Historic England

Southern England: A Review of Animal Remains from Saxon, Medieval and Post-Medieval Archaeological Sites

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SUMMARY
Presented here is a zooarchaeological review of assemblages from 323 sites within southern England. Data are summarised for each of the major periods (Saxon, medieval and post-medieval) based on the primary themes of food, symbolic and social exploitation, animal husbandry, redistribution of animals and animal products, and inter-site analysis. Findings are then synthesised to look at more specific temporal trends relating to the key ideas around the provisioning of sites, visibility of social hierarchies through food and symbolism, changes in the local fauna resulting from introductions, over-hunting and extirpations, economic uses of animals, the effect of increasing urbanisation and regional differences. Other, more specific, themes relate to the visibility of the Agricultural Revolution, coastal exploitation and diet. The final chapter pulls together the results of the survey to provide a research framework for zooarchaeological analysis undertaken in the south of England. As well as highlighting gaps in current knowledge it includes recommendations for future work.

COVER
Illustration of agriculture in the English countryside *c* 1600, with horses and chickens; by Judith Dobie. © Historic England

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ARCHIVE LOCATION
The database for this report is available online via the ADS website at the following address:
http://archaeologydataservice.ac.uk/archives/view/animalbone_he_2017/

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2011–2014

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1 INTRODUCTION AND METHODOLOGY

1.1 Introduction

Previous work undertaken on behalf of Historic England (formerly English Heritage) has included reviews of the zooarchaeological records from the Mesolithic to modern periods of central England (Albarella and Pirnie 2008) and Mesolithic to Roman periods of southern England (Allen 2012; Baker *et al* forthcoming; Hambleton 2008; Serjeantson 2011). This report will contribute to the series for southern England by adding sites from the post-Roman to modern periods. The aim is to provide a synthesis of existing animal bone assemblages from Saxon, medieval and post-medieval sites in southern England, review the current state of knowledge of zooarchaeology for the region and identify areas where data are lacking or could be improved.

By identifying gaps in the zooarchaeological record and establishing priorities, this work will be an essential resource for future assessment of the nature and significance of the southern archaeological record between the Saxon and post-medieval periods. The study will determine how future research can best be focused to advance understanding. As such, it will be of value to a number of practitioners working in the archaeological, historical and heritage fields.

Regional reviews come under SHAPE sub-programme 11172.110 Supporting Research Frameworks: National, Regional, Local, Diachronic and Thematic Frameworks (English Heritage 2008, 29), as they facilitate understanding of current knowledge of the past through the use of environmental remains. Gaps in knowledge can then be identified and priority areas for future research ascertained at local, regional and national levels. In this way, the most important and urgent needs of the historic environment can be highlighted (Corporate Objective 1A), allowing frameworks and agendas for future research to be defined (Research Theme G2). They are also aligned with other initiatives. Within the National Heritage Protection Plan (NHPP), this is primarily to Activity 5B2 Underpinning Local Planning Processes of NHPP (English Heritage 2010a, 10) but also Topic 3A (Survey and Identification) and Measure 4 (Assessment of Character and Significance). The publication of the National Planning Policy Framework (NPPF; Department for Communities and Local Government 2012) emphasises the importance for local planning authorities to consider 'the desirability of sustaining and enhancing the significance of heritage assets' (NPPF Policy 126), and that where part or the whole of a heritage asset is affected by development 'they should also require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance' (NPPF Policy 141). Regional environmental reviews help assess the nature of the current resource and its significance and determine how future research can advance understanding. Such syntheses are therefore integral to the protection of the historic environment and our shared past. Planning Policy Statement 5 (PPS5; English Heritage 2010b) emphasises the importance of regional and local authorities having 'evidence about the historic environment and heritage assets' (PPS5 Policy HE 3) and that where part or the whole of a heritage asset is affected by development 'local planning authorities should require the developer

to record and advance understanding of the significance of the heritage asset before it is lost' (PPS5 Policy HE 12.3).

Further strategies that will be aided by this review are the regional research frameworks, particularly the Surrey Archaeological Research Framework (SARF); the South East Archaeological Research Framework (SERF), which includes Kent, Surrey and Sussex; the Solent-Thames Archaeological Research Framework for Berkshire, Oxfordshire, Hampshire and the Isle of Wight; and the South West Archaeological Research Framework (SWARF) for Cornwall, Devon, Wiltshire, Dorset, Gloucestershire and Somerset. These are developed collaboratively by Historic England and local authorities, with similar objectives to the regional reviews, including assessment of the archaeological resource, compilation of a research agenda and identification of a research strategy to improve areas identified by the latter.

