Animal bones from excavations at Darling Walk (now known as Darling Quarter), Darling Harbour, 2008-2010

Melanie Fillios

Report to

Casey & Lowe Pty Ltd

On Behalf of

Lend Lease Development

April 2010

II. List of Figures

III. List of Tables

1.0   Introduction

This report discusses the faunal remains (animal bone) recovered from excavations conducted by Casey & Lowe Pty Ltd for Lend Lease at Darling Quarter, previously known as Darling Walk, Darling Harbour, Sydney, NSW. Excavation was carried out over several periods in 2008-2009. The 13,375 fragments of bone are analysed and discussed with the following aims:

1. To present a general, descriptive overview of the animal bones recovered from Darling Walk, Darling Harbour;
2. To provide a critical analysis of the species exploited with specific reference to the possible relationship between the socio-economic status of the inhabitants and type of meat cut and/or animal consumed;
3. To provide an intra-site analysis of areas/contexts (domestic vs industrial/commercial) based on both species and body part representation;
4. To situate the assemblage from Darling Walk within the larger historical framework of nineteenth-century colonial Sydney through comparison with other available contemporaneous faunal assemblages.

Animal bone was recovered from 249 separate contexts from five areas of the site.

1. Area 5 – Location of the Boiler House associated with the P.N. Russel Foundry
2. Area 6 – 1820s Barker's Jetty, subsequent reclamation work and industrial development
3. Area 7 – 1850s reclamation, Murphy's wharfage and cottage
4. Area 8 – 1840s reclamation and workers' housing
5. Area 9 – 1820s Barker's mill yard and mill pond, and later industrial development (Casey & Lowe, 2009).

1.1 Limitations

As with any analysis, determination of the origin and function of faunal remains can only be as comprehensive as the recovered material. Conclusions are drawn on the excavated material, and may be subject to change given larger sample sizes. The material analysed here represents a small portion of a much greater assemblage. Additionally, recovered remains are subject to excavation and retrieval biases; with those contexts subjected to 100% wet sieving having a greater likelihood of complete recovery of all animal fragments, including those from smaller species. Also during final reporting for the excavation report some contexts may have been identified as having been incorrectly located in specific areas and were updated in the main report and where possible in this report.

2.0 Methods

100% of the recovered animal bone from Darling Walk was analysed, and identified with the aid of modern comparative reference collections. Further identification was aided by reference to standard faunal texts (Hillson 1992; Schmid 1972). The resulting data was recorded on an Excel spreadsheet, and later entered into an Access database. Animal bone was analysed by context, and identified to the level of species and element. All identified bone was given a catalogue number. All forms of bone surface modification were noted, including weathering stage, presence/absence of butchery marks (including type, location and quantity), presence/absence of scavenger tooth marks (rodent/dog gnawing), burning, weathering, pathology and any other distinguishing characteristics. All elements were assessed for age markers; either according to the state of epiphyseal long bone fusion or state of tooth wear/eruption (see Appendix 9.1 for catalogue definitions). All faunal material was quantified using NISP (number of identified specimens) after Lyman (1994). All identified skeletal elements were broken down into the following broad body part groups to facilitate analyses: cranial (skull, mandible, teeth), axial (vertebra, rib, innominate, scapula), appendicular (humerus, radius, ulna, femur, tibia, fibula) and foot (metacarpal, metatarsal, metapodial, carpal, tarsal, astragalus, calcaneus, phalange). Identified bone from all areas (except area 8) was bagged separately by catalogue number. Bone from area 8 was bagged by context, unless individual fragments were deemed significant for further analysis (i.e. worked, cut-marked, burned). No attempt was made to differentiate sheep and goat.

In general, bone was recovered in the field by hand from areas 5, 6, 7 and 9. However, excavation methodology and thus artefact collection varied, dependent on context/feature type. In general all in situ occupation-related material was 100% wet sieved (e.g. Area 8 underfloor deposits), and is unlikely to be subject to size recovery bias. Cesspit backfills were often sample sieved. The collection of artefacts after wet sieving was as comprehensive as possible, though discarding of items, such as tiny fragments of bone, was undertaken. Areas and contexts not wet sieved are likely biased toward those skeletal elements readily discerned by eye during excavation. Material from cesspits and rubbish pits from all areas was 100% excavated but not sieved. Collection of artefacts from these was comprehensive, but biased towards larger and/or diagnostic items.

3.0 Overview of the assemblage

A total of 13,735 fragments of animal bone were recovered and analysed from five separate areas within the Darling Walk site (Areas 5,6,7,8,9), each containing numerous distinct contexts. The largest portion of recovered remains came from domestic contexts in Area 8 (12530), and is largely comprised of fish and rodent bones (Table 1). Areas 6 and 7 also yielded a significant quantity of bone. There were far fewer remains in Areas 9 and 5. The excavated areas likely represent not only distinct phases of the site's use and occupation, but also quite distinctive differences in function. While material recovered from Areas 8 and 9 was largely from domestic contexts, animal bone from 5,6,7 appears to be of an industrial nature – possibly waste from animal butchering and processing (butcher's shop, abattoir) and tanning / soap making.

A total of 4598 fragments of bone (33%) were "non-diagnostic", and were not identifiable to species. The majority of these unidentifiable fragments were from Area 8, and were a combination of ribs and vertebral fragments from medium sized mammals. These fragments of bone likely belong to sheep and pig; however it was not possible to definitively attribute the fragments to either species with certainty as they lacked diagnostic features.

Traces of butchery were identified on a significant proportion of the bone, with all areas yielding evidence for both saw and cut marks. Differences in butchery mark frequency between areas may reflect industrial versus domestic contexts. For example, Area 6 yielded a large frequency of sawn cattle rib bones, while Area 8 yielded comparatively few butchery marks relative to the size of the assemblage. Butchery marks identified in Area 8 were commonly made by knives, suggesting domestic butchery, while those from Areas 6 and 7 were heavily sawn – perhaps reflective of butcher's waste from an abattoir. Further analyses of butchery patterns are addressed in section 5.1.

In general, animal bones from Darling Walk were in a good state of preservation. The majority were analysed as belonging to weathering stage 0-1 (after Behrensmeyer, 1978), suggesting they were buried soon after discard. In addition, some bones bore traces of burning and possibly boiling. The distribution of these taphonomic factors were spread throughout the recovered assemblage, so no clear patterning is evident permitting further conclusions.

3.1 Frequency of species represented across the site

Sheep account for the majority of identified remains from Darling Walk, followed by fish, rodents, chicken, cattle and pig respectively (Fig 1). Dog, cat, a variety of birds, horse, reptile, turtle and human teeth complete the assemblage (Table 1).
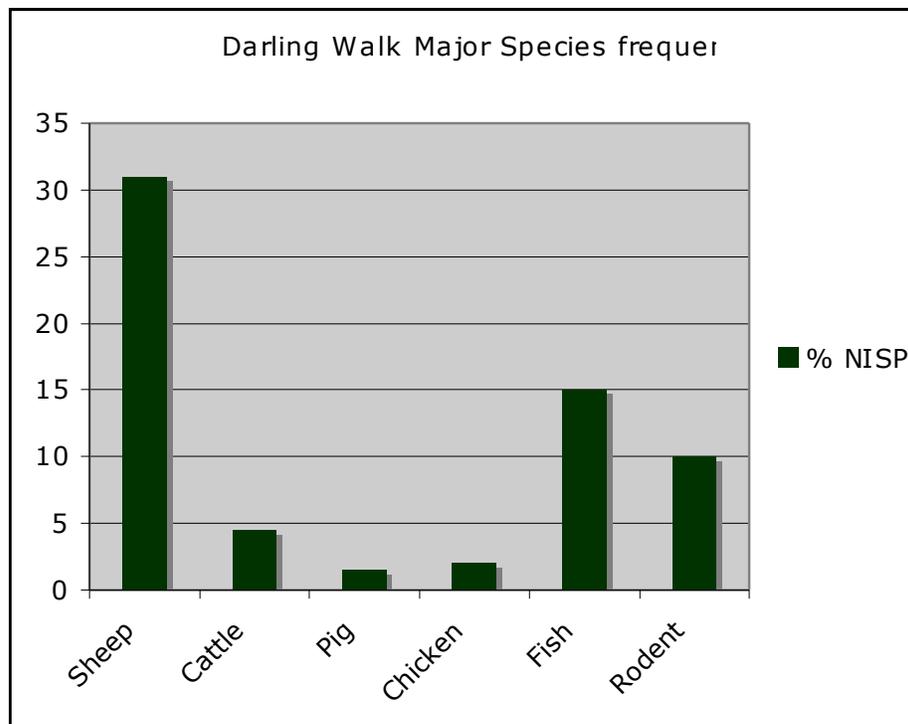
Figure 1. Frequency of major species, Darling Walk (all areas)

Variation in species frequency is likely a reflection of differences between domestic and industrial contexts. Area 8 contains the largest diversity of species, with a significant number of fish and rodent bone, while Areas 6, 7 and 9 yielded a smaller range of species. Sheep and cattle comprise the majority of meat animals in all areas, with pigs and domestic fowl comprising the remainder of food remains. Fish appear to have comprised a significant portion of the diet in Area 8, and rodents (mice and rats), while intrusive, appear to have been widespread. In general, the high frequency of sheep and cattle bone is consistent with the results of other colonial faunal assemblages in Sydney (see section 6.0), as is the smaller frequency of pig. The small number of identified pig elements may not be completely reflective of the actual quantity of pig in the colonial diet. Large numbers of ribs and vertebra in the assemblage that can only be identified as medium mammal (MM) likely belong to pigs, as well as sheep, thereby artificially lowering the frequency of pig.

Differences in animal utilization across the site may be reflected not only in differences in species composition between areas, but also in differences in skeletal element frequency. Areas 6 and 7 in particular appear to reflect waste of a more industrial nature, possibly from a butcher, an abattoir, or industry relating to tanning/soap making. In contrast, Area 8 bears a distinctly domestic signature. These differences are addressed in detail in sections 5.0.

4.0 Area Analyses

Differences between domestic and industrial areas across colonial Darling Harbour are aptly reflected in the faunal remains. The following section will individually discuss all excavated areas with animal bones in depth, and will highlight specific contexts that have the potential to yield the greatest information regarding life in colonial Sydney.

4.1 Area 5

A total of just eight fragments of animal bone (NISP) were identified from Area 5 recovered from three contexts (Table 2). The small number of animal bones is consistent with the former industrial character of the area – the location of the Boiler house associated with P.N. Russel Foundry (Casey & Lowe, 2009). Species identified include sheep and cattle (Table 3). The limited number of animal bone recovered from this area renders further analyses uninformative.

4.2 Area 6

A total of 541 fragments of animal bone (NISP) were identified from Area 6, recovered from 71 contexts (Table 4). Species identified include sheep, cattle, pig, horse, dog, chicken, bird, rat and turtle (Table 5). Sheep comprise the majority of the identified material (54%), followed by cattle (37.3%), chicken (4.4%) and pig (2.5%) (Fig 2).
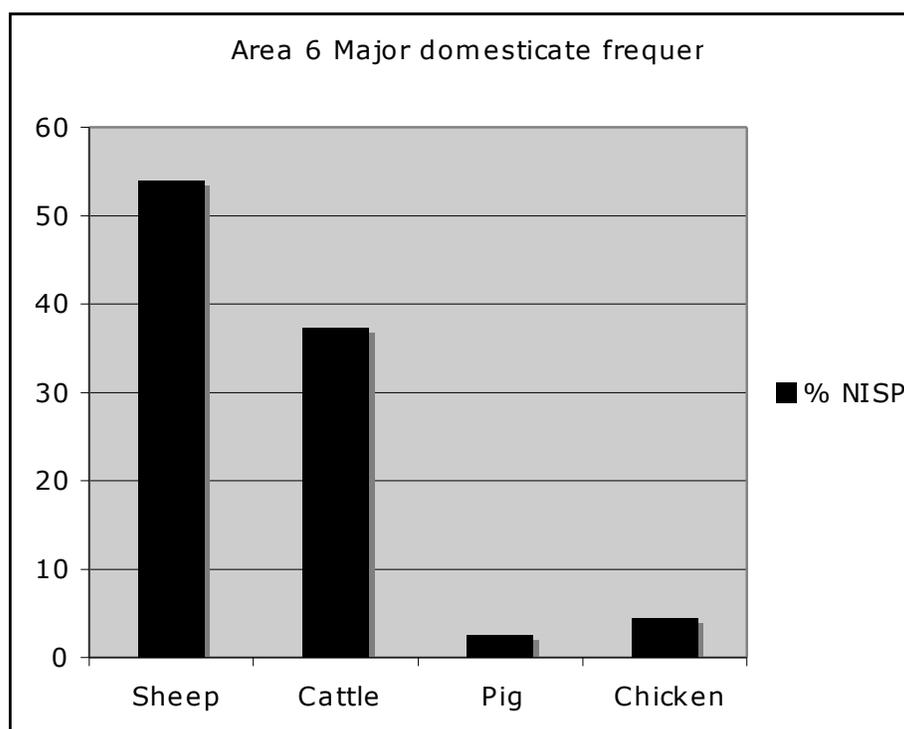
Figure 2. Area 6 frequency of major domesticates

Cursory analysis of species frequencies in Area 6, compared with those from domestic contexts, shows a higher frequency of cattle (see Fig.4), thus while it is difficult to definitely ascertain the origin of the animal bone, the high frequency of cattle suggests an

industrial origin. While the dominance of the major domesticates, sheep, cattle and pig render either domestic or industrial refuse a possibility, further examination of skeletal element frequencies, coupled with analyses of bone surface taphonomic indicators, such as butchery marks, burning and state of preservation, suggest the bones could largely be a result of commercial activities known from historical record to have been in the area (Case & Lowe, 2009).

