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REVIEW OF MIDDLE BRONZE AGE–LATE IRON AGE FAUNAL ASSEMBLAGES FROM SOUTHERN BRITAIN

Ellen Hambleton

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SUMMARY

This study provides a synthetic review of published faunal assemblages. Key themes include: animal husbandry; diet and economy; agricultural diversification and specialisation; and the nature of 'special deposits'. Assessments of species frequency and relative abundance confirm that domestic mammals predominate. Consequently, analyses (e.g. ageing, butchery, biometric data) focus on the exploitation and deposition of sheep, cattle, pig, horse and dog. Other taxa (e.g. wild mammals, birds, fish and amphibians) are also discussed. Regional variations are evident in the availability and composition of faunal assemblages. Understanding of the Bronze Age relies heavily on a small number of large faunal assemblages, while the Iron Age dataset is more extensive. Zooarchaeological evidence comes mainly from the Wessex chalklands. The far Eastern and Western counties yield significantly fewer assemblages. Prehistoric pastoral farming in areas outside Wessex and 'off the chalk' requires further investigation. Landscape-based 'environs' studies, are identified as an important way forward in expanding our understanding of prehistoric farming communities. Integration of faunal data with other lines of archaeological evidence also has considerable potential to provide new insights. The review summarises current understanding of later prehistoric animal exploitation in the region, highlights gaps in current knowledge, and makes recommendations for future research.

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DATE OF RESEARCH

2003-2007

COVER

Sheep at Butser Ancient Farm (Ellen Hambleton).

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LIST OF ABBREVIATIONS

OD	Ordnance Datum

Periods:

BA	Bronze Age
IA	Iron Age
RB	Romano-British

E[period]	Early[Bronze Age/Iron Age/Romano-British]
M[period]	Middle[Bronze Age/Iron Age/Romano-British]
L[period]	Late[Bronze Age/Iron Age/Romano-British]

Zooarchaeology terms:

ABG	Associated Bone Group
MNE	Minimum Number of Elements
MNI	Minimum Number of Individuals
NISP	Number of Identified Specimens

1. ZOOARCHAEOLOGY OF THE MIDDLE BRONZE AGE – LATE IRON AGE IN SOUTHERN ENGLAND

1.1 Introduction

This study aims to provide a synthetic review of the Middle/Late Bronze Age – Late Iron Age faunal material recovered from archaeological investigations in southern Britain. This review summarises existing knowledge of extant faunal assemblages, drawing on published reports of assemblage composition and the information these provide concerning key themes, such as animal husbandry, diet and economy, agricultural diversification and intensification, and the identification of 'special deposits'. In addition, the review highlights gaps in our current knowledge and proposes areas of future research, with a view to furthering our understanding of the archaeology of southern Britain in the later prehistoric period with particular reference to the faunal record.

Such an overview is of potential benefit to professional bodies as a background information source informing the planning and post-excavation assessment stages of archaeological projects and to providing support for local curatorial decisions. The review also highlights key research issues and priorities in the zooarchaeology of later prehistoric southern England, which will be of value to professionals and academics co-ordinating and advancing research agendas at regional and national levels. In turn this review also has the potential to add to the broader public understanding of the role of animals in our archaeological past.

This review forms an integral component within the broader framework of English Heritage Programmes, which share the primary goal of supporting the development of research frameworks, specifically the Regional Environmental Reviews (English Heritage 2003: 8.2). In addition the project also has cross-linkages with other programmes aimed at advancing the understanding of England's archaeology by assessing the known resource (*ibid:* 1.8 and 2.6), and undertaking thematic syntheses (*ibid:* 3.3). Furthermore many of the key themes explored by the project will tie in with those addressed in other regional and period reviews and research agendas (e.g. Haselgrove et al 2001).

1.2 Earlier Surveys

There have been several previous reviews of faunal assemblages focussing on the later prehistoric period (principally the Iron Age) of Southern Britain (e.g. Maltby 1981a, 1994, 1996, Grant 1984a, and Hambleton 1999). These provide a useful benchmark against which to evaluate the extent to which the extant Later Bronze Age and Iron Age faunal dataset has grown and with it our understanding of animal exploitation and deposition in this period. Most of these reviews concentrate their discussion on central southern England because most of the available zooarchaeological data comes from this region, data from the southeast and southwest being scarce. Another common feature is the focus on domestic animal husbandry, with little data available for wild species.

Maltby (1981a) provided the first comprehensive review of Iron Age zooarchaeological evidence from Britain; he reviewed the quantitative evidence for the relative importance of different species, considering problems of inter- and intra-site variability, as well as

ageing and metrical data. Maltby's 1981 review highlighted at the time how few large faunal assemblages had been fully analysed and published in detail. Grant's (1984a) zooarchaeological study paid particular attention to investigating husbandry strategies within the central southern region and demonstrated distinct differences in faunal assemblage composition between the chalk downland sites of Wessex and sites on the Thames Valley gravels. This direct comparison of quantitative data in relation to variables such as topographic location proved to be informative, and influenced the methodological approach taken by subsequent reviews (e.g. Hambleton 1999).

The 1984 regional review of environmental archaeology (Keeley 1984), made little or no detailed mention of Bronze Age material and discussion of Iron Age animal bone evidence from within the southern region was also limited. The second volume of the review (Keeley 1987) provided more information on the animal bones from the south midlands (Robinson and Wilson 1987) and Wessex (Coy and Maltby 1987). Coy and Maltby's (1987) discussion included additional new published assemblages, such as Balksbury and Winnall Down, and discussed exploitation of wild species, making reference to Bronze Age material. However, this review added little significant new information to that set out by Maltby in 1981. The south midlands review (Robinson and Wilson 1987) provided limited quantitative data from five Bronze Age sites from within the southern region and discussed possible seasonal transhumance of domestic cattle. The Iron Age discussion was wider ranging but brief; wild and domestic species abundance, and age profiles, size and butchery of domesticates were all considered but despite the greater number of Iron Age faunal assemblages mentioned, only limited quantitative data were included.

The 1980s and early 1990s saw a considerable increase in the number of published reports on detailed analyses of large faunal assemblages. Maltby highlighted this in the next major review of Iron Age zooarchaeological evidence in 1996, which incorporated new evidence from several major faunal assemblages from the southern region, including Balksbury, Danebury, Groundwell Farm, Micheldever Wood, Mingies Ditch, Owslebury and Winnall Down. The greater number of assemblages enabled a more comprehensive discussion of inter-regional differences in animal exploitation, and areas within the southern Region, such as Wessex and the Upper Thames valley were discussed in some detail. Maltby's 1996 review maintained the previous emphasis on domestic animal husbandry, but with discussion expanded to include ritual deposition in the light of the interpretation of 'special deposits' at Danebury. Wild species also received a brief mention, taking into account work by Grant (1981) on the significance of deer remains on Iron Age occupation sites.

Building on previous observations by Maltby (1981a; 1996) and Grant (1984a), Hambleton's (1999) comparative study considered variables such as topography, site type and date and their relation to faunal assemblage composition and husbandry strategies on British Iron Age settlements. The range of species discussed was restricted to three main domesticates (cattle sheep/goat and pig) and the emphasis was on quantitative faunal data (particularly relative species abundance and mortality profiles). Hambleton (*ibid*) investigated inter-regional comparisons, although the regional groupings used do not map directly onto the southern region defined by English Heritage. Certain areas within the southern region, such as Wessex and the Upper Thames Valley, were shown to be particularly rich in faunal data and provided the basis of more detailed intra-regional comparative discussion. The majority of data used by Hambleton from southern region

came from the same assemblages of >1000 fragments reviewed by Maltby (1996), although she included additional, smaller assemblages which improved coverage of some areas within the southern region, such as Buckinghamshire and Sussex.

These earlier nationwide and regional reviews of the zooarchaeological evidence provide excellent overviews, summarising key patterns of domestic animal exploitation. Quantitative comparisons of assemblages within and between regions, highlight the small size of the majority of later prehistoric faunal assemblages from southern Britain (Grant 1984a: 102-3) and the problems of different methods of data analysis and presentation resulting in quantitative and ageing data than are not directly comparable between sites (Hambleton 1999). The differences between earlier and later studies register the impact of crucial sites such as Danebury, which have sufficiently large assemblages and duration of occupation to investigate change in animal exploitation through time at a single site, as well as having stimulated discussion of ritual treatment of animals. The increasingly large number of assemblages reviewed has provided an appreciation of what is typical for the region, which in turn has allowed atypical features of assemblages to be highlighted, e.g. the Iron Age cattle and sheep mortality profiles at Owslebury (Maltby 1996: 21, 22), and the relatively high abundance of pig at Ower (Hambleton 1999:46).

A considerable body of new data from published faunal reports has become available since previous reviews of the Bronze Age in the 1980s and Iron Age in the 1990s. Notable additions to the M-LBA dataset include those from Bishops Cannings Down (Maltby 1992) and Brean Down (Levitan 1990), which provide insights into animal exploitation in Wessex and on the edge of the Severn Estuary respectively. Large midden deposits from excavations at Runnymede Bridge (Done 1980, 1991; Serjeantson 1996) and Potterne (Locker 2000) are a major new contribution to our understanding of animal exploitation and disposal practices during the late Bronze Age and Early Iron Age. The Danebury Environs Programme (Hamilton 2000a) probably represents the most significant addition to the Iron Age faunal dataset from the southern Region in recent years. As well as contributing individual site reports for several large assemblages, the Danebury Environs Programme also attempts to place the zooarchaeological evidence within a broader investigation of farming systems and the role of sites within the Iron Age agricultural landscape of Danebury.

Here, the zooarchaeological evidence is discussed thematically. The format of earlier reviews is followed, considering exploitation of different species and focussing on domestic animal husbandry, making it possible to see the contribution new sites have made to the existing picture. An important additional feature of this review is the inclusion of an accompanying database (that can be downloaded or queried from http://ads.ahds.ac.uk/catalogue/resources.html?animalbone_eh_2009) providing individual assemblage data in support of the interpretative quantitative and qualitative summaries provided in the main body of the text. Discussion of the evidence for domestic animal exploitation incorporates themes such as agricultural specialisation and intensification, seasonal exploitation of the farming landscape and long-distance trade and exchange. The effect of different influences acting on assemblage composition is considered, including depositional and preservation effects as well as cultural and environmental influences on choice of animal husbandry regimes. Zooarchaeological analyses are not restricted to consideration of diet and husbandry strategies, and it is important to recognise the progression of theoretical debate and evaluation of arch evidence pertaining to

'structured' deposition and interpretation of potential ritual treatment of animal remains in later prehistoric southern Britain (e.g. Grant 1984b, Hill 1995). Thus a quantitative and qualitative evaluation of the zooarchaeological evidence pertaining to the structured deposition of animal remains is a further major theme addressed by this review.

1.3 Scope of the review

There are many factors that may limit the quantity and quality of information obtained from a zooarchaeological assemblage. The level of quantitative analyses and range of questions that may be asked of a faunal assemblage is commonly greater in large assemblages than in small ones. Furthermore, the level of qualitative and quantitative zooarchaeological analyses and the extent to which such data are fully published is also variable; systematic recovery of faunal remains from archaeological sites has not always been the norm, and detailed quantitative accounts of these assemblages are seldom available from publications prior to the 1970s. Many more LBA –LIA faunal assemblages are extant and published than were included in this review, but many provide only scant or unreliable faunal data. Thus, in order to maximise the quality information included in this review, sites yielding faunal assemblages were required to meet certain criteria before being included within the review dataset. All criteria have their advantages, limitations and occasional exceptions; these are discussed below.

1.3.1 Criteria for sites included in the review:

- *Sites fall within the defined geographical Southern Region*
  The region incorporates the whole of the English Heritage Southwest and Southeast regions, which cover all counties from Cornwall in the west to Kent in the east and Gloucestershire, Oxfordshire and Buckinghamshire to the north. Greater London is excluded from the study. The geographical borders of this review follow modern administrative boundaries, which aids the logistics of data collection and project management. However, such boundaries may have had little or no significance in the period under study; something that should be borne in mind when attempting to investigate any geographical variations in faunal assemblage composition and distribution.

- Sites have faunal assemblages that fall within the defined Middle/Late Bonze Age to Late Iron Age period
  This period ranges from 1500BC - AD43. Inevitably some Middle/late bronze Age - Late Iron Age sites will have periods of occupation that extend outside these dates, but wherever possible the review will be restricted to faunal material from within the stated timeframe. Some attempt has been made to use temporal cut-off points that coincide with some degree of cultural change evident in the archaeology of the region. The starting point of the temporal range of this review is linked to the appearance of settlements with Deverel-Rimbury pottery in the middle of the second millennium BC, while the Roman invasion of AD43 provides a more obvious cut-off at the later end of the temporal range. However, such archaeologically visible or historically documented events need not represent a significant influential event in relation to the exploitation and deposition of animals,

and certainly not at exactly the same time across the whole of the southern region.

- Sites have complete reports on the faunal assemblage published and/or in the public domain

  Reports on faunal assemblages included in the review are published in monographs, peer-reviewed journals or publicly available report series (e.g. English Heritage AML/CfA reports). In general, only reports published after 1970 are included in the review dataset, since prior to this date zooarchaeological studies were in their infancy, so earlier reports seldom provide sufficient data in accessible format for cross comparison of assemblages with other sites. Occasional earlier publications are included where the assemblage report is judged to be of sufficient quality to add relevant and reliable information to the dataset, or where the assemblage adds significantly to an otherwise poorly-represented part of the region, e.g. in the far southwest of the region.

  The existence of suitable faunal reports was established by a systematic review of the published literature using the British and Irish Archaeological Bibliography, this was supplemented by resources such as the Environmental Archaeology Bibliography and the bibliographies of previous reviews (e.g. Hambleton 1999; Maltby 1981a, 1996). Further searches of bibliographic databases and library catalogues were targeted at finding excavation reports of sites covering M/LBA-LIA period, which were then checked for presence of faunal reports; local journals for each county, and key British prehistoric journals (e.g. Antiquity, and Proceedings of the Prehistoric Society) were also searched in a similar manner. Literature searches were completed in February 2004; no reports published after this date were included in this review. Unpublished archive and assessment reports and other similar 'grey literature' were normally excluded from the study, with exception of the Battlesbury Bowl report, which was both readily accessible and a significant new addition to the Iron Age faunal dataset.

- Sites have faunal assemblages with circa 200 or more fragments identified to species

  In general, large faunal assemblages provide more detailed and reliable picture of animal exploitation and deposition than small ones; Davis (1987:46) provides a rough guide to the level of information obtainable form different sized samples, suggesting 100 identified fragments is just sufficient to provide information about relative species importance, while 1000 identified fragments can provide an indication of mortality profiles. Serjeantson (unpub.) states that samples below 100 identified fragments are not normally considered large enough to infer behaviour at a site. However, including small assemblages has the advantage of increasing the number of sites in the study, especially from parts of the region where poor animal bones are poorly represented in the archaeological record and consequently knowledge of animal exploitation is limited. Exclusion of small samples can also exclude of particular types of site and archaeological context that typically only yield small assemblages of faunal material, e.g. funerary assemblages. By contrast, Hambleton's (1999: 39-40) comparative study of IA faunal assemblages recommended excluding samples of fewer than 300 identified fragments on the grounds that these are to small to be considered reliable Certainly reports on larger

faunal assemblages more consistently provide a wider range of information, e.g. body part and ageing information, as well as basic species quantification. While such guides are useful, it must also be borne in mind that each assemblage is different, and the context from which remains are recovered will be a major factor influencing the extent to which the faunal assemblage may provide reliable and representative information about economic exploitation or specific aspects of depositional behaviour.

For the purposes of this review, a minimum sample size of c.200 identified fragments was considered inclusive enough to obtain good coverage of sites across the region, while still ensuring that all assemblages were large enough to enable some level of reliable quantitative comparison. Thus assemblages of fewer than c.200 identified fragments were normally excluded from the study. However, a need for flexibility in this area was recognised in order that smaller, yet still significant, assemblages could be considered within the review to provide a more complete picture of the region.

1.4 Data organisation

Information was collected from the selected animal bone reports and entered into a relational database, which can be found at http://ads.ahds.ac.uk/catalogue/resources.html?animalbone_eh_2009. Information was recorded at two hierarchical levels; the 'site' and the 'assemblage', which allowed for multiple faunal assemblages to be recorded from each site excavation report (where the faunal remains from a site had been subdivided into several smaller assemblages). Thus the database contains many more 'assemblage' records than it does 'site' records. For example, four 'assemblage' records are present in the database for the site of Gussage-all-Saints, because in Harcourt's (1979) report on the animal bones from this site, faunal data are available for the Iron Age period as a whole, but also for smaller subdivisions into separate faunal assemblages of Early, Middle, and Late Iron Age date. Subdivisions of the faunal remains from a site into several distinct assemblage records were made predominantly on the grounds of date. Very rarely, faunal material was subdivided into separate assemblage records based on of spatial or typological grounds, such as the animal 'burials' from Cadbury (Hamilton-Dyer and Maltby 2000) which formed an assemblage record separate to the disarticulated faunal remains from other deposits; although in most cases, such subdivisions also corresponded to chronologically distinct groupings.

Each 'site' record corresponds to a major excavation or animal bone report; so where the same monument and location have been revisited by a series of separately published excavations, there may be several different 'site' records. For example, the1968-78 excavations at Danebury (Cunliffe 1984) are recorded in a separate 'site' record to the 1979-88 excavations at Danebury (Cunliffe and Poole 1991), respecting distinctions that already existing in the published literature.

Data pertaining to the excavation site as a whole (e.g. its geographical and geological location, overall bone preservation, methods of excavation, location of site archive and full bibliographic reference) were collected in the 'SITE LEVEL INFO' table within the database. Data pertaining specifically to the individual animal bone assemblages (e.g. date, site/monument type, predominant feature type, faunal assemblage size and quantification

of major taxonomic groups) were collected in the 'ASSEMBLAGE LEVEL INFO' table. Additional faunal data (e.g. species present within the main taxonomic groups; quantification, body part representation, ageing, metrical and butchery information for the main domesticates; and evidence for special deposits and/or Associated Bone Groups) were recorded, where available, for each assemblage in a series of separate 'ASSEMBLAGE DETAIL' tables. Data in separate tables were linked via individual identification numbers for each site and assemblage level record. The database is self-contained, and a full set of explanations and definitions to all codes and fields used are incorporated in the properties and design fields for all tables within the database. A brief outline to the database structure and relationships is provided in Appendix 2.

1.5 Methods of Quantification

The two main types of quantitative data available from faunal reports for use in investigating the relative abundance of species are NISP (Number of Identified Specimens) and MNI (Minimum Number of Individuals). The basic principles of these two quantification methods, the extent to which they do or do not provide reliable indication of species abundance in past animal populations, and their relative advantages and limitations for inter- and intra-site comparative studies of species abundance have been discussed at length within the zooarchaeological literature (e.g. Hambleton 1999), and need not be reiterated here. It is sufficient to mention that the two data types are not directly comparable, and there is a tendency for NISP counts to better represent larger species, such as cattle, relative to smaller species, such as sheep.

One further point worth mentioning is that NISP counts may over-represent species for which all the bones from associated bone groups (ABGs), particularly partial or complete skeletons, are included. The effect that including ABGs may have on the relative abundance of species NISP can vary. For example, in the EIA-MIA assemblage from Brighton Hill South (Maltby 1995b), there is no statistically significant difference in domestic species NISP between samples that include or exclude the small number of sheep bones from ABGs within the abundant sample of disarticulated sheep remains. However in the LIA-ERB assemblage from the same site, including or excluding the large number of bones from dog ABGs in the sample, where disarticulated dog remains are comparatively rare, results in obvious (and statistically significant) differences in domestic species NISP. Generally the net result of including ABGs in NISP counts is an over-representation of species that are a) poorly represented overall in the disarticulated assemblage, and b) have ABGs with large numbers of bones, such as complete skeletons. Many analysts deal with potential problems by simply excluding partial skeletons from published NISP data (e.g at Maiden Castle, Armour-Chelu 1991 and Dibble's Farm, Gamble 1988). Other analysts include them only after establishing that to do so would not significantly alter interpretations concerning the relative abundance of species (e.g. at Battlesbury Bowl, Hambleton and Maltby unpub.). Where reports do include partial skeletons and other ABGs in NISP data, this is usually clearly stated, and the effects on relative species abundance discussed. For assemblages included in this review, potentially biasing ABGs are excluded from the NISP data wherever possible. It is not possible to exclude potentially biasing ABGs in all cases, but wherever possible their presence, and any corresponding bias in NISP, is noted in the database.

1.6 Referencing Sites and Assemblages

Bibliographic references for all zooarchaeological reports reviewed are listed in the database. In the forthcoming chapters, references are not normally cited for each separate mention a faunal assemblage by site name where the data discussed are included in the database. Instead, a list of site names alongside citations for all reviewed faunal assemblage reports is provided in Appendix 1 and full references included in the bibliography. Exceptionally, citations are included after mention of a site assemblage in the text where reference is made to specific information not detailed in the database records (e.g. in Chapter 5, where specific contextual and compositional details for ABG deposits have not been not included in the database and must be drawn from the published reports).

1.7 Summary of the dataset

Having met the criteria for inclusion in the regional review, a total of 108 site reports were recorded in the database. These 108 'site' records correspond to reports from excavations at 101 separate monument locations. These sites generated 154 distinct 'assemblage' records for faunal assemblages of c.200 or more fragments identified to species. Wherever possible a full suite of data was recorded for each assemblage. However, not all assemblages had the same level of information available. For example, from Rope Lake Hole (Coy 1987c) information concerning species present, and quantification, ageing, butchery, body part representation and metrical data were available for the overall Iron Age-Romano-British faunal assemblage, but when subdivided into separate E-MIA, MIA and LIA assemblages, only NISP data for cattle sheep/goat and pig were available. A consequence of these differing levels of available information is that the numbers of samples vary for the different types of data under discussion in this review.

1.7.1 Assemblage size

The size of assemblages, and consequently the level of zooarchaeological information available, varies considerably among the reviewed reports. Assemblage sizes range from 88 identified (to species) fragments in the EIA assemblage from Quarry Field, Compact Farm (Clark 2002), to over 57600 identified fragments in the Iron Age assemblage from the 1969-78 excavations at Danebury (Grant 1984c). Among the 141 assemblages for which total NISP counts were available, almost half (49%) were small samples of <1000 identified fragments, while only 5% yielded large samples of >10000 identified fragments (Figure 1.1). With the exception of the MBA and MBA-LIA sub-periods, which yielded only small-moderate assemblages, moderate-large assemblages of >4000 identified fragments were represented in all sub-periods from MBA-LIA to LIA-ERB (Table 1.1). Almost all of the largest assemblages came from Danebury; Owslebury and Potterne being the only other two sites yielding such large assemblages.

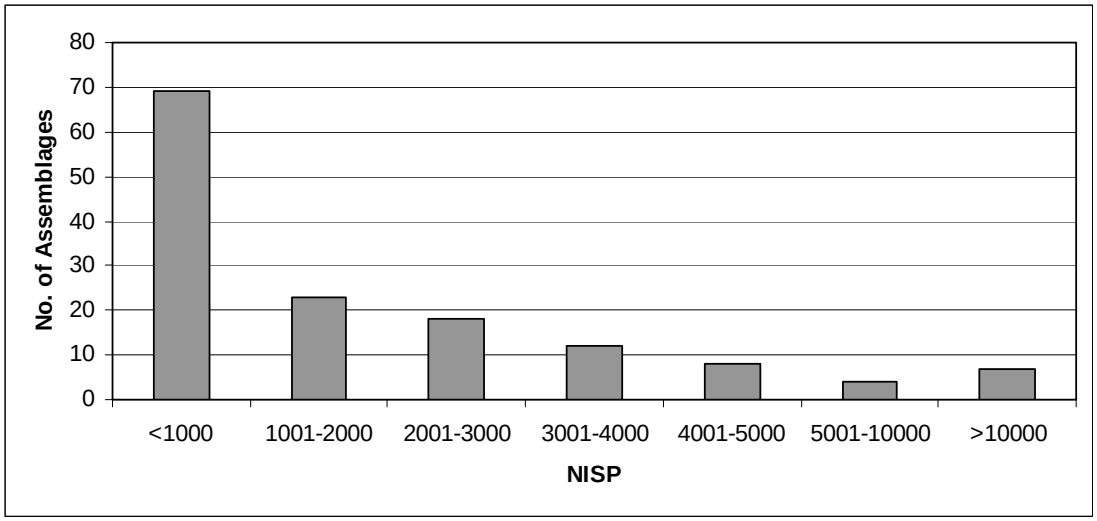

Figure 1.1: Frequency of different assemblage sizes among the reviewed reports of M-LBA-LIA faunal remains from southern England. (n=141).

Table 1.1: Frequency of different assemblage sizes from each sub-period among the reviewed reports M-LBA-LIA faunal remains from southern England.

	NISP						
period	<1000	1001-2000	2001-3000	3001-4000	4001-5000	5001-10000	>10000
MBA	3	0	1	0	0	0	0
MBA-LBA	4	0	0	1	0	0	0
LBA	2	2	2	0	1	0	0
LBA-EIA	2	1	1	0	0	0	1
EIA	7	2	4	0	1	0	1
EIA-MIA	8	3	0	4	0	1	0
MIA	8	3	2	3	2	1	1
MIA-LIA	6	1	1	1	0	1	1
LIA	8	7	2	1	2	0	0
LIA-ERB	6	0	3	1	1	0	1
LIA-RB	1	0	0	0	0	0	0
total no. assemblages	**55**	**19**	**16**	**11**	**7**	**3**	**5**
BA	0	0	0	0	0	0	0
BA-IA	0	0	0	0	0	1	0
IA	14	4	2	0	1	0	2
IA-RB	0	0	0	1	0	0	0
total no. assemblages	**14**	**4**	**2**	**1**	**1**	**1**	**2**

Discussions of later prehistoric animal exploitation often focus on information gleaned from a restricted suite of good quality zooarchaeological reports based on large faunal assemblages and/or detailed analyses. Danebury (Grant 1984c, 1991a) has produced by far the largest British faunal assemblage of prehistoric date (over 240,000 fragments) and is one of the most frequently cited examples in discussions of Iron Age faunal assemblages from southern England, as are the assemblages from Maiden Castle (Armour-Chelu 1991), Owslebury (Maltby 1987a), Winnall Down (Maltby 1985a) and Ashville (Wilson *et al.* 1978). Runnymede Bridge (Done 1980, 1991; Serjeantson 1996) and Potterne (Locker 2000) are also frequently cited as Bronze Age examples. Clearly the quality and quantity of information from such zooarchaeological reports justifies this emphasis, and it is

important for this review to utilise these better-known sites as points of reference within the discussion. However, by dint of their frequent use as illustrative examples, such assemblages are often taken by default to typify the period and region under study while the contributions of smaller assemblages to the picture may be overlooked. It is hoped that in this review the inclusion of illustrative examples from a broad range of assemblages, in conjunction with those from the most prominent sites, will help shift focus away from a few key sites and provide a useful introduction to smaller, less well-known assemblages.

1.7.2 Temporal Range

The period under review is 1500BC-AD43. Within this broad range, spanning the Middle Bronze Age to Late Iron Age, assemblages were assigned to periods and sub-periods following the RCHME standard definitions (English Heritage 1998a). Assemblages were assigned to date classes based solely on the chronological information provided in the published site excavation reports; however it is recognised that some of these assemblages might be assigned to different date classes in the light of more recent absolute dating evidence for some sites, and revisions of Iron Age pottery chronologies. Wherever possible, assemblages were assigned to the following sub-periods: MBA; LBA; EIA; MIA; LIA. Subdivision of assemblages into chronological groups did not always fall neatly along the RCHME defined date divisions, and some assemblages spanned two or more sub-periods. Assemblages were assigned to single categories wherever possible, based on the date of the *majority* of faunal material. Where faunal material was not more closely dated or assemblages comprised mainly material of mixed date, broader combined date ranges are used.

Table 1.2: Number of assemblage records for each period class.

period	no. assemblages	% of total
MBA	4	2.6%
MBA-LBA	5	3.2%
LBA	7	4.5%
LBA-EIA	6	3.9%
EIA	16	10.4%
EIA-MIA	17	11.0%
MIA	22	14.3%
MIA-LIA	12	7.8%
LIA	23	14.9%
LIA-ERB	13	8.4%
LIA-RB	1	0.6%
BA	1	0.6%
BA-IA	2	1.3%
IA	24	15.6%
IA-RB	1	0.6%
total	154	

The distribution of assemblages by period class is shown in Table 1.2. By far the majority of assemblages included in the review are of Iron Age date (c.84%), with far fewer available assemblages containing material dating from the Bronze Age. In general, later prehistoric settlement sites from southern Britain tend to produce larger assemblages of

faunal remains than non-settlement sites. In this way, the preponderance of Iron Age faunal assemblages included in this review reflects the overall archaeological record for the region, in that the Iron Age archaeology of southern Britain is characterised by a predominance of settlement archaeology, whereas in earlier periods the excavated archaeological record includes a higher proportion of non-settlement sites, such as funerary monuments. The predominance of Iron Age material means that there is greater potential for more detailed analyses and reliable conclusions to be drawn from this period than for the Bronze Age. Nevertheless there is still potential to investigate the M-LBA period in some detail for the southern region, and for this review to draw conclusions about several different period groups and to investigate changing patterns of animal exploitation and deposition through time throughout the MBA-LIA.

1.7.3 Types of Site

The faunal assemblages included in this review come from a range of different types of archaeological site. Site classes recorded for each assemblage conform to the NMR monument type thesaurus (English Heritage 1998b). The category assigned to each assemblage was based on conclusions drawn in the published site reports and do not take into account any subsequent re-interpretations that may have been made. Where possible, the specific terminology used in the published report was used when categorising an assemblage by site type, provided that monument type is listed in the NMR thesaurus and more than one reviewed site had been found in that category. Where there were only single incidences of a particular NMR defined monument type, such as the 'burnt mound; from Sandy Lane (Maltby 2001a) these assemblages were included under broader, more generic headings such as 'occupation'. Site type categories were assigned to each assemblage rather than each site, since different assemblages may reflect subdivisions relating to change in form/function of a site. It proved difficult to classify assemblages using a consistent scheme, since authors categorise sites according to a wide range of different criteria, such as their physical form (e.g. open/enclosed), the nature of the occupation activity (e.g. domestic/agricultural/ritual or religious) or their social status and function (e.g. oppidum). Futhermore, a variety of terminologies are in use across the region, so similar site types may be labelled differently in different areas. Despite some of the categories used being necessarily broad or overlapping, other classes of site are clearly distinguished by shared morphology, function and date range (e.g. banjo enclosures).

Table 1.3: Number of assemblage records for each class of site (monument) type.

type of site	no. assemblages	% of total
settlement	44	28.6%
enclosed settlement	35	22.7%
hillfort	25	16.2%
unenclosed settlement	17	11.0%
enclosure	13	8.4%
occupation	7	4.5%
banjo enclosure	5	3.2%
religious/ritual	5	3.2%
promontory fort	3	1.9%
total	154	

The distribution of the reviewed assemblages into different site (monument) types is

shown in Table 1.3. It is immediately apparent that by far the majority of zooarchaeological assemblages are derived from settlement occupation and/or farming activity from the full range of MBA to LIA-ERB sub-periods. A high proportion of assemblages are from hillfort sites; this is a common later prehistoric monument type within the southern region, and many hillforts have been the focus of archaeological investigations. No hillfort assemblages dating from the Bronze Age were included in this review, although assemblages from this monument type represent the full range of Iron Age sub-periods. The abundance of hillfort assemblages within the dataset is mainly due to the multiple assemblages representing the different sub-periods groups from two separate excavation reports on Danebury hillfort. Excavations at Danebury hillfort have produced the largest bone assemblage known from any later prehistoric site in Britain.

Ritual/religious sites reviewed included assemblages of MBA, EIA, LIA and LIA-ERB date. Very few of the reviewed assemblages are classified as solely 'ritual/religious' (e.g. assemblages from the Uley Shrines, and Hayling Island Temple), and of these none are from funerary contexts. Although faunal assemblages from funerary contexts do exist for this period from the region, none have yielded samples of >200 identified fragments and so fail to meet the criteria for inclusion in this review. During the Iron Age in southern Britain, ritual/religious activities, as evidenced in the archaeological record, occurred on settlement sites and separate ritual/religious sites did not become common until the Romano-British period. Thus the level of detailed analyses and reliable conclusions that may be drawn from this review will tend to focus on the exploitation and deposition of animals on and around farming settlements, although within this sphere there remains ample opportunity for the investigation of potentially ritual activity in addition to domestic animal husbandry.

1.7.4 Distribution of sites

The locations of sites yielding faunal assemblages included in this review are shown in Figure 1.2. The distribution of recorded sites is clearly uneven across the southern region, with the central part of the region being much better represented than western and eastern reaches of the region. The Wessex chalklands of Hampshire, Wiltshire and Dorset account for approximately half the site records and the majority of assemblage records in the review database (Table 1.4). From the three counties of Hampshire, Wiltshire and Dorset, assemblages of all sub-periods from MBA to LIA-ERB are represented within this review dataset, although no Bronze Age assemblages were recorded from Hampshire, while from Wiltshire no assemblages later than the MIA were recorded. Oxfordshire and Gloucestershire are also fairly well represented by sites from limestone areas and the gravel terraces of the Upper Thames Valley. Although couple of later Bronze Age assemblages were recorded from Oxfordshire and Gloucestershire, sub-periods from MIA to LIA-ERB are best represented from these two counties.

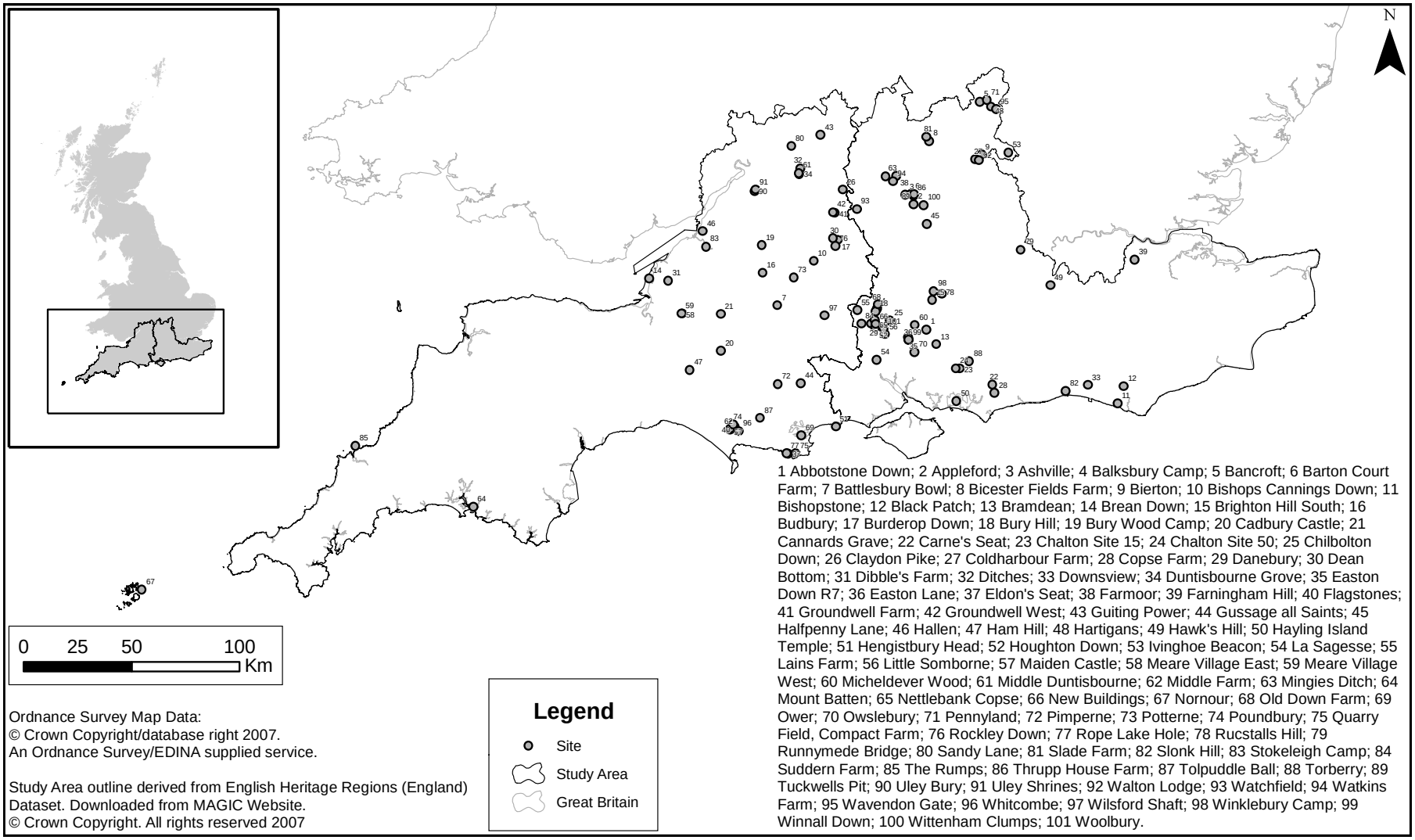

Figure 1.2: Location of sites included in regional review

Sites are sparse across most of Buckinghamshire; there is a cluster of four sites with assemblages of MIA, LIA, LIA-ERB and general IA dates from around Milton Keynes, on the gravels and terraces of the River Ouzel and its tributaries. Elsewhere in Buckinghamshire a further three sites are located in the Vale of Aylesbury (with assemblages of MBA, LIA and general IA date), and one isolated IA site, Ivinghoe Beacon, is situated high on a chalk ridge. Berkshire exhibits even poorer coverage, with only three reviewed sites, all LBA, and all of which are located on low-lying ground at the riverside at Runnymede. With the exception of several records for the Meare Lake Villages, there are very few sites with noteworthy faunal assemblages from the western counties of Somerset, Devon and Cornwall. Only MIA-LIA and LIA sub-periods are represented from Cornwall and Devon, but assemblages from Somerset show a greater diversity in date with MBA, LBA and EIA-MIA to LIA-ERB sub periods represented. A similar dearth of sites is apparent from the east of the region in Surrey (IA assemblage) East Sussex (Bronze Age assemblages), West Sussex (MIA to LIA-ERB assemblages), and Kent (LIA assemblage). Similar observations have been made previously (Hambleton 1999:41), and it would appear that archaeological investigations over the past 5-10 years have added few sizable assemblages to the *published* Iron Age faunal record outside of the central area of southern England.

Table 1.4: Number of site and assemblage records for each county

county	No. of site records	No. of Assemblage records
Berkshire	3	3
Buckinghamshire	8	9
Cornwall	2	2
Devon	1	1
Dorset	13	23
East Sussex	3	3
Gloucestershire	9	10
Hampshire	28	50
Kent	1	1
Oxfordshire	13	13
Somerset	10	14
Surrey	1	1
West Sussex	4	7
Wiltshire	12	17
Total	108	154

The distribution of sites with faunal assemblages large enough for inclusion in this review corresponds broadly to the acidity of soils in the region. Many more sites situated on lime-rich soils yielded bone assemblages than did sites situated on acidic soils. Also, the largest and best-preserved of the bone assemblages reviewed tended to be those from sites on the lime-rich soils. Differences in the frequency of archaeological investigations across the south of England may also account for differences in the frequency of archaeological faunal assemblages. Recent investigations into the number and distribution of archaeological field evaluations between 1990-1999 (Darvill and Russell 2002:28) reveal a lower density of archaeological field evaluations in the southwest counties of Devon and Cornwall than in the central and eastern areas of southern Britain (Figure 1.3). The low numbers of faunal assemblages from Devon and Cornwall may therefore reflect the lack of archaeological excavation in this part of the southwest. However, the low numbers of faunal assemblages from Surrey, Sussex and Kent is at odds with the high

density of archaeological evaluations in these counties. Thus, while the level of development and accompanying archaeological investigation in a region may increase the likelihood of faunal remains being recovered, it would appear that soil conditions have the greater influence on faunal assemblage survival and recovery.