1.2 Previous Work

A number of synthetic reviews of the faunal record of Britain for the post-Roman period exist. They fall into two categories, the first including only sites from the southern region and the second those compiled on a national scale.

The earliest regional review of the study area (Noddle 1975b) included eight sites in a comparative study investigating social differences, local agricultural conditions and changes in time between sites, as well as the inclusion of data from Europe. In 1984 the first of two major reviews of the environmental archaeology of England was published (Keeley 1984), which included short summaries of selected sites from the Isles of Scilly, Cornwall, Devon, Somerset, Gloucestershire and the Thames Valley in the south-west (Bell 1984). The review also included a summary of work on animal bone assemblages from urban sites in the region, lamenting the backlog of animal bone assemblages resulting from the many rescue excavations that remained unpublished (Bell 1984, 95). The second volume (Keeley 1987) included more detailed chapters on the state of zooarchaeology in a number of southern regions not included in the first volume, as well as suggestions of areas of importance for future work. Relevant chapters include the south Midlands (Robinson and Wilson 1987), incorporating sites from Oxfordshire, Wessex (Coy and Maltby 1987) and London (Armitage *et al* 1987). The review of each respective region drew broadly on available data from the faunal record to investigate continuity and change through time, with particular emphasis on urban and rural differences and the exploitation of wild and domestic animals.

In 1987 an edited volume on the palaeoeconomy of south-west England was produced, including a chapter on the exploitation of non-domestic animals (Coy 1987), which used both archaeological and documentary evidence to investigate the past use of shellfish, fish, wild and domestic birds, and wild and marine mammals. A second paper looked at animal husbandry in the south-west (Levitan 1987a), including data from 22 urban, rural, religious and high-status sites. Emphasis was placed upon the relative proportions of the major domestic and wild animals as well as a more specific investigation into two sites from Exeter. The major conclusions suggested that the considerable inter-site

variation within a single town should lead to the consideration of urban assemblages together where possible, rather than any single one being seen as representative of the town as a whole; also, that urban sites should be judged in relation to nearby rural sites [which was also a recommendation of the Keeley reviews (1984, 1987)], and that a regional research design should be created, identifying research questions to be considered in future excavations.

The advantage of reviews undertaken on a regional basis lies in the detailed consideration given to the underlying geology and topography of the region, and perhaps reflects the more common trend in the past for specialists (and archaeological units) to be region-specific, whereby a detailed understanding of the past animal economy within that region was acquired. With the opening up of the archaeological market to more competitive tendering in the 1990s, this system became (to a large extent) impractical as units moved further afield in their work. Perhaps this is what has led in more recent times to the production of national reviews by independent specialists, who have taken advantage of the increase in available animal bone reports since the 1970s and 1980s (Fig 1.1).

These national syntheses are based on specific timescales, such as the Saxon (Clutton-Brock 1976a; Holmes 2011a, 2014b; Poole 2011; Sykes 2007b, 2011), Norman (Sykes 2007b), medieval (Grant 1988a, 1988b; Sykes 2009b) and post-medieval (Thomas 2005a) periods. They use raw data from an extensive range of sites and infer widespread trends of various aspects of human–animal relationships relevant to a particular period. These works will be invaluable when setting the data from the southern region within a national context, but do not provide recommendations for future work within a regional framework nor give a detailed background to specific regional considerations.

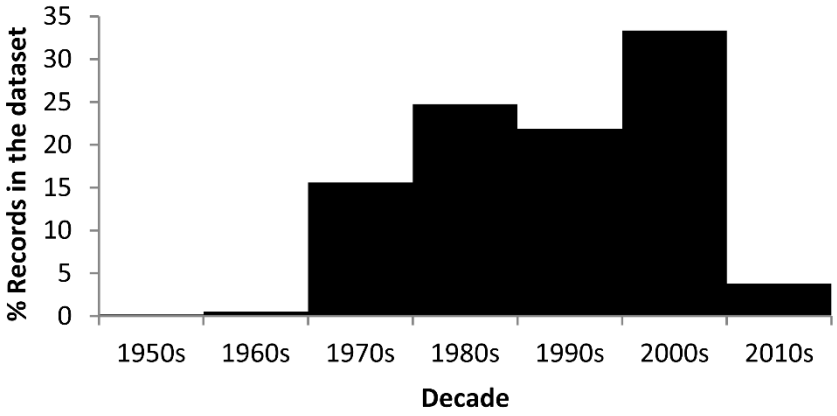

Fig 1.1: Proportion of site records in the dataset by decade of publication

1.3 Limiting Factors

Both regional and national reviews have significant limitations and problems inherent in inter-site comparisons (for example Coy 1987, 9–10; Maltby 1981, 163–70). These have not changed since the earliest syntheses, and include three main areas that remain pertinent to this study.