Skeletal element frequency: Animal bones from the axial skeleton (trunk) account for the highest frequency of identified elements (52.1%). Bones from the appendicular skeleton (forelimb, hindlimb), foot and cranium follow respectively (Table 6). In general, animal bones that are the end-product of consumption are characterized by a high frequency of axial and appendicular elements, with few foot or head bones. However, Area 6 (along with Area 7) yielded a higher frequency of cranial elements than the domestic contexts of Area 8. The higher frequency of heads and feet, typically lower economic utility parts of the animal, suggests a number of possible interpretations: The presence of all body parts of an animal is usually interpreted as reflecting on-site butchery. Thus, contexts not domestic in nature, containing all major portions of an animal, are frequently interpreted as evidence of industrial waste, possibly originating from a butcher's shop, abattoir or other commercial activity involving animal by-products.

Butchering marks: Over one quarter (28%) of the bone fragments from Area 6 have traces of butchering in the form of cut/chop marks and/or saw marks. Sixty percent of bones bearing evidence of butchery are marks made by a butcher's saw, while the remaining 40% are either cut or chop marks made by metal implements. Most bones have more than one mark on them, and are often both cut and sawn. It is significant that nearly one third of a relatively small assemblage has evidence of butchery, with such a high frequency of saw marks. This suggests that a portion of the assemblage in Area 6 may have originated from either a butcher's shop or abattoir. This hypothesis is further supported by the presence of all major body parts discussed above.

Age profiles: An analysis of the age at which the major domesticates were slaughtered can provide insight into industry and socio-economic issues. In Area 6, the majority of sheep and cattle elements belonged to adult individuals, while the few pig elements belonged to juveniles (under 12 months of age). These data are consistent with historical records that show that during the later nineteenth century sheep were primarily used for wool, with meat a secondary, beneficial by-product (Garran & White, 1985).

Burning: There is no distinct patterning with respect to burned bone in Area 6. Just over 3% of the assemblages bear traces of burning, found on a variety of cattle and sheep skeletal elements. Several cattle and sheep bones also appear to have been boiled, although once again, there is no clear patterning with regard to context or body part.

Area 6 contained the 1820s Barker's Jetty and was privy to subsequent reclamation work (Casey & Lowe, 2009). The mixture of bones in Area 6 suggests a combination of largely commercial deposits, which might be consistent with fill from later reclamation work at the site. If so, this would render most of the animal bone a secondary deposit, not

in primary depositional context. Consistent with the likely redeposition of the faunal material, some bones may have originated from domestic contexts as well. Unfortunately, the history of reclamation in Area 6 makes finer conclusions tenuous.

4.2.1 Area 6 discussion of selected contexts

Five individual contexts were selected as meriting further analyses based upon the number of bones recovered, as well as additional information from the preliminary excavation results. The following is a discussion of contexts 8214, 8261, 8295, 8330 and 8367.

Context 8214 (Reassigned to Area 7) – A total of 22 fragments of animal bone were recovered from context 8214. The context constitutes imported fill used to level the site after reclamation, and is dated to phase 6 (1840s to 1860s Reclamation, Residential and Industrial Development) of the site (Casey & Lowe, 2009). The animal bone consists of just two species, sheep and cattle, with the majority of bones coming from the axial and appendicular skeleton (Table 7). Four elements have traces of a butcher's saw – all belonging to cattle. The small size of the assemblage renders any broad conclusions tenuous; however the distribution of elements with cut marks suggests the remains of either butchering waste or domestic consumption – likely in secondary depositional context.

Context 8261 – A total of 21 fragments of animal bone were recovered from context 8261 from two species, cattle and sheep. According to the preliminary excavation report (Casey & Lowe, 2009) the context constitutes fill representing domestic waste as a rubbish pit. It was unclear during excavation whether the fill is occupation related or imported. Though likely mid nineteenth century in date this rubbish pit context has been assigned to phase 9 of the site (twentieth century) as it constituted an isolated feature found during machine clearance and not subject to detailed excavation (Casey & Lowe 2009). The distribution of species is nearly evenly split between cattle and sheep, and all major body parts are represented (Table 8). Of interest, however, is the relatively large frequency of cranial skeletal elements, with respect to the rest of the assemblage. At Darling Walk, bones from the skull are the least frequently represented. Further, the cattle can be aged as young adults, while sheep are older individuals. The relatively young ages of the cattle, coupled with the high frequency of heads, might suggest waste of an industrial nature, more likely an abattoir than another form of industry. Evidence of butchery marks on cranial and foot elements further support this suggestion. Analysis of the faunal remains, therefore suggests that the fill may be imported, rather than occupation related. Given the small number of remains once again, however, this conclusion is equivocal.

Context 8295 (Reassigned to Area 7) – A total of 40 identified animal bones were analysed from context 8295. The context consists of fill imported to level the site post-reclamation – 1850s, and is also dated to phase 7 (1860s to 1900) (Casey & Lowe, 2009). Species identified include cattle, chicken, and sheep, respectively. Bones from the axial skeleton account for the largest portion of recovered elements, followed by those from

the appendicular skeleton (Table 9). Eight elements have been sawn by a butcher's saw, most of which are cattle ribs (and one sheep's skull). The combination of exclusively meat animals, coupled with saw marks likely suggests butcher's waste. As the bones have been designated as fill, it is possible the assemblage represents elements from an originally commercial context, such as an abattoir or butcher's shop.

Context 8330 (Reassigned to Area 7) – The largest quantity of animal bone in area 6 was recovered from context 8330, 125 identified specimens. The context is a rubbish dump, dated to phase 7 (1860s-1900 residential and industrial development) of the site (Casey & Lowe, 2009). The assemblage is comprised of sheep, cattle, pig and chicken, respectively, with bones from the axial skeleton accounting for the majority of identified body parts (Table 10). Many bones appear to have been in contact with metal, perhaps iron, as they are both very friable and stained reddish green. Of particular note is the high frequency of cattle elements that have been sawn (45% of cattle bones), the majority of which are from the axial skeleton. Cut and saw marks are also evident on sheep bones, although to a lesser extent than cattle. The high frequency of butchery marks on largely prime meat-bearing bones suggests the bones likely originated from a commercial context – such as an abattoir or butcher's shop.

Context 8367 – A total of 38 animal bones of sheep and cattle were identified from the levelling fill of context 8367. The fill likely represents imported material from the local area, and has been attributed to phase 6 (Casey & Lowe, 2009). All major body parts are represented for both species (Table 11) and one third of the bones bear traces of butchery in the form of cut and saw marks. Ageable sheep mandibles suggest older individuals. These factors once again suggest that the bones likely originated from butcher's waste.

4.3 Area 7

Area 7 of Darling Walk is largely characterized by deposits from the 1840s-1850s reclamation of the site, along with Murphy's wharfage and cottage dating from the 1860s (Casey & Lowe, 2009). A total NISP of 542 animal bones were recovered and analyzed from the area from 41 separate contexts (Table 12), and three phases (5,6,7). The most common species in Area 7 include sheep, cattle, pig and chicken, respectively (Fig 3). Cat, dog, fish, turtle and unidentified birds and medium mammals were further identified (Table 13). The faunal remains from Area 7 are similar to those recovered from Area 6, with the main difference appearing in the somewhat wider diversity of recovered species.
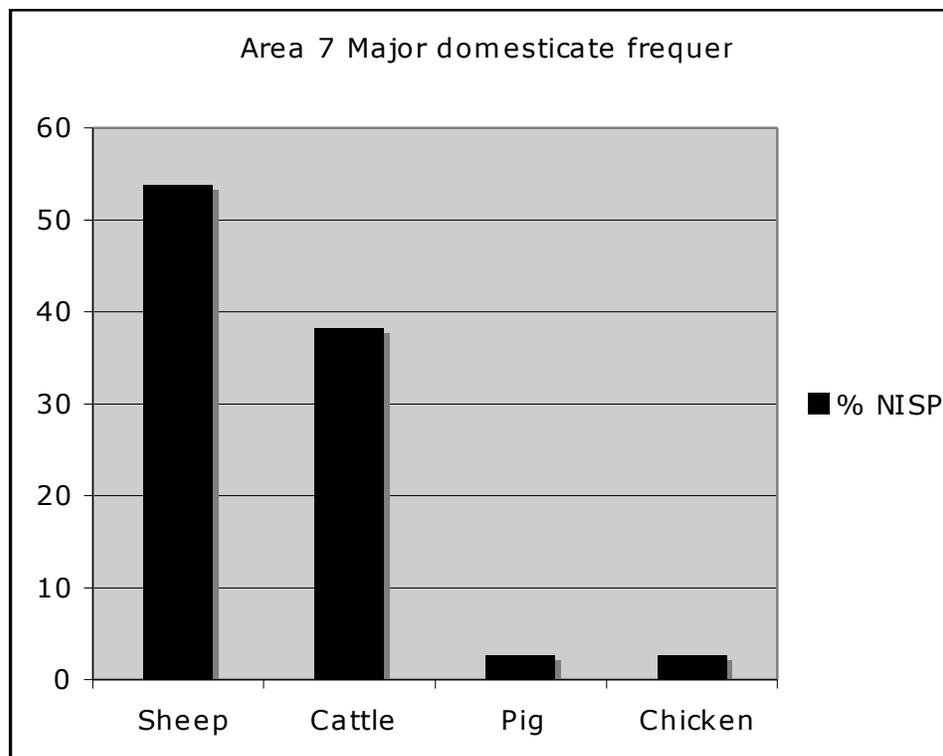
Figure 3. Area 7 frequency of major domesticates

Skeletal element frequency: Bones from the axial skeleton (trunk) constitute the majority of identified elements, followed by appendicular (forelimb, hindlimb), foot and cranial, respectively (Table 14). This distribution of body parts suggests similar hypotheses to those offered for Area 6 – namely the presence of all major body parts characteristic of on-site butchery or slaughtering of animals. This suggests the bones largely stem from either commercial or industrial contexts, such as a butcher's shop or even possibly a tannery or industry involving animal by-products. The high frequency of prime meat-bearing bones relative to the less desirable head and foot bones however lends more weight to the assemblage originating from a butcher's shop or abattoir, rather than industries such as tanning. Several elements also appear to have been in contact with metal during burial, as they are stained by iron and copper. A further few appear to have spent some time in a wet environment, as their surfaces are root-marked, and marked with accretions from sea water.

Butchery marks: Thirty one percent of the bones from Area 7 have butchering marks in the form of chop, cut, and saw marks. Butchery marks are not exclusive to either sheep or cattle, nor are they found on any one element more than another. Further, cut marks and saw marks are often found together on an element, suggesting initial slaughtering and dismemberment of an animal, followed by further preparation in the form of further disarticulation of small portions for sale, perhaps. This patterning lends more support to the bones originating as part the food industry as opposed to other commercial activities.

Age profiles: Ageable skeletal elements from Area 7 suggest a mix of age profiles, with some patterning, however. Both cattle and pig bones appear to belong to younger individuals. In the case of cattle, tooth wear and eruption stage, coupled with epiphyseal fusion of long bones suggests many individuals were less than 4-5 years of age. Age estimates of pig teeth suggest individuals less than 12 months of age. Sheep appear to have been slaughtered at a relatively older age, with aging data suggesting an age around 5 years (relatively older for sheep than cattle). The discernible patterning from age profiles of the major domesticates bolsters the hypothesis that the bones likely originate from commercial food waste (i.e. butchering or abattoir).

Burning: Approximately 4% of the cattle and sheep bones from Area 7 show traces of burning, widely dispersed through various contexts. There is no clear discernable patterning to the burning, although it does not seem to have occurred for long periods of time as the bones are blackened as opposed to white (calcined).

If all contexts are considered as one unit in Area 7, data gleaned from the faunal material suggests the bones are probably in secondary depositional context, and likely originated from either an abattoir or butcher's shop. The majority of identified elements from phases 6 and 7 of the site are prime meat-bearing bones, which coupled with a high frequency of butcher's saw marks and younger pig and cattle bones, lends support of the commercial origin of the faunal material. It is possible however, that those contexts attributed to phase 5 of the site, represent some type of industrial use of animal by-products. Contexts dated to this phase have a dominance of cranial and foot bones, suggesting their use in an industrial context, such as tanning or perhaps glue/candle/soap making.