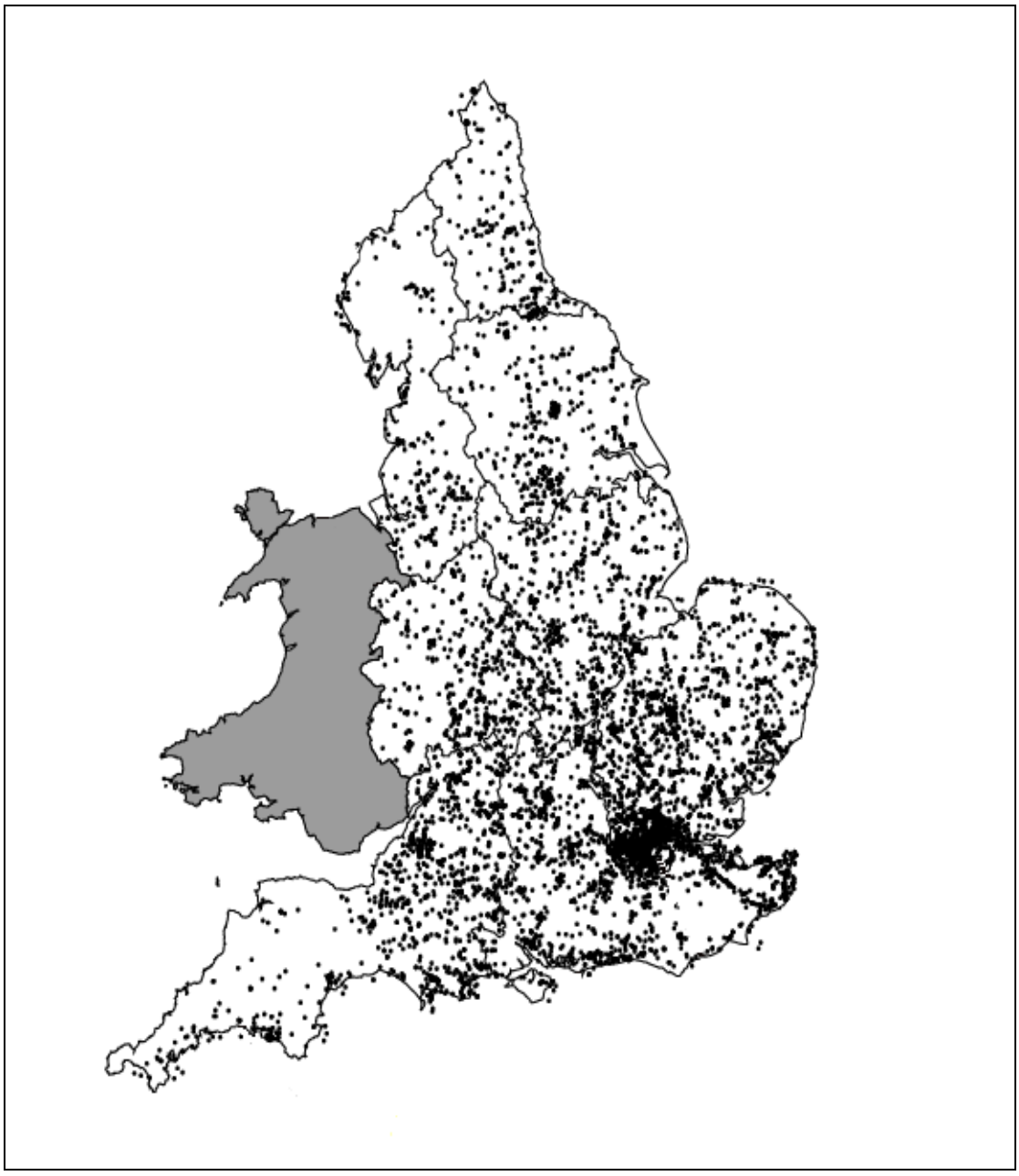

Figure 1.3: Distribution of Field Evaluations undertaken in England 1990-1999 (source: Darvill & Russell 2002:28)

Fortunately the coverage of zooarchaeological assemblage reports within certain areas of the southeast and southwest of England does look set to improve in the near future. The programme of excavations undertaken as part of the development of the Channel Tunnel Rail Link (CTRL) has considerable potential to add to our understanding of later prehistoric animal exploitation in Kent (an area that is currently poorly represented in the review dataset). By the end of 2003, CTRL UK Ltd assessment reports included at least

three sites yielding Iron Age faunal assemblages of >200 identified fragments (Charles 2001; Pipe and Reilley 2001; Reilley, Pipe and Liddle 2001). Although there has been no developer funded excavation programmes of the on the scale of the CTRL in the southwest, the body of extant faunal data from Somerset is growing considerably as a result of research led excavations undertaken as part of the South Cadbury Environs Project. Work around South Cadbury has revealed a wealth of later prehistoric archaeology and excavations at several sites have produced faunal assemblages of size and date comparable to those included in this review (Randall *pers. comm.*). Recent work around Little Wittenham, Oxfordshire, has also added significantly to the extant faunal dataset from the region. The Castle Hillfort and Wider Landscape Project (Allen and Lamdin-Whymark 2005) has yielded at least five assemblages with NISP >200 of EIA and MIA date from the sites of Castle Hill, Hill Farm and Little Wittenham (Worley *pers. comm.*).

The southern region incorporates a broad range of different environments, soil conditions and topography, all of which may have influenced distribution of wild species and choice of domestic animal husbandry strategies. Socio-cultural choices also influence animal exploitation, and the southern region is unlikely to have represented a single cohesive cultural group throughout the period under study. Certainly for the LIA at least, the southern region incorporates the territories of several different tribal groups, including the Dumnonii in the far southwest, the Durotiges and Atrebates in central southern England, and the Cantiaci in the far southeast, as well as parts of the Dobunni and Catevellauni territories towards the north-western and north-eastern extent of the southern region (Cunliffe 2005: 179). It is not known whether these tribal groupings extend back into the earlier Iron Age and Bronze Age, but the distribution of certain ceramic groupings in the MIA (Cunliffe 2005: 122) do seem to loosely equate to the regions suggested for LIA tribal territories, so it is certainly possible that such cultural groupings have the potential to have been a long-term influence on patterns of animal exploitation within the southern region. Changes in the social, political and economic structure of cultural groups through time may also account for some of the temporal patterns observable among the faunal assemblage composition throughout the region.

2. SPECIES PRESENT

Records of species (and broader taxonomic groups) present were available for 150 of the reviewed assemblages. Table 2.1 lists the taxa identified from MBA-LIA sites from the southern region and the number of assemblages in which they occur. Lists of species present include those identified from sieved samples, as well as hand-recovered remains. Unsurprisingly, the larger assemblages tend to show greater species diversity than the smaller assemblages. Sieving also tends to result in an increase in the number of taxa present, especially amongst the small mammals, herpetofauna and fish. Assemblage size, preservation and recovery method are the main factors influencing species diversity. There is no evidence from the reviewed assemblages of any significant relationship between species diversity (or the suite of species present) and site period, site type or geographical location (with the possible exception of ritual/religious assemblages, which tend to exhibit low species diversity). The low species diversity apparent in the MBA and MBA-LBA samples reflects the small sample sizes of assemblages from these sub-periods. Presence/absence records for the reviewed assemblages reveal a wide variety of taxa present on sites throughout the region in all major sub-periods (Tables 2.2,2.3 and 2.4), including large and medium sized mammals, birds, small mammals, amphibians, reptiles and fish. Large and medium domestic mammals are by far the most common.

*Table 2.1: List of taxa identified from MBA-LIA assemblages from the southern regional review dataset and number of assemblages where each is present. (*intrusive)*

taxa		no. of assemblages where taxa present	% of assemblages where taxa present
sheep/goat	*Ovis/Capra* sp.	150	100%
cow	*Bos taurus*	149	99%
pig	*Sus scrofa* (domestic)	149	99%
horse	*Equus caballus*	143	95%
dog	*Canis familiaris*	132	88%
red deer	*Cervus elaphus*	105	70%
roe deer	*Capreolus capreolus*	50	33%
fox	*Vulpes vulpes*	45	30%
hare	*Lepus* sp.	32	21%
cat	*Felis* sp.	32	21%
rabbit*	*Oryctolagus cuniculus*	23	15%
badger	*Meles meles*	18	12%
polecat/ferret*	*Mustela putorius*	6	4%
pine marten	*Martes martes*	5	3%
whale/dolphin	Order *Cetacea*	5	3%
beaver	*Castor fiber*	4	3%
otter	*Lutra lutra*	4	3%
wild boar	*Sus scrofa* (wild)	3	2%
fallow deer*	*Dama dama*	3	2%
seal	Family *Phocidae*	2	1%
bird		114	76%
small mammal		88	59%
amphibian		65	43%
fish		31	21%
reptile		1	1%
total no. assemblages		150	

*Table 2.2: Presence (+) and absence of large and medium mammal and other taxa in different periods from reviewed assemblages. (*intrusive)*

		Period												
taxa		MBA	MBA-LBA	LBA	LBA-EIA	EIA	EIA-MIA	MIA	MIA-LIA	LIA	LIA-ERB	BA-IA	IA	IA-RB
sheep/goat	*Ovis/Capra*	+	+	+	+	+	+	+	+	+	+	+	+	+
sheep	*Ovis aries*	+	+	+	+	+	+	+	+	+	+	+	+	+
goat	*Capra hircus*			+	+	+	+	+	+	+	+	+	+	+
cow	*Bos taurus*	+	+	+	+	+	+	+	+	+	+	+	+	+
pig	*Sus scrofa* (domestic)	+	+	+	+	+	+	+	+	+	+	+	+	+
horse	*Equus caballus*	+	+	+	+	+	+	+	+	+	+	+	+	+
dog	*Canis familiaris*	+	+	+	+	+	+	+	+	+	+	+	+	+
red deer	*Cervus elaphus*	+	+	+	+	+	+	+	+	+	+	+	+	+
roe deer	*Capreolus capreolus*	+	+	+	+	+	+	+	+	+	+	+	+	+
fox	*Vulpes vulpes*			+	+	+	+	+	+	+	+	+	+	+
hare	*Lepus sp.*	+		+		+	+	+	+	+	+		+	
cat	*Felis sp.*	+		+	+	+	+	+	+	+	+		+	
rabbit*	*Oryctolagus cuniculus*	+	+	+		+	+	+	+	+	+	+	+	+
badger	*Meles meles*	+	+	+	+	+	+	+	+	+	+	+	+	+
polecat/ferret*	*Mustela putorius*				+	+							+	
pine marten	*Martes martes*	+	+				+			+			+	
cetacean	*Order Cetacea*	+										+	+	+
beaver	*Castor fiber*				+			+		+				
otter	*Lutra lutra*			+			+		+	+				
wild boar	*Sus scrofa* (wild)			+	+					+				
fallow deer*	*Dama dama*					+	+						+	
seal	*Family Phocidae*											+	+	
bird		+	+	+	+	+	+	+	+	+	+	+	+	+
small mammal		+	+	+	+	+	+	+	+	+	+	+	+	
amphibian		+	+	+	+	+	+	+	+	+	+	+	+	+
fish		+		+	+	+	+	+	+	+	+	+	+	+

*Table 2.3: Presence (+) and absence of small mammal taxa in different periods from reviewed assemblages. (*intrusive)*

		Period												
	period	MBA	MBA-LBA	LBA	LBA-EIA	EIA	EIA-MIA	MIA	MIA-LIA	LIA	LIA-ERB	BA-IA	IA	IA-RB
field vole	*Microtus agrestis*	+	+	+	+	+	+	+	+	+	+	+	+	
water vole	*Arvicola terrestris*	+	+	+	+	+	+	+	+	+	+	+	+	
wood (field) mouse	*Apodemus* sp.	+		+	+	+	+	+	+	+	+	+	+	
house mouse	*Mus* sp.	+			+	+	+	+	+	+		+	+	
common shrew	*Sorex araneus*	+			+	+	+	+	+	+	+		+	
mole	*Talpa europaea*	+	+	+			+	+	+	+	+		+	
bank vole	*Cleithronomys glareolus*	+		+	+	+	+	+	+	+			+	
weasel	*Mustela nivalis*		+	+			+	+		+	+		+	
hedgehog	*Erinaceus europaeus*						+	+	+	+	+			
rat*	*Rattus* sp.									+		+	+	
stoat	*Mustela erminea*		+					+	+				+	
pygmy shrew	*Sorex minutus*	+		+	+		+	+						
water shrew	*Neomys fodiens*								+					

Table 2.4: Presence (+) and absence of bird taxa in different periods from reviewed assemblages.
NB. Only the most common species are listed in this table; a full list of all bird species identified from each assemblage is recorded in the database.

	Period												
Taxa (and most common species)*	MBA	MBA-LBA	LBA	LBA-EIA	EIA	EIA-MIA	MIA	MIA-LIA	LIA	LIA-ERB	BA-IA	IA	IA-RB
Domestic fowl (*Gallus gallus*)	+		+		+	+	+	+	+	+	+	+	+
Wildfowl (Family *Anatidae*)	+	+	+	+	+	+	+	+	+	+	+	+	+
mallard/domestic duck			+	+	+	+	+	+	+	+	+	+	
geese	+	+	+	+	+	+	+	+	+	+	+	+	
teal				+	+	+	+			+		+	
wigeon					+	+	+	+	+			+	
Corvids (Family *Corvidae*)	+		+	+	+	+	+	+	+	+	+	+	
raven			+	+	+	+	+	+	+	+	+	+	
rook/crow	+		+		+	+	+	+	+	+		+	
Other/Small Passerines (Order *Passeriformes*)	+	+	+	+	+	+	+	+	+	+	+	+	+
thrushes (*Turdus* sp.)	+		+	+	+	+	+		+	+	+	+	
house sparrow					+		+			+		+	
starling			+			+		+	+	+		+	
Birds of Prey, Falcons and Owls (Families *Accipitridae, Falconidae* and *Strigidae*)			+	+	+	+	+	+	+	+	+	+	+
buzzard			+	+	+	+	+	+	+	+	+	+	+
Wading birds (Families *Scolopacidae* and *Charadriidae*)	+	+		+	+	+	+	+	+	+	+	+	+
woodcock	+			+			+		+	+	+	+	+
golden plover		+			+	+	+	+				+	
Seabirds	+			+	+	+	+	+	+		+	+	+
Gamebirds Families *Tetraonidae* and *Phasianinae*)		+	+			+	+	+			+	+	
Other Birds		+	+	+	+	+	+	+	+	+	+	+	
pigeons/doves (*Columba* sp.)		+	+		+	+		+	+	+		+	
Heron							+	+	+		+	+	
Crane			+	+		+	+	+	+		+	+	

2.1 Large and medium mammals

Domestic Sheep/goat are ubiquitous; they are present in all of the 150 assemblages for which presence/absence data were recorded. Difficulties in distinguishing sheep from goat among fragmented skeletal remains mean that, for most assemblages, remains of these species are grouped together as 'sheep/goat' for the purpose of quantification and interpretation of faunal remains. Nevertheless, differentiation of sheep (*Ovis* sp.) from Goat (*Capra* sp,) is possible on certain skeletal elements, and positive identifications of sheep were recorded from 110 assemblages and goat from 69 assemblages. In the majority of assemblages where sheep and goat were positively identified, sheep were more abundant than goat. Thus most of the reviewed reports conclude that the majority of undifferentiated sheep/goat fragments probably belonged to sheep rather than goat. Based on these observations, this review includes all specifically identified sheep and goat specimens within all counts of sheep/goat remains. The term 'sheep' is taken throughout this review to include sheep, goat and sheep/goat unless clearly stated otherwise.

Remains of cattle were present in all settlement assemblages from the region. Domestic cattle (*Bos taurus*) account for all the contemporary cattle remains identified among the MBA-LIA assemblages reviewed, supporting previous observations (Yalden 1999:105) that aurochs (*Bos primigenius*) were extinct in southern Britain by the Early Bronze Age. At Danebury, two fragments of very large cattle bones from an Iron Age feature were reported as possible aurochs, but their poor state of preservation relative to other bones suggested they were residual finds from the Neolithic (Grant 1984c:513). However, more recently Hammon (forthcoming) has identified possible aurochs of LIA date from the vicinity of Danebury.

Domestic pigs (*Sus scrofa*) were noted as present in 149 assemblages. By far the majority of pig remains reported from LBA-LIA sites across the region are clearly identified as belonging to domestic rather than wild pigs. It is not uncommon among the reviewed faunal reports for authors to make the tentative suggestion that that some of the larger pig remains might be those of wild rather than domestic pigs, e.g. at Ivinghoe Beacon (Westley 1968). However, more confident determinations of the presence of wild boar (*Sus scrofa*) are rare (from only four assemblages). One large tibia probably belonging to wild boar was noted from the LIA assemblage at Farningham Hill (Locker 1984), but the other examples of wild pig are all from earlier, LBA-EIA, assemblages (La Sagesse, Runnymede Bridge, and Potterne). At Runnymede, for example, Done (1980:75) clearly states that the LBA assemblage 'includes both wild and domestic' pigs, but points out the problem of probable size-overlap between large domestic pigs and smaller wild boar. Serjeantson (1996: 219-220) also reports large pig remains from other LBA assemblages at Runnymede but stresses the difficulties in making clear distinctions between skeletal remains of wild boar and large domestic males, particularly where wild and domestic populations may have been inter-breeding.

Horse (*Equus caballus*) and domestic dog (*Canis familiaris*) are also present at the majority of sites reviewed. Cats (*Felis* sp.) are much less common (present in only 21% of assemblages) and probably include both domestic cat (*Felis catus*), usually inferred from the presence of juvenile remains, and wild cat (*Felis sylvestris*) most probably represented by the larger cat remains. Similarly, several reports recognise the possibility that some remains grouped under the label 'dog' may include other canid species such as fox (*Vulpes vulpes*), or possibly even wolf (*Canis lupus*). Fox is seldom present in

large numbers but is nevertheless a fairly common species among the reviewed dataset, having been identified as present in 30% of assemblages. Where both fox and domestic dog are identified as present, dog are generally the predominant species. There is no definite evidence of wolf remains recovered from any of the reviewed MBA-LIA assemblages from the southern region, but a single large canid mandible in the dog assemblage from MBA Walton Lodge may possibly be that of a wolf (Sadler 1991), and at Meare Village East some of the larger canid remains are categorised as dog/wolf (Cornwell and Coles 1987). More recently, a wolf bone dated to the Bronze Age was recovered from Wittenham Clumps in Oxfordshire (Worley 2006).

Red deer (*Cervus elaphus*) is the large wild mammal most commonly present among the reviewed assemblages from the region; 70% of assemblages report some evidence of red deer, while remains of the smaller, roe deer (*Capreolus capreolus*) are less widespread, being present in only 33% of assemblages. Other wild species occur even less frequently among the reviewed assemblages and include hare (*Lepus* sp.), badger (*Meles meles*), pine marten (*Martes martes*) and polecat (*Mustela putorius*). The presence of otter (*Lutra lutra*) and beaver (*Castor fiber*) in a small number of assemblages probably reflects the availability of suitable habitats in freshwater rivers or streams within the locality of these sites.

Marine mammals are only rarely identified among the reviewed assemblages and, except for one fragment of burnt cetacean bone from Maiden Castle, Dorset, were only recovered from sites in close proximity to the coast. Cetacean bone was reported from five assemblages identified in assemblages from five sites, including one bone of a large baleen whale (Family *Balaenopteridae*) from Rope Lake Hole, Dorset, and remains of porpoise (Family *Phocoenidae*) from Nornour, Scilly. The assemblage from Nornour also produced abundant seal remains, including those of grey seal (*Halichoerus grypus*) (Turk 1967), while the small number of seal remains from Bishopstone are probably those of common seal (*Phoca vitulina*).

2.2 Small mammals

Small mammal assemblages can provide some indication of the local environmental conditions on MBA-LIA sites from the region, provided it can be established how the small mammal remains were accumulated and if they can be shown to be contemporary. Rats, moles and most of the other small mammal species identified are burrowers, which means all individuals that died naturally *in situ* are potentially intrusive. However, accumulations of small mammal remains that are demonstrably anthropogenic in origin, were killed by predators, or were accidental pitfall victims are normally considered to be contemporary with the deposits in which they were found. None of the reviewed reports suggest that small mammals were deposited as a result of deliberate human activity, and where the origins of small mammal remains are discussed they are usually concluded to be pitfall victims or deposited by owls or other birds of prey.

Small mammals were regularly identified from hand-recovered assemblages as well as from sieved environmental samples. Sieved assemblages generally produced a greater relative abundance of small mammal remains and sometimes a greater diversity of small mammal species than assemblages that were not sieved, but in terms of simple presence/absence data for small mammal species, sieved and non-sieved assemblages appear broadly similar. Small mammal taxa were identified in 88 of the reviewed

assemblages; not all small mammal remains were identified to species level, some are simply classified as 'small mammal' or in broad taxonomic groups such as 'rodent' (order *Rodentia*), voles (subfamily *Microtinae*) or mice (subfamily *Murinae*). Unlike wood mouse (*Apodemus sylvaticus*), there were no definite identifications of yellow-necked mouse (*Apodemus flavicollis*) within the dataset, and remains identified as *Apodemus* sp may include both species. A list of the small mammal species identified and a count of assemblages in which they were present within the review dataset is provided in Table 2.5. Presence/absence data for small mammal taxa for each sub-period are provided in Table 2.3.

*Table 2.5: List of small mammal taxa identified from MBA-LIA assemblages from the southern regional review dataset and number of assemblages where each is present. (*intrusive)*

Taxa		no. of assemblages where taxa present
field vole	*Microtus agrestis*	57
water vole	*Arvicola terrestris*	44
wood (field) mouse	*Apodemus sylvaticus*	41
house mouse	*Mus musculus*	23
common shrew	*Sorex araneus*	23
mole	*Talpa europaea*	14
bank vole	*Cleithronomys glareolus*	13
weasel	*Mustela nivalis*	12
hedgehog	*Erinaceus europaeus*	6
rat*	*Rattus* sp.	5
stoat	*Mustela erminea*	4
pygmy shrew	*Sorex minutes*	4
water shrew	*Neomys fodiens*	1
small mammal		88

Grassland species such as field voles (*Microtus agrestis*) and water voles (*Arvicola terrestris*) are present in the greatest number of assemblages, indicating that sites were commonly located in the vicinity of open land, which would be consistent with a landscape dominated by open farmland. The presence of house mouse (*Mus musculus*), which first appears during the MBA-EIA in this region, is also consistent with farming activities such as cereal cultivation and grain storage. Wood mouse (*Apodemus sylvaticus*) is also frequently present among the reviewed assemblages, indicating the presence of woodland or scrub at or within reach of these sites. Although relative abundance of small mammal species was not quantified as part of this review, the general impression is consistent with Yalden's (1999: 117) observations for Bronze Age and Iron Age British sites that most assemblages tend to show a greater relative abundance of open grassland species than woodland species.

Careful taphonomic studies of small mammal remains to establish their depositional origins are essential when attempting to interpret environmental information from later prehistoric small mammal assemblages from Britain, since the species represented and their relative abundance may not provide a straightforward indication of the surrounding habitat (Yalden 1999). Pitfall victims are likely to represent smaller, more immediate catchments than many predator deposits. Also, different predators may selectively predate different species; for example Barn Owls and Buzzards tend to hunt in open landscapes whereas Tawny Owls tend to hunt in woodlands and this behaviour is

reflected in the relative abundance of different small mammal species in their pellets (Yalden 1999:118). Thus the relative abundance of open grassland species, such as field vole and water vole reported in many of the reviewed assemblages, may reflect predation habits rather than being representative of the prevailing local environment. The Bronze Age shaft at Wilsford is a good example of a small mammal assemblage where a predominance of woodland small mammal fauna is at odds with other strands of environmental evidence, all of which indicate the shaft was situated in an open landscape exploited for arable and pasture (*ibid*).

2.3 Amphibians and reptiles.

Amphibian bones were reported from 65 assemblages and include the remains of common frog (*Rana temporaria*), common toad (*Bufo bufo*) and unspeciated remains of frog/toad. Only one assemblage produced reptilian bones; remains of grass snake (*Natrix natrix*) were reported from MBA deposits at Brean Down. Frog and toad remains were commonly recovered from the bottom layers of pit fills and where the origin of these deposits have been discussed in reports they have most often been interpreted as pitfall victims or sometimes predator accumulations. There are no suggestions in the reviewed reports of anthropogenic origin for any amphibian and reptile remains.

2.4 Fish.

A count was made of all assemblages where presence of fish was reported. Identifications to species or broader taxonomic grouping were normally noted where such information was available. Fish are poorly represented across the region as a whole, with fish remains present in only 21% of assemblages. Recovery methods influence the likelihood of recovering identifiable fish remains. Fish were present at 39% of sites where sieving was noted as a recovery method; by contrast, where the recovery method was hand collection alone, only 19% of sites yielded fish remains. Although more rigorous environmental sampling and sieving clearly improves their chance of recovery, fish remains were generally scarce, even at sites where sieving had taken place, suggesting there was only very limited exploitation and disposal of fish by people living in the southern region during the MBA-LIA period.

Where fish remains have been recovered from MBA-LIA sites in the region, they are often unidentified beyond, simply, 'fish'. Freshwater fish remains among the reviewed assemblages include those identified as belonging to family *Salmonidae*, such as salmon (*Salmo salar*) and trout (*Salmo trutta*), as well as eel (*Anguilla* sp.), pike (*Esox lucius*) and dace (*Leuciscus leusiscus*). Marine fish reported from the reviewed assemblages include basses (family Serranidae), wrasses (family Labridae), codfishes (family Gadidae), flatfishes (family Pleuronectidae and Bothidae) and conger eels (*Conger* sp.). Most of the different marine species noted from the region come from a single assemblage from the Bronze-Iron Age site at Nornour in the Scilly Isles, which produced: wrasse; conger; possible hake; ling (common); bass (common); pollack; turbot; and plaice (Turk 1967). The MBA and LBA assemblages from Brean Down also produced a variety of marine and freshwater species, including: cod; conger; sturgeon; salmon/trout; and pike. A single shark tooth, possibly blue shark (*Prionace glauca*), was recovered from an Iron Age pit at Tolpuddle Ball, but as Hamilton-Dyer (1999:193) points out, this need not infer shark fishing took place since such loose teeth may be found on beaches within reach of the site, which lies only eight miles inland from the Dorset coast. Where species are noted

in the database it is apparent that inland sites tend only to have freshwater species, e.g. pike, eel, salmonids, while marine species are only present on coastal sites. Exploitation of fish appears to have been limited to those available locally, rather than fish being traded or exchanged over any distance. One possible exception to this pattern among the reviewed assemblages is the report of flounder, which is primarily a marine species, from the inland site of Owslebury (Maltby 1987a). However, flounders are tolerant of freshwater and have been known to migrate considerable distances upstream in rivers (Jenkins 1958: 188), so it is possible that the remains from Owslebury represent a local catch.

2.5 Birds

Within the reviewed dataset a diverse range of bird species have been identified, including domestic poultry and many different classes of wild bird (Table 2.6). Some species, such as domestic fowl, mallard duck and raven, are present in a relatively high proportion of assemblages from across the region, while other species are rare (e.g. hen harrier and tawny owl) and identified from only one or two assemblages (see database assemblage records for full lists of species represented). Bird remains were reported from 76% of assemblages, but in the majority of these assemblages birds make up less than 1% of identified specimens and never contribute more than 5% of the identified faunal sample. Thus birds are frequently present in MBA-LIA archaeological assemblages from the southern region, but seldom in large numbers.

Wildfowl are frequently present (in 45% of assemblages) in relatively small numbers. Large duck and geese remains may include both domestic and wild birds. Remains identified as mallard (*Anas platyrhynchos*) may also belong to domestic ducks. Where remains of greylag (*Anser anser*) were identified to species (e.g. at Pennyland, Winnall Down and Danebury) they are generally taken to be those of domestic geese, although other specimens identified only to the genus *Anser* may belong to wild species (Coy 1984: 529-30). Other wildfowl present in assemblages include several species of smaller duck, such as wigeon (*Anas penelope*) and teal (*Anas crecca*), as well as swan (*Cygnus* sp.).

Corvids are a major presence throughout the dataset. As well as being one of the classes of bird most frequently present (in 35% of assemblages), corvid remains are also the most numerous remains in most of the bird assemblages reviewed. Raven (*Corvus corax*) is particularly well represented in terms of the number of assemblages in which this species occurs and the abundance of bones within those assemblages. Also common are bones of crow (*Corvus corone*) and rook (*Corvus frugilegus*); the remains of these two species can be difficult to differentiate and are commonly grouped together as rook/crow, but both species have been separately identified within the review dataset. Other smaller corvid species, such as jackdaw (*Corvus monedula*) and jay (*Garralus glandarius*) were noted, although less frequently than the larger corvids. Although nowadays ravens are rare, other corvids are still common today on the chalk downlands of southern England, and their frequency in the archaeological record is likely to reflect suitable environmental conditions during the MBA-LIA. Scavengers such as ravens and crows would have been attracted to settlements, where exposed middens and other accessible waste would have provided rich pickings. Also, the availability of grain from storing and processing of crops may have attracted rooks. The high proportion of corvid remains in bird assemblages also reflects the frequency with which corvids, particularly ravens, occur as complete or partial skeletons. Although many may

be accidental accumulations, some corvid remains, have been interpreted as 'special', ritual burials. Serjeantson (1991: 481) argues that the scavenging activities of ravens may have been seen as useful and their presence encouraged on settlements and that ravens may even have been kept as pets. She further argues that the raven was viewed as sacred to the Celtic deity, Lugus, and may therefore have had ritual importance and been regarded as having special status by Iron Age communities (*ibid*).

Table 2.6: List of major bird taxa and the most common species identified from MBA-LIA assemblages from the southern regional review dataset and number of assemblages where each is present.
***NB. Only the most common species are listed in this table; a full list of all bird species identified from each assemblage is recorded in the database.*

Taxa (and most common species)*	no. of assemblages where taxa present	% of assemblages where taxa present
Domestic fowl (*Gallus gallus*)	**47**	**31%**
Wildfowl		
(Family *Anatidae*)	**68**	**45%**
mallard/domestic duck *Anas platyrhynchos*	47	
goose *Anser* sp.	33	
teal *Anas crecca*	12	
wigeon *Anas penelope*	12	
Corvids		
(Family *Corvidae*)	**53**	**35%**
raven *Corvus corax*	36	
rook/crow *Corvus frugilegus/Corvus corone*	27	
Other/Small Passerines		
(Order *Passeriformes*)	**42**	**28%**
thrushes *Turdus* sp.	24	
house sparrow *Passer domesticus*	11	
starling *Sturnus vulgaris*	7	
Birds of Prey		
(Families *Accipitridae, Falconidae* and *Strigidae*)	**33**	**22%**
buzzard *Buteo buteo*	23	
Wading birds		
(Families *Scolopacidae* and *Charadriidae*)	**25**	**17%**
woodcock *Scolopax rusticola*	11	
golden plover *Pluvialis apricaria*	8	
Seabirds		
(Families *Alcidae, Laridae, Phalacrocoracidae, Procellariidae* and *Sulidae*)	**18**	**12%**
Gamebirds		
(Families *Tetraonidae* and *Phasianinae*)	**9**	**6%**
Other Birds	**32**	**21%**
pigeons/doves *Columba* sp.	12	
heron *Ardea* sp.	11	
crane *Grus grus*	10	
Identified Bird	114	76%
Total no. assemblages	150	

Based on the presence of a complete buzzard skeleton at Danebury, Serjeantson (1991:481) suggests that this species may also have had ritual importance akin to that

proposed for raven. Birds of prey are represented in 22% of assemblages by a wide range of species, including kestrel (*Falco tinnunculus*), red kite (*Milvus milvus*) and tawny owl (*Strix aluco*), although buzzard (*Buteo buteo*) is by far the most common predator species. A diverse selection of small passerine species is also represented in the dataset; thrushes (*Turdus* sp.) are particularly frequent and include blackbird (*T. merula*), fieldfare (*T. pilaris*), redwing (*T. iliacus*), mistlethrush (*T. viscivorus*), and songthrush (*T. philomelos*.). Wading birds are most commonly represented by woodcock (*Scolopax rusticola*) and golden plover (*Pluvialis apricaria*). Gamebirds are less common, and most of the records are from Danebury; partridge (*Perdix perdix*) is only reported from two sites other than Danebury (Burderop Down and Dean Bottom) and in both cases the remains are thought to be intrusive (Maltby 1992). Among the reviewed assemblages, black grouse (*Tetrao tetrix*) is recorded only from Danebury and Nornour. More recently, black grouse has also been identified from the later prehistoric period at Ogbourne St Andrew, Wiltshire (Baker *pers. comm.*). Sea birds (mostly gulls) are present both on coastal and inland sites, the coastal assemblages undoubtedly include species that were breeding locally while the inland assemblages mainly include species that were likely to have been wintering inland.

The largest and most diverse bird assemblages tend to be found among the largest faunal samples (e.g. from Danebury), although the site of Nornour, Scilly Isles, also produced a wide variety of different species, mainly seabirds, reflecting a greater emphasis on the exploitation of wild bird and mammal species than seen on mainland sites. Although Danebury produced a wider variety of species than many of the other reviewed assemblages, Coy (1984: 531) argues that the range of species is only a small selection of those that were probably breeding locally, indicating very little exploitation of wild birds. The presence of kittiwake (*Rissa tridactyla*) in several periods at Danebury suggests that some birds may have been brought in from coastal locations a considerable distance away from the site (Coy 1984: 530). However, in most of the reviewed assemblages the birds represented are all species that could have exploited nearby habitats, in some cases seasonally, or occurred as occasional stray migrants. Thus, exploitation of wild birds appears to have been mostly small-scale and local.

Domestic fowl (*Gallus gallus*), also referred to as chicken, are one of the most commonly identified species (present in 31% of assemblages), but are only rarely present in assemblages before the M-LIA period. Chicken bones normally occur in very low numbers, except in assemblages where counts are inflated by the presence of complete fowl skeletons (e.g. at Winklebury and Houghton Down), and in the LIA-ERB votive deposits from the Uley Shrines. These observations are in keeping with those of previous reviews (Maltby 1981a; 1994; 1996), which concluded that domestic fowl were rare during the Iron Age in southern Britain and were only exploited during the latter part of the Iron Age. Other potentially domestic poultry represented in the reviewed assemblages include ducks and geese, although as Maltby (1981a:161) points out there is often no certainty as to whether remains belong to wild, tamed or domesticated individuals. Whether wild or domestic, their frequent presence in assemblages from across the region highlights goose and mallard duck as a widely available resource, although like most other bird species, they are rarely present in large numbers.

It is difficult to evaluate the extent of exploitation of birds for meat since such activities leave little trace in the zooarchaeological record; fowl and other birds require little

butchery and may be easily dismembered without leaving any discernible marks on bones. Coy (1984:530) suggests the prevalence of wing bones in some species from Danebury may have resulted from processing birds for meat and, despite a lack of butchery marks, asserts that during the Iron Age at Danebury, 'fowl, goose, duck, swan and a number of the other birds would have been readily eaten' (*ibid*). By contrast, Maltby (1981a: 161) comments that evidence for the consumption of poultry by Iron Age people in southern England is scarce, and suggests this might be explained by Julius Caesar's claim that the Britons had a taboo on eating chickens and geese. Although not quantified as part of review, the general impression from the dataset supports previous observations that butchered bird bones are not common. Nevertheless, occasional examples of butchered domestic fowl bones are reported e.g. from Owslebury (Maltby 1987a) and Maiden Castle (Armour-Chelu 1991:147). A taboo on the consumption of fowl and goose flesh could well explain the generally low abundance of domestic poultry in later prehistoric assemblages from southern Britain, but occasional butchered remains suggest that any such restrictions may not have applied to the whole region, or to all social strata, or that the practise was not always strictly adhered to.

Wild and domestic species could have been exploited for resources other than meat, such as eggs or feathers (Maltby 1981a: 161; Coy 1984: 530; Serjeantson 1991: 481) and certain birds may have been of ritual importance (Serjeantson 1991: 481). Butchery marks have been observed on wild species such as ducks, suggesting they were exploited for food. Other evidence of cut marks on wild birds is more ambiguous; corvids are not classed as 'edible species' in the Danebury assemblage, but some of the raven bones bore cut marks (Coy 1984). It is possible that some cut marks may result from processing of wild bird carcasses for other purposes other than consumption. For example, cut and saw marks on a crane tarsometatarsus from Battlesbury Bowl were interpreted as bone-working activity, having been found in association with other worked antler and mammal bone fragments (Hambleton and Maltby unpub.). On the whole, however, there is little evidence to suggest that wild or domestic birds were extensively exploited or that they made any significant contribution to the diet or economy of later prehistoric communities in southern England. Despite substantial variation in the quantity and diversity of bird bone assemblages, there are no major trends relating the range of species or relative abundance of bird remains in assemblages to cultural factors such as site type. Furthermore, there is only one obvious chronological trend among the reviewed bird assemblages, which is the increase in the occurrence of domestic fowl in the later Iron Age period.

2.6 Intrusive species

Several examples of species present in the reviewed MBA-LIA assemblages from the southern region are not contemporary and are later intrusions into earlier archaeological deposits caused by subsequent disturbance (often by the animals themselves). Several burrowing species have the potential to be intrusive and cause problems by intruding into earlier deposits themselves, but also their burrowing action disturbs the stratigraphic sequence of archaeological deposits, mixing layers of different date and drawing later material down into earlier contexts. For example, the disturbance of stratigraphy caused by rabbit activity at Brean Down calls into question the provenance the house mouse remains among MBA deposits (Levitan 1990), which if contemporary would represent the earliest known find of house mouse in Britain. Similarly, the remains of domestic fowl (predominantly a Later Iron Age introduction to the region) present in the LBA assemblage from Brean Down are interpreted as

intrusive, due to disturbance of archaeological layers by burrowing rabbits (*ibid*).

Rabbits are the main example of an intrusive species that was not present in the region during the MBA-LIA period. The accepted understanding is that rabbits were introduced to Britain during the Norman period (Yalden 1999), thus earlier finds are generally considered intrusive. Certainly, from the 23 assemblages where rabbit remains were present, for 19 assemblages the reports concluded that rabbit remains were probably intrusive due to their burrowing activities, and several reports omit rabbit remains from NISP counts. No mention is made of the provenance of the rabbit remains for the remaining four assemblages, but there is no evidence from any of the reviewed reports to suggest that any rabbit remains reported from MBA-LIA assemblages were contemporary. A similar situation is seen with remains of rat, which were also post-Iron Age introductions to Britain, in the case of Black rat (*Rattus rattus*) during the Roman period and Brown rat (*Rattus norvegicus*) in the 18th Century (*ibid*). Rat remains were present in five of the reviewed assemblages and reports clearly identify rat remains as intrusive for three of these assemblages. Reports on the other two assemblages fail to discuss the provenance of the remains, and certainly offer no evidence to suggest the remains were contemporary with prehistoric deposits.

It is commonly held that fallow deer were absent from Britain since the start of the post-glacial period until limited attempts at reintroduction during the Roman period and the subsequent more successful Norman reintroduction (Grant 1981, Yalden 1999, Sykes 2004). Fallow deer remains are reported from only three assemblages and although not burrowing intruders like the species discussed above, their provenance is doubtful in all three cases. Both of the faunal assemblages from Torberry hillfort, are reported as being made up predominantly of material from the Iron Age occupation of the site but with the likelihood that some material from later medieval activity at the site may also be included (Higgs 1976), which most probably accounts for the presence of fallow deer in both assemblages. At Meare Village East, the identification of fallow deer remains is highlighted as questionable by the authors (Cornwall and Coles 1987). Sykes' (2004) review of fallow deer in the British faunal record also reported only intrusive fallow deer remains or shed antler from southern Iron Age sites. Thus there is no evidence to suggest that fallow deer were present in the region during the later prehistoric period, since all reports are of potentially later intrusions, misidentified specimens, or antler (which could have been imported).

Often rather more ambiguous and difficult to interpret are the remains of native species, particularly burrowing species, which have the potential to be either contemporary deposits or later intrusions. For example, moles were considered as probably intrusive in ten of the fourteen assemblages where this species was present. Hare remains among the reviewed later prehistoric assemblage are normally considered to contemporary, but at Carne's Seat the remains of at least thirteen adult and juvenile hares from deposits adjacent to the ploughsoil, possibly from an old burrow, were interpreted as intrusive (Beech 1986: 47). At Stokeleigh Camp the hare remains, along with rabbit and mole, are also thought to be intrusive (Everton 1975). The few examples of polecat may or may not be considered intrusive, but in its domesticated form (ferret) it is recognised as a later intrusion at Danebury (Grant 1984c) and Brighton Hill South (Maltby 1995b). Other small mustelids, rodents, fox, and even birds have also been interpreted as probable intrusions in some of the reviewed assemblages, but generally the remains of native species are assumed to be contemporary and their

provenance of is seldom called into question unless there is clear evidence of disturbance in the stratigraphy.

2.7 Iron Age introductions

Several species that are now well established members of the British wild and domestic fauna appear to have been introduced during the Later Bronze Age and Iron Age period. Among the mammalian species introduced to Britain from the late Mesolithic to Roman period, Yalden (1999: 122-8) highlights house mouse (*Mus musculus*) and domestic cat (*Felis catus*.) as Late Bronze Age and Iron Age introductions, as well as speculating that brown hare (*Lepus europaeus*) may also have been introduced, or at least re-established itself, sometime after the Neolithic and by the Iron Age. The Iron Age also sees the introduction of domestic fowl (*Gallus gallus*) and the first records of house sparrow (*Passer domesticus*) in Britain.

Domestic fowl (chicken) remains are by no means numerous or widespread throughout the reviewed assemblages, and among many sites yielding large Iron Age faunal assemblages, such as Danebury and Ashville, there is a distinct absence of domestic fowl remains until the later periods (Coy 1984, Serjeantson 1991, Wilson *et al* 1978). This supports previous observations that permanent introduction and exploitation of domestic fowl did not take place until the latter part of the Iron Age in the southern region (Maltby 1994: 10), coinciding with a period of increasing continental influence during the Late Iron Age (Maltby 1996: 24). Where assemblages have been assigned to sub-periods within the review database, it is clear that domestic fowl are far more common among later Iron Age assemblages (domestic fowl occur in 62% of LIA-ERB assemblages where birds are present), than in earlier assemblages (domestic fowl occur in fewer than 25% of M-LBA, E-MIA and M-LIA assemblages where birds are present). Evidence for domestic fowl remains dated to before the LIA is extremely rare; almost all examples of domestic fowl remains from earlier assemblages included in the review database either lack a clear confirmation of precise date (e.g. at Winklebury), or are reported to be intrusive (e.g. at Walton Lodge), from disturbed contexts (e.g. at Brean Down), or from securely dated LIA contexts included within a broader assemblage made up of predominantly earlier material (e.g. at Micheldever Wood).