1.3.1 Specialist Methodology

There is a lack of standardisation in the recording, analysis and interpretation of animal bone assemblages between specialists. The reasons for this are many, and range from the training received by the specialists, to their level of experience, to site-specific research questions (Maltby 1985, 35), all of which have repercussions on the ease with which faunal data can be used in comparative work. In this study, this is addressed by recording data from the most widely used methodologies, for example number of individual specimen (NISP) fragment counts. Quantification of tooth wear and bone fusion was done using raw data where possible, but when only summary data were published these were also included in broader analyses. The specific types of data used are considered in depth in section 1.6.1, however, the mechanics of recording and analysis are infrequently published, so considerable variation will remain.

1.3.2 Formation Processes

Differences in formation processes also exist. Perhaps the most pertinent is the variation in refuse disposal between the occupants of urban sites, who were more likely to use pits and dumps, and those of rural sites, who made use of organic refuse for manuring the fields (Jones 2005, 62; Serjeantson 1996, 75), thereby removing part of the faunal record from the settlement. This can lead to the accumulation of smaller animal bone assemblages at rural sites, and better preservation of material at urban settlements. To address this issue, the nature of the site must be considered in comparisons.

1.3.3 Taphonomic Factors

Taphonomy encompasses all post-mortem processes affecting an animal, from butchery and gnawing, to the burial and possible reburial of the bones, to the excavation of an assemblage (for a more detailed appraisal see Lyman 1994). These factors will affect the preservation of an assemblage, and consequently inter-site comparability. To attempt to understand the effects of taphonomy on the animal record several aspects have been recorded: the underlying geology, the condition of the bones and the use of sieving (*see* section 1.5).

All of these limiting factors have been addressed to some extent during the data collection and analysis stages, and their effects on the quality and comparability of the faunal record will be further considered throughout the review.

1.4 The Dataset

The dataset comprises 656 individual records from 323 sites (Fig 1.2; *see* Appendix 1). The records derive largely from published material available as specialist commentaries in excavation reports, although unpublished reports were also occasionally included. Three criteria were defined regarding the inclusion of reports in the database.

1.4.1 Geographical Area

The project includes data from the southern counties of England (Berkshire, Cornwall and the Isles of Scilly, Devon, Dorset, Gloucestershire, Hampshire and the Isle of Wight, Kent, London (Middlesex), Oxfordshire, Somerset, Surrey, East and West Sussex, and Wiltshire), incorporating the government-defined regions of south-east and south-west England. Although sites have been recorded from all counties, the densest distributions lie within Oxfordshire, Hampshire and London (Table 1.1). There is a general correlation between population density and frequency of sites recorded, and the reasons for this may be two-fold. Firstly, given the nature of developer-led archaeology prevalent since the 1990s, one premise may be that the greater the population of a county, the greater the demand for new development. Secondly, the relationship between counties with better agricultural land attracting a greater population in the past would also influence modern-day settlements. This is reflected in the prevalence of greater populations in counties with neutral soil, suitable for both arable and pastoral economies.

The three major exceptions to these arguments are Oxfordshire, Somerset and Dorset. In Oxfordshire the majority of sites (53%) come from within Oxford itself, a town that has benefitted from considerable excavation in the past, combined with exceptional, extensive publication of site reports both in the regional journal (*Oxoniensia*) and in a synthesis of smaller excavations (Wilson 2003). Similarly, Somerset has recently benefited from work undertaken as part of the Shapwick project (Gidney 2007) and a previous synthesis of smaller sites, a number of which would otherwise have remained unpublished (Levitan 1987a). Compared with the latter two counties, the paucity of published data from Dorset is unexpected, particularly given the high population density and neutral soils conducive to good bone preservation. The above exercise has therefore served to illustrate the value of good publication strategies at a county level to the compilation of useful datasets.

Throughout the analysis, the county of origin is occasionally used when considering a site. It must be remembered, however, that although many of the county boundaries were in a recognisable form by the end of the late Saxon period (Reynolds 1999, 73–5), they may have had little influence on the daily lives of the general population, particularly for those farming on the boundaries of regions and who may have supplied markets in more than one county.

1.4.2 Time Frame

The time frame covered runs from the early Saxon (AD 450) to post-medieval (AD 1900) periods. Although dates for each period follow those given in the Royal Commission on the Historical Monuments of England (RCHME) archaeological thesaurus (English Heritage 1999), some were considered too broad, with the potential to obscure more nuanced changes between sub-periods. Therefore, the phasing was refined to produce smaller period divisions (Table 1.2). Sites were allocated to a period using data given in the site report, although sometimes a site spanned more than one period. These periods are used for convenience in the analysis of data; in reality the distinctions between

one period and the next would have been of little consequence to the population and animal economy as a whole.