4.3.1 Area 7 Discussion of selected contexts

A total of eight contexts in Area 7 were selected for further analysis and discussion based upon preliminary examination of the faunal material, as well as excavation data.

<u>Context 7904</u> – A total of 56 fragments of bone were recovered from context 7904, identified as reclamation fill. The deposit has been identified as imported fill used to build up ground level in the foreshore area, and has been attributed to phase 5 of the site (Casey & Lowe, 2009). Three main domesticates are represented in the assemblage – cattle, sheep and pig, respectively. All major body parts are also present, with axial elements comprising the majority of identified bones, followed by appendicular, cranial and foot (Table 15). Approximately two-thirds of the cattle elements have butchering marks, as compared with one third of sheep bones. The high frequency of cut marks on prime meat-bearing bones suggests the assemblage likely originated as butcher's waste. Further, the surfaces of many of the bones in the assemblage are markedly degraded/weathered, suggesting exposure at some period to the elements, supporting their secondary deposition as reclamation fill.

Context 7906 – A total of 19 fragments of animal bone were recovered from context 7906. The small number of bones renders conclusions regarding the origin and characterization of the deposit equivocal; therefore the following hypotheses should be considered preliminary. The context has been designated as a reclamation/tidal deposit, consisting of early reclamation fill. The excavated sediments contained quantities of sawdust that may relate to the surrounding industries that included slaughterhouse and tanneries. The context has been attributed to phase 5 of the site occupation (Casey & Lowe, 2009). The species identified include cattle, sheep and pig, along with one fish bone. While all major body parts are represented, foot bones comprise the majority of identified bones (Table 16). This is in stark contrast to the usual dominance of axial and appendicular elements in assemblages with meat origin. While cautionary due to the small size of the deposit, it is possible that the animal bones originated from an industrial context, and the high frequency of foot and cranial elements are consistent with skeletal element profiles known from tanning contexts. The smaller frequency of butcher's saw marks lends further support to this possibility. Further, the majority of cattle and sheep elements appear very worn, possibly as a result of redeposition or possibly from boiling prior to redeposition. Unfortunately few of the elements allow for accurate age determinations, however the state of epiphyseal fusion does suggest the animals were adult. It is likely the bones are derived from industrial waste.

Context 7927 – A total of 42 fragments of animal bone were identified in context 7927. The assemblage constitutes fill associated with the late nineteenth-century industry (likely the foundry Biggs' Iron Foundry), and is attributed to phase 7 (Casey & Lowe, 2009). The assemblage consists mainly of sheep and cattle, followed by pig and cat, respectively. Axial elements comprise the majority of identified bone, followed by appendicular, foot and one cranial element (Table 17). The high frequency of axial elements, followed by appendicular elements, suggests the assemblage likely constitutes the remains of domestic refuse. Once again, the small number of bones from any one species mitigates further conclusions.

Context 7986 – A total of 49 fragments of animal bone were recovered as part of imported reclamation fill used to build up foreshore of harbour during phase 5 of the site (Casey & Lowe, 2009). Cattle were the main animal identified, followed by sheep, chicken and bird. In context 7986, cranial and foot elements comprise the major body parts identified (Table 18). This is in contrast to contexts in which the origin of the faunal material may have been derived from either domestic or butcher's waste. The high frequency of the two least useful body parts, from a meat perspective, suggests the origin of the remains is likely to be industrial. Further weight is lent to this suggestion upon examination of the high frequency of chop marks on cattle foot and cranial bones, as opposed to very few saw marks. Those saw marks that do occur are on prime meat-bearing bones, however. During phase 5 of occupation at Darling Walk, both a tannery and abattoir were extant in the area. The skeletal element profiles suggest that the bone used as part of the fill may have derived from these contexts. While it has been suggested the fill was imported, it may have been imported from an industrial area, rather than from domestic contexts.

Context 7987 – The largest number of animal bones in Area 7 were recovered from context 7987, with 100 identified specimens. The assemblage represents an occupation deposit related to 1850s Murphy's wharfage (phase 6) and its occupation to late nineteenth century (phase 7), and has therefore a mix of phases 6 and 7 (Casey & Lowe, 2009). Cattle and sheep are the most frequently occurring species, followed by chicken, bird, pig and turtle (Table 19). Axial elements constitute the most frequently occurring elements, followed by appendicular, foot and a few cranial bones. The skeletal element profiles, coupled with the relatively higher frequency of chicken, are consistent with domestic refuse. A number of cattle axial bones have been sawn, while cut marks are also common on both cattle and sheep bone.

Context 7991 – A total of 39 fragments of animal bone were recovered from the Industrial-related fill used to level the ground after reclamation, attributed to phase 6 of the site (Casey & Lowe, 2009). Sheep are the most common species identified, followed by cattle, and one pig element (Table 20). Axial elements account for the highest frequency of bones recovered, followed by appendicular, foot and cranial (Table 20). Several high meat yield cattle and sheep bones have both saw and cut marks. While the small number of bones mitigates detailed analyses, the species distribution, skeletal element frequencies, and the occurrence of cut marks suggest it is likely the bones originated as domestic refuse.

Context 8004 – A small number of animal bones were recovered from context 8004 – 19 fragments. The context constitutes an occupation-related deposit within Murphy's cottage. While the cottage was built during phase 6 of the site, the deposit is more likely associated with the last phase of use of the cottage, phase 7. Nonetheless, the deposit is likely a mix of phases 6 and 7 (Casey & Lowe, 2009). The deposit is dominated by sheep, followed by chicken and dog, respectively (Table 21). The sheep bones are largely from the axial skeleton, followed by the foot and appendicular. It is likely the bone represents domestic refuse. The small quantity of sheep elements renders analyses related to the socio-economic status of the occupants untenable.

Context 8037 – A total of 49 elements were recovered from context 8037, cesspit fill. According to the preliminary report, the deposit is likely to contain a mix of domestic rubbish and other waste as well as backfill, and is associated with the occupation of Murphy's wharfage, phase 7 (Casey & Lowe, 2009). Sheep are the dominant species represented, followed by cattle, chicken and dog (Table 22). Axial and appendicular elements comprise the majority of identified bone, consistent with a domestic deposit. The sheep bones represent the prime meat-bearing bones of the skeleton.

4.4 Area 8

Area 8 of Darling Walk is mainly characterized by contexts from the 1840s reclamation of the site and workers' housing (Casey & Lowe, 2009). The majority of faunal remains were recovered from domestic contexts, in particular underfloor deposits. A total of 120 contexts were examined from Area 8 (Table 23), comprising 12,530 bone fragments. The

---

domestic nature of the deposits, coupled with wet sieving of most deposits, has a significant impact on the diversity and frequency of species recovered, particularly with respect to small fragments of rodent and fish bone. In general, medium sized mammals, especially sheep, constitute the largest portion of the assemblage, accounting for nearly 65% of the identifiable bones (Table 24). The high frequency of unidentifiable medium mammal remains consists largely of medial rib fragments and vertebral fragments, coupled with long bone shaft fragments. These bones likely belong to either sheep or pig; however it is not possible to identify to which species with 100% certainty. Fish account for the next most frequently occurring species (16.8%), followed by rodents (rats and mice) at 11% (Table 24). Fish are largely represented by vertebra and dorsal fin ray fragments. No attempt was made to identify the type of fish represented, leaving scope for future analyses.

Rodents are intrusive in the deposits, and are not only harbourers of disease, but known accumulators of bone. Both adult and juvenile rodent bones were identified, suggesting that the rodents were living and breeding beneath the house floors. The large number of rodent bones, especially in workers' housing, is to be expected, as the houses likely belonged to individuals of lower economic means. Additional species identified include cattle, pig, cat, dog, chicken, rabbit, bird, goose, lizard, turtle, yabbie and humans (teeth) (Table 24).

The diversity of species recovered from Area 8 is mirrored in faunal assemblages across Sydney in the nineteenth century (see section 6.0). Common food animals in Area 8, and in contemporaneous sites across Sydney, include sheep, cattle, pig, chicken and rabbit, with the later two less commonly eaten in nineteenth-century Sydney (Table 25). As the origin of the domestic contexts analysed here is known, larger questions that can be asked of the assemblages surround issues of a socio-economic nature. Differences between species representation may provide insight into the economic means of the workers. In Area 8 as a whole, sheep comprise over 83% of the exploited species, followed by cattle and pig (Fig 4). While the relationship between meat cut and economic means has been frequently addressed (see Colley, 2006 among others), it is still a beneficial pursuit to examine both species frequency and the parts of the animals consumed to paint a fuller picture of workers' lives in colonial Sydney. At Darling Walk, the high frequency of sheep, especially in comparison with an extremely low frequency of cattle, suggests individuals of a medium economic stratum. Of great interest, is the near even frequency of cattle and pig. In general, domestic refuse in colonial Sydney favours cattle by a wide margin over pig, especially given that pork was generally the most expensive meat of the three. While sheep was the cheapest meat, the price of beef was often evenly matched, occasionally rising a bit higher due to fluctuating supply and demand (often related to periodic droughts and rainfall). A deeper look into the skeletal element frequencies of the three main domesticated species from Area 8, sheep, cattle and pig, may provide further information.

Area 8 Major domesticate frequency
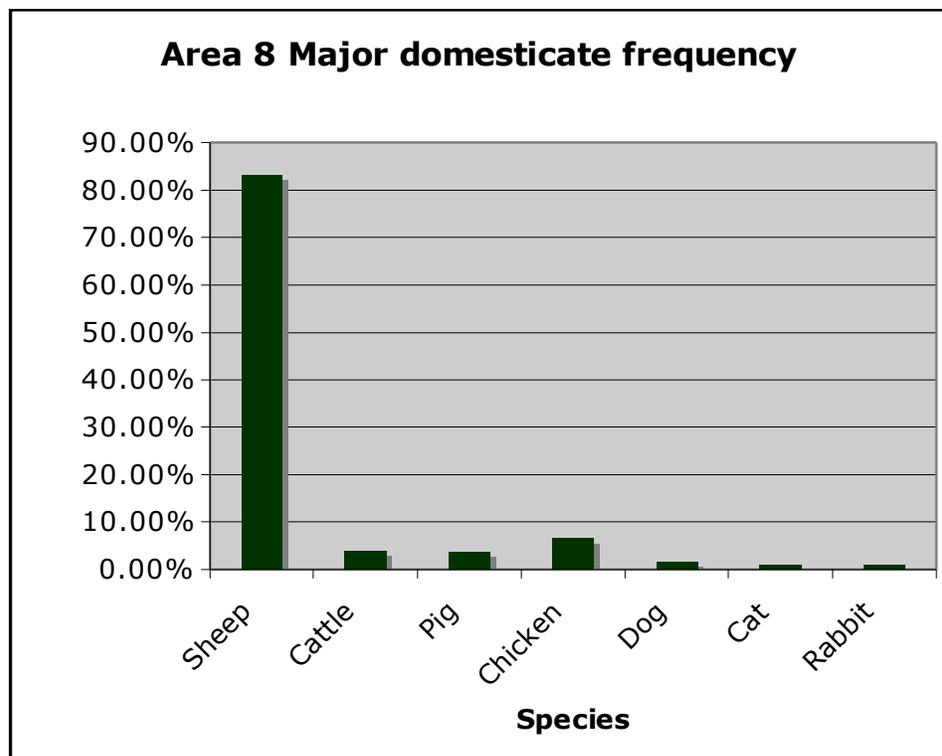
Figure 4. Area 8 Frequency of major domesticates

Major domesticates skeletal element frequency: The specific parts of an animal consumed may provide some insight into economic status by virtue of the quantity of meat available. While meat cuts and butchery practices are subject to cultural variability over time, general conclusions can be drawn regarding the desirability of an animal portion with respect to its potential meat yield. For example, appendicular elements, such as the upper shoulder/forelimb (humerus) and the upper hindlimb (femur) generally contain a larger amount of meat than most other portions of the body, and are thus of high dietary value. This is followed by elements from the trunk (ribs, vertebra) (see Colley, 2006). These elements are generally termed 'high' economic utility elements. They may be more expensive or more desirable, and their presence may suggest that the occupants had the economic means to purchase these higher quality portions of an animal.   In contrast, the feet, coupled with the lower forelimbs and the caudal vertebra are generally less desirable due to their poor meat yield, and their frequent occurrence may indicate individuals of a lower economic stratum (see Piper, 1990 for detailed discussion). Therefore, the general prevalence of a body portion may provide insight into the economic means of the inhabitants. A general comparison of the three major food animals at Darling Walk reveals a dominance of axial elements (ribs, vertebra), followed by appendicular elements (upper fore and hindlimbs) for cattle and sheep (Table 26). Pig skeletal element frequency varies considerably from this pattern, with cranial and foot elements accounting for the most frequently exploited body parts (Table 26).   These patterns warrant further attention.