Not all early examples of domestic fowl are of questionable provenance, however. The recent, unpublished CTRL excavations at White Horse Stone produced domestic fowl remains firmly dated to the early Iron Age (Carbon 14 date: 2429±55BP) (Worley *pers. comm.*). From the regional review dataset, the 'special' deposit of two complete domestic fowl, one cock and one hen, and the possible remains of a chick, found together in pit at Houghton Down would also seem to confirm the presence of domestic fowl in the region during the Early Iron Age (Hamilton 2000f: 139). Arguably, though, it could have been the rarity of this species in the region at the time that afforded these individuals a particular significance and 'special' deposition.

Among the very small bird remains there often difficulties identifying bones to species and the presence of non-specific 'sparrow' remains are noted at LBA-EIA Potterne and MBA-LBA Poundbury. Specific reports of house sparrow are restricted to 11 assemblages of IA date from the southern region, thus the evidence from the reviewed assemblages suggests that house sparrow were not introduced prior to the Early Iron Age. House sparrows are commensal, exploiting mainly agricultural landscapes and feeding on cereals (Ericson *et al.* 1997: 183). It has been suggested that in some parts of

northern Europe the arrival of house sparrow coincided with the introduction of domestic fowl (Løppenthin 1967, cited in Ericson *et al.* 1997), although the evidence from the southern region suggests this is unlikely to have been the case in Britain, since house sparrow remains were present in advance of domestic fowl at sites such as Danebury where they are reported from EIA and MIA assemblages as well the LIA (Coy 1984).

The house mouse (*Mus musculus*), another commensal species associated with human agricultural activity, particularly grain storage, also appears for the first time in the British archaeological record during the period under review. House mouse remains are not especially abundant among the reviewed assemblages and were recorded as present in only 24 assemblages of MBA to LIA date from 14 sites. House mouse remains are most commonly recovered from the Wessex counties of Hampshire, Wiltshire and Dorset from major sites yielding large, well preserved faunal assemblages where some sieving has been undertaken, for example Danebury, Potterne and Battlesbury Bowl. Evidence of house mouse among the reviewed assemblages indicates that this species was well established in the region by the Middle Iron Age. The recovery of a house mouse skeleton from Brean Down has raised the possibility of a Bronze Age date for the introduction of *Mus* into Britain, but unfortunately the disturbed stratigraphy at the site means that the specimen is potentially a more recent intrusion (Levitan 1990; Yalden 1999: 124). Nevertheless, early examples of house mouse from the LBA-EIA at Potterne (Locker 2000) and EIA at Danebury (Grant 1984c) and Old Down Farm (Maltby 1981b) suggest that house mouse may have been introduced before the end of the Late Bronze Age.

Although the European wild cat (*Felis sylvestris*) is native to Britain, it is generally thought that rather than being locally domesticated from native wild cat populations, domestic cats were introduced to Britain during the Iron Age Yalden (1999: 125), perhaps hot on the heels of the house mouse! Domestic cats were first domesticated from the African and Near Eastern strain of wild cat (sub-species *Felis sylvestris lybica*) in north Africa or western Asia (Yalden *ibid*) or the Near East (Driscoll *et al.* 2007). Yalden (*ibid*) summarises the origin of domestic cat in Britain thus: after the initial domestication of the African and Near Eastern wild form, domestic cats were subsequently introduced throughout Europe, first arriving in Britain during the Iron Age, persisting through the Romano-British period and becoming abundant during the Medieval period. The juvenile specimens from the MIA phase at Gussage all Saints (Harcourt 1979) are commonly cited as the earliest examples of domestic cat in Britain. Subsequent reports from EIA-MIA assemblages at Danebury (Grant 1984c) and Houghton Down (Hamilton 2000f) provide examples of domestic cat remains of similar, or possibly slightly earlier, date to those from Gussage. Among the reviewed sites where cat remains are present, the earlier Bronze Age or Early Iron Age assemblages report only wild cat, but from the Middle Iron Age onwards cat is listed among the domestic species for the majority of assemblages.

Identification and differentiation of the skeletal remains of wild cat and domestic cat is not always straightforward. Certain elements may be distinguished based on morphometric criteria (e,g, Kratochvil 1973, cited in Locker 2000) but these are not always easily applied to archaeological cat remains, which are often incomplete or immature. Most recently, biometric work by O'Connor (2007) indicates that wild cats and house cats may be distinguished using the log-ratio technique. However, most

identifications of wild cat among the reviewed assemblages are based on general observations of large size of bones and teeth, but reports seldom cite which, if any, specific morphometric criteria were used. Very few identifications of domestic cat among the reviewed assemblages are based on their size; rather their domestic status is inferred by the presence of juvenile remains, following Harcourt's (1979:154) argument that most wild cats killed and brought on to settlements would belong to adults, while the predominance of juvenile, especially neonatal, cat remains at Gussage all Saints implied cats bred and raised on the settlement, i.e. a domestic population. Several reports stretch this argument a little further, taking merely the presence (rather than the predominance) of juveniles to infer a domestic cat population. Other assemblage reports list cat among the domestic species but fail to indicate upon what basis the differentiation between wild and domestic was made.

Despite a general acceptance in the zooarchaeological literature (e.g. Yalden 1999) that domestic cats were introduced to Britain during the Iron Age, it is apparent from the reviewed assemblages from the southern region that in fact the evidence relating to the Iron Age introduction of domestic cats remains rather ambiguous. Even where inferred identifications of domestic cat are accepted, without clear evidence that the remains derive from introduced, non-native cats during this period, there still remains the possibility that the earliest examples of 'domestic' commensal house cats may have derived locally from the indigenous British wild cat population, even though introduced domestic populations subsequently prevailed. O'Connor (2007) puts forward a strong argument that the genetic boundary is too blurred to confidently argue for separate and distinct 'domestic' and 'wild' species due to the likelihood of hybrid forms wherever and whenever wildcat and house cat were present in the same geographical range. Further research is clearly required, and it is possible that stable isotope, trace element and genetic analyses of cat remains from Iron Age Britain may have the potential to provide more concrete evidence concerning the origins of British house cats in the Iron Age and subsequent periods.

3. HUMAN EXPLOITATION OF WILD ANIMALS

Within the reviewed dataset there is little evidence that the extent of exploitation of wild species is related to particular types of site or geographical areas within the region, although the location of sites close to particular habitats will have influenced which wild species were locally available for exploitation or accidental inclusion in archaeological deposits. For instance, in addition to the more common terrestrial mammal species such as red and roe deer, assemblages from coastal sites tend to have a rather different wild fauna to inland sites, characterised by the presence of seabirds, marine fish and sea mammals. Wild species have some potential as environmental indicators and the presence of red and roe deer remains have provided an indication of the availability of woodland throughout the region, while certain small mammal species such as field vole and water vole are good indicators of grassland. However, the level of detailed environmental information provided by the presence and relative abundance of wild species is often limited because the catchments reflected vary considerably, depending on the behaviour of the species themselves, taphonomic factors such as natural predator activity, and human actions influencing composition of assemblages. The reviewed reports indicate that the wild bird species in particular are useful indicators of local habitats, although interpretations tend to rely on current and historical knowledge of migratory behaviour and habitat preferences and one must be alert to the possibility that for certain species these may have been different during the Iron Age.

As well as providing evidence of the local environment around settlements, the presence of wide range of wild species (including large, medium and small mammals, birds, and even fish) points to the availability of a range of wild resources across the region. The extent to which these potential resources were utilised by local communities is difficult to determine since it is often hard to differentiate between the remains of animals that died naturally and were accidentally incorporated into archaeological deposits and those that were deliberately killed and exploited by humans. Nevertheless, the relative abundance of wild species remains within faunal assemblages may provide some indication of the level of exploitation and their economic importance compared to domestic species. The following section aims to explore the importance of wild resources by examining the relative abundance of wild and domestic mammal species in the reviewed assemblages. In addition, different types of wild mammal, bird and fish resources available to later prehistoric communities across the southern region are highlighted and evidence for their exploitation discussed.

3.1 Relative abundance of wild and domestic mammals

It was possible to calculate the percentage contribution of wild and domestic species to the mammal NISP counts from 139 of the reviewed assemblages (Figure 3.1). Wild mammals are commonly present; only 12% of assemblages had no wild mammal remains. Where present however, they are seldom recorded in large quantities. Domestic mammal remains predominate throughout, and wild species contribute less that 5% of the identified mammal remains in121 (87%) of these assemblages. Wild species represent more than 10% of the identified mammal count in as few as 10 (7%) assemblages, none of which provide any indication that wild species may have represented a significant economic contribution.

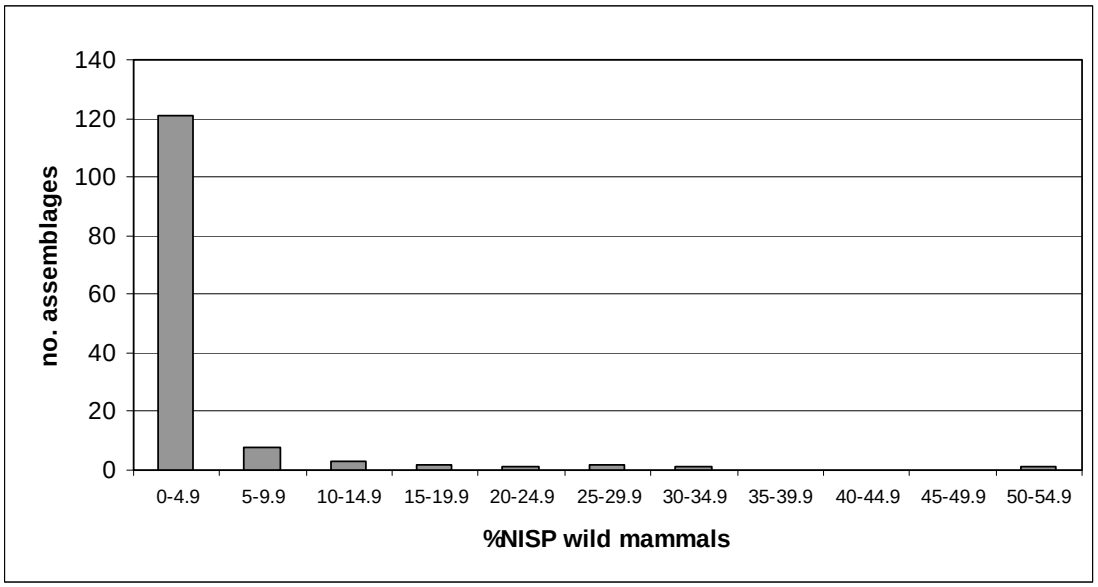

Figure 3.1: Graph showing the relative abundance of wild species in NISP counts of mammal species in assemblages from MBA-LIA southern Britain. (n=139).

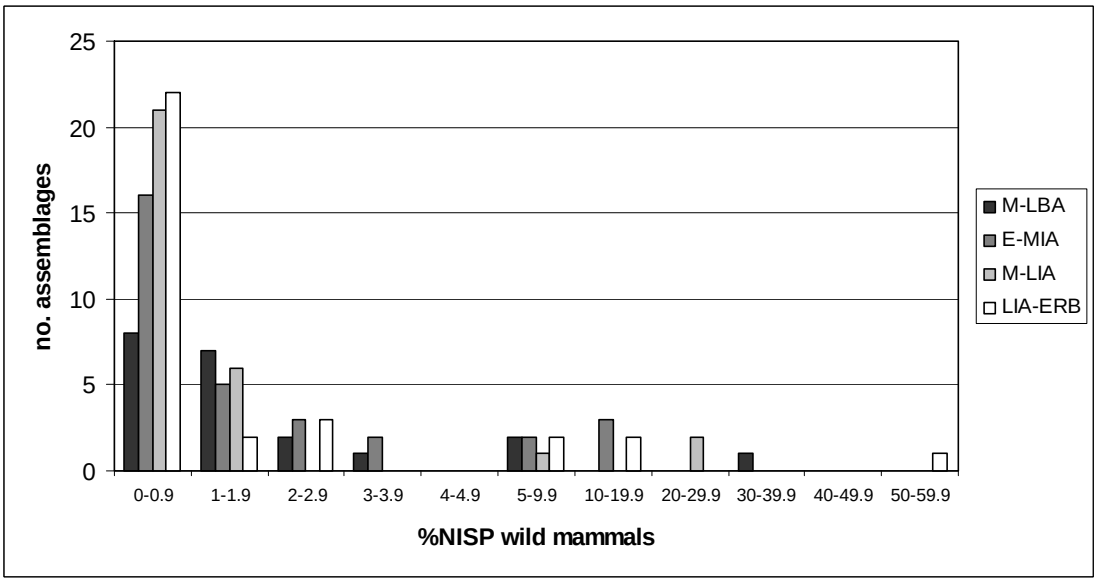

Figure 3.2: Graph showing the relative abundance of wild species in NISP counts of mammal species in assemblages from southern Britain, grouped by date. (n=114).

In these assemblages the abundance of wild species is invariably over-represented by the NISP counts, usually due to the inclusion of small mammal remains. Often whole or partial small mammal skeletons are present, and on rare occasions the NISP counts may include sieved material, which tends to include a high proportion of small mammal remains and, potentially, fish and bird, thus inflating the number of wild species relative to hand-recovered assemblages. In small assemblages particularly, the inclusion of skeletons and ABGs of any wild species in NISP counts can have a dramatic effect on the apparent abundance of wild species; e.g. at Carne's Seat, wild species make up over 50% of the NISP count, but if the group of multiple hare skeletons had been excluded from the NISP count, the wild species component in the assemblage would have been zero. Furthermore, in several cases the skeletons inflating the numbers of wild species

are intrusive (e.g. rabbits at Brighton Hill South, and hares at Carne's Seat) and not even contemporary with the rest of the identified mammal assemblage. Of the numerous small mammal remains included among many counts of wild mammals, none are of anthropogenic origin and people clearly did not exploit them as a wild resource. It must be concluded therefore that the extant faunal dataset from southern England indicates that during the M/LBA-LIA, wild mammals were not commonly exploited and certainly not disposed of in significant quantities.

Further analysis of the distribution of assemblages with low abundance (1-5%) and extremely low abundance (<1%) of wild species in mammal NISP counts does reveal differences between period groups, which possibly reflect a gradual decrease in the level of wild species exploitation through time (Figure 3.2). In the M-LBA group, relatively few assemblages (only 38%) display extremely low wild mammal abundance, while rather more of the M-LBA assemblages have wild mammal NISP values of between 1-5%. In the subsequent E-MIA group extremely low wild mammal abundance is much more common (in 52% of assemblages), and an even greater majority (69-70%) of M-LIA and LIA-ERB assemblages have extremely low abundances of wild mammals. This pattern could suggest that the hunting and exploitation of wild mammals by people was more common during the Bronze Age and Early Iron Age than in subsequent Iron Age periods. Serjeantson (unpub) concluded that although domestic species dominate zooarchaeological record, wild mammals such as Red deer were regularly hunted during the Late Neolithic and Early Bronze Age in the southern region. By the later part of the Iron Age, however, hunting of deer and exploitation of other wild mammals appear to have become much less common pursuits. This is not to say that wild species had no significance in Iron Age society, but their archaeological presence is minimal and certainly their level of exploitation and economic importance appears negligible relative to domestic species.

3.2 Exploitation of wild resources

The presence of wild mammal bird and fish species identified in the reviewed assemblages demonstrates the availability of wild resources across the region, even if such resources were not extensively exploited. Probably the most obvious potential use of wild species is as a source of food with which to supplement the domestic component of the diet. The extremely low incidences of fish remains among the reviewed assemblages provide little evidence of fishing, even at coastal sites. Recovery strategy may influence the relative abundance of small bones taxa such as fish, small mammals and birds. Sieving increases the chances of recovering such taxa, although throughout the review dataset, fish, small mammals and wild birds tend to be scarce even at sites where sieving was undertaken. The only site from the region where there is any evidence for and emphasis on the exploitation of coastal resources is Nornour, Scilly Isles, where the high proportion of seal remains reported in the faunal assemblage represent a significant food resource (Turk 1967). It is possible that some of the wild bird species reported from the reviewed assemblages may have been caught for food, perhaps by netting (Serjeantson 1991: 480), but reports of butchery marks on wild bird bones are rare, and without them it is difficult to demonstrate that birds were eaten. Reports on the bird remains from Danebury state that there was 'no deliberate and large scale exploitation of the edible birds from the neighbourhood' (Coy 1984: 531; Serjeantson 1991:481), and similar conclusions were reached for most other assemblages from the region.

Despite deer bones being present in only low numbers in the majority of assemblages, occasional observations of butchery marks indicate they were exploited for their meat. For example, a red deer femur from 1st century BC deposits at Owslebury bore knife cuts on the proximal end consistent with disarticulation from the pelvis (Maltby 1987a), while Bronze Age and Iron Age assemblages from Poundbury included butchered bones of both red and roe deer, and a group of articulated thoracic and lumbar vertebrae of red deer from Poundbury may also represent evidence of carcass-processing for meat (Buckland-Wright 1987). The occurrence of parts of the trunk and upper limb bones might suggest that whole carcasses of hunted deer may have been processed at these settlements. This is not the case at all sites, however; the red deer bones in one of the LBA assemblages from Runnymede Bridge comprise mainly distal limb bones, which suggests deer may have been butchered at the kill site and meat subsequently transported to the settlement off the bone along with hides still attached to the lower limb bones (Done 1991). Such differences may reflect variations in cultural practices, the individual preferences of the hunters, or the distances and terrain over which the deer had to be transported from the kill site.

The relative abundance of red deer remains in the LBA assemblage from Sandy Lane is reported as being unusually high for the later prehistoric period in southern Britain (Maltby 2001a), but even though post-cranial remains of red deer are well represented, a large proportion of the red deer assemblage is antler fragments. Antler fragments make up the bulk of red deer remains in many assemblages. For example, at Ashville the only deer remains present in the faunal assemblage were fragments of red deer antler (Wilson *et al* 1978). Antler itself was an important resource as a raw material for making tools and other artefacts. Since antlers are shed annually they could have been gathered and brought to settlements to be worked; the presence of antler at sites therefore need not reflect hunting of deer. A further implication is that antler need not necessarily have been locally collected and artefacts and raw materials could have been transported or traded over distances, although the presence of post-cranial deer remains in assemblages probably indicate where local populations of red deer were available as a sources of antlers. Grant (1981) points out that collecting antler was probably a seasonal activity taking place around the time of year that antler were shed, which in the case of red deer is during March and April.

Red deer antler is generally thought preferable to roe deer antler as a raw material (Riddler 2003:41), and certainly where the presence of worked-antler off-cuts are noted in the reviewed bone reports they almost always belong to red deer rather than roe deer. Two fragments of roe deer antler with signs of working were reported from Battlesbury Bowl, but these are outnumbered by chopped and sawn fragments of red deer antler at the same site (Hambleton and Maltby unpub.). The most common evidence for the exploitation of red deer during the MBA-LIA in the southern region is in the form of antler artefacts, such as 'weaving combs', and worked antler off-cuts. At Danebury, 22% of all bone/antler small finds were constructed from antler (Grant 1991: 532), which is in stark contrast to the un-worked faunal assemblages from the site where deer bones contribute less than 0.5% of identified remains. The frequency of such finds would suggest antler should be considered a more important, and certainly more frequently exploited resource than venison.

It is likely that some mammals may also have been hunted for their hide or fur (Fairnell 2003). There is some direct evidence from the reviewed reports for the processing of

wild mammals for their pelts; for example, badger remains from the LBA assemblage at Runnymede Bridge show signs of having been skinned (Serjeantson 1996). However, for most of the reviewed assemblages hunting of wild mammals (other than deer) for furs or meat can only be inferred by the occasional presence of species such as badger, fox, beaver and otter, since skinning or other butchery marks on the remains of these wild mammals are rare. The feathers of wild birds may have been used, along with those domestic fowl and geese, but such activities remain invisible in the zooarchaeological record.

Also difficult to investigate zooarchaeologically is the non-economic value that may have been placed on wild species. Chaplin and Coy (1964) suggested one possible non-economic role, speculating that the immature beaver remains found in the LIA assemblage from The Rumps may have belonged to a young animal kept as a pet. However tenuous such suggestions, it is important to remember that in addition to their economic importance, many wild species may have had further, perhaps even greater, symbolic value to later prehistoric communities as the embodiment of virtues, markers of wealth, power and social status, links to cults and deities, or as totemic symbols. It may be that it was not particular species that were of special importance, rather it was the interaction with wild animals outside the domestic sphere that was of social value and activities such as hunting may have been associated with significant rites of passage. These issues are raised in several of the reviewed reports; for example, Serjeantson (1991:481) discusses the sacred and magical status of raven in Celtic religion and folklore with reference to the relative abundance of remains of this species and their apparent ritual deposition during the Iron Age period at Danebury. Such influences may also account for the apparent lack of exploitation of certain species; for example, Julius Ceasar's claim that the Britons had a taboo on eating the flesh of hare and fowl is discussed by Powell (1999) in relation to the hare remains from the LIA assemblage at Middle Duntisbourne.

There is clear evidence from the reviewed assemblages that wild species were exploited in the region during the MBA-LIA, although, compared to domestic species, they played only a relatively minor, albeit potentially significant, role in people's diet, economy, and daily life. The only notable exception is at Nornour where the greater emphasis on exploitation of wild resources is almost certainly a result of the limited agricultural potential of its island location (Maltby 1996:24). Conditions for agriculture were much more favourable at the other reviewed sites from the region, and this is reflected in the composition of the faunal assemblages, which are dominated by domestic mammal remains. Thus the remaining sections of the review will focus on the exploitation and deposition of domestic mammals by later prehistoric communities in southern Britain.

4. HUMAN EXPLOITATION OF DOMESTIC MAMMALS

Domestic species were the mainstay of the pastoral economy across the southern region throughout the Middle Bronze Age to Late Iron Age period. Sheep/goat, cattle, pig, horse and dog are found in the majority of reviewed assemblages, and their exploitation was clearly an established feature of Bronze Age and Iron Age daily life across the southern region. By contrast, domestic cats do not appear to have had the same widespread importance. Although introduced during this period, domestic cat remains occur infrequently among the reviewed assemblages, and in low numbers (cf. section 2.1). Consequently, this review will focus on the evidence for human exploitation of only the five main domestic mammals (sheep, cattle, pig, horse and dog). The different contributions of these species to the agricultural economies of the time, and the nature of domestic animal husbandry and exploitation strategies are considered in the following section.

4.1 Relative abundance of domestic species

This review includes assemblages from a broad geographical area, encompassing a range of soil types and topographical locations, as well as a wide temporal coverage and a variety of site types. Previous studies have demonstrated that many of these inter-site, and also intra-site, variables have some relationship to relative species abundance at sites (Grant 1984a; Hambleton 1999; Maltby 1981a; 1994 and 1996). This section aims to investigate patterns of relative abundance of domestic species within the review dataset relative to several potentially influential variables.

4.1.1 Methods of quantification

The two main types of quantitative data available from faunal reports for use in investigating the relative abundance of domestic species are NISP (Number of Identified Specimens) and MNI (Minimum Number of Individuals). Both MNI and NISP data for the five most common domestic species were available from 52 assemblages, whereas a far greater sample (140 assemblages) provided NISP counts for these species. NISP counts therefore contribute the largest possible sample on which to base discussions of species relative abundance.

In this review, discussions of relative abundance of domestic species utilise NISP data for comparison in two main forms:

1) Relative percentages of NISP, either for all five common domesticates (cattle, sheep, pig, horse and dog) or for the three main domesticates (cattle, sheep and pig).
2) Rank order of the five common domesticates based on NISP.

4.1.2 Patterns of relative abundance of domestic species

The overall pattern of species abundance evident in this review is the same as in previous reviews of Iron Age animal exploitation (Hambleton 1999, Maltby 1981a, 1994 and 1996). NISP counts for cattle, sheep, pig, horse and dog show clearly that the remains of sheep and cattle dominate most faunal assemblages. This is likely to reflect the relative abundance and, to some degree, economic importance of these two species throughout the southern region during the period under review. The larger size of cattle means that they would have contributed the most meat, even where cattle remains are substantially outnumbered by sheep, although lamb and mutton would

clearly also have been a major feature of the meat diet. Pigs are present in the majority of assemblages and normally contribute a much smaller proportion of the remains than sheep or cattle. Horse and dog are generally the least abundant among the quantified domestic species.

Table 4.1: Frequency of assemblages with high, moderate or low relative abundance of cattle, sheep and pig*

Cattle relative abundance:	**high**	**moderate**	**low**
No. of assemblages	31	67	47
% of assemblages n=145	21%	46%	32%
Sheep/goat relative abundance:	**high**	**moderate**	**low**
No. of assemblages	79	41	25
% of assemblages n=145	54%	28%	17%
Pig relative abundance	**high**	**moderate**	**low**
No. of assemblages	1	10	134
% of assemblages n=145	1%	7%	92%

*Relative abundance values:
High: NISP >50%
Medium: NISP 30%-50%
Low: NISP <30%

An impression of the relative abundance of the three main domesticates may be obtained by comparing NISP for cattle, sheep and pig (available for 145 assemblages). Table 4.1 shows the number of assemblages with high (>50% of main domestic species NISP), moderate (between 30-50% of main domestic species NISP), or low (<30% of main domestic species NISP) percentages of cattle, sheep or pig. High percentages of sheep occur in well over half (54%) of all assemblages, while far fewer assemblages (only 17%) have very low percentages of sheep. By contrast, cattle tend to be less abundant than sheep, with relatively few assemblages showing high percentages of cattle. More commonly, assemblages have only moderate abundance of cattle. Low percentage of pig is a feature of almost all assemblages, with only a handful of sites having moderate or high pig abundance. At only one of the sites reviewed (Ower, in Dorset) did pig remains make up >50% of the main domestic species assemblage. Sheep are only ranked third after cattle and pig in a handful of assemblages (5%), including the coastal sites of Mount Batten and Hengistbury Head, and the two adjacent LIA sites of Middle Duntisbourne and Duntisbourne Grove in Gloucestershire. This emphasis on sheep contrasts with that seen in Serjeantson's (unpub.) study of Neolithic and Early Bronze Age assemblages, where more than half of all sites displayed high percentages of cattle, and pig were also abundant, particularly during the late Neolithic.

4.1.2.1 Intra-regional variation: Chronological

A declining trend in the relative abundance of cattle in favour of sheep from Bronze Age to Iron Age does seem to be apparent within this review dataset. The proportion of assemblages with high percentages of cattle is greater among the earlier assemblage group (MBA-EIA), than in E-MIA group, and declines yet further in the M-LIA group. The proportion of assemblages with high percentages of cattle remains low in the very latest group of assemblages (LIA-RB).

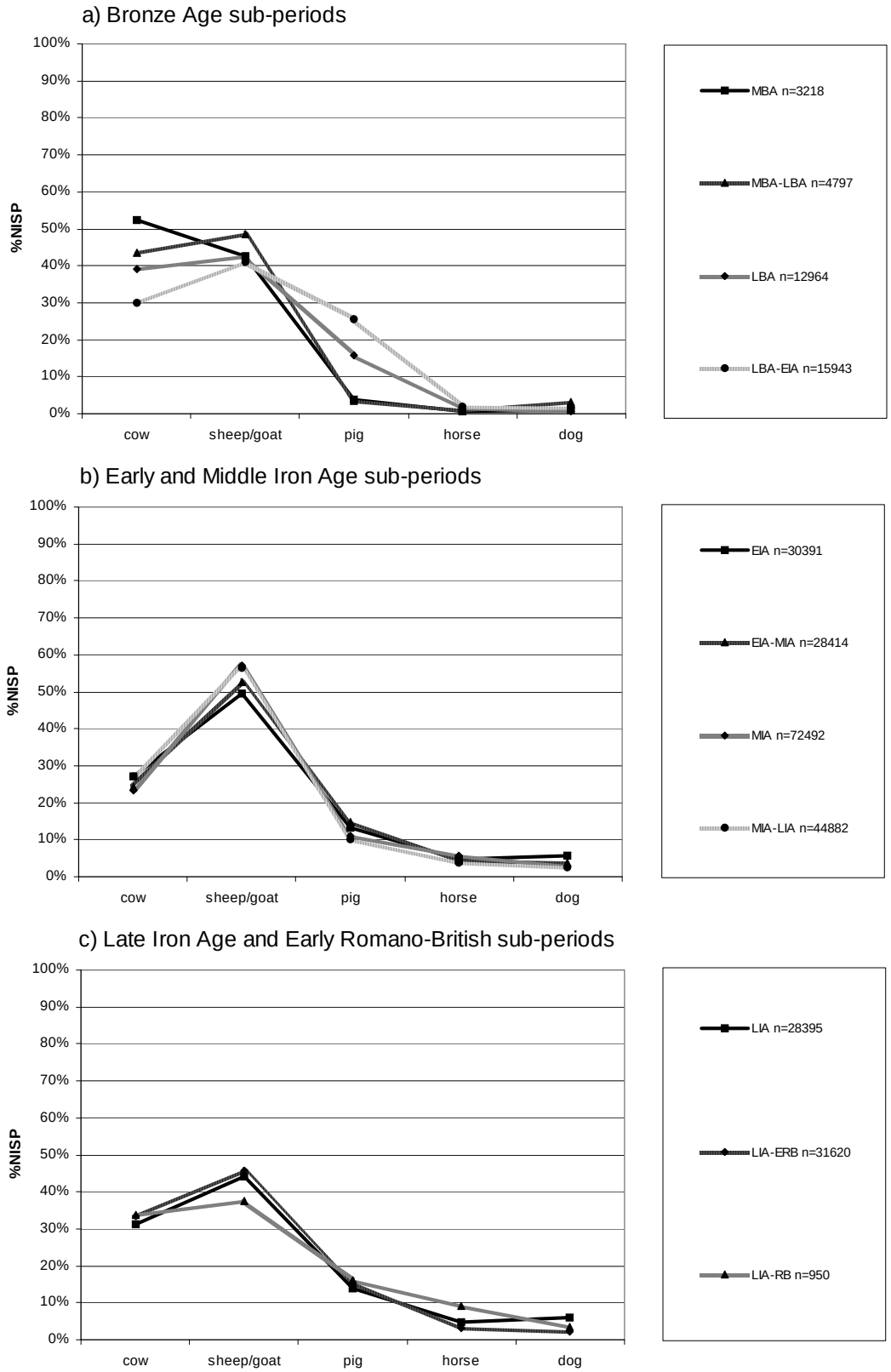

Figure 4.1: Relative abundance of main domesticates in different sub-periods

Comparison of the total NISP counts for each sub-period for cattle, sheep, pig, horse and dog (Figure 4.1) suggests a gradual decline over time of cattle in favour of sheep throughout the first millennium BC, with some increase in the abundance of cattle and also pig relative to sheep in the late pre-Roman Iron Age. Pig remains are relatively poorly represented overall, contributing between 4% and 16% of domestic species NISP in most periods. The one apparent exception to this is in the LBA-EIA, where pig bones make up 25% of the overall assemblage. In fact, the majority of assemblages from the LBA-EIA period all show the much lower percentages of pig seen in other periods. However, the abundance of pig in the LBA-EIA sample is heavily influenced by the abundance of pig at one site. This assemblage, from Potterne (NISP main domesticates = 11536), is by far the largest from the period and dominates the overall NISP counts, consequently masking the more common 'low pig' pattern seen in smaller assemblages from sites such as La Sagesse and Eldon's Seat.

When comparing assemblages of different phases from within the same site for several different sites from Iron Age Wessex, Maltby (1996:21) concluded that there was no consistent chronological development evident in the patterns of domestic species abundance. Certainly the picture becomes less clear upon examining the review dataset in more detail. All of the amalgamated NISP counts mask considerable variability in relative abundance of species between individual assemblages within each sub-period group. Also, as seen with Potterne for the LBA-EIA, very large assemblages may strongly influence the appearance of amalgamated NISP counts. Chronological variation in domestic species abundance within more recently analysed assemblages from sites such as Battlesbury Bowl (Hambleton and Maltby unpub.) and Cadbury Castle (Hamilton-Dyer and Maltby 2000) also fails to show any clear pattern developing through the Iron Age, and any variations in species abundance within these sites seem to relate less to temporal variation between assemblages and more to intra-site differences in spatial and contextual location.

Despite the lack of a clear pattern of development from Early to Middle to Late Iron Age among the reviewed assemblages, there do seem to be trends evident through time between broader period groups. The number of assemblages sharing generally similar patterns of species abundance do tend to support the overall impression that cattle are of greater importance than sheep in terms of numbers in the Middle-Late Bronze Age, but that sheep become more important during the Iron Age. Towards the very end of the Iron Age cattle abundance once more increases at several sites, although sheep still remain the predominant species in the majority of assemblages.

4.1.2.2 Intra-regional variation: Geographical

Considerable variation in faunal assemblage composition is evident across the southern region. There are no patterns in relative species abundance directly corresponding to site geology, but there do appear to be trends in domestic species abundance within certain geographical areas. Similar patterns of species abundance within broad geographical areas are apparent when comparing the domestic species NISP for each county (Figure 4.2), although the amalgamated NISP counts for each county do disguise variation between individual assemblages. The proportion of assemblages with different predominant species for each county reveal similar broad regional trends (Table 4.2).

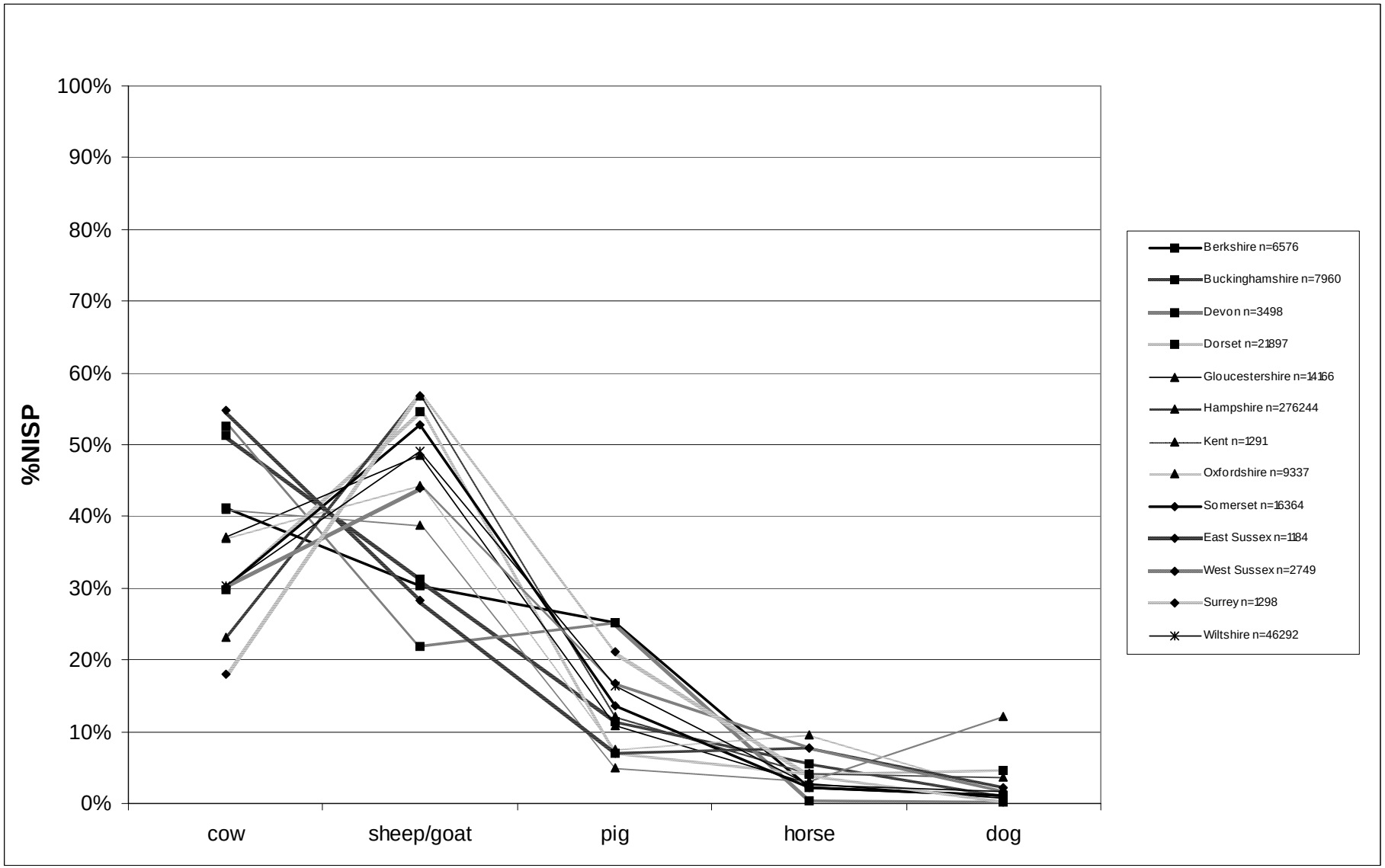

Figure 4.2: Relative abundance of main domesticates in different counties

Table 4.2: Frequency of assemblages with different species predominant (based on NISP) from each county

predominant species:	sheep		cattle		pig		horse		
	no.	%	no.	%	no.	%	no.	%	total
Berkshire	1	33%	1	33%	1	33%			3
Buckinghamshire	2	22%	7	78%					9
Devon			1	100%					1
Dorset	11	69%	4	25%	1	6%			16
East Sussex			3	100%					3
Gloucestershire	5	50%	4	40%	1	10%			10
Hampshire	37	74%	12	24%			1	2%	50
Kent			1	100%					1
Oxfordshire	6	55%	5	45%					11
Somerset	10	91%	1	9%					11
Surrey	1	100%							1
West Sussex	5	71%	1	14%	1	14%			7
Wiltshire	16	94%	1	6%					17
total	94	67%	41	29%	4	3%	1	1%	140

In the central southern parts of the region, sheep dominate by far the majority of assemblages from the Wessex counties of Hampshire, Wiltshire and Dorset, as well as the adjoining counties of West Sussex and Somerset (Table 4.2). The high percentages of sheep seen at Danebury, in Hampshire, and Maiden Castle, in Dorset, are often used as examples of the pattern of species abundance typical for Wessex. Assemblages from other hillforts in this area show similar emphases on sheep (e.g. at Bury Wood Camp in Wiltshire, Winklebury in Hampshire and in the Middle Iron Age assemblage at Cadbury Castle). However, several other hillforts from this area show marked differences in domestic species abundance; assemblages from Torberry hillfort in West Sussex have unusually high percentages of pig (>30%), while at Bury Hill in Hampshire horse are the predominant species, and at Woolbury hillfort, near Danebury, cattle are by far the most abundant species (although the sample is small and possibly subject to bias). High percentages of sheep occur at other types of settlement throughout the Iron Age from this area, such as at Slonk Hill in West Sussex, Quarry Field, Compact Farm in Dorset, Burderop Down in Wiltshire, Ruckstalls Hill in Hampshire, and Cannard's Grave in Somerset. Not all assemblages share this pattern of high percentages of sheep; at many other sites from the area, sheep remains are predominant but do not greatly outnumber those of cattle. In a much smaller proportion of assemblages (e.g. from Bishop Canning's Down, and Easton Down), cattle are the predominant species. While there is variability within the dataset, an emphasis on sheep husbandry would appear to be typical in the central southern counties.

In contrast to the central parts of the region, cattle are the most abundant domestic species at all of the small collection of assemblages from the far southeast of the region in Kent and East Sussex, Black Patch and Bishopstone in particular have very high percentages of cattle (at least 75%). At the north-eastern edge of the region, the assemblages from Buckinghamshire show a degree of uniformity in patterns of domestic species abundance; cattle are the most abundant species in seven of the nine assemblages from this county (Table 4.2) from a variety of sites, including the Iron Age, or possibly Late Bronze Age hillfort of Ivinghoe Beacon, the Middle Iron Age enclosed settlement of Pennyland and the Late Iron Age 'Belgic' settlement at Coldharbour Farm. Sheep and cattle are of almost equal abundance in the Middle Bronze Age assemblage

from Walton Lodge. From Buckinghamshire it is only in the Late Iron Age assemblage from Bierton where sheep are noticeably more abundant than cattle, although there is also a marked abundance of pig at this site, which distinguishes it from the sheep-dominated assemblages of Wessex.

A different picture still is seen towards the north of the region in the counties of Gloucestershire and Oxfordshire. The assemblages from both counties show a very mixed pattern of domestic species abundance, with sheep the most abundant species in just over half of assemblages. Assemblages with high percentages of sheep remains (>60%) and very low percentages of cattle remains (<30%) are quite rare from this area, and are only observed at two settlement sites (Guiting Power and Tuckwell's Pit) and the votive assemblages from the Uley shrines. Given the votive nature of the assemblages from the Uley shrines, it is perhaps unsurprising that they do not conform to the pattern of species relative abundance common to the settlement sites from this part of the southern region. High percentages of cattle (>50%) and low percentages of sheep (<30%) are present in assemblages from Sandy Lane and Duntisbourne Grove in Gloucestershire, and Watchfield and Bicester Field Farm in Oxfordshire. In most assemblages from Oxfordshire and Gloucestershire, cattle and sheep numbers are more even; where sheep are the predominant species, they typically only contribute around 50% or less of the domestic species remains, and cattle are also moderately abundant (>30%) (e.g. at Halfpenny Lane in Oxfordshire and Uley Bury in Gloucestershire). It has been suggested that sites from Oxfordshire indicate that horse exploitation may also have been a significant feature of this part of the region (Wilson 1990; 1993). Relatively high percentages of horse of between 10-20% are present at a number of sites, including Watkin's Farm and Mingies Ditch from Oxfordshire, and Claydon Pike in Gloucestershire. Some assemblages from other areas of southern England also have a high abundance of horse remains, but in Oxfordshire a greater proportion of assemblages tend to show percentage values towards the upper end of the range for horse. Horse outnumbers pig to be the third most abundant species at the majority of Oxfordshire sites.

From the far southwestern counties, quantitative faunal data are only available from Mount Batten. This site is noteworthy for its unusually high abundance of cattle and pig, which outnumber sheep. Maltby (2006a) suggests the site at Mount Batten may have been involved in the production of salt meat during the later Iron Age, which would explain the unusual species abundance at this and other sites from the southern region, such as Ower in Dorset. However, the lack of any other assemblages from Devon and Cornwall makes it impossible to draw any conclusions concerning patterns of domestic species abundance for the far southwest of the southern region.

Sheep husbandry appears to be the main focus in the central southern part of the region, whereas there is a more mixed pattern in the northern part of the region, although animal husbandry does appear to be more focused towards cattle than in Wessex. In the in the northeastern part of the region there is a clear emphasis on cattle husbandry, and this also appears to be a feature of the small sample of sites from the far southeast of the region. Such geographically distinct groups may correspond to cultural groupings. For example, the sites from northern Buckinghamshire fall into what is thought to have been the tribal area of the Catuvellauni (Cunliffe 2005: 179) while those from Wiltshire, Hampshire and West Sussex correspond to the tribal area of the Atrebates (*ibid*). Although these tribal territories may not extend back into the earlier

Iron Age and Bronze Age, it is certainly possible that similar cultural groupings may have influenced choices of domestic species husbandry in certain areas of the southern region throughout the period under review.

4.1.2.3 Intra-regional variation: Topographical

Grant's (1984a) previous study comparing Iron Age faunal assemblages from Wessex and the Upper Thames Valley highlighted a tendency for greater abundance of cattle at the low lying valley sites with greater emphasis on sheep on higher ground. Grant (*ibid*.104) concluded that this reflected the suitability of the Thames Valley to cattle rearing as it offers the necessary good quality pasture with ready access to water, while on the Wessex downland the dryer poorer quality pasture on the higher ground is better suited to keeping sheep. This model explains much of the differences in relative abundance of cattle and sheep *between* the two areas. It has also been suggested that *within* the Thames Valley there may also be a greater emphasis on sheep husbandry evident in assemblages from the higher ground of the upper gravel terraces (e.g. at Ashville) compared to those from the floodplain (e.g. at Farmoor) (Wilson 1978 *et al*.:136; Maltby 1996:20). To some extent, a similar pattern can also be observed at a more local level within areas of Wessex. In Hampshire, sheep are the most abundant species in by far the majority of assemblages (78%) on the higher ground (above 75mOD) where only a small proportion of assemblages (19%) show a predominance of cattle. On the lower ground in Hampshire, although sheep remain the most abundant species in the majority of assemblages (62%), the proportion of assemblages dominated by cattle (38%) is greatly increased.

There is clearly evidence within certain areas of southern England to support Grant's model relating cattle husbandry to lower lying settlements and sheep husbandry to higher pastures. Outside of Wessex and the Thames Valley patterns of animal husbandry are seen which clearly relate to environmental and cultural conditions other than simply topographical location. For example, the environment in the immediate vicinity of sites on the wetlands of the Somerset and Avon levels would probably not have provided ideal pasturage for sheep, and yet the assemblages recovered from the Meare Lake Villages (Bailey, Levine and Rogers 1981; Backway 1986; Levine 1986; Cornwall and Coles 1987) and Hallen (Hamilton-Dyer 2002b) indicate that sheep were the predominant species at sites in these areas. Furthermore, in the (albeit very small) assemblage from Woolbury, a hillfort in the Danebury environs, cattle remains make up 63% of the domestic assemblage (Roncaglia and Grant 2000). At Ivinghoe Beacon, situated high on the Buckinghamshire chalk, (Westley 1968) cattle also far outnumber sheep. It would therefore be a gross over-simplification to suggest the same patterns of cattle and sheep husbandry were universal throughout the southern region.

4.1.2.4 Intra-regional variation: Site Type

In addition to chronological and geographical trends among faunal assemblages, there are other patterns to be explored concerning site morphology. Campbell (2000) and Hamilton (2000a) argue that different sites may each represent a small component of a broader farming system within a landscape. Certain types of site may be associated with a particular socio-economic role or husbandry activity, which may be reflected in the faunal record. Diversity between assemblages within the same localities may therefore be a reflection of the different types of site present. However, the majority of reviewed assemblages come from sites where the site type is non-specific, falling under

the general description of 'settlement' or 'occupation', and unsurprisingly share no common pattern of species abundance.

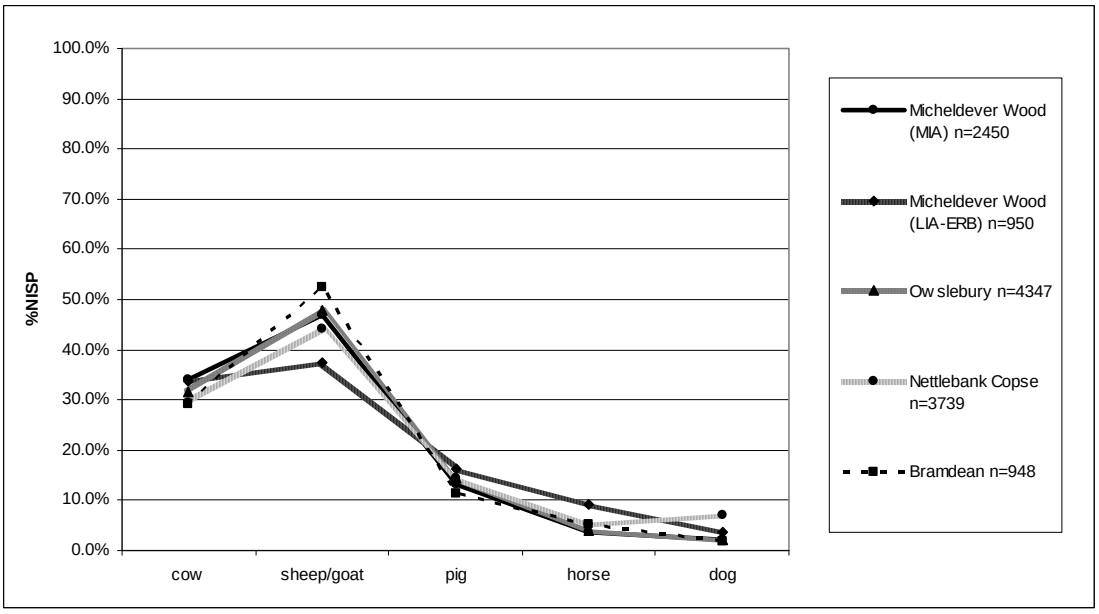

Figure 4.3: Relative abundance of main domesticates in 'banjo enclosure' assemblages

For some assemblages within the review dataset, there is a clear relationship between species abundance and the type of site from which they came. For example, all the assemblages recorded from banjo enclosures display striking uniformity in relative abundance of domestic species (Figure 4.3). It has been suggested that banjo enclosures had a clearly defined economic or social function within broader settlement complexes, perhaps serving as stock corrals (Perry 1972) or marking the division between arable and pastoral land (Hingley 1984). The uniformity in species abundance could imply that there was a very specific suite of animal husbandry or depositional activities being undertaken at banjo enclosures. The banjo assemblages are all of broadly similar date (Middle-Late Iron Age) and are all from the same part of the southern region (Hampshire), factors which may account for the similarities in faunal assemblage composition as much their shared site morphology.

Few other types of site exhibit such uniformity among assemblages in terms of domestic species abundance. The term hillfort has been applied to a wide range of sites from across the region, and has been subject to a range of interpretations including temporary refuges, elite or high status settlements, and centres of redistribution. It is probably not surprising then that assemblages from sites classed as hillforts display considerable variation in relative abundance of the domestic species. As mentioned above, the assemblages from the developed hillforts of Wessex do tend toward high percentages of sheep and low percentages of cattle, as seen at Danebury, Maiden Castle, and Bury Wood Camp. However, the sample is dominated by multiple assemblages from Danebury, and if these are discounted the pattern is clearly more mixed. At Uley Bury in Gloucestershire, sheep are the most abundant species, but cattle remains are only a little less common, while some hillforts display a predominance of other domestic species, including cow, pig, or even horse.

Despite considerable variation in domestic species NISP among assemblages from 'unenclosed' and 'enclosed' settlements, a slight trend is apparent. Sheep are the most

abundant species in the majority of assemblages from both enclosed and unenclosed settlements. However the emphasis on sheep is much more pronounced among the sample of assemblages from unenclosed settlements, where cattle dominate only a very small proportion of assemblages, whereas in a much greater proportion of assemblages from 'enclosed' settlements cattle are the most abundant species. A key difference between these two groups is the morphology of sites; most of the 'enclosed' settlements are characterised by the presence of a large peripheral ditch, while 'unenclosed' settlements typically exhibit a different combination of archaeological features. It is likely that the differences in the predominance of cattle and sheep at unenclosed and enclosed settlements reflect the effects of intra-site variability (discussed below) rather than relating inter-site differences in pastoral economy.

4.1.3 Intra-site variability

Maltby (1985a) and Wilson (1993; 1996) have demonstrated on later prehistoric sites a tendency for cattle bones to be relatively more abundant in ditches at the periphery of a site compared to smaller mammals such as sheep, which tend to be more abundant in pits located within the settlement. This is due to the poorer preservation conditions of ditches, particularly in the upper fills, favouring preservation of larger species, as well as a tendency for larger species to be processed and therefore deposited at the edges of settlements. The same pattern of intra-site variability is observed across the southern regions and commented upon in many of the faunal assemblage reports included in this review, for example at Micheldever Wood in Hampshire (Coy 1987a) and Pennyland in Buckinghamshire (Holmes 1993).

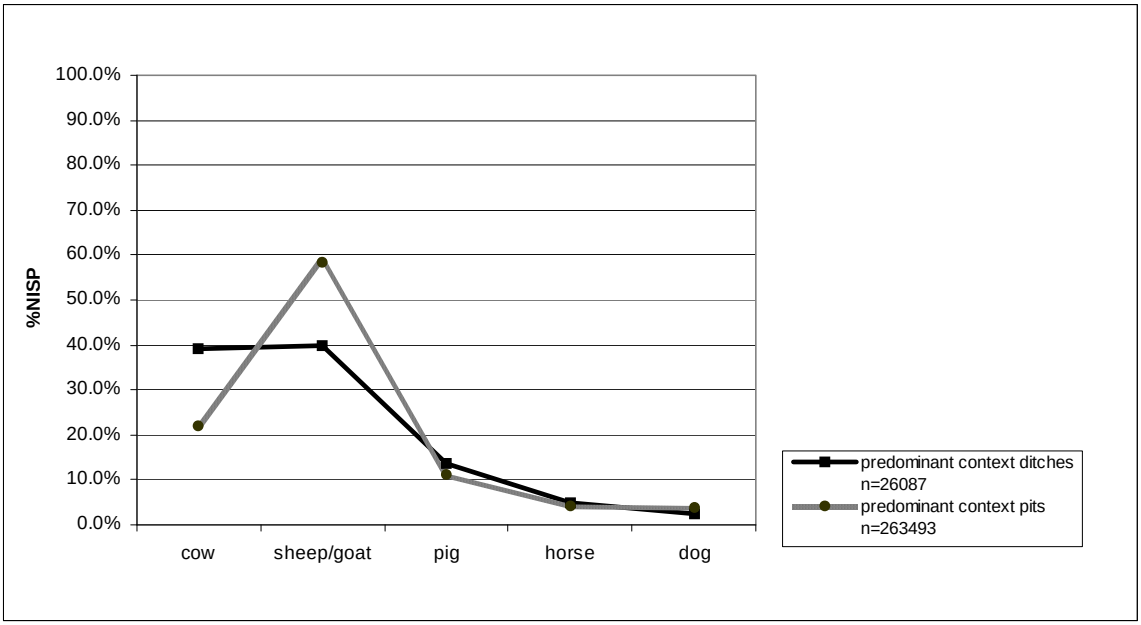

Figure 4.4: Relative abundance of main domesticates in assemblages from predominantly ditches compared to those from predominantly pits

It is clear from Maltby and Wilson's observations that intra-site variability in species abundance relating to the spatial and contextual distribution of faunal remains may have considerable influence on the overall composition of a faunal assemblage. This certainly appears to be the case within the review dataset, where the relationship between feature type and species composition does appear to be quite strong for pits and

ditches. If one compares the relative abundance of domestic species in assemblages where faunal remains derive predominantly from ditches, with those derived predominantly from pits (Figure 4.4), the assemblage results do reflect the pattern of sheep and cattle abundance typical for each feature type. However, despite this apparent trend there is still clearly considerable variation between assemblages from different sites grouped according to predominant feature/context. Spatial and contextual origin of faunal material is clearly not the only factor influencing assemblage composition.

4.2 Exploitation of individual species

Analysis of the relative abundance of sheep, cattle, pig, horse and dog has provided information about the importance of these species at different sites from across the region. There is evidence to suggest different patterns of cattle and sheep husbandry from different geographical and topographical locations. Also, certain assemblages have been highlighted where there is an emphasis on some of the less common domestic species (pig, horse, and dog). Further analysis of the faunal evidence for each species is required if one is to understand the ways in which animals were exploited, and their economic and social roles. An attempt is made in the following section to address these points by investigating the types of animals present, and any evidence concerning their deposition and disposal, together with evidence for their management.

4.2.1 Sheep

4.2.1.1 Type of animals

During the Middle Bronze Age to Late Iron Age in southern Britain, sheep typically were small, slender, horned varieties, of similar size and probably appearance to 'primitive' brown-fleeced breeds such as the Soay. It has been commented that sheep from different Iron Age sites appear consistently similar in size (Maltby 1981a:189), with new, larger stock varieties appearing in the Romano-British period. This does appear to be the case among the reviewed assemblages. There is evidence of new hornless varieties of sheep having been present at some sites prior to the Romano-British period, but these are generally restricted to late Iron Age contexts, for example at Bierton. However, at Nornour, Scilly, new sheep of a four-horned variety appeared in the later periods, although the earlier sheep stock are of the more typical Soay types seen across the region, albeit of slightly smaller stature due to their island location.

One previous review of sheep metrical data (Maltby 1981a) provided a range for distal tibia width measurements of c.17-26mm for Iron Age assemblages, most of which come from the Wessex area of the southern region (*ibid*.190). Subsequently the large sample from Danebury (Grant 1984c) increased the upper end of this range to c.28 mm, but although the Danebury assemblage clearly contained larger sheep than at the other sites, the mean values from all these Wessex sites are all similar at around 22mm. The report on the animal bones from Ashville (Wilson *et al* 1978) also summarised sheep measurements from a different selection of Iron Age assemblages, all of which fall within the ranges for the Danebury sheep. The Iron Age sheep measurements from the Danebury Environs sites are all reported to be equivalent in size to the sheep from Danebury. Earlier assemblages also appear similar; distal tibia widths of sheep from the Late Bronze Age and Early Iron Age at Runnymede and Potterne (Locker 2000:105) fall within the ranges for Danebury and are similar to the other Iron Age assemblages cited by Maltby (1981a), and sheep from the Middle Bronze Age at Brean Down were similar

in size to those from Potterne (Levitan 1990). Unfortunately the suite of measurements published in the Ashville report do not include the distal tibia width, which means stock sizes cannot be directly compared with those summarised in Maltby's review. This illustrates a recurring problem among the reviewed reports, which is that there is no consistent approach to comparison of metrical data between sites.

Metrical data was present for the majority of assemblages reviewed, and at least 20% of assemblages provided datasets of moderate size or better. A small number of assemblages, e.g. from Danebury, Suddern Farm, Battlesbury Bowl and Owslebury, even provided rich or very rich collections of metrical data. Nevertheless, while the majority of faunal analyses record a standard suite of measurements (following von den Driesch 1976), such data are seldom fully published; the way measurements are summarised in reports varies considerably, and accessibility of archive data is variable. Where measurements in faunal reports are compared to those from other sites, the choice of sites against which they are compared varies; some reports compare measurements to those from Danebury, others to those in Maltby's (1981a) summary, some to those summarised in the Ashville report, while still others choose assemblages from the same immediate locality and/or date for metrical comparisons. The lack of a consistent standard against which measurements are compared makes it very difficult to assess the overall size range of Iron Age sheep, and even harder to assess inter-assemblage variation in stock size and shape. Davis' (1996) published standards and log ratio technique provide a means by which such cross-comparability may be achieved in future analyses of metrical data. By revisiting metrical datasets and applying such techniques it may be possible to achieve a much more detailed understanding of the similarity and differences between assemblages and factors influencing stock size and shape during the later prehistoric period in southern Britain.

4.2.1.2 Relative abundance

Sheep are ubiquitous throughout the reviewed assemblages and always among the three most common species. Sheep are the most common species remains identified at by far the majority of assemblages (67%) throughout the Iron Age. Sheep are the second most abundant species in only 28% of assemblages, usually after cattle, but sometimes after pig, and only once after horse. If one considers that NISP counts may well be biased against the smaller remains of sheep relative to cattle in fragmentary or poorly preserved assemblages, it is even possible that sheep are under-represented in many assemblages. Assemblages where sheep are the most abundant species are found at sites throughout the whole of the southern region (Figure 4.5). Very high percentages of sheep relative to the other domesticates are most prevalent among assemblages from the chalk downland landscape of Wessex (mainly Wiltshire, Hampshire and Dorset) as well as eastern Somerset, suggesting a primary focus on sheep husbandry in the pastoral economies of this area.

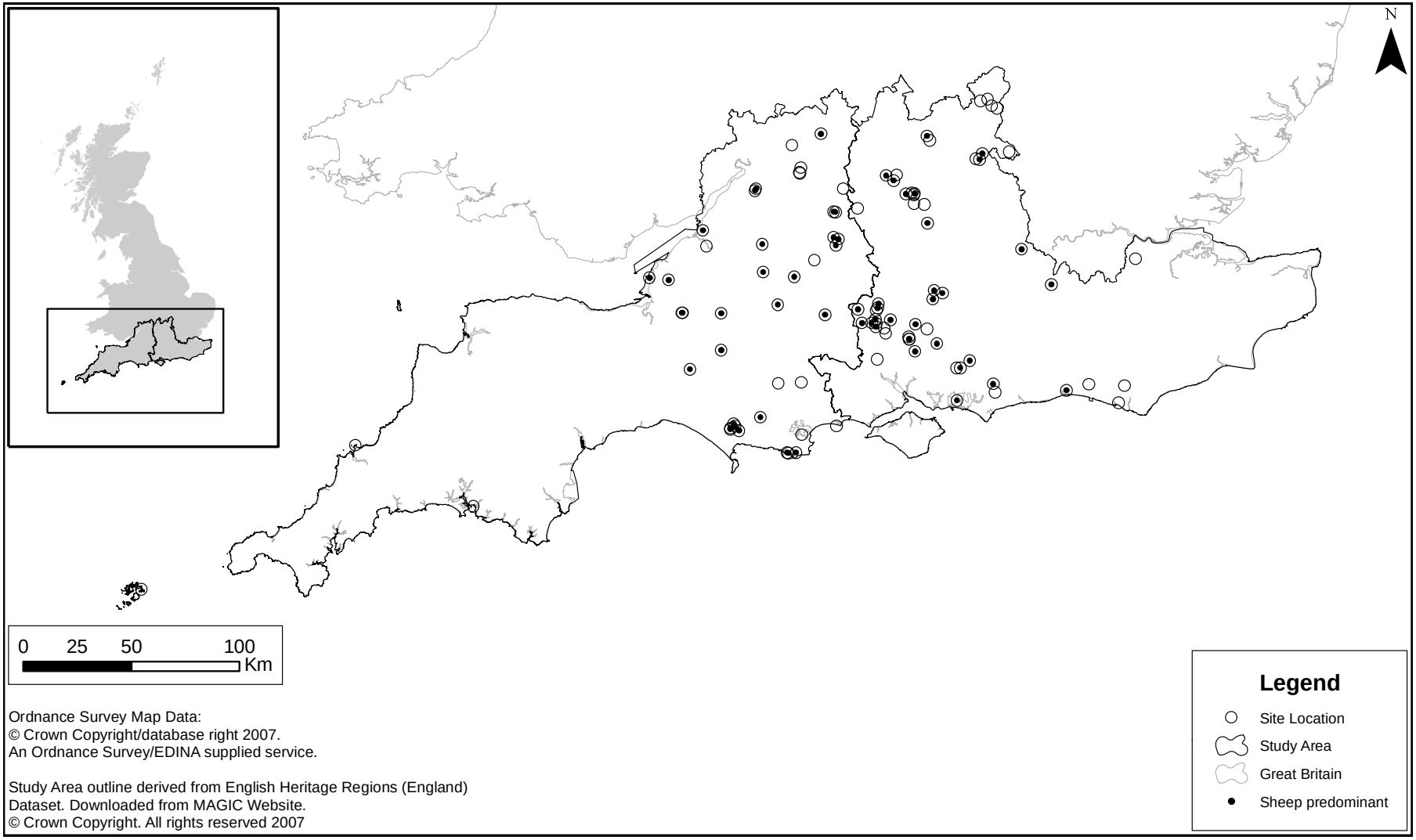

Figure 4.5: Location of sites where sheep is most abundant domestic species in NISP count

Proportions of sheep among the three main domesticates range from 4% within the assemblage of the MIA-LIA cattle burials from Cadbury Castle, to 81% in the possible ritual assemblage from Wilsford Shaft. Other ritual/religious assemblages from the Uley shrines and Hayling Island Temple are also characterised by high percentages of sheep, or goat in the later phases at Uley. At Old Down Farm the high percentage at least partly due to the presence of several partial and complete skeletons of sheep and young lambs, which were included in the NISP, and the high percentage of sheep at Tuckwell's pit also includes Associated Bone Groups (ABGs). Nevertheless, even if one excludes ABGs from these assemblages, a clear emphasis on sheep remains evident.

Given the high percentages of sheep remains from the developed hillforts of Wessex, sheep husbandry was clearly the focus of the pastoral economies in and around these sites. High percentages of sheep at non-hillfort settlements from Wessex are also indicative of the importance of sheep consumption, deposition and husbandry in central southern England. As the previous section has demonstrated, the percentages of sheep relative to cattle are generally lower in areas to the north and east of the region outside of Wessex. Assemblages from Buckinghamshire and East Sussex have some of the lowest percentages of sheep noted among the review dataset, at sites such as Hartigans, and Black Patch. Sheep are less commonly the predominant species in these areas. The main emphasis on sheep husbandry in the northern counties appears to be among the sites situated on the higher ground around river valleys, rather than on the lower terraces and floodplains.

4.2.1.3 Nature of exploitation

Relative abundance of different skeletal elements or body parts can reflect patterns of carcass processing, consumption and disposal, however such information is often limited when attempting to consider patterns of body part representation for assemblages as a whole (Hambleton 1999: 32). Frequently poor preservation and fragmentation of assemblages due to gnawing, trampling or similar destructive taphonomic processes have resulted in the under-representation of low density elements and an abundance of more robust elements, such as distal tibiae and metapodia, as well an abundance of loose teeth. Generally the full range of sheep body parts are represented among later prehistoric assemblages from the region, indicating the slaughter and consumption of complete individuals on site, with differential preservation of elements reflecting their response to a range of taphonomic processes. The absence of certain sheep skeletal elements can reflect human selection as well as natural taphonomic processes; for example the under-representation of sheep metacarpals (but not metatarsals) from the LBA faunal assemblage at Runnymede is due to bone working activity where sheep metacarpals were preferentially selected for the manufacture of bone points (Done 1980: 75-76).

Often more informative from published assemblage reports is the analysis of body part representation at an intra-site level, in individual features or contexts, with variability in element representation reflecting differential disposal of primary processing and food waste in different features. This is certainly true for later prehistoric assemblages from southern Britain. Intra-site variability in body part representation among sheep, as well as other domestic species, is reported for many of the reviewed assemblages, but even where considerable intra-site variability is reported between individual features the interpretation of the overall pattern of sheep body part representation is the same for 78% of assemblages, i.e. primarily the result of preservation and/or retrieval bias (e.g. at

Rope Lake Hole and Battlesbury Bowl). A small proportion of assemblages show other patterns of skeletal element abundance in sheep. For example, at Hayling Island there is an abundance of meat bearing elements of sheep throughout the assemblage, which has been interpreted as reflecting 'offerings' of prime meat joints (King and Soffe 1998:42; King 2005:339). The abundance of head and feet in the sheep assemblage from Lains Farm is more indicative of primary butchery waste. However, this pattern of body part representation reflects the composition of a single pit, rather than a uniform bias across the whole site. In a further 12% of sheep assemblages, the representation of skeletal elements is closer to natural anatomical abundance, which may be indicative of generally good preservation conditions across the site. More commonly such patterns are due to the presence of a high incidence of complete or almost complete sheep skeletons in a small number of well preserved deposits, e.g. at Nettlebank Copse, Old Down Farm and Whitcombe.

Clearly both butchery and food waste was routinely disposed of on Late Bronze Age and Iron Age settlements. Several of the reviewed assemblages included large accumulations of partial sheep skeletons with butchery marks which have been interpreted as deposits of butchery processing waste, e.g. at Old Down Farm (Maltby 1981b). Evidence for sheep butchery and disposal of butchery waste comes not just from the presence of cut marks on skeletal remains, but from accumulations of particular groups of body parts. Most recently this has been highlighted by analyses of the sheep associated bone groups (ABGs) from Battlesbury Bowl where the authors argue that several ABGs with butchery marks represent well preserved deposits of carcass processing waste, and that similarly composed groups without any obvious butchery marks may be interpreted in the same way (Hambleton and Maltby unpub.).

Wilson's summary of the butchery evidence from Ashville Trading Estate (Wilson *et al.* 1978) still remains one of the most comprehensive reports on butchery from any of the reviewed assemblages. Subsequently Maltby (1985c) has called for more detailed quantitative analyses of butchery marks, and his reports on the butchery evidence from sites such as Owslebury (Maltby 1987a) and, most recently, Battlesbury Bowl (Hambleton and Maltby unpub.) further highlight the potential of detailed quantitative analyses of butchery marks to improve understanding of the utilisation of domestic mammals in the southern region during the Iron Age. However, Maltby argues that butchery analyses continue to be under-utilised in Iron Age faunal studies (*ibid.*). The data from the reviewed assemblages support this observation; while some qualitative summaries of sheep butchery, including those noting absence of evidence, were available for 93 assemblages, quantitative information providing an indication of the proportion of butchered sheep fragments in the assemblage was only available for 33 assemblages. One obvious gap among the reviewed data is the paucity of detailed description and quantitative analyses of the butchery in the published animal bone reports from Danebury (Grant 1984c and 1991a); this a notable omission, given the quality and quantity of other types of faunal data from Danebury and the pivotal role this site has had in our understanding of Iron Age animal exploitation in southern Britain.

Despite the limited butchery data it is clear from the reviewed assemblages that sheep butchery practices at the majority of sites were broadly similar to those described by Wilson *et al.* (1978) for Ashville and Maltby (1987a) for Owslebury. Filleting marks on limb bones are reported, particularly on scapulae, but generally the majority of butchery evidence from sheep long bones relates to skinning marks, removal of the feet, and

disarticulation of the front limbs at the shoulder and elbow joints and hind limbs at the knee (*ibid*). Articulated groups of sheep vertebral bodies with signs of lateral trimming are a relatively common find and represent secondary butchery waste where flank meat has been removed from the spine and the vertebrae discarded. Axial splitting of sheep vertebrae and limb bones is relatively uncommon among the majority of Iron Age assemblages, but was observed in the LBA assemblage from Potterne (Locker 2000: 114). Where data are available from the reviewed assemblages, the proportion of butchered fragments among the identified sheep remains is generally low (<5%) compared to cattle, which reflects the fact that sheep require less processing to produce manageable portions for cooking than larger animals. Done (1980:75) points out that sheep carcasses may easily have been cooked whole, which could explain the low frequency of butchery marks on sheep bones at Runnymede. However, poor preservation may also have affected survival of cut marks in some assemblages. The prevalence of cut marks over chop marks in the majority of sheep butchery records throughout the review dataset provides clear evidence that knives, rather than cleavers, were the most common tools used for skinning, dismembering and filleting throughout the region during the Late Bronze Age and Iron Age. Cleaver butchery is more typical of the Roman period in this region (Maltby 1985c:20) and it is pertinent to note that within the review database the only record of chops outnumbering cuts on sheep bones is from the reportedly 'romanized' assemblage (Reilly 1988: 82) from Ditches hillfort, dating to the 1st Century AD.

Table 4.3: Frequency of assemblages with different generalised age (mortality) profiles for the main domestic species. Most common profiles for each species are in ***bold****.*

	number of assemblages			
age profile	cattle	sheep	pig	horse
mostly juvenile	2	11	8	
mostly subadult	5	3	11	
mostly juvenile+subadult; few/no adult	4	3	**25**	
even juvenile/subadult/adult	6	**16**	**12**	
mostly juvenile+adult; few subadult	**20**	**44**	2	
even subadult/adult; few juvenile	9	10	5	
mostly adult	**23**	9	2	**30**
mostly adult+elderly	5			**19**
mostly elderly				2
Total no. assemblages	74	96	65	51

Ageing data provide further information concerning the nature of sheep exploitation across southern England during the later prehistoric period. Most faunal reports included in this review provided some discussion of the age structure for the main domestic species. For this review, discussion of mortality patterns draws primarily on mandibular tooth wear data, although epiphyseal fusion data are discussed in many of the published reports. Not all assemblages were large enough, or recorded in sufficient detail, for authors to suggest a pattern of mortality. Nevertheless a total of 96 assemblages could be assigned a generalised age profile, and as many as 68 assemblages produced samples of >20 sheep mandibles. Wessex sites, in particular Danebury, produced most of the large assemblages with over 100 aged sheep mandibles. (See Table 4.3 for a summary of age profiles for the main domesticates).

Previous overviews of British Iron Age faunal assemblages (Maltby 1981a; 1996; Hambleton 1999) have revealed a consistent pattern of sheep mortality among many of

the Iron Age assemblages from southern England. Sheep assemblages were characterised by a high proportion of juvenile (<1year old) deaths, with most of the remaining sheep surviving to adulthood (> 3 years) and very few sheep killed as subadults at the optimum age for meat production (1 ½ - 3 years), for example at Danebury, Balksbury, and Ashville (Maltby 1996: 22). More recent published Iron Age assemblages included in this review provide further examples of similar mortality profiles, e.g from Cadbury Castle in Somerset, Watchfield in Oxfordshire, and Battlesbury Bowl in Wiltshire. There are variations; some sites show a greater percentage of juveniles than adults, and others have a greater percentage of younger adults than older adults. Nevertheless the same broad pattern of sheep mortality is noted for 46% of assemblages with recorded sheep age profiles, showing a consistent emphasis on juveniles and adults, and a lack of subadults.

Although the faunal evidence indicates that juvenile and adult sheep were processed for meat, the low incidence of subadults of prime meat age suggests that the focus of sheep husbandry was not on meat production. Adults would have been retained for breeding stock, but maintaining an adult flock would have also provided opportunities to obtain secondary products such as milk, wool and manure. Maltby (1996:22) argues that given the probable poor quality of fleece from Iron Age sheep, in particular from female sheep, which make up the majority of adult assemblages, it is unlikely that there was a primary focus on sheep husbandry for the purposes of wool production. Although sex data are limited within the review dataset, a predominance of females is apparent; only 16 assemblages provided sex profiles for adult sheep, the majority of which (13 assemblages) were dominated by females. (See Table 4.4 for a summary of sex profiles for the main domesticates).

Table 4.4: Frequency of assemblages with different generalised sex profiles among adults for the main domestic species. Most common profiles for each species are in ***bold****.*

	number of assemblages			
sex profile	cattle	sheep	pig	horse
only females	1		2	
female dominated	**13**	**13**	2	
even	4	2	3	2
male dominated	3	1	**6**	**7**
only males				3
Total no. of assemblages	21	16	13	12

The apparent emphasis on juveniles and adult females could suggest a focus on sheep for dairy products, however this appears less likely when one examines the ageing data more closely. Payne (1973) suggested that in a specialist dairying economy one might expect to see a high mortality among very young (male) infants and neonates, and most of the remaining (female) individuals kept well into adulthood. Although at some sites, such as Old Down Farm, neonatal lambs contributed a significant proportion of the assemblage, Hambleton (1999:70) observed that the majority of juvenile deaths were of older lambs around 6-12 months old. Furthermore, few assemblages show the large proportions of older adults one might expect from an economic focus on secondary products; in the majority of sheep assemblages there is a greater emphasis on young adult deaths, with few surviving beyond 4 years old, e.g. at Pennyland in Buckinghamshire and Watkins Farm in Oxfordshire. The high proportion of animals killed at 6-12 months and as young adults probably reflects a non-specialist and non-intensive strategy whereby sheep are managed for a range of products (Hambleton

1999; Maltby 1996).

Not all assemblages lack prime meat-aged sheep; 17% of assemblages indicate similar numbers of subadults, juveniles and adults (often predominantly young adults), for example at BA Brean Down, MIA Owslebury and LIA Bierton. The presence of a significant proportion of subadults and young adults suggests that these assemblages were more geared towards exploitation of sheep for meat, rather than those assemblages with a preponderance of juveniles and adults which were less intensively managed for meat in favour of a mixed range of products. However, very few assemblages show a majority of 1 ½ - 3 year olds indicative of a strong specialisation in rearing sheep for meat, the main exceptions being the assemblages from LIA Owselbury and LIA-ERB Stokeleigh Camp. Site type or location appears to have had little influence on which sheep mortality profiles are exhibited by different assemblages. There does appear to be a chronological trend evident among sheep mortality profiles; Table 4.5 clearly shows that while the majority of Early, Middle and Late Iron Age assemblages show an emphasis on juvenile and adult sheep, there is a clear increase in the proportion of assemblages more commonly exploiting subadult and young adult sheep. Although sample size is small, there is also some indication that there was a greater emphasis on sheep for meat during the Bronze Age, with sheep being less intensively managed for meat during the subsequent EIA and MIA periods.

Table 4.5: Frequency of assemblages with different generalised age (mortality) profiles for sheep, grouped by period. Most common profiles for each period are in ***bold****.*

	number of assemblages			
sheep age profile	MBA-LBA	EIA-MIA	MIA-LIA	LIAandERB
mostly juvenile	2	3	3	3
mostly subadult			1	2
mostly juvenile+subadult; few/no adult	1		1	1
even juvenile/subadult/adult	**3**	2	2	**6**
mostly juvenile+adult; few subadult		**11**	**16**	**7**
even subadult/adult; few juvenile		2	1	**6**
mostly adult	1	1	3	2
mostly adult+elderly				
mostly elderly				
Total no. of assemblages	7	19	27	27

Some degree of intra-site variability in the age composition of sheep is apparent among the reviewed assemblages; for example, difference in age profiles among pits and ditches were reported from Brighton Hill South (Maltby 1995b) and Owslebury (Maltby 1987a). Greater frequencies of juvenile remains are commonly observed in assemblages from pits, while ditches show a greater prevalence of subadults and adults; thus a predominance of faunal remains from either pit or ditch contexts may influence the overall age composition of the sheep assemblage. This is certainly apparent among the reviewed assemblages where those assemblages from predominantly pit fills are more likely to exhibit an emphasis on juvenile sheep than those from predominantly ditch fills. Such biases are particularly apparent among some of the smaller assemblages where a single feature may heavily bias the overall sheep mortality profile; for example at Rucstalls Hill where juveniles made up 22% of aged sheep mandibles from the site but all of the juvenile sheep came from a single pit containing at least 12 individuals with adult 1st Molar teeth just erupting (Gregory 1978:83).

Groups of several young lambs of similar age, deposited together in pits, are commonly reported from Iron Age settlements from the southern region and may reflect concentrations of culling and deposition at particular times of the year, e.g. at Battlesbury Bowl where sheep mortality and deposition in pits suggests a concentration of animals killed and deposited in late spring/early summer and in the autumn (Hambleton and Maltby unpub.). This highlights another potential of ageing analyses: the identification of seasonal culls. It is important to remember that one cannot assume that such finds of seasonal deposits of neonates and infants in pits are a true reflection of the emphasis of sheep culls during the farming year. It could be simply that the combination of quantities of unprocessed carcasses from natural mortalities discarded at the same time of year when open and empty pits were ready receptacles, resulted in good preservation, making such neonatal mortalities more archaeologically visible than the older animals killed, processed and discarded throughout the rest of the year. Having said that, at Potterne, without any heavy bias from multiple deposits of young lambs, the LBA assemblage produced clear evidence of an annual peaks in sheep mortality, suggestive of an Autumn cull, amongst all age cohorts (Locker 2000:115). Hamilton (2000a: 62-69) makes further use of evidence for seasonal peaks and hiatuses among sheep ageing data to investigate seasonality among the Danebury Environs sites, demonstrating how different sites of different types, located in different parts of a local landscape, may be identified as foci for different seasonal activities. Such an approach provides considerable insight into how later prehistoric communities in areas of southern England may have exploited the wider farming landscapes throughout the course of the farming year.

4.2.1.4 Summary of economic significance

Sheep were generally the most commonly exploited species and, although they would probably have contributed less meat to the diet than cattle, they were the main focus of animal husbandry activity in Wessex and throughout most of the central southern region. The indication from the majority of assemblages is that sheep were probably not exploited primarily for meat, and that the predominance of young animals of less than a year old and adult animals indicate exploitation of secondary products such as milk or wool. Further evidence for wool production comes from the presence of spindle whorls and loom weights from settlements across the region, although the extent to which such artefacts can provide an indication of the relative importance of wool production at different sites is questionable (Marchant 1989). The pastoral economies of many Iron Age communities, in particular those of Wessex Hillforts, are focused on sheep rather than cattle, but arguably the agricultural economy throughout the region is more heavily centred around arable production. There is little indication of a pastoral focus or intensive exploitation of sheep for meat after the Bronze Age. Rather than a concentration on one particular product, it is suggested that during the Iron Age sheep were exploited for their full range of products and were managed in a way that complemented other pastoral and arable activities (Maltby 1996; Hambleton 1999). A move towards greater exploitation of prime aged sheep seen at some sites from the region during the Later pre-Roman Iron Age may be early evidence for the intensification of agriculture thought to have taken place more generally during the Romano-British period (Lambrick 1992).

4.2.2 Cattle

4.2.2.1 Type of animals

Published morphometric analyses of cattle remains from among the review dataset all support previous observations that Iron Age cattle in southern Britain where mainly small in stature and of a short-horned type, with larger 'improved' varieties not appearing until the Roman period (Maltby 1996:22). Some variety in the type of cattle is evident from the presence of hornless cattle at several sites. Both naturally hornless and deliberately polled individuals are reported within the review dataset, although not all reports clearly differentiate between the two. The term 'polled' has been used within the reviewed faunal reports to describe both naturally hornless cattle crania and those where horn buds or horncores have been deliberately removed (these latter are normally identified by the presence of raised areas or stumps on the frontal bone which show evidence of healing). Jones (1977: 61) states that the presence of polled cattle at sites as early as Winklebury (EIA-MIA) is unusual, and certainly the examples of polled crania from earlier (LBA) deposits at Runnymede are all the result of deliberate horn removal rather than naturally hornless specimens (Done 1991:334). Nevertheless, more recent faunal analyses have demonstrated that naturally hornless specimens are present, albeit in small numbers, at several earlier Iron Age sites in addition to specimens with horns deliberately removed. For example, from EIA and MIA deposits at Suddern Farm and Nettlebank Copse, and amongst the LBA-MIA faunal remains from Battlesbury Bowl.

Table 4.6: Comparison of 'Greatest Length' measurements of cattle astragali from several published sources.

Site	Assemblage Date	Range (in mm)	Mean	N	Source
Brean Down	BA	59.3-64.4	61.5	4	Levitan 1990
Runnymede Bridge	LBA	49-66	58.3	38	cited in Locker 2000
Potterne	LBA-EIA	49.5-66.7	-	71	Locker 2000
Battlesbury Bowl	LBA-MIA	50.1-62.9	57.6	22	Hambleton and Maltby unpub.
Winnall Down	MIA	53.1-61.0	57.3	7	cited in Maltby 1981a
Balksbury 1973	MIA	55.0-63.1	57.9	12	cited in Maltby 1981a
Gussage All Saints	IA	54-62	57	54	cited in Maltby 1981a
Appleford	IA	55-60	58	8	cited in Maltby 1981a
Ashville	IA	53-64	58.5	18	cited in Maltby 1981a
Farmoor	IA	57	57	1	Wilson 1979a
Danebury 1969-78	IA	41-65	57	94	Grant 1984c
Danebury 1979-88	IA	48-64.6	57.6	66	Grant 1991a

It is generally accepted that there was a reduction in cattle size from the Late Neolithic to Early Iron Age, and certainly astragali greatest length measurements from Late Bronze Age assemblages from Potterne, Runnymede and Brean Down all include measurements towards the upper end of the scale, or even larger than those cited by Maltby (1981a) for Iron Age sites from the region (Table 4.6). The Potterne and Runnymede assemblages also include small cattle, and Locker (2000: 104) argues that the broad range of sizes seen in these LBA-EIA assemblages, compared to the narrower ranges cited by Maltby (1981a) for Iron Age sites such as Gussage-all-Saints, suggests cattle became more uniform in size during the Iron Age. This could perhaps be due to fewer or less varied cattle 'types', to more exchange of stock and greater generic mixing, or as a result of reduced sexual dimorphism in cattle populations. This is certainly plausible, although despite the apparently greater variation in cattle size at

these LBA sites compared to several Iron Age assemblages, similarly broad ranges in astragali lengths are also seen at Iron Age Danebury.