The majority of sites are tightly phased, of which approximately 25% are dated to the Saxon and post-medieval periods, respectively, and 50% to the medieval period (Table 1.2). The relative dearth of Saxon sites may be linked to the rural nature of settlement during much of the second half of the first millennium AD, and the destruction of their traces in urban sites resulting from the more robust building techniques utilised from the medieval period (Hamerow 2011). The post-medieval period is often overlooked in the publication of site reports, even where material from the period exists. This is due largely to the perceived 'recent' nature of such remains, which are often considered redundant given the large body of historical records existing for the period (Thomas 2009).

1.4.3 Assemblage Size

A lower limit of 100 fragments identified to the major domesticates (cattle, sheep/goat and pig) was applied as a minimum for using the data to compare species present (Davis 1987a, 46). (Sheep and goat are usually considered together, reflecting how the data are often presented in the source material; sheep is sometimes used as a short-hand for the category sheep/goat.)

Occasionally, unusual assemblages were included where numbers of the main domesticates fell below this limit, for example if there were exceptionally high numbers of wild species, and these will be considered in the discursive text only. Other site reports only detail fish or bird remains, and so the breakdown of the assemblages recorded in the dataset shown in Table 1.3 will contain fewer than the 656 records that exist in the database.

There is some caution to be sounded regarding the use of small sample sizes in inter-site comparisons (Hambleton 1999, 39–40; Lyman 2008, 192–4), and the potential for small samples to be unrepresentative of the animal economy. Data were plotted to investigate the effect of sample size on the numbers of cattle, sheep/goat and pig from all sites (Fig 1.3). A number of outliers was present in all categories of sample size, and so the possibility that this is caused by real factors affecting the numbers of species, rather than sample size bias, cannot be ruled out, and makes even smaller samples worthy of further analysis.

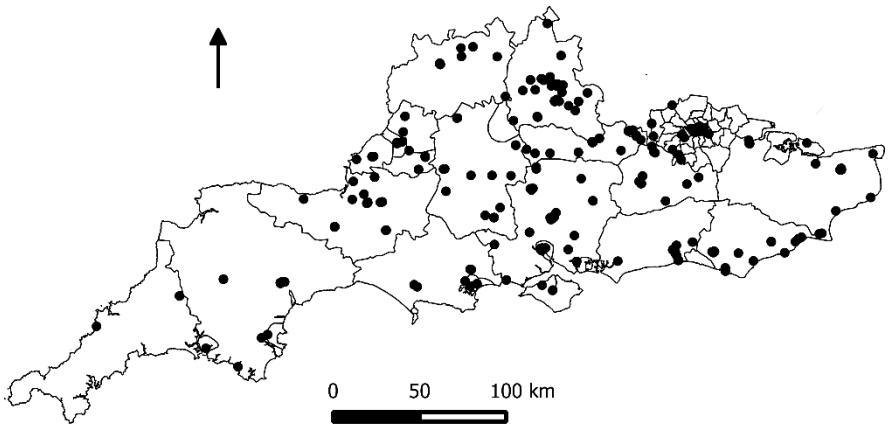

Fig 1.2: Location of all sites in the dataset

Table 1.1: Number of sites per county, including population densities (people/km²) and general pH of the soils

County	*n* sites	Population/km²*	pH*
Oxfordshire	63	249	Alkaline–neutral
Hampshire	52	3 428	Alkaline–neutral
London	44	4 979	Neutral
Sussex	30	1 274	Acid–neutral
Somerset	29	405	Acid–neutral
Berkshire	23	1 797	Acid–neutral
Gloucestershire	18	1 582	Acid–neutral
Devon	15	1 830	Strong acid
Kent	15	880	Acid
Surrey	11	678	Acid
Wiltshire	11	509	Alkaline–neutral
Dorset	7	1 996	Neutral
Cornwall	2	151	Strong acid
Isle of Wight	3	370	Neutral
Total	323		

**Population densities from mid-year estimates for 2010 (Office for National Statistics 2010); pH data from the Land Information System (Cranfield University 2001).*

Table 1.2: Number of assemblages recorded by period, using Forum on Information Standards in Heritage (FISH) definitions where applicable (English Heritage 1999)

Period	RCHME dates, AD	Dates, AD	*n* assemblages	% assemblages
Saxon			1	<0.5
Early Saxon		410–650	23	4
Early–middle Saxon			1	<0.5
Middle Saxon	Early medieval 410–1066	650–850	38	6
Middle–late Saxon			9	1
Late Saxon		850–1066	48	7
Saxo-Norman		1000–1100	40	6
Medieval			6	<0.5
Early medieval		1066–1150	35	5
Early–high medieval			23	4
High medieval	Medieval 1066–1540	1150–1350	161	25
High–late medieval			45	7
Late medieval		1350–1540	77	12
Late medieval–post-medieval			8	1
Medieval–post-medieval			3	<0.5
Post-medieval	Post-medieval 1540–1901	1540–1901	137	21
Total			656	

Table 1.3: Size of assemblages in the dataset, excluding reports where only birds or fish were analysed

	Number of fragments identified as cattle, sheep/goat and pig				
Phase	100–500	501–1 000	1 001–5 000	5 001–10 000	>10 000
Early Saxon	13	6	3	1	
Early–middle Saxon		1			
Middle Saxon	13	5	12	2	2
Middle–late Saxon	2	1	3	2	
Late Saxon	19	10	16		
Saxo-Norman	20	11	11		
Early medieval	15	2	8	1	1
Early–high medieval	8	2	5		
High medieval	88	38	21	3	1
High–late medieval	27	7	6		
Late medieval	41	13	18		
Medieval	1	1	1		
Late medieval–post-medieval	3				
Medieval–post-medieval	3	1			
Post-medieval	84	22	26	1	2
Total	337	120	130	10	6

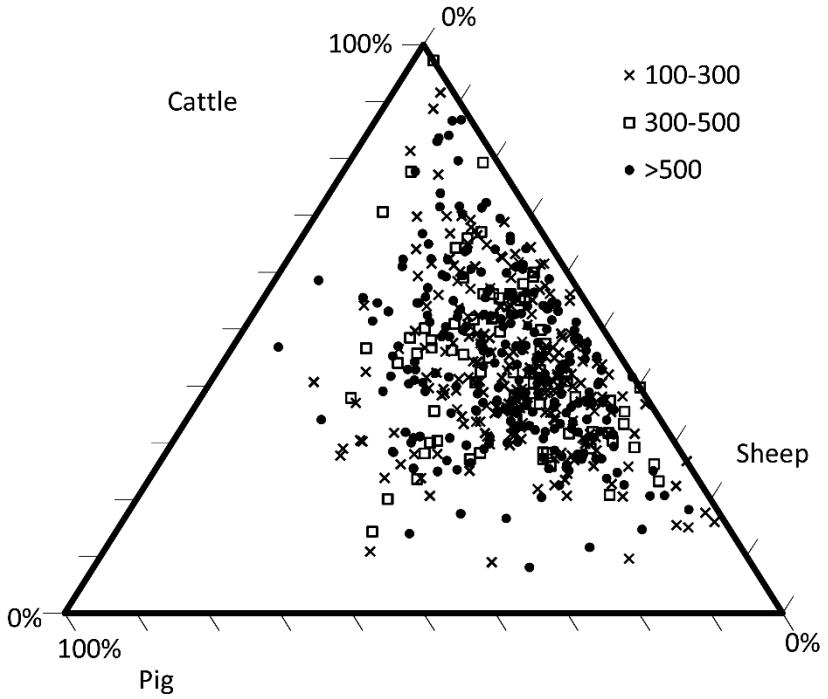

Fig 1.3: Exploration of the effect of sample size on reliability of the data. Sheep= sheep/goat. Quantification based on NISP

1.5 Recording

All data were entered into a database, which is available at http://archaeologydataservice.ac.uk/archives/view/animalbone_he_2017/overview.cfm as a fully searchable resource (Holmes 2017). The 323 sites recorded are detailed in Appendix 1, along with references for each animal bone report. The number of individual records is greater than the number of sites, as multi-phase sites were entered true to the specialist's phasing where possible. Although every effort was made to include as many sites as possible, the list is not exhaustive.

Counts of mammal, bird and fish species were entered directly from the animal bone report, as were anatomical parts and mortality data when raw data were available. However, a large number of site reports, particularly those based on smaller sample sizes, did not include quantification of anatomical elements or mortality profiles as raw data, although some did present summary data either tabulated or as part of the specialist commentary. To make comparisons easier interpretations of mortality and body part data are summarised in the database (*see* section 1.6), so sites where raw data are available have also been summarised in this way.

Conclusions drawn in the text relating to butchery and metrical data were also recorded as summary information, as the former are not easily quantifiable, and to have noted individual measurements would have taken longer than the designated time of the project. Data on the sex of cattle, sheep/goat and pigs from tooth morphology, horn core, pelvis and metapodial measurements were also recorded where available.

The use of sieving in the retrieval of animal bones has been shown to increase considerably the abundance of small bones and teeth, fish, birds and small mammals in many assemblages (Payne 1972). However, sieving is not always employed on site and, even where it is, samples are not always included in the site report. Therefore, for greatest comparability, only hand-collected assemblages were analysed together where possible and a note was made in the database of sites where sieving was undertaken. The exception to this was in the recording of fish bones, which are often missed during hand retrieval. Therefore, quantification of fish from samples was used, where possible, to increase the usefulness of this resource.

Basic data recorded included the classification of site type based on the description given in the site report, using predefined terms from the National Monument Thesaurus (English Heritage 1999). These site types were then placed in one of four categories to aid analysis of the data (Table 1.4). The four major site types were defined depending on the nature and location of the site: rural, urban, high-status (secular) and religious house. The increasingly urban nature of the archaeological record following the advent of *wics* in the middle Saxon period (*see* section 2.1.2) is illustrated by the growth of urban sites in the dataset (Fig 1.4). Although *wics* and many *burhs* (*see* section 2.1.3) of the late Saxon period do not strictly conform to many definitions of urbanism (for example Dyer 2003, 58; Perring 2002, 10), this is a convenient label when considering the animal economy, as they would nonetheless include a large

population engaged in non-agrarian activities resulting in a consumer-led bias in provisioning. This is reflected in the proportions of material derived from butchery or craft-based activities (Fig 1.5) present in middle Saxon *wics*, which are known as centres of craft production, and from the increasingly commercialised towns of the medieval period. Sites were considered rural if they were located outside an urban settlement. High-status and religious classifications for site type were largely taken from the original site report; however, two sites have since been widely regarded as high-status: High St, Ramsbury, given its relationship to metal working (Thomas 2011, 412), and Lake End Rd, Berkshire (Ulmschneider 2011, 162). Data from cemeteries were not included.

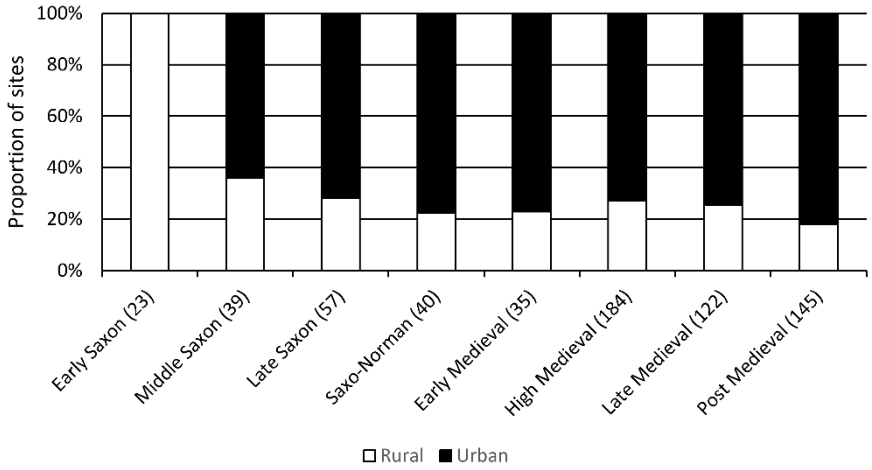

*Fig 1.4: Proportion of urban and rural assemblages recorded for the major time periods. (*n*)= number of sites*

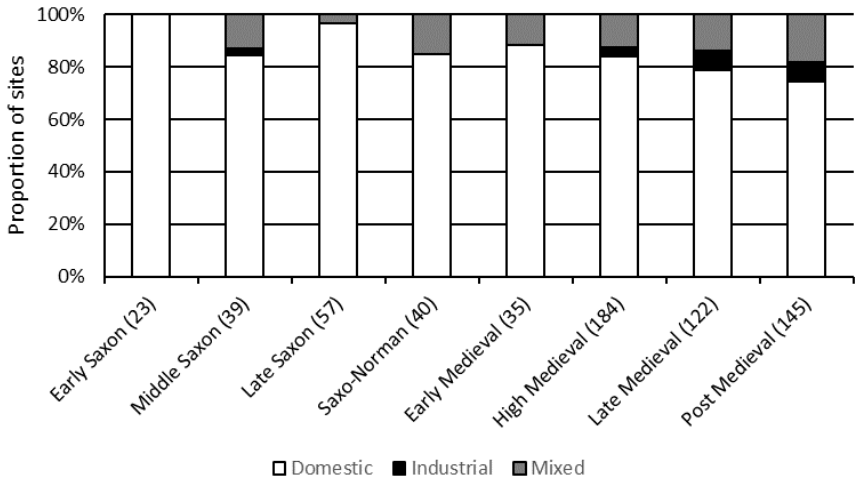

*Fig 1.5: Proportion of assemblages derived from domestic (food/table waste), industrial (craft/butchery processes) and mixed sources for the major time periods. (*n*)= number of sites*

Table 1.4: Number of assemblages by site type for the Saxon (Sax), medieval (Med) and post-medieval (PM) periods, showing broad categories used during analysis

Site type	Sax	Med	PM
Urban	65	238	112
Unclassified		4	
Backyard		3	1
Boat yard		2	
Bone-working site	1		
Boundary ditch		2	3
Bridge		1	
Burh	37	5	
Butchery site/tannery			1
Construction works		4	
Defence		2	
Dwelling		1	
Farm			2
Fish market		2	
Fisherman's house		1	
Garden			2
Garderobe		1	
House		7	3
Industrial site			1
Inn			2
Iron-working site		1	
Kitchen		1	3
Land drainage			1
Midden		1	
Mill		1	1
Museum			1
Pits		2	
Pond		2	
Port		1	2
Pottery workshop			1
Prison		2	2
Quarry	2		
Ringwork		1	
Road		1	
Rubbish dump		3	3
Rubbish pit		60	10
Settlement	1	9	
Sewer			2
Stables		1	
Stable yard?		1	1
Student hostel		2	
Tannery		2	2
Tenement		52	14
Town		33	38
Town wall		2	1
Town/*burh*		1	
Trading	23		

Site type	Sax	Med	PM
Rural	43	44	15
Cottage		1	
Defence			1
Demolition layer			5
Deserted medieval village		3	0
Deserted settlement			1
Ditch		1	
Farm		9	2
Field boundary	1		
Field system	1		
Garden		1	2
Hamlet	1	2	
Lime kiln			1
Manure works		1	
Mining settlement		1	
Pit			1
Rubbish pit		3	
Settlement	34	11	
Storehouse		1	
Sunken featured Building	1		
Temporary camp	1	1	
Trading settlement	3		
Village	1	9	2
High status	6	69	16
Bishop's palace		1	
Castle		35	3
Cellar			1
Demolition layer		1	2
Grange		2	
Hill fort	1		
Hunting lodge		1	
Manor	1	25	2
Mansion			6
Moated house		1	
Palace	1	3	1
Settlement	1		
Smelter	1		
Trading settlement	1		
Waterfront			1
Ecclesiastical	6	37	5
Benedictine nunnery	1		
Church	2		1
Convent		1	
Demolition layer		1	
Hospital		5	
Minster	1		
Nunnery		2	

Site type	Sax	Med	PM
settlement/*wic*			
University		1	
Waterfront	1	21	11
Whaling station			1
Wharf			2

Site type	Sax	Med	PM
Priory and hospital		3	
Religious house	1	24	4
Rubbish pit	1		
Vicarage		1	

1.6 Quantification

As noted in section 1.3.1, there is considerable variation between inter-specialist methodologies. This is not necessarily a criticism, as methods of recording and analysis largely depend on the nature of the site itself and the research questions asked of the material culture. To enable optimum comparability between sites, decisions had to be made regarding quantification of the most abundant data, that of the type and number of species, anatomical elements and mortality data (tooth wear and fusion).

1.6.1 Species Represented

Basic fragment counts (NISP) were recorded, while sites that were only quantified using minimum number of individuals (MNI) counts were excluded. Fortunately, few sites included MNI data only, the majority employing either both methods or just NISP. The reliability of MNI has been called into question following extensive work by Lyman (2008), who concluded that 'NISP is to be preferred over MNI as the quantitative unit used to measure taxonomic abundances' (Lyman 2008, 81), largely because of considerable inter-specialist variation in the calculation of minimum number counts.

As well as the problem of small sample bias (*see* section 1.4.3), which may affect the comparability of sites, a further issue with small sample sizes lies in assemblage variability. That is, the number of species likely to be recovered from a site will increase with the number of bones in the assemblage (Casteel 1979). Fortunately, there is only a relatively small range of mammal species likely to be recorded for post-Roman sites that will be directly affected by the human population, either through direct husbandry or hunting for food (cattle, sheep, goat, domestic pig, horse, dog, cat, red deer, roe deer, fallow deer, hare, rabbit and wild pigs). The potential for greater variation in bird and fish species exists, so these species are considered separately.

In order not to inflate numbers artificially, associated bone groups such as burials of complete or partial skeletons were, where quantified, included as a count of one in the species counts. Similarly, where possible, antler was not included in counts of deer bones (although a note was made of the presence of antler or antler working where recorded in the site report), as this is a resource that can be collected during the moult at the end of winter when they are shed. Other wild taxa, such as fox, badger, small mammals and amphibians, were also recorded.

1.6.2 Anatomical Elements

Two methods are commonly employed when quantifying anatomical elements. These are the basic fragment count (NISP) and a count of the minimum number of elements (MNE). The latter reduces fragmentation bias caused by the breakage of larger bones into a greater number of pieces than those from smaller animals, or of fragile specimens compared with denser elements. Both these methods are widely used in the literature, so both have been included in the database.

Where raw data were not available in the site report, the representation of body parts was recorded, if given, as a description of the relative frequencies of head (skull and mandible), horn core, vertebra, upper leg (scapula, pelvis, humerus, radius, femur, tibia), lower leg (metapodial) and foot (phalange) fragments.

1.6.3 Mortality Data

Two types of mortality data were included, bone fusion, and tooth eruption and wear. It was decided to use both forms of data as, where redistribution of body parts occurs at more complex sites, skulls and mandibles may be discarded as part of the butchery process, so teeth will not be available for analysis.

Fusion of the ends of the bone shaft with the epiphysis occurs within a particular age range during the life of an animal. The timings vary with anatomical element, and so can be used to build a picture of when animals were culled; when an animal is skeletally mature all bones will be fully fused. As this happens by around 3–4 years in cattle, sheep and pigs, this method is only useful for animals that are culled prior to maturity.

The use of tooth wear, however, can give continuous mortality profiles, as an animal's teeth erupt, come into wear and show distinctive wear patterns throughout its life. There are numerous ways in which stages of tooth eruption and wear can be established (for example Grant 1982; Habermehl 1975; Jones and Sadler 2012; Payne 1973; Zeder 2006). A further technique has been devised that allows many of these to be amalgamated or compared (Hambleton 1999, 64), by classifying the data according to nine stages (A to I), which are used in the database.

As with the quantification of carcass parts, some reports do not include raw data for either fusion or tooth-wear stages. In these cases, a summary description is noted, where possible, of the age profile of the main domesticates.

1.7 Analysis

Following collection of the dataset, the aim of the analysis and interpretation phase is to 'review the current state of knowledge of the zooarchaeology of Saxon, medieval and post-medieval sites from southern England [and] prioritise those areas where data are lacking', as defined in the project design (Holmes 2011c). Therefore, the first step in analysis involves developing an understanding of the current state of zooarchaeology from the study area. Four major areas have been identified, which will be considered for each period using a number of techniques.

- The use of animals for food, pets, entertainment and labour: the relative proportions of the major food animals (cattle, sheep, pig, wild mammals such as deer, hare and rabbit, wild birds and fish) gives some idea of their contribution towards the diet of the population. The presence of companion animals such as cats, dogs or more exotic species may also be highlighted by considering their prevalence and the ways in which they are deposited in the archaeological record. The use of animals as entertainment may also be observed archaeologically, through evidence for menageries, hunting, racing or baiting pits. Finally, the use of non-food animals such as horses, dogs and cats for labour (for example haulage, herding, hunting and pest control) may also be inferred.
- Animal husbandry: this can be explored by considering the value placed on the major domestic animals, from primary products such as meat to secondary products including milk, traction and wool, and mixtures of the two. These will be investigated using age data from fusion and tooth wear, herd profiles through sexing data and changes in size reflecting stock 'improvements'.
- Redistribution of animals and animal products: an analysis of age profiles, body parts and butchery data may be useful for investigating the movement (or lack of) of animals between sites, technological changes in butchery and bone and horn working, and specialisation of craft and industry.
- Inter-site analysis: combining the results of the previous three areas of analysis, relationships between various site types may be inferred that illustrate social hierarchy, trade networks and the presence of consumer and producer sites.

The major techniques of data analysis for all phases are summarised here. However, it is important to establish that the potential uses of animals and their products suggested here are based on an overview of the data; individual assemblages may have different pathways that will only be evident at a site-specific level. Nonetheless, in order to allow synthetic interpretation, the following broad comparative models will be considered.

1.7.1 Species Proportions

A number of methods were utilised to compare the relative numbers of species in assemblages and understand the importance of food animals to the diet and non-food animals for particular tasks. To analyse the raw data, a combination of tabulation, triplots, principal component analysis and statistical tests was undertaken as required. In all analyses the proportions of minor species (dog, cat, horse, birds and wild mammals) are given as a percentage of the main domesticates (cattle, sheep/goat and pig) to provide a consistent gauge of the relative importance of these species between sites. To reduce the diversity bias arising from small sample sizes (Casteel 1979; Lyman 2008), a minimum NISP of 300 cattle, sheep/goat and pig was used to investigate minor species (birds and wild mammals).

Fish are considered and classified by habitat (freshwater, marine and migