.Taukome/Zhizo body units rank order QNT%.

Analyzing Taukome/Zhizo cattle body part representations by grouping bones together according to body part as in Figure 8-2 confirms that cranial elements are most common during this time period, followed by digits and distal sesamoids. Distal sesamoids lie at the distal back of the second phalanx (See Illustration 8.2), so are part of the "package" of the phalanges. Proximal sesamoids lie at the distal back of the metapodials, so are part of the "package" of the lower legs. Classifying distal sesamoids separately allows possible butchering or body part distribution patterns to emerge. At 57.1% (n=105), cranium elements are most common, followed by digits plus distal sesamoids (10.3%, n=19). Upper back leg elements are also common (6.5%, n=12) and upper front leg elements 5.4%, n=10) are also very common.

EARLY AND MIDDLE TOUTSWE

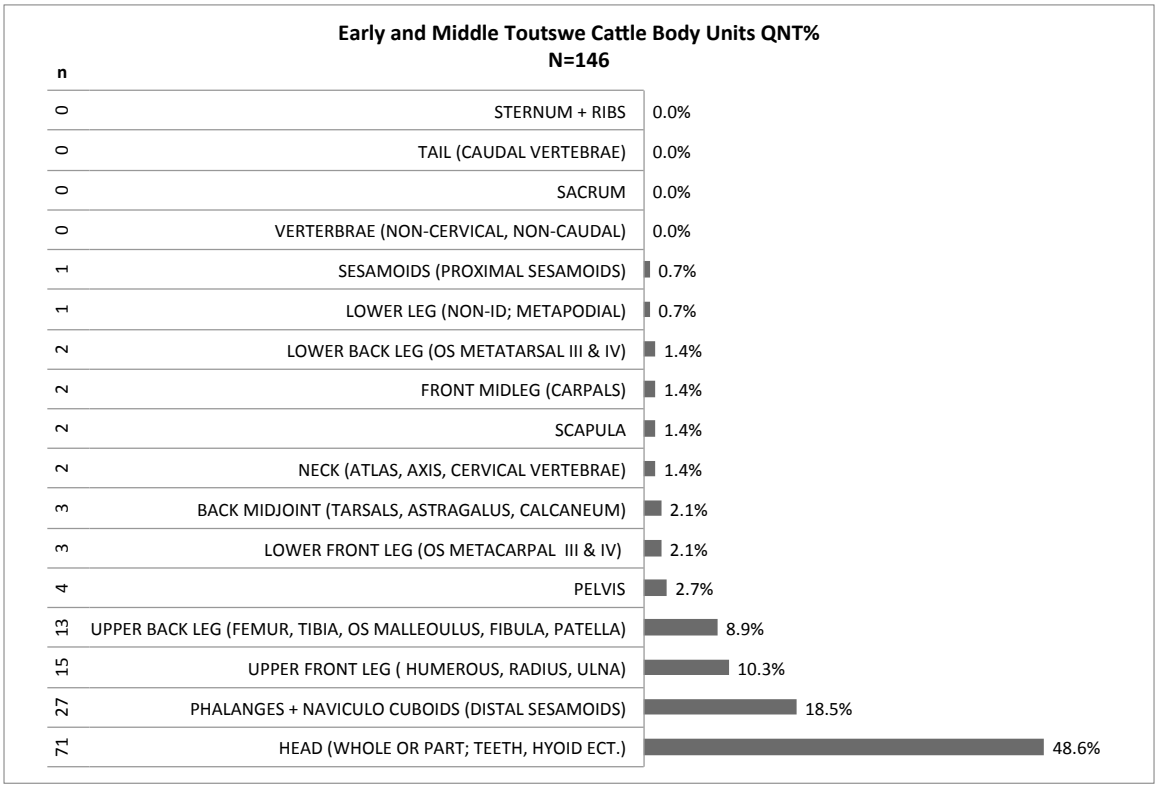


Figure 8-3. Early and Middle Toutswe cattle body units rank order QNT%

The Early and Middle Toutswe body part distributions follow the patterns of the Taukome/Zhizo period. Cranial elements are most common (48.6%, n=71), followed by phalanges (18.5%, n=27). Upper front and back legs continue to occupy the third and fourth categories when body units are arranged by rank order.

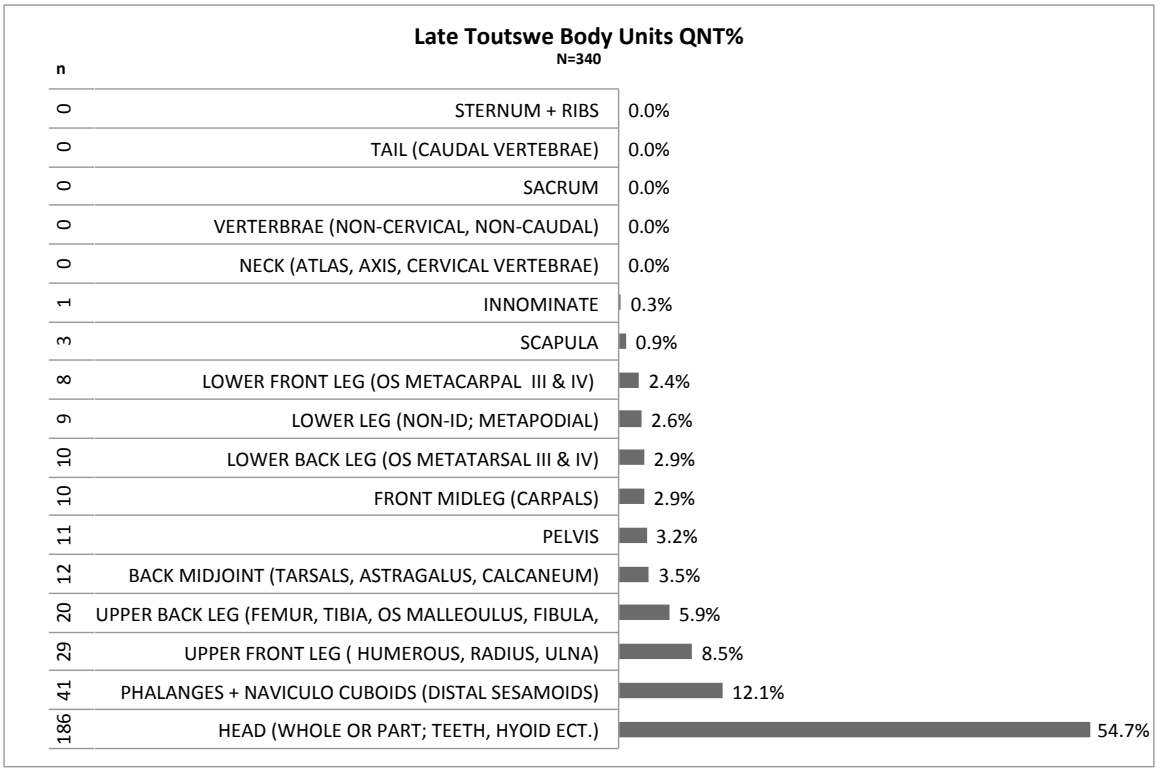


Figure 8-4 Late Toutswe Cattle Body Units Rank Order QNT%.

The body part distribution for the Late Toutswe (Figure 8-4) continues to follow the patterns noted in previous time periods: cranial elements are most numerous, followed by phalanges and distal sesamoids. Upper front leg elements and upper back leg elements are the third and fourth most common body units.

LOSE

During the Lose period, it becomes possible to compare the diets of the elites living in the Central precinct to the commoners living on the periphery of the site. If there were not differences in how elites and commoners used body parts, we would expect to see no strong differences in body part distribution in these two areas of the site.

When comparing the bone and body unit proportions of the Central and the Western precinct during the Lose period, it is immediately apparent that mandible fragments and loose teeth are better represented in the Western precinct. There are small differences in lower leg elements and phalanges, but these differences are not strong. However, strong differences do

become apparent when body parts that bear more meat are considered; the femur, tibia, humerus, radius and scapula are all better represented in the Central precinct compared to the Western precinct. These findings suggest that while access to lower legs was not a focus of restrictive social forces, other body parts were; the Central precinct had preferential access to upper limbs, while the Western precinct had greater access to cattle craniums. Since the Central precinct was occupied by elites during this time period, it may be possible to assert that these elements were more highly regarded than other body parts, while craniums were lower status than other body parts, resulting in a differential distribution pattern at Bosutswe. The difference in body part distributions between the two precincts is evidence of at least some sharing; if each precinct kept its own slaughtered animals within its own spatial boundaries, each precinct ought to confirm to the body part distribution patterns of the Taukome/Zhizo and Toutswe periods.

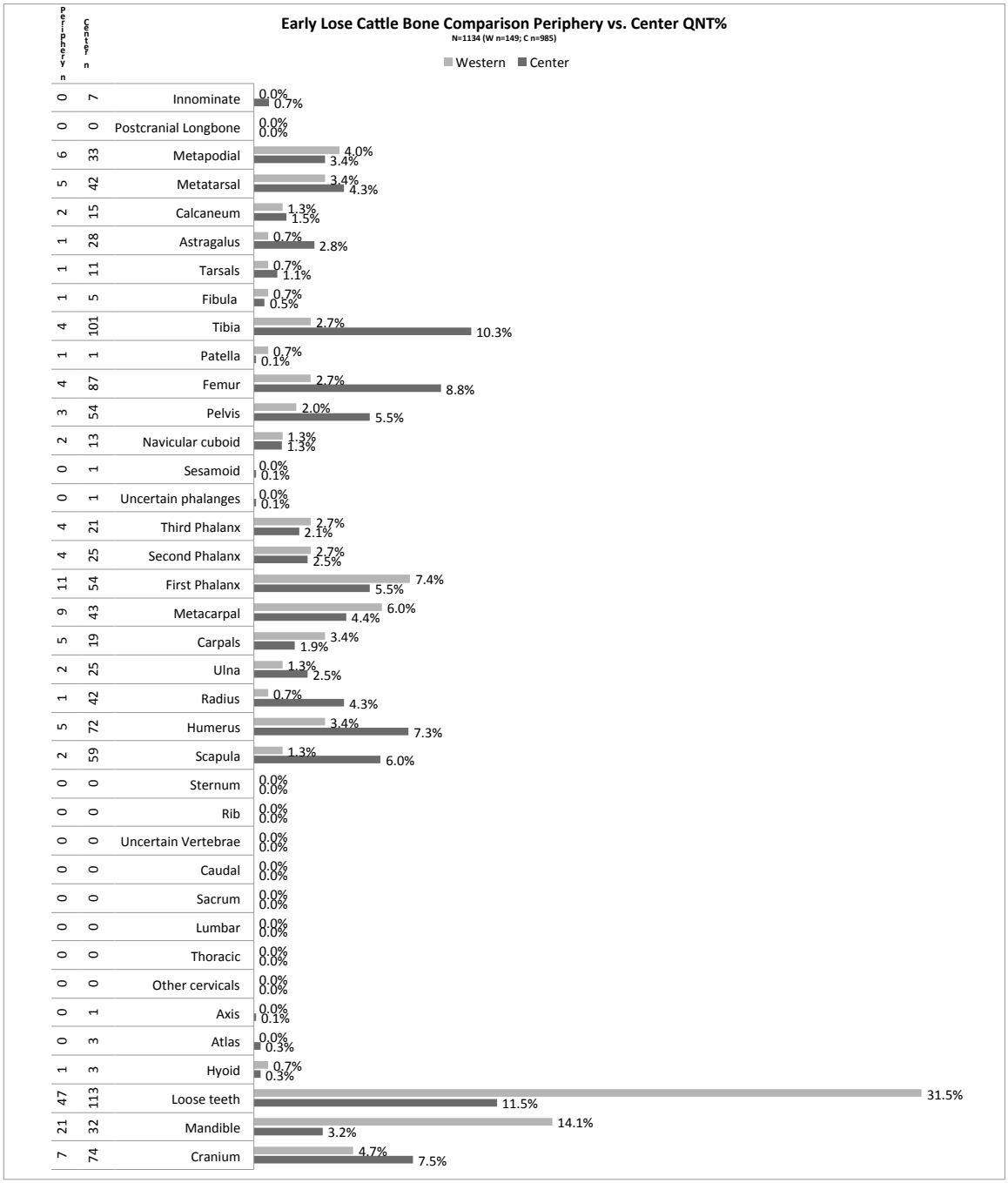


Figure 8-5. Early Lose Cattle Bone Distribution Western vs. Central Precinct QNT%.

As is apparent in Figure 8-5, there are several strong differences in body part distribution when comparing the Western and Central precinct. Loose teeth are the most highly represented element in the Western precinct (31.5%, n=47), followed by mandibles (14.1%, n=21) and first

phalanges (7.4%, n=11). The most common element in the Central precinct is loose teeth (11.5%, n=113) followed by tibia fragments (10.3%, n=101) and femur fragments (8.8%, n=87).

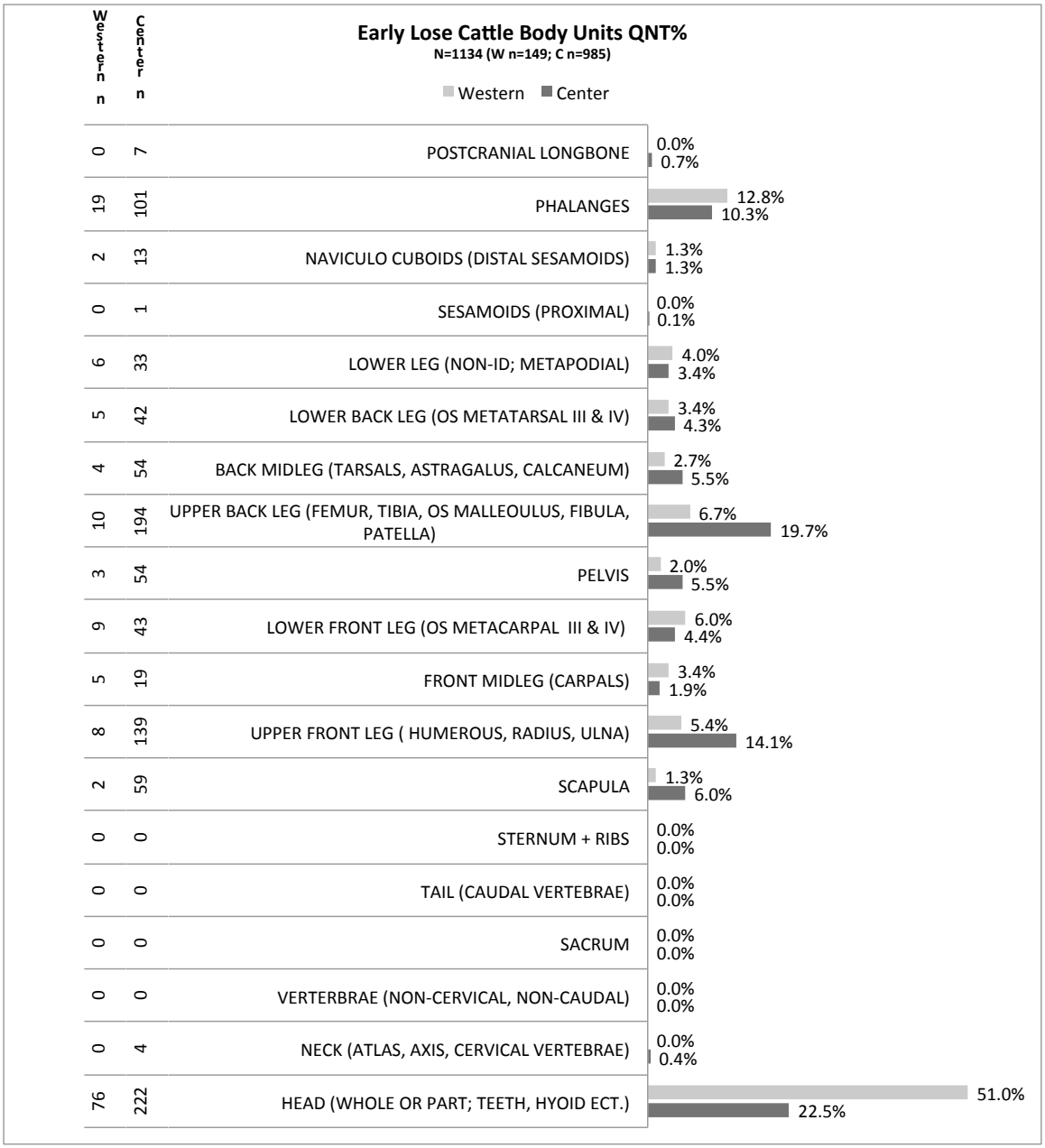


Figure 8-6. Early Lose Body Part Distribution Western vs. Center QNT%.

As Figure 8-6 illustrates, grouping bones together according to body part further supports the supposition that commoners in the Western precinct consumed cranial elements most often

(W 51.0%, n=76; C 22.5%, n=222), while elites in the Central precinct preferentially consumed upper back leg elements (W 6.7%, n=10, C 19.7%, n=194.). There were also strong differences in scapula (X^2 =5.4923 p= 0.0191) and upper back leg elements (X^2 =8.7674, p=0.003066). These results indicate substantial dietary differences in what body parts were most often consumed in the Central and Western Precincts. The Western precinct has continued to follow the pattern of the Taukome/Zhizo period, in which cranial elements are most numerous, followed by digits and distal sesamoids, then by upper leg elements. In the Early Lose, lower front leg elements are fourth most numerous; this is a change from the earlier distribution patterns, when the third and fourth most numerous positions were occupied by either the front or the back upper leg. Metapodials carry considerably less meat than upper legs, but may be a substantial source of bone marrow.

The body part distribution in the Central precinct follows a new and different pattern; cranial elements are most common, followed by upper back leg elements, then upper front leg elements, then phalanges and digits. This indicates an important culinary difference between the elites and the commoners at Bosutswe; elites may have had greater access to body parts carrying more meat compared to commoners.

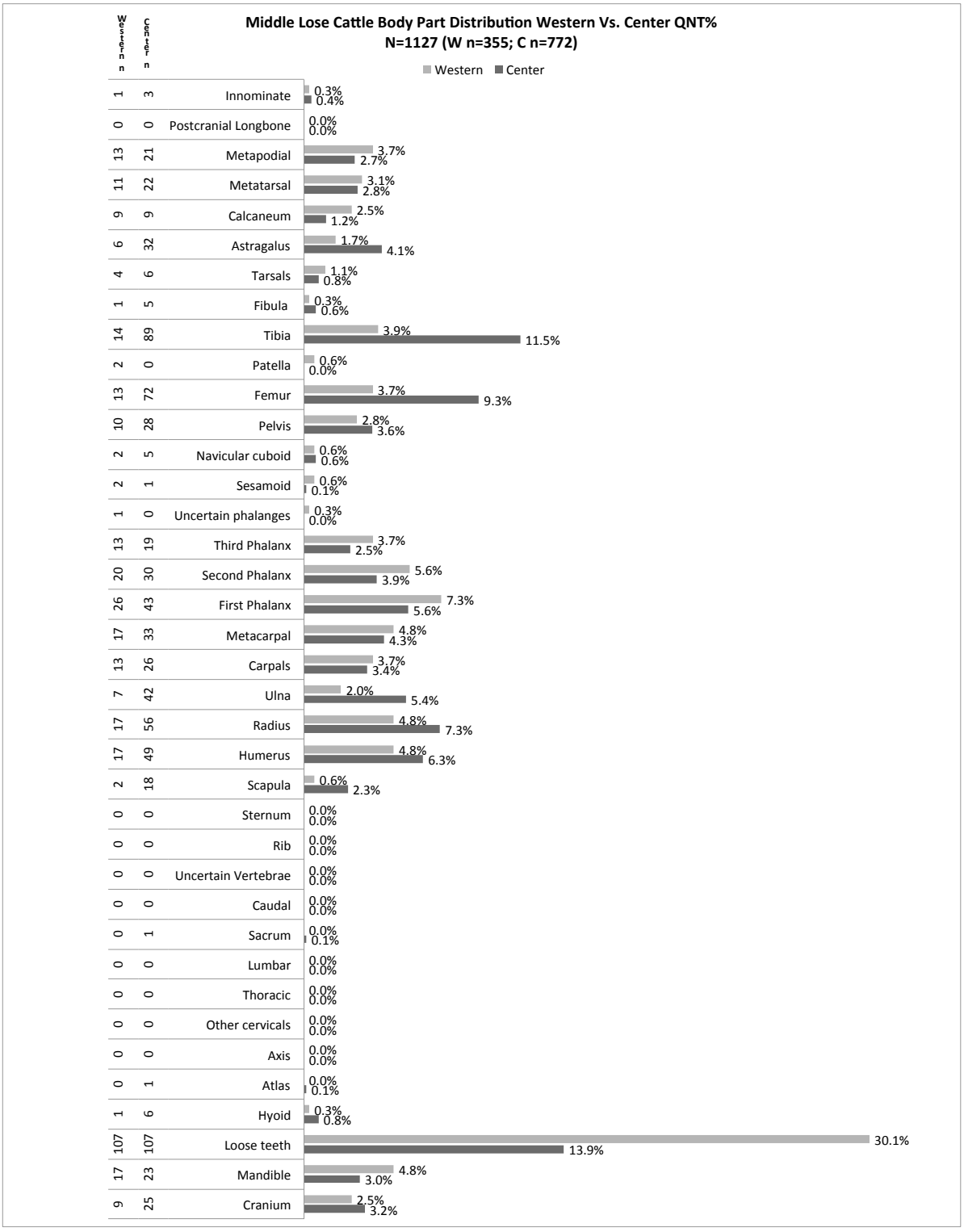


Figure 8-7. Middle Cattle Lose Body Part Distribution Western vs. Center QNT%.

Figure 8.7 suggests that the novel culinary patterns noticed during the Early Lose have continued into the Middle Lose. Loose teeth are the most common element in the Western precinct (30.1%, n=107), followed by first phalanges (7.3%, n=26) second phalanx (5.6%, n=30) and mandible fragments, humeri, radii and metacarpal are tied for fourth most common at 4.8%, n=17). The most common cattle element in the Central precinct was loose teeth (13.9%, n=107), followed by tibia specimens (11.5%, n=89), femur specimens (9.3%, n=72) and radii fragments (7.3%, n=56).

Despite some fluctuations in body part proportions compared to the Early Lose, this pattern seems to suggest that elites consumed more upper leg elements than commoners, who consumed more cranial and foot elements.

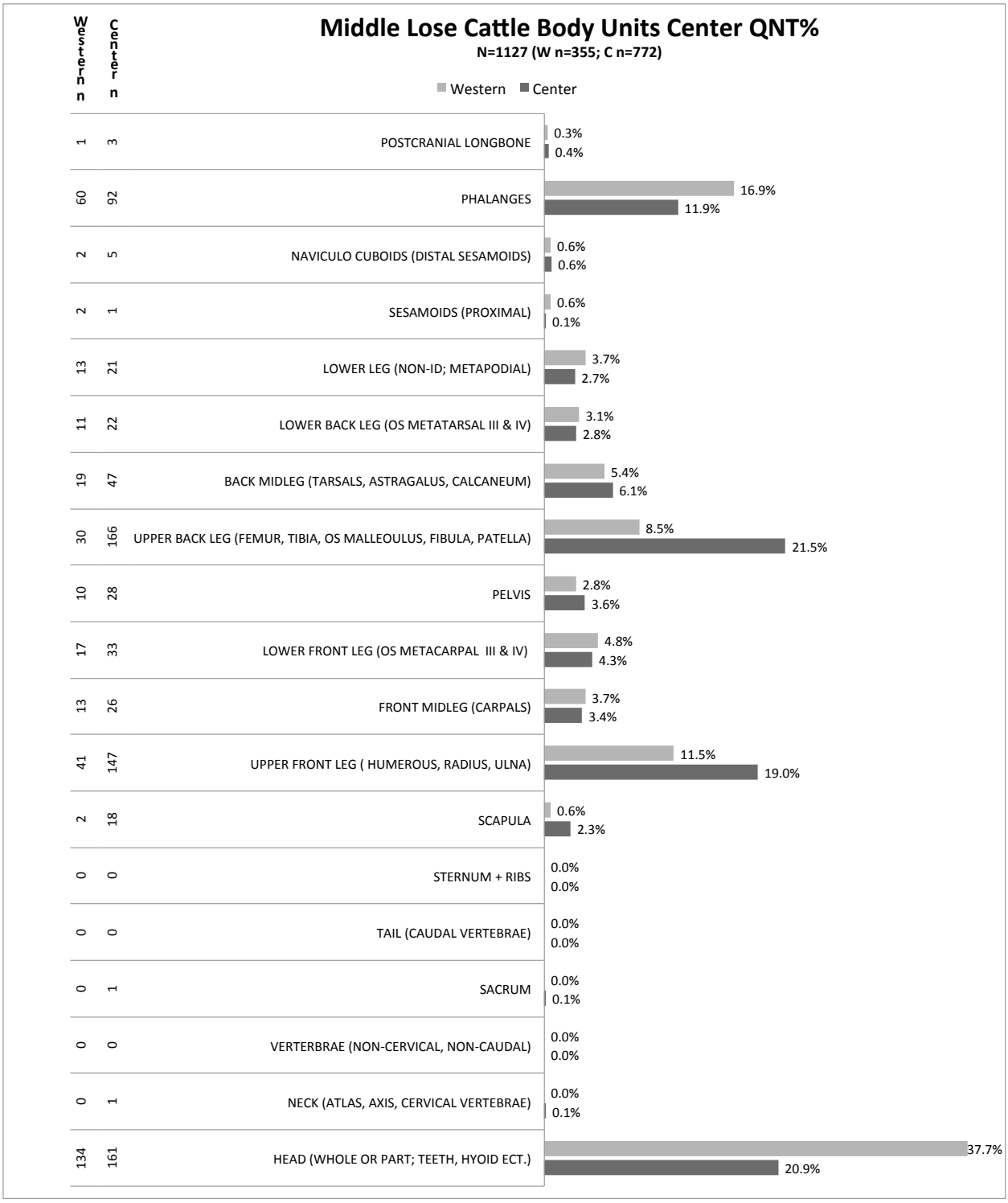


Figure 8-8. Middle Lose Cattle body part distribution Western vs. Central QNT%.

The pattern suggesting that elites consumed more body parts with high meat values than the Western precinct continues to hold when specimens are analyzed as body part units (Figure

8-8). The most prevalent body part in the Western precinct is the head (37.7%, n=134, followed by digits (19.9%, n=60), upper front leg (11.5%, n=41), and the upper back leg (8.5%, n=30). Upper back leg elements continue to be the most common is the Central precinct (21.5%, n=166), followed by cranial elements (20.9%, n=161), upper front leg elements (19.0%, n=147) and phalanges and distal sesamoids (11.9%, n=92).

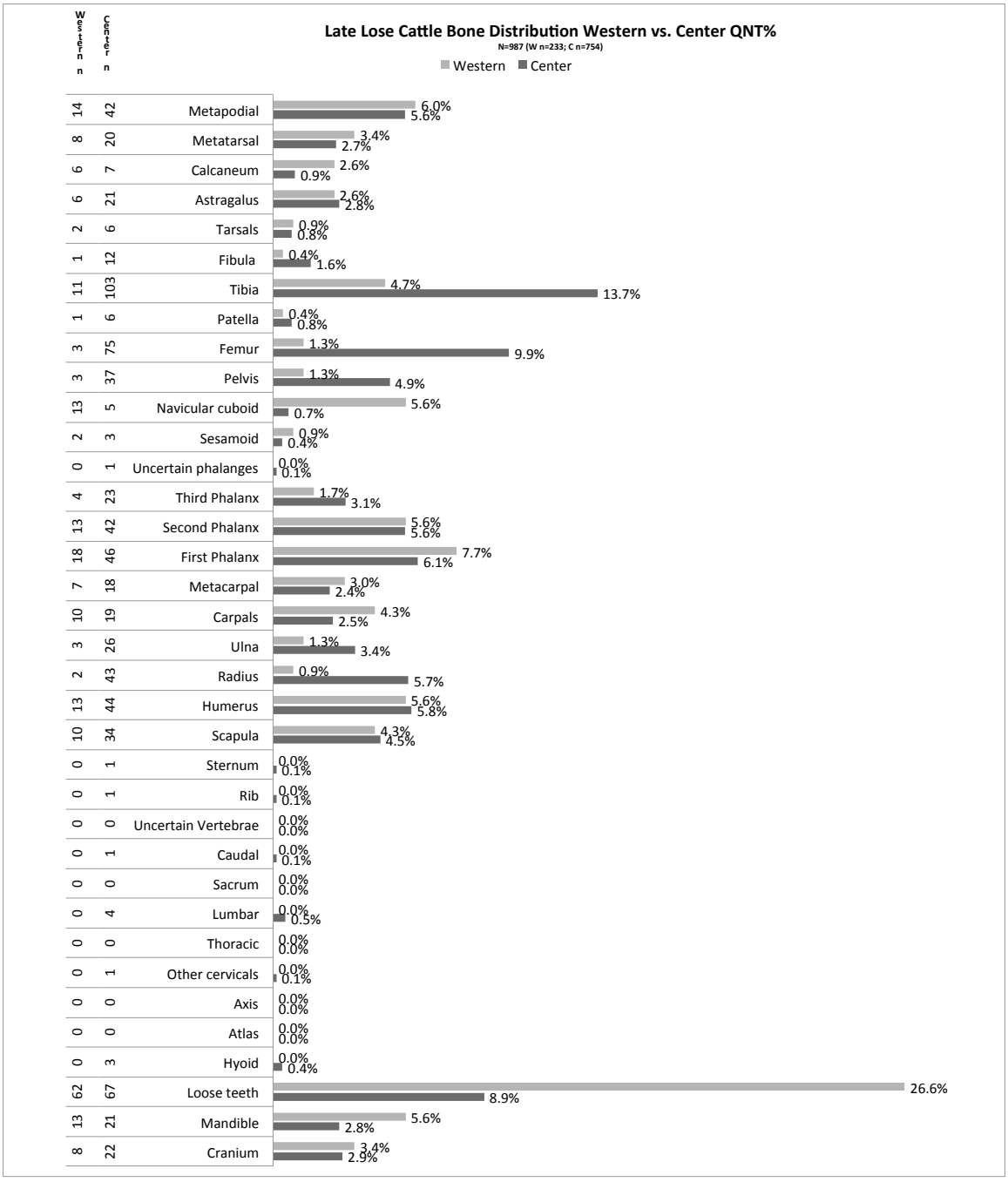


Figure 8-9. Late Lose Cattle Bone Distribution Western vs. Center QNT%.

The Elite/Central meat distribution pattern continues into the Late Lose period; in the Western precinct, loose teeth are the most common element, followed by the first phalanx, metapodials, and mandibles. In the Central precinct, the most common element is the tibia, followed by femora, loose teeth and first phalanges.

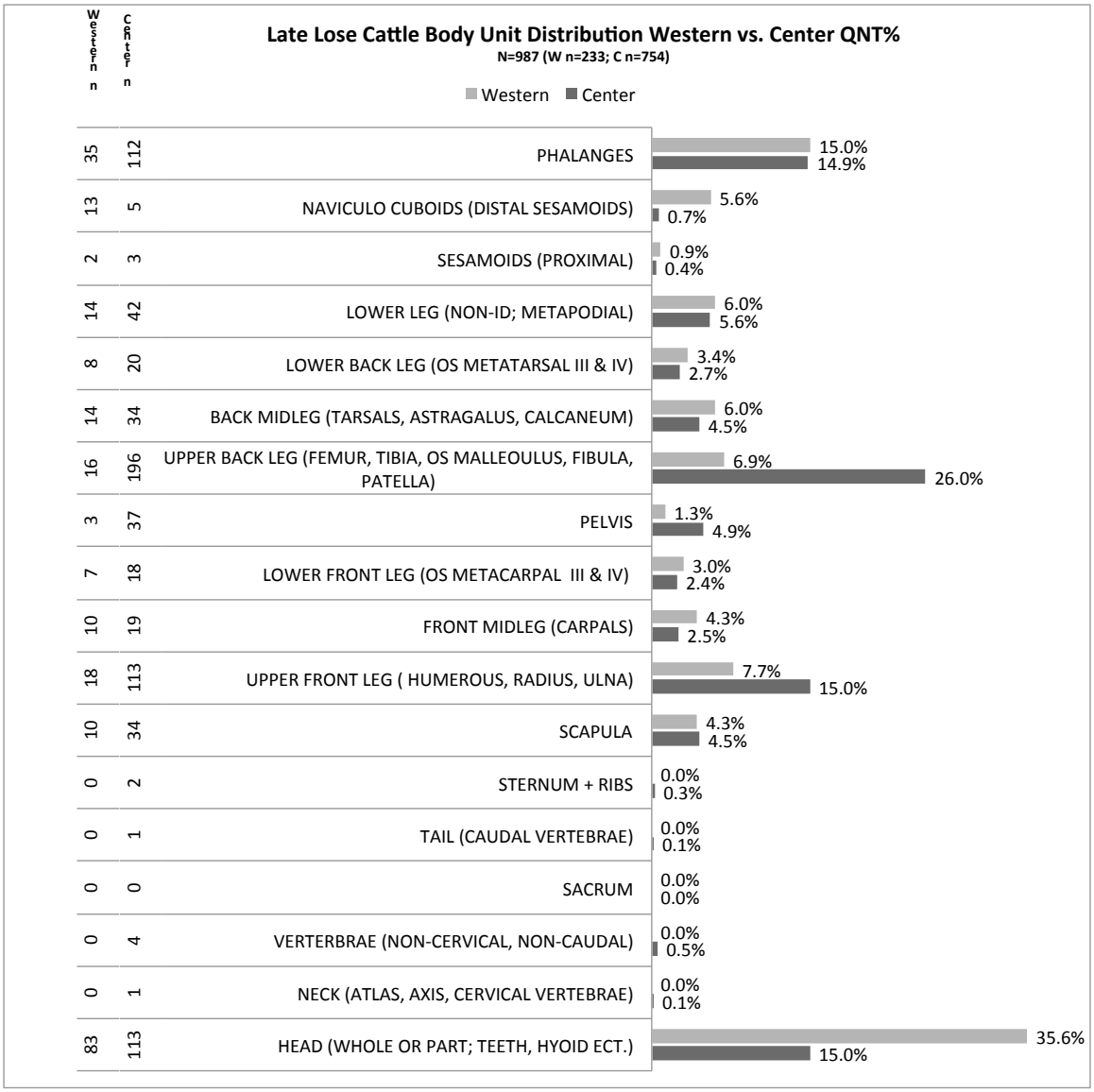


Figure 8-9. Late Lose Cattle Body Unit Distribution Western vs. Center QNT%.

Analysis of body units during the Late Lose (Figure 8-9) confirms that the Western precinct assemblage confirms that the commoners of Bosutswe consumed high amounts of cranial elements, followed by foot elements, then the upper front leg and upper back leg elements. The most common body unit in the Central precinct was the upper back leg. The upper front leg makes up 15.0% of the assemblage, and the phalanges make up 15% of the assemblage. Both the Central and the Western precinct contain similar percentages of phalanges, but the Western precinct contains a slightly higher percentage of distal sesamoids.

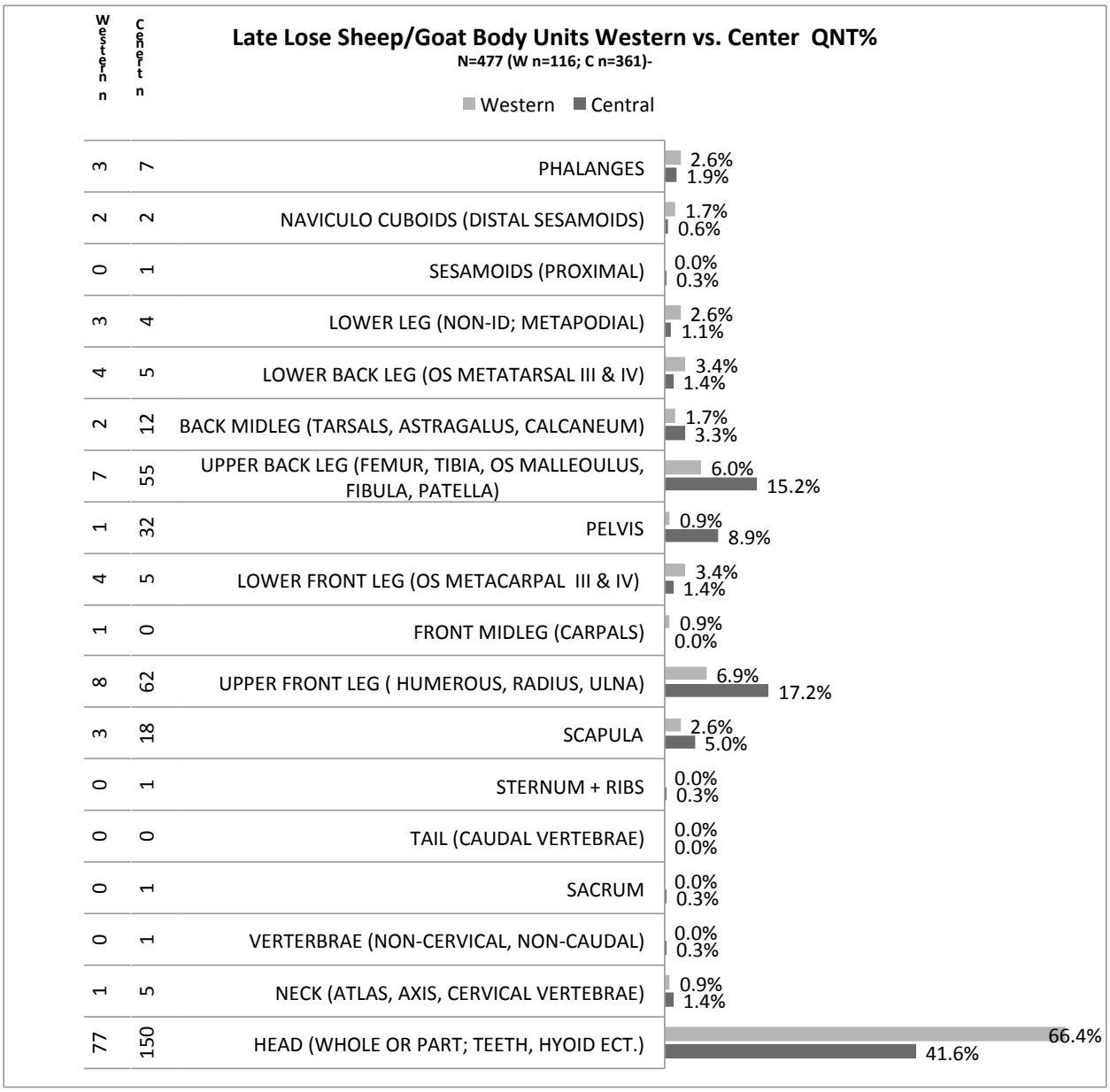


Figure 8-10. Late Lose Sheep/Goat Body Part Distribution Western vs. Center QNT%.

As illustrated in Figure 8-10, small stock were subject to the same social forces guiding body part distribution that cattle were. Cranial elements are over-represented in the Western precinct, while upper leg elements and pelvis elements, are over-represented in the Central precinct.

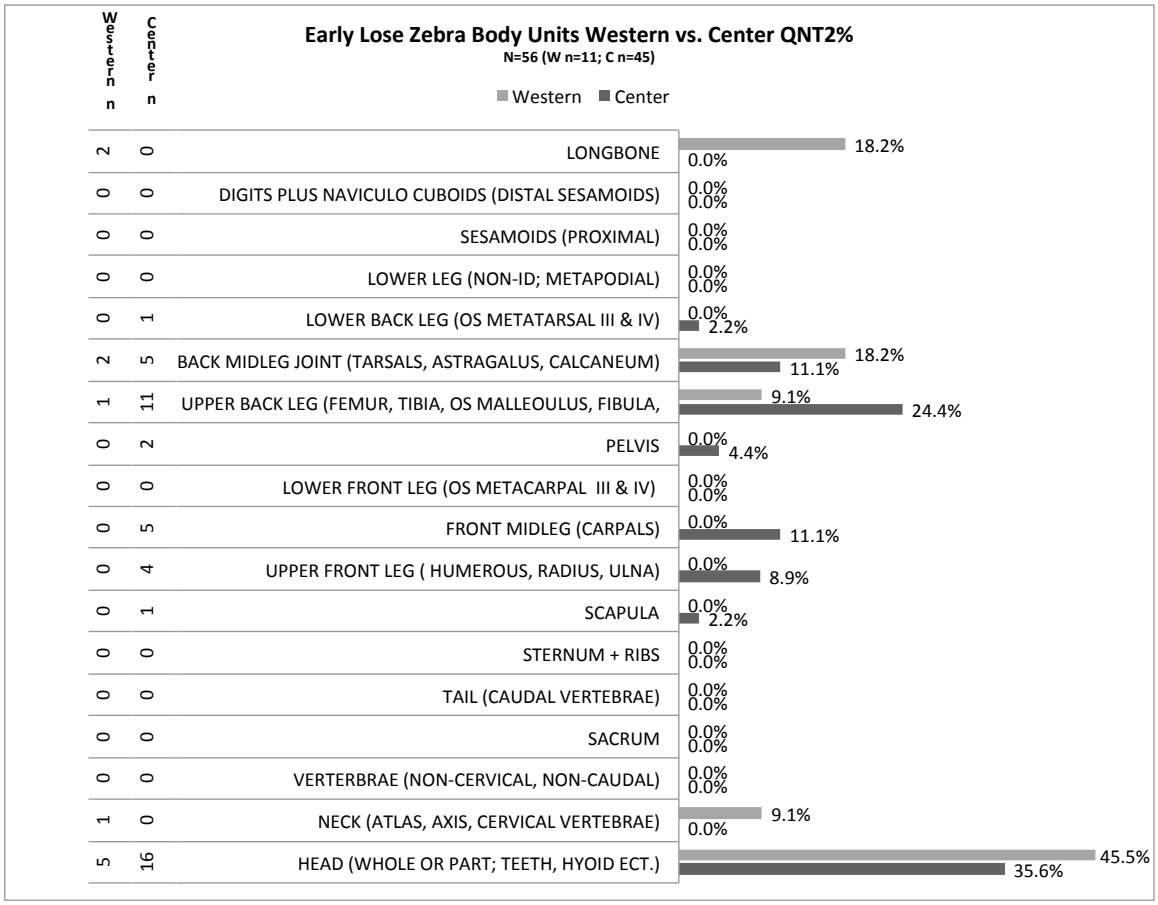


Figure 8-11. Early Lose Zebra Body Unit Distribution Western vs. Central Precinct QNT%.

Figure 8-11 illustrates the body part distribution of zebra elements from the Early Lose period. During the Early Lose, zebra exploitation reached its peak at Bosutswe. In contrast to later periods, both commoners and elites consumed zebra during this time period. The body part distribution follows that of the most common animals: cattle, sheep and goats. Cranial elements are most common in the Western precinct, while upper leg elements are most common in the Central precinct. This suggests that upper front and back legs were preferred by elites, while cranial elements were either more preferred by commons, or more commonly distributed to them by elites.

CARCASS PROCESSING, PREPARATION, AND DISCARD

It has been demonstrated that there are noticeable culinary differences in what body parts were more commonly consumed in the Central and Western precinct, indicating that some cuts of meat were more highly preferred by elites and were preferentially appropriated by them. It has also been shown that culinary differences existed in what species were eaten in what proportions; inhabitants of the Central precinct consumed more domestic compared to wild game during much of Bosutswe's inhabitation, and cattle age profiles suggest that cattle were used or obtained differently by commoners and elites. Despite these differences, archaeological data suggests that how meat was processed and cooked did not differ substantially in the Western and Central precincts; Goody's argument that there is no *haute* cuisine in Africa may hold partially true at Bosutswe when only cooking methods are considered. While what was eaten generated social divisions, how it was cooked generated social bonds.

Carcass Processing and Cooking Methods

Ethnography suggests that in modern Botswana, domestic animals are slaughtered and butchered near the kraal, and that that others receive different portions of the animals based on their relationship to the animal's owner (Mooketsi 1999; Mosugelo 1999). While the vast majority of bones at Bosutswe are fragmented, only a minority display distinct processing marks. If fragmentation rates are likely the result of human action, it is likely they were broken in a way that does not clearly indicate human action. Plug (1996) states that many bones from Bosutswe have cut and chop marks located on or near their articulations, likely relating to carcass dismembering. Most ribs could not be identified down to the species level, but were chopped off between the sternum and the vertebral column (Plug 1996). At Bosutswe, there are two main lines of evidence relating to carcass processing; chop marks and cut marks. Chop marks may be further subdivided in to plain chopping, and chopping through bone. Bone fragment size and degree of burning present can indicate cooking methods.

Processing Marks and Methods

Despite the differences in wild/domestic animal use between commoners and elites at Bosutswe, cooking methods seem to have been similar in the two precincts. Processing marks at Bosutswe can be divided into four categories: cut marks, chop marks, bones that were chopped through, and bones that display both cut and chop marks. Cut marks could take place during processing or consumption while removing meat from bone. Chopping could take place before or after cooking (Kent 1993). Examination of individual processing marks reveals differences between the Western and Central precinct that relate to what body parts were consumed most often and the cooking method used.

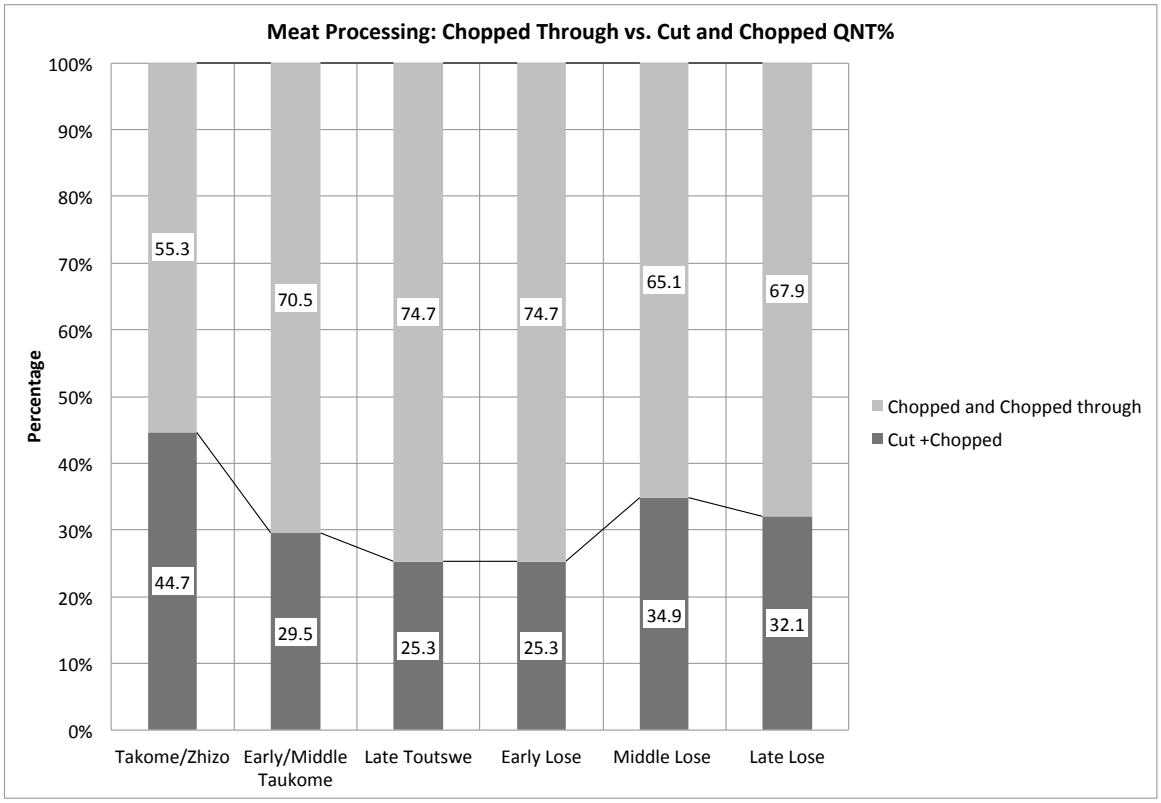


Figure 8-12. Meat Processing: Chopped through vs. Cut and Chopped Bone QNT%.

	Taukome/Zhizo	Early/Middle Toutswe	Late Toutswe	Early Lose	Middle Lose	Late Lose
Cut +Chopped	21	18	19	193	169	109
Chopped and Chopped Through	26	43	56	370	315	231
Total	**47**	**61**	**75**	**563**	**484**	**340**

Table 8-12. Chopping vs. cut marks QNT%.

As Figure 8-12 shows, chopping versus cutting rates at Bosutswe are broadly similar through time after the Taukome/Zhizo period, suggesting that butchery practices did not undergo radical change through time, despite the increase in social inequality. This suggests that dismemberment methods in the Central and Western precinct may have been similar.

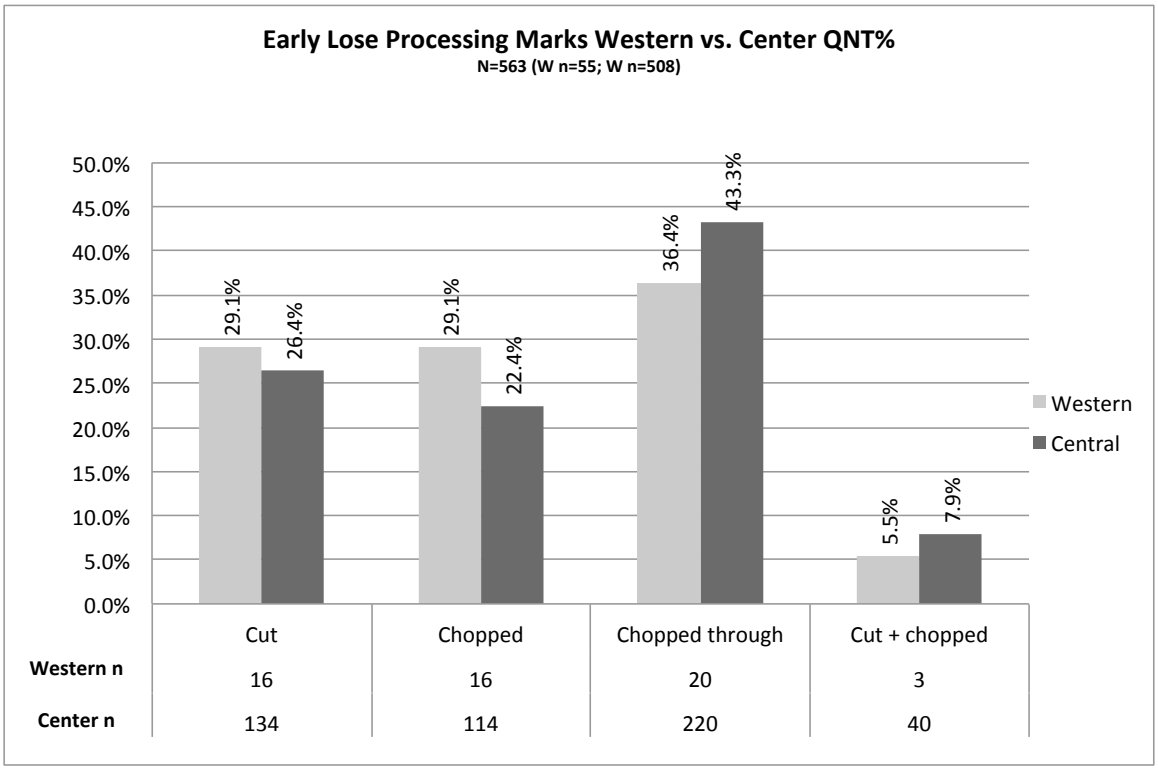


Figure 8-13. Early Lose Processing Marks Western vs. Center QNT%

Differences in processing mark patterns between the Western and Central precinct (Figure 8-13) are likely related to the differential body part distribution in the Central and Western precinct. The Western precinct consistently has a greater proportion of bones that have only chop marks, and the Central precinct consistently has a greater proportion of bones that are chopped through. The Central precinct contains more bones with high meat values (i.e., femur, humerus, et cetera), and more longbones. These bones are more likely to be chopped through (see below), accounting for the consistently higher "chopped through" levels in the Central precinct.

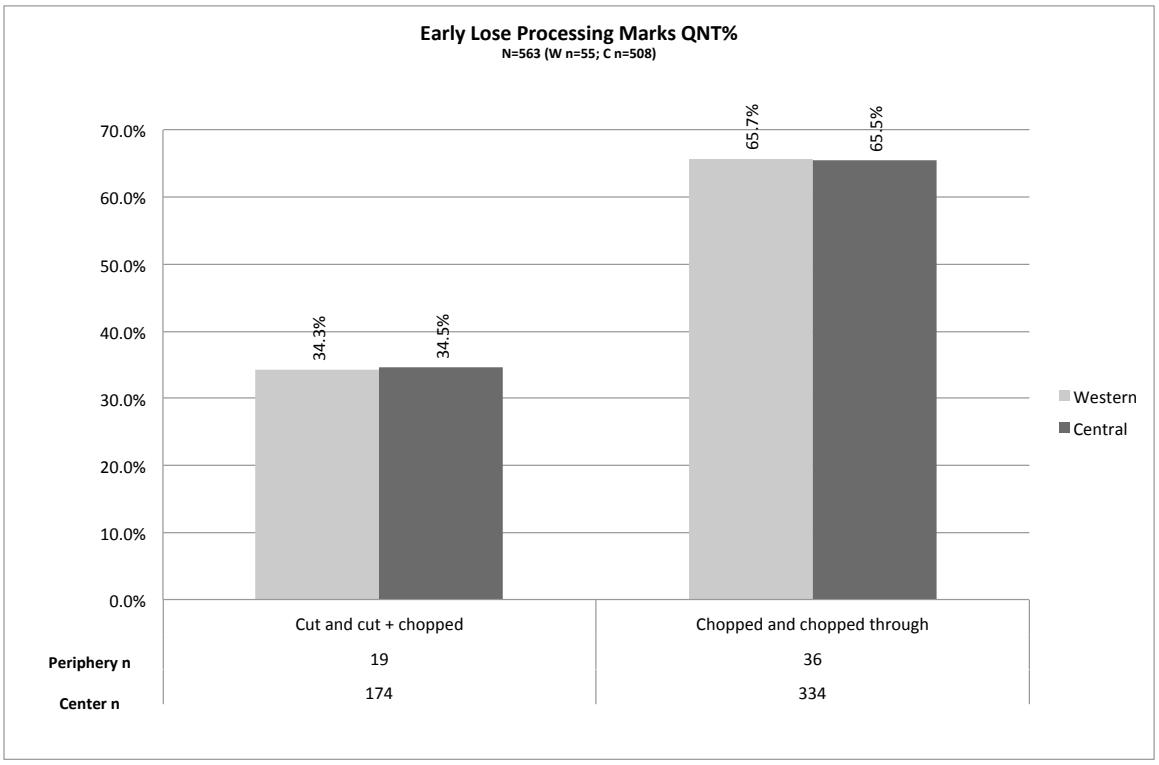


Figure 8-14. Early pose processing marks Western vs. Center QNT%.

As Figure 8-14 illustrates, the apparent differences between the two precincts are minimized when processing marks are divided into bones with cut marks and bones with no cut marks. This pattern suggests that cooking methods involving removing meat from the bone were similar in the different areas of the site.

Chopping through Bone

Analysis of which bones were chopped through strongly indicates that breaking bone and meat down into small fragments was standard procedure at Bosutswe. Aside from an anomaly during the Late Toutswe, when first phalanges were most often chopped through, long bones, such as the femur, radius, tibia, metapodials and humerus were preferentially chopped through. It is likely that the butchers at Bosutswe intentionally reduced these long bones so that they could fit in cooking pots, as illustrated in Figure 8-15. Voight (1983) argues that chopping bone and accompanying meat into smaller pieces was common practice in Southern Africa.

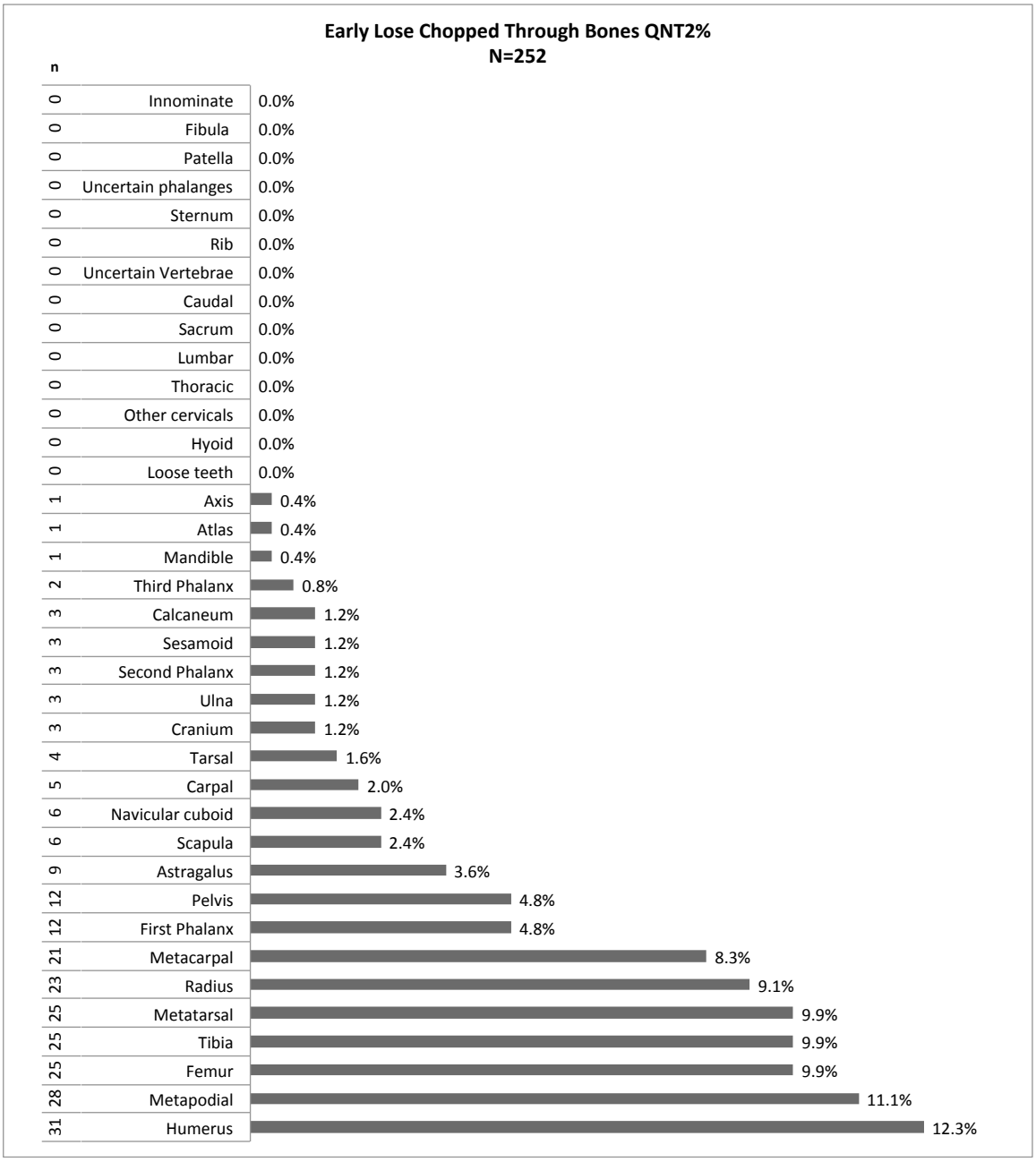


Figure 8-15. Early Lose Chopped Through Bones Rank Order QNT%.

Differences in sample size preclude a reliable statistical comparison concerning which bone was cut, chopped, or cut and chopped in the Western and Central Precinct; but, it is apparent that the longer bones such as metapodials, femora, and tibia were preferentially chopped through when examining the assemblage as a whole, suggesting that smaller size was a valued attribute when preparing and cooking cuts of meat.

Fragmentation Rates

Many bones in archaeological assemblage are broken, either through direct human processes or through post-depositional processes. Fragmentation rates are consistently very high at Bosutswe. While post-depositional processes cannot be ruled out as a factor in this, it could be that this pattern is a direct result of human action.

Fragmentation rates range from 88.2% to 97% when rodents, unidentified specimens and snail shells and ostrich eggshells are not considered. Rodent bones are least likely to be fragmented; many rodent remains are most likely self-introduced, and not used for food. Fragmentation rates are slightly higher in the Central precinct compared to the Western precinct; this is likely due to the higher prevalence of teeth in the Western precinct, since teeth, along with smaller bones such as tarsals, carpals, phalanges and sesamoids are least likely to be fragmented.

Specimen Size

Combined with the low incidence of burned bone at Bosutswe, the general size of bones at Bosutswe further supports the hypothesis that boiling meat was a favored cooking method at Bosutswe. Plug (1996) indicates that limb bones were often smashed to obtain bone narrow, and to reduce their size for cooking. The average size for a cooking pot opening at Bosutswe was 18-25 cm (180-250 mm; 7 to 9.8 inches) (Denbow, personal communication).

In order to assess bone size, rodents, unidentified specimens (many of which are most likely rodents), ostrich eggshell, land snail and loose teeth were excluded from analysis. These specimens are either likely to be very small, to have not been a part of the diet, or both. Specimen measurements were only available for the Lose period, but specimens from all time periods at Bosutswe were highly fragmented.

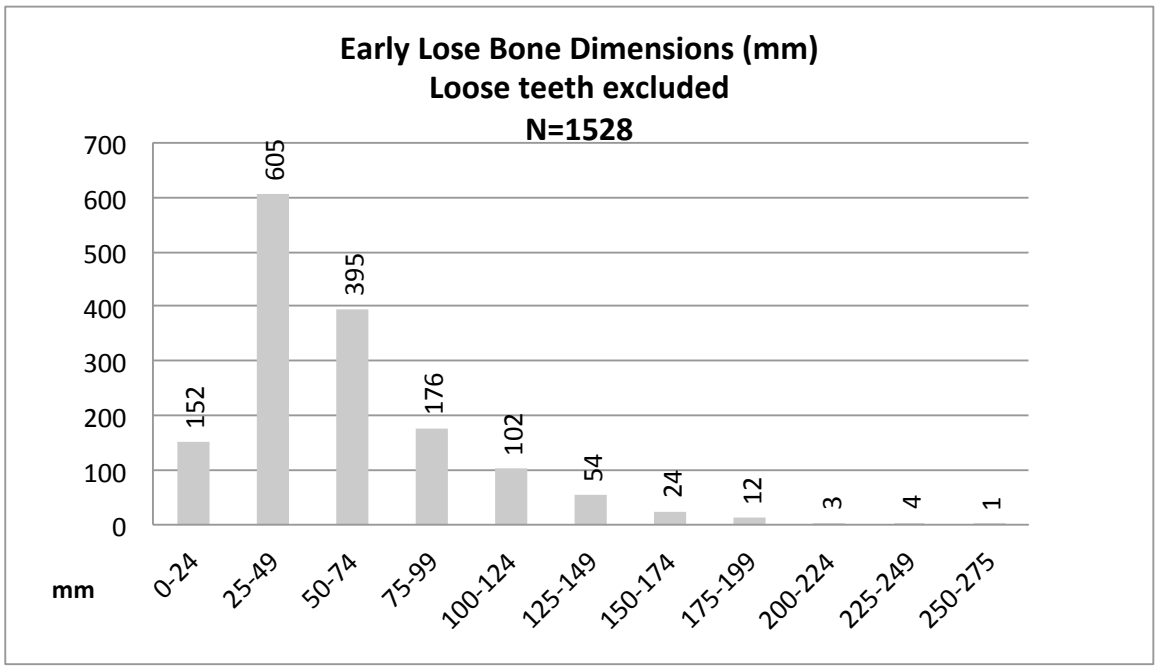


Figure 8-16. Early Lose bone dimensions in mm. One giraffe radius + ulna with chop marks. omitted (590 mm in length) omitted. Rodents, unidentified specimens, land snail and ostrich eggshell excluded.

The bone dimensions during the Early Lose period (Figure 8-16) indicate a marked preference for smaller pieces of bone. 25mm- 49mm specimens are the most prevalent, making up 39.6% of the assemblage (n=605). 97.1% of the assemblage falls with the 1-149mm size range. This excludes one outlier, a 590 mm long giraffe radius + ulna with chop marks on the distal and proximal shaft. These bones would have easily fit into cooking pots to be boiled. 86.9% of measured specimens fall within the 0-99 mm size range (n=1328).

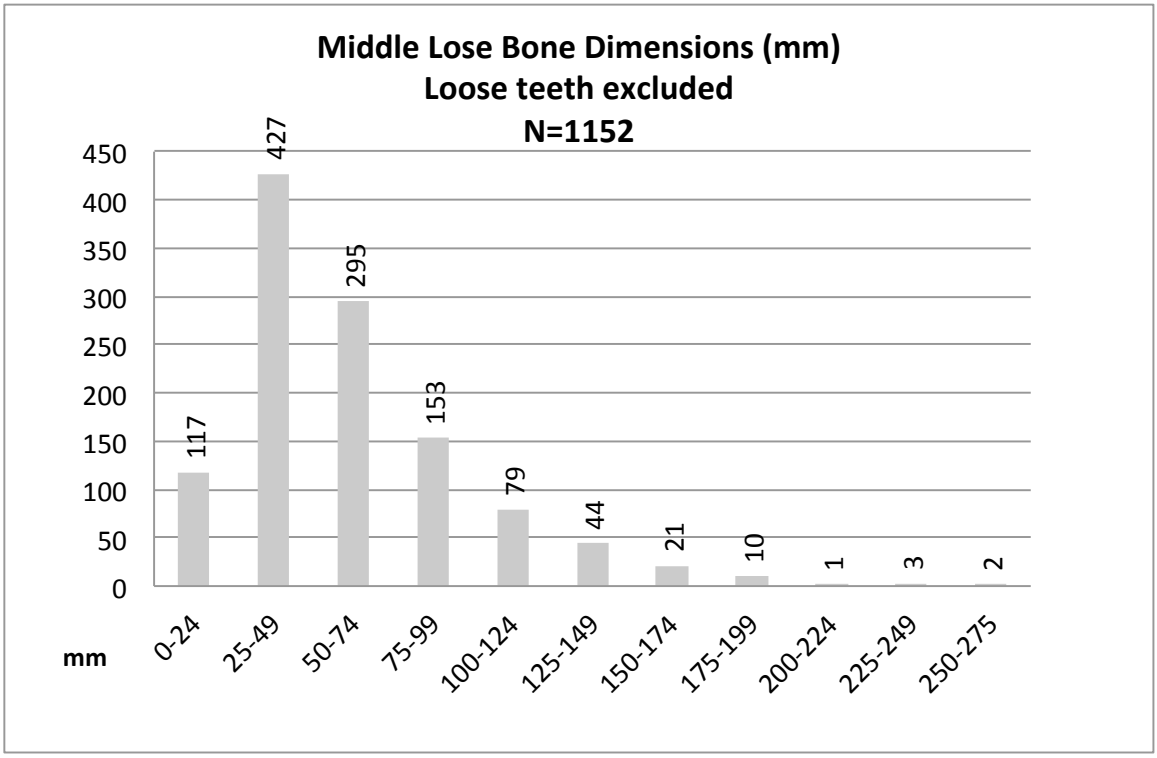


Figure 8-17. Middle Lose bone dimensions in mm.

The Middle Lose specimen dimensions (Figure 8-17) follow those of the Early Lose, indicating at least some continuity in food preparation preferences. 24-49mm remains the most common size category at 37.1%. 96.8% of the specimens fall into the 1-149 millimeter size range, and 86.1 (n=992) fall within the 1-99 mm size range.

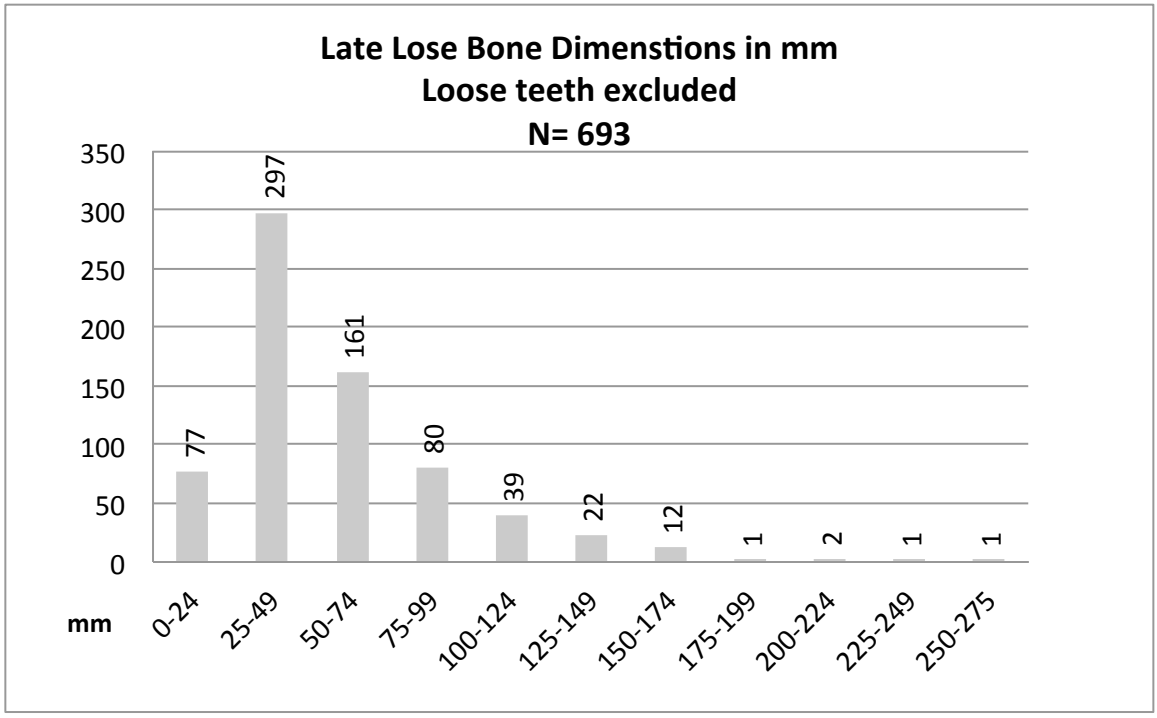


Figure 8-18. Late lose bone dimensions in mm.

With the analysis of Late Lose bone dimensions as shown in Figure 9-18, the long-lasting preference for smaller pieces of meat and bone can be more strongly argued for; at 49.2% (n=297), 25-49mm is again the most common size category. 97.5% (n=676) of the specimens that that were measured fall within the 1-149mm size range, and 88.7% (n=615) fall within the 1-99 mm size range.

Discussion

There is remarkable continuity in a preference for small bone sizes at Bosutswe, with an average of 97.1% of specimens being less than 150mm long, and 87.5% being less than 100 mm long. There is also a consistent pattern of specimens in the 25-49 mm size range being the most common. Arnold and Lyons (2011) argue that the small size of bones fragments (100 millimeters or less) in the modern Mahas Region of Sudan is associated with stew-based cuisine that requires cooking in pots. In this study, men performed the butchering, while women dictated the portion sizes of individual fragments. Pieces of bone that were too large to fit in

cooking pots were returned to the men for further size reduction. The size range of the Bosutswe specimens indicates that many of them were small enough to fit into cooking pots for stewing.

Burning Rates

The percentage of burnt bone at Bosutswe is low, suggesting that roasting was not a common cooking method. Ethnography indicates that boiling meat in modern times is preferred to roasting; the Bosutswe data suggests that this preference existed in antiquity as well. Most bones were unburnt, and it appears that long bones were preferentially chopped through. However, there was a small increase in burning during the Late Lose that indicates a small increase in the amount of roasted meat during this late time period.

The variable effects that heat and burning have on bone can be indexed visually. When heated, bone first browns, then blackens. After blackening, bone turns grey and/or bluish, then finally white when it becomes calcinated (David 1990). Brown bone is taken to indicate roasting. Black bone may resemble roasted bones, as localized blackening can occur on bone that is not covered by flesh when exposed to heat (Bulmer 1976). Black can also indicate burning, rendering food inedible, or trash disposal. Blue/grey and white indicate accidentally overcooking meat past the point where it is edible, or trash disposal.

Boiling and frying are the preferred methods of cooking meat in Botswana today (Denbow and Thebe 2006). Boiling does not discolor bone in the same way that heating over a fire does, leaving it white when it enters an archaeological assemblage, assuming taxonomic factors have not intervened to otherwise discolor it. Wing (2000) argues that if bone does not show evidence of burning, it is likely that it was boiled or stewed. If it does show evidence of burning, it was likely roasted. However, Kent (1993) argues that meat on the bone can often be roasted without showing evidence of being charred. In their ethnoarchaeological study of butchering and cooking in Sudan, Arnold and Lyons (2011) link the low incidence of burned bone in the Mahas Region with the high prevalence of cooking meat in stews, both on and off the bone, rather than roasting it.

Voight (1983) notes that disposing of hot ash in a midden could burn bone through a slow charring process, resulting in brown or black bones. Hearths in modern Botswana are cleaned regularly, as ash buildup is undesirable. (Denbow, personal communication).

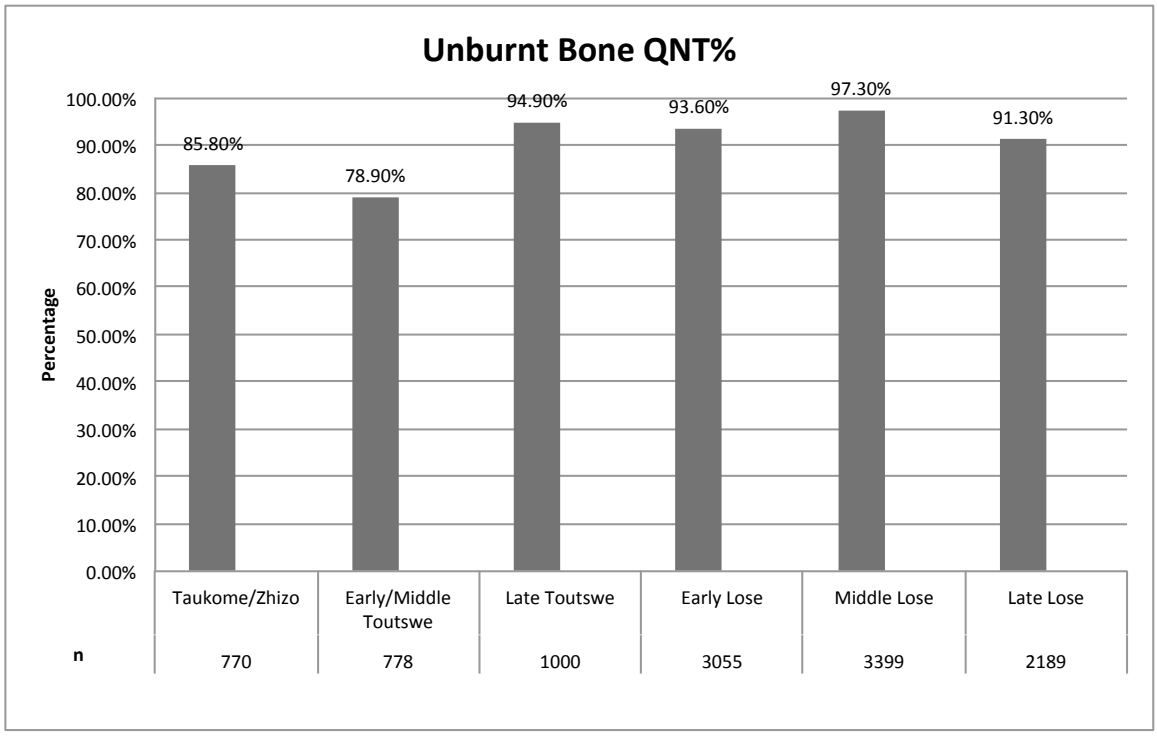
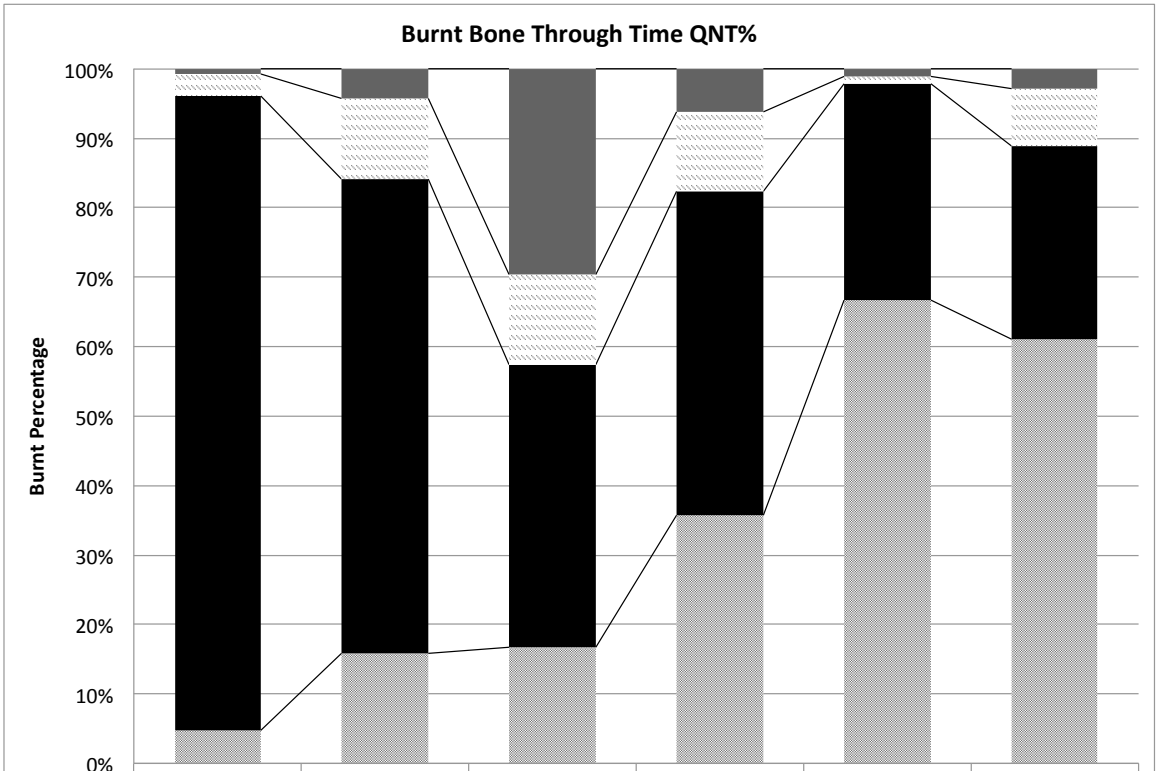


Figure 8-19. Unburnt vs. burnt bone QNT%.

As Figure 8-19 illustrates, most bone at Bosutswe is not burnt. Unburnt bone is most common during the middle Lose (97.3%, n=3399), and lowest during the Early/Middle Toutswe (78.9%, n=778), when the excavated portion of the site was used as an animal kraal. Unburnt bone seems to become more common during and after the Late Toustwe periods. Burning rates are never high at Bosutswe, and the vast majority of bone does not show evidence of being burnt.



	Taukome/Zhizo	Early/Middle Toutswe	Late Toutswe	Early Lose	Middle Lose	Late Lose
White n	1	9	16	13	1	6
Grey n	4	24	7	24	1	17
Black n	116	142	22	98	29	58
Brown n	6	33	9	75	62	127

Figure 8-20. Burnt Bone Through Time QNT%.

The small amount of bone that is burnt at Bosutswe (Figure 8-20) becomes less black and more brown through time, especially in the Lose period. Roasting may have become more common during the Lose period, but only slightly. Boiling was still the dominant mode of cooking.

A Taste for Meat

It has been shown that there were substantial differences between the Western and Central precincts in terms of what age cattle and small stock were slaughtered during the Early and Middle Lose. During these time periods, the inhabitants of the Western precinct

preferentially consumed adult animals (possibly continuing to adhere to herding and culling practices designed to increase numbers of domestic animals), while the inhabitants of the Central precinct preferentially consumed non-adult animals, including older and younger animals that they were able to obtain from other people's herds, or from a common herd. This pattern of southern African elites consuming older animals has been observed at other high-status sites such as uMgungundlovu. The meat from these older animals would have been chewy and tough unless boiled for an extended period of time (Plug and Roodt 2000).

As Mintz (1985) has argued, social emulation can influence what products are considered desirable. Among modern Batswana, meat makes a meal. Usually the "best" meat is beef, and the best meat is chewy. This desire for chewy beef may have its origins in the unequal availability of beef and the social requirement of sharing. Chewy beef at Bosutswe would have been especially plentiful during the Early and Middle Lose, when elites consumed mainly young and aged cattle. This beef would have been a luxury: these young and old animals represent a significant departure from the reproduction-oriented herding strategies of Western precinct inhabitants. Elites were able to obtain and consume domestic animals from commoners, using them for meat rather than allowing them to reproduce. These aged and young animals were marked by their special qualities and social significance as luxuries (Ervynck, et al. 2003; van der Veen 2003). The ethnographically documented importance of sharing as a way to emphasize and increase social cohesiveness has been noted (Amanze 2002; Denbow and Thebe 2006). Sharing creates social bonds, but also generates indebtedness and emphasizes status differences (Dietler 2001; Mauss 1967). Bosutswe elites preferred certain cutes of meat- especially upper limbs- but shared meat with commoners by distributing other parts of animals, especially lower limb bones and craniums. Sharing with commoners on the part of elites likely generated feelings of gratitude and social cohesiveness among the inhabitants of Bosutswe, but reserving highly valued cuts of meat for elites also expressed social divisions and codified status differences.

Sharing the meat of these luxury animals conforms to standard Marxist models of mediating class conflict through creating false consciousness. With declines in wildlife and/or

changes in hunting practices during the Toutswe period, wild meat became scarcer and domesticates, especially cattle, became more valued. Persons who happened own cattle were placed in an advantageous position, and were able to exploit this situation by expanding their herds and implementing a *mafisa*-style herding system, enmeshing less-wealthy individuals in this system. Less wealthy individuals could have herded the cattle of others in the hopes of becoming wealthy cattle owners themselves. Bosutswe elites were also able to exert power over others by extracting tribute or fees from commoners in the form of domestic animals, further emphasizing their status as elites.

Gnawing

Many animals scavenge the bones of dead animals in order to take advantage of pieces of meat and tissue clinging to them, and/or to ingest them for the calcium they contain (Wing 2000). If bones are fresh, dogs and cats will preferentially choose bones that have large muscle attachments, because these bones tend to have more meat on them after humans have taken what they are able to. Dogs often choose the proximal end of the humerus bone from bovids to gnaw on for this reason (O'Connor 2000). Dogs tend to leave overlapping, shallow and wide craters, as well as grooves when they gnaw on bones. Cats leave narrow, deep puncture marks. Rodents leave chisel-like marks when they gnaw on bone (O'Connor 2000). It is very common for rodents to gnaw on bone.

It is likely that carnivore gnaw marks at Bosutswe are largely the result of domestic dogs, since wild carnivores are unlikely to frequent settlements and deposit gnawed bones there (Plug and Badenhorst 2006). One domestic dog upper premolar was recovered from the Middle Lose period. Plug and Badenhorst (2006) argue that dog remains are under-represented in southern Africa, because as a non-food species, it was rare for their remains to be placed in middens. Instead, many dogs may have died in the bush during hunting expeditions. Hunting with dogs is documented in southern Africa (Schapera 1984) since the 6th century CE (Plug and Robertson

1989; Plug 2000). Dogs are useful for guarding homes as well as hunting (Lupo 2011; Russell 2012; Schapera 1938).

Reitz and Wing (1999: 135) indicate that specimens that were gnawed were likely not buried when they were disposed of. Despite the documented presence of domestic dogs at Bosutswe, and the occurrence of concomitant rodent pest species, the overall incidence of bone gnawing at Bosutswe is low, suggesting that bones may have been quickly disposed of after meat consumption, rather than being left out in the open. This, of course, does not address the complete destruction of bone by domestic dogs. Dogs are capable of removing large quantities of bone from the archaeological record (Davis 1987; Payne and Munson 1986; Spennemann 1990).

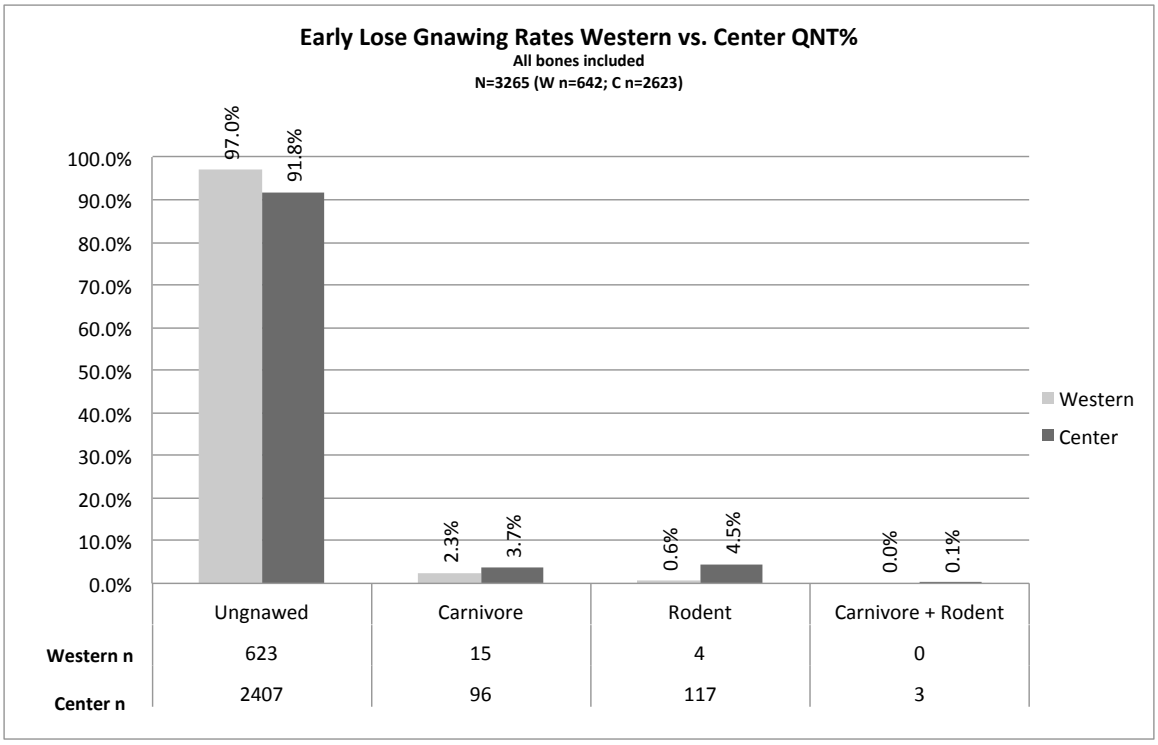


Figure 8-22. Early Lose Gnawing Rates Western vs. Center QNT%.

The Central precinct assemblage shows significantly more signs of rodent gnawing (X^2=21.2835, p= 0.0001) (Figure 8-22), presumably relating to a greater proportion of rodents attracted to grain compared to the Western precinct. The difference in carnivore gnawing rates is not significant. The faunal assemblage may provide direct evidence that elites participated in

hunting; while elites chose to consume more domesticates than wild animals, they made an exception for zebras. During the Early Lose period, elites in the Central precinct consumed greater numbers of zebra then commoners, and also consumed higher-status zebra body parts, such as upper limbs. It is possible that commoners and elites both participated in communal hunts during this time period, when wild Class III ungulates were heavily exploited.

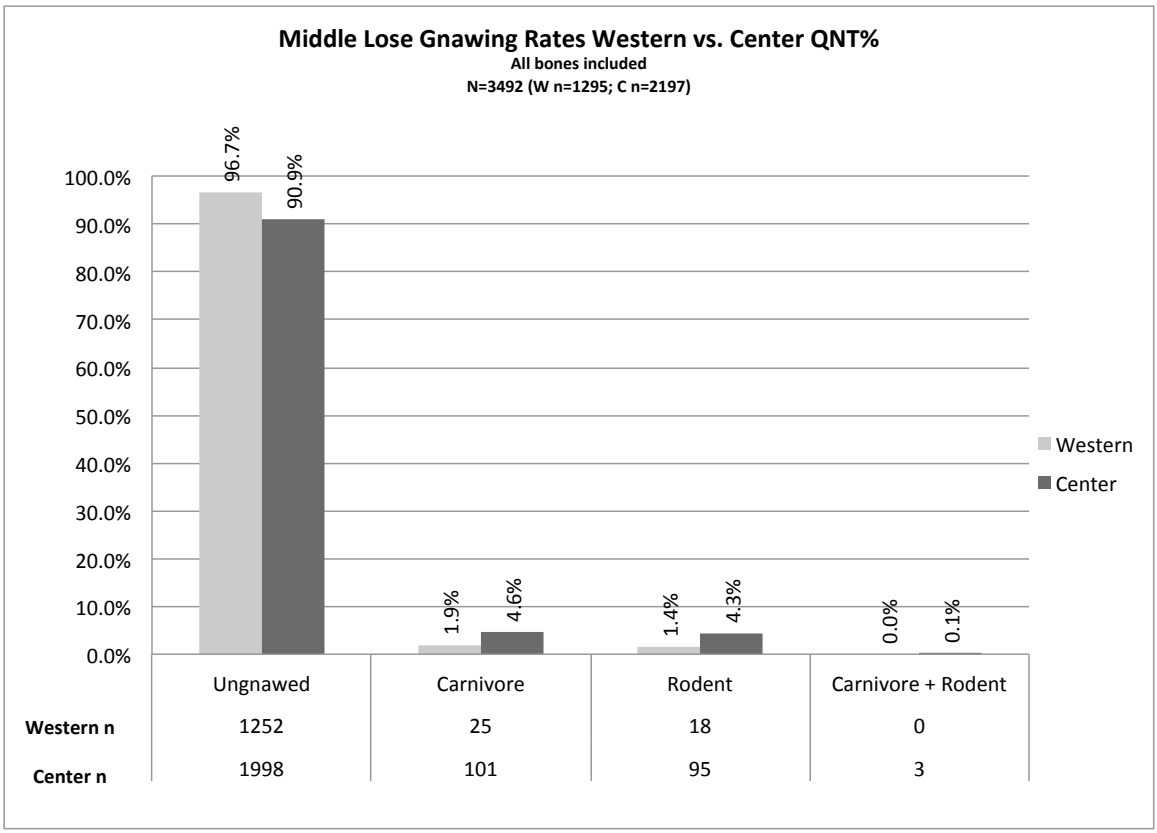


Figure 8-23.Middle Lose Gnawing Rates Western vs. Central QNT%.

As Figure 8-23 shows, the Central Precinct has significantly greater (X^2=22.4007; <0.0001) rodent gnawing rates as well as significantly greater (X^2=16.6583; p=<0.0001) carnivore gnawing rates during the Middle Lose. What may be a dog's lair that was used for gnawing bones was discovered during Middle Lose layers in the Central precinct. The higher carnivore gnawing rate is surprising, considering the low rate of hunted animals in the Central precinct Middle Lose assemblage. Dogs are useful as guard animals, but also for hunting (Lupo

2011; Russell 2006; Segobye 1998a; Voight 1983). Dogs may have roamed throughout the site, instead of only staying in one particular precinct, thereby spreading evidence of their activities- in this case, gnawing- throughout the site. Comparison of Western vs. Central species profiles indicate that Westerners may have consumed more wild animals than inhabitants during the Central precinct during this time period (see Chapter 11); but the rates of carnivore gnawing in the Central precinct, presumably caused by dogs, suggest that these inhabitants also participated in hunting. Communal hunting could have been used as a group activity to foster bonds between different segments of the Bosutswe community, but also may have provided elites with a way to display their leadership skills.

While both commoners and elites may have participated in communal hunts, the species distribution of wild animals indicates that wild animals were consumed at higher rates by commoners during the Lose period(see Chapter 11); Hunting together may have served to bring the community together and emphasize group action, but the physical division of wild animals at the site, where commoners consumed relatively greater portion of wild animals and elites consumed a greater portion of domestic animals, served to emphasize rank and inequality at Bosutswe.

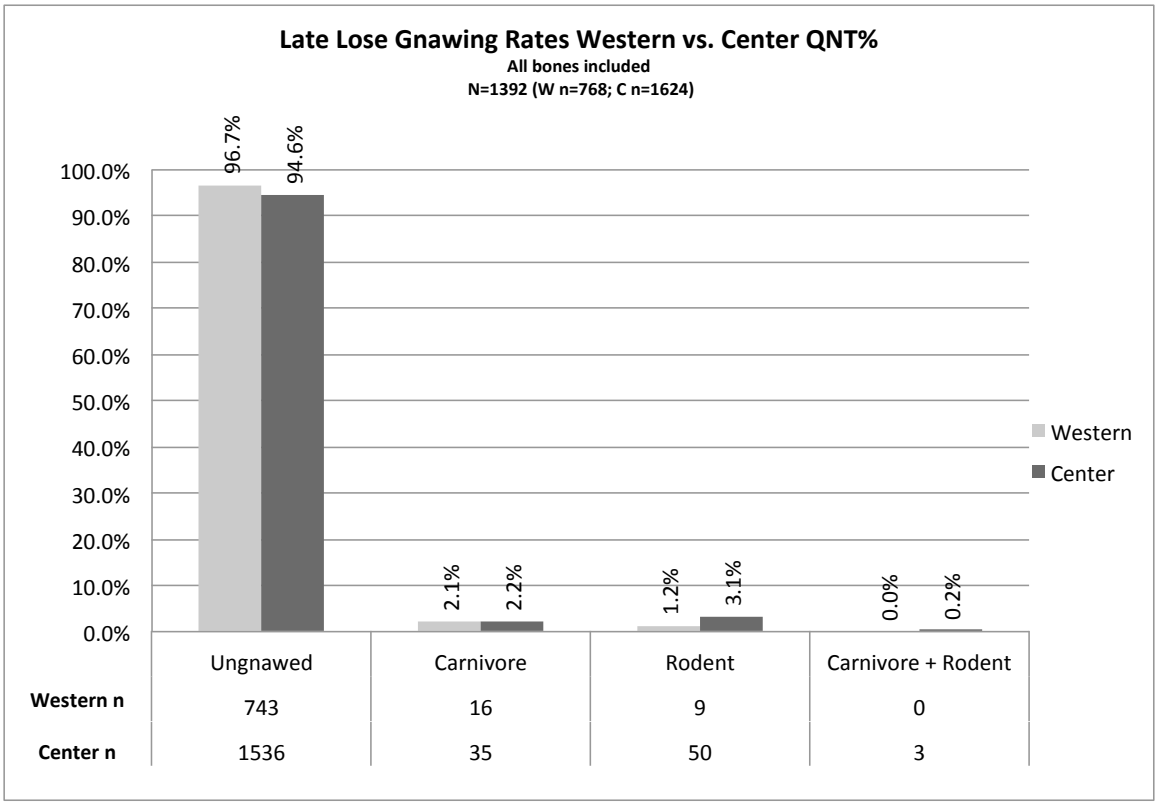


Figure 8-24. Late Lose Gnawing. Western vs. Central QNT%.

The supposition that dogs at Bosutswe were used for hunting at least some of the time is supported by a comparison of Western and Central gnawing rates during the Late Lose period (Figure 8-24), when wild animal resources' contribution to the diet reached their nadir. During the Late Lose, when the wild ungulate assemblage is dominated by Bovid I specimens, communal hunting may not have been a common activity. These small bovids are less gregarious than larger bovids, and are more likely to have been caught in traps and snares. With hunting contributing a minimal amount to the diet of all inhabitants, the difference between the carnivore gnawing rates in the Western and Central precincts is negligible and statistically insignificant. With the need for hunting reduced, the Western and Central precincts seem to have had similar dog populations.

The importance of cooking

While not wanting to make stereotypical assumptions about gender or sex roles (Gilchrist 1999), there is wealth of ethnographic data to suggest that sex, age and patrilineage were used (and continue to be used) to structure the division of labor among the Tswana, and that women care out food preparation activities in many societies Cross-cultural data (Murdock and Provost 1973; Stein 2012) indicate that women often carry out cooking activities, and men often carrout butchering activities. Women in Tswana society are responsible for many household duties involving food storage and preparation, so the examination of food storage and preparation may be a way to explore the role women played in the past (Conkey and Gero 1991; Hastorff 1991). It is likely that males spent much of their youth engaged in herding activities (Setiloane 1976), while females carried out their tasks closer to home.

The examination of culinary practices at Bosutswe provides a way to examine women's roles in society and their contribution to sustaining and contesting inequality at Bosutswe (Messer, et al. 2008; Montón Subías 2002). Arnold and Lyon (2011) argue that our focus on transportation costs (the activity of men) when considering butchery may be misplaced. Women in the Mahas region of Sudan make decisions about the condition of food when it is actually cooked, sending cuts of meat with bone back to the male butchers for further subdivision if they are too large to be placed in cooking pots for stewing. Since women were likely to have been in control of food preparation at Bosutswe, similar decision making processes could have taken place at Bosutswe. Food is a premier social material that allows us to read equality and inequality in the material record. Because it is likely that women were in charge of culinary activities at Bosutswe, their decisions can be read as continually making and re-making part of the social world.

The social rule emphasizing sharing as a way to strengthen and define social bonds is visible in the body part distribution of food species at Bosutswe. Women made daily decisions concerning how food was to be divided and then prepared it. Some people received more highly valued cuts of meat, but food was generally prepared the same way among elites and

commoners. By deciding and continually re-deciding that certain people should consume different animals or body parts, women were an essential component in creating and validating class difference at Bosutswe. By maintaining the social requirement for sharing and perpetuating similar cooking practices across social classes, It can be argued that women symbolically expressed the need to have social solidarity and goodwill in order for everyone in society to prosper.

Chapter 9: Wild Animals: the role of hunting and divination in negotiating inequality

While the material goods and dietary data indicate that the inhabitants of Bosutswe habitually enacted inequalities in their daily lives, the commoners of Bosutswe were able to counter these divisive forces in several ways that helped to bind the community together; communal hunting could have helped to generate ties amongst commoners and elites. Faunal remains of animals that ethnographic data suggest are used in divination are found in both the Central and the Western precinct, suggesting that commoners might have wielded spiritual power of their own and that the elites did not have a monopoly on spiritual power. The belief that some animals are spiritually significant is widespread in southern Africa, and some beliefs may have been borrowed from the original Basarwa inhabitants of southern Africa (Hammond-Tooke 1999; Kopytoff 1987).

DIVINATION AND RITUAL SPECIALISTS AT BOSUTSWE: SHARING SPIRITUAL POWER.

Ditaola: divining bones

When considering the number of identified specimens at Bosutswe, it is apparent that some species are present at only very low numbers. While these specimens most likely did not provide a reliable, steady part of the diet to the inhabitants of Bosutswe, their low numbers should not automatically send them to the dustbin to be forgotten; their presence may be used to extend ethnographically documented ritual practices back into the past, providing a way to gauge their time depth. Some species with low NISP may relate to ritual practices (Badenhorst 2003; Nelson 2008).

Ritual practices involving wild plants and animals are well documented in southern Africa (Schapera 1971, 1984; Dennis 1978; Hammond-Took 1999; Amanze 2002). The use of divination bones (ditaola) is very widespread in Botswana (Schapera 1984; Amanze 2002). In modern Botswana, traditional diviners who use bones in their practice are called "horned

doctors," *dinaka tse dinka*. They use their skills and spiritual knowledge to diagnose disease, as well as spiritual ailments based on the pattern bones fall in after they are thrown.

Diviner's kits can be made from a variety of bones from a variety of species, as well as other objects, such as seeds. Astragali, also called knucklebones, have been used worldwide for gaming and divination (Dandoy 2006), and are used in southern African divination (Binsbergen 1995; Dennis 1978; Folk-Lore 1898).

There is strong evidence for divination in the Central precinct: a feature named the Hyena Floor was discovered in 1990 with white agate disks and several hyaena canines suggest that this area was used by a person who wielded spiritual power(Denbow 1999). But, evidence for divination is not limited to the elite areas of Bosutswe. Carnivores and more unusual animals such as antbear (aka aardvark) are common in the Western precinct and become more common through time. While sanctioned divinatory activities, including possible chicken sacrifice (Nelson 2008) may have been carried out in the Central precinct by elites, commoners at Bosutswe were also able to become ritual specialists. While the inhabitants of the Central precinct had greater access to high-status material good such as glass beads and metal personal adornments, access to spiritual power may have been available to both commoners and elites. This could have provided commoners with an avenue to ameliorate at least some of the inequalities in their daily lives. It should be noted that social inequality at Bosutswe may not have been experienced in the personally limiting and emotionally upsetting ways many modern Americans may expect it to be (Denbow, Mosothwane, et al. 2008). Rituals carried out by elites would have been carried out for the benefit of all, not just for the benefits of elites.

Rainmaking

Botswana is a relatively dry country that is subject to drought, which can be disastrous for crops and livestock. In the past, rainmaking was a crucial duty of chiefs, as well as specialized rainmakers (Schapera 1971) (called *moroka ya pula*; Denbow and Thebe 2006). The chief acted as an intermediary between humans and the ancestors, and through the ancestors

Modimo (high god) (Schapera 1971.) This ability to successfully ask the ancestors, and by proxy *Modimo*, for rain was limited to the chief, because he was the most senior living descendant of the ancestors. A specialized rainmaker might be called in to assist the chief in his efforts.

Rainmaking rituals and their archaeological correlates

There are two classes of rainmaking ceremonies; some ceremonies are carried out every year, and others are only carried out in cases of drought.

Rainmaking rituals of the chief and ritual specialists must be taught, and were often conducted in secret with specific tools, such as horns to hold doctored soot or lion fat (Schapera 1971). In Schapera's work with the Kgatla, he describes a large horn (*lenaka labogosi* "horn of cheifship", also called *lenaka lantwa* "war horn" holding t*shitlho*, a sooty paste containing various ingredients, and a smaller horn (*lenaka lapula*, "rain horn") that contained a specific type of *tshitlho* that was only made of rain medicines. This *tshitlo* is called *medupe*, which can be translated as "soft, steady rain" or "female rain". Other rainmaking paraphernalia included a piece of wood with arrows carved at each end, and a clay bowl and pot (Schapera 1971: 32).

The color black is strongly associated with rain because of the dark color of rainclouds, and this color features prominently in rainmaking. Black pots were used in rainmaking (Schapera 1971:72), as well as black sheep and oxen for sacrifice. Rain medicines consisted of fat, especially lion fat. They also often contained snake dung, from a python if possible, since pythons are associated with rain pools and mountain springs.

Huffman (2009b) has tied the rise of Mapungubwe and increased status-based social distinction to the power wielded by chiefs as rainmakers. This sacred leadership was based in the special relationship of the ruler to the land, his ancestors and God. Huffman (ibid) believes that drought at the end of the 13th century undermined the people's confidence in the sacred leaders of Mapungubwe, leaving a power vacuum in the region.

Klipspringers are used in rainmaking rites to relieve droughts (Amaze 2002; Scapera 1971). Klipsringers live in mated pairs or in a family group of three. They live in steep, rocky

landscapes. Live klipspringers were captured in a *letsholo* (see chapter 6) and sacrificed to God in the *kgotla*. Medicines were made from the skin and intestines, which were then taken to the bush and burned. Two klipspringer specimens are present in the Early and Middle Toutswe. Two specimens are present in the Central Early Lose assemblage.

Isolated human bones

Several isolated human bones were discovered during the 2000 and 2001 excavations at Bosutswe. Their isolated context made them difficult to identify as human while excavations were being carried out, resulting in their grouping with faunal remains. As Plug (1996) and Mitchell and Plug (2001) have discussed, human bones not found in association with a burial may indicate past ritual activity. Isolated human specimens are found in all time periods except the Late Lose, but are especially common in the Early and Middle Toutswe, when 8 out 15 specimens are found (57.1%); these levels in the Western precinct contain most of the burials discovered at Bosutswe. These Early and Middle Toutswe specimens consist of one molar, three left carpals, one left tarsal, one left metatarsal shaft of the big toe, one metapodial, and three 3rd phalanges, one of which could be identified as a big toe. The other two phalanges could not be identified to a more complete level. Three specimens (two carpals and a first phalanx) are found during the Taukome/Zhizo period. Two specimens are found during the Early Lose: one second phalanx in the Western precinct, and one deciduous molar in the Central precinct. Of course, the deciduous tooth may not be related to ritual mutilation. During the Middle Lose, one third phalanx was identified as likely being the end of a right big toe. The 1990 excavation discovered a human phalanx in the Toutswe deposits, and a finger phalanx in the Early Lose deposits

Plug and Mitchell (2001) argue that ritual mutilation in southern Africa can be used to signal both ethnic and gender identity. Among the Khoisan, deliberate phalange removal was used to reinforce the dominance of men over women. Khoikoi sometimes cut or bit off a finger as a sign of mourning when a close relative died. Bantu speakers from South Africa's Eastern

Cape Province are reported to have amputated finger joints to cure illness or dispel inappropriate behavior. It may have also been used as a visible marker of group membership.

No cut marks were observed on the isolated human specimens. Three specimens from the Early and Middle Lose show signs of burning. Their color is light brown. According to Plug and Mitchell (ibid.) fingers are most often associated with ritual mutilation; no isolated fingers could be firmly identified from the 2001 and 2002 Bosutswe assemblage.

Predators

Predators are common in the Bosutswe assemblage. Predators may be regarded as a nuisance and killed simply to eliminate a potential source of danger (Hitchcock 1978). Hyaenas specimens from the 2000 and 2001 excavations are limited to the Central precinct apart from one lower second incisor from the Early and Middle Toutswe levels in the Western precicnt. Hyaneas become more common through time; one specimen was identified in the Early Lose, two in the Middle Lose, and four in the Late Lose. If hyaena were held spiritual value, elites may have held exclusive rights to use them. Hyaenas today are imbued with spiritual value in Botswana; witches are said to ride on them, and traditional doctors use the anal scent glands in their initiation ceremony (Denbow, personal communication, 12/21/13).

Predators seem to be increasingly common at Bosutswe through time; they are present in both the Central and the Western precinct. While some animals, such as hyaenas, are limited to the Central precinct, in general carnivores are much better represented in the Western precinct.

Animal Skins and Status

In relatively recent times, it is known that sumptuary laws were in place in regards to who could possess certain animal skins; lion and leopard skins had to be given to the chief (Shapera 1932). Three lion remains were found, two in the Western precinct and one in the Central precinct: one metapodial was discovered in the Early and Middle Toutswe Western assemblage, one metatarsal was identified in the Early Lose Central assemblage, and a first phalanx was found in the Middle Lose Western assemblage If lion skins were limited to rulers in

the past, lion skin preparation may have been carried out in the Western precinct. Numbers are small, but lion remains do not conform to the expectation that high-status animals will be limited to the Central precinct.

Chickens

Chickens are not difficult to raise (Simpson and Mcdowell 1986), and they are very common in modern Botswana (Grivetti 1981), necessitating an explanation for their differential consumption rates in the Central and Western precincts. Chickens are present in small amounts from the Taukome/Zhizo period at Bosutswe, but they are present in larger numbers in the Central precinct than the Western precinct. Chickens may have been used in ancestor sacrifice among the Tswana (Nelson 2008) at greater rates among persons living in the Central precinct for the same reasons.

The Bosutswe assemblage has a wide variety of animals that may be special in some way. They stand out because of what they may indicate about beliefs and daily life of the inhabitants of Bosutswe: they hunted large game, were connected to other regions of southern Africa, and practiced ritual divination. Inequalities were apparent in the diet of commoners and Westerners, but the use of wild animals could have served to both counter and magnify these divisive forces. Like hyaena and megafauna (see below), chicken may have been the focus of special social forces.

Very Large Mammals

Very large mammals are never numerous and are not present in the Bosutswe assemblage until the Early Lose period. While large game are the most efficient choice when they are available locally (Ugan 2005), hunting large game can be beneficial even when long-distance trips of up to 100-200 km are needed to acquire them. It can be difficult to disentangle the importance of social prestige gained from hunting big game from their nutritional value (Grimstead 2010).

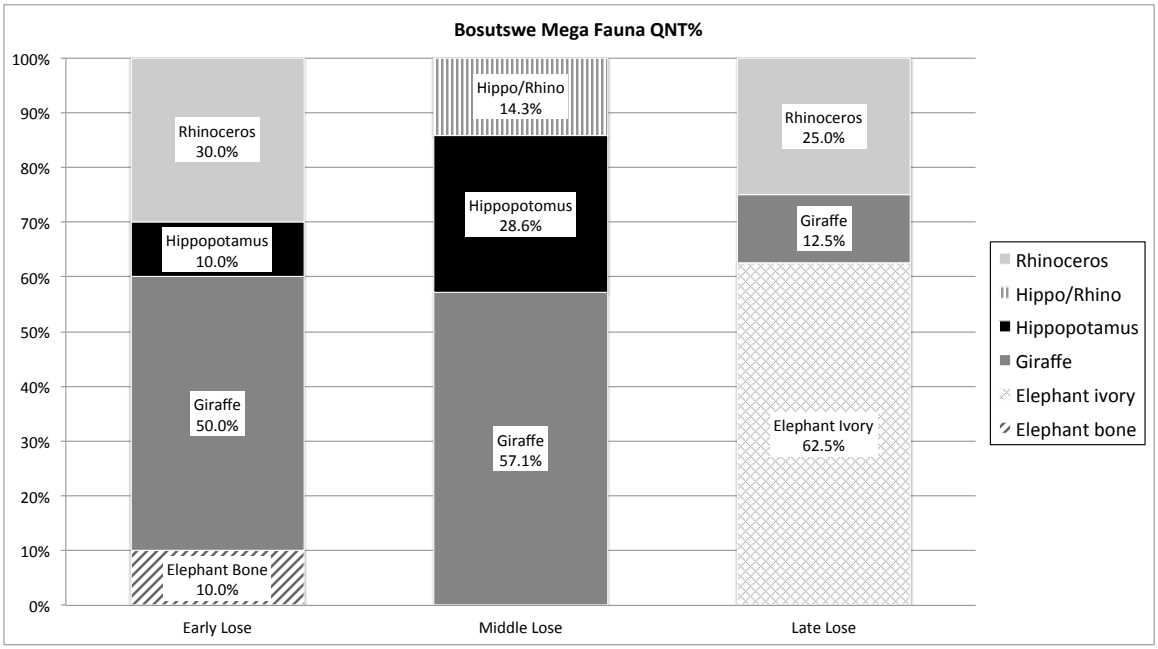


Figure 9-1. Bosutswe megafauna QNT%

	Early Lose	Middle Lose	Late Lose
Elephant Bone	1	0	0
Elephant Ivory	0	0	5
Giraffe	5	4	1
Hippopotamus	1	2	0
Hippo/Rhino	0	1	0
Rhinoceros	3	0	2
Total	**10**	**7**	**8**

Table 9-1. Bosutswe megafauna QNT.

Figure 9-1 illustrates the prevalence of megafauna at Bosutswe over time. Most megafauna are limited to the Central precinct, apart from a giraffe tibia with chop marks from the Middle Lose, and a giraffe sesamoid from the Late Lose Period. No megafauna were found in the Western precinct in the Early Lose Western assemblage. Megafauna hunting seems to have declined in importance through time at Bosutswe. The many chop marks on the megafauna bone may indicate that the animals were hunted, or at least collected while fresh enough for meat to have been removed.

The Early Lose period shows the greatest amount of megafauna diversity; elephant bone (not ivory, which was a trade item), giraffe, hippopotamus and rhinoceros are all represented in the assemblage, indicating the inhabitants of Bosutswe chose to pursue a variety of very large game. The Middle Lose may be more diverse; giraffe, hippopotamus, and either hippo or rhinoceros are present. Most of the megafauna remains from the Late Lose are ivory fragments (part of an ivory bangle and four pieces of polished ivory), which may relate to the southern African ivory trade rather than hunting by the inhabitants of Bosutswe. Two rhinoceros longbone fragments are present, one showing chop marks and signs of being burnt brown. One giraffe sesamoid is also present. These data suggest that giraffe were the most common megafauna for the inhabitants of Bosutswe- they may have also been the easiest or least dangerous to obtain. The only megafauna found in the Western precinct are giraffe; this may indicate relatively low status of giraffe compared to other megafauna; still, their presence in all sections of Bosutswe may indicate commoner participation in communal hunting and the social bonds it entails.

Trade

It is culturally significant that exotic non-local species such as sitatunga and waterbuck are present in the assemblage during the Taukome and Zhizo time periods; Estes (1991) identifies waterbuck as a highly water dependent and large antelope. Its current range is limited to the Okavango Delta and River, as well as the more local Limpopo River. Waterbuck can occasionally wander far from their normal habitats (Smithers 1971). Sitatunga are highly specialized antelopes that inhabit swampy environments. Within Botswana, they are limited to the Okavango Delta and River and the Chobe River (Smithers 1971), but were formerly present in the Lake Dow area (Livingstone 1857).

As non-local species, sitatunga and waterbuck represent contact with other regions of southern Africa. This could have taken the form of hunting excursions carried out by men as suggested by Plug 1996, or it could represent indirect contact through trade. Waterbuck are

found during the Taukome/Zhizo and Toutswe period, but not the Lose period. The waterbuck specimens from the Taukome/Zhizo period could represent a single back leg: one patella, two first phalange, two second phalanges and one third phalanx are present. The sitatunga remains are limited to the Western precinct and are found during the Taukome/Zhizo, Early and Middle Toutswe, Late Toutswe and Early Lose. Such imported goods can be luxuries in that, even when they are abundant in their place of origin, they are rare at the place of consumption. The costs of transport, together with their limited availability on the market, make these goods especially costly (Ervynck, et al. 2003). Their symbolic association with wet areas could have also had symbolic importance for the inhabitants of Bosutswe, since they were likely concerned with rain and engaged in rainmaking activities.

Negotiating Inequality

Animals may have been exploited or avoided for non-economic reasons (Zimmerman-Holt 1996) at Bosutswe. The sudden appearance of megafauna during the Early Lose, a time of distinct and strong social inequality at Bosutswe, may point to a deeper meaning in these animals besides acquiring nutritious meat, including the importance of acquiring ivory and rhino horn through long-distance trade. Gnawing rates in the Central precinct may indicate that, despite the overall lower contribution of wild animals to the diet of Bosutswe elites, they were avid hunters. Alternatively, carnivore gnawing rates might not be correlated with presence of dogs used for hunting. Elites could have hunted with or without commoners. It is possible that during the Early Lose, elites and commoners hunted together for many ungulates, but hunting megafauna may have been restricted to elites. Alternatively, both commoners and elites hunted for megafauna, but megafauna were views as special and commoners were not permitted to keep their remains in the Western precinct. Both commoners and elites consumed zebra during the Early Lose, although elites were able to claim highly valued body parts at greater rates than commoners. The social bond generated by communal hunting may have been especially important during this period, when strong inequalities were new and very strongly expressed.

During the Middle and Late Lose, megafauna are found in both the Western and Central precinct, indicating that commoners gained access to this resource, and may have been permitted to participate in megafauna hunting expeditions. It is possible that Western inhabitants participated in megafauna hunts during earlier time periods, but that evidence has not been found for this due to small sample size

Collective hunting at Bosutswe may have been performed by men as a way to generate cohesive social bonds. It is possible that the sudden interest in megafauna in the Lose period may indicate the use of hunting to emphasize the status differences between elites and commoners by limiting their distribution to the Central precinct, but this cannot be determined with certainty.

Chapter 10 Local Habitat

Inferring Environment and Habitat

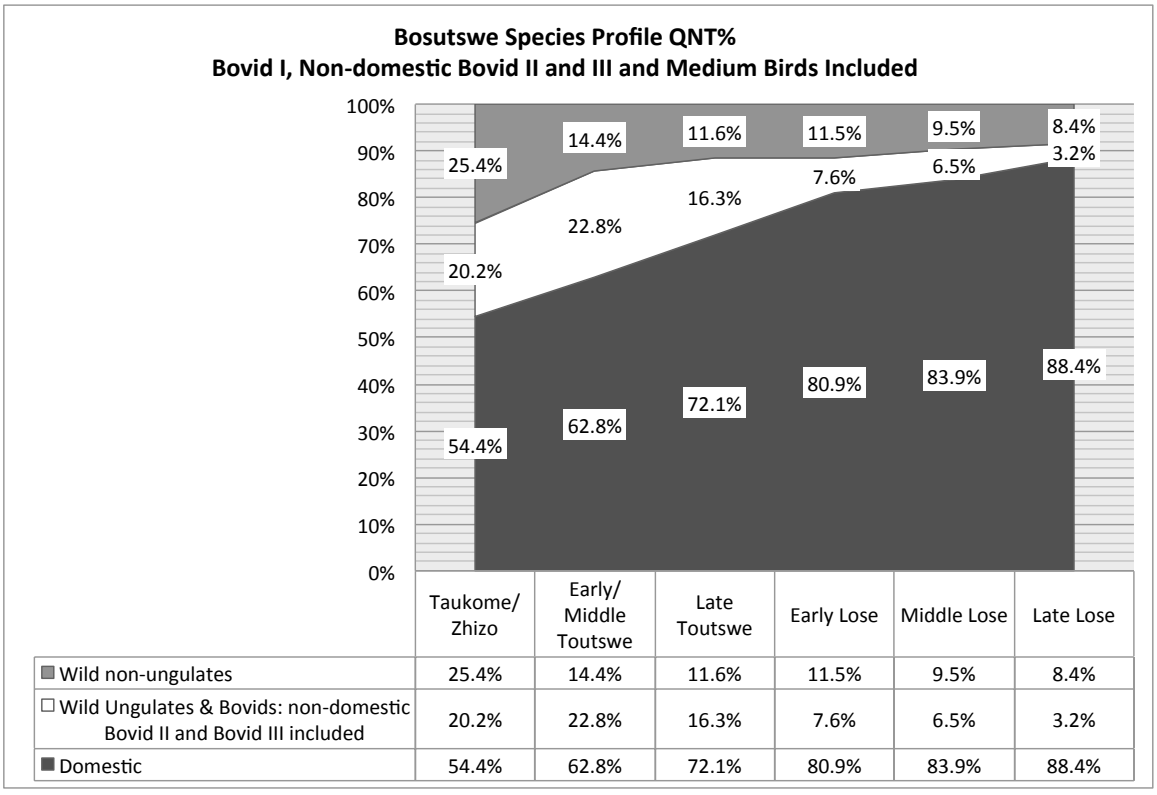
Animals with narrow habit ranges and feeding preferences are excellent bioindicators of the paleohabitat of the archaeological site under investigation (Reitz and Wing 1999). For this reason, a comparison of species represented at the site, especially wild animals, and animal habitat preferences can be used to reconstruct estimations of paleoenvironment (Stahl 1996; Reitz and Wing 1999; O'Connor 2000). Archaeologists should keep in mind that the habitat range of animals varies through time, and that an animal present at a particular site in the past may not have ranged there in the past, and vice versa (Campbell and Child 1971; Lyman 1994; O'Connor 2000).

Temperature, precipitation, evaporation rate and soil type, as well as other factors, all affect vegetation in a given area. In the case of Bosutswe, the long-term habitation of the site means that humans may have impacted the local habitat and ecosystem. Humans may have coped with these changes by hunting wild animals or housing domestic animals further away from the site as needs dictated, or may have developed other coping strategies. The information that zooarchaeology can provide about human impact on the local environment surrounding a site is pertinent to the current interest in the long-term effects that human actions can have on the environment. Zooarchaeology can be practical and useful for living people, and can affect our lives and decisions (Amorsi, et al. 1996; Lyman 1996).

Evidence for Habitat Change Around Bosutswe

It is clear that as time went on at Bosutswe, wild animal resources declined in importance. Bosutswe was occupied for an exceptionally long time for the region, allowing the possibility of local environmental degradation due to overexploitation of local resources and the need to maintain gardens and fields to produce plant crops. The rise in domestic animal consumption may have been the result of changing culinary

preferences that additionally relate to the high cultural value placed on beef and live cattle, as well as small stock and chickens. A decrease in the importance of communal hunting could have occurred. It is also possible that the change in species profile could be a result of environmental degradation, leaving the inhabitants with no other choice than to focus their energies on domestic livestock, as other researchers have suggested (Plug 1996, 2000; Plug and Badenhorst 2006; Badenhorst 2011). The high value placed on cattle in this scenario would have thus been a cultural response to diminished options. Campbell and Child (1971) indicate that habitat destruction along with hunting is more likely to reduce wild animal populations than hunting alone, except in the case of rhinoceros, and possibly giraffe and elephant.



	Taukome/ Zhizo	Early/ Middle Toutswe	Late Toutswe	Early Lose	Middle Lose	Late Lose
Wild non-ungulates	25.4%	14.4%	11.6%	11.5%	9.5%	8.4%
Wild Ungulates & Bovids: non-domestic Bovid II and Bovid III included	20.2%	22.8%	16.3%	7.6%	6.5%	3.2%
Domestic	54.4%	62.8%	72.1%	80.9%	83.9%	88.4%

Figure 10-1. Bosutswe Species Profile QNT%. Non-domestic Bovid II and III excluded.

	Taukome and Zhizo	Early and Middle Toutswe	Late Toutswe	Early Lose	Middle Lose	Late Lose
Domestic	337	432	535	1938	2012	1508
Wild Ungulates	125	157	121	182	157	54
Wild non-ungulates	157	99	86	275	229	144
Total	**619**	**688**	**742**	**2395**	**2398**	**1706**

Table 10-1. Bosutswe Species Profile QNT. Unspecified Bovid II and III excluded.

EXPECTED PATTERN OF ENVIRONMENTAL DEGRADATION

If human exploitation of plant and animal resources resulted in negative impacts on the local habitat of Bosutswe, we would expect to see changes in both the local plant and animal population as grasslands decreased and scrub and trees increased. The changes in the wild plant population would not be directly observable in this study, but would be reflected in the animal species that chose to live near the site and in hunting areas, as a consequence of what local plant species were available for them to feed on. It is expected that humans affected the local plant species population through gathering firewood and wild plants, grazing cattle near the site before they were moved off-site, keeping some domestic cattle and sheep near the site at least part of the time after the shift to a dispersed grazing pattern, and planting crops and gardens. It is expected that local hunting and trapping of wild animals took place near the site, and that long-distance hunting trips also occurred. Wild animal resources were also likely brought to Bosutswe through exchange with foragers.

Change in the natural environment is constant; even areas considered to be "pristine" often bear the stamps of human activity (Hayashida 2005). Wild animals in Botswana being negatively impacted by humans has been documented in modern times. Smithers (1971) notes that cattle grazing resulting in increased wild resource consumption by cattle, combined with a natural boom-and-bust population cycle noted by

Child (1968), resulted in unusually heavy juvenile wildebeest deaths in the northeastern Makarikari. Campbell and Childe (1971) remarked on the radical changes in animal and plant populations in Botswana compared to the travel journals of white hunters such as Cummings (1879) and others, making it clear that human actions affect the wildlife of Botswana. Grivetti (1981) noted a decline in the number of species present and a decline in the total number of animals in east of the Notwani River since the late 1800's that is likely a result of a rise in the local human population and a reduction in animal habitat. It is likely that these changes are not relatively recent, but have been occurring since the increased habitat disruption caused by farming and animal husbandry began in the first millennium CE.

If human activities at Bosutswe were affecting the local plant habitat, it is expected that biotic succession was taking place. While Botswana as a whole is semi-arid, Bosutswe is located in an ecotone, with dryer grassland and sandveld soils to the west, and wetter bush/grassland/tree savannah with hardveld soils to the east. The need to pasture cattle, goats and sheep is expected to negatively impact plant populations; cattle are grazers that prefer grass, while sheep and goats are mixed browsers and grazers that will also consume shrubs and other woody plants. It is expected that cattle would negatively affect grasslands through grazing, and that the need to increase agricultural output would also negatively impact natural plant populations. Cattle may have also fed on grass stubble from agricultural fields based on C4 stable isotope data from Bosutswe (Denbow et al. 2008).

Drought or a larger than normal amount of rain also affects plant and animal habitats. Drought can lead to wild animal die-offs due to starvation, while increased plant growth during wetter periods can be beneficial. Grasses are highly affected by the rain that falls in their growing season, and desiccate rapidly after the rainy season ends; by the later part of the season, only dry grass is available (Norman and Ogutu 2013). Tree foliage production is a reflection of the previous season's rainfall (Owen-Smith and

Ogutu ibid.). Rainfall levels during the Lose period at Bosutswe are believed to have been around 500mm/year, which is enough rain to allow rain-fed agriculture (Denbow et al 2007).

Overgrazing by domestic livestock results in predictable patterns of vegetation change in Botswana; as grasses are decimated, bushes and other woody species come to take their place. Perennial grass species may be replaced by annual grass species (Campbell and Child 1971; Hitchcock 1978). Bushy species and trees (i.e. browse) should become more common. The soil becomes drier (Campbell and Child 1971), and the wild species profile changes according to these altered conditions. More solitary bovid species prefer more closed habitats with more trees, while more gregarious bovid species such as wildebeest and zebra prefer habitats that are more open and have more grass. Herd size also varies by season (Estes 1971).

The change from grassland to woodland can occur rapidly, within 20 years (Parris and Child 1973). The persistence of the changes caused by poor veld management and overgrazing by cattle is a matter of some debate; Hitchcock (1978) indicates that many of the grass species that grew in formerly overgrazed areas will return once the cattle are removed from the area, while Campbell and Child (1971) indicate that trees and bush tend to persist once they have encroached upon a particular biome. The extent of the environmental damage may contribute to this discrepancy. Grasslands are more subject to change than bush or woodlands (Campbell and Child 1971).

There seems to be a strong increase in the number of cattle, sheep and goats and a decrease in hunted ungulates and bovids at Bosutswe during the Early Lose period; carbon staple isotope measures of Bosutswe cattle, along with the absence of dung deposits at the site during the Lose period suggest that cattle were moved off-site and herded elsewhere in the landscape (Denbow et al. 2008). This is a magnification of trends occurring during the preceding Late Toutswe period. Stable isotope data from Bosutswe cattle indicate that cattle consumed a diet heavy in C4 graze, which indicates a diet of

domestic and/or wild grasses. This contrasts strongly with the modern pattern of cattle switching to C3 browse once preferred C4 grasses are exhausted due to overgrazing (Denbow et al 2007; Mosothwane 2010). Small stock did not receive this herding treatment, and their isotopic values indicate access to both C3 browse and C4 graze.

Results

Animals and Plant Cover Through Time

Changes in animal populations at Bosutswe might reflect changes in the local and distant plant communities. In order to make this assessment, animals were separated into six groups according to their habitat requirements as defined by Smithers (1971), Estes (1991), Hawthorn (2011), and the University of Michigan's Animal Diversity Web (Meyers et al 2013). Where authors disagreed on habitat requirements, the habitat with more cover was selected. Where there was debate concerning feeding habits of grazing versus browsing, the author(s) advocating at least some browsing was favored (e.g., zebra).

Animals defined as preferring more open environments were identified as blue wildebeest, Burchell's zebra, Cape hartebeest, gemsbok, reedbuck, and springbok. Aardwolf, blackbacked jackal, eland, giraffe, impala, rhinoceros, roan, sable, scrub hare, Sharp's steenbok, steenbok, warthog, and waterbuck were designated as animals preferring an open habitat with some cover. Animals requiring cover were defined as kudu and wild cat. Lacustrian species were defined as hippopotamus and sitatunga. Kilpspringers were defined as requiring a rocky and steep habitat. Animals occupying a wide variety of habitats were defined as antbear (aka aardvark), baboon, elephant, hedgehog, hyaena, leopard, leopard tortoise, lion, mongoose, spotted hyaena, tortoise, and wild dog. Civets, genets, mongooses, common duikers, and spring hares were defined as occupying a wide variety of habitats, but needing or preferring at least some cover. Ostrich eggshells were omitted, as were specimens that could not be identified to a

level that allowed their habitat to be specified (i.e. medium birds, francolin size birds, unspecified carnivores, unspecified bovids, et cetera). Domestic species were also excluded.

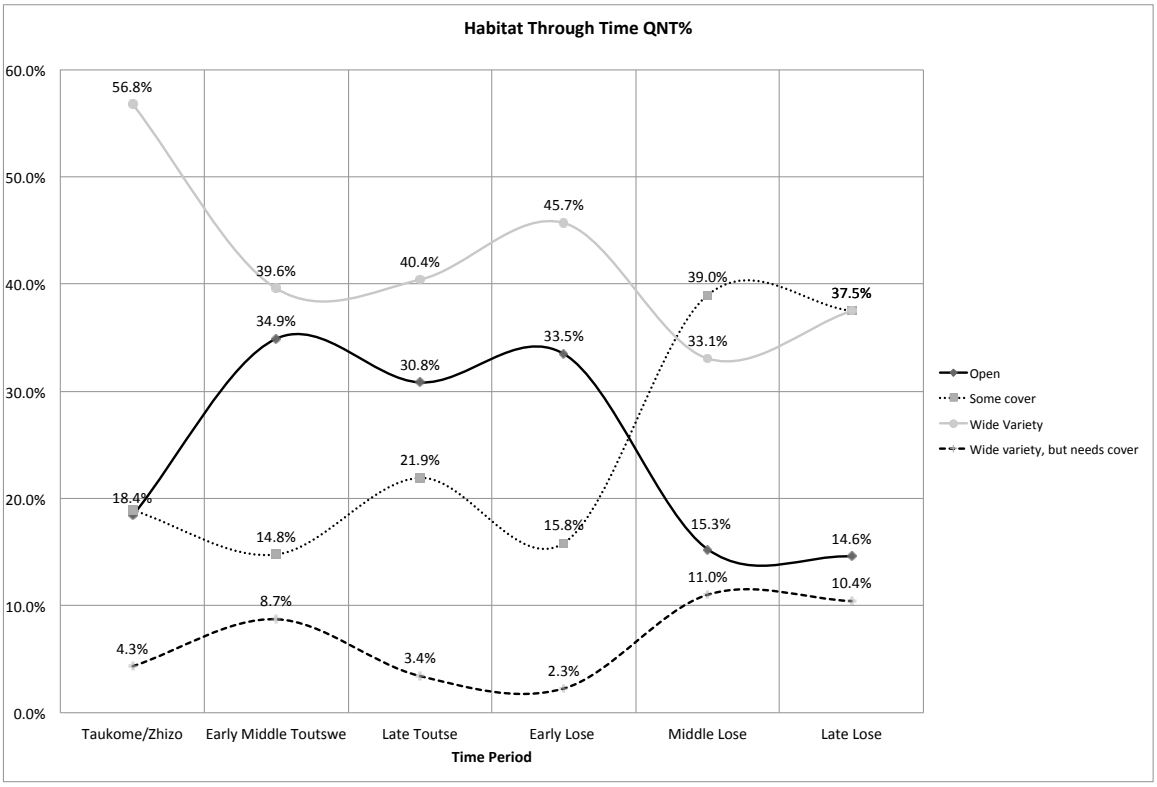


Figure 10-3. Animal habitat representation through time QNT%. Lacustrine, rocky and steep, and cover omitted for clarity.

	Taukome/Zhizo	Early/Middle Toutswe	Late Toutswe	Early Lose	Middle Lose	Late Lose
Open	34	52	45	74	18	7
Some Cover	35	22	32	35	46	18
Cover	0	0	1	1	0	0
Lacustrine	1	1	2	3	2	0
Rocky and Steep	2	2	2	2	0	0
Wide Variety	105	59	59	101	39	18
Wide Variety, but needs cover	8	13	5	5	13	5
Total	**185**	**149**	**146**	**221**	**118**	**48**

Table 10-3. Animal habitat representation through time QNT.

As Figure 10-3 shows, there are fluctuations in species preferring certain habitats through time, but two periods of major change: the Taukome/Zhizo and Early/Middle Toutswe transition, and the Early Lose to Middle Lose transition. After the Taukome/Zhizo period, animals preferring a wide variety of habitats decreased from 56.8% to 39.6%, and species preferring an open habitat increased from 18.4% to 39.4%, suggesting that open habitat was available during this time, perhaps due to clearing the land for fields and villages. During the Early Lose to Middle Lose transition, species preferring open habitats declined from 33.5% to 15.35%, and species preferring a wide variety of habitats decreased from 45.7% to 33.1%. Species needing some cover increased from 15.8% to 39.0%. The sharp decline in species occupying open habitats and the increase in species occupying mixed habitats after the Early Lose indicates that there may have been a shift in vegetation towards a habitat containing more shrubby plants and trees through time. The similar rise in animals occupying a wide variety of habitats but needing some cover also supports this conclusion. This may be due to bush encroachment due to overgrazing and field abandonment.

Feeding Habits Through Time

Grazers were defined as animals consuming mainly grasses, including grass rhizomes, such as blue wildebeest, gemsbok, hippopotamus, leopard tortoise, reedbuck, scrub hare, spring hare, tortoise, warthog and waterbuck. Graze with some browse were defined as zebra. Browsers, focusing on leaves, stems and bark from trees and shrubs were defined as Cape porcupine, giraffe, impala, klipspringer and kudu. Mixed grazers and browsers were defined as those focusing on grasses, as well as trees and shrubs, such as Cape hartebeest, common duikers, eland, elephant, rhinoceros, roan, sable, sitatunga, springbok, steenbok, and Sharp's steenbok.

Insectivores, carnivores, ostrich and domestic animals were excluded from this analysis.

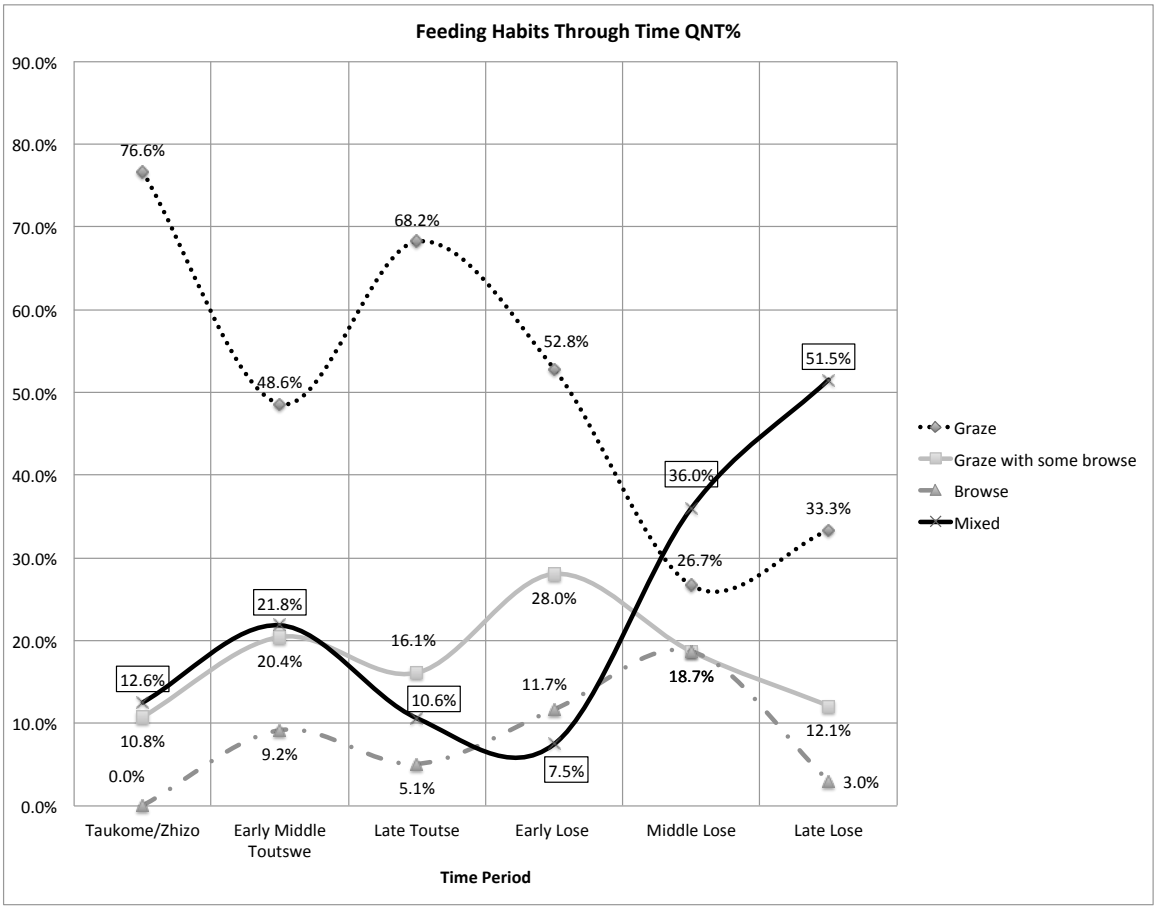


Figure 10-4. Feeding Habits Through Time QNT%.

	Taukome/Zhizo	Early/Middle Toutswe	Late Toutswe	Early Lose	Middle Lose	Late Lose
Graze	128	69	161	113	20	11
Graze with some browse	18	29	38	60	14	4
Browse	0	13	12	25	14	1
Mixed	21	31	25	16	27	17
Total	**167**	**142**	**236**	**214**	**75**	**33**

Table 10-4. Feeding habits through time QNT.

As Figure 10-4 illustrates, grazing species and mixed grazers/browsers undergo radical fluctuations through time. In this graph, it is expected that grazers will decrease, while other feeders will increase. The results indicate that grazers are very common during the Taukome/Zhizo period (76.6%), then decrease to 48.6% during the Early/Middle Toutswe, only to rebound to 68.2% during the Late Toutswe. However, after the Late Toutswe, grazers begin a steep decline, reaching a nadir of 26.2% during the Middle Lose. This suggests that during the Late Toutswe and subsequent periods, graze was less available for wild animals to consume. Grazing animals rise to 33% during the Late Lose. However, by the Late Lose period, the number of wild animals consumed was very small (see Figures 10-1 and 10-2).

Grazers who consume some browse (zebras), browsers, and mixed feeders follow similar patterns during the Taukome/Zhizo, Early/Middle Toutswe and Late Toutswe period, all increasing in importance during the Early/Middle Toutswe when grazers fall in importance and falling again during the Late Toutswe, only to diverge during the Early Lose period. During the Early Lose, grazers who occasionally browse (zebras) represent 52.8% of the wild animals whose feeding habits could be quantified. They reach their nadir during the Middle Lose (26.7%). After the Early Lose, mixed browsers increase rapidly in importance, surpassing other feeders during the Middle Lose and Late Lose, and making up 51.5% of the assemblage by the Late Lose.

Browsers do not come to dominate the assemblage; they peak at 18.7% during the Middle Lose, when grazers reach their nadir. The relatively small number of animals classified as browsers should be considered in this assessment. In addition to the radical overall decrease in wild animals at Bosutswe, the Bosutswe data appear to indicate a change in habitat. Open grasslands seem to decrease, while more closed scrubland favoring mixed feeders and browsers seems to increase. Hunting strategies switching from communal game drives targeting gregarious species such as zebra and wildebeest to trapping and snaring smaller, more solitary ungulates could have resulted in as similar pattern.

Small animals and the local environment

Leopard Tortoise: Population Decline

Leopard tortoises (*Stigmochelys pardalis*, formerly *Geochelone pardalis*) were the only firmly identified tortoise species at Bosutswe; many tortoise specimens that could not be identified to the species level were also recovered. Leopard tortoises are the largest tortoises in southern Africa, reaching sizes of 30-45 cm. Broadley (1989) notes that the southern subspecies is larger than the northern subspecies that inhabits Botswana, which reaches weights of up to 18.6 kg/41 lb. Females are larger than males (McMaster and Downs 2006b). Other tortoises, such as the Kalahari tent tortoise/serrated tortoise (*Psammobates oculifer*) and Speck's hinged tortoise (*Kinixys speckii*) are known to inhabit Botswana (Branch 1993).

The age at which leopard tortoises reproduce is largely a function of reaching a certain size, rather than a certain age (Moll 1979; Obst 1986);but, there is a lacuna in knowledge about wild leopard tortoise behavior and ecology (McMaster and Downs 2006a). As a large species, it may take them as long as 15 years to reach sexual maturity (Obst 1986), although they likely reach reproductive age younger in captivity due to greater access to reliable food sources and a longer annual growth period (Auffenberg

and Iverson 1979). Leopard tortoises lay up to six clutches of 6-15 eggs during the summer (Branch 1993); Obst (1986) indicates that they lay up to seven clutches a year. In any case, leopard tortoises seem to follow the general rule that larger turtles and tortoises tend to produce more offspring than smaller turtles and tortoises (Moll 1979). Excluding predation of hatchlings, it is clear that leopard tortoises are well adapted to producing a high number of offspring. Despite this, they undergo a strong decline through time at Bosutswe; during the Taukome/Zhizo, they made up 42.5% of the non-ungulate assemblage, but by the Late Lose, they comprise only 0.4% of the non-ungulate assemblage.

The dramatic decline in tortoises through time may indicate local environmental degradation and overexploitation of tortoises. Leopard tortoises are noted as being consumed in Southern Africa today (Broadley 1989; McDougal 2000; Thorbjarnarson 2000). Tortoises are very easy to capture since individuals found in the bush can simply be picked up and carried back to town. Human activities that do have the ability to negatively affect leopard tortoise populations has been documented by Broadley (1989), who noted that today leopard tortoises are rare in densely populated areas. Today, the leopard tortoise has secure populations in more rural areas (Broadley 1989; McDougal 2000). The decline in leopard tortoises may be a strong indicator of local habitat destruction and animal overexploitation in the area surrounding Bosutswe.

Medium Birds Increase, but Do Not Indicate Environmental Stability

There is a marked increase in medium-sized birds at Bosutswe through time. As has been discussed in Chapter 5, it is likely that this increase in wild medium-sized birds is illusory, and that these medium birds, which cannot be identified down to the species level, are likely to be chickens. See Plug 1996.

Lagromorphs and Pedetes: Holding Steady

In contrast to tortoises, hares and spring hares maintain their importance in the Bosutswe assemblage, and may even increase in importance when examined as a percentage of the wild assemblage. The more rapid reproduction of these species compared to tortoises may in part be responsible for their continued success. From the Taukome/Zhizo to the Early Lose period, hares and spring hares make up between 7.9% and 15.2% of the non-ungulate assemblage. If medium birds are kept in the analysis, the percentage of hares and spring hares falls within these values; if they are removed, hares and spring hares rise to 21% during the Middle Lose, and to 30.9% during the Late Lose.

The rise in these small species may support the conclusion that the hunting areas surrounding Bosutswe became overexploited and degraded through time. Spring hares are often found in areas subject to heavy grazing by wild and/or domestic species (Smithers 1971), so perhaps would have thrived in conditions other animals would find intolerable. Scrub hares, as their name suggests, prefer to live in areas with scrub, but have the advantage of breeding throughout the year (Smithers 1971). Large prey are more efficient to exploit when available locally compared to small prey (Ugan 2005). The increased use of small prey might therefore further indicate that larger-bodied species became less available through time. Alternatively, communal hunting activities may have taken place less often through time.

SUMMARY

Plug (2000) and Plug and Badenhorst (2006) have suggested that the greater proportion of domestic species is not simply a function of the higher status of those sites, but is instead a result of environmental degradation caused by humans and their domestic animals. In this paradigm, as human populations expand in number, opportunities for cumulative environmental degradation increase. Thus, the decrease in wild game and the consequent increase in domesticates at Bosutswe through time can be viewed primarily as

a result of human impact on the environment, and not a result of pure culinary preference for and cultural value placed on domestic animals.

There does seem to be evidence for habitat change at Bosutswe and the surrounding hunting areas. While certain small, local species that reproduce quickly, such as hares and spring hares, were able to prosper and even increase in relative importance over time in the changing habitat of Bosutswe, other species that take longer to reach sexual maturity, such as tortoises, declined. This occurs in an overall context of profound decline in the total percentage of wild animal specimens in the Bosutswe assemblage, amid indications that open grasslands were becoming less available for wild animals, while more closed scrubland were becoming comparatively more available. The Bosutswe assemblage suggests that humans and their animals reduced the total number of wild animals in surrounding hunting areas, and also caused these habitats to change from grassland to scrubland to some degree.

Chapter 11: Animals, Food and Power

DIET AND INEQUALITY AT BOSUTSWE

In addition to what body parts were eaten at Bosutswe, there were differences in the ratios of domestic to non-domestic meat consumption rates between elites and commoners during the Lose period. Unclassified bovids will be omitted from the following graphs because they cannot be reliably classified as wild or domestic. When they are included, they increase the differences between the Central and the Western precinct domestic vs. wild consumption rates substantially. Without unspecified bovids, the Central precinct consumes a higher proportion of domestic animals than the Western precinct.

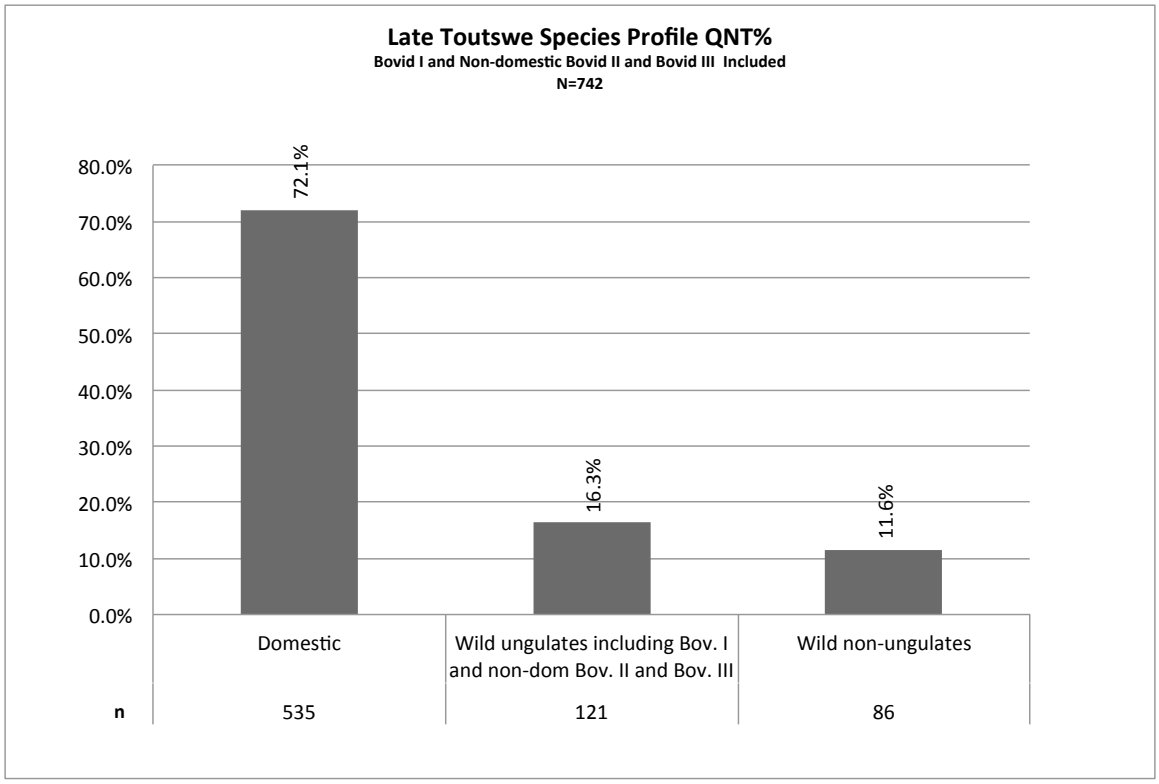


Figure 11-1. Late Toutswe species profile QNT%. Data refer to Western precinct only.

As Figure 11-1 illustrates, domesticates occupied a prominent place in the diet by the Late Toutswe period. When unspecified bovids are omitted, domesticates represent 72.1% of the Bosutswe assemblage. Wild ungulates were somewhat more numerous than wild non-ungulates.

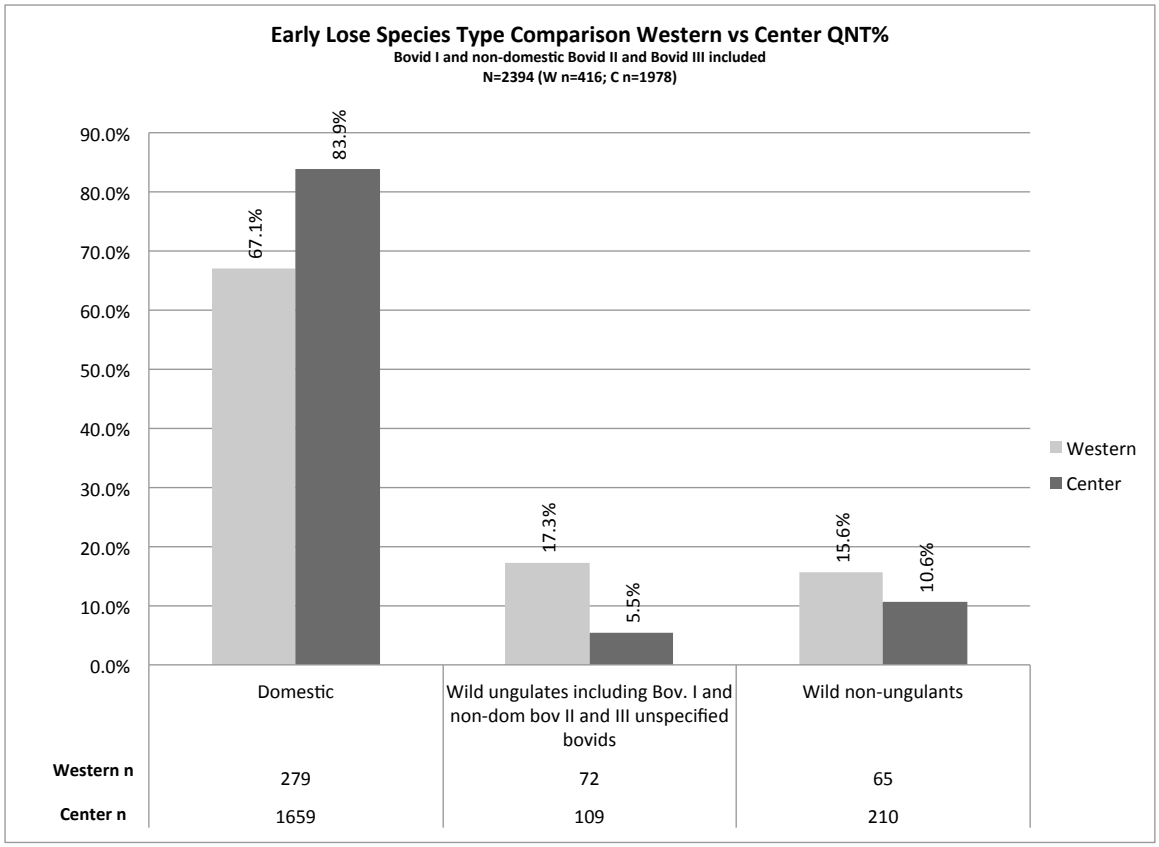


Figure 11-2. Early Lose Species Type Comparison Western vs. Center QNT%

Social status-based dietary differences are apparent in the ratio of wild to domestic specimens in the Early Lose period (Figure 11-2). Elites consumed significantly more domesticates than commoners (X^2=65.9531; p=<0.0001), indicating that commoners at Bosutswe had relatively less access to domestic animal meat than elites. Commoners ate significantly more wild ungulates (X^2=68.4435; p=<0.0001) and wild non-ungulates (X^2=8.479; p=0.003593).

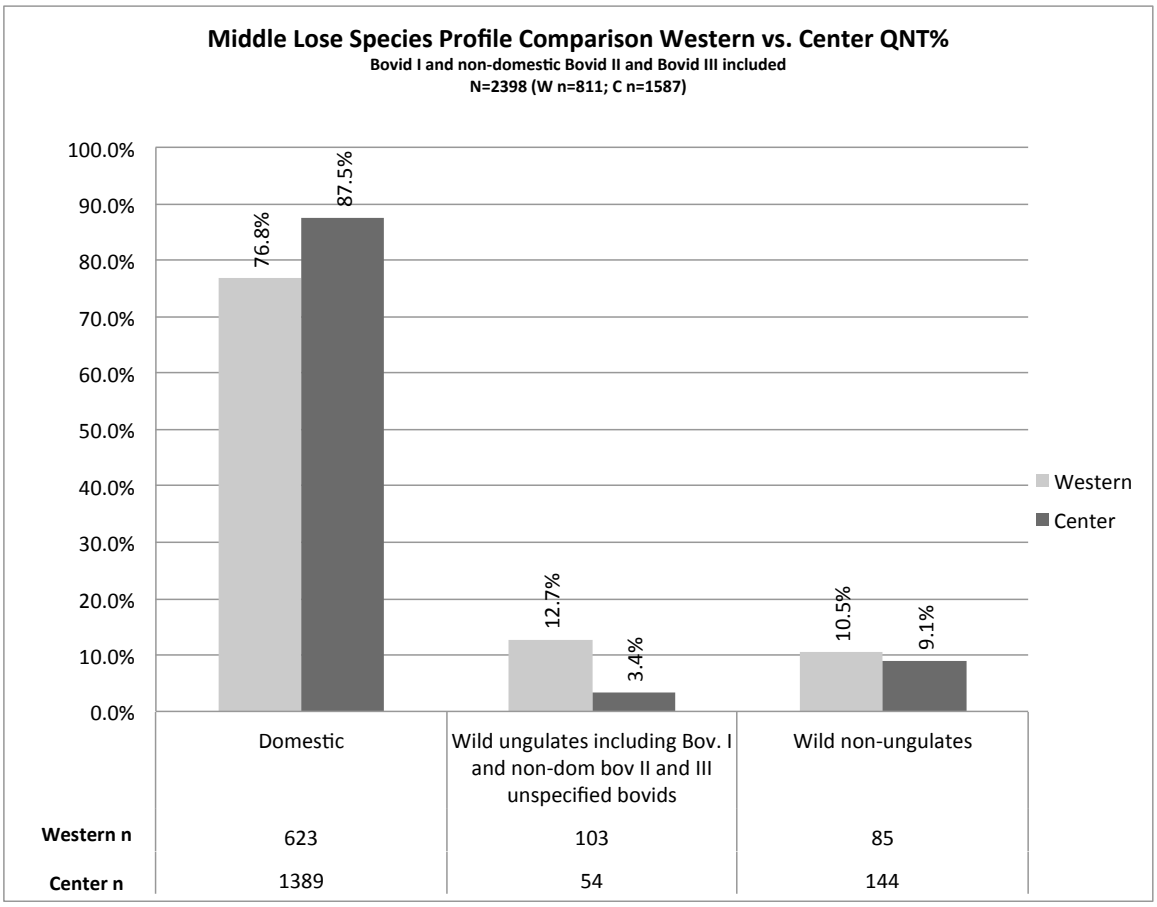


Figure 11-2. Middle Lose species profile Western vs. Center QNT%

The pattern of elites consuming more domesticates than commoners is still significant (X^2=45.5403; p=<0.0001) during the Middle Lose (Figure 11-2). As during the Early Lose, elites and commoners consumed similar proportions of large to small stock. The difference between wild non-ungulates is small and not significant, but Western inhabitants consumed significantly more wild ungulates than Central inhabitants dis (X^2=75.8331; p=<0.0001).

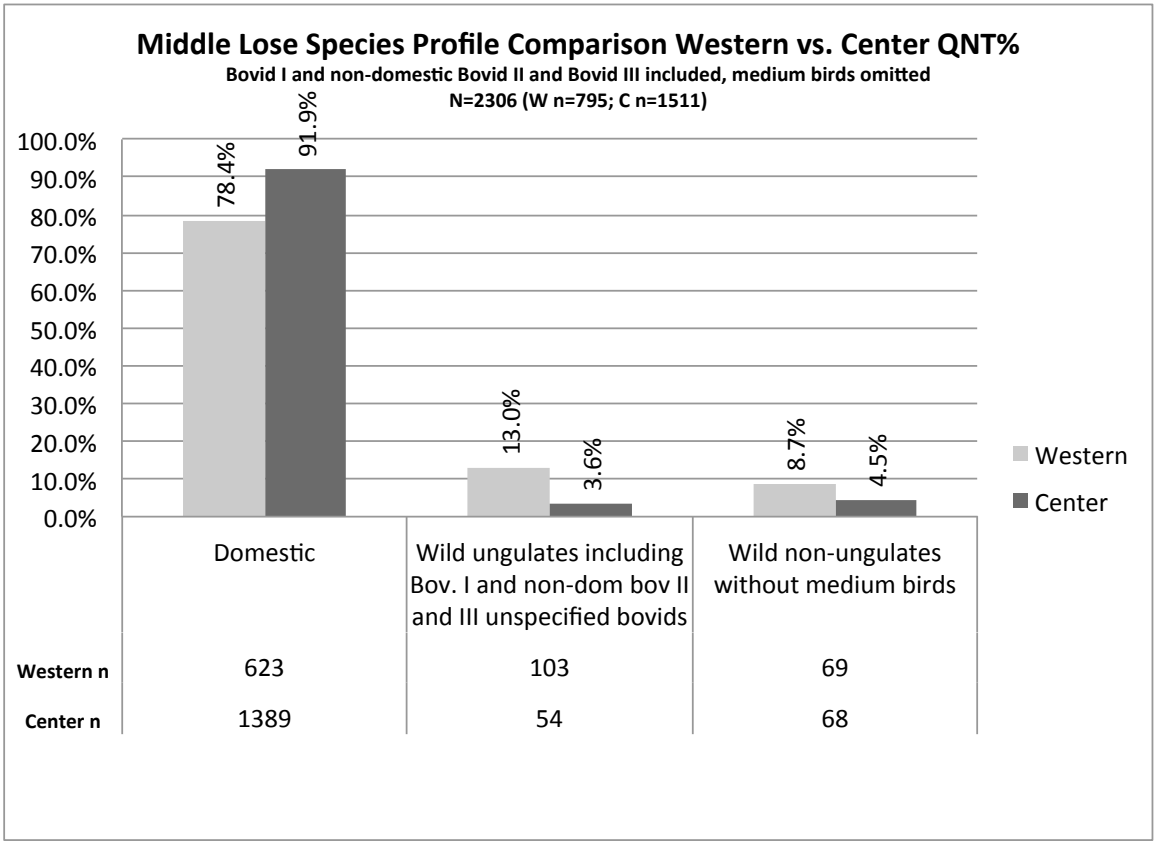


Figure 11-3. Middle Lose species profile Western vs. Center QNT%. Medium birds omitted.

During the Middle and Late Lose (Figure 11-3), elites consumed a noticeably higher proportion of medium sized birds, which are theorized to be chickens. With these uncertain specimens removed, it is still apparent that social status-based dietary differences continued unabated into the Middle Lose: elites continued to consume more domesticates than commoners. If medium birds represent chickens, the inhabitants of the Western precinct consumed significantly more wild non-ungulates compared to Central inhabitants (X^2=15.94498; p=<0.0001). Wild ungulates now appear to be more numerous than non-ungulates. They also have higher meat values, further emphasizing their importance.

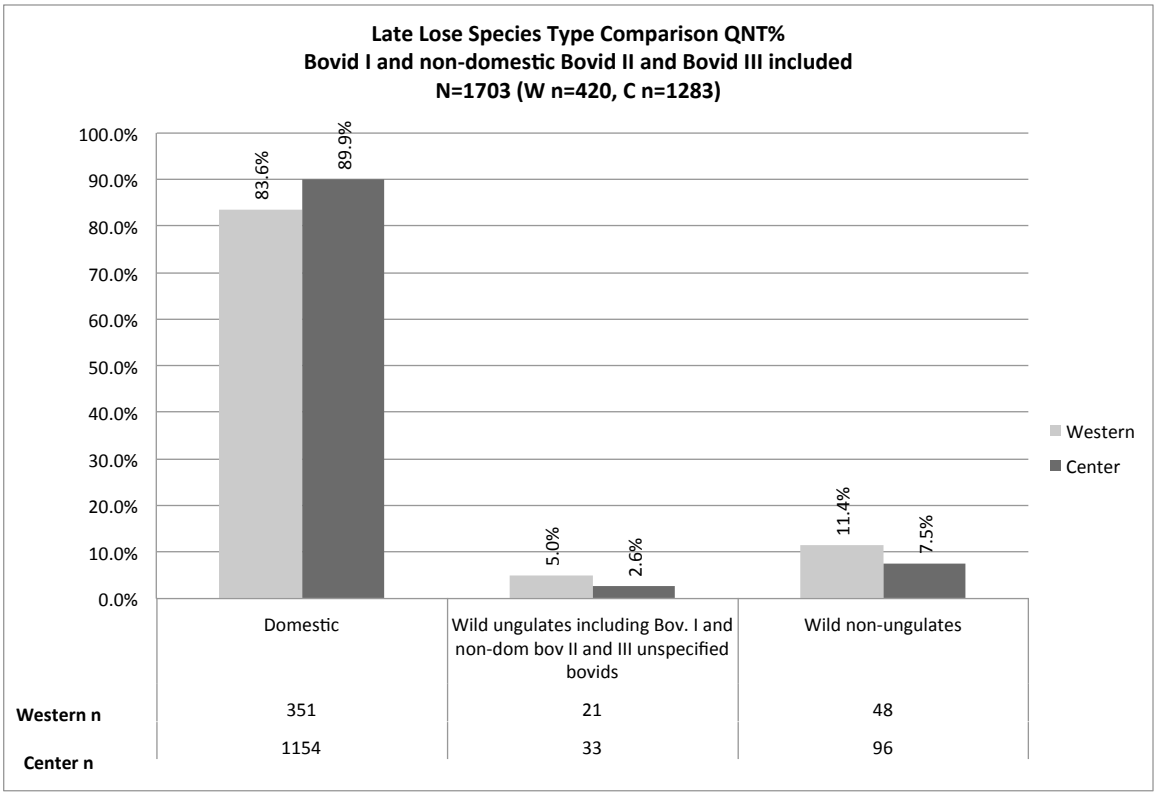


Figure 11-4. Late Lose species comparison Westen vs. Central QNT%.

With unspecified bovids removed and medium birds included, it appears as it there were processes of equalization at work at Bosutswe during the Late Lose period. The power of elites to extract tribute from others seems to have declined, indicating that status of Bosutswe may have declined as well. Rates of domesticate consumption in the Western and Central precinct seem to have normalized. Only slight differences are observable in the rates of wild resource consumption. It is likely that Western inhabitants continued to consume more wild resources than Central inhabitants (X^2=12.5117; p=0.000404). Elites manufactures ostrich eggshell beads during this time period. This may indicate that they were looking for ways to increase their role in the long-distance trade system and re-gain some of their lost influence.

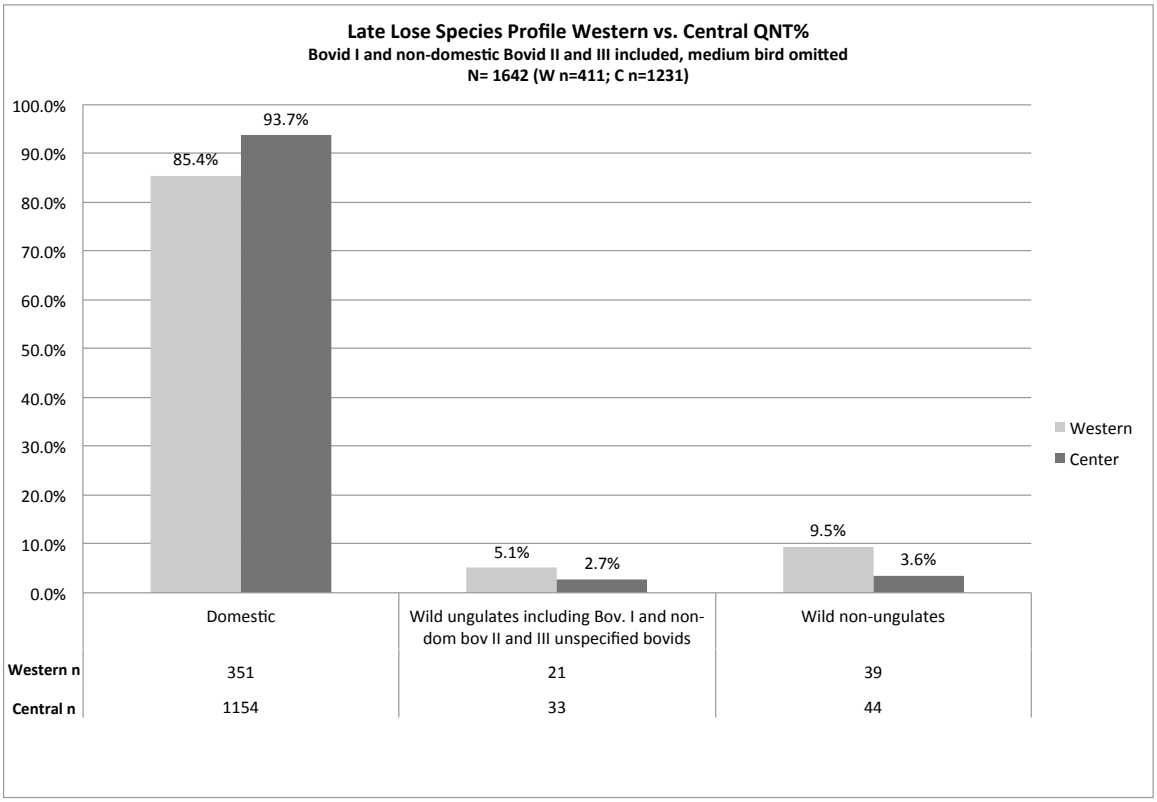


Figure 11-5. Late Lose species profile Western vs. Central QNT%

As Figure 11-5 illustrates, when medium-sized birds are omitted from the analysis, the level of equalization in wild vs. domestic resource use is reduced, but still apparent and significant (X^2=28.0484; p=<0.0001). Figure 11-5 suggests that commoners continued to exploit wild resources, especially wild non-ungulates, more than elites. Inequalities still continued to be expressed through the diet.

FOOD AND INEQUALITY AT BOSUTSWE

Mennell (1996) locates the shift from domestic animals to wild game served at the tables of Europe's aristocrats in their desire to create social distance and prestige by consuming animals that were less readily available to the non-elites. A similar social process carried out through opposite actions could be represented in the Bosutswe data. Elites had the power and animal resources necessary to take advantage of this changing situation, while commoners lacked these resources and had to rely to a greater degree on

wild animal resources, enacting their inequality through the consumption of more wild animals than elites. Communal hunting, similar cooking methods, and sharing emphasized the need for social cohesion, but what was consumed by elites and commoners emphasized unequal power relations. The shift towards more solitary, territorial game during the Lose period could indicate a lessening of central power and the ability to organize communal hunts for gregarious game such as zebra and wildebeest.

Similarly to medieval European elites (Grant 2002), Bosutswe elites during the Early and Middle Lose Periods consumed rare foods with special social meaning. Not only did they consume more highly-valued food–greater amounts of domestic cattle, goat and sheep, as opposed to wild game–they differentiated their food from the food of non-elites by preferentially consuming special domesticates- young and aged domesticates. Elites and commoners consumed similar proportions of domesticates cattle and small stock, but elites were able to consume greater amounts of these animals. Commoners consumed more wild game.

People appear to have been healthy during the Taukome/Zhizo and Toutswe periods. The population followed a typical pattern of high infant and child mortality. Persons who survived these dangerous times had a good chance of surviving until at least their mid-thirties (Mosothwane and Steyn 2004), and the inhabitants of Bosutswe had relatively high access to animal protein (Mosothwane 2010). The dietary differences between Lose elites and commoners could have been compensated for by increased consumption of dairy and wild animal protein by commoners. But, some chickens and megafauna seem to have been largely restricted to elites and were strategically used to demonstrate social status divisions and elite/commoner identity.

Chapter 12: Eating Inequality: Food and Power at Bosutswe

This study has attempted to use faunal remains investigate the forces that generated and sustained social inequality and division in prehistoric southern Africa, and the forces that served to generate social cohesion. This was intended to explore why non-elites participated in social and economic inequality. It was expected that elites at Bosutswe would have ideally ruled with a gentle touch in order to ensure the continued participation and support of commoners in an unequal system (Reid 1996). Making differential access to resources too extreme was most likely not a good strategy for non-state level rulers to maintain power (Danforth 1999). If rulers were too harsh or exploitative, commoners could have left the site or agitated for a new ruler. For the elites of Bosutswe, ruling likely required a delicate balance of self-aggrandizement and enacting policies and actions that benefited society as a whole, bringing the local people together through providing them with material benefits and the feeling of belonging to a unified community.

As time progressed at Bosutswe, domestic animals became increasingly important as a source of food and wealth. Cattle outnumber smallstock in every time period but the Early and Middle Toutswe. Wild animals decrease in number through time at Bosutswe, and the species composition of the wild animal assemblage undergoes a very strong transformation through time; large ungulates such as zebra and wildebeest are common in the early Iron Age occupational phases at Bosutswe, but have been displaced by much smaller Bovid I animals by the Late Lose period. Tortoises are common in the early occupational phases, but are very rare by the Late Lose period.

This study has revealed that definite social status-based inequalities are present in the food and animal-based archaeological record of Bosutswe; elites and commoners exploited animals in distinctly different patterns.

Domesticates and status-based inequality

One of the most unexpected and revelatory findings was the ability of the Early and Middle Lose elites to collect cattle and sheep from other people's herds, likely in the form of fees and/or tribute. Alternatively, they may have chosen to cull animals from a common herd in this conspicuous manner. Elites were able to consume a comparatively greater amount of domesticates compared to commoners, who consumed a greater proportion of wild animals. Elites and commoners consumed similar ratios, but different amounts, of cattle and small stock. Chickens were more highly concentrated in the elite Central precinct, indicating that that access to them was somewhat restricted, despite being easy to raise (Simpson and McDowell) and common in modern Botswana (Grivitti 1981).

Ritual animals and inequality

The concentration of chickens within the Central precinct could indicate that their ownership was somewhat controlled by the elites of Bosutswe. Chickens are noted as being an appropriate sacrificial animal in Botswana (Nelson 2008), and they could have served this function in the past as well at Bosutswe. The 1990 excavation uncovered evidence for at least one ritual practitioner performing activities at the "Hyaena Floor" (Plug 1996) in the Central precinct. The Western precinct has a high variety of wild animals, some of which may or may not have be used in divining dice sets. Ritual activities performed in the Central precinct, such as sacrificing animals to the ancestors or carrying out rainmaking rituals, were likely carried out for the benefits of all the inhabitants of Bosutswe, not just the elites (Schapera 1971). The ability of the chief to ask the ancestors for rain provided tangible benefits to all members of society. It also helped to provide a justification for social inequality, since the chief had his elevating position and rainmaking responsibilities due to his closer relationship to the ancestors.

The social role of communal hunting: leadership and social solidarity

The makeup of the wild ungulate assemblage indicates that large Class III ungulates were the focus of hunting activities through the Early Lose period, but their prevalence begins to decline in the Middle Lose period. By the Late Lose period, Bovid I specimens are the most common ungulate found at Bosutswe. Ethnographic sources (Harris 1857; Grivitti 1981; Cummings 1879; Plug 1996) indicate that large gregarious ungulates were hunted communally by groups of men while smaller species were more often trapped or snared by individuals or smaller groups of men. The switch from a greater prevalence of communal hunting to a greater prevalence of trapping and snaring could be related to deteriorating wildlife habitat and/or to the loss of the ability of the elites to successfully organize these hunts.

Elites tended to consume a smaller amount of domesticates compared to commoners, but were avid consumers of zebra during the Early Lose. This is the only time period in which elites consumed more zebra than commoners. They also consumed greater amounts of high-status body parts such as lower limbs compared to commoners during this time period. This supports the idea that hunting activities lead by elites had active social uses during the Early Lose period and that some wild animal were the focus of restrictive social forces.

Since large hunts such as *letsholo* were linked with generating group solidarity and directly providing meat to members of the community, their cessation could be linked to the apparent decline in Bosutswe's power during the Late Lose period. Grivitti (1981) argues that the termination of regimental hunts since Botswana's independence resulted in a reduction in the power of the chiefs. The switch away from communal hunts of large ungulates due to reduced wild animal populations could have resulted in a reduction of the authority of Bosutswe elites. It is also possible that hunting strategies changed because Bosutswe's elites no longer had the desire to organize communal hunts,

which resulted in a loss of authority. In any case, the termination of large communal hunts likely resulted in a reduction of solidarity among age regiments.

BOSUTSWE: CUISINE AND INEQUALITY

Bosutswe elites were able to exercise authority over others through extracting domestic animals from them during the Early and Middle Lose. This allowed elites to engage in a kind of conspicuous consumption focused on consuming the meat of domestic animals, instead of trying to maximize the reproductive capacity of their herds as commoners did. By redistributing animal resources to Bosutswe commoners, elites simultaneously created social solidarity by pleasing others through gift-giving, and emphasized status differences by preferentially reserving highly valued cuts of meat (upper limbs) for themselves and redistributing less-valued cuts of meat (lower limbs and craniums) to the commoners of Bosutswe. Sharing and generosity are highly valued personal attributes in modern-day Botswana (Denbow and Thebe 2006); this may have been true in the past as well, but not to the extent that all social distinctions were ignored or disguised. Despite the difference in body part distribution, boiling meat seems to have been the preferred cooking technique in both the Western and Central precint.

The ability of Bosutswe's elites to obtain animals from others seems to have dissipated in the Late Lose period, when Central inhabitants adopted a herding strategy designed to maximize the reproductive capacity of domestic animals. This herding strategy is observable in the Western precinct in all time periods. Despite this, elites continued to consume a greater proportion of domesticates then commoners, and commoners continued to consume a greater proportion of wild animals than elites. The body part distribution of domestic animals continues to show a concentration of upper limbs in the Central Precinct and cranial and lower leg/foot elements in the Western precinct during the Late Lose period, indicating that the inhabitants of the Central precinct still had the ability to command desired cuts of meat.

With both elites and commoners acknowledging the need for social cohesion, many processes encouraging both equality and inequality are apparent at Bosutswe. The overall role that wild animals played in the diet decreased radically through time, while domestic animals increased through time. This may have been due to environmental degradation in the area surrounding Bosutswe, which favored the adoption of a dispersed herding system and the consumption of more domesticates. A culturally-induced change in hunting patterns may also have occurred. Elites were able to satisfy the desire for meat using their greater ability to extract cattle and small stock from others. Non-elites were forced to enact their non-elite status daily through their consumption of a greater amount of wild, as opposed to domestic, game. Helping herd the cattle owned by elites would have provided commoners with increased access to political support and milk, and may have be a beguiling way to hint that commoners could become wealthy by assisting elites. This system may have provided commoners with material benefits, even as they grappled with the problems of an increasingly hierarchical society.

Appendix

TAUKOME AND ZHIZO NISP AND QNT

Taxon	Common Name	NISP	NISP%	QNT	QNT %
Achatina Species	Giant African Land Snail	1	0.11%	1	0.11%
Aepyceros melampus	Impala	11	1.22%	11	1.23%
Alcelaphus buselaphus	Cape Hartebeest	4	0.45%	4	0.45%
Aves: small	Bird: small	1	0.11%	1	0.11%
Aves: small-medium	Bird: small-medium	2	0.22%	2	0.22%
Aves: medium	Bird: medium	7	0.78%	7	0.78%
Aves: medium-large	Bird: medium-large	1	0.11%	1	0.11%
Aves: large	Bird: large	5	0.56%	5	0.56%
Bos taurus	Cow	183	20.38%	184	20.51%
Bovid I	Bovid size class I	11	1.22%	10	1.11%
Bovid II	Bovid size class II	89	9.91%	89	9.92%
Bovid II (domestic)	Bovid size class II, domestic species	14	1.56%	14	1.56%
Bovid II (non-domestic)	Bovid size class II, non-domestic species	22	2.45%	22	2.45%
Bovid III	Bovid size class III	103	11.47%	103	11.48%
Bovid III (non-domestic)	Bovid size class III, non-domestic species	21	2.34%	21	2.34%
Bovid IV	Bovid size class IV	1	0.11%	1	0.11%
Bull Frog	Bull Frog	1	0.11%	1	0.11%
Capra hircus	Goat	30	3.34%	30	3.34%
Carnivore: small	Carnivore: small	1	0.11%	1	0.11%
Carnivore: small-medium	Carnivore: small-medium	3	0.33%	3	0.33%
Carnivore: medium	Carnivore: medium	5	0.56%	5	0.56%
Clarias synodontus	Barble/squeaker/ Red tail synodont	1	0.11%	1	0.11%
Connochaetes taurinus	Blue Wildebeest	10	1.11%	10	1.11%
Equus burchelli	Burchell's zebra	18	2.00%	18	2.01%
Francoline size bird	Francoline size bird	3	0.33%	3	0.33%
Gallus domesticus	Chicken	1	0.11%	1	0.11%
Gallus/Numidae	Chicken/Guinea Fowl	1	0.11%	1	0.11%

Stigmochelys pardalis	Leopard Tortoise	34	3.79%	34	3.79%
Hippotragus equinus	Roan	5	0.56%	5	0.56%
Hippotragus niger (cf)	Sable (cf)	1	0.11%	1	0.11%
Homo sapiens	Human	4	0.45%	3	0.33%
Kobus ellipsiprymnus	Waterbuck	6	0.67%	6	0.67%
Lagromorphia	Hare	3	0.33%	3	0.33%
Lepus saxatilis	Scrub hare	5	0.56%	5	0.56%
Lepus Species	Hare	4	0.45%	4	0.45%
Mammal: Large	Mammal: large	1	0.11%	1	0.11%
Oreotragus oreotragus	Klipspinger	2	0.22%	2	0.22%
Oryx gazella	Gemsbok	2	0.22%	2	0.22%
Ovis aries	Sheep	57	6.35%	57	6.35%
Ovis/Capra	Sheep/Goat	65	7.24%	65	7.25%
Polished Bone	Polished bone	1	0.11%	1	0.11%
Raphicerus campestris	Steenbok	4	0.45%	4	0.45%
Raphicerus melanois sharpei	Sharp's Steenbok	1	0.11%	1	0.11%
Rodent	Rodent	19	2.12%	19	2.12%
Rodent: small-medium	Rodent: small-medium	1	0.11%	1	0.11%
Rodent: medium	Rodent: medium	4	0.45%	4	0.45%
Rodent: medium-large	Rodent: medium-large	2	0.22%	2	0.22%
Struthio camelus	Ostrich	10	1.11%	10	1.11%
Sylvicapra grimmia	Common Duiker	4	0.45%	4	0.45%
Taurotragus oryx	Eland	2	0.22%	2	0.22%
Toad/Frog	Toad/Frog	3	0.33%	3	0.33%
Tortoise	Tortoise	71	7.91%	71	7.92%
Tragelaphus spekei	Sitatunga	1	0.11%	1	0.11%
Varanus	Monitor Lizard	1	0.11%	1	0.11%
Viverridae	Civet/Genet/Mongoose	4	0.45%	4	0.45%
x	Unknown but included in collection	31	3.45%	31	3.46%
Total		**898**	**100.00%**	**897**	**100.00%**

EARLY AND MIDDLE TOUTSWE NISP & QNT

Taxon	Common Name	NISP	NISP%	QNT	QNT%
Aepyceros melampus	Impala	10	1.01%	10	1.01%
Alcelaphus buselaphus	Cape Hartebeest	17	1.71%	17	1.72%
Aves: medium	Bird: medium	9	0.91%	10	1.01%
Bos taurus	Cow	147	14.82%	147	14.91%
Bov. I	Bovid: size class I	25	2.52%	25	2.54%
Bov. II	Bovid: size class II	87	8.77%	89	9.03%
Bov. II (domestic)	Bovid: size class II, domestic species	9	0.91%	9	0.91%
Bov. II (indet)	Bovid: size class II, domestic or non-domestic	8	0.81%	8	0.81%
Bov. II (non-dom)	Bovid: size class II, non-domestic species	35	3.53%	35	3.55%
Bov. III	Bovid: size class III	114	11.49%	114	11.56%
Bov. III (non-domestic)	Bovid: size class III, non-domestic	22	2.22%	22	2.23%
Capra hircus	Goat	46	4.64%	44	4.46%
Carnivore: small	Carnivore: small	1	0.10%	1	0.10%
Carnivore: small-medium	Carnivore: small-medium	1	0.10%	1	0.10%
carnivore medium	Carnivore: medium	6	0.60%	6	0.61%
carnivore medium-large	Carnivore medium-large	1	0.10%	1	0.10%
Connochaetes taurinus	Blue Wildebeest	6	0.60%	6	0.61%
Equus burchelli	Burchell's zebra	29	2.92%	29	2.94%
Francolinus sp.	Francoline species	1	0.10%	1	0.10%
Gallus domesticus	Chicken	5	0.50%	5	0.51%
Geochalone pardalis	Leopard Tortoise	30	3.02%	30	3.04%
Hippotraginae species	Sable/Roan	3	0.30%	2	0.20%
Homo sapiens	Human	8	0.81%	8	0.81%
Hyaeninae	Hyaena	1	0.10%	1	0.10%

Kobus ellipsiprymnus	Waterbuck	1	0.10%	1	0.10%
Lagromorphia	Hare	2	0.20%	2	0.20%
Lepus species	Hare	1	0.10%	1	0.10%
Lepus saxatilis	Scrub hare	6	0.60%	6	0.61%
Oreotragus oreotragus	Klipspringer	2	0.20%	2	0.20%
Ovis aries	Sheep	82	8.27%	82	8.32%
Ovis/Capra	Sheep/Goat	149	15.02%	154	15.62%
Panthera leo	Lion	1	0.10%	1	0.10%
Papio ursinus	Chacma Baboon	1	0.10%	1	0.10%
Polished bone	Polished Bone	2	0.20%	2	0.20%
Polished rib	Polished Rib	2	0.20%	2	0.20%
Raphicerus melanois sharpei	Sharp's Steenbok	1	0.10%	1	0.10%
Rodent	Rodent	50	5.04%	40	4.06%
Rodent: small–medium	Rodent: small-medium	1	0.10%	1	0.10%
Rodent: medium	Rodent- medium	3	0.30%	3	0.30%
Rodent: medium-large	Rodent: medium-large	2	0.20%	2	0.20%
Struthio camelus	Ostrich	9	0.91%	9	0.91%
Sylvicapra grimmia	Common Duiker	3	0.30%	3	0.30%
Taurotragus oryx	Eland	2	0.20%	2	0.20%
Toad/Frog	Toad/Frog	1	0.10%	1	0.10%
Tortoise	Tortoise	26	2.62%	26	2.64%
Tragelaphus spekei	Sitatunga	1	0.10%	1	0.10%
Viverridae	Civet/Genet/Mongoose	10	1.01%	10	1.01%
x	Unknown but included in collection	13	1.31%	12	1.22%
Total		**992**	**100.00%**	**986**	**100.00%**

LATE TOUTSWE NISP & QNT

Taxon	Common Name	NISP	NISP%	QNT	QNT%
Achatina sp.	Giant African Ground Snail	2	0.19%	2	0.19%
Aepyceros melampus	Impala	9	0.86%	9	0.85%
Alcelaphus buselaphus	Cape Hartebeest	2	0.19%	2	0.19%
Antidorcas marsupialis	Springbok	1	0.10%	1	0.09%
Aves: medium	Bird: medium	1	0.10%	1	0.09%
Aves: medium-large	Bird: medium-large	1	0.10%	1	0.09%
Bos taurus	Cow	340	32.57%	340	32.26%
Bov. I	Bovid: size class I	15	1.44%	15	1.42%
Bov. II	Bovid: size class II	104	9.96%	104	9.87%
Bov. II (indet)	Bovid: size class II, domestic or non-domestic	1	0.10%	1	0.09%
Bov. II (non-dom)	Bovid: size class II, non-domestic	5	0.48%	5	0.47%
Bov. III	Bovid: size class III	132	12.64%	135	12.81%
Bov. III (non-domestic)	Bovid: size class III, non-domestic	18	1.72%	18	1.71%
Bov. III (non-ID)	Bovid: size class III, not ID'd	1	0.10%	1	0.09%
Canis species	Dog/Fox/Jackal species	1	0.10%	1	0.09%
Capra hircus	Goat	16	1.53%	15	1.42%
Carnivore: small	Carniviore: small	1	0.10%	1	0.09%
carnivore medium-large	carnivore medium-large	1	0.10%	1	0.09%
Connochaetes taurinus	Blue Wildebeest	3	0.29%	3	0.28%
Equus burchelli	Burchell's zebra	33	3.16%	38	3.61%
Francoline	Francoline	1	0.10%	1	0.09%
Francoline size bird	Francoline size	2	0.19%	2	0.19%

	bird				
Frog/Toad	Frog/Toad	1	0.10%	1	0.09%
Gallus domesticus	Chicken	3	0.29%	3	0.28%
Gallus domesticus/Guninea Fowl	Chicken/Guinea Fowl	1	0.10%	1	0.09%
Taxon	Name	NISP	NISP%	QNT	QNT%
Geochalone pardalis	Leopard Tortoise	8	0.77%	8	0.76%
Hippotagus equines	Roan	1	0.10%	1	0.09%
Hippotragus niger	Sable	1	0.10%	1	0.09%
Kobus ellipsiprymnus	Waterbuck	4	0.38%	4	0.38%
Lagromorphia	Hare	5	0.48%	5	0.47%
Lagromorphia species	Hare	4	0.38%	4	0.38%
Lepus saxatilis	Scrub hare	3	0.29%	3	0.28%
Lycaon pictus	Wild Dog	1	0.10%	1	0.09%
Oreotragus oreotragus	Klipspringer	2	0.19%	2	0.19%
Oryx gaxella	Gemsbok	1	0.10%	1	0.09%
Ovis aries	Sheep	47	4.50%	47	4.46%
Ovis/Capra	Sheep/Goat	130	12.45%	130	12.33%
Panthera pardus	Leopard	2	0.19%	3	0.28%
Papio ursinus	Chacma Baboon	2	0.19%	2	0.19%
Pedetes capensis	Spring hare	1	0.10%	1	0.09%
Polished bone	Polished bone	4	0.38%	4	0.38%
Polished bone flake	Polished bone flake	1	0.10%	1	0.09%
Polished rib	Polished rib	1	0.10%	1	0.09%
Raphicerus campestris	Steenbok	13	1.25%	13	1.23%
Raphicerus melanois sharpei	Sharp's Steenbok	1	0.10%	1	0.09%
Rodent	Rodent	16	1.53%	16	1.52%
Rodent: small	Rodent: small	1	0.10%	1	0.09%
Rodent: small–medium	Rodent: small-medium	12	1.15%	12	1.14%
Rodent: medium	Rodent: medium	2	0.19%	2	0.19%
Struthio camelus	Ostrich	4	0.38%	4	0.38%
Sylvicapra grimmia	Common Duiker	4	0.38%	4	0.38%
Terrestrial Gastropod	Land Snail	2	0.19%	2	0.19%

Tortoise	Tortoise	43	4.12%	45	4.27%
Tragelaphus spekei	Sitatunga	2	0.19%	2	0.19%
Tragelaphys strepsiceros	Kudu	1	0.10%	1	0.09%
Worked Bone	Worked Bone	2	0.19%	2	0.19%
x	Unknown but included in collection	28	2.68%	28	2.66%
Total		**1044**	**100.00%**	**1054**	**100.00%**

EARLY LOSE NISP & QNT

Taxon	Common Name	NISP	NISP%	QNT	QNT%
Achatina sp.	Giant African Ground Snail	2	0.19%	2	0.19%
Aepyceros melampus	Impala	9	0.86%	9	0.85%
Alcelaphus buselaphus	Cape Hartebeest	2	0.19%	2	0.19%
Antidorcas marsupialis	Springbok	1	0.10%	1	0.09%
Aves: medium	Bird: medium	1	0.10%	1	0.09%
Aves: medium-large	Bird: medium-large	1	0.10%	1	0.09%
Bos taurus	Cow	340	32.57%	340	32.26%
Bov. I	Bovid: size class I	15	1.44%	15	1.42%
Bov. II	Bovid: size class II	104	9.96%	104	9.87%
Bov. II (indet)	Bovid: size class II, domestic or non-domestic	1	0.10%	1	0.09%
Bov. II (non-dom)	Bovid: size class II, non-domestic	5	0.48%	5	0.47%
Bov. III	Bovid: size class III	132	12.64%	135	12.81%
Bov. III (non-domestic)	Bovid: size class III, non-domestic	18	1.72%	18	1.71%
Bov. III (non-ID)	Bovid: size class III, not ID'd	1	0.10%	1	0.09%
Canis species	Dog/Fox/Jackal species	1	0.10%	1	0.09%
Capra hircus	Goat	16	1.53%	15	1.42%
Carnivore: small	Carnivore: small	1	0.10%	1	0.09%
carnivore medium-large	Carnivore medium-large	1	0.10%	1	0.09%
Connochaetes taurinus	Blue Wildebeest	3	0.29%	3	0.28%
Equus burchelli	Burchell's zebra	33	3.16%	38	3.61%
Francoline	Francoline	1	0.10%	1	0.09%
Francoline size bird	Francoline size	2	0.19%	2	0.19%

	bird				
Frog/Toad	Frog/Toad	1	0.10%	1	0.09%
Gallus domesticus	Chicken	3	0.29%	3	0.28%
Gallus domesticus/Guninea Fowl	Chicken/Guinea Fowl	1	0.10%	1	0.09%
Geochalone pardalis	Leopard Tortoise	8	0.77%	8	0.76%
Hippotagus equines	Roan	1	0.10%	1	0.09%
Hippotragus niger	Sable	1	0.10%	1	0.09%
Kobus ellipsiprymnus	Waterbuck	4	0.38%	4	0.38%
Lagromorphia	Hare	5	0.48%	5	0.47%
Lagromorphia species	Hare	4	0.38%	4	0.38%
Lepus saxatilis	Scrub hare	3	0.29%	3	0.28%
Lycaon pictus	Wild Dog	1	0.10%	1	0.09%
Oreotragus oreotragus	Klipspringer	2	0.19%	2	0.19%
Oryx gaxella	Gemsbok	1	0.10%	1	0.09%
Ovis aries	Sheep	47	4.50%	47	4.46%
Ovis/Capra	Sheep/Goat	130	12.45%	130	12.33%
Panthera pardus	Leopard	2	0.19%	3	0.28%
Papio ursinus	Chacma Baboon	2	0.19%	2	0.19%
Pedetes capensis	Spring hare	1	0.10%	1	0.09%
Polished bone	Polished bone	4	0.38%	4	0.38%
Polished bone flake	Polished bone flake	1	0.10%	1	0.09%
Polished rib	Polished rib	1	0.10%	1	0.09%
Raphicerus campestris	Steenbok	13	1.25%	13	1.23%
Raphicerus melanois sharpei	Sharp's Steenbok	1	0.10%	1	0.09%
Rodent	Rodent	16	1.53%	16	1.52%
Rodent: small	Rodent: small	1	0.10%	1	0.09%
Rodent: small–medium	Rodent: small-medium	12	1.15%	12	1.14%
Rodent: medium	Rodent: medium	2	0.19%	2	0.19%
Struthio camelus	Ostrich	4	0.38%	4	0.38%
Sylvicapra grimmia	Common Duiker	4	0.38%	4	0.38%
Terrestrial Gastropod	Land Snail	2	0.19%	2	0.19%

Tortoise	Tortoise	43	4.12%	45	4.27%
Tragelaphus spekei	Sitatunga	2	0.19%	2	0.19%
Tragelaphys strepsiceros	Kudu	1	0.10%	1	0.09%
Worked Bone	Worked Bone	2	0.19%	2	0.19%
x	Unknown but included in collection	28	2.68%	28	2.66%
Total		**1044**	**100.00%**	**1054**	**100.00%**

MIDDLE LOSE NISP AND QNT

Taxon	Common Name	NISP	NISP%	QNT	QNT%
Achatina species	Giant African Ground Snail	2	0.06%	2	0.06%
Aepyceros melampus	Impala	10	0.28%	10	0.29%
Aves: small-medium	Bird: small-medium	2	0.06%	2	0.06%
Aves: medium	Bird: medium	85	2.40%	91	2.61%
Aves: medium-large	Bird: medium-large	1	0.03%	1	0.03%
Aves: large	Bird: large	1	0.03%	1	0.03%
Bos taurus	Cow	1137	32.15%	1125	32.22%
Bov. I	Bovid: size class I	43	1.22%	42	1.20%
Bov. II	Bovid: size class II	214	6.05%	216	6.19%
Bov. II domestic	Bovid: size class II, domestic	9	0.25%	9	0.26%
Bov. II (non-dom)	Bovid: size class II, non-domestic	26	0.74%	26	0.74%
Bov. III domestic	Bovid: size class III, domestic	2	0.06%	2	0.06%
Bov. III	Bovid: size class III	306	8.65%	317	9.08%
Bov. III (non-domestic)	Bovid: size class III, non-domestic	27	0.76%	27	0.77%
Canis familiaris	Dog	1	0.03%	1	0.03%
Capra hircus (cf)	Goat (cf)	46	1.30%	42	1.20%
Carnivore: small	Carnivore: small	1	0.03%	1	0.03%
Carnivore: small-medium	Cavore: small-medium	3	0.08%	3	0.09%
Carnivore: medium	Carnivore: medium	5	0.14%	5	0.14%
Clarias gariepinus	African Sharptooth Catfish	1	0.03%	1	0.03%
Connochaetes taurinus	Blue Wildebeest	3	0.08%	3	0.09%
Crocuta crocuta	Spotted Hyaena	2	0.06%	2	0.06%
Equus burchelli	Burchell's zebra	14	0.40%	14	0.40%
Francoline	Francoline	4	0.11%	4	0.11%
Francoline size bird	Francoline size bird	9	0.25%	9	0.26%
Frog/Toad	Frog/Toad	1	0.03%	1	0.03%
Gallus domesicus	Chicken	80	2.26%	80	2.29%
Gallus/Numidae	Chicken/Guineafowl	18	0.51%	18	0.52%
Geochalone pardalis	Leopard Tortoise	12	0.34%	12	0.34%
Giraffa cameopardalis	Giraffe	4	0.11%	4	0.11%
Hippopotamus amphibius	Hippopotomus	2	0.06%	2	0.06%
Hippopotomus/Rhinoceros	Hippopotomus/Rhinoceros	1	0.03%	1	0.03%
Hippotragus equinus	Roan	1	0.03%	1	0.03%
Homo sapiens	Human	1	0.03%	1	0.03%
Lagromorphia	Hare	13	0.37%	13	0.37%

Lagromorphia species	Hare	3	0.08%	3	0.09%
Lepus saxatilis	Scrub hare	12	0.34%	12	0.34%
Mammal: large	Mammal: large	1	0.03%	1	0.03%
Mongoose	Mongoose	1	0.03%	1	0.03%
Numidae species	Guineafowl sp.	2	0.06%	2	0.06%
Orycteropus afer	Antbear	1	0.03%	1	0.03%
Oryx gaxella	Gemsbok	1	0.03%	1	0.03%
Ovis aries	Sheep	114	3.22%	109	3.12%
Ovis/Capra	Sheep/Goat	674	19.06%	656	18.79%
Panthera Leo	Lion	1	0.03%	1	0.03%
Pedetes capensis	Spring hare	1	0.03%	1	0.03%
Phachochoerus aethiopicus	Warthog	1	0.03%	1	0.03%
Polished bone	Polished bone	1	0.03%	1	0.03%
Polished bone flake	Polished bone flake	6	0.17%	6	0.17%
Polished rib	Polished rib	1	0.03%	1	0.03%
Proteles cristatus	Aardwolf	1	0.03%	1	0.03%
Pyxicephalus adsperus	Pyxce Frog	1	0.03%	1	0.03%
Raphicerus campestris	Steenbok	12	0.34%	12	0.34%
Rattus ratttus	Rat	31	0.88%	27	0.77%
Rodent	Rodent	330	9.33%	308	8.82%
Rodent: small	Rodent: small	2	0.06%	3	0.09%
Rodent: small-medium	Rodent: small-medium	1	0.03%	1	0.03%
Rodent: medium	Rodent: medium	12	0.34%	11	0.32%
Serpentis species: medium	Snake: medium	3	0.08%	4	0.11%
Struthio camelus	Ostrich	35	0.99%	36	1.03%
Suid	Pig	1	0.03%	1	0.03%
Sus	Pig	1	0.03%	1	0.03%
Sylvicapra grimmia	Common Duiker	11	0.31%	11	0.32%
Taurotragus oryx	Eland	3	0.08%	3	0.09%
Terrestrial Gastropod	Land Snail	1	0.03%	1	0.03%
Tortoise	Tortoise	22	0.62%	22	0.63%
Unionidae	Mussel	1	0.03%	1	0.03%
Varanus species	Monitor Lizard	8	0.23%	8	0.23%
Viverridae	Civet/Genet/Mongoose	1	0.03%	1	0.03%
Worked Bone	Worked Bone	1	0.03%	1	0.03%
x	Unknown but included in collection	151	4.27%	152	4.35%
Total		**3536**	**100.00 %**	**3492**	**100.00 %**

LATE LOSE NISP AND QNT

Taxon	Common Name	NISP	NISP%	QNT	QNT%
Alcelaphes species	Hartebeest/wildebeest	1	0.04%	1	0.04%
Aves: Falconi formes (Order)	Bird of Prey	2	0.08%	2	0.08%
Aves: small	Bird: small	1	0.04%	1	0.04%
Aves: small-medium	Bird: small-medium	1	0.04%	1	0.04%
Aves: medium	Bird: medium	61	2.50%	61	2.54%
Aves: raptor, medium	Bird: medium raptor	1	0.04%	1	0.04%
Aves: large	Bird: large	3	0.12%	3	0.13%
Bos taurus	Cow	994	40.74%	988	41.22%
Bov. I	Bovid: size class I	26	1.07%	26	1.08%
Bov. II	Bovid: size class II	130	5.33%	126	5.26%
Bov. II domestic	Bovid: size class II, domestic	3	0.12%	3	0.13%
Bov. II (non-dom)	Bovid: size class II, non-domestic	2	0.08%	2	0.08%
Bov. III	Bovid: size class III	246	10.08%	254	10.60%
Bov. III (non-domestic)	Bovid: size class III, non-domestic	7	0.29%	7	0.29%
Bov. III (indet)	Bovid: size class III, domestic or non-domestic	1	0.04%	1	0.04%
Canis mesomelas	Blackbaked Jackal	2	0.08%	2	0.08%
Canis species	Dog/Fox/Jackal species	3	0.12%	3	0.13%
Capra hircus (cf)	Goat (cf)	20	0.82%	20	0.83%
Carnivore: small-medium	Carnivore: small-medium	3	0.12%	3	0.13%
Carnivore: medium	Carnivore: medium	6	0.25%	6	0.25%
Carnivore: medium-large	Carnivore: medium-large	1	0.04%	1	0.04%
Crocuta crocuta	Spotted Hyaena	4	0.16%	4	0.17%
Equus burchelli	Burchell's zebra	4	0.16%	4	0.17%
Erinaceaus frontalis	Hedgehog	5	0.20%	5	0.21%
Francoline	Francoline	1	0.04%	1	0.04%
Francoline size bird	Francoline size bird	5	0.20%	5	0.21%

Frog/Toad	Frog/Toad	4	0.16%	4	0.17%
Gallus domesticus	Chicken	40	1.64%	41	1.71%
Gallus/Numidae	Chicken/Guineafowl	12	0.49%	12	0.50%
Giraffa cameopardalis	Giraffe	1	0.04%	1	0.04%
Hippotragus equinus	Roan	1	0.04%	1	0.04%
Lagromorphia	Hare	16	0.66%	16	0.67%
Lepus saxatilis	Scrub hare	6	0.25%	7	0.29%
Loxodonta africana	Elephant	5	0.20%	5	0.21%
Orycteropus afer	Antbear	3	0.12%	3	0.13%
Oryx gaxella	Gemsbok	1	0.04%	1	0.04%
Ovis aries	Sheep	62	2.54%	53	2.21%
Ovis/Capra	Sheep/Goat	428	17.54%	407	16.98%
Pedetes capensis	Spring hare	2	0.08%	2	0.08%
Polished bone	Polished bone	7	0.29%	7	0.29%
Polished bone flake	Polished bone flake	1	0.04%	1	0.04%
Polished rib	Polished rib	1	0.04%	1	0.04%
Raphicerus campestris	Steenbok	3	0.12%	3	0.13%
Raphicerus melanotis sharpei	Sharp's Steenok	2	0.08%	2	0.08%
Redunca arundinum	Reedbuck	1	0.04%	1	0.04%
Rhinocerotidae	Rhinoceros	2	0.08%	2	0.08%
Rodent	Rodent	104	4.26%	100	4.17%
Rodent: small	Rodent: small	1	0.04%	1	0.04%
Rodent: medium	Rodent: medium	1	0.04%	1	0.04%
Struthio camelus	Ostrich	134	5.49%	138	5.76%
Sylvicapra grimmia	Common Duiker	3	0.12%	3	0.13%
Tortoise	Tortoise	1	0.04%	1	0.04%
x	Unknown but included in collection	65	2.66%	52	2.17%
Total		**2440**	**100.00%**	**2397**	**100.00%**

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