Comparing stock size between sites using single dimensions, such as astragalus length or estimated withers height calculated from long bone length, may highlight some variation in cattle sizes but does little to facilitate investigation of variation in shape. Locker (2000: 103) illustrates this problem, noting that while the Potterne and Runnymede metacarpal measurements display similar size ranges, when one compares length and breadth measurements it is apparent that the larger metacarpals at Potterne are more slender; these may reflect variations in the sex ratio or different types of cattle present. Either way, it is apparent that metrical analyses drawing on a broad suite of measurements have the potential to provide more detailed information about stock size and shape than single measurement comparisons.

The availability of cattle metrical data from the reviewed assemblages was similar to that for sheep. Most assemblages yielded some metrical data for cattle and just over 20% of assemblages provided datasets of moderate size or better, with assemblages from Danebury, Gussage all Saints, Runnymede Bridge and Owslebury providing rich or very rich metrical datasets. As for sheep, not all faunal reports publish the full suite of cattle measurements, and not all choose to compare the same measurement or the same sites. Thus our understanding of temporal and regional variation in cattle size and shape during the later prehistoric period would benefit from more comprehensive access to raw metrical data in order to undertake metrical analyses using a more standardised approach similar to that proposed by Davis (1996) for sheep.

4.2.2.2 Relative abundance

Cattle are present in almost all of the reviewed assemblages. When NISP counts for cattle are compared with those for the other main domesticates (sheep, pig, horse and dog), cattle are always among the three most abundant species although often less well represented than sheep. Cattle are the most abundant species in terms of NISP in only 29% of assemblages, and much more often (59% of assemblages) are the second most abundant species, usually after sheep. The occurrences of cattle as the predominant species (i.e. ranked first in NISP counts) show the same chronological trend outlined in the previous section, that is cattle remains appear more prevalent relative to sheep and other domesticates in assemblages from the Middle Bronze Age to Early Iron Age, than in subsequent Early to Late Iron Age periods. There is some increase in the proportion of assemblages with cattle predominant in the Late Iron Age – Early Roman period, which supports evidence to suggest that in the late pre-Roman Iron Age there may be a rise in the importance of cattle, perhaps associated with changes in the economy and consumption patterns reflecting a shift in the expression of cultural identity associated with Roman influence. Assemblages where cattle are the most abundant species most commonly occur in the southeast region, while far fewer are evident in the southwest (Figure 4.6). Cattle husbandry appears to be of particular importance in the more northerly areas of the southern region, at sites from Buckinghamshire, and at many of sites from the low-lying river valleys in Oxfordshire and Gloucestershire.

Preservation conditions have influenced the relative abundance of cattle to some degree. When comparing relative abundance (from NISP) of cattle with the other commonly occurring domesticates (sheep, pig, horse and dog), the rank order of

species abundance in assemblages can be informative. Cattle are more commonly ranked as the most abundant species among assemblages where bone preservation is classified poor or very poor. Among the better-preserved assemblages, cattle are more often ranked second in abundance after sheep. Certainly at sites such as Hengistbury Head, where the acid soil conditions have resulted in very poor bone preservation, the extremely high percentage of cattle bones is clearly due to better survival and recovery of the more robust bones of larger mammals (e.g. cattle) than those of the smaller species (e.g. sheep and pig). As mentioned previously, the spatial and contextual patterns in species representation identified by Wilson (1996) and Maltby (1985a) on settlements from this period, and linked to preservation environment and depositional practices, may also affect the relative abundance of cattle. Within the review dataset, assemblages where faunal remains come predominantly from ditches/gullies do tend to have relatively higher proportions of cattle remains, compared to assemblages from predominantly pits. This is not to say that high NISP percentages of cattle are limited to poorly preserved assemblages; several sites with good bone preservation also produced assemblages where cattle bones dominated the NISP counts (e.g. the Buckinghamshire sites of Ivinghoe Beacon, and Hartigans).

Some cattle-rich assemblages reflect large deposits of complete or partial cattle skeletons included in the NISP counts, such as the partial cattle carcasses from the Mid-Late Bronze Age ditch at Poundbury or the discrete Mid-Late Iron Age group of cattle and calf burials from Cadbury Castle. Other assemblages, such as those from Black Patch and Wavendon Gate show a genuine predominance of cattle fragments among the disarticulated faunal remains. Proportions of cattle among the three main domesticates range from 0% at the Romano-Celtic temple assemblage at Hayling Island to 95% among the discrete group of animal burials at Cadbury Castle. Even when one excludes such extremes as the Hayling Island assemblage and assemblages where the cattle NISP count is inflated by the inclusion of multiple cattle burials, variation is still evident and relative abundance of cattle ranges from 14% in the LIA-ERB assemblage from Nettlebank Copse to 85% at Hengistbury Head.

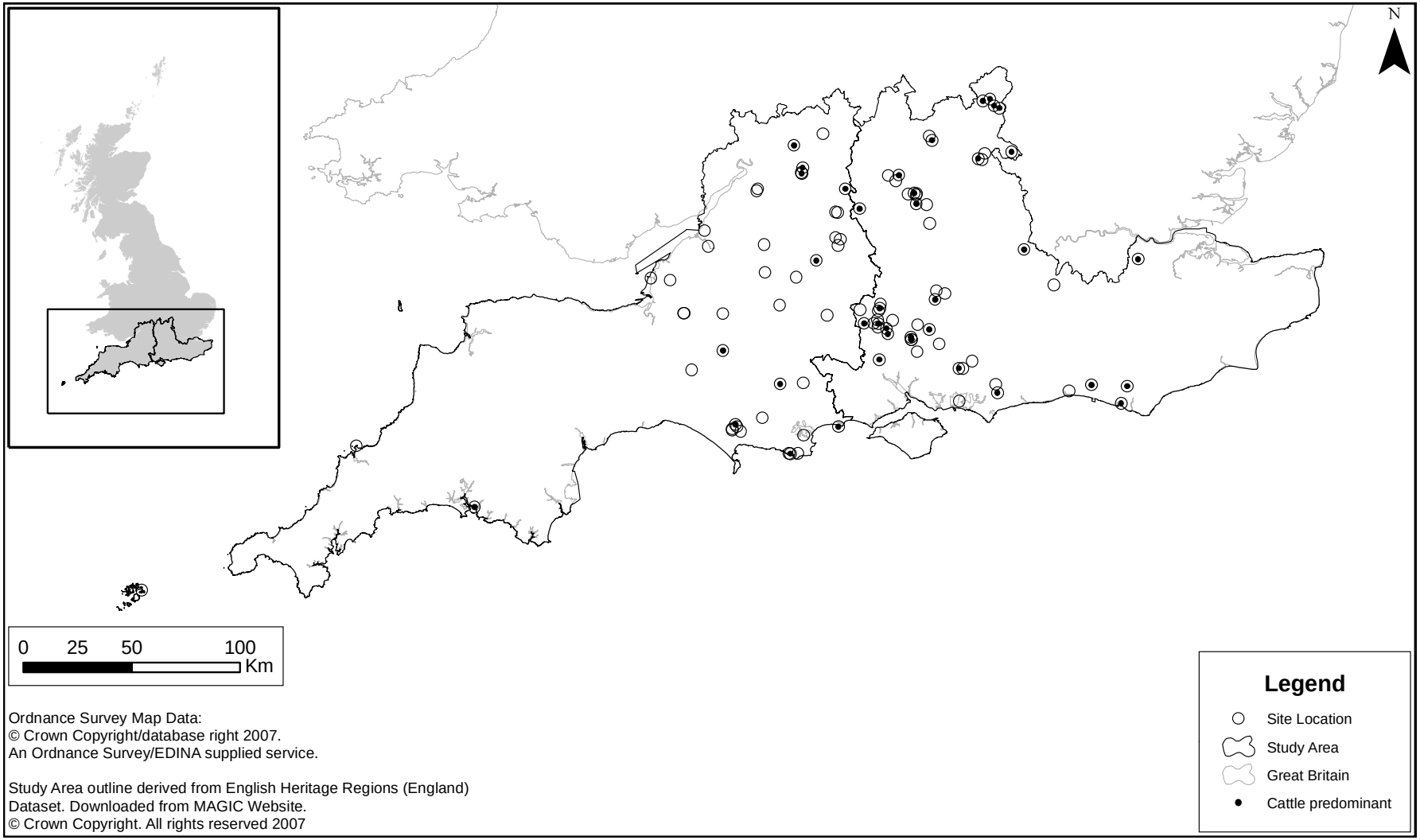

Figure 4.6: Location of sites where cattle is most abundant domestic species in NISP count

4.2.2.3 Nature of exploitation

Of 105 assemblages providing information on cattle body part representation in the review database, in 68% the relative abundance of different skeletal elements of cattle at assemblage and site level appears to have been primarily determined by preservation and/or retrieval bias. As with other species, where particular patterns of body part representation are observed at assemblage level, they often reflect the element representation from a single large deposit or group of deposits. For example, in the MIA-LIA assemblage from Cadbury Castle, the even representation of elements as per normal anatomical abundance reflects the composition of the multiple deposits of complete calf skeletons at the site. Alternatively, apparent absences of elements my be accounted for by the effects of heavy fragmentation, as is the case at Potterne where the main limb bones were often too heavily fragmented to be identified to species, resulting in a bias towards head and feet because loose teeth and the relatively complete small foot bones could be more readily identified to species (Locker 2000:109).

Intra-site variability in cattle body part representation is commonly reported among the reviewed assemblages, but in most cases all parts of the carcase are present, indicating the processing and consumption of complete individuals on site, with no evidence for import or export of parts of carcasses to or from settlements. It is extremely rare among the reviewed assemblages for over- or under-representation of certain body parts to have been interpreted as evidence for import or export of parts of cattle carcasses, but there are some notable exceptions. The cattle assemblage from Mount Batten is dominated by head and foot bones, which have been interpreted as primary butchery waste left over from preparation of salt beef for export (Grant 1988; Maltby 2006a), Also, Levine (1986) argues the abundance of prime meat bearing elements in the LIA assemblage form Meare Village East indicates cattle were being butchered away from the site and the parts of the carcass to be cooked and consumed were brought on to the site (although this division of activity could have occurred at a very local level and need not imply import of meat from any great distance). Abundance of head elements in the LIA-ERB assemblage from Brighton Hill South is due to the large numbers of cattle horncores imported for the purpose of industrial processing and specialist horn working activities (Maltby 1995b: 55).

At Poundbury the Middle-Late Bronze Age assemblage is dominated by a large accumulation of butchery waste from at least six processed cattle, which is reflected in the abundance of trunk, and to a lesser extent, head elements. The butchered remains from Bronze Age Poundbury indicate that complete limbs were removed from the cattle carcass and taken away as the main meat bearing parts, while vertebrae were discarded as waste elements along with the head. This pattern is broadly similar to that described by Wilson *et al.* (1978) for the Iron Age cattle remains from Ashville. Detailed descriptions of cattle butchery marks from Owslebury (Maltby 1987a) and Battlesbury Bowl (Hambleton and Maltby unpub.) also reveal broadly similar techniques of cattle butchery. Knife cuts on skulls are generally interpreted as evidence of meat removal or skinning. Cut marks and occasional chop marks at the distal ends of long bones made during disarticulation and dismemberment of limbs are common. More variable are observations concerning the extraction of marrow. Splitting of cattle bones for marrow was noted for the LBA assemblage at Runnymede (Done 1980), while a lack of processing for marrow was noted as a feature of the LBA-EIA assemblage from La Sargesse (Bourdillon 1990). Maltby (1987a) attempted to quantify such differences

using the degree of fragmentation of metapodials to suggest that there was little breakage for marrow at Winnall Down and Balksbury, compared to more intensive processing of cattle bones for marrow during the Iron Age at Owslebury.

Similar numbers of assemblages provide qualitative and quantitative butchery data for cattle as for sheep. Where quantitative data is available, the majority of assemblages reveal a higher prevalence of butchery marks (>5%) for cattle, compared with the much lower prevalence of butchery marks in sheep. The larger cattle carcasses required more processing than smaller sheep to obtain manageable portions for cooking or preserving. This may also explain the more general impression drawn from qualitative observations that the remains of cattle tend to exhibit more filleting marks than those of sheep. Chop marks also appear more common on cattle bones than on sheep, perhaps reflecting the greater forces required in processing bones of larger animals. However, cut marks still outnumber chop marks on cattle remains among the majority of reviewed assemblages, supporting previous observations that knives were the tools most commonly utilised for the skinning, dismemberment and filleting of cattle carcasses throughout the later prehistoric period in southern Britain. Chop marks are nevertheless reported from cattle bones throughout the Bronze Age and Iron Age periods. Saws were not commonly used for butchery and most observations of saw marks among the reviewed assemblages are restricted to horncores and obvious bone-working waste.

As discussed for sheep, the prevalence of chop marks on cattle remains from Ditches hillfort may indicate the adoption of Roman butchery techniques during the Late pre-Roman Iron Age. By contrast, at Owslebury the typical Iron Age pattern of knife butchery continues well into the Roman period (Maltby 1987a). It is possible there are some temporal changes in butchery practices evident among the reviewed assemblages, since all five assemblages where cattle bones exhibit a greater abundance of chops than cuts date from the Late Iron Age, however in the Late Iron Age as for earlier periods cut marks on cattle bones still outnumber chop marks in by far the majority of assemblages. It is clear that cleaver butchery, as evidenced by a prevalence of chop marks, does not appear to have been commonly adopted during the Late Iron Age on settlements in southern England. It should be noted that fine cut marks seldom survive as well as heavy chop marks, and poor preservation may account for chop marks out numbering cut marks on cattle remains at sites where there is poor bone preservation, e.g. at Middle Duntisbourne and Duntisbourne Grove.

The butchery and body part data provide good evidence of utilisation of cattle for primary products such as meat, horn and hide. Ageing and sexing data provide evidence for the use of cattle as dairy or draught animals exploited for secondary products. Compared with sheep however, cattle provided more limited ageing data with which to evaluate the management of cattle herds for specific products such as meat or milk. Seventy-four assemblages provided generalised age profiles based on mandibular toothwear, but only 26 assemblages produced samples of >20 cattle mandibles. Six assemblages produced large samples of over 100 aged cattle mandibles from the sites of Brean Down, Danebury, Gussage all Saints and Owslebury.

This review upholds the results of previous analyses of cattle ages from Iron Age assemblages in the southern region, which observed considerable variation in cattle mortality profiles on different sites (Maltby 1981a:179; 1996:21; Hambleton 1999:78). The ageing data are dominated by assemblages from the Wessex region in which

subadult specimens of optimum age for meat exploitation (approximately 1 ½ - 3 ½ years) are poorly represented. The most common mortality profiles for cattle throughout the region (Table 4.3) indicate a predominance of adult individuals (e.g. at Winnall Down, or more recent samples from Groundwell West, Nettlebank Copse and Houghton Down). Also common is a combination of adults over c.4 years and juveniles killed in their first year (e.g at Cadbury Castle and Battlesbury Bowl), although the number of assemblages with this profile may be somewhat inflated by the multiple assemblages from Danebury. Within these broad groupings of age profiles there is considerable variation between sites in terms of the relative proportions of juveniles and adults as well as the ages of individuals within the 'juvenile' and 'adult' categories. For example, Danebury juvenile cattle show unusually high percentages of very young infant/neonatal calves (Grant 1984c). These high proportions of neonatal/infant remains at Danebury have been explained variously as the effect of seasonal movement of cattle between pastures (Stopford 1987), Danebury having been a special centre for calving (Grant 1984c), or possibly indicative of a dairying strategy. The prevalence of female dominated cattle assemblages from Danebury and other sites within the review dataset (Table 4.4) may also indicate the importance of breeding and dairy animals among adult herds, although the male dominated and more even sex ratios from other assemblages points to a range of different husbandry strategies.

The lack of subadults suggests that cull strategies were not primarily focused on keeping cattle for meat, but rather an emphasis on secondary products or mixed husbandry. Maltby (1996:21) cites Owslebury as an exception to this Wessex pattern, since the assemblages showed an emphasis on the exploitation of subadults and younger adults for meat greater than at other Wessex sites. A greater emphasis on cattle of prime meat age is noted for only a small proportion of assemblages from Wessex, including LBA-EIA Potterne, MIA Suddern Farm and LIA-ERB Quarry Hill. The results of this review support previous observations of regional trends in mortality profiles which indicate greater exploitation of subadult and young adult prime beef cattle in the more northerly areas of the southern region (Grant 1984a; Maltby 1991; Hambleton 1999); for example at Barton Court Farm and Bicester Fields Farm in Oxfordshire, Claydon Pike and Middle Duntisbourne in Gloucestershire, and Bierton and Pennyland in Buckinghamshire. Exploitation of subadult and young cattle is also evident from elsewhere in the region, for example at Mount Batten, Devon, where the remains may be those of cattle used in the preparation of salt beef (Maltby 2006a).

Various models have been proposed to explain the apparent differences in cattle mortality patterns between Wessex and the more northerly areas of the southern region. Grant (1984a) suggested differences in cattle age profiles in the southern region reflected cattle management strategy involving movement of herds between upland and low-lying valley sites. Grant's model proposes that cattle were calved and older breeding and draught animals kept to support arable activities on upland sites, while at the low-lying valley sites there was a greater emphasis on pastoral activities and younger cattle were grazed and surplus subadult animals culled. Analysis of the review dataset does indicate the emphasis on juveniles and adults is certainly much more common on assemblages from upland sites (Table 4.7). However, this distribution need not indicate different elements of a single cattle management system, rather it may simply reflect different husbandry strategies employed in the Thames Valley and Wessex, perhaps reflecting the suitability of their different environments to different farming regimes (Hambleton 1999: 88). Maltby (1996:21) highlights, the need for analyses of upland and

valley sites in the same local area to test Grant's model, but as yet there is still insufficient data to draw any firm conclusions.

*Table 4.7: Frequency of assemblages with different generalised age (mortality) profiles for cattle on low-lying (0-75mOD) and upland (>75mOD) sites. Most common profiles are in **bold**.*

Cattle age profile	Number of assemblages 0-75mOD	>75mOD
mostly juvenile		2
mostly subadult	3	1
mostly juvenile+subadult; few/no adult	3	1
even juvenile/subadult/adult	2	3
mostly juvenile+adult; few subadult	4	**16**
even subadult/adult; few juvenile	3	6
mostly adult	**11**	**12**
mostly adult+elderly	1	4
mostly elderly		
Total no. assemblages	27	45

*Table 4.8: Frequency of assemblages with different generalised age (mortality) profiles for cattle, grouped by period. Most common profiles for each period are in **bold**.*

cattle age profile	number of assemblages M-LBA	E-MIA	M-LIA	LIAandERB
mostly juvenile		2		
mostly subadult	1		2	2
mostly juvenile+subadult; few/no adult	1		2	1
even juvenile/subadult/adult	1	1	2	
mostly juvenile+adult; few subadult	**4**	**3**	**4**	2
even subadult/adult; few juvenile		1	2	**5**
mostly adult	**2**	**4**	**4**	**9**
mostly adult+elderly		2	1	2
mostly elderly				
Total no. assemblages	9	13	17	21

Maltby (1996:21) suggests that chronological change may account for some of the differences in cattle mortality patterns across the region, but again the dataset is far from adequate to draw any firm conclusions. Nevertheless, the emphasis on juveniles does appear somewhat reduced among LIA-ERB assemblages compared to those from earlier periods (Table 4.8). Other trends are also apparent within the review dataset that might account for some of the variation among cattle age profiles. In assemblages where sheep are more abundant than cattle, there is a greater tendency for cattle age profiles dominated by juveniles and adults. Among assemblage in which cattle are the predominant species, the cattle mortality profiles are more varied and include a greater abundance of assemblages with an emphasis on subadults. There is a tendency among hillforts for assemblages with predominantly juvenile and adult cattle mortality (e.g. at Danebury, Maiden Castle, and Cadbury Castle), although though this is probably a bias resulting from the high proportion of assemblages from Danebury in the hillfort sample. There is also an indication that intra-site variability may have some influence on the age composition of cattle; assemblages derived mainly from pits also tend to show a greater emphasis on juveniles, while those derived mainly from ditches have a greater emphasis on adults and subadults. This may reflect poorer preservation conditions in ditch fills, where juvenile remains survive less well than in the sometimes deeper, and possibly

more rapidly filled, pits. Factors such as regional location, site type, altitude, prevalent context type and bone preservation are all inter-linked, and analyses of age profiles must consider the full range of complex variables carefully before offering interpretations of husbandry strategies.

4.2.2.4 Summary of economic significance

Cattle remains were less numerous than those of sheep in the majority of reviewed assemblages, although their large body size relative to sheep means cattle would have been the main source of meat in peoples' diet during the Bronze Age and Iron Age in southern Britain. As well as meat, cattle would have provided milk and manure, and acted as draught animals and beasts of burden. Cattle were also exploited for hides and horns, and there is some evidence for specialist industrial horn processing at Brighton Hill South (Maltby 1995b:55). Other possible examples of specialist cattle processing include salting of beef at Mount Batten (Maltby 2006a). The Thames Valley, and Buckinghamshire areas to the north of the region tend to display a greater emphasis on cattle husbandry than in the more central and southern area of Wessex. The Thames Valley assemblages provide some indication of a meat-based cattle economy in the area, although mortality profiles vary suggesting differences between sites in the intensity of cattle husbandry and management for specific products. Despite evidence that cattle were regularly processed and consumed, there is little evidence from Wessex for the intensive management of cattle herds for meat. The pattern of cattle husbandry more typical of Wessex appears to be a mixed strategy where adult animals are kept as breeding stock, draught animals and as dairy cattle.

An emphasis on juveniles at some sites may be due to deliberate culls associated with specialist dairying, or the effect of seasonal activity, but as yet no single satisfactory explanation can be applied. There is extensive evidence for increasing arable production throughout the region during the Iron Age (Jones 1996) and it is likely that some of the older cattle represented in assemblages may have been draught animals. Lipid residues in pots from sites such as Brean Down, Potterne, Danebury and Maiden Castle have provided conclusive evidence for utilisation of dairy products in the region throughout the Bronze Age and Iron Age (Copley *et al* 2005a; 2005b). It is likely that adult female cattle would have been maintained as a source of milk as well as a breeding population. However, there is little evidence within the reviewed faunal dataset for kill-off strategies specifically focused on dairy production, with the possible exception of assemblages from Danebury. Generally the faunal evidence suggests cattle were exploited for a range of products and, with the possible exception of some of the Bronze Age assemblages, were not the main focus of the agricultural economy but rather, in conjunction with sheep, formed an intrinsic part of farming systems increasingly focused on arable production.

4.2.3 Pig

4.2.3.1 Type of animals

According to analyses of pig measurements from Danebury, the 'typical' IA pig is small by modern standards; distal tibia breadth measurements at Danebury range from 25-32mm (Grant 1984c:517). LIA-ERB pig measurements at Ditches are comparable with those from Danebury (Reilly 1988), and LIA pigs from the Duntisbournes are of a similar size, and also comparable to later Roman pigs from the same area (Powell 1999:442). Pig measurements from the LBA assemblages at Runnymede Bridge also

appear broadly comparable in size to those from Danebury. At Potterne the LBA-EIA pig measurements from astragali and humeri indicate pigs were generally rather larger than at Danebury and Runnymede, although the distal tibia breadth measurements (range 26-33mm) are more equivalent to those from Danebury.

Analyses of pig measurements in the reviewed faunal reports are extremely limited. Very few measurements are available from even the largest assemblages; Danebury provided the only 'rich' assemblage of pig measurements, and for by far the majority of assemblages metrical data for pigs are either poor or absent. High proportions of immature pigs in most assemblages result in a lack of suitable measurable elements due to the prevalence of unfused epiphyses and poorly preserved fragments. Due to the general lack of data, previous reviews of Iron Age faunal remains provide little summary information relating to pig size, although some faunal reports do address the issue in more detail. Most metrical analyses of pig remains for the period under review tend to focus on differentiating between domestic pigs and wild boar (e.g. at Potterne); large specimens are usually noted as 'probable' wild boar (e.g. at Farningham Hill) although few metrical analyses provide conclusive identifications as large domestic and small wild pigs may have overlapped in size (Locker 2000:105).

4.2.3.2 Relative abundance

Pig remains are present, albeit in small quantities, in the majority of assemblages in the region during the period under review. Pig remains are normally greatly outnumbered by those of sheep and cattle, but their consistent low-level presence means pig is normally considered to be the third main domestic species, even though often outnumbered by horse. Pigs are only rarely the most abundant species, and the three sites where pig is predominant are dispersed across the region (Figure 4.7). Pigs are the second most abundant species in a slightly larger proportion (11 %) of assemblages. More commonly pigs are ranked third or fourth among domestic species NISP. When comparing NISP for cattle, sheep and pig, the percentages for pig range from 0% (in the EIA assemblage from Wilsford Shaft) to 48% (in the LIA assemblage from Ower). Pig are particularly abundant (>25%) in only a small proportion (c.10%) of all assemblages, including assemblages dating to the Late Bronze Age and Early Iron Age from Runnymede Bridge and Potterne, Early and Middle Iron Age from Groundwell Farm and Torberry, Middle and Late Iron Age from Mount Batten, and Late Iron Age- Early Romano-British period from Balksbury Camp, Hayling Island Temple, Middle Duntisbourne and Ower.

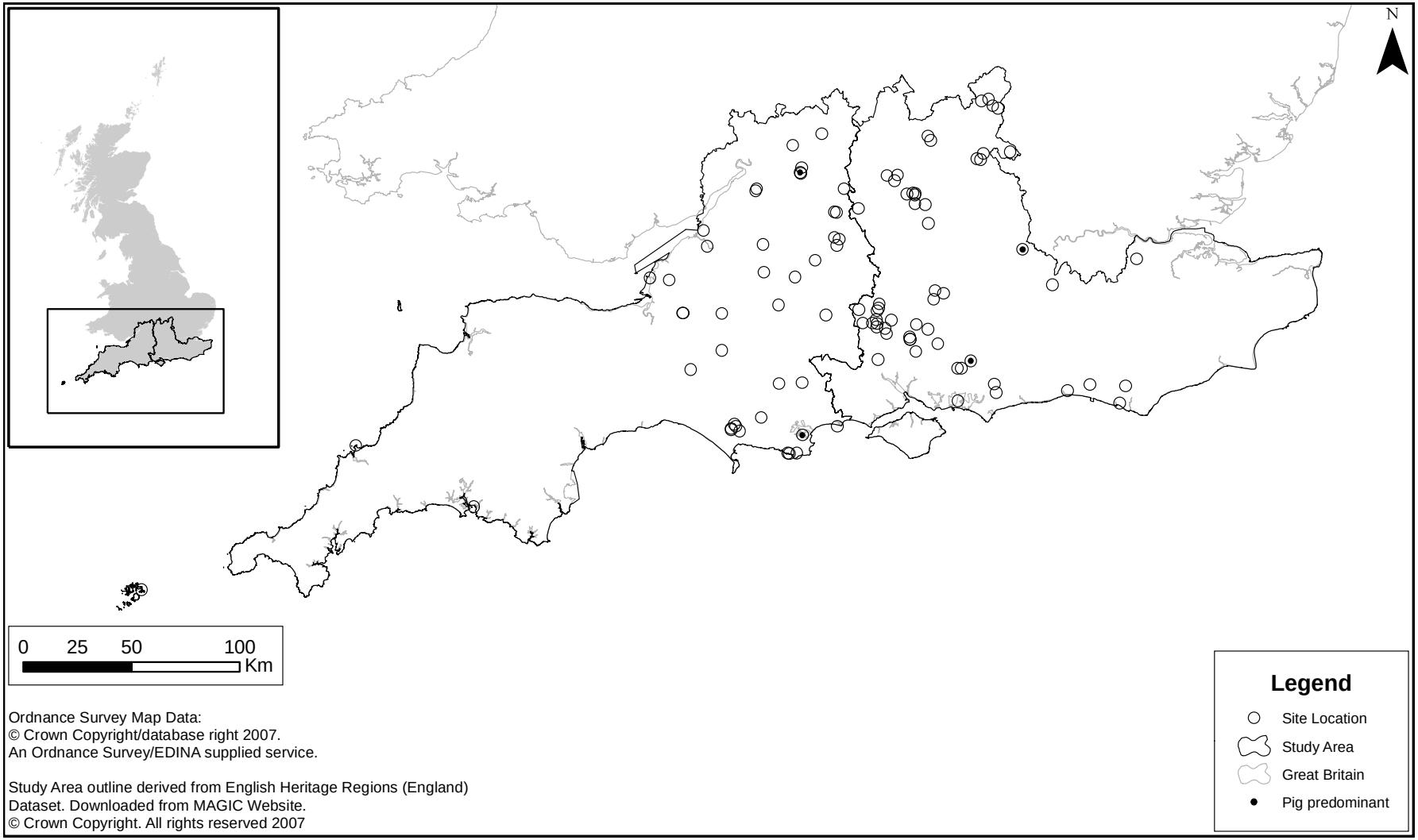

Figure 4.7: Location of sites where pig is most abundant domestic species in NISP count

High percentages of pig remains are explained in a variety of ways for different sites. The availability of nearby surrounding woodland or similar suitable environments for pannage has been proffered as an explanation for the apparent emphasis on pig exploitation at sites such as Groundwell Farm, Torberry and Middle Duntisbourne. The environmental evidence from the Late Bronze Age at Runnymede Bridge also indicates good foraging conditions for pigs, although Serjeantson (1996) argues that cultural factors also played an important role, and that the emphasis on pigs may well have been an expression of group or individual identity in terms of wealth and status, perhaps even a tradition continuing from the Neolithic. The broadly contemporary Iron Age settlements at Groundwell Farm and Groundwell West shared the same environment, but only the former site yielded high percentages of pigs. Thus environmental conditions may be viewed as a facilitating factor in Bronze Age and Iron Age pig exploitation, but not necessarily the key determining factor. At Mount Batten and Ower, the high percentages of pigs reflect the economic focus of these sites on long-distance trade of commodities such as preserved pork.

4.2.3.3 Nature of exploitation

Ageing information for pigs is limited by small sample size; only 24 assemblages provided ageing information for 20 or more mandibles. Age profiles were also noted for many smaller assemblages, providing age profiles for a total of 65 assemblages (Table 4.3). In line with previous studies, which indicate that few pigs were kept beyond 3 years old during the British Iron Age (Hambleton 1999), most of the reviewed assemblages show a preponderance of juveniles and subadults, or young adults of around 2 ½ -3 years old. Very few older adult individuals are present. The fact that most pigs were killed before reaching maturity indicates that the majority of animals from all these assemblages were exploited for their primary products (i.e. meat or lard). The high fecundity of pigs means that there would have been little need to maintain a large adult breeding herd of females and no need for a cull strategy directed at either sex, which may account for the lack of any obvious consistent pattern of sex bias in pig assemblages (Table 4.4).

The emphasis on juveniles, subadults and young adults does vary between assemblages at different sites. Throughout all periods at Danebury, and especially in the Later Iron Age, there is a high percentage of juveniles (less than c.14 months) and subadults with little emphasis on adults. A high incidence of juveniles is also evident during the Middle Iron Age at Winnall Down. By contrast, Late Iron Age assemblages from Owslebury and Middle Duntisbourne show a greater emphasis on slightly older subadult individuals between c.1 and 2 years old, as do some of the Late Bronze Age assemblages from Runnymede. A more even distribution of juveniles, subadults and adults is apparent in assemblages from Stokeleigh Camp and Gussage-all-Saints. At Potterne there is a greater emphasis on young adults and adults of prime meat age, with the majority of pigs surviving beyond 2 years old (Locker 2000). There is no evidence for deliberate exploitation of very young suckling pig even at sites with a high incidence of juveniles. The presence of juvenile and foetal/neonatal individuals indicates that pigs were reared on or around most settlement sites. One noteworthy exception is the site of Mount Batten, at which there is a complete absence of mandibles from juvenile pigs, and which Maltby (2006a:121) argues is evidence of prime pigs being brought to the site where salt pork was prepared for export. A similar argument is put forward to explain the high proportion of pigs of at least 2 years of age, and low numbers of juveniles noted at Ower.

Mount Batten and Ower also both have unusually high proportions of primary butchery waste elements (mostly heads) of pigs, which further support Maltby's (2006a) arguments for specialist preparation of salt meat at these two sites. Several other assemblages also had an abundance of pig cranial elements, however some caution should be exercised when interpreting such patterns. A prevalence of pigs' heads may indicate concentrations of primary processing waste, but high proportions of cranial elements may also occur as a result of poor preservation since pig skull fragments and loose teeth remain easily identifiable to species even when heavily fragmented. Certainly poor preservation and retrieval bias account for the relative abundance of different skeletal element in most assemblages where pig body part representation was recorded. The only assemblage with a clear bias towards the main meat bearing pig bones comes from Hayling Island Temple, suggesting the assemblage was comprised of 'offerings' of prime cuts of pork (King and Soffe 1998:42).

Due to the small numbers of pig remains in most assemblages, reports of pig butchery and carcass processing are frequently only brief, with more detailed discussions limited to the larger assemblages. Recent analysis of pig butchery from Danebury compared to other Wessex Iron Age sites indicates that butchery patterns were broadly similar for primary processing and disarticulation of pig (Knight 2003). Where sufficient data are available, other reports from the review dataset support this observation. Nevertheless there are differences between sites in the extent to which, after disarticulation, there was further processing and filleting of meat from the bone prior to cooking or curing. At Danebury, marks on the long bone shafts indicate meat was filleted rather than cooked whole on the bone (*ibid*.28). Similar evidence for filleting was noted from several other hillforts and smaller settlements, while at Maiden Castle filleting marks on hind limb bones were lacking (*ibid*. 31). A general absence of filleting was also apparent in the assemblage from Runnymede Bridge, where pig butchery was limited to jointing of the carcass, indicating that pork was probably most commonly prepared by roasting on the bone, rather than by stewing (Serjeantson 1996:222). Thus differences in the extent of carcass processing within the region may reflect different practices of cooking and consumption of pork. Serjeantson (*ibid*) considers pork consumption and pig keeping to have played an important social role, perhaps expressed in communal activities such as feasting during the Late Bronze Age, when pigs may have been linked to the wealth and status of an individual or group. Knight's (2003) suggestion that lack of filleting may be indicative of communal eating in large groups, also stresses the social as well as the economic aspects of pig exploitation in the Iron Age of southern Britain.

4.2.3.4 Summary of economic significance

Pork clearly contributed to people's diet at the majority of sites, but the generally low numbers indicate that the economic contribution of pigs was substantially less than that of cattle and sheep at the majority of sites. Pigs made a more significant economic contribution to the communities of a small number of sites where assemblages had a high incidence of pig remains relative to sheep and cattle. It has been argued that high percentages of pig remains, and also cattle, at some later Iron Age sites reflect new traditions of diet and cuisine associated with the expression of a more 'Roman' identity. While this may be a factor influencing species abundance in the late pre-Roman Iron Age at sites such as Braughing (King 1988) from outside the southern region, within the southern region it is apparent that earlier prehistoric as well as later cultural traditions, in addition to economic and environmental factors, may all have influenced the extent of

pig husbandry.

There is little evidence to suggest that pigs were intensively farmed at sites in the southern region during this period, and no structural evidence to suggest the presence of substantial sties. The presence of neonatal and juvenile remains at many sites suggests pigs were bred and reared on or in close proximity to settlements, and the abundance of pig at sites where the local environment was suited to pig foraging (e.g. at Runnymede Bridge) supports the notion of free-roaming pigs rather than sty-reared animals. Pigs may have been of some use in arable agriculture for turning and fertilizing heavy soils prior to sowing, but capacity for pigs to destroy plant crops means that they would have to have been herded away from arable fields (Serjeantson 1996:222). There may well have been variation in the extent to which pigs were left to roam and forage freely or fed on scraps and at least loosely corralled at different sites and during different seasons of the year.

Because the primary focus of pig husbandry at all sites was on the utilisation of primary products, the exploitation strategies employed for pigs appear quite uniform by comparison to sheep and cattle. Nevertheless, diversity of pig exploitation is evident within the southern region during the Middle Bronze Age to Late Iron Age period. There are differences evident in the types of meat products utilised and produced (e.g. fresh or cured), and the ways in which pork was cooked (e.g. roasting or stewing) and consumed (e.g. by individuals or small groups on a small scale, or by large-scale communal feasting). In turn, these different products and consumption strategies may relate to differences in the socio-economic organisation of communities, possibly based around redistribution of produce and wealth within a local community, or (as suggested for some of the Later Iron Age salt-meat production sites) trade and exchange within a market economy, sometimes over long distances.

4.2.4 Horse

4.2.4.1 Type of animals

All equid remains mentioned in the reviewed reports from the period, even those of the smallest individuals, are assigned to horse, and no confirmed examples of donkey or mule are noted from among the reviewed assemblages. However, more recently Johnstone (2004) identified remains of donkey from Danebury among the bones previously analysed by Grant (1984c). Johnstone's (2004) study suggests that donkeys and mules may well have been present in Iron Age Britain, although horse was by far the predominant equid in this period. Of the 76 assemblages that produced horse measurements, only Danebury produced sufficient measurements to be considered a 'rich' dataset. 'Moderate' metrical datasets are available from a further 15 assemblages, most of which are from Hampshire, and the Danebury environs sites in particular. Metrical data was not collected as part of this review, but general impressions from faunal reports support the observations of earlier reviews by Maltby (1981a; 1996). Iron Age horses were small, generally between 10-14 hands in height (Maltby 1981a:192), and normally averaging around 11-13 hands. At under 14 hands, these horses would be considered ponies by modern standards. Gussage has at least one very small individual (c.10 hands) equivalent in size to a Shetland pony (Harcourt 1979), while at Copse Farm a tibia was noted as large enough to be that of a 'horse', rather than a pony (Browne 1985). Very little metrical data are available for horse from the Middle and Late Bronze Age assemblages, but the few available withers heights (e.g. Done 1980:75,

and Locker 2000:118) are from animals of 12-14 hands, which is within the Iron Age range. More metrical data are available from Iron Age assemblages. Maltby (1981a:192) indicates that fewer of the smallest horses and more of the larger specimens were present at later Iron Age sites. The majority of assemblage reports where horse measurements are available comment that horse sizes are 'typical' for the Iron Age, and comparable with other local sites.

4.2.4.2 Relative abundance

Horse remains were present in most assemblages, but in low numbers, normally making up less than 10% of the domestic species counts. Horse is ranked as the fourth most abundant domestic species from NISP counts in the majority (61%) of assemblages, generally ahead of dog. Horse remains sometimes outnumber pig and are ranked third in 23% of assemblages. At Bury Hill in Hampshire, horse remains represent a remarkable 43% of the domestic species; this is the only site where horse are the predominant species (see Figure 4.8 for location). In the remaining assemblages, percentages of horse range from 0% (e.g. at Black Patch, East Sussex) to 18% at Watkins Farm in Oxfordshire. Only three other assemblages from across the region (Hartigans, Copse Farm and Claydon Pike) had 'high' percentages of >15% horse. Horses appear to be relatively more abundant in the Iron Age assemblages than in the Bronze Age assemblages (where percentages for horse are consistently below 5%). From the assemblages reviewed, it is those from the Middle Iron Age that display the greatest prevalence of horse across the region, although at Danebury horse was more prevalent in the later Iron Age deposits.

4.2.4.3 Nature of exploitation

Unless biased by the effects of poor preservation and heavy fragmentation, the remains of all parts of the horse skeleton are usually represented in proportions reflecting their natural skeletal abundance, and are often found as complete bones. This suggests that all parts of the carcass were disposed of on site and there was no movement of particular parts of horse carcasses on or off settlements. The presence of a relatively high frequency of associated bone groups of horses, in the form of articulated limbs or more complete skeletons, and the fact that horse bones are more commonly found intact than those of cattle, might indicate that horse carcasses were not always as extensively processed as cattle. Nevertheless butchery marks on horse in over half the assemblages where horse was present provides proof that some horses were processed. Several reports comment that the butchery marks on cattle and horse are similar, suggesting a degree of consistency in methods of butchery and levels of carcass processing. Clear evidence of butchery marks associated with meat removal was noted from Lains Farm, and at Watkins Farm even more extensive processing of horse was evident, including skinning, meat removal and also bone-working. By contrast, at several other sites (e.g. Coldharbour Farm), horse butchery appears to be limited to evidence for skinning only.