Sheep: Medium to high dietary values are given to skeletal elements from the axial (trunk) portion of sheep, with the highest values given to the limbs. A closer look at the specific bones represented in Area 8 as a whole for each broad body portion suggests that the inhabitants of Darling Walk were eating a decent diet, albeit limited in scope (Table 27). While ribs and vertebra comprise the largest quantity of identified bones, they are followed by elements from the hind and forequarter and pelvis – bones with very high dietary value. This pattern is even more striking if the relative number of bones belonging to each portion of one sheep carcass is taken into account. For example, one sheep will have 26 ribs, but only two femurs. There is an expectation, therefore, for a higher frequency of ribs and vertebra compared with leg bones. Thus, from the perspective of meat yield, the inhabitants of Darling Walk were eating well.

Cattle: Dietary values given to different cattle body parts are broadly similar to sheep, albeit with a higher quantity of meat per part. The limited number of cattle remains renders conclusions based on meat cut tenuous, but if examined, once again ribs and vertebra are the most frequently occurring elements (Table 28), both medium-high valued parts. In comparison with sheep, far fewer limb bones were recovered. Perhaps, then, the limited quantity of cattle in general has more information to offer regarding the diet of the inhabitants at Darling Walk than do the actual bones themselves. Could the extremely low frequency of cattle in general be reflective of a lower socio-economic class of inhabitant, rather than the actual cut itself?

Pig: Compared to beef and lamb, pork was more expensive to purchase in nineteenth-century Sydney. This may be due to biological/ecological constraints of raising pigs in an often dry, hot country. The higher price may therefore have been a reflection of supply and demand; however, cultural practices may also have played a role. It is interesting to examine the elements present for pigs against those of cattle and sheep. Unlike the other two domesticates what one would typically consider low economic utility – cranial and foot bones – are more common than the higher axial and appendicular portions (Table 29). Such a bizarre pattern may actually be more reflective of identification bias, rather than actual frequency. For example, a large percentage of the assemblage in Area 8 is comprised of ribs and vertebra from unidentifiable medium mammals. A significant portion of these could belong to pigs, thereby changing the element profiles, and species frequencies, completely. As it currently stands, the absence of the higher meat yielding parts is often explained in the processing of pork – especially in the absence of refrigeration. Pork is typically salted for preservation, and often off the bone. It is possible that the meat was purchased in this state, explaining the paucity of axial and appendicular elements. The large frequency of cranial elements is more difficult to explain. Pigs are an easy animal to manage, they can subsist on garbage, and can therefore be a "backyard" pet (temporary of course), while getting fattened. Historical records attest to pigs being kept in the backyards of domestic housing, supporting this possible explanation for the higher numbers of cranial elements, especially teeth. If some animals are not raised on site, then perhaps the seeming predilection for heads and feet is more tied to price and food preference? Perhaps the heads and trotters were the least expensive portion of the pig, thereby explaining their prevalence in an area of lower economic means.

Age profiles: A further difference between domesticates is readily seen in the ages at which slaughter occurred. Pigs are consistently consumed at a young age, the prevalence of teeth showing an age structure less than 12 months. Cattle are still young, under the age of 5, but sheep should better be referred to as mutton, as they are frequently older. Perhaps this is where the economic status of the occupants is better displayed – in the dominance of older, tougher animals as a dietary staple.

4.4.1 Area 8 Discussion of selected contexts

A total of 17 contexts were accorded further analysis from Area 8. These contexts are a mix of underfloor and other occupation related deposits. While the underfloor deposits are characterized by large quantities of rodent and fish bone, sheep are consistently the most frequently occurring mammal exploited in all contexts. In general, bones from Area 8 are characterized by a high rate of fragmentation, which may suggest some contexts have been subject to redeposition (perhaps due to construction through different occupational phases). The faunal assemblages from Area 8 holds the potential to shed further light on the working inhabitants of Darling Walk, and perhaps the socio-economic position of the nineteenth-century working class in Sydney.

<u>Context 8520</u> – A total of 186 fragments of animal bone were recovered from context 8520. The deposit was recovered from the yard of House 11, and represents an early occupation rubbish dump attributed to phase 6 of the site (Casey & Lowe, 2009). Sheep are the most frequently occurring species, followed by pig and cattle, respectively (Table 30). Chicken, dog and cat were also present (Table 30). As expected, elements from the axial skeleton of sheep account for the majority of the identified bone, however high meat value upper limb bones are also frequent, suggesting that the inhabitants were eating the best parts of the sheep. It was not possible age the sheep bones further than to ascertain that the majority are from adult individuals. Cattle elements are exclusively ribs from the axial skeleton. The majority of the pig bones come from the head, with the two from the foot and appendicular skeleton (Table 30). These patterns are consistent with both the species and element frequencies of Area 8 as a whole unit.

Nearly 80% of the cattle bones have cut and/or saw marks on their surfaces. A few bones have also been gnawed by rodents. Sheep bones contain relatively fewer traces of butchery. The higher frequency of pig, compared to cattle remains, is once again notable. As this context dates to the earliest phase of colonial occupation, this is a potential pattern worth further exploration with respect to other colonial faunal assemblages in Sydney.

<u>Context 8527</u> – A total of 138 fragments of animal bone were identified from context 8527. The assemblage is an occupation deposit from within a shed structure in the rear yard of House 13. It is attributed to phases 6 and 7 of the site (Casey & Lowe, 2009). Sheep bones account for the majority of species identified, with rat and non-diagnostic medium mammals following, respectively (Table 31). Cat, chicken, bird and fish are also present (Table 31). The pattern revealed by the skeletal element frequency of sheep

---

bones shows a dominance of axial elements, followed by those from the appendicular skeleton (Table 31). The pattern shown in context 8527 is consistent with a similar yard occupation deposit from context 8520 of House 11.

Context 8529 – A total of 2802 fragments of bone were analysed from context 8529. The assemblage is derived from an underfloor deposit in the rear room (kitchen) of House 11, and has been attributed to phases 6 and 7 of the site (Casey & Lowe, 2009). Sheep are the most frequently occurring species in this context, followed by fish bone (Table 32). Additional food species represented include a high frequency of chicken, followed by pig and cattle, respectively. The assemblage also contains dog, cat, rabbit, chicken, rodents and two human teeth (Table 32). The wide variety of species represented is likely to stem both from the nature of the deposit – an underfloor assemblage – as well as the intensity of recovery methods. One hundred percent of the context was wet sieved, likely resulting in higher recovery of smaller fragments of bone. The frequency of species is consistent with those recovered from Area 8 as a whole with respect to food waste. The high frequency of rats and mice is also characteristic of domestic contexts during this period in Sydney.

A high proportion of the faunal remains have traces of butchery. Cattle ribs are frequently sawn, while sheep elements are cut marked. Over 50% of the assemblage has traces of rodent gnawing; lending further weight to the problem that may have been experienced by rodents in domestic contexts.

Context 8557 – A total of 45 fragments of animal bone belonging to sheep and cattle were identified from context 8557 (Table 33). The deposit is levelling fill, identified as preconstruction fill used to level the ground prior to construction of House 13, and has been attributed to phase 6 of the site (Casey & Lowe, 2009). The assemblage is almost exclusively sheep, with just one cattle bone. Sheep skeletal element frequency mirrors similar deposits – with axial elements accounting for the majority of the recovered bones.

Context 8583 – A total of 95 animal bone fragments were recovered from context 8583 in House 11. The deposit represents an accumulation around the fireplace of the rear room (kitchen), and is attributed to phases 6 and 7 (Casey & Lowe, 2009). Axial elements from sheep constitute the majority of the identified remains (Table 34), consistent with Area 8 as a whole. The assemblage is completed by bone from fish, rodents, pig and bird (Table 34). In comparison with context 8529, also from House 11, far fewer species are represented, but those species that are represented present similar trends. The assemblage is typical of domestic refuse.

Context 8585 – A total of 528 fragments of animal bone were recovered from the underfloor deposit from the third room of House 13; the context is attributed to phases 6 and 7 (Casey & Lowe, 2009). The majority of the bones are from fish, followed by unidentified medium mammals and sheep, respectively. Pig, dog, chicken, bird and rodents account for the remaining fragments (Table 35). As is typical for the whole of Area 8, bone from the axial skeleton account for the majority of identifiable remains. The deposit is typical of domestic refuse.

Context 8610 – A total of 747 fragments of bone were recovered from the underfloor deposit in the rear room (kitchen) of House 9; the deposit is attributed to phases 6 and 7 (Casey & Lowe, 2009). The deposit is dominated by sheep and fish bone, together accounting for over 50% of the identified fragments. Small quantities of pig, cattle, dog, and chicken, along with two juvenile human teeth, make up the remaining mammals. Rodents are also present (Table 36). Axial elements from sheep predominate, followed by appendicular elements. Again, this distribution mirrors that of Area 8 as a whole. Less than 1% sheep bones have evidence of butchery. Pigs are juvenile animals, while the cattle and sheep appear to be adults. The assemblage is characteristic underfloor deposits in the area, and typical of domestic food refuse.

Context 8614 – A total of 217 bones were recovered from the underfloor deposit in the third room of House 13. The deposit is not attributed to any phase, but appears to be an early deposit (Casey & Lowe, 2009). As the house was constructed in phase 6, it can reasonably be assumed this is the terminus post quem for the deposit. The assemblage is dominated by sheep, whose bones comprise 50% of the recovered remains. They are followed by fish, cattle and pig, respectively (Table 37). Axial elements again predominate, followed by bones from the appendicular skeleton. Two sheep bones have traces of butchery. The deposit contained no rodent bone, a characteristic that differentiates it from all other underfloor deposits, and is notable considering context 8585 is from the same house and room, and contained a large quantity of rodent bone.

Context 8630 – A total of 3028 fragments of animal bone were recovered from the underfloor deposit in room two (kitchen) of House 13. Sheep account for the most frequently identified species, followed by fish and rodents. A relatively high frequency of chicken and pig, followed by dog, small numbers of cattle, bird and cat bones complete the assemblage (Table 38). A small number of sheep bones have butchery marks. Sheep are represented by all major body parts – a departure from the patterns seen in the underfloor deposits of the other houses. The significant quantity of foot bones, coupled with a few cranial elements, may suggest at some time the occupants were of lower economic means. The equally high frequency of pig cranial and foot bones (Table 38) may lend further support to this hypothesis.

Nearly one third of the bones from context 8630 are non-diagnostic, unidentifiable fragments. Such a high frequency of non-diagnostic fragments suggests the assemblage is very fragmented, and may have been subject to further breakage after deposition by some type of disturbance – perhaps from either animals or construction. The relatively high frequency of rodent gnawed bones may explain some of the fragmentation.

Context 8634 – A total of 108 bones were recovered from the underfloor deposit from the Parlour (front room) of House 9, attributed to phases 6 and 7 (Casey and Lowe 2009). The distribution of species and skeletal elements identified – rodents, sheep, fish, chicken and pig, respectively (Table 39), may be a reflection of the location the context within the house. This underfloor deposit was recovered from the front of the house, where it is more likely that any accumulation will be general rubbish. The majority of the bones

belonged to rats, followed by sheep axial elements.   A number of sheep bones were gnawed by rodents.

Context 8700 – A total of 786 fragments of bone were recovered from the underfloor deposit (kitchen) of House 7, attributed to phases 6 and 7 (Casey & Lowe 2009). Unidentified medium mammals account for just over half of the recovered bone, likely belonging to sheep and pig.   Fish and rodents constitute a significant quantity of recovered bone, followed by sheep, chicken, cattle, pig and dog, respectively (Table 40). Unlike most underfloor contexts, House 7 contains a higher frequency of cattle bone. Sheep are characterized by the presence of all major body parts, with axial elements dominant, followed by appendicular, foot and cranial (Table 40). A few elements form both sheep and cattle have butchery marks, and the pig can be aged as a juvenile. The assemblage is likely quite characteristic of a kitchen underfloor deposit, containing a variety of species and skeletal elements.

Context 8736 – A total of 53 fragments of animal bone were recovered from context 8736 in House 7. The deposit constitutes cesspit fill to the rear of the house before it became connected to sewer. It is possible the deposit contains occupation-related rubbish (Casey & Lowe, 2009). The deposit was waterlogged, and has been attributed to phase 7. Sheep comprise over half of the identified species, followed by cattle, chicken, pig and rat, respectively (Table 41). The skeletal element distribution of sheep bones differs from the pattern in Area 8 in that appendicular elements constitute the most commonly occurring elements. The limb bones are commonly represented by medial fragments, suggesting they may have been chewed by dogs. The bones are also frequently split and metal stained. The dark colour of the bones, coupled with the staining, is consistent with the water-logged state of the deposit, and the skeletal element frequency of sheep, coupled with the portion of bone present, suggests occupation-related rubbish.

Context 8737 – A total of 138 fragments of animal bone were recovered from the cesspit fill to the rear of House 9. The deposit appears to contain occupation related rubbish. The deposit was waterlogged, and is attributed to phase 7 (Casey & Lowe, 2009). Sheep are the most frequently occurring species, followed by chicken. Fish, cattle, dog, pig, bird and lizard complete the assemblage (Table 42). Axial elements from sheep comprise the majority of the recovered body parts, followed by foot elements. A few bones have been stained by contact with metal, a characteristic of cesspit fills. The assemblage is consistent with occupation related rubbish likely originating from food waste.