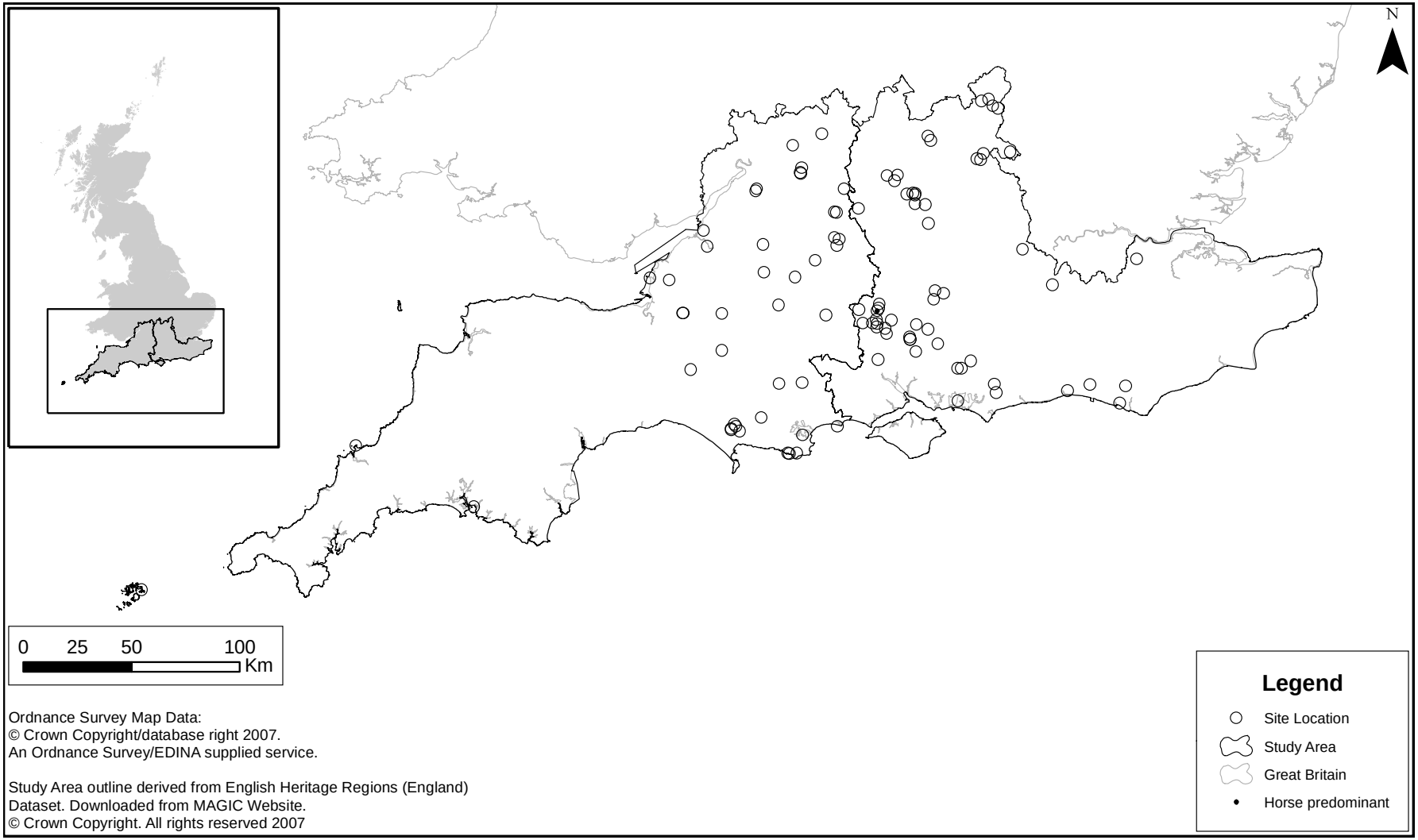

Figure 4.8: Location of sites where horse is most abundant domestic species in NISP count

All of the 51 assemblages that provided sufficient dental age data to give some indication of mortality profile for horse showed an overwhelming majority of adult individuals (Table 4.3). Often very old adult individuals are present. Young adults of less that 5 years old were rare (except in the large horse assemblage from Bury Hill where around 20% of individuals died as young adults). The remains of young horses are very rare, particularly those of juveniles that died before c.1 ½ years of age, and also subadults younger than c.3 ½ years. Evidence of foetal or neonatal dentition was only observed in two assemblages (from Danebury and Battlesbury Bowl). The emphasis on older individuals clearly indicates that, although sometimes eaten, horses were not exploited intensively for meat. The predominance of older individuals is more consistent with adult animals being used for load bearing work carrying goods or people. Where sufficient data was available to determine sex of individuals, assemblages were most commonly dominated by males (Table 4.4). Where assemblage reports mention only males, this may be due to a recording bias whereby the presence of a canine (indicative of a male) may have always recorded while the absence of a canine (indicative of female) was not recorded. Nevertheless, where assemblage reports include positive identifications of both males and females, the males still commonly outnumber females.

Harcourt (1979) states that the overwhelming majority of old individuals indicates that horses were not bred, but rounded up from independent populations and only adults selected for training and subsequent domestic use. Wilson (1990:78) argues that the presence of immature individuals at Mingies Ditch and Farmoor indicates that horses were bred on some of the Thames Valley settlements. However, the evidence for definite foetal/neonatal remains at these sites is questionable; the example cited from Farmoor is not mentioned in the original assemblage report (Wilson 1979a), and the deciduous tooth found at Mingies Ditch was worn (Wilson 1993: 189) indicating that, although young, it was not from a foetal/neonatal individual. More convincing evidence for the possible breeding and rearing of horses on site comes from Battlesbury Bowl, where the frequency of neonatal and juvenile horse remains is greater than at most other Iron Age sites (Hambleton and Maltby unpub.). While the possibility remains that immature horses were reared at a few sites, the evidence indicates that horse breeding was not common practice at settlements in the southern region. Hamilton (2000b:72) develops a convincing model to explain the relative abundance and age and sex profile of horses from Bury Hill, whereby 'managed' feral horse populations were periodically rounded up, some animals selected for further use in the domestic sphere, the mares released for breeding and the surplus stallions killed and consumed.

4.2.4.4 Summary of economic significance

Horses were occasionally eaten, but did not contribute a major part of the meat diet for people during the Bronze Age and Iron Age. There is also evidence to suggest the utilisation of other primary products such as hides, or bones for tool making. However, horse carcasses were not always intensively processed, and their main contribution to the economy clearly came from the exploitation of live animals. Certainly age profiles from the majority of assemblages show little or no evidence of breeding on site, and the almost exclusive emphasis on adults is characteristic of animals kept for secondary products rather than meat. Artefact evidence from the region in the form of harness fittings supports the interpretation that horses were used as pack animals or for riding during the Iron Age. The most commonly accepted model of horse exploitation for the Iron Age period is that horse populations existed as loosely managed independent herds, from which adult individuals were periodically selected, or 'rounded up' for

training and domestic exploitation. Certain sites (probably those with noticeably higher percentages of horse or those where younger horses are present, such as Bury Hill) may have been the focus of this activity, supplying horses to other settlements in the local area.

Harcourt (1979: 158) considered the issue of whether horses were wild, feral, or domestic to be a moot point. However, the way horses were viewed by the people exploiting them in terms of their social as well as their economic status may well have influenced the way in which they were exploited and disposed of. Technically, having descended from domestic animals, independent breeding herds of horses from this period should be considered 'feral' (Hamilton 2000b:72), and certainly their exploitation and treatment on Iron Age sites is markedly different to that of wild species such as deer, which would suggest horses were not viewed as 'wild' by the people of the time. Neither, however, is their exploitation and treatment especially similar to that of the fully managed domestic populations of cattle and sheep. It would appear that although horses were an important part of daily life, and exploited within the domestic sphere, they retained a unique and perhaps high status distinct from other species.

4.2.5 Dog

4.2.5.1 Type of animals

Dog measurements were noted as having been taken for 58 assemblages, but these were not always fully published. Most metrical datasets were considered 'poor', although in relation to the number of dog remains recovered overall the proportion of measurable fragments is probably higher than for other species. The high incidence of intact bones from complete or partial skeletons probably account for much of the dog metrical data; this is certainly true for the 'rich' dataset from Houghton Down, where the majority of measurements come from just such deposits (Hamilton 2000f). It is possible that if there was deliberate selection involved in the deposition of dog skeletons, the measurements may not be fully representative of dog populations for the period. Clarke (2000) suggests that a more reliable picture may be obtained by comparing measurements from ends of bones, which would allow for greater consideration of the disarticulated and fragmented remains.

The most commonly quoted source concerning the size and type of dogs from the Middle Bronze Age to Late Iron Age period in Britain is Harcourt's (1974) review of dog remains from archaeological sites. The size range for shoulder height of Iron Age dogs given by Harcourt is 29-58cm (*ibid*:163), with most examples at the upper end of this range. Subsequent reviews of the archaeozoological evidence by Maltby in 1981 and 1996 concurred with these observations, raising the upper end of the Iron Age size range slightly. Since then the main additions to the available published metrical data are those from the Danebury environs programme, which Hamilton (2000a: 61) concludes match Harcourt's figures for 'typical Iron Age dogs'.

Harcourt's study concluded that prehistoric dogs were, on the whole, quite uniform in terms of size and shape up until the Roman period, when there was an explosion in the variety of skeletal size and morphology. Harcourt's estimated shoulder heights indicated that the majority of Iron Age dogs were of similar size or marginally smaller than those from the Bronze Age, but there was a broader range of sizes seen in the Iron Age, which included a few smaller animals. More recently, using additional metrical data

recovered since Harcourt's initial study, Clarke (2000) has demonstrated that the range of sizes for the Iron Age period in is broader than previously thought, and has provided strengthened confirmation of the presence of shorter dogs in the Iron Age (*ibid*:167). This raises the possibility that the increase in variability of dog skeletal morphology from the Iron Age to Roman period may have actually been more of a gradual transition than a sudden one.

4.2.5.2 Relative abundance

Dogs are present, but rarely abundant, in the majority of assemblages. Even where no dog remains are recovered, evidence of gnawing on the bones of other species will often attest to the presence of canids. Their remains are the least abundant of all domestic species in most assemblages. Occasionally dog remains outnumber those of horse, but seldom those of other domestic species. Percentages of dog remains, relative to those of other domestic species, range from 0% at several sites from across the region to 24% at Flagstones in Dorset. In the vast majority of assemblages percentages of dog are well below 10% of domestic species NISP. Greater abundances of dog (>10%) are present in as few as 13 assemblages, around half of which are from Danebury or its environs. The presence of multiple complete or partial dog skeletons included in the NISP counts is a common feature among assemblages with the highest percentages of dog (e.g. at Nettlebank Copse, Suddern Farm, and Flagstones).

4.2.5.3 Nature of exploitation

The high frequency of largely complete skeletons suggests dog carcasses were not usually processed for meat. This is supported by the low incidence of butchery; only about a third of assemblages with dog remains noted any evidence of butchery for this species. Where butchery marks are present and commented upon, they are usually cut marks and signs of disarticulation of the lower limbs consistent with skinning. It is probable that dogs were occasionally exploited for meat, and some of the butchery marks from Watkins farm have been interpreted by the authors as possible evidence of meat removal (Wilson and Allison 1990). Age data suggests dogs mostly died or were killed as adults or young pups. Large collections of neonatal remains found together (e.g. at Balksbury Camp, and Flagstones) are commonly interpreted as either natural mortalities or the result of deliberate cull of surplus litters for the purposes of population control.

4.2.5.4 Summary of economic significance

The consensus from the published reports is that dogs were most probably used for stock herding, or as guard animals, during the later prehistoric period. Dogs were seldom exploited for meat, although the butchery evidence suggests Iron Age people were not averse to utilising their skins. Harcourt (1974) cites classical sources as evidence that hunting dogs may have been exported from Britain in the Late Iron Age. If exported for the purposes of hunting, dogs presumably could have served as hunting animals in southern Britain, but the general lack wild species in the majority of faunal assemblages would suggest hunting was uncommon. The presence of small lap dogs of Roman type at a Late Iron Age site from outside the southern region has been associated with evidence of overseas trade and contact (Maltby 1996:24), but as yet there are no Iron Age equivalents from within the southern region.

4.3 Conclusions

This review of the domestic faunal assemblages from southern Britain from the Middle Bronze Age through to the late pre-Roman Iron Age generally supports the observations and conclusions concerning Iron Age animal exploitation made by previous zooarchaeological analyses (e.g. Maltby 1981a, 1994, 1996, and Hambleton 1999). The composition of faunal assemblages differs throughout the review dataset in terms of relative abundance of species and their ages at death. There is some indication that the economic importance of different species changed through time across the region. Lambrick (1992) puts forward a convincing model for the Thames Valley suggesting a move away from Bronze Age pastoralism to an emphasis on arable farming during the Iron Age, with non-intensive pastoral farming supporting an expansion and some intensification of arable farming throughout the Iron Age, culminating in all-round agricultural intensification during the Roman period. It is possible that Lambrick's model may be expanded to explain similar changes in animal exploitation elsewhere in the southern region.

Despite some evidence for temporal variation, a key factor influencing faunal assemblage composition within the southern region is geographical location, which may relate to cultural groupings as well as general environmental conditions. Hambleton (1999: 88-89) argues that those areas with valley pastures more suited to cattle husbandry could have supported herds large enough to sustain a cull of prime meat aged animals, whereas on upland sites with poorer pasture there was a much greater emphasis on sheep husbandry with only small cattle herds that were less intensively managed for meat and instead geared towards a mixed strategy including secondary products. What is apparent from this review is that such models should be tempered by the fact that some of the main factors influencing faunal assemblage composition appear to be intra-site variability in deposition and preservation. Predominance of cattle and an emphasis on adults and prime meat aged specimens could in many cases be exaggerated by poor preservation conditions biasing against smaller, less robust animals such as sheep, and fragile juvenile remains.

Although several trends are apparent throughout the reviewed assemblages, caution must be exercised when attempting to relate assemblage composition and apparent husbandry strategy to a single key variable. Date, site type, site location, prevalent context and preservation condition may all independently influence species representation and mortality profiles. Furthermore, relative abundance of species is also closely linked to age profiles, and other variables may also be partly interdependent, for example site type and location, prevalent context and preservation, date and site type. It is clear that a complex mesh of factors has influenced the composition of zooarchaeological assemblages from the original choice of husbandry strategy, through deposition, preservation, recovery and subsequent analysis and interpretation. Despite these complexities, the reviewed assemblages still provide insights into the exploitation of domestic animals by later prehistoric societies in southern England.

Sheep and cattle were the main species exploited, although the emphasis on sheep husbandry appears to be greater in the central southern part of the region, in particular the chalk downlands of Wessex. Cattle husbandry appears to have been of greater importance further to the north of the region in parts of the Thames Valley and also in Buckinghamshire. Both sheep and cattle appear to have been exploited for a range of products. Sheep mortality from most assemblages involved killing animals in their first

year or as adults, which suggests a mixed strategy utilising all potential products rather than focused primarily on exploitation for meat. Different strategies of cattle husbandry appear to have been used at different sites; some sites, particularly those on the Wessex chalklands, exhibit mortality patterns consistent with dairying or emphasis on other secondary products, while other sites, particularly those from the valley and floodplain settlements to the north of the region show a greater emphasis on the exploitation of prime meat aged cattle. In recent years, the development of techniques to analyse protein and lipid residues from pottery fragments have provided evidence confirming the use of meat products, but more importantly the presence of ruminant dairy fats confirming the widespread occurrence of dairying in southern England during the Bronze Age and Iron Age (Copley *et al* 2003; 2005a; 2005b). Unfortunately these techniques are not yet able to reliably distinguish between the dairy fats of different domestic ruminant species, which means the importance of milk from sheep relative to cattle remains unknown. Nevertheless such studies have considerable potential for adding to our understanding of the utilisation of different animal food products.

As well as the exchange and redistribution of domestic animal products and livestock, live animals may also have been temporarily moved between settlements at different times of the year for breeding purposes, for communal use of traction animals, or simply to exploit better grazing. It is likely that cattle from individual settlements, and also sheep, represent smaller components of system of herding and management strategies incorporating several different sites interacting within a broader landscape. The importance of looking beyond individual settlements to consider the wider landscape is also seen with the exploitation of pig and horse. High levels of pig may be indicative of nearby wooded environment, which has implications for the extent of other pastoral and arable activities in the locality. More recently attention has also been drawn to patterns of long distance trade and exchange during the Late Iron Age, in which pig, or more specifically salt pork, may have been an important commodity. With regards to the exploitation of 'feral' horse populations, one must also consider whether such herds were closely controlled in close proximity to settlements, or whether they exploited grazing much further away and were more loosely managed across these longer distances.

Models of Bronze Age and Iron Age societies focus on social organisation based around interactions between individuals and social groups from different settlements. Evidence for social stratification from burials, as well as presence of status goods and evidence of traded items on different settlements makes it clear that settlements and individuals did not function in isolation, and that the same is undoubtedly true for their domestic animal populations and their contribution to the pastoral economy. It has been convincingly argued for the Danebury Environs landscape that contemporary sites within the same locality constitute different components of a broader farming system (Campbell 2000; Hamilton 2000a). Further consideration of the interaction of sites within their broader agricultural landscape is essential for further investigations of Bronze Age and Iron Age faunal assemblages from southern England if one is to gain a fuller picture of domestic animal exploitation and its place in society.

5. RITUAL, 'SPECIAL DEPOSITS' AND THE FAUNAL RECORD.

Animals were central to the lives of Iron Age people in southern England, whether as a source of food, materials, economic wealth or social status. In an agrarian society where interaction with animals formed an essential part of daily, seasonal and yearly cycles, it seems inevitable that animals would also have played a role in the spiritual aspects of society, forming an integral element of religious beliefs, symbolism and ritual acts.

When found associated with human burials as 'grave goods', the role of animals and animal produce in ritual acts, and the notion of a symbolic/religious dimension to animals in society, are generally accepted. Similarly, in contexts that are seen to be unequivocally religious in character, such as the Celtic shrines or temples reported from Hayling Island, Hampshire (Downey *et al* 1979) and Uley, Gloucestershire (Woodward and Leach 1993), there is also little hesitation in interpreting the faunal remains as having been an integral part of ritual and religious activity (Levitan 1993; Soffe and King 1998). Despite a readiness among archaeologists and zooarchaeologists to recognise the ritual/symbolic significance of animal remains from graves, cemeteries or religious shrines, there has been a much slower acceptance of the potential ritual/symbolic significance of faunal remains from domestic contexts. There are a small number of assemblages from non-domestic ritual/religious sites (e.g. celtic shrines/temples) in this regional review dataset, and evidence for the ritual use of faunal remains from these sites will be discussed later. Unfortunately there is little scope here for the investigation of faunal remains as funerary offerings, given the absence of cemetery and/or burial assemblages of sufficiently large sample size, although there has been some effective discussion of faunal remains as grave and pyre goods by other authors (e.g. Whimster 1981; McKinley *et al.* 1997; Maltby 2002a) as part of investigations of LIA human burials and cremations from the region. By far the majority of faunal assemblages large enough to be considered as part of this study were from domestic agrarian settlements. Thus, the discussion that follows will concentrate on 'special deposits' of faunal remains on settlement sites as the main area for investigation of the regional review dataset.

5.1 Previous studies and current debate

The evidence for the part played by animals in the belief systems and ritual activities of later prehistoric societies, from the archaeological faunal record of domestic/settlement sites, has been an active area of discussion since the publication of Cunliffe's (1984) Danebury excavations. Grant's (1984c) analysis of the faunal assemblage from Danebury recognised the presence of 'special deposits' of animal remains (skeletons; skulls; articulated limbs), usually found at the bases of pits. Grant interpreted these as evidence for ritual activities involving sacrificial offerings, and the symbolic and religious importance of specific animals. Grant used the term 'special' to describe faunal remains that were remarkable primarily because of their apparent difference to the disarticulated, fragmented and mixed remains that constituted the 'ordinary' domestic refuse at the site. As a result of her interpretation of these special animal deposits from Danebury, the term 'special', as used by Grant (*ibid*) has become synonymous with ritual/religious deposits of faunal material.

Grant's categories and classifications of 'special' pit deposits have entered into common use in British Iron Age studies and have been accepted uncritically in many instances. For example, Wait (1985) uses Grant's criteria as definitive identifiers of ritual animal deposits in his broader study of Iron Age ritual and religion. However, Grant's

classifications of 'special' (i.e. ritual) animal deposits have not escaped criticism. It has been argued that such deposits are 'special' only in that they appear 'unusual', and that the noteworthy composition of such deposits may be the result of everyday utilitarian actions such as carcass processing and disposal activities, and/or preservation conditions and other taphonomic factors (Maltby 1985b; Wilson 1992; Hill 1995). There is a strong case to be made for the re-evaluation of how we categorise and interpret complete animal skeletons, articulated or associated bone groups (ABGs) and other distinctive faunal finds from prehistoric sites; this is an area of current research (Morris in prep). A dichotomous, either/or, approach to interpreting these deposits of faunal remains, as special/ordinary, non-functional/functional, sacred/profane, is certainly an oversimplification (Grant 1991b; Hill 1995:102). Domestic activities would have taken place within a broader social arena where religious beliefs, symbolism and ritual activity imbued all aspects of daily life. In which case, there may be no such thing as 'ordinary' domestic refuse and, as Hill (1995:95) has argued, some form of 'structured' or culturally induced patterning may be evident in the vast majority of archaeological deposits from southern England during the later prehistoric period.

The influence of cultural religious beliefs and ritual and symbolic acts on the composition of archaeological faunal assemblages is undoubtedly an added complication to zooarchaeologists attempting traditional palaeoeconomic investigations. Never the less it may be possible to approach ritual activity as another, albeit extremely complex, taphonomic process. Thus, if we can attempt to recognise the way ritual acts have influenced the composition of the archaeological record in the same way we attempt to recognise the many and varied and combined effects of other cultural and natural taphonomic processes, we can still hope to gain some understanding of domestic activities. This lack of a purely domestic or ordinary archaeological faunal record need not be seen as a barrier to zooarchaeologists attempting reconstruction of diet, economy and husbandry. While many archaeological deposits of faunal remains may have a 'ritual' element, so too are they 'domestic', and therefore will, if investigated thoughtfully, still be able to shed light on past animal husbandry and exploitation (Wilson 1992; Hambleton 1999:11). Furthermore, the recognition that past ritual and symbolic acts are manifested in the faunal record has stimulated new areas of zooarchaeological investigation and an opportunity to integrate faunal evidence into broader theoretical debates concerning the later prehistoric societies of southern England.

5.2 Identification of potential 'ritual' deposits within a faunal assemblage

How then might one identify ritual deposits in the archaeological faunal record? The faunal record on its own is unlikely to produce unambiguous evidence of ritual activity. The presence of animal skeletons, articulated limbs and skulls may be taken as indicative of special deposits (Grant 1984c: 533-548, 1984b, 1991b; Wait 1985:125), but, as discussed above, this is a questionable assumption as non-ritual taphonomic factors, both natural and cultural, may account for such accumulations of bone. It is apparent that simply identifying the presence of unusual groups of faunal remains is not sufficient to conclude that they are part of a special or ritual deposit. Grant's recognition of special faunal deposits is not based solely on the bones themselves; additional evidence of careful 'placement' of the faunal remains and/or association with other artefacts play a further part in determining whether faunal remains constitute a 'special' deposit. Their location in certain features, particularly storage pits, is also seen as an important criterion of special deposits (Wait 1985:151; Cunliffe 1992).

Hill's (1995) work further emphasises that full integration of the zooarchaeological material with all other forms of archaeological evidence is an essential part of investigating and identifying patterns of ritual activity. Hill's approach was to look for unusual or 'alerting' groups of associated or articulated bone (ABGs) and evaluate these groups in conjunction with other archaeological evidence to see if these potentially special deposits showed evidence of structured deposition. According to Hill, not all ABGs need result from cultural patterning or 'structured deposition'; similarly, structured deposits need not all be ritual, but can provide a sound starting point for the identification of ritual deposits. The composition of a faunal assemblage can therefore be used as a means of recognising deposits with *unusual* composition which may *potentially* have resulted from ritual activity, and thus require further investigation. However, study of a faunal assemblage in isolation from all other accompanying archaeological evidence is unlikely to provide conclusive, unambiguous evidence for ritual deposition.

These previous studies provide a framework in which to investigate the collection of faunal assemblages that form the regional review dataset. It has been shown that deposits containing ABGs are open to a range of explanations, which are seldom conclusive or independent of the theoretical approach of the author. In order to investigate evidence for ritual deposits in the regional review dataset, it is important (following Hill 1995) that all ABGs and other noteworthy faunal deposits are considered in the first instance, since these remains are all open to *potential* interpretation as special deposits (following Grant 1984b and c), even if (following Wilson 1992) other non-ritual explanations may be more or equally valid.

5.3 Recording Categories

Data collected was restricted to general presence/absence of species represented by ABGs, the type of ABGs represented, and the type of interpretations suggested by the faunal report authors. The Regional Review dataset takes into account all mentions of ABGs (of any size) in the published faunal reports, with the caveat that it is unlikely that every ABG recovered would have been fully reported. Nevertheless, a general presence/absence approach should gain sufficient information to provide a broad overview of the composition of ABGs and other potential 'special' deposits.

Species and type of ABGs present were investigated for three main taxonomic groups:

1) Large and medium mammals - Identified to species.
2) Birds - Identified to species.
3) Other taxa - Identified to the following taxonomic groups: small mammals; amphibians; fish; and other taxa. Further identification details noted in comments where relevant.

For each group, individual species or other taxonomic groups were noted as present if represented by one or more ABG or potential 'special' deposit.

The categories of ABG mentioned in bone reports, especially those linked with ritual explanations, tend to follow the categories used by Grant (1984c: 533) and Hill (1995: 57). Thus these are the categories of ABG considered by this review. In addition, a further category 'other' was included to accommodate articulated and/or associated bone groups or individual bones that were reported as particularly unusual or noteworthy and potentially 'special', but which fell outside the existing categories of

ABG. For each broad taxonomic group the following types of ABG deposits were recorded as present if noted in a faunal assemblage report

1) Skeleton - complete and partial carcasses. For the purposes of this review, the term 'partial' skeleton includes any ABG referred to as such in the published reports. 'Partial' skeletons are normally almost complete individuals likely to have been deposited as whole carcasses but missing a small proportion of elements as a result of poor preservation or recovery. Also, 'partial' skeletons may be individuals that are largely complete but where a small proportion of the carcass, such as a skull, or a limb, has been deliberately removed prior to deposition.
2) Limb - ABG of elements from the same front or hind leg, normally consisting of four or more articulating elements.
3) Trunk - ABG of elements from the axial skeleton, normally consisting of four or more articulating elements.
4) Skull(s) - complete or almost complete crania, normally excluding mandibles.
5) Other - ABG or individual bone that falls outside the previous categories, but which has been highlighted by report authors as potentially 'special'.

If any of the ABGs bore butchery marks then butchery evidence was simply noted as present for that taxonomic group, irrespective of species or ABG type. Presence of ABG categories and particular species were also noted independently of each other. No quantitative data was recorded concerning frequency of occurrence either for particular species, or particular ABG types.

The interpretation of ABGs put forward by the faunal analyst of each assemblage was also noted. While it is appropriate to critically discuss the various approaches to classification and interpretation of unusual bone deposits or associated bone groups, if one is to correctly summarise current understanding it is equally important to take these interpretations at face value. The purpose of this review is to provide an overview of the existing published faunal dataset, to summarise current understanding and to suggest future research directions, rather than to re-evaluate all published interpretations. Any reported bone groups or possible special deposits have therefore been categorised according to the various authors published interpretations rather than my own evaluation of the material. Author interpretations of ABGs for each assemblage were assigned to one of the following categories:

1) Unspecified – no interpretation offered in faunal report.
2) Normal/chance – considered accidental or chance accumulation, or the result of domestic/industrial activity rather than religious/ritual activity.
3) Special/structured – considered by author to be the direct result of ritual/religious activity, either by deliberate deposition of material as a 'sacrifice' or votive offering and/or the placing/deposition of material as part of a ritual/rite and/or the disposal of material that was the waste or by-product of a ritual/religious activity (such as waste from feasting).
4) Mixed – interpretation includes both normal/chance and special/structured. This occurs when there are multiple occurrences of ABGs/specials in an assemblage, some of which are clearly interpreted as 'normal/chance' while others are interpreted as 'special/structured' faunal. This category is also used when an analyst offers both types of interpretation as equally possible explanations for one or more ABG/special deposit.

5.4 Summary of the evidence

The quantitative data collected do not reveal the full complexity and variety of the ABGs and 'special' groups recorded in the database. ABGs/special deposits may be found as individual deposits, like the dog partial skeleton from Ditches Hillfort or the partial lamb from Ham Hill , or as much larger accumulations of ABGs of multiple individuals such as at Old Down Farm and Lains Farm. There are many combinations of ABG categories represented among the Iron Age assemblages from the region, including skulls, partial skeletons and complete individuals, and many combinations of wild or domestic species, including bird or large, medium or small mammal. There have been investigations of the different combinations of species and ABG categories for sites where such potentially 'special' deposits are particularly abundant; the reports on assemblages from Danebury (Grant 1984c) and the Danebury Environs sites (Hamilton 2000a, b, c, d, e and f) provide good examples of such discussion. However, it is beyond the scope of the database and remit of this review to fully investigate all these permutations, so researchers will need to return to the published reports and site archives to undertake further detailed studies. Nevertheless, the database does serve to highlight those assemblages where ABGs/special deposits have been recognised, and also to provide a brief characterisation of these groups.

Of the 108 bone reports covered by the review, 70 reports included some mention of associated bone groups and/or 'special' deposits within the faunal assemblage. It should be borne in mind that this is an indication of the prevalence with which Associated Bone Groups of faunal remains or special animal bone deposits are *reported* in the literature, rather than any real indication of their *actual* prevalence in the zooarchaeological record. After all, such animal bone groups may well have occurred on sites without ever having been mentioned in the bone report. This may be because such details were edited out of the bone report before publication, or even because potential special deposits noted during excavation were not brought to the attention of the faunal analyst. For some assemblages therefore, the significance of particular finds of ABGs, or even single bones, may never have been addressed by the zooarchaeological report. Nevertheless, those reports that include mention of such ABGs and/or special deposits do provide a basis from which one may begin to investigate their occurrence. Of the 150 assemblage records in the database, some form of ABG or special deposit was noted from 99 (66%) of these assemblages. These ABGs come in many forms. They may range from single instances of small rodent skeletons, which are most convincingly explained as the accidental victims of pitfalls, to multiple large-scale deposits of domestic mammal skeletons or body parts, which provide compelling evidence of ritual and/or religious activity and significance by the nature of their unusual composition and/or archaeological context. The special significance of ABGs (and individual bones) may be linked to their associations with particular artefacts, structures, or broader site location.

5.4.1 Interpretation of ABGs

It is indisputable that 'ritual' explanations for ABGs have become more common in the faunal literature since the publication of Grant's work on the Danebury assemblage in 1984. Comparison of the publication dates of site reports in the regional review dataset, where ABG/specials were present, against the interpretations assigned to these groups, shows that prior to the publication of Grant's (1984c) work on the Danebury assemblage, 'special/structured' interpretations were very rare, whereas after 1984 a

much higher proportion of ABGs and other notable bones were interpreted as 'special/structured' deposits. This is not to say that as a consequence of Grant's publication of the Danebury material faunal analysts have favoured ritual explanations; after 1984, interpretations of 'normal/chance' and 'mixed' interpretations also became more common, compared to earlier studies where the majority of ABG/special groups remained 'unspecified'. Thus Grant's work has stimulated debate and precipitated attempts to provide explanations for the presence of ABGs, giving full consideration to both 'ritual' and 'functional' explanations. More detailed study of the interpretations provided for individual ABGs may also reveal the impact of other theoretical approaches, such as that of Hill (1995) (Morris in press).

5.4.2 Site type and period

Wait (1985: 137) observed differences between the EIA, MIA and LIA periods in the species, type and abundance of ABGs/special deposits, and in their prevalence on hillforts compared to other settlement types. Wait's evidence of such variations was limited by the small size of his sample, particularly for the LIA, but his observations would benefit from further detailed investigation of a large sample of assemblages. There is potential among the faunal reports included in this review for examining chronological and site type variations in the abundance and character of individual ABGs/special deposits within the LBA-LIA period. However, although many site reports do provide information about ABGs for each sub-period, several reports only assign ABGs to the broader 'Iron Age' period. Similarly, there may be problems in effectively categorising site-type for each assemblage (cf. section 1.7.3). As mentioned above (section 5.3), the review database was limited to records of general assemblage level presence/absence of ABG categories, rather than quantitative records of individual ABGs/special deposits. As a result of this, the capacity for examining chronological variation in ABG/special deposit abundance, character and composition throughout the LBA-LIA period is limited by small sample size once the dataset has been further subdivided according to sub-period or site type. For the purposes of this review all the ABGs and special deposits have therefore been considered as a single LBA-LIA period group and no differentiation has been made between site-type when considering ABGs/special deposits. It is important to remember that such a broad period grouping encompasses a diverse range of social and religious activity, and that subtleties of chronological and cultural patterns may be lost when investigating these ABG data for trends in character and interpretation.

5.4.3 Location of special deposits

The review database is restricted to broad, assemblage-level observations of ABGs, so, although frequently commented upon, no systematic record was made of the location and feature in which individual ABG/special deposits were found. Location of special deposits is clearly a potentially fruitful area for further investigation. General observations of the reports revealed that ABGs are commonly reported from pits, and apparently less commonly from ditches and other feature types. Assemblages from Danebury and other sites in its environs, clearly demonstrate that Iron Age ABGs/special deposits in the region are recovered predominantly from pits (Cunliffe 1992; 1995:72-88; 2000:128-134). Nevertheless, ABGs and potentially 'special' deposits do occur in other features. For example, Wilson (1979a) interpreted a pair of horse skulls from the entrance terminals of a hut at Farmoor as a ritual deposit. At Tuckwells Pit (Wilson 1998), a horse skull and sheep mandibles from the enclosure gullies, and a

dog skull from the well were also interpreted as potential special deposits. ABGs are observed from ditches and layers; partial skeletons of dogs were recovered from the enclosure ditches at Barton Court Farm (Wilson 1984), Watkins Farm (Wilson and Allison 1990) and Balksbury Camp (Maltby 2001b), and numerous calf skeletons were recovered from layers at Cadbury Castle (Hamilton-Dyer and Maltby 2000). Smaller ABGs are also common from ditches, for example the small groups of articulating cattle bones reported at Hallen (Hamilton-Dyer 2002b), Easton Lane (Maltby1989) and Duntisbourne Grove (Powell 1999).

More significantly, there is a greater tendency for ABGs from pits to be *interpreted* as special compared to ABGs from other features. Pit location is seen as an intrinsic part of symbolic/ritual deposits (Cunliffe 1992; Wait 1985). Wilson (1992:342) highlights the fact that in characterizing Iron Age special animal deposits, Wait (1985) unaccountably dismisses evidence for special deposits from gullies and ditches, concluding that, "*special deposits occur only in pits'* (*ibid*. 151). Hill (1995) challenges the assumption that deposits in ditches are 'functional' whereas those in pits are 'ritual'. Certainly the current situation appears to be that one legacy of the work of Grant, Wait, and Cunliffe is that ABGs from pits are much more likely to be interpreted as 'ritual/special' than those from ditches, despite Hill's demonstration that structured deposition occurs in ditches as well as pits.

The importance of the location of ABGs *within* features is an area that has been under researched, although it is covered by some faunal reports. Grant (1984c:539) draws attention to the location of special deposits at the bottom of the Danebury pits, and ABGs in the primary fills of pits are similarly noted from other sites in the region, such as Suddern Farm (Poole 2000:145) and Flagstones (Bullock and Allen 1997). The location of ABGs at the bases of pits is highlighted by Cunliffe (1992) in his discussion of proprietary deposits. However, to assume that ritually significant ABGs only occur in basal deposits is naïve, since similar groups are also found in the middle and upper layers of features. For example, ABGs of cattle limbs, sheep limbs and skulls were present in the middle layers of a pit at Lains Farm (Coy 1991), and one of the most significant 'special' deposits from Battlesbury Bowl (Hambleton and Maltby unpub.) was a collection of cattle and horse skulls from the middle fills of a ditch. Furthermore, most of the special deposits noted during excavations at Bury Hill were from the upper layers of pits, none at the bottom (Hamilton 2000b). The importance of considering the character of ABGs in relation to their location within features is further highlighted by the assemblage from Nettlebank Copse (Hamilton 2000e) where the composition of ABGs from the lower fills of pits, which were characterised by limbs and skeletons, differed from the ABGs in the upper fills, which comprised mainly skulls and mandibles.

5.4.4 Preservation and retrieval

The extent to which abundance of ABGs in pits, compared to other features, may be the result of taphonomic factors is also a matter for continuing debate (Wilson 1992, 1996). The question may be raised as to whether ABGs more commonly are the result of favourable preservation conditions than of deliberate selection and deposition. At Winnall Down and Balksbury, Maltby (1985a;1995a) demonstrated that bone preservation was better in the bottom layers of deeper features. This might suggest that the tendency to find well preserved undisturbed bone groups at the bases of pits may at least in part be due to the fact that similar ABGs deposited elsewhere have simply failed to survive in a recognisable form.

The sampling strategy employed during excavation may also be a barrier to recognising and interpreting ABGs or special deposits. The standard practice of excavating short sections of ditches and half or quarter sections of large pits can lead to problems when partial skeletons are recovered. There can be ambiguity over whether carcasses were deposited in an incomplete state or whether the missing elements were originally deposited but remain in the unexcavated section. There is potential for recovery bias against disarticulated ABGs, since articulated bone groups are easier to recognise and more likely to prompt further excavation to ensure complete retrieval. This bias may be exacerbated if it is expected that ABGs and special deposits will be in the form of articulated remains, since when such articulated groups are found they will be more thoroughly excavated. Prejudgement may also compound the problem by targeting particular features such as entrance terminals and pit bottoms where one might expect to find special deposits. If an excavator is more alert to the possibility of special deposits in a particular feature then groups of articulated remains and other ABGs are more likely to be recognised in these features than if they occur outside these expected locations.

5.4.5 Representation of species and ABG categories

Table 5.1 shows that a much smaller suite of species were present in the form of ABGs/special deposits than were present generally in LBA-LIA assemblages from the region. Domestic species predominate among the ABGs as they do in the overall assemblage compositions. Wild species are much less common, as are birds, small mammals and other taxa. The following sections will discuss the nature of ABGs for the main taxonomic groups (Large and medium mammals, birds, small mammals). Reflecting their abundance relative to other taxa, detailed discussion of ABGs composition, character and interpretation will focus on the main domestic mammals.

5.4.5.1 Large and medium mammals

ABGs of large and medium mammal species were reported from 92 assemblages. The main domestic species (cattle, sheep, pig, horse and dog) occurred as ABGs far more commonly than other species. Cattle were noted for the greatest number of assemblages (60), followed closely by dog (54), with horse (51) and sheep/goat (49) ABGs present in a similar numbers of assemblages. Pigs were much less frequently present in the form of ABGs, with only 26 assemblages. ABGs of species other than the main domesticates, were only present in 16 assemblages. ABGs of cat (all interpreted as domestic) were present in assemblages from four sites. Among the regional Review dataset, foxes were probably the wild species most commonly present as ABGs; examples of complete and partial fox skeletons were noted in eight assemblages from at least seven different sites. Red deer ABGs were only recorded for two Iron Age assemblages. Badger and hare were the only other wild species present in the form of ABGs.

Table 5.1: Overall number of assemblages with taxa present compared to overall frequency of assemblages with taxa occurring in the form of ABGs.

Taxa	no. of assemblages where taxa present	no. of assemblages where taxa occurs as ABG	% assemblages where taxa (if present) occurs as ABG
All taxa	150	99	66%
sheep/goat	150	49	33%
cow	149	60	40%
pig	149	26	17%
horse	143	51	36%
dog	132	54	41%
red deer	105	2	2%
roe deer	50	0	0%
fox	45	8	18%
hare	32	1	3%
cat	32	4	13%
rabbit	23	0	0%
badger	18	1	6%
pine marten	5	0	0%
cetacean	5	0	0%
beaver	4	0	0%
otter	4	0	0%
polecat	4	0	0%
wild boar	4	0	0%
fallow deer	3	0	0%
seal	2	0	0%
bird	114	23	20%
small mammal	88	22	25%
amphibian	65	12	18%
fish	31	0	0%

Wait (1985:129) noted, in his study of Iron Age special animal deposits, that representation of species among special deposits was not the same as the relative abundance of these species among the overall faunal assemblage from a site. (i.e. the 'domestic' record differed from the 'ritual' record in terms of relative abundance of species). This was particularly apparent in the case of horse and dog, which were over-represented in the 'special' record compared to the remaining faunal record, and pig, which appeared under-represented in 'special' deposits. Although absolute numbers of species were not recorded for the ABG/special deposits as part of this review, the presence/absence data for the main domestic species present in each assemblage, compared to the presence/absence data of species represented by ABGs, paints a similar picture (Table 5.2). Among the 99 assemblages where ABGs of any taxa were noted, cattle, sheep/goat and pig were almost universally present in the assemblage as a whole (present in 99-100% of all assemblages), while horse (97%) and dog (93%) were only slightly less common occurrences (Table 5.2, section a). Whereas the presence/absence records for species among the ABG deposits themselves (Table 5.2, section b) reflect Waits observations; dog was present as an ABG deposit in 55% of all assemblages for which ABGs/specials were reported, second only to cattle (61%). Despite occurring less commonly overall than the omnipresent sheep, horse was present as ABGs in 52% and sheep only present as ABGs in 49 % of assemblages with

ABG deposits. Pigs, despite being present in the majority of assemblages, were only present in the form of ABGs in 26% of assemblages.

Table 5.2: Overall presence of domestic species in assemblages where ABGs present compared to presence of domestic species as ABGs within the same assemblages.

		cattle	sheep/ goat	pig	Horse	dog
a) no. of assemblages where species present (from all assemblages where ABGs noted) n=99	No.	98	99	98	96	92
	%	99%	100%	99%	97%	93%
b) no. of assemblages where species present as ABG n=99	No.	60	49	26	51	54
	%	61%	49%	26%	52%	55%

This discrepancy in species representation between the overall 'domestic' assemblage and the ABG 'special' assemblage has been interpreted as indicating that horse and dog have a special ritual, religious or symbolic significance which might account for their common appearance on sites in the form of ABGs/special deposits (Wait 1985:152). Grant (1984b; 1984c) has suggested that horse and dog in particular may have been among the most commonly selected species for sacrificial deposits because Iron Age communities did not heavily exploit these species as a food source. Their sacrifice therefore resulted in less of an intrinsic economic loss to the community than, for example, the deposit of a whole or partial carcass of cattle or sheep. This argument presupposes that such ABGs of horse and dog are indeed 'special' sacrificial offerings. However, a more functional explanation for the prevalence of horse and dog ABGs may be suggested.

Horse and particularly dog were not as commonly exploited for food during the late Bronze Age to Late Iron Age, compared with other domestic species, so butchery and further processing of horse and dog carcasses was less common. As a consequence of this, horses and dogs would more commonly have been deposited intact and therefore more likely to survive in the archaeological record in the form of ABGs than the more heavily processed carcasses of species utilised more regularly for food. In a similar vein, the less common presence of pig ABGs could be taken to indicate a less significant ritual/symbolic role for this species, at least in the context of domestic settlement. However, while pigs may not be particularly well represented among ABGs, there is nevertheless still evidence for pig 'special' deposits during the later prehistoric period in southern England in the form of grave and pyre goods (e.g. at Westhampnett; McKinley *et al* 1997), and the location and spatial orientation of pig deposits on some IA settlement sites may also have symbolic or ritual significance (Parker-Pearson 1996: 127-128).

The species presence/absence data from ABG-bearing assemblages apparently supports Wait's observations that certain species (horse and dog) are better represented, and other species (pig) are more poorly represented, among ritual deposits than among the 'normal' domestic faunal assemblage. However, a closer look at the data suggests that cultural selection associated with ritual and symbolism may in fact have been less important than other taphonomic factors in determining which species survived as ABGs. The % presence values for the main domestic species varied less where those

domestic species were present as ABGs interpreted as 'special' by faunal analysts (Table 5.3, section a) than where the ABGs were interpreted as normal/chance occurrences (Table 5.3, section b). The discrepancies, similar to those noted by Wait, between overall species occurrence and the occurrence of those species as ABGs (e.g. very low occurrence of pig as ABGs and very high occurrence of dog as ABGs) are actually more pronounced among those ABGs groups interpreted as 'normal/chance' occurrences, than among those ABGs interpreted as 'special'. This would suggest that normal 'domestic' taphonomic factors have a greater role than ritual/symbolic cultural selection in determining which species are deposited or preserved as ABGs, or complete skulls, or other apparently 'special' or 'ritually significant' faunal deposits. It may also suggest that some of the deposits Wait interpreted as 'ritual' may in fact result from more 'normal' domestic taphonomic processes.

Table 5.3: Frequency and % occurrence of main domestic species presence in assemblages with ABGs, grouped according to interpretation.

		cattle	sheep/ goat	pig	Horse	dog
a) No. of assemblages where species present as ABG interpreted as 'structured/special' n=18	No.	14	11	10	13	13
	%	78%	61%	56%	72%	72%
b) No. of assemblages where species present as ABG interpreted as 'normal/chance' n=24	No.	16	15	6	11	15
	%	67%	63%	25%	46%	63%

A key impression gained from reviewing the faunal reports is that the character and composition of ABGs varied between species. This is a view shared by previous studies of special animal deposits (Grant 1984c; Wait 1985; Hill 1995). Without systematic recording for each ABG details of its composition, location and associations with other ABGs it is not possible to undertake a quantitative analysis of the similarities and differences in ABG character between species. The general observations made nevertheless provide an overview of the main characteristics of ABG/special deposits apparent for the main domesticates and other large and medium mammal species.

5.4.5.1.1 Cattle

Associated Bone Groups of cattle were reported from 60 assemblages. These ABGs take a variety of forms. Complete cattle burials are noted from several sites, for example, a complete cattle burial from Watchfield (Hamilton-Dyer 2002a), and the well-known skeletons of a complete adult female cow skeleton with perinatal calf from Gussage-all-Saints (Harcourt 1979). Complete cattle burials were particularly abundant at Cadbury Castle, where, in addition to two adult individuals, around 30 neonatal calves were deposited in the vicinity of the shrine (Hamilton-Dyer and Maltby 2000). This predominance of very young individuals amongst the complete cattle burials is also apparent at Danebury where 11 of the 14 cattle skeletons noted belonged to neonatal or infant calves (Grant 1984c:533).

Incidences of complete cattle burials are, however, the exception to the norm among cattle ABGs on Iron Age sites from the region where they more commonly occur in the form of small groups of associated bones or individual skulls. There are numerous examples of single and multiple deposits of ABGs of postcranial cattle remains. These

groups often show evidence of butchery marks, or comprise groups of elements that typically result from particular stages of carcass processing. As such, these ABGs tend to be the ones most commonly interpreted as 'normal' domestic refuse, although 'special' interpretations of these processed remains, as refuse from 'feasting', are not uncommon. For example, a group of partial cattle skeletons representing the processed carcasses of approximately six cattle were found at Watchfield and interpreted as the possible remains of a feast (Hamilton-Dyer 2002a). Articulated cattle limbs appear to be relatively rare; only three cattle articulated limbs are reported from the 1969-78 excavations at Danebury (Grant 1984c:540), although there are examples from other sites such as Middle Farm (Bullock and Allen 1997) and Old Down Farm (Maltby 1981b). Cattle ABGs are more common in the form of smaller groups of articulating vertebra and/or ribs, e.g. at Watkins Farm (Wilson and Allison 1990), and groups from smaller sections of articulated limbs, such as upper limbs, feet, or elbow and hock joints, e.g. at Duntisbourne Grove (Powell 1999).

Numerous site reports note the presence of single or multiple deposits of cattle skulls, and they are among the most common type of cattle ABG to be interpreted as 'special' deposits. At Danebury for example, 29 cattle skulls were noted among the 'special' deposits (Grant 1984c:537), which was more than double the number of complete cattle skeletons noted from the same assemblage. Many reports interpret cattle skulls as 'special' for a variety of reasons. These include the apparently careful and deliberate 'placing' of cattle skulls, e.g. at Bicester Fields Farm (Charles 2000) and Tolpuddle Ball (Hamilton-Dyer 1999); and their location in pits, e.g. at Balksbury Camp (Maltby 1995a) and Halfpenny Lane (Lovett 1991). Cattle skulls bearing cut marks are remarked upon e.g. at Cadbury Castle (Hamilton-Dyer and Maltby 2000) and Battlesbury Bowl (Hambleton and Maltby unpub.), and are potentially 'special' as they may have been cleaned up for display purposes. Some cattle skulls are more confidently interpreted as 'ritual' or 'special' than others. For example, the cattle skull from Watchfield (Hamilton-Dyer 2002a) was confidently interpreted as a ritual deposit because it was found with a human skull, while at Hawk's Hill, in the absence of any evidence to the contrary (and prior to the influence of Grant's (1984b and c) writings on 'special deposits') the authors prefer to interpret cattle skulls in pits as part of the everyday occupation debris (Carter *et al* 1965).

5.4.5.1.2 Sheep/goat

Associated Bone Groups of sheep or goat were present in 49 assemblages. Although present in fewer assemblages than cattle, this disguises the fact that the frequent multiple occurrences of ABGs of sheep on Iron Age sites from the region means they are more common than for cattle. On settlement sites, goats are occasionally noted among the ABGs, e.g. at Poundbury (Buckland-Wright 1987) and Owslebury (Maltby 1987a), but on the whole goats are infrequent finds and sheep by far outnumber them among the ABGs. Indeed some goat finds, such as the worked goat horn cores from Suddern Farm (Poole 2000:146), may simply be considered 'special' deposits because of their rarity. As with cattle, a range of different sheep/goat ABG types is represented among the reviewed assemblages. Generally, skulls are among the least common form of sheep ABG. It may be that the presence of sheep skulls in an assemblage is under reported as they are simply less likely to evoke specific written comment than the larger, more striking finds of horse or cattle skulls. Nevertheless, sheep skulls are specifically noted among the ABGs and special deposits in assemblages such as those from Danebury (Grant 1984c) and Slonk Hill (Sheppard 1978).

Articulated limbs are present among the sheep ABGs, but individual complete limbs are not especially common. More frequently just the articulated lower limbs (feet) are present. This is certainly true at Danebury where eight of the 10 articulated sheep limbs noted among the reported special deposits were ABGs of lower limbs (Grant 1984c: 540). Small ABGs of feet, or other parts of the carcass such as vertebrae and ribs, are present at other sites, e.g. Quarry Field, Compact Farm (Clark 2002) and Groundwell West (Hambleton 2001). Such groups tend to be more likely to be interpreted as normal domestic refuse from butchery and carcass processing and are less commonly attributed as 'special'.

The most frequently observed sheep ABGs take the form of complete or substantial parts of carcasses. These deposits are sometimes the remains of single individuals, e.g. the adult female sheep skeleton from Quarry Field, Compact Farm (Clark 2002) or the partial skeleton of a lamb from Ham Hill (Hamilton-Dyer 2001). However, it is very common for the complete or partial skeletons of several sheep to be deposited together (sometimes in association with ABGs of other species). Such large multiple deposits are evident at Old Down Farm where there were several large multiple deposits of complete and part skeletons of neonatal and partially butchered older sheep, including one deposit of ABGs from at least 12 individuals (Maltby 1981b). Other sites such as Whitcome (Buckland-Wright 1990) produced similar large groups of individuals, while on other sites smaller groups of two or three individuals are more common, e.g. Poundbury (Buckland-Wright 1987) and Battlesbury Bowl (Hambleton and Maltby unpub.). As is the case with cattle and pigs, a high proportion of the sheep/goat complete and part skeletons belonged to neonates and infants. This is illustrated in the 1969-78 Danebury assemblage where 17 of the 26 sheep skeletons noted belonged to neonatal or infant lambs (Grant 1984c:533).

5.4.5.1.3 Pig

Pig ABGs were present in only 26 assemblages. The impression is that ABGs of pigs are not especially common on settlement sites compared to the other domestic species. Where present, the ABGs tend to belong to the partial or complete skeletons of juveniles, amongst which neonatal or infant individuals predominate. Articulated limbs and other smaller ABGs are uncommon. This pattern is epitomised at Danebury where 14 out of the 22 pig burials assigned as special deposits were neonates or infants, and in addition only one articulated limb group was recorded (Grant 1984c: 533; 540). Multiple pig burials do occur; for example, five very young pigs were deposited together in a pit at Hawk's Hill (Carter *et al* 1965). There are few accumulations of obviously processed carcasses, although the group of three partial pig skeletons without longbones at Bishopstone is indicative of the carcasses having been processed and joints of meat removed (Gebbels 1977). Rather than in domestic settlement contexts, the best examples of associated groups of pig remains with a ritual interpretation from the Iron Age of southern Britain all occur in human burial contexts such as those at Portesham (Fitzpatrick 1996), Westhampnett (McKinley *et al* 1997), and Alington Avenue (Maltby 2002a).

5.4.5.1.4 Horse

Horse ABGs were reported from five of the reviewed assemblages. The horse ABGs are predominantly the remains of adults. Complete and partial horse skeletons do

occur within the review dataset; for example, at Runnymede Bridge a complete adult horse was buried in a pit with its forelimbs unusually positioned (Done 1991). However, complete horse burials are rare on LBA-LIA settlement sites throughout the region. This rarity is reflected at Danebury, where only three adult horse skeletons were noted among the quantified special deposits (Grant 1984c: 533).

The review dataset gives the impression that articulated limbs are a relatively more common form of ABG among horses than among other species. Certainly among the special deposits quantified from Danebury, articulated limbs are more common for horse than for any other species (Grant 1984c: 540). ABGs of articulated upper limb bones, such as the horse hind limb from Ashville (Wilson *et al.* 1978), are less common than groups of articulated lower limb bones, e.g. at Houghton Down (Hamilton 2000f). Small ABGs from the trunk, such as the group of horse vertebra from Pimperne (Barnetson 1993), are reported less frequently than articulated limbs. The low incidence of trunk ABGs may result from the fact that ribs and vertebrae from large mammals are less often identified to species than appendicular elements. However the general impression form the reviewed faunal reports is that where large mammal vertebrae and ribs are found as articulated ABGs these elements are more likely to be identified to species than when they are recovered as disarticulated and isolated remains.

Skulls are the most common type of horse ABG, occurring either as single deposits or multiple deposits e.g at Bicester Fields Farm (Charles 2000) and Winklebury Camp (Jones 1977). Grant's (1984c) discussion of the special deposits from Danebury also indicates that skulls were the most common form of horse ABG; 27 horse skulls were noted (Grant 1984c: 537). A further 11 complete, isolated horse mandibles were also treated as a special category at Danebury (Grant 1984c: 538), which is a practice that other authors have subsequently followed. Horse skulls are often found deposited in association with cattle skulls, e.g. at Battlesbury Bowl (Hambleton and Maltby unpub.) and Chalton (Startin 1976). As is the case with cattle, many of the horse skulls are interpreted as 'special' due to their relative abundance, location, evidence of careful 'placement', and/or evidence of careful cleaning, e.g. at Farmoor (Wilson 1979a).

5.4.5.1.5 Dog

Dog ABGs were reported from 54 assemblages. The general impression is that complete and partial skeletons appear to be by far the most common form of dog ABG reported among the reviewed assemblages, while isolated skulls are less common, and ABGs of articulated limbs are extremely rare This general pattern differs somewhat from the quantified dog special deposits from Danebury, where 11 dog skulls outnumbered the eight complete and partial dog burials, although there were no articulated limbs (Grant 1984c: 535-537). At Danebury, no multiple dog burials were reported among the ABGs, of which the majority were juvenile or adult and none belonged to neonates (*ibid*). Nevertheless, on other LBA-LIA sites from the region, dog complete and partial skeletons often occur as groups of multiple individuals, many of which include a high proportion of neonates. One explanation put forward for the presence of multiple neonatal dog skeletons at sites such as Balksbury (Maltby 1995a) and Flagstones (Bullock and Allen 1997) is that they represent deliberate culls of litters of puppies as a means of population control. Complete and partial skeletons of single individuals do occur, for example at Little Somborne (Locker 1979) and Budbury (Westley 1970). The general impression from the review dataset is that, among dog ABGs, multiple groups of dog skeletons tend to be frequent and that these multiple

groups tend to be predominantly puppies, while single dog skeletons tend to belong to adults or older juveniles.

Many of the whole and partial dog skeletons show no sign of having been butchered, but some dog ABGs do show signs of butchery and carcase processing. For example, the partial skeleton of a butchered dog was recovered at Quarry Field, Compact Farm (Clark 2002), and at Tolpuddle Ball (Hamilton-Dyer 1999) a dog's head and feet with cut marks were interpreted as skinning waste. Small ABGs of dog bones are less common than complete/partial skeletons, but in several cases are reported as deliberate 'special' or ritual deposits, for example the two paws of a large dog found at Bury Wood Camp (Bunting *et al* 1963), or the severed dog skull from Appleford (Wilson 1980). As is the case with other species, dog ABGs are likely to be interpreted as 'special' when found in association with human burials e.g. at Dibbles Farm (Gamble 1988), or with unusual artefacts. For example 'ritual' interpretations of dog ABGs were applied at Bramdean, where dog skeletons were found buried with fossil sea urchins and sponges (Clutton-Brock 1982), and at Slade Farm, where a partial dog skeleton was found in a pit with MIA pottery vessels and an EIA (possibly curated) razor (Hammon 2001). In the case of the dog skull and baculum deposited together at Suddern Farm (Hamilton 2000c), it is the remarkable combination of body parts that is considered special.

5.4.5.1.6 Other large and medium mammals

Associated Bone Groups belonging to large and medium mammal species other than the five main domesticates were rare, and were recorded for only 16 of the reviewed assemblages. The majority of these ABGs appear to be complete or partial skeletons which represent the remains of individuals deposited as complete carcasses. Iron Age assemblages from Danebury (Grant 1984c) and Owslebury (Maltby 1987a) each yielded a cat skeleton, while Gussage-all-Saints (Harcourt 1979) and Whitcombe (Buckland-Wright 1990) each produced a deposit of multiple ABGs of immature cats. A neonatal red deer skeleton was recovered from a pit at Danebury (Grant 1991a:482), and an adult stag was recovered, along with the remains of 12 foxes, from a pit at Winklebury (Jones 1977: 64). The large deposit of wild species at Winklebury was described by Wait (1985:138) as a 'unique special deposit' for this period in England. Certainly, wild species are generally uncommon in faunal assemblages from the middle/late Bronze Age and Iron Age periods in southern England, and are only rarely found present as ABGs. The Winklebury assemblage provides the only example from the regional review dataset of a large deposit of multiple ABGs of wild animals.

5.4.5.2 Birds

Associated Bone Groups of bird species were recorded for 23 of the reviewed assemblages, although many of these assemblages represent different period groups from the same site (e.g. Danebury and Owslebury). Bird ABGs from LBA-LIA sites from southern England include a range of species. Ravens are the most commonly reported bird species present as ABGs (ABGs of raven were present in13 assemblages from six different sites). Other corvids (crow and/or rook) are present as ABGs in eight assemblages from five different sites. Other wild bird species occur much less commonly; single ABGs of cormorant, buzzard, house sparrow and kestrel were present, each on a different site. The skeleton of a possible hawk/falcon was also noted at Pimperne (Barnetson 1993) but was not further identified to species. Domestic fowl

are also present as ABGs and/or special deposits in 6 assemblages from five different sites.

Among the reviewed assemblages, bird ABGs occur predominantly in the form of complete/part skeletons, although smaller ABGs were present at Danebury in the form of several raven wings (Coy 1984: 530). Some symbolic significance may be ascribed to deposits of wings if they resulted from deliberate selection. However, Coy argues that taphonomic factors such as the heavy ligamentation of the wing or the manner in which bird carcasses are butchered may account for the greater tendency for wing bones to be found articulated and intact (*ibid*). It is possible that where reports lack details of the composition of bird ABGs, sometimes the term 'part skeleton' may include isolated wings and other such small ABGs. The only other type of 'special' deposit noted among the bird bone assemblages is the accumulation of domestic fowl bones from the Uley Shrines, which, along with the remains of sheep and goat, are considered to be the remains of votive offerings (Levitan 1993).

Most bird ABGs from the reviewed assemblages are considered to be 'normal' chance deposits of wild species that died naturally on or around the site before being accidentally incorporated into the archaeological record. For domestic fowl ABGs, the interpretation of such remains as structured or 'special' deposits is closely dependant on context. For example, 'special' interpretations are assigned to domestic fowl when present in a clearly religious context such as at the Uley Shrines (Levitan 1993), when in association with other animal special deposits as at Houghton Down (Hamilton 2000f), or when grave goods in a human burial context as at Whitcombe (Buckland-Wright 1990). In addition to the few burials from Whitcombe, domestic fowl are present as grave goods in later Iron Age Durotrigian burials at Alington Avenue (Maltby 2002a). Examples of domestic fowl associated with funerary contexts are also seen outside the region in the cremation burials at King Harry Lane (Stead and Rigby 1989). However, in other LIA inhumations and cremation burials from the region, such as Maiden Castle, Poundbury and Westhampnett, domestic fowl are much less common (Maltby 2002a: 170).

The scavenging habits of ravens and other corvids are well known and may explain their relative abundance on settlements and their incorporation into the archaeological record (Coy 1984:530). Nevertheless because the raven is recognised as having symbolic importance in Celtic mythology and religion (Green 1992), there is a case to be made for raven remains having ritual significance (Cunliffe 1997:196). Among the reviewed assemblages, very few raven ABGs are unequivocally 'functional' or 'ritual' and interpretations are usually mixed. As with other species, it is the context of the raven deposits that is used to support 'special interpretations. For example, the association of ravens with other special animal groups in pits at Danebury (Grant 1984c: 540), or the apparent careful positioning of the 'spreadeagled' raven skeleton from Winklebury (Jones 1977; Green 1992).

5.4.5.3 Small mammals and other taxa

Small mammal ABGs were present in 22 assemblages from 17 different sites and amphibian skeletons were present in 12 assemblages from eight sites. The small mammal and amphibian ABGs are all complete and partial skeletons and usually represent groups of multiple individuals. The amphibian ABGs all belong to species of frog and toad. With the exception of three weasels from Maiden Castle (Armour-Chelu

1991), the small mammal ABGs all belong to rodents, including common native species of mouse, vole and shrew. Most small mammal ABGs in the reviewed assemblages are thought to be contemporary with the deposits in which they were found, one notable exception being the intrusive house mouse (*Mus*) skeleton recovered from a Middle Bronze Age context at Brean Down (Levitan 1990).

A common explanation for many of the small mammal remains in pits, e.g. at Easton Lane (Maltby 1989) and Lains Farm (Coy 1991), is that they represent 'pitfall' victims that fell into the pit and were unable to climb out. It is also possible that some of the small mammals and amphibians may have been resident in the features from which they were recovered. Coy (1984:526-7) suggests that some of the small mammal groups from Danebury pits, particularly the large accumulations of *Microtus* and *Apodemus*, may be the remains of bird pellets dropped by owls or buzzards perching on poles adjacent to open pits. None of the small mammal or amphibian ABGs are interpreted as special or structured deposits; where interpretations are given, the small mammal and amphibian ABGs are all thought to represent normal/chance accumulations.

5.5 Religious sites

There are a small number of faunal assemblages considered by this review which are regarded by the faunal analysts as being unequivocally religious or ritual in nature, coming as they do from the Celtic shrines or temples at Hayling Island, Hampshire (Downey *et al* 1979; King and Soffe 1998) and Uley, Gloucestershire (Levitan 1993). The 'votive' faunal assemblages are distinguishable from domestic refuse by their location within the temple precinct and their associations with other votive artefacts. However, the most striking characteristic of the 'votive' assemblages from Uley and Hayling Island is that both suggest a high level of selectivity in terms of species and to some extent age group (King and Soffe 1998:41). The Hayling Island assemblage is dominated by sheep and pig remains, with little or no evidence of the cattle remains one would expect to see on a contemporary settlement site. The votive assemblage from the Uley shrines is less strongly biased towards particular species, but juvenile sheep/goat are abundant in a number of 'ritual' pits, and goats are more common than on other contemporary sites (Levitan 1993:274). The votive assemblage from subsequent Romano-British phases at Uley comprise almost exclusively goat (and to a lesser extent, sheep) and domestic fowl (Levitan 1993). The predominance of sheep/goat remains is apparent in the LIA-ERB faunal assemblages from other comparable LIA-ERB religious sites outside of the region, for example at Harlow Temple in Essex, where the faunal assemblage is dominated by the remains of juvenile sheep slaughtered in the autumn of their first year (Legge and Dorrington 1985; Legge *et al.* 2000). At Hayling Island the sheep and pig votive offerings appear to have taken the form of the prime meat cuts and skulls (King and Soffe 1998:42). At Uley, Levitan (1993:266) suggests the deliberate selection of goats and fowl is clearly of ritual significance as there is compelling evidence from other artefacts from the site indicating the importance of goat and cockerel in association with the deity Mercury.

The religious sites at Hayling Island and Uley clearly indicate that animals were important as votive/sacrificial offerings, and that the deliberate selection of species, body parts and age groups may also have had some ritual significance (King and Soffe 1998; Levitan 1993). However, the assemblages reviewed from these two sites are Late Iron Age – Romano-British in date and cannot therefore be considered characteristic of earlier Iron Age and Bronze Age ritual/religious practices associated with animals.

Furthermore, the specific religious/ritual nature of the Hayling and Uley Shrines sites makes them difficult to compare with other evidence of ritual animal deposits from the LBA-LIA period, which comes predominantly from settlement sites.

Some settlement sites such as Danebury and Cadbury Castle, do have evidence for possible ritual/religious 'shrines' (Wait 1985:194), but there is no clear evidence of animal remains in direct association with these structures. However, the numerous neonatal calf burials from Cadbury are located close to the shrine so may be associated ritual deposits (Hamilton-Dyer and Maltby 2000). If the calf burials from Cadbury are ritual deposits associated with a shrine, then they do share some similarities with the votive offerings from Hayling Island Temple and the Uley Shrines in that they are dominated by the similarly aged juvenile remains of a single species; however this is purely conjecture in the absence of a direct stratigraphic relationship between the calf burials and the possible shrine structure.

The Wilsford Shaft (Ashbee *et al* 1989) is the only other reviewed site that might be considered to be a specifically ritual/religious site. The deep shaft has been interpreted either as a Middle Bronze Age ritual shaft or a functional well (*ibid*), although these two interpretations need not be mutually exclusive. The animal bone assemblages from the shaft, especially in the MBA deposits, are mostly comprised of associated bone groups, particularly foetal/neonatal sheep skeletons and the heads and feet of older individuals (Grigson 1989). Grigson (1989) suggests these remains indicate unusual discard behaviour and suggests they may be ritual deposits, but also suggests other, functional, interpretations and points out that other faunal remains from the shaft are clearly domestic rubbish.

5.6 Discussion

It is apparent from this review that groups of associated animal bones (ABGs) are frequently reported among the published LBA-LIA faunal assemblages from southern England. These animal bone groups are often specifically remarked upon in the published reports because, as highlighted by Grant (1984b and c), Wait (1985) and Hill (1995), such remains have the potential to provide evidence of ritual activity in the form of 'special' deposits, possibly votive or sacrificial offerings. In order to survive together intact in the archaeological record, groups of associated or articulated bone from the same individual must have experienced a different taphonomic history from the damaged and disarticulated material that more usually represents the remains of day to day exploitation, disarticulation, dispersal and disposal of animal remains. One explanation is that some animals, or parts of animals, were deliberately deposited and buried as part of a 'ritual' act, and this 'special' treatment resulted in their survival in the archaeological record in the form of ABGs. However other, more mundane, domestic activities may also explain the deposition and survival of whole and part skeletons. When interpreting such remains it is therefore important to consider all of the possible taphonomic factors, including 'ritual' behaviour, which may account for the deposition and preservation of specific bone groups.

The majority of ABGs reported belong to the main domestic mammal species (cattle; sheep; pig; horse; and dog). Skulls, whole skeletons, and smaller groups of articulated bone from isolated body parts (particularly limbs), are the main types of ABG category noted among the assemblages, although the frequency of such categories does vary between species. It is these categories of ABG that most commonly provide the most

convincing evidence of ritual activity and 'special' deposition; however, such finds need not always be the result of deliberate 'special' or structured deposition. Zooarchaeologists need to be wary about interpreting animal remains as 'special' based purely on their ABG category alone (Wilson 1992). Some of the difficulties in interpreting the three main categories of ABG are discussed below.

5.6.1 Skeletons

There is a propensity for complete articulated skeletons to be regarded as 'special', ritual deposits. This may be, at least in part, attributed to their striking appearance and easy recognition in the archaeological record. Many zooarchaeologists recognise that alternative explanations exist to account for the deposition of complete carcasses. It is apparent from the reviewed assemblages that one factor influencing the likelihood of skeletons being deposited intact is the size of the animal. At Suddern Farm, for example, smaller species such as sheep and pig are more commonly present as whole skeletons than large species such as cattle (Hamilton 2000c). A straightforward explanation is that large animals such as cattle require more disarticulation and processing in order to reduce a carcass into manageable portions for distribution and cooking, whereas smaller animals, such as sheep, require less processing as they are already of a manageable size when whole. Whether or not an animal is exploited for food may also influence its likelihood of being deposited intact. If an animal carcass was not exploited for food or as a source of other raw material, there would no need for it to be processed and disarticulated, thus it would be more likely to enter the archaeological record whole. This appears to be the case with traditional non-food animals such as dogs, cats, foxes, small mammals and wild birds, which are commonly found as largely complete skeletons. Natural deaths, perhaps from disease, may account for the deposits of complete skeletons of species normally exploited for food, such as cattle, sheep and pig. Natural neonatal mortalities in particular may account for the collections of complete skeletons of very young individuals of a variety of species from sites such as Danebury (Grant 1984c), Cadbury (Hamilton-Dyer and Maltby 2000) and Hawks Hill (Carter *et al* 1965).

5.6.2 Isolated body parts

Perhaps the most difficult category of ABG to conclusively categorise as either ritual or functional are the smaller groups of isolated body parts such as articulated limbs, feet, hock joints, vertebral and rib groups. These are variously regarded as significant deliberate selections (particularly when found in conjunction with skulls or complete burials), or as the result of natural or cultural taphonomic processes. A key area of debate is to what extent many of these 'special' ABGs of isolated body parts may actually represent well preserved butchery and carcass processing waste. For example groups of articulated foot bones associated with skulls may have been deliberately selected for a 'head and hoof' burial or ritual deposition of hide with head and feet still attached. Equally such ABGs may also represent straightforward disposal of primary butchery and skinning waste. Zooarchaeologists need to be open to consideration of both ritual and functional explanations, as is the case with the head and foot remains deposited at Claydon Pike (Wilson and Allison unpub.) and Wilsford Shaft (Grigson 1989). Although, as Hill (1995) argues, there may be a ritual or structured element inherent in the disposal of almost all domestic refuse on LBA-LIA settlement sites from the region. It should certainly be borne in mind that evidence of butchery and processing need not preclude a ritual interpretation; such deposits may be the remains

of a ritual meal or feasting activity, the waste from which may have been either casually discarded in a single event or more purposefully accumulated. For example, the accumulations of parts of butchered carcasses from sites such as Tuckwell's Pit (Wilson 1998), Watchfield (Hamilton-Dyer 2002a) and Battlesbury Bowl (Hambleton and Maltby unpub.) have been interpreted as butchered food waste from 'feasting'.

5.6.3 Skulls

Skulls are probably the single skeletal element most commonly interpreted as special/structured deposits when found on LBA-LIA archaeological sites from southern England. As is the case with whole skeletons, it may be the striking appearance of a complete skull that encourages archaeologists to consider it as a special object. Species may also influence interpretation in a similar manner; it is more common for cattle and horse skulls to be remarked upon and categorised as special in archaeological reports than the smaller, less visually impressive skulls of sheep and pigs. The question should be raised why the skull, as an individual element, should be so readily accepted as having potential for special significance while other individual post-cranial elements are commonly excluded from consideration as potential ritual deposits. The potential for individual post-cranial elements to be 'special' deposits is demonstrated at Suddern Farm, where Poole (2000:146) interprets some deposits of single post-cranial bones as 'special', based on their association with other significant archaeological finds.

Wilson (1992:342) rightly observed that it is the combination of skulls with other factors, such as their spatial and contextual location, or their association with other remains or artefacts, that in most cases provides the justification for interpreting skulls as 'special' deposits. Unfortunately, the simple presence of elements, such as skulls, which are notorious for their common appearance in 'special' deposits, have come erroneously to be seen as a defining 'special' characteristic in themselves, even in the absence of other supporting contextual information (*ibid*). It must be remembered that deposits of skulls in isolation, or with other faunal remains, may be convincingly explained as discarded domestic refuse and butchery waste as at Winnall Down (Maltby 1985a). Fortunately most zooarchaeologists recognise this distinction; this is apparent at Watchfield (Hamilton-Dyer 2002a) where a cow skull was interpreted as 'special' based on its association with a human skull, and at Farmoor (Wilson 1979a) where two horse skulls were interpreted as 'special' based, amongst other things, on their location a the entrance terminals of a ditch. Also, at Battlesbury Bowl (Hambleton and Maltby unpub.) evidence that cattle and horse skulls had been carefully cleaned and modified provided evidence that these skulls were objects of display and therefore 'special' even before a large group of them were deposited together in a ditch.

5.6.4 An integrated approach

The presence of a particular category of ABG on its own is clearly not sufficient to reliably recognise evidence of ritual activities associated with faunal remains. Integration of contextual information is essential to our understanding of animal bone deposits, including the type of site and feature in which they occur, their spatial location on a site and within a feature, and their associations with other animal remains, human remains, artefacts or ecofacts. Also crucial to the interpretation of potential 'structured' or 'special' deposits is taphonomic information concerning the nature of their deposition. In other words, it is important to understand the original composition of the deposit in which faunal remains are found, i.e. to recognise evidence concerning the rapidity of

burial and later disturbance as well as careful placement of animal bones and their associations with other objects. Moreover, it is not just information concerning the depositional context of ABGs, skulls and other faunal remains that can provide evidence that they were 'special' objects. Traditionally studies of 'special' animal remains have focused on the remains in the ground and the special nature of their final resting place, where they were incorporated into the archaeological record. However it is important not to restrict our investigations of 'special' or symbolic importance of faunal remains to their deposition below ground, but to be open to the possibility that some faunal remains may well have had symbolic or special importance long before they were ever buried. It is essential that the full range of evidence available from faunal remains and associated archaeological evidence is utilised to consider the 'life' of these objects prior to deposition and the role they played during their active use in daily life.

5.7 Conclusion

This review has provided an overview of the types of ABGs discussed in zooarchaeological reports and the range of different explanations that have been put forward in the literature to explain their presence in later prehistoric faunal assemblages from southern England. Among the reviewed assemblages there is clearly a strong case for some (but by no means all) of these ABG deposits to be interpreted as 'special' deposits of some kind. This interpretation of animal remains as having been deposited as part of a ritual act is strengthened where additional contextual evidence also indicates careful placement of the remains, and the additional presence of other unusual, well preserved or carefully placed objects. Without such supporting contextual evidence, however, caution must be exercised when interpreting ABGs as 'special' deposits, since it is clear that many taphonomic factors and human choices outside the 'ritual' sphere could account for the presence of ABGs in archaeological deposits.

The identification and description of ritual activity within the faunal record of later prehistoric southern England is fraught with difficulties. This study could only take into account incidences of ABGs that have been mentioned in the published bone reports. It is almost certainly the case that many ABGs of a mundane nature have not warranted a specific mention in bone reports. Similarly, over zealous attempts to find evidence for ritual and structured deposition in the archaeological record may have placed undue emphasis on the interpretation of skulls, skeletons and bone groups which could just as easily merit a more prosaic explanation. The range of activities that lead to the formation of ABGs is complex and variable. The tendency to assign ABGs and indeed other faunal remains within the dichotomous classification of 'ritual' or 'non-ritual/functional' is inappropriate as animal remains can be both at the same time, as well changing role and meaning through time. Such classifications are also unhelpful as they can mask an interesting, and often unique, history of treatment and deposition of animals and their remains which can only be revealed through integrated contextual studies and the creation of a detailed narrative. It is clear that the available published information is rarely sufficiently detailed to advance interpretation further. Considerations of taphonomic history, associated artefacts and detailed contextual information are seldom available in a way that can be effectively integrated with the faunal record. While establishing these contextual details for many published assemblages may be difficult, or impossible, it is clearly something that needs to be addressed by current and future archaeological site investigations. It is increasingly evident that detailed contextual analyses are essential if associated bone groups in particular and faunal remains in general are ever to be effectively interpreted.

6. ZOOARCHAEOLOGY OF THE MIDDLE BRONZE AGE – LATE IRON AGE IN SOUTHERN ENGLAND: CURRENT UNDERSTANDING AND FUTURE DIRECTIONS

The preceding chapters have reviewed the abundance and availability of faunal assemblages, the species present, the exploitation of wild and domestic species and the structured deposition of animal remains during the Middle Bronze Age to Late Iron Age in southern England. These sections have all to some degree explored regional variation and change through time in relation to several common themes: patterns of consumption and deposition; the activities undertaken on individual sites and the relationship of sites within the wider agricultural landscape; the economic contribution of different animals and their less easily identified social, cultural and ritual roles. The aim of this final chapter is to summarise the findings of this review, to provide an overview of our current understanding of the later prehistoric zooarchaeological record from southern England, and to highlight areas of existing enquiry and new avenues of investigation requiring future research.

6.1 The amount and availability of faunal evidence

Compared to earlier periods of prehistory, faunal data are abundant from the later Bronze Age and Iron Age in southern England. Published bone reports from over 100 archaeological sites met the criteria for inclusion in this review, providing data from over 150 faunal assemblages. Despite the abundance of good quality faunal analyses, the evidence remains patchy and there are several gaps in the dataset that need to be addressed if we are to improve our understanding of the period and region.

6.1.1 Period

Most of the reviewed zooarchaeological material dates to the Iron Age. The Middle and Late Bronze Age is poorly represented and more faunal assemblages of this date are needed and should be a priority for study if and when they are recovered during future excavations within the region. However, simply aiming to increase the number of Bronze Age assemblages from the region *per se* may not improve our understanding of animal exploitation in the Middle/Late Bronze Age as much as focusing attention on sites with continuous Bronze Age to Iron Age occupation, which may afford us greater understanding by examining change of landscape use and social organisation through time.

6.1.2 Site type

The majority of assemblages, including the largest ones, come from settlement sites, which is unsurprising since animal remains accumulate as refuse where people are living and utilising and disposing of animals on a regular basis. Faunal assemblages from non-settlement contexts such as cemeteries are generally small and as such tend to be excluded from reviews of this type. Increasing the number of large published assemblages from poorly represented site types would undoubtedly benefit our understanding of the role of animals on such sites. However, as with poorly represented period groups, recovering new assemblages is not the only way of improving upon our existing knowledge. For example, our understanding of ritual and funerary contexts would be

improved by a more detailed study of the existing zooarchaeological evidence from these sites, including comparing and contrasting new and existing cemetery and funerary assemblages with other contemporary non-funerary sites in their immediate vicinity.

Middens are another type of site/cultural deposit, which are increasingly recognised from the Bronze Age and Early Iron of the region but are, as yet, poorly documented by detailed published faunal analyses. Exceptions include the detailed reports on zooarchaeological assemblages from midden deposits at Runnymede (Serjeantson 1996) and Potterne (Locker 2000). Recent discussions have linked later prehistoric large middens from the southern region to large-scale communal feasting and acts of display, e.g. at East Chisenbury (McComish 1996, Ralph 2005), but such studies have not drawn on detailed zooarchaeological analyses of the material from such sites. Outside the region, other large middens dating to the Late Bronze Age and Early Iron Age have been reported, e.g. at Llanmaes, Wales, where the high relative abundance of pig remains and the long period of use (8th-4th centuries BC) provide an interesting contrast to some of the southern English middens, such as the shorter-lived, sheep-dominated assemblage from East Chisenbury (Gwilt and Lodwick 2006). Further research focusing on the zooarchaeological remains will clearly be of crucial importance in furthering our understanding the activities undertaken at such sites and their social and economic context. This type of dense, extremely productive archaeological deposits has huge potential to provide detailed information from such large assemblages, but can present serious difficulties over how to deal with such quantities of material during excavation and post-excavation analyses. In future, when such sites are excavated, appropriate funding is needed to support full analyses of material recovered. Integration of faunal analyses fully with other specialist studies will also add to understanding of how these deposits were formed and the past activities they represent.

6.1.3 Spatial groups and intra-regional distribution

As highlighted by previous reviews (Maltby 1981a; Hambleton 1999), our understanding of animal husbandry and exploitation in later prehistoric southern England is drawn primarily from the chalk downlands of Wessex. The quality and quantity of available faunal evidence from the far southwest and southeastern counties remains extremely scarce; poor preservation of bone in the acidic soils of these areas is a major limiting factor. As a result of this uneven distribution of zooarchaeological evidence, there has been a tendency for central Wessex to be used as a proxy for models of animal exploitation in areas of southern England where faunal assemblages are lacking; this is clearly a problem as the difference in soils reflects different ecologies and topographies that would almost certainly have promoted different agricultural strategies to those employed on the chalk downs, or on the gravel terraces and floodplains of the Thames Valley (another area rich in faunal assemblages). The investigation of animal exploitation and the pastoral component of agricultural strategies 'off the chalk' is an essential target for future research if we are to gain a fuller understanding of the variety of agricultural and economic strategies employed and, consequently, the social and cultural diversity of the southern region later prehistory. High priority must therefore be given to the study of faunal assemblages from the areas where soils tend to result in poor faunal assemblage coverage; this may necessitate the consideration of numerous very small and poorly preserved assemblages. Traditionally such assemblages may not have been prioritised for analysis because of the limited quantity and quality of data they can provide when studied in

isolation; however cumulative studies of multiple low-resolution assemblages have the potential to reveal general patterns of animal exploitation and deposition.

6.1.4 Access to and dissemination of zooarchaeological data

Although most reports on sizable faunal assemblages make their way into press eventually, many analyses of smaller assemblages obtained from small evaluation excavations or from sites with poor bone preservation remain as 'grey literature' in the archives of contracting units and the personal archives of independent faunal analysts. This review was largely restricted to published zooarchaeological analyses and therefore excludes many relevant assemblages. The need for a searchable register of extant zooarchaeological analyses has been the subject of recent discussion within the zooarchaeological profession in Britain. As well as communicating the existence of the newest large assemblages (ones which will eventually be fully published) an even greater advantage of providing a searchable register of faunal studies would be to highlight the existence and availability of all the small bone assemblages which would normally not be deemed sufficient to progress beyond initial assessment, and which may never be published. While individually the information provided by small samples is limited, cumulatively they have potential to supplement our understanding of time periods, regions or site types that remain poorly represented by detailed published bone reports.

The difficulty in releasing this potential lies in identifying the existence of relevant 'grey literature'. This is not just a problem for zooarchaeology, and the development of systems for recording grey literature is currently being addressed by FISH (Forum on Information Standards in Heritage). There is potential to expand existing schemes such as OASIS (Online Access to the Index of Archaeological Investigations) and AIP (Archaeological Investigations Project) for the purposes of creating a searchable register of zooarchaeological and other specialist archive reports. However, OASIS has been slow in coming into active use and in its current form may not record sufficient detail to identify separately the existence of individual specialist archive reports. Furthermore, while it remains voluntary, full and even coverage of the archaeological resource by OASIS is unlikely. The active data collection policy of the AIP would ensure more complete coverage, but at present their remit does not extent to registering specialist archive reports. As an interim measure, the Professional Zooarchaeology Group (PZG) has encouraged and assisted the 'logging' of unpublished zooarchaeological reports by extending the remit of the EAB (Environmental Archaeology Bibliography) to include 'grey literature'. This is a good start to addressing a difficult problem, but, as with any voluntary system, coverage is likely to remain patchy until registering the existence of contracted specialist reports becomes an automatic and mandatory part of the archaeological process.

Another aspect of improved access to zooarchaeological data is the increasing availability of digital archives from archaeological projects via the internet. This is an encouraging trend as it provides easy access to comparative faunal data. Resources such as ABMAP, which provides zooarchaeological biometric data for domestic animals from British sites from a range of periods, are excellent research tools. Encouraging the on-line dissemination of datasets at the end of projects is important (it is hoped that the database created for this review will be made available on-line), but there is yet greater potential in exploring how such project datasets, after initial dissemination, may remain dynamic and

be added to by other researchers to provide a continually expanding and up-to-date resource. However, as an aid to future research, the provision of on-line access to research archives and zooarchaeological data is secondary to the need to provide a well-publicised accessible register of their existence in the first place.

6.2 The species represented

Considerable species diversity was observed overall among the reviewed data. In addition to the common large and medium domestic mammals (cattle, sheep, pig, horse, dog and, occasionally, goat) and some finds of cat and domestic fowl, a wide range of wild species, particularly birds and microvertebrates, are regularly recovered from later prehistoric southern sites. These wild species can be useful indicators of the local environment. However, for the majority of small to medium sized assemblages species diversity was low and restricted primarily to the main domestic species.

Several questions are raised concerning species introduced during the 1st millennium BC. Exactly when certain species such as domestic fowl and house mouse were first introduced remains unclear, as do the means of their introduction and the mechanism and speed of their dispersal. Further consideration of the context of Iron Age domestic fowl and the other animal remains and artefacts with which they are associated could help to establish how these early 'rare' fowl were viewed by Iron Age societies. Were they treated as 'special', exotic and high status commodities or as something mundane and everyday, and did attitudes change with their increasing numbers and more regular exploitation in IA-RB transition? Clarification is also needed in relation to the status of cat as wild or domestic; it is essential that cat bones from this period are identified on the basis of their morphometric characteristics rather than making assumptions of 'wild' or 'domestic' based solely on context, age profile and date. DNA and isotope studies may have potential to establish whether Iron Age house cats had a contemporary local or overseas origin. Goat is another species that warrants further investigation; it is seldom present in large numbers and consequently has usually been amalgamated with sheep for purposes of Iron Age faunal analyses. Separate consideration of sheep and goat material, where possible, to investigate differences in sheep and goat husbandry would add an extra dimension to our current understanding of farming practices.

6.3 Exploitation of wild resources

The faunal assemblages from the Late Bronze Age and Iron Age of southern England are overwhelmingly comprised of domestic mammal remains (as highlighted by previous reviews, e.g. Maltby 1981a, 1996; Hambleton 1999). Wild species appear to have been more commonly exploited across the region during the Bronze Age, reflecting continuity of earlier Neolithic traditions, but by the Iron Age there is almost exclusive emphasis on domestic species exploitation, with the exception of a few sites in marginal environments. The evidence more generally points towards very little *exploitation* of wild resources. Wild birds, small mammals, herpetofauna and fish almost exclusively represent natural, chance incorporations in the archaeological record, rather than cultural accumulations of exploited resources. Nevertheless there are exceptions; for example, there is frequent evidence that antler for making combs and other objects was a widely utilised wild resource. Rarer is evidence for the exploitation of wild animals for primary products, or their deliberate incorporation in structured or 'ritual' deposits. It should be borne in mind

that the absence of evidence for regular or intensive exploitation of wild resources does not mean such species were of no importance to people. A cultural preference to eschew certain foods (such as fish) and to place emphasis on the consumption of others (domestic mammals) on a daily basis, or on special occasions, may have been a powerful way to express social identity and/or an embodiment of beliefs. When wild species are found on later prehistoric sites it is essential that any analyses and interpretation take full account of the context and associated archaeological remains. It is only in this way that the social, as well as economic significance of wild resources can be fully explored.

6.4 Exploitation of domestic animals

A major element of this review has been to provide an overview of domestic animal husbandry in the southern region during the later prehistoric period. Equally important is the need to discuss how the depth and breadth of our understanding of domestic animal exploitation may be developed in the future to improve the overview. In line with previous observations (e.g. Maltby 1981a, 1996; Grant 1984c; Hambleton 1999), this review has clearly identified an animal economy focused almost exclusively on the exploitation of domestic species, with particular emphasis on cattle and sheep throughout the region. The importance of different domesticates varies between sites and smaller regional groups, but the general pattern throughout the region is one of mixed farming with a pastoral economy closely linked to arable production. There are exceptions, particularly in the later Iron Age, where a greater emphasis on a single species, such as pig or horse, suggests certain sites had adopted a more specialised agricultural strategy.

Sheep appear to have been husbanded according to a 'mixed' strategy; the age profiles of sheep in most assemblages throughout the region reveal neither an emphasis on the exploitation of adults for secondary products, or prime-aged adolescent individuals for meat. Instead, there are often a high proportion of individuals killed in their first year; this suggests individuals utilised for meat, but not an optimum meat production strategy. The proportion of sheep killed at around 6-12 months, probably representing autumn and early winter deaths, varies between assemblages and is extremely high at some sites. Hambleton (1999:73) suggests these variations may be linked to the intensity of arable production at different sites, and that understanding of this pattern will only be reached by analysing faunal remains in conjunction with other strands of evidence around the wider agricultural economy and farming year (e.g. Cunliffe 2000:58). Cattle present a more varied picture than sheep across the southern region. Although, like sheep, cattle are likely to have been exploited for a range of products, there is a greater indication that specialist strategies were employed in the management of cattle herds. Mortality profiles suggest that cattle were more specifically managed for secondary products/dairying in parts of Wessex, while some sites in Oxfordshire, Gloucestershire and Bedfordshire may have been concentrating on meat production.

Pigs were universally exploited for meat, but there is still evidence for variation in their economic and social status in the way their meat was processed and consumed. Roasting and communal consumption of pigs has been suggested for Bronze Age sites (Serjeantson 1996) and some Iron Age assemblages (Knight 2003), while Late Iron Age assemblages from Mount Batten and Ower indicate specialisation in meat preservation and redistribution via established trade and exchange networks (Maltby 2006a). Horses were sometimes processed for meat and other primary products, but they were most

important as live animals for traction or riding. Horses were managed rather differently to other domestic species; there is little evidence for horse breeding on the majority of Iron Age sites from the southern region and Harcourt's (1979) suggestion of feral populations being systematically rounded up still holds up for most assemblages. There is evidence that although most communities used horses, their management, procurement and redistribution may have been a specialist activity occurring only at a few sites (e.g. Bury Hill, Hamilton 2000:72).

Since the last major review of zooarchaeological evidence from the southern region, new scientific techniques have been developed and applied that have already furthered our understanding of later prehistoric animal husbandry. Compositional analyses of organic residues have identified the presence of dairy fats, meat fats and plant lipids on prehistoric pottery sherds. Combining pottery residue analyses with zooarchaeological evidence may help refine understanding of production and consumption at sites; animal mortality profiles may indicate a possible emphasis on the production of meat and/or dairy at sites, while residue analyses provides an indication what products were stored and consumed. Such studies have already provided confirmation of dairying in southern Britain during the Bronze Age and Iron Age (Copley *et al* 2003, 2005a, 2005b). Comparisons of these possible production and consumption signatures may be used to investigate the extent to which products produced were also consumed at the same site, providing insights into the redistribution and exchange of surplus.

As well providing direct evidence for storage and consumption of different foods, the identification of mixed residues highlights the possibility of dishes made from combinations of dairy, meat and plant products. This provides a means by which investigation of concepts such as 'cuisine' can be further explored by considering animal products as 'ingredients'. Other observations from residue studies suggest further avenues of integrated zooarchaeological investigation. For instance, the absence of pork adipose fats in residues at certain sites could indicate that pork was roasted rather than cooked in pots (Copley *et al* 2005a); this raises the question of whether evidence for pot-cooking versus dry roasting is greater at sites where there is evidence for the possible importation (and presumably consumption) of salt pork. Zooarchaeological and residue analyses could also be combined to further explore Late Iron Age changes in patterns of consumption and social practices that have been suggested by recent studies of Gallo-Belgic ceramic assemblage composition (Pitts 2005).

6.4.1 Intra- regional variation

There are variations in assemblage composition within the southern region, many of which are explainable by environmental differences and the suitability of particular husbandry strategies to local environment. Sheep appear to have been the most important species husbanded on the poorer quality pastures of the Wessex downlands, while there was a greater emphasis on cattle husbandry at more suitable lower-lying locations in the river valleys of Oxfordshire, Gloucestershire and Buckinghamshire. Cultural influences may also account for sites from the same geographical area within the region sharing similarities in husbandry practices. Such spatial clusters could be reflecting tribal groupings, for example. Further variability of assemblage composition and animal exploitation within smaller 'micro-regions' may also reflect diversity of local environment. Also to be considered is the type of site and its location within a landscape and the

realisation that different sites may perform different functions within the same agricultural system. Particular site forms, such as banjo enclosures, may be linked to specific agricultural functions within the landscape. The agricultural landscape model produced by the Danebury Environs programme (Cunliffe 2000) has highlighted the importance and potential of looking at landscape divisions and considering sites within the same locality as elements of a wider agricultural, economic and social system.

6.4.2 Change through time

Variations among assemblages in the region also reflect change through time. A general increase in the importance of sheep husbandry in relation to cattle from the Bronze Age into the Iron Age is evident from the relative proportions of these species in assemblages of different date. Towards the end of the Iron Age, pigs appear to have become more commonly exploited, perhaps indicating a change in dietary preferences. The composition of faunal assemblages can indicate changes in the ways in which animals were husbanded, consumed, and disposed of through time, which in turn may be linked to other strands of archaeological evidence indicative of continuity or change. For example, the occurrence of large middens in the Bronze Age and Early Iron Age could demonstrate continuity from the Neolithic when other sites from the region also show evidence for communal feasting and/or large-scale middening e.g. Durrington Walls (Wainwright and Longworth 1971, Albarella and Serjeantson 2002, Parker Pearson *et al* 2005). The phenomenon does not appear to continue into the Middle and Late Iron Age, which may reflect a change in patterns of consumption and social organisation during the Bronze Age-Iron Age transition (McOmish 1996).

With reference to the Iron Age-Roman transition, it has been argued that changing pottery styles in southeast Britain during the Late Iron Age are indicative of changes in the Iron Age socio-political framework that began well before the Roman conquest (Pitts and Perring 2006:190). The southern region faunal record also indicates that aspects of social economic political changes often thought to be associated with Roman acculturation, such as change in dietary preferences and agricultural specialisation and intensification, may well have much deeper roots within the Iron Age period. If we are to further our understanding of the transition from the Iron Age to Roman period in southern Britain we must not focus solely on the 1st century AD period immediately pre- and post- conquest, and should consider the process of change form as early as the Middle Iron Age and throughout the whole of the Late Iron Age from around BC 150 onwards.

Changes in characteristics of faunal assemblages possibly reflect change in economic and social structure. For example, in the Late Iron Age the decline of hillforts such as Danebury and the rise of '*oppida*' and coastal entrepôts in other locations show not only a geographical shift in the focus of high status centres, but a move from elite centres located in the heartland of agricultural production to those located at the hub of wide ranging trade networks. This may reflect significant changes in the socio-political makeup of Iron Age societies, involving a shift away from the direct control of surplus production and redistribution/exchange of agricultural produce and other goods by the ruling elite, and the rise of the 'middle man' as an intermediate agent between producer and consumer in perhaps a more market-based economy. Such a change may also be evidenced at some sites during the Late Iron Age moving from a mixed agricultural approach to becoming specialist production centres, e.g. the specialist preparation of

preserved meat for trade and exchange at Ower, or the management and training of horses at Bury Hill. In addition to recognising specialisation in agricultural production, by examining other aspects of the archaeological record it may even be possible to identify 'social specialisation', i.e. a move away from a focus on communal activity in which all of society is in some way engaged, towards a focus on specialised sub-groups within society defined by the specific roles they perform. One possible example of this is the appearance of sites in the LIA-ERB period which are specific foci for ritual/religious activities (e.g the Uley Shrines and Hayling Island Temple). These religious sites contrast with earlier evidence for ritual/religious activity located on settlements and apparently embedded within the daily life and activities of Iron Age peoples (e.g. at Danebury and Battlesbury Bowl).

6.5 Associated Bone Groups, structured deposition and 'ritual'

Among later prehistoric assemblages from southern Britain, associated bone groups (ABGs) are common and take a variety of forms (whole skeletons, isolated body parts, skulls). They are subject to a range of different interpretations. Some deposits are interpreted as 'functional', i.e. butchery waste or hygienic disposal of inedible whole carcases; other deposits are interpreted as 'ritual' or 'special', i.e. offerings or sacrifices that had some symbolic meaning in terms of the choice of animal, the parts of the animal represented and their specific location within a particular feature. Whether functional, ritual, or a more complex combination of the two, in all cases reviewed the most convincing interpretations of ABGs relied on detailed analyses of associated artefactual evidence combined with a taphonomic history of the faunal remains and a depositional history of the deposits more generally.

In the past, interpretations of animal ABGs have tended to reflect the theoretical paradigm of prehistoric archaeology of the time (albeit with a slight time lag as zooarchaeology adopts and adapts to new ideas). The resulting tendency has been to apply blanket interpretations of ABGs as all being ritual (or indeed all being functional). If we are to move away from such simplistic interpretations it evident that effective interpretation of finds of ABGs and other potentially structured deposits requires detailed contextual analysis on a case-by-case basis. Many different taphonomic and cultural factors may result in similar ABGs. It is only by careful integrated analyses of the zooarchaeological remains alongside any other associated artefacts, their state of preservation and their position within the context and feature that the depositional history of ABGs and other possible structured deposits may be established.

Hill (1995) demonstrated the importance of integrating the analyses of different materials, e.g. pottery, human and animal bone, when attempting to investigate and identify structured deposition in Iron Age pits. He identified that there were some significant associations between certain types of material but that universal rules could not be applied. More importantly, Hill's work highlights the importance of understanding the taphonomic history of all material within the deposits. Discussion of the range and location of different materials found in association with animal ABGs is not uncommon and formed an important part of the identification and interpretation of 'special' pit deposits at Danebury (Cunliffe 1984; 1992) and on the Danebury Environs sites (Cunliffe 2000). However, these and the majority of other recent excavation reports often fall into the trap of presupposing certain deposits are 'special' by looking for universal patterns to

describe them rather than looking in detail at the taphonomy of these 'special' features and constructing individual case-histories to enable interpretation of each deposit on its own merits.

Building on Hill's (1995) work, a recent analysis of Iron Age pit fills from Sigwells, near South Cadbury, integrates not only analyses of different finds, but also soil and sediment analyses for individual contexts, thus providing a detailed narrative history of the formation of pit fills (Randall 2006). Preservational and taphonomic analyses of several different materials indicated different sources for material within same context, and demonstrated careful selection of the included materials for certain contexts. Further combined evidence indicated that carefully selected material was often left exposed and visible for long periods; Randall (*ibid*) theorises that certain of the Sigwells deposits were chosen to be representative of different aspects of the landscape and to serve as a mnemonic device. This level of detailed evidence and interpretation was only possible through the application of a fully integrated interdisciplinary approach at context-by-context level.

Crucial to success of Randall's 2006 study was the planning and execution of this integrated approach from the inception of the project. Hill (1995) encountered significant problems when attempting an integrated analysis of different materials long after the completion of the original post-excavation analyses. The success of retrospective integrated studies attempting to undertake context-by-context or even feature-by-feature analyses are limited by the extent to which archives of different materials can be successfully cross-referenced and re-integrated. If we are to progress our understanding of ABGs and other potentially structured deposits by undertaking detailed taphonomic studies and integrated contextual analyses, then it is essential that in future such questions are addressed at the planning stage of any excavation project.

In addition to understanding of ritual in relation to structured deposits and ABGs, there is a need for further consideration of other types of ritual context. Iron Age cemetery and temple assemblages are at present under-researched by zooarchaeological studies and would benefit from more detailed investigation as discrete groups.

6.6 Towards an integrated understanding of later prehistoric life in southern Britain

As animals and animal products were an intrinsic part of a web of later prehistoric economic, social, political and religious activities, so zooarchaeological evidence is most effective when integrated with other strands of archaeological evidence in order to understand these many different facets of prehistoric life. For instance, when investigating broad themes such as consumption, the zooarchaeological evidence may indicate the availability of certain animal products. However, a broader understanding of the consumption of these products would require many other avenues of investigation, including the other ingredients with which they may have been combined, the ceramic, metal or organic objects utilised in processing, storage, preparation and serving of foodstuffs, the social space in which food was prepared and consumed, as well as the socio-economic, political and kinship relationships formed, strengthened, celebrated and defined by consuming a shared meal. To address such complex relationships, it is essential that we devise more meaningful ways to investigate the archaeological record. These should include consideration of faunal remains in combination with other types of

evidence at the level of context, feature, site and wider landscape.

6.6.1 Towards an understanding of context

The importance of taking into account context cannot be underestimated when analysing and interpreting zooarchaeological assemblages. The specific conditions within each context and feature may differentially affect bone preservation and survival. Furthermore, different types of animal bone deposits may accumulate in different types of feature due to taphonomic and cultural influences, even before differential preservation conditions come into play. The resulting intra-site variability in faunal assemblage composition can mask general economic trends when attempting to draw 'site level' conclusions. Most faunal assemblages are not a representative unbiased sub-sample of all animal remains that were present at a site throughout its occupation, rather they represent the accumulated remains over time of many separate, and often very different, events. A contextual approach allows one to gain an understanding of what parts of the faunal assemblage are specific to particular events and thus take these influences into account when drawing broader 'site level' conclusions about subjects such as diet and economy.

The point has already been made above that detailed integrated contextual analyses are crucial to our understanding of structured deposition and possible ritual on later prehistoric sites from southern Britain. The same approach may also provide insight into many other areas of life such as seasonal agricultural activities and community gatherings, the use and re-use of pits, butchery and carcass processing practices. The interdisciplinary approaches applied at contextual and site level can also be expanded to address broader inter-site comparisons and wider landscape studies.

6.6.2 Towards an understanding of local and regional landscapes

The notion of understanding animal husbandry 'off the chalk' emphasises the importance of taking a landscape-based approach. Certainly it is helpful to identify areas where we lack zooarchaeological evidence, such as East Sussex, Kent and Surrey in the southeast, and West Somerset, Devon and Cornwall in the southwest. Highlighting such gaps can alert contracting units, curatorial bodies and county archaeologists to the importance of recovering, analysing and disseminating information about faunal assemblages to improve out knowledge of animal exploitation in these areas. However, it is important to guard against a 'stamp collecting' approach; improving coverage in these areas is a means to an end, not an end in itself. An even coverage of widely spaced assemblages may not be as informative as examining several contemporary assemblages located in close proximity to each other.

The Danebury Environs project provides a good example of how the integrated study of several different sites within a locality has potential to provide much greater insight into the activities and functioning of past communities than the study of single sites in isolation. Different sites performed different functions that were often closely determined by their geographical location, and these different foci of activities within the broader agricultural economy also formed an integral aspect of the socio-political interactions within the community in and around Danebury. Such 'landscape' approaches provide an opportunity to explore not just the link between the geographical (topographical/ecological) landscape and the agricultural landscape, but also the relationship between the agricultural landscape

and the broader economic, social, political and cultural landscapes of later prehistoric societies.

The work currently being undertaken by the South Cadbury Environs Project (SCEP) has great potential for understanding the later prehistoric landscape around South Cadbury hillfort. SCEP surveys and excavations have identified numerous broadly contemporary later prehistoric sites (as well as sites from other periods) that represent a range of domestic settlement, agricultural, ritual and industrial activities (Randall *pers. comm.*). The potential is there to explore how such sites may have interacted as part of a broader system in the South Cadbury area, and how this relates to their situation within the landscape. Similarly, at little Wittenham, Oxfordshire, a recent programme of excavations have been undertaken with the aim of investigating the Castle Hill hillfort and its relationship to other sites within its wider environs (Allen and Lamdin-Whymark 2005). Understanding of the animal husbandry systems in areas, such as the Upper Thames Valley, where these new landscape focused excavation programmes are yielding faunal assemblages, may be further enhanced by re-examining existing faunal assemblages and data where previous excavations and surveys have supplied information from several other broadly contemporary sites within the same general locality.

It would be beneficial to approach all new excavations with the aim of understanding the relationship between different contemporary sites in the same locality. Future long-term programmes of excavation targeting multiple contemporary sites within the same locality need not be restricted to research-funded projects; coordination by the county archaeologist could recognise groups of separately excavated sites that may be further researched together. Combining the study of sites within a shared landscape my be applied retrospectively in some cases, but once target areas have been recognised proactive measures can be taken in the prioritising and planning of future excavations to maximise their contribution to landscape studies.

Application of GIS (geographic information systems) is now commonplace within archaeology and plays a key role in most landscape studies. Typically such studies have concentrated on the mapping of archaeological sites, features and finds and analysis of their distribution in relation to geographical features and to each other. However, increasingly GIS is being used with other types of archaeological data as a means of exploring economic, social and political relationships and interactions within a landscape. Geographical and topographical information can be combined with spatial distribution studies of a wide range of archaeological data such as pottery styles, monument forms, burial rites and classical documentary sources to attempt to identify the later prehistoric geographical and political boundaries most relevant to regional studies of zooarchaeological and other data.

The incorporation of zooarchaeological data within a GIS approach in order to understand the pattern of animal production and consumption on sites within Iron Age landscapes in northeast England is the focus of recent research (Sewpaul 2006). This demonstrates the potential of a GIS approach in placing site-level zooarchaeological evidence for the exploitation management and disposal of animals within a broader landscape context. Sewpaul (*ibid*) also highlights the potential of combining isotope/trace element studies alongside existing traditional studies of animal bones and the complementary use of GIS to enhance our understanding of stock movement in later

prehistoric landscapes.

6.6.3 Planning integrated studies

Approaches that address thematic questions by integrating the findings of zooarchaeological, ceramic, archaeobotanical, small-find, and many other archaeological analyses can generate detailed and wide ranging interpretations of contexts, features, sites and landscapes that are greater than the sum of their individual parts. The importance and potential of detailed integrated contextual analyses and interdisciplinary approaches to the study of animal and other archaeological remains has been clearly demonstrated for the British Iron Age (e.g. Hill 1995, Cunliffe 2000, Randall 2006) and in archaeology more widely (Maltby 2006b). However, such approaches have not yet been adopted as a matter of course by archaeological units undertaking developer-funded excavations. With this in mind, revisiting existing datasets as part of integrated multidisciplinary projects will be an important feature of future research. In addition to such retrospective integrated analyses, a more ambitious and yet wholly desirable approach would be the full integration of zooarchaeological and other specialist analyses right from the inception of new projects.

The practical considerations of a fully integrated approach need to be addressed at the planning stage. Such studies require communication between all post-ex specialists and key members of the project management and excavation teams *prior* to excavation and throughout the course of the project (Maltby 2002b). It is essential to have the capacity for specialists to re-evaluate and further analyse datasets in the light of information provided by other specialists. This may require additional time and financial support, and would require some change in working practices, but only by investing in these changes will we advance. A fully integrated approach should be easily managed within the timescale of large long-term research projects and even large-scale developer-funded projects, but test cases are needed. In some cases it may be sensible to apply an integrated approach to a few key features, or to one specific research question, or to integrate only some specialist analyses. The potential is there for integrated analyses to become the norm for archaeological projects as the benefits of this approach become apparent and as methodological and managerial approaches continue to be refined through use.

6.7 Conclusions

The new datasets incorporated into this study have provided new information, which has enabled confirmation of much of what was concluded by previous reviews and enhanced understanding of additional aspects of the later prehistoric faunal record of southern England. The overview of evidence for potential structured deposition is an area not previously covered in detail by earlier reviews. It is clear from this study that to further our understanding of structured animal bone deposits will require consideration of other associated non-faunal evidence at a detailed contextual level. What is apparent from this review is that any significant new insights in our understanding of later prehistoric animal exploitation within the southern region have been provided by studies that have integrated faunal data with other lines of archaeological data and have taken a thematic approach beyond the site-level investigation of diet and economic subsistence. Thus, recommendations for further research highlight the importance of interdisciplinary studies

and the need to investigate zooarchaeological remains in conjunction with other forms of archaeological evidence. A further important approach is the interpretation of zooarchaeological evidence in relation to its archaeological context, at feature level, site level, and within the broader geographical and social landscape. Full analysis of new faunal assemblages is always recommended as a means of furthering our understanding of human-animal relationships. The need to expand the faunal dataset or plug gaps in spatial or chronological coverage by recovering new assemblages is of secondary importance to the detailed examination of new assemblages in order to more fully understand their immediate, local and regional context.

The evidence provided by faunal remains for the exploitation and disposal of animals and their economic, social, cultural and ritual importance provides tantalising glimpses into broader aspects of later prehistoric society in southern Britain. Nevertheless, faunal specialists have long recognised that they cannot advance understanding on their own, and that the information provided by faunal studies is severely limited when such remains are considered in isolation from other strands of archaeological evidence. It is only by undertaking integrated interdisciplinary studies of a wide range of archaeological data that we can really progress our understanding of Iron Age societies. It is anticipated, and recommended, that this regional review will be among the last of those to focus on a single type of archaeological material; there is much greater benefit to be gained in future from undertaking thematic reviews that incorporate a wide variety of archaeological material and data to address theoretically informed regional research questions. The days of analysing, interpreting and indeed reviewing zooarchaeological data in splendid isolation are over; archaeology needs to approach zooarchaeological data as a strand among many threads of evidence that must be viewed together as a whole in order to more fully understand the rich tapestry of later prehistoric life in southern Britain and beyond.

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APPENDIX 1: LIST OF REVIEWED SITES AND BONE REPORT REFERENCES.

name of site	county	bone report reference	Periods represented by faunal assemblages													
			MBA	MBA-LBA	LBA	LBA-EIA	EIA	EIA-MIA	MIA	MIA-LIA	LIA	LIA-ERB	BA	BA-IA	IA	IA-RB
Abbotstone Down	Hampshire	Maltby 1986										*				
Appleford	Oxfordshire	Wilson 1980													*	
Ashville	Oxfordshire	Wilson *et al* 1978													*	
Balksbury Camp	Hampshire	Maltby 1995a; 1985d; 1987b					*			*		*				
Balksbury Camp	Hampshire	Maltby 2001b					*									
Bancroft	Buckinghamshire	Holmes and Rielly 1994										*			*	
Barton Court Farm	Oxfordshire	Wilson 1984									*					
Battlesbury Bowl	Wiltshire	Hambleton and Maltby unpub				*		*	*					*		
Bicester Fields Farm	Oxfordshire	Charles 1999									*					
Bierton	Buckinghamshire	Jones 1988									*					
Bishops Cannings Down	Wiltshire	Maltby 1992	*													
Bishopstone	East Sussex	Gebbels 1977													*	
Black Patch	East Sussex	O'Connor 1982			*											
Bramdean	Hampshire	Clutton-Brock 1982								*						
Brean Down	Somerset	Levitan 1990	*		*								*			
Brighton Hill South	Hampshire	Maltby 1995b						*		*		*				
Budbury	Wiltshire	Westley 1970					*									
Burderop Down	Wiltshire	Maltby 1992			*											
Bury Hill	Hampshire	Hamilton 2000b							*							
Bury Wood Camp	Wiltshire	Bunting, Verity and Cornwall 1963													*	
Bury Wood Camp	Wiltshire	Coy 1969													*	
Cadbury Castle	Somerset	Hamilton-Dyer and Maltby 2000							*	*	*					
Cannards Grave	Somerset	Hamilton-Dyer 2002c							*							

name of site	county	bone report reference	Periods represented by faunal assemblages													
			MBA	MBA-LBA	LBA	LBA-EIA	EIA	EIA-MIA	MIA	MIA-LIA	LIA	LIA-ERB	BA	BA-IA	IA	IA-RB
Carne's Seat	West Sussex	Beech 1986										*				
Chalton Site 15	Hampshire	Startin 1976							*							
Chalton Site 50	Hampshire	Startin 1976				*										
Chilbolton Down	Hampshire	Maltby 1984						*								
Claydon Pike	Gloucestershire	Wilson and Allison unpub; Miles and Palmer 1982							*							
Coldharbour Farm	Buckinghamshire	Johnstone 1997													*	
Copse Farm	West Sussex	Browne 1985									*					
Danebury	Hampshire	Grant 1984c					*	*	*	*					*	
Danebury	Hampshire	Grant 1991a					*	*	*		*				*	
Dean Bottom	Wiltshire	Maltby 1992		*												
Dibble's Farm	Somerset	Gamble 1988						*								
Ditches	Gloucestershire	Reilly 1988										*				
Downsview	East Sussex	Stevens 2002		*												
Duntisbourne Grove	Gloucestershire	Powell 1999									*					
Easton Down R7	Hampshire	Coy and Winder 1976					*									
Easton Lane	Hampshire	Maltby 1989						*				*				
Eldon's Seat	Dorset	Phillipson 1968				*		*								
Farmoor	Oxfordshire	Wilson 1979a						*								
Farningham Hill	Kent	Locker 1984									*					
Flagstones	Dorset	Bullock and Allen 1997									*					
Groundwell Farm	Wiltshire	Coy 1982						*								
Groundwell West	Wiltshire	Hambleton 2001													*	
Guiting Power	Gloucestershire	Wilson 1979b								*						
Gussage all Saints	Dorset	Harcourt 1979					*		*		*				*	
Halfpenny Lane	Oxfordshire	Lovett 1991							*							

name of site	county	bone report reference	Periods represented by faunal assemblages													
			MBA	MBA-LBA	LBA	LBA-EIA	EIA	EIA-MIA	MIA	MIA-LIA	LIA	LIA-ERB	BA	BA-IA	IA	IA-RB
Hallen	Gloucestershire	Hamilton-Dyer 2002b								*						
Ham Hill	Somerset	Hamilton-Dyer 2001													*	
Hartigans	Buckinghamshire	Burnett 1993													*	
Hawk's Hill	Surrey	Carter, Phillipson and Higgs 1965													*	
Hayling Island Temple	Hampshire	King and Soffe 1998										*				
Hengistbury Head	Dorset	Grant 1987									*					
Houghton Down	Hampshire	Hamilton 2000f						*								
Ivinghoe Beacon	Buckinghamshire	Westley 1968													*	
La Sagesse	Hampshire	Bourdillon 1990				*										
Lains Farm	Hampshire	Coy 1991													*	
Little Somborne	Hampshire	Locker 1979													*	
Maiden Castle	Dorset	Armour-Chelu 1991													*	
Meare Village East	Somerset	Cornwall and Coles 1987													*	
Meare Village East	Somerset	Levine 1986									*					
Meare Village West	Somerset	Backway 1986; Coy1987b									*					
Meare Village West	Somerset	Bailey, Levine and Rogers 1981								*						
Micheldever Wood	Hampshire	Coy 1987a							*							*
Middle Duntisbourne	Gloucestershire	Powell 1999									*					
Middle Farm	Dorset	Bullock and Allen 1997		*												
Mingies Ditch	Oxfordshire	Wilson 1993							*							
Mount Batten	Devon	Grant 1988								*						
Nettlebank Copse	Hampshire	Hamilton 2000e					*				*					
New Buildings	Hampshire	Hamilton 2000d					*									
Nornour	Cornwall	Turk 1967; 1978												*		
Old Down Farm	Hampshire	Maltby 1981b					*		*			*				
Ower	Dorset	Coy 1987									*					

name of site	county	bone report reference	Periods represented by faunal assemblages													
			MBA	MBA-LBA	LBA	LBA-EIA	EIA	EIA-MIA	MIA	MIA-LIA	LIA	LIA-ERB	BA	BA-IA	IA	IA-RB
Owslebury	Hampshire	Maltby 1987a							*		*	*				
Pennyland	Buckinghamshire	Holmes 1993							*							
Pimperne	Dorset	Barnetson 1993					*									
Potterne	Wiltshire	Locker 2000				*										
Poundbury	Dorset	Buckland-Wright 1987		*											*	
Quarry Field, Compact Farm	Dorset	Clark 2002					*					*				
Rockley Down	Wiltshire	Maltby 1992		*												
Rope Lake Hole	Dorset	Coy 1987c						*	*		*					*
Rucstalls Hill	Hampshire	Gregory 1978								*						
Runnymede Bridge	Berkshire	Done 1980			*											
Runnymede Bridge	Berkshire	Done 1991			*											
Runnymede Bridge	Berkshire	Serjeantson 1996			*											
Sandy Lane	Gloucestershire	Maltby 2001a			*											
Slade Farm	Oxfordshire	Hammon 2001							*							
Slonk Hill	West Sussex	Sheppard 1978						*		*					*	
Stokeleigh Camp	Somerset	Everton 1975										*				
Suddern Farm	Hampshire	Hamilton 2000c					*		*		*					
The Rumps	Cornwall	Chaplin and Coy 1964									*					
Thrupp House Farm	Oxfordshire	Wilson and Lockyer 1999													*	
Tolpuddle Ball	Dorset	Hamilton-Dyer 1999													*	
Torberry	West Sussex	Higgs 1976					*	*								
Tuckwells Pit	Oxfordshire	Wilson 1998							*							
Uley Bury	Gloucestershire	Levitan 1983								*						
Uley Shrines	Gloucestershire	Levitan 1993									*	*				
Walton Lodge	Buckinghamshire	Sadler 1991	*													

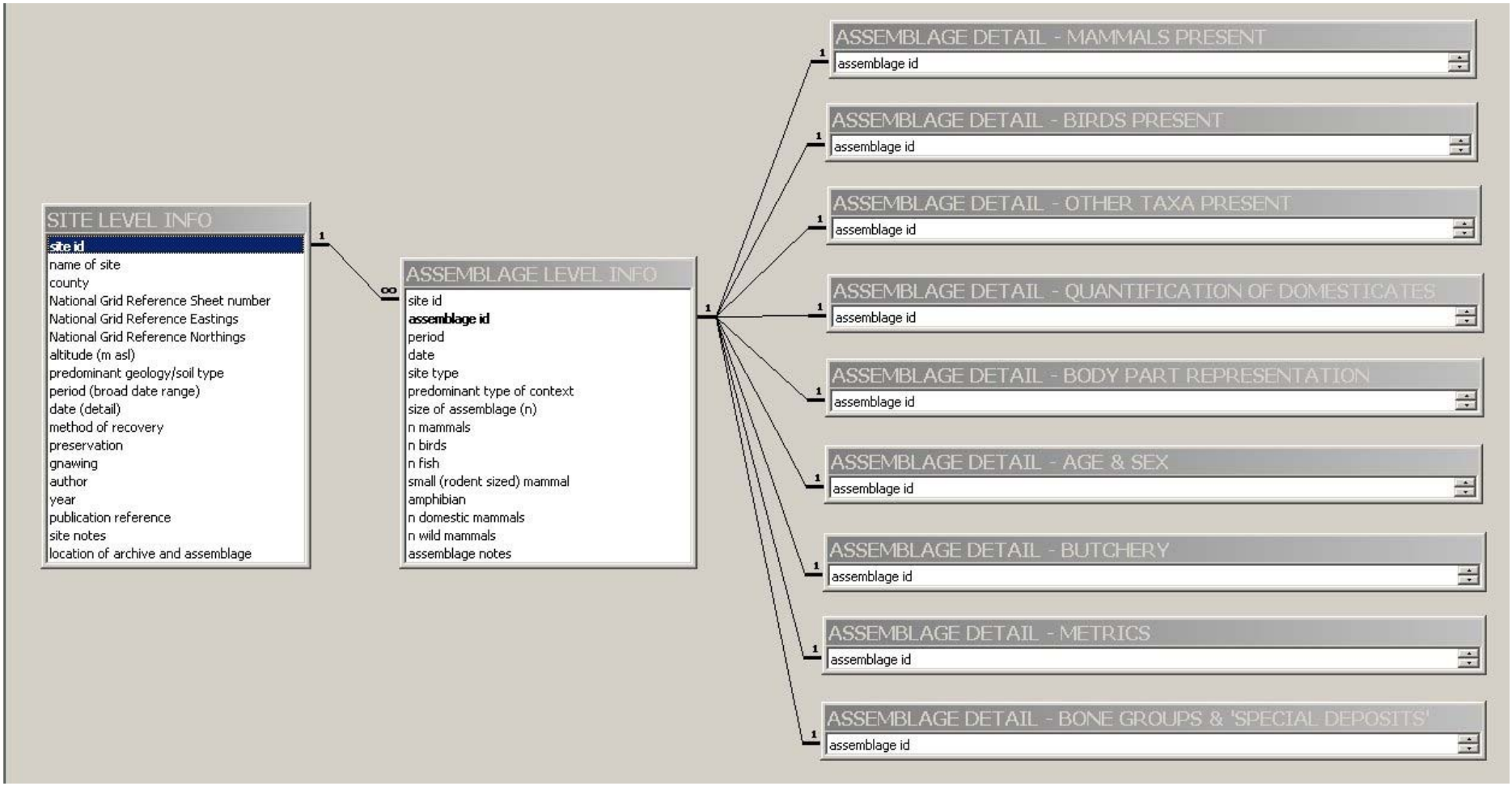
name of site	county	bone report reference	Periods represented by faunal assemblages													
			MBA	MBA-LBA	LBA	LBA-EIA	EIA	EIA-MIA	MIA	MIA-LIA	LIA	LIA-ERB	BA	BA-IA	IA	IA-RB
Watchfield	Oxfordshire	Hamilton-Dyer 2002a													*	
Watkins Farm	Oxfordshire	Wilson and Allison 1990							*							
Wavendon Gate	Buckinghamshire	Dobney and Jaques 1996									*					
Whitcombe	Dorset	Buckland-Wright 1990									*					
Wilsford Shaft	Wiltshire	Grigson 1989	*				*									
Winklebury Camp	Hampshire	Jones 1977						*								
Winnall Down	Hampshire	Maltby 1985a					*		*							
Wittenham Clumps	Oxfordshire	Carter 1979				*										
Woolbury	Hampshire	Roncaglia and Grant 2000						*								

APPENDIX 2: GUIDE TO SOUTHERN REGIONAL REVIEW MBA-LIA DATABASE.

Table	Relationships	Description of content
SITE LEVEL INFO	Linked to 'ASSEMBLAGE LEVEL INFO' by 'Site ID' field.	Contains information (where available) for each separate site or excavation concerning geography, period of use, faunal recovery and preservation, location of archives and details of published faunal assemblage reports. (NB. there may be more than one assemblage recorded from each site, e.g. if subdividing by date).
ASSEMBLAGE LEVEL INFO	Linked to 'SITE LEVEL INFO' by 'Site ID' field Linked to all 'ASSEMBLAGE DETAIL' tables by 'Assemblage ID' field	Contains details (where available) of site type, period, and a quantitative summary for each separate faunal assemblage (NB. there may be more than one assemblage from each site, e.g. if subdividing by date)
ASSEMBLAGE DETAIL (all tables)	All tables linked to 'ASSEMBLAGE LEVEL INFO' table by 'Assemblage ID' field.	Where sufficient information was supplied in the published reports, the following specific details of each recorded faunal assemblage was recorded in the appropriate ASSEMBLAGE DETAIL TABLES: ASSEMBLAGE DETAIL - MAMMALS PRESENT: List of mammal taxa with ticks indicating presence of each taxa within each assemblage ASSEMBLAGE DETAIL - BIRDS PRESENT: List of bird taxa with ticks indicating presence of each taxa within each assemblage ASSEMBLAGE DETAIL - OTHER TAXA PRESENT: List of other taxa (e.g. amphibians, reptiles and fish) with ticks indicating presence of each taxa within each assemblage ASSEMBLAGE DETAIL - QUANTIFICATION OF DOMESTICATES: Records NISP and MNI counts for Cattle, Sheep/goat, Pig, Horse and Dog ASSEMBLAGE DETAIL - BODY PART REPRESENTATION: Records brief description of pattern of body part representation for Cattle, Sheep/goat, Pig and Horse ASSEMBLAGE DETAIL - AGE & SEX: Indicates method of ageing used in published report Records counts of individuals assigned to each of four broad age categories based on mandibular tooth eruption and wear Records brief description of age composition of assemblage for Cattle, Sheep/goat, Pig and Horse. Records brief description of sex composition of assemblage for Cattle, Sheep/goat, Pig and Horse

		ASSEMBLAGE DETAIL - BUTCHERY: Records the quantity and brief description of the type of butchery marks reported for Cattle Sheep/goat and pig Records the presence of butchery marks reported for Horse and Dog ASSEMBLAGE DETAIL - METRICS: Records availability and abundance of published metrical data for Cattle, Sheep/goat, Pig, Horse and Dog ASSEMBLAGE DETAIL - BONE GROUPS AND 'SPECIAL DEPOSITS': Indicates which mammals, birds and other taxa are present as Associated Bone Groups (ABGs). Indicates the categories of ABGs present within each broad taxonomic group Indicates the interpretation placed upon ABGs by authors of published faunal reports.
Other tables (various)		look-up tables for data categories used in SITE LEVEL INFO, ASSEMBLAGE LEVEL INFO and ASSEMBLAGE DETAIL tables.

Database Relationship Diagram





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