Context 8810 – A total of 71 fragments of animal bone were recovered from the underfloor deposit (kitchen) of House 15. The context has been attributed to phases 6 and 7 (Casey & Lowe).   The majority of the bones are non-diagnostic fragments belonging to medium mammals (likely sheep and pig), but the high rate of fragmentation does not permit definitive identification. Of the small number that are identifiable, the majority are from sheep, followed by fish. Cat, pig, cow and chicken complete the assemblage (Table 43). The high rate of fragmentation and the lack of rodent bones is uncharacteristic for a kitchen underfloor deposit. A number of bones are also stained from close proximity and/or contact with metal. The context is more characteristic of a

cesspit deposit than underfloor, and the bones may suggest redeposition of some type, perhaps due to construction during the house's history of occupation.

Context 8850 – A total of 1738 bones were recovered from the underfloor deposit in House 19. The deposit comes from the front room of an originally one room house, and is attributed to phase 6 (Casey and Lowe, 2009).   A wide variety of species were identified, with fish the most common, followed by sheep. Rodent, pig, chicken, cattle, bird, dog, rabbit and cat complete the assemblage (Table 44). Sheep are represented by all body parts, and are dominated by foot elements, followed by axial and appendicular and cranial. This pattern is unusual for an underfloor deposit. The uncharacteristic skeletal element distribution might be explained by the extremely high number of unidentifiable medium mammal bones in the assemblage. Sixty percent of the bone cannot be assigned to a particular species, and of this, nearly half of the bones are from the axial skeleton. If a majority of these are sheep, as they are likely to be, the pattern would be similar to other underfloor deposits in the area. The high rate of fragmentation is also unusual, suggesting the possibility that some redeposition due to construction may have occurred.   Metal staining on several elements might support this possibility. Additionally, quite a few bones are porous suggesting they may have been digested by dogs.

Context 8860 – A total of 205 fragments of animal bone were recovered from context 8860 from House 17. The context is a possible underfloor deposit from the rear room of the house, which was artefact rich, but did not have the usual underfloor matrix; it has been attributed to phases 6 and 7 (Casey & Lowe, 2009). The species distribution is similar to Area 8 underfloor contexts in general, with fish, rodents, sheep, cattle, chicken, rabbit and pig making up the assemblage (Table 45). Once again, unidentifiable medium mammal's bones constitute a high proportion of the assemblage (72%), the majority of which are axial elements. If they are from sheep, it would make sheep the most frequently occurring animal. The relatively high frequency of non-diagnostic fragments, coupled with low frequencies of fish and rodent bones and some metal staining on bones, is more characteristic of a cesspit than an underfloor deposit. Perhaps this context has some redeposited fill?

Context 8874 – A total of 118 fragments of animal bone were recovered from the context 8874, an occupation deposit from House 19. The context is a charcoal-rich deposit from around a fireplace in the front room. It is attributed to phases 6 and 7. The majority of this context consists of unidentified medium mammal bone (73%), suggesting a mixture of household rubbish. Sheep, rats, birds, fish, pig and dog complete the assemblage (Table 46). Two bones have been burned.

4.5 Area 9

A relatively small quantity of animal bone was recovered from Area 9 – 1820s Barker's mill yard and pond, and later industrial development (Casey & Lowe, 2009). A total of 114 fragments of bone from 14 distinct contexts were analyzed (Table 47). The small

amount of bone, coupled with its dispersal over several contexts, renders analyses tenuous. However, analysis of the faunal remains as a unit may still yield information on the function of the area as a whole.

Species representation: Over 60% of the assemblage is comprised of sheep, followed by cattle (25.4%), chicken (7%) and pig (2.6%). Additional species identified include cat, dog, pheasant and bird (Table 48). The mix of species is consistent with waste from domestic and/or industrial activity, and is broadly similar in composition to Area 6. The absence of small species, such as rats and fish, may be a reflection of recovery methods.

Skeletal element frequency: Bones from the axial elements are the most frequently occurring elements, followed by bones from the appendicular skeleton (Table 49). Foot and cranial bones are represented by just a few elements. The frequency of major body parts is most consistent with domestic waste; given the small quantity of bone, however, an industrial and/or commercial origin for the assemblage cannot be ruled out.

Butchery marks: Saw and cut marks are present on 21% of the bones recovered from Area 9. Marks made by a butcher's saw are three times as common as those inflicted by a metal knife. The frequency of saw marks is similar to contexts with an industrial or commercial origin.

Age profiles: Based on the few bones that can be reliably aged, the animals from Area 9 represent a mixture of slaughter ages. This is contrary to the pattern suggested from other areas of Darling Walk; in which sheep appear to be over five years of age at the time of slaughter, cattle nearer to the 4-5 year mark, and pigs juvenile. This pattern, or lack thereof, is likely an artefact of small sample size.

In general, it is difficult to draw broad conclusions based upon the faunal assemblage from Area 9 due to the limited sample size and recovery methods that favour larger bones. Tentative conclusions suggest that the bones are likely more characteristic of industrial waste than domestic refuse, however this hypothesis is certainly open to revision should a larger sample size be recovered.

4.5.1 Area 9 Discussion of selected contexts

Three contexts from Area 9 were singled out for further analysis based on the preliminary analysis of the animal bone coupled with excavation data.

Context 9201 – A total of 54 fragments of animal bone were recovered from this context, characterized as backfill over the mill pond from 1860. The deposit s likely to be municipal rubbish, and has been attributed to phase 7 (Casey & Lowe, 2009). Sheep are the most common species present, followed by cattle and pig. Bones from the appendicular skeleton are the most prevalent for sheep, however all major body parts are represented (Table 50). Both cattle and sheep bones have cut and saw marks. Overall, the pattern of animal bones is consistent with commercial / industrial waste, likely a

butcher's shop or abattoir due to the high frequency of appendicular elements relative to other skeletal parts.

Context 9206 – A small number of bones were recovered from context 9206, 14. The deposit is characterized as an accumulation from within the mill pond (built 1820s), and is attributed to phase 4 or 5 (Casey & Lowe, 2009). Sheep, cattle and bird bones are present, with the majority of bones from the axial skeleton (Table 51). The small number of bones renders any further analysis uninformative.

Context 9249 – A small quantity of animal bone, 15 NISP, was recovered from the fill material used to line the mill pond. The fill was imported from local area and is attributed to phase 4 (Casey & Lowe, 2009). The species identified include: sheep, chicken, pig, cattle, pheasant and bird, respectively (Table 52). Most body parts are represented. The small number of bones mitigates further analyses.

5.0 Inter-area analyses

There are clear differences between the faunal assemblages recovered from Areas 5-9 at Darling Walk, Darling Harbour. In particular, the assemblages from Areas 6, 7 and possibly 9 may be consistent with industrial waste, whereas the assemblage from Area 8 is largely a by-product of domestic refuse.

5.1 Butchery

A general discussion of the domestic meat situation in colonial Sydney has already received attention in section 4.4. In order to complement this, and data from other contemporaneous faunal assemblages, a more detailed analysis of butchery at Darling Walk will ensue.

As previously noted, sawn and cut marked bone is most common in those areas with a likely industrial origin to their faunal remains (Areas 6 and 7), with fewer marks present on bone originating from domestic contexts. For the site as a whole, bone from the axial skeleton, notably ribs, vertebra, and pelves have the highest frequency of butchering marks. Ribs are frequently sawn in thirds, vertebra in half longitudinally, and pelves or innominates in quarters. These patterns are consistent with the initial butchery of an animal into smaller, saleable portions. It is these patterns that lend weight to the butchery / abattoir origin of many of bones.

Cattle bones typically contain a higher frequency of cut marks than sheep. This pattern may be partially attributed to the size difference between the two species, which might also relate to the relative quantity of meat purchased for each species. It is likely that sheep carcasses were purchased in larger portions (i.e. a leg of mutton vs an entire leg of beef), and were thus subject to more home butchery, which would be reflected in marks inflicted by metal knifes/cleavers. While an in-depth analysis of butchery patterns is

beyond the scope of this faunal report, the quantity of bone with cut marks could certainly form a more in-depth study at a later date.

5.2 Industry

While the industrial character of the bones from Areas 6 and 7 is fairly clear, further refinement to particular industries is difficult. The faunal assemblages from both areas are characterized by high frequencies of sawn / marked bones, especially cattle elements. The butchery marks, coupled with the presence of all major skeletal elements, suggest that an abattoir was a likely origin of much of the faunal assemblage from both areas, and certainly Area 7.

The high frequency of cattle bones does not rule out the likelihood of refuse associated with a tannery. Typically, waste from tanning activities is characterized by a high frequency of head and foot bones. Neither area has this element profile. However, a tannery may have been just one part of an industrial complex that also included an abattoir. If so, it is certainly possible that the waste from both activities is mixed, especially given the redeposition that likely occurred as a result of reclamation.

While both Areas 6 and 7 have high cattle frequencies, Area 7 differs from Area 6 in the wider diversity of species, coupled with higher frequency of prime meat bearing bones. A tentative hypothesis might be that the assemblage from Area 6 contains a mix of bones from either tanning or other industries using animal by products, while Area 7, given its larger diversity of species, and higher frequency of higher value limb bones, represents bones originating from a combination of domestic refuse and slaughter house remains.

5.3 Domestic housing

There is great potential to learn more regarding the lives of Sydney's working class in the late nineteenth century from the analysis of faunal remains in domestic contexts. As animal bones were recovered from eight different houses in Area 8, a comparison of species and element frequencies from those houses with underfloor kitchen deposits may be able to examine potential differences in socio-economic status between households. Of the eight houses yielding animal bone, four have underfloor deposits from kitchens (houses 7, 9, 13, 15) all attributed to the same phase of the site, 6 and 7. The faunal remains from these 5 contexts account for nearly 60% of the remains recovered from Area 8 as a whole. In general, unidentified medium mammals (likely sheep and pig) account for the majority of the recovered bones (33%), followed by sheep (28%), fish (19%) and rodents (13%) (Table 53). With the exception of House 15, for which there were too few species to draw larger conclusions, underfloor kitchen deposits from Area 8 appear similar with respect to the distribution of major species (Fig 5a-f)).
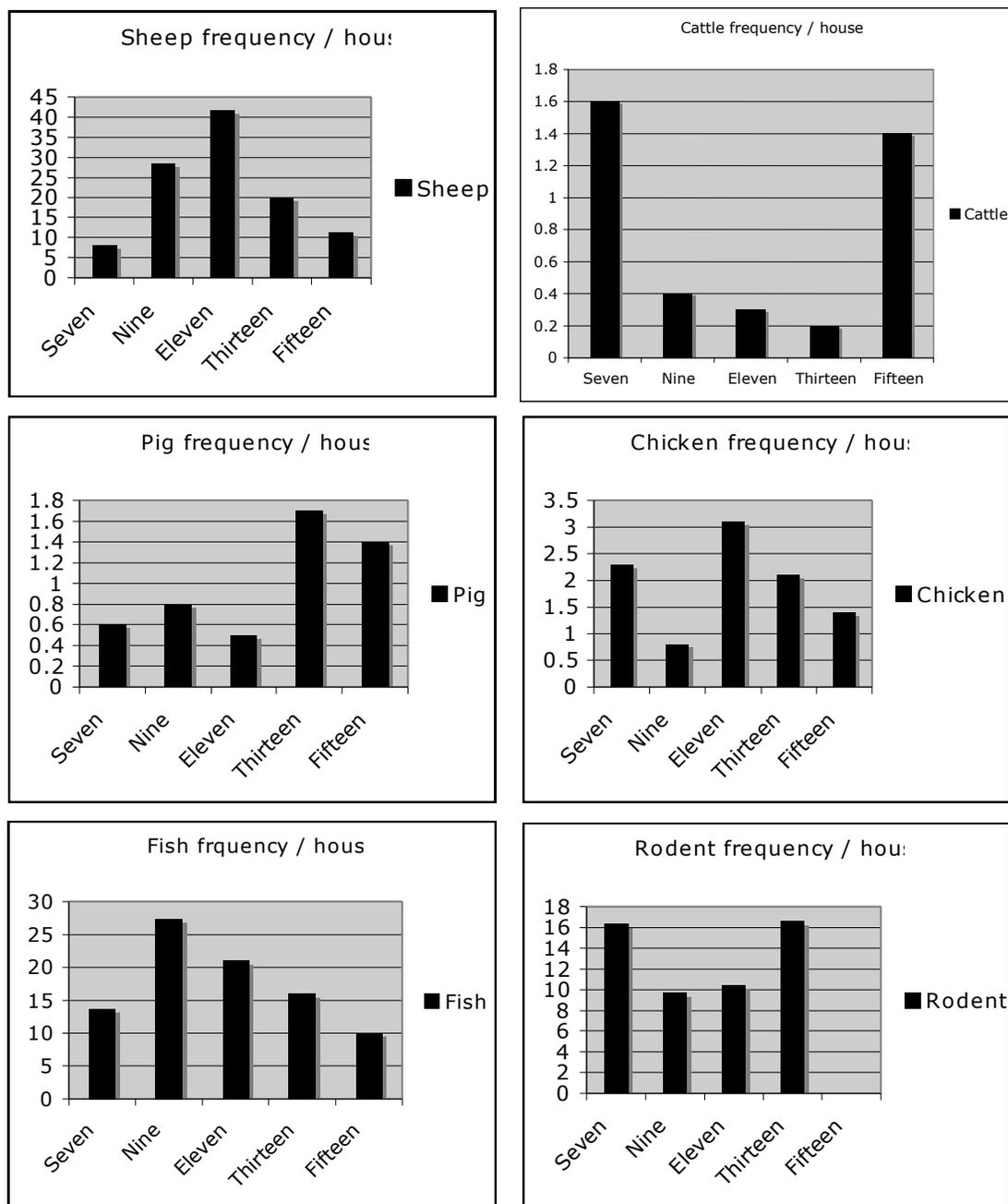
Figure 5. Area 8 Comparison of species frequency between houses. a) sheep, b) cattle, c) pig d) chicken, e) fish, f) rodents.

This comparison of contemporaneous, like contexts, provides little in the way of illuminating differences between households. The major species present are roughly similar; however, there is slight variation in their frequencies, especially with respect to cattle and pig. Interestingly, those houses with higher frequencies of pig have lower frequencies of cattle. House 7 is the most notable, with a low frequency of sheep, and relatively high frequency of cattle (and low frequency of pig) (Fig 5). While it is known that the price of pork was generally higher than the either mutton or beef, what is not

known is the role that culture and food preferences played in food choice. These data could be better used in comparison with house of a higher socio-economic stratum.

5.4 Socio-economic distinctions

In reality, the quantifiable differences between the main species exploited for food may reflect element patterning that is often tied to meat cuts / dietary preferences, and this patterning has been frequently been used to address socio-economic issues. However, numbers may not always provide the information needed to address the cultural preference for one part of an animal, or even one species, over another. Arguably, understanding these intangible factors may hold the greatest potential in painting a fuller picture of the inhabitants of colonial nineteenth-century Sydney. That said, the high frequency of the cheapest meat animal, sheep, in Area 8 domestic contexts, does suggest the occupants of Darling Walk were of lower economic means than perhaps the industrial species frequencies of Areas 6 and 7 would suggest.

The relatively small variety of animal species represented also suggests that the inhabitants of Darling Walk had limited dietary breadth, with respect to meat. Of course, the animal bone can only reflect those cuts of meat that were purchased on the bone, and cannot speak to meat that was purchased without the bone. The high frequency of cattle in other areas attests to its significance in the nineteenth-century colonial diet, and yet, this is not reflected in the bone recovered from any context in Area 8 – underfloor, cesspit or fill. If availability was not a factor, perhaps the low frequency of cattle and pig are related to a combination of price and / or cultural preference. Again, a more informative study would likely be a comparison between assemblages from lower class and middle/upper class housing during the same period.

6.0 Inter-site comparison with other Colonial contexts in NSW

How does the faunal assemblage at Darling Walk compare with similar domestic assemblages in nineteenth-century Sydney? Given the myriad of variables that can affect faunal assemblages, the best comparative analysis would be between contemporaneous assemblages from similar contexts like. Faunal remains from the CSR site at Pyrmont provide such data.

The CSR site at Pyrmont, Sydney yielded faunal remains from an underfloor deposit (context 18) of House 15 of the Harvey St. precinct. The house and its occupants are said to have been of lower socio-economic status. This context therefore provides a solid body of comparative data for the underfloor deposits in Area 8. Examination of the species frequency from House 15 reveals a similar pattern to Darling Walk. However, the Pyrmont assemblage is dominated by fish, followed by sheep and a small number of cattle and pig, respectively (Fig 6) (Torres, 1997). At Darling Walk, sheep are the most common species, followed distantly by fish, pig and cattle.
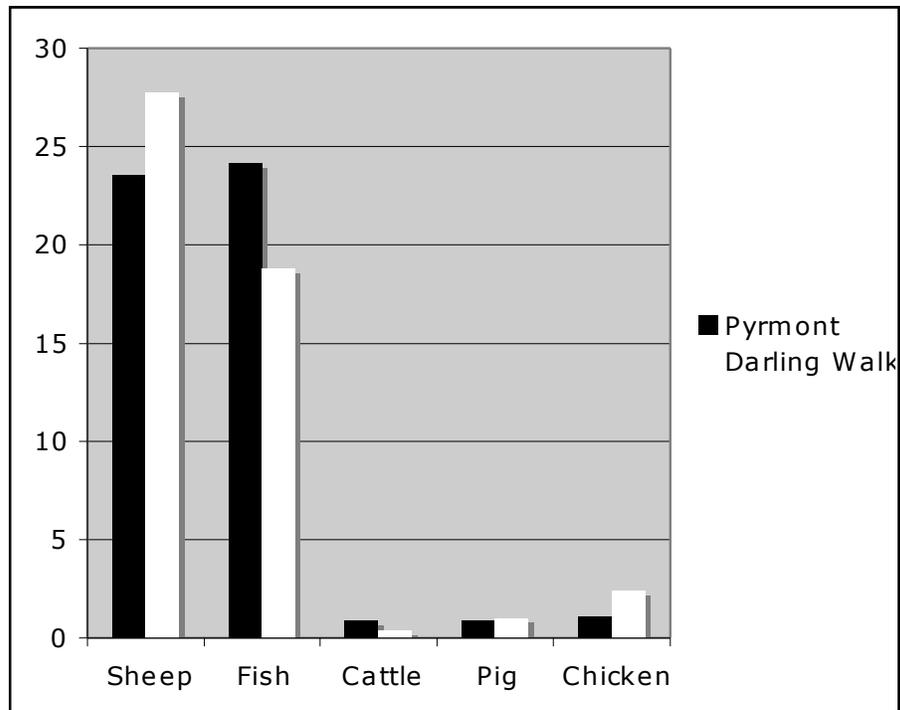
**Figure 6. Major food species comparison in kitchen underfloor deposits:
15 Harvey St, Pyrmont and Area 8 Darling Walk**

This small inter site comparison reveals similar patterns with respect to food consumption for the occupants of Pyrmont and Darling Walk – two areas in close proximity to one another with occupants of a likely similar socio-economic means.

These limited data suggest a pattern of heavy reliance on sheep and fish that should be tested with a wider sample of sites.

7.0 Significance of the faunal remains and potential for further research

The faunal assemblage from Darling Walk affords a vital insight into two key aspects of life in nineteenth-century Sydney – industry and domestic, working- class housing. The size of the assemblage, coupled with detailed information on provenience and historical record renders this assemblage a key corpus of information on animal exploitation in colonial Sydney. As such, there are several potential areas for further study with respect to the animal bones from Darling Walk, Darling Harbour:

1. A detailed analysis of the fish bone could be done to identify the major species exploited;
2. An in-depth study of the butchery patterns on sheep and cattle would certainly benefit from in-depth analyses in order to ascertain the exact cuts of meat eaten by the inhabitants of Darling Walk, gaining deeper insight in socio-economic factors governing food choice;
3. A comprehensive study using inter site analyses of workers' housing in nineteenth-century Sydney may provide further information on working class living conditions;
4. A comprehensive, inter site analysis of animal industries, such as abattoirs, tanneries and soap making.

8.0 References

Behrensmeyer, A.K., 1978. Taphonomic and ecologic information from bone weathering. *Paleobiology* 4 (2), 150–162.

Casey & Lowe, 2009. *Darling Walk Archaeological Excavation 2008/2009: Preliminary Results*. Unpublished report to Lend Lease Development, June 2009. Casey & Lowe Pty Ltd; Marrickville, NSW. Available at http://www.caseyandlowe.com.au/pdf/darlingquarter/DarlingQuarter_ArchaeologicalExcavation_2008-2009.pdf

Colley, S. 2006. A preliminary beef meat cuts typology for nineteenth-century Sydney and some methodological issues. *Australasian Historical Archaeology* 24: 47-54. Available at http://www.ashadocs.org/aha/24/24_04_Colley.pdf.

Garran, J.H., White, L. 1985. *Merinos, Myths and Macarthurs: Australian grazers and their sheep: 1788-1900*. Australian University Press, Canberra.

Hillson, S. 1992. *Mammal bones and teeth: An introductory guide to methods of identification*. Henry Ling, Ltd., London.

Lyman, L. 1994. *Vertebrate Taphonomy*. Cambridge Manuals in Archaeology, Cambridge.

Piper, A. 1991. *Butchery analysis in Australian historical archaeology.* Unpublished MA Thesis, Department of Archaeology and Palaeoanthropology, University of New England, Armidale.

Schmid, E. 1972. *Atlas of animal bones: for prehistorians, archaeologists and quaternary geologists*. Elsevier, London.

Torres, C. 1997. *Behind every bone there is a great animal: Analysis of faunal remains from the CSR site at Pyrmont*. Unpublished Honours Thesis, Prehistoric and Historical Archaeology, The University of Sydney.

9.0 Appendices

9.1 Catalogue definitions

Terminology used in the analyses of faunal remains from Darling Walk, Darling Harbour:

Site – Darling Walk, Darling Harbour

Area – Larger portion of the site to which the context, and thus catalogue number belongs; this report contains faunal material from areas 5,6,7,8,9.

Box – box in which the material analysed is stored

Context – Provenance to which a particular bone belongs

Catalogue # – Unique number given to each identified bone fragment

Element – Species bone identified i.e. femur, humerus, etc.

Portion – identification of the anatomical portion of the element remaining i.e. proximal, medial, distal

 # Fragments – Number of pieces of a particular type of bone i.e. 3 = 3 ribs

Side (handedness) – side of the individual to which bone belongs i.e. left / right.

Fused / Unfused (U or F) – Method used to determine relative age; referes to state of epiphyseal fusion (Fused = Mature / UnFused = Juvenile)

Family – Latin larger group to which a particular species belongs i.e. Bovid = larger family of which sheep and cattle are both part

Species – Latin species nomenclature i.e. Bos = cattle

Cut – Type of butchery mark: saw mark, cut mark, skinning mark, chop mark

Location – Physical location on a particular element where evidence of butchery occurs

Tooth – evidence of tooth marks made by either carnivores (dogs) or rodents (rats)

Burning – Evidence of burning and/or calcination

Colour – Physical colour of the bone

Weathering – State of bone surface; graded from 0 (least) – 5 (completely degraded) after Behrensmeyer, 1978).

_____

Tooth wear stage – method of establishing relative age; conducted according to Grant, 1984.

Other – refers to any obvious surface modifications/taphonomic impacts to the material such as metal-staining, root-etching, intentional working, etc. not accounted for by a separate field in the catalogue

MNE – Minimum Number of Elements – a quantitative measure used to describe how many complete skeletal elements are represented by the fragment(s) in question

MNI – Minimum Number of Individuals – a quantitative measure used to describe how many individuals are likely represented by the fragment(s) in questions.

NISP – Number of Identified Specimens (total number of bone fragments)

Skeletal element group – 4 main broad body part groups to which particular elements belong: Axial (vertebra, ribs, scapula, pelvis), Appendicular (humerus, radius, ulna, metacarpal, femur, tibia, fibula, metatarsal), Foot (phalanges, metapodial), Cranial (skull, teeth, mandible).

9.2 Tables

Species	Area 5	Area 6	Area 7	Area 8	Area 9	Species total
	NISP	NISP	NISP	NISP	NISP	NISP
Ovis aries (sheep*)*	5	292	292	3645	69	**4303**
Bos Taurus (cow)	3	202	207	171	29	**612**
Equus caballus (horse)	-	3	-	-	-	**3**
Sus scrofa (pig*)*	-	14	14	163	3	**194**
Oryctolagus cuniculas (rabbit)	-	-	-	17	-	**17**
Felis domesticus (cat)	-	-	1	24	1	**26**
Canis familiaris (dog)	-	3	4	70	2	**79**
Gallus domesticus (chicken)	-	24	14	291	8	**337**
Pheasant	-	-	-	-	1	**1**
Strepera graculina (currawong)	-	-	-	3	-	**3**
Anser sp. (goose)	-	-	-	5	-	**5**
Avis sp.(bird)	-	2	5	75	1	**83**
Mus musculus (house mouse)	-	-	-	196	-	**196**
Rattus sp.(rat)	-	1	-	1164	-	**1164**
Homo sapiens (human)	-	-	-	5	-	**5**
Fish	-	-	1	2103	-	**2103**
Cherax destructor	-	-	-	1	-	**1**
Chelonia sp. (turtle)	-	1	1	1	-	**3**
Varanus sp. (lizard)	-	-	-	1	-	**1**
Non-diagnostic	-	-	3	4595	**-**	**4598**
Area total	**8**	**541**	**542**	**12530**	**114**	**13735**

Table 1. Inter-area animal bone frequency / species

Context No	Total fragments (NISP)
9101	1
9140 TT 54	1
9153 TT2, BH2	6
Total	**8**

Table 2. Area 5: Total NISP recovered from each context

Species	Common name	NISP / Assemblage %
Ovis aries	Sheep	**5 / 62.5%**
Bos Taurus	Cow	**3 / 37.5%**
Total NISP		**8 / 100%**

Table 3. Area 5: Faunal overview

Context No*	Total fragments (NISP)	Context No*	Total fragments (NISP)	Context No*	Total fragments (NISP)
8129	4	8281	3	8214 TT14	11
8201	10	8288	1	8228 TT14	2
8208	6	8289	4	8233 TT14	2
8209	1	8293	10	8240 TT14	2
8210	9	8295*	40	8248 TT14	9
8211	2	8297	2	8249 TT14	10
8214*	22	8301	11	8268 TT14	6
8232	1	8308	7	8272 TT14	7
8233	1	8311	8	8277 TT18	2
8235	5	8313	10	8278 TT18	2
8241	1	8317	2	8278 TT18	2
8245	4	8318	1		
8250	4	8326	3	**Total NISP**	**541**
8251	2	8330*	124		
8252	3	8331	1		
8256	13	8338	1		
8257	5	8345	13		
8259	1	8355	2		
8260	2	8360	4		
8261*	21	8367*	38		
8262	2	8392	5		
8263	2	8395	3		
8267	8	8399	2		
8279	46	8416	1		
8280	12	8436	3		
8280	12	8434	2		

Table 4. Area 6: Total NISP recovered from each context (*indicates further analysis of context) (Note – contexts 8214, 8295, and 8330 were <u>reassigned to Area 7 after this specialist report was written.</u>)

_____

Species	Common name	NISP / Assemblage %
Ovis aries	Sheep	292 / 54%
Bos Taurus	Cow	202 / 37.3%
Sus scrofa	Pig	14 / 2.5%
Equus caballus	Horse	3 / .5%
Canis familiaris	Domestic dog	3 / .5%
Gallus domesticus	Chicken	24 / 4.4%
Rattus sp.	Rat	1 / neg
Avis sp.	Bird	2 / neg
Chelonia sp.	Turtle	1 / neg
Total NISP		541 / 100%

Table 5. Area 6: Faunal Overview

Body Portion	Skeletal Element	NISP
Cranial **44 / 8.1%**	Skull	8
	Tooth	13
	Mandible	21
	Maxilla	2
Axial **282 / 52.1%**	Vertebra	61
	Rib	160
	Scapula	20
	Pelvis	36
	Sacrum	5
Appendicular **151 / 27.9%**	Humerus	32
	Radius	17
	Ulna	9
	Femur	37
	Tibia	48
	Long bone shaft fragment	8
Foot **64 / 11.8%**	Metacarpal	12
	Metatarsal	29
	Calcaneus	6
	Astragalus	7
	Phalanx	10
Total		**541**

Table 6. Area 6: Skeletal element frequency

Species	NISP total	Body Part Frequency			
		Appendicular	**Axial**	**Cranial**	**Foot**
Ovis aries (sheep*)*	14	8	4	-	2
Bos Taurus (cow)	8	1	7	-	-
Context total	**22**	**9**	**11**	**0**	**2**

Table 7. Area 6: Context 8214 (Reassigned to Area 7)

Species	NISP total	Body Part Frequency			
		Appendicular	**Axial**	**Cranial**	**Foot**
Ovis aries (sheep*)*	11	2	2	6	1
Bos Taurus (cow)	10	1	4	4	1
Context total	**21**	**3**	**6**	**10**	**2**

Table 8. Area 6: Context 8261

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	11	3	2	1	5
Bos Taurus (cow)	16	-	16	-	-
Gallus domesticus (chicken)	13	9	2	0	2
Context total	**40**	**12**	**20**	**1**	**7**

Table 9. Area 6: Context 8295 (Reassigned to Area 7)

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	69	20	29	4	16
Bos Taurus (cow)	52	9	43	-	-
Sus scrofa (pig)	3	1	1	1	-
Gallus domesticus(chicken)	1	1	-	-	-
Context total	**125**	**31**	**73**	**5**	**16**

Table 10. Area 6: Context 8330 (Reassigned to Area 7)

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	16	8	3	2	3
Bos Taurus (cow)	22	2	16	2	2
Context total	**38**	**10**	**19**	**4**	**5**

Table 11. Area 6: Context 8367

Context No*	Total fragments (NISP)	Context No*	Total fragments (NISP)
7901	27	7986*	49
7902	1	7987*	100
7903	3	7991*	39
7904*	56	7994	4
7906*	19	8000	2
7907	5	8004*	19
7910	7	8005	2
7912	14	8006	1
7918	1	8010	3
7919	1	8014	14
7920	2	8037*	49
7927*	42	8043	6
7928	1	8060	1
7943	5	8066	4
7950	15	8069	1
7952	1	8090	8
7953	7	8091	3
7954	5	8097	5
7959	3	8098	8

7979	5	8108	1
7981	3		
		Total NISP	**542**

Table 12. Area 7: Total NISP recovered from each context (*indicates further analysis of context)

Species	Common name	NISP / Assemblage %
Ovis aries	Sheep	292 / 53.8 %
Bos Taurus	Cow	207 / 38.2%
Sus scrofa	Pig	14 / 2.6%
Felis domesticus	Domestic cat	1 / neg
Canis familiaris	Domestic dog	4 / > 1%
Gallus domesticus	Chicken	14 / 2.6%
Avis sp.	Bird	5 / > 1%
Chelonia sp.	Turtle	1 / > 1%
-	Fish	1 / > 1%
Medium mammal	Non-diagnostic	3 / > 1%
Total NISP		542

Table 13. Area 7 Faunal Overview

Body Portion	Skeletal Element	NISP
Cranial 9.4%	Skull	12
	Horn Core	1
	Mandible	28
	Tooth	10
Axial 47.7%	Vertebra	45
	Rib	170
	Scapula	14
	Pelvis	24
	Sacrum	5
Appendicular 26.1%	Humerus	25
	Radius	26
	Ulna	4
	Femur	25
	Tibia	50
	Fibula	1
	Long bone shaft fragment	10
Foot 16.8%	Metacarpal	30
	Metatarsal	24
	Metapodial	2

	Carpal	-
	Tarsal	3
	Astragalus	6
	Calcaneus	11
	Phalanx	15
Total		541

Table 14. Area 7: Skeletal element frequency

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	21	4	9	4	4
Bos Taurus (cow)	34	9	21	2	2
Sus scrofa (pig*)*	1	-	-	1	-
Context total	**56**	**13**	**30**	**6**	**6**

Table 15. Area 7: Context 7904

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	8	-	2	2	4
Bos Taurus (cow)	5	1	2	1	1
Sus scrofa (pig*)*	5	1	-	1	3
Fish	1	1	-	-	n/a
Context total	**19**	**3**	**4**	**4**	**8**

Table 16. Area 7: Context 7906

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	21	3	14	-	4
Bos Taurus (cow)	18	3	13	-	2
Sus scrofa (pig*)*	2	1	-	1	-
Felis domesticus (cat)	1	-	1	-	-
Context total	**42**	**7**	**28**	**1**	**6**

Table 17. Area 7: Context 7927

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	16	3	5	7	1
Bos Taurus (cow)	31	5	5	8	13
Gallus domestcus (chicken)	-	-	1	-	-
Avis sp.(bird)	-	-	1	-	-
Context total	**49**	**8**	**12**	**15**	**14**

Table 18. Area 7: Context 7986

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	43	18	18	2	5
Bos Taurus (cow)	43	3	35	-	5

Sus scrofa (pig*)*	2	1	1	-	-
MM unid	1	1	-	-	-
Gallus domesticus (chicken)	7	3			4
Avis sp.(bird)	3	2			1
Turtle	1		carapace		
Context total	**100**	**28**	**55**	**2**	**15**

Table 19. Area 7: Context 7987

Species	NISP total	Body Part Frequency			
		Appendicular	**Axial**	**Cranial**	**Foot**
Ovis aries (sheep*)*	25	5	16	-	4
Bos Taurus (cow)	12	-	9	3	-
Sus scrofa (pig*)*	1	1	-	-	-
MM unid	1	1	-	-	-
Context total	**39**	**7**	**25**	**3**	**4**

Table 20. Area 7: Context 7991

Species	NISP Total	Body Part Frequency			
		Appendicular	**Axial**	**Cranial**	**Foot**
Ovis aries (sheep*)*	16	3	8	1	4
Canis familiaris (dog)	1	-	-	-	1
Gallus domesticus(chicken)	2	1			
Context total	**19**	**4**	**8**	**1**	**5**

Table 21. Area 7: Context 8004

Species	NISP total	Body Part Frequency			
		Appendicular	**Axial**	**Cranial**	**Foot**
Ovis aries (sheep*)*	44	8	33	-	3
Bos Taurus (cow)	2	-	1	1	-
Canis familiaris (dog)	1	-	1	-	-
Gallus domesticus(bird)	2	2	-	-	-
Context total	**49**	**10**	**35**	**1**	**3**

Table 22. Area 7: Context 8037

Context No*	Total fragments (NISP)	Context No*	Total fragments (NISP)
8501	239	8661	13
8505	18	8663	4
8506	7	8664	9
8510	2	8666	3
8512	6	8680	4

Context No*	Total fragments (NISP)	Context No*	Total fragments (NISP)
8515	19	8683	5
8517	10	8689	2
8519	28	8691	2
8520*	186	8694	7
8525	3	8695	2
8527*	138	8696	22
8528	10	8700*	786
8529*	2802	8705	1
8535	9	8713	6
8539	4	8724	13
8546	1	8727	2
8557*	45	8730	3
8560	20	8735	112
8563	15	8736	53
8570	7	8737*	138
8572	5	8739	45
8574	4	8754	4
8576	6	8756	6
8579	20	8765	1
8583*	95	8772	11
8585*	528	8785	25
8587	37	8787	26
8591	13	8802	4
8592	5	8810*	71
8598	3	8814	1
8600	2	8815	5
8602	3	8821	39
8606	5	8834	11
8608	54	8837	2
8609	10	8838	3
8610*	747	8840	1
8614*	217	8841	16
8615	47	8843	2
8616	46	8845	6
8617	1	8847	39
8621	8	8850*	1738
8625	15	8856	3
8626	4	8860*	205
8627	3	8861	18
8629	19	8873	21
8630*	3028	8874*	118
8631	35	8875	21
8633	52	8900	4
8634*	108	9001	1
8639	13	9002	7
8640	3	9010	1
8641	18	9012	1
8644	8	9029	2
8645	6	9037	9
8647	23	9038	10
8650	14	9040	54

Context No*	Total fragments (NISP)	Context No*	Total fragments (NISP)
8652	13	9041	4
8653	1	9042	9
8654	1	9044	3
8655	2	9220	1
		Total	**12530**

Table 23. Area 8: Total NISP recovered from each context (*indicates separate analysis of context)

Species	Common name	NISP / Assemblage %
Ovis aries	Sheep	3645 / 29.1%
Bos Taurus	Cow	171 / 1.4%
Sus scrofa	Pig	163 / 1.4%
Felis domesticus	Cat	24 / > 1%
Canis familiaris	Domestic dog	70 / > 1%
Gallus domesticus	Chicken	291 / 2.3%
Oryctolagus sp.	Rabbit	17 / > 1%
Strepera graculina	Pied Currawong	3 / > 1%
Anser sp.	Goose	5 / > 1%
Avis sp.	Unidentified Bird	75 / > 1%
Mus musculus	House mouse	196 / 1.6%
Rattus sp.	Rat	1164 / 9.3%
Homo sapiens	Human	5 / > 1%
Medium mammal	Non-diagnostic	4447 / 35.5%
Small mammal	Non-diagnostic	148 / 1.2%
Fish	SM-MM	2103 / 16.8%
Chelonia sp.	Turtle	1 / > 1%
Cherax destructor	Yabbie	1 / > 1%
Varanus sp	Lizard	1 / > 1%
Total NISP		**12530**

Table 24. Area 8 Faunal overview

Species	Common name	NISP / %
Ovis aries	Sheep	3645 / 83.2%
Bos Taurus	Cow	171 / 3.9%
Sus scrofa	Pig	163 / 3.7%
Felis domesticus	Cat	24 / > 1%
Canis familiaris	Domestic dog	70 / 1.6%
Gallus domesticus	Chicken	291 / 6.6%
Oryctolagus sp.	Rabbit	17 > 1%
Total NISP		**4381 / 100%**

Table 25. Area 8: Frequency of Identified Major domesticates

Body Portion	Sheep %	Cattle %	Pig %	Total NISP
Cranial	2.6%	5.3%	51.5%	**186**
Axial	69%	75.4%	> 1%	**2646**

Appendicular	17%	12.9%	17.2%	**668**
Foot	11.5%	6.4%	30.7%	**479**
Total NISP	**3645**	**171**	**163**	**3979**

Table 26. Area 8: Comparison of Major domesticates skeletal element frequency (%). Total NISP = 3979

Body Portion	Skeletal Element	NISP
Cranial **93**	Skull	22
	Horn core	19
	Tooth	28
	Mandible	19
	Maxilla	5
Axial **2516**	Vertebra	1106
	Rib	1201
	Scapula	33
	Pelvis	173
	Sacrum	3
Appendicular **618**	Humerus	83
	Radius	87
	Ulna	38
	Femur	155
	Tibia	83
	Fibula	1
	Long bone shaft fragment	169
	Patella	2
Foot **418**	Metacarpal	49
	Metatarsal	44
	Calcaneus	25
	Astragalus	41
	Phalanx	142
	Tarsal/carpal	105
	Metapodial	12
Total		**3645**

Table 27. Area 8: Sheep element frequency (NISP)

Body Portion	Skeletal Element	NISP
Cranial 9	Skull	-
	Tooth	6
	Mandible	3
	Maxilla	-
Axial 129	Vertebra	28
	Rib	94
	Scapula	7
	Pelvis	-
	Sacrum	-
Appendicular 22	Humerus	2
	Radius	2
	Ulna	3
	Femur	3
	Tibia	1
	Long bone shaft fragment	11
Foot 11	Metacarpal	-
	Metatarsal	3
	Calcaneus	-
	Astragalus	-
	Phalanx	2
	Tarsal/carpal	6
Total		171

Table 28. Area 8: Cattle element frequency (NISP)

Body Portion	Skeletal Element	NISP
Cranial 84	Skull	-
	Tooth	61
	Mandible	22
	Maxilla	1
Axial 1	Vertebra	-
	Rib	-
	Scapula	1
	Pelvis	-
	Sacrum	-
Appendicular 28	Humerus	4
	Radius	6
	Ulna	6
	Femur	5
	Tibia	3
	Long bone shaft fragment	3
	Patella	1
Foot 50	Metapodial	2
	Metatarsal	10
	Calcaneus	3
	Phalanx	35
Total		163

Table 29. Area 8: Pig element frequency (NISP)

Species	NISP Total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	97	30	59	-	8
Bos Taurus (cow)	9	-	9	-	-
Sus scrofa (pig)	23	1	-	21	1
Gallus domesticus (chicken)	2	1	-	-	1
Canis familiaris (dog)	1	-	-	-	1
Felis domesticus (cat)	1	-	1	-	-
MM	53	6	47		
Context total	**186**	**38**	**116**	**21**	**11**

Table 30. Area 8: Context 8520

Species	NISP Total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	115 (22 non-diag)	15	68	5	5
Felis domesticus (cat)	3	-	2	-	1
Gallus domesticus (chicken)	1	-	1	-	-
Avis sp.	1	1	-	-	-
MM / SM	7 (4 non-diag)	2	-	1	-
Rat	9	5	2	2	-
Fish	2	-	1	1	-
Context total	**138**	**23**	**74**	**9**	**6**

Table 31. Area 8: Context 8527

_____

Species	NISP Total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	1171 (incl. 19 non)	111	908	16	117
Bos Taurus (cow)	10	2	5	1	2
Sus scrofa (pig*)*	15	1	-	5	9
Canis familiaris (dog)	16			4	12
Felis domesticus (cat)	4	-	-	1	3
Oryctogalus sp. (rabbit)	1		1		
Human	2			2	
MM	511 (incl. 402 non)	56	51	2	
SM	72 (incl. 60 non)	2	9	1	
Gallus domesticus (chicken)	87 (incl. 4 eggshell frag)	12	60		11
Avis sp.	30 (incl.9 eggshell)	9	11		
Fish (incl. 1 cherax)	591 (incl. scales)				
Mus musculus (house mouse)	24				
Rattus sp.(rat)	267				
Context total	**2802**				

Table 32. Area 8: Context 8529

Species	NISP Total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	44	12	25	3	4
Bos Taurus (cow)	1	-	1	-	-
Context total	**45**	**12**	**25**	**3**	**4**

Table 33. Area 8: Context 8557

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	52	4	42	-	6
Sus scrofa (pig*)*	1	-	-	-	1
MM	21 (incl. 11 non)	-	10	-	-
Avis sp.	1	1	-	-	-
Fish	17				
Mouse	1				
Rat	2				
Context total	**95**	**5**	**52**	**-**	**7**

Table 34. Area 8: Context 8583

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	94	5	75	7	7
Bos Taurus (cow)	1	-	1	-	-
Sus scrofa (pig)	7	-	-	4	3
Canis familiaris (dog)	3	-	-	1	2
MM	117 (98 non)	11	8	-	-
Gallus domesticus (chicken)	6	1	5	-	-
Avis sp.	1	1	-	-	-
Fish	251				
Mouse	9				
Rat	39				
Context total	**528**				

Table 35. Area 8: Context 8585

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	214	29	161	4	20
Bos Taurus (cow)	3	1	1	-	1
Sus scrofa (pig)	6	-	-	6	-
Canis familiaris (dog)	2	-	-	2	-
Human	2	-	-	2	-
MM	226 (192 non)	16	18	-	-
SM	6 non				
Gallus domesticus (chicken)	6	-	5	-	1
Avis sp.	4	-	2	-	2
Fish	205				
Mouse	23				
Rat	50				
Context total	**747**				

Table 36. Area 8: Context 8610

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	110	13	90	5	2
Bos Taurus (cow)	8	2	4	2	-
Sus scrofa (pig)	3	-	-	2	1
MM	61(59 non)	-	-	2	-
Fish	35(incl. 1 turtle)				
Context total	**217**				

Table 37. Area 8: Context 8614

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	605	62	470	12	61
Bos Taurus (cow)	5	-	4	-	1
Sus scrofa (pig)	51	5		26	20
Canis familiaris (dog)	25	1	1	13	10
Felis domesticus (cat)	3	-	3	-	-
MM	1243 (950 non)	14	272	2	5
SM	37 (36 non)		1		
Gallus domesticus (chicken)	64	12	39	-	13
Avis sp.	7	5			2
Fish	485				
Mouse	50				
Rat	453				
Context total	**3028**				

Table 38. Area 8: Context 8630

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	39(1non)	1	36	-	1
Sus scrofa (pig*)*	1	-	-	1	-
MM	2 (1non)		1		
Gallus domesticus (chicken)	2	2	-	-	-
Fish	15				
Mouse	1				
Rat	48				
Context total	**108**				

Table 39. Area 8: Context 8634

Species	NISP Total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	64	16	33	6	9
Bos Taurus (cow)	13	-	13	-	-
Sus scrofa (pig*)*	5	1	-	1	3
Canis familiaris (dog)	5	-	-	1	4
MM	442 (231)	34	175	1	1
SM	3 non				
Gallus domesticus (chicken)	18	5	13		
Fish	108				
Mouse	32				
Rat	96				
Context total	**786**				

Table 40. Area 8: Context 8700

Species	NISP Total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	31	17	7	-	7
Bos Taurus (cow)	7	-	7	-	-
Sus scrofa (pig*)*	1	1	-	-	-
MM	11	3	8	-	-
Gallus domesticus (chicken)	2	1	1	-	-
Rat	1				
Context total	**53**				

Table 41. Area 8: Context 8736

Species	NISP Total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	76	20	49	-	7
Bos Taurus (cow)	7	-	7	-	-
Sus scrofa (pig)	2	1	-	-	1
Canis famiiaris (dog)	3	1	-	1	1
MM	22 (1 non)	10	10	1	-
SM	1	1	-	-	-
Gallus domesticus	16	4	10		2
Avis sp.	2	2	-	-	-
Fish	8				
Varanus sp.	1	-	-	1	-
Context total	**138**				

Table 42. Area 8: Context 8737

Species	NISP Total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	8	3		1	4
Bos Taurus (cow)	1	-	-	-	1
Sus scrofa (pig)	1	-	-	1	-
Felis domesticus (cat)	2	-	-	1	1
MM	51 (44 non)	1	5		1
Gallus domesticus (chicken)	1	-	1	-	-
Fish	7				
Context total	**71**				

Table 43. Area 8: Context 8810

Species	NISP Total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	181	53	54	15	59
Bos Taurus (cow)	13	1	12		
Sus scrofa (pig)	18	4		4	10
Oryctolagus sp. (rabbit)	3	-	-	-	3
Canis familiaris (dog)	7	-	-	-	7
Felis domesticus (cat)	1	1	-	-	-
MM	1043 (479 non)	78	481	2	3
SM	7 (6 non)	-	1	-	-
Gallus domesticus (chicken)	17	5	12	-	-
Avis sp.	10	4	6		
Fish	274				
Mouse	35				
Rat	129				
Context total	**1738**				

Table 44. Area 8: Context 8850

Species	NISP Total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	9	1	5	-	3
Bos Taurus (cow)	9	-	8	-	1
Sus scrofa (pig)	2	-	-	2	-
MM	148 (70 non)	13	64	-	-
SM	1 non				
Oryctogalus sp (rabbit)	4	2	2	-	-
Gallus domesticus (chicken)	5	1	4	-	-
Fish	14				
Mouse	1				
Rat	12				
Context total	**205**				

Table 45. Area 8: Context 8860

Species	NISP Total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep)	10	1	7	-	2
Sus scrofa (pig)	1	-	-	1	-
Canis familiaris (dog)	1	-	-	-	1
MM	86 (30non)	7	48	-	1
Avis sp.	7	6	1	-	-
Fish	5				
Rat	8				
Context total	**118**				

Table 46. Area 8: Context 8874

_____

Context No*	Total fragments (NISP)	Context No*	Total fragments (NISP)
9201*	54	9252	1
9203	2	9254	2
9206*	14	9401	3
9230	4	9509	4
9248	3	9203	6
9249*	15	9252	2
9470	1		
9202	3	**Total**	**114**

Table 47. Area 9: Total NISP recovered from each context (*indicates further analysis of context)

Species	Common name	NISP / Assemblage %
Ovis aries	Sheep	69 / 60.5%
Bos Taurus	Cow	29 / 25.4%
Sus scrofa	Pig	3 / 2.6%
Felis domesticus	Domestic Cat	1 / 0.8%
Canis familiaris	Domestic dog	2 / 1.7%
Gallus domesticus	Chicken	8 / 7%
Phasianus sp	Pheasant	1 / .8%
Avis sp	Bird	1 / .8%
Total NISP		**114 / 100%**

Table 48. Area 9 Faunal overview

Body Portion	Skeletal Element	NISP
Cranial **5 / 4.4%**	Skull	1
	Mandible	4
Axial **53 / 46.5%**	Vertebra	8
	Rib	30
	Scapula	6
	Pelvis	7
	Sacrum	2
Appendicular **41 / 36%**	Humerus	12
	Radius	1
	Ulna	1
	Femur	8
	Tibia	15
	Fibula	1
	Long bone shaft fragment	3
Foot **15 / 13.2%**	Metacarpal	6
	Metatarsal	8
	Calcaneus	1
Total NISP		**114**

Table 49. Area 9 Skeletal element frequency

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	37	17	9	4	7
Bos Taurus (cow)	16	2	12	-	2
Sus scrofa (pig)	1	-	1	-	-
Context total	**54**	**19**	**22**	**4**	**9**

Table 50: Area 9, context 9201

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	9	3	5	-	1
Bos Taurus (cow)	4	-	4	-	-
Avis sp.(bird)	1	-	-	-	1
Context total	**14**	**3**	**9**	**-**	**1**

Table 51. Area 9: Context 9206

Species	NISP total	Body Part Frequency			
		Appendicular	Axial	Cranial	Foot
Ovis aries (sheep*)*	6	2	2	1	1
Bos Taurus (cow)	1	-	1	-	-
Sus scrofa (pig*)*	2	-	1	-	1
Gallus domesticus (chcken)	4	3	1	-	-
Pheasant	1	1	-	-	-
Avis sp.(bird)	1	1-	-	-	-
Context total	**15**	**7**	**6**	**1**	**1**

Table 52. Area 9: Context 9249

Species	House 7 (8700)	House 9 (8610)	House 11 (8529)	House 13 (8630)	House 15 (8810)	Species total
	NISP	NISP	NISP	NISP	NISP	NISP
Ovis aries (sheep)	64	214	1171	605	8	**2062**
Bos Taurus (cow)	13	3	10	5	1	**32**
Sus scrofa (pig)	5	6	15	51	1	**78**
Oryctolagus cuniculas (rabbit)	-	-	1		-	**1**
Felis domesticus (cat)	-	-	4	3	2	**9**
Canis familiaris (dog)	5	2	16	25	-	**48**
Gallus domesticus (chicken)	18	6	87	64	1	**176**
MM	442	226	511	1243	51	**2473**
SM	3	6	72	37	-	**118**
Avis sp.(bird)	-	4	30	7	-	**41**
Mus musculus (house mouse)	32	23	24	50	-	**129**
Rattus sp.(rat)	96	50	267	453	-	**866**
Homo sapiens (human)	-	2	2	-	-	**4**
Fish	108	205	591	485	7	**1396**
Context total	**786**	**747**	**2801**	**3028**	**71**	**7433**

Table 53. Area 8 Inter-house comparison of kitchen underfloor deposits, phases 6 and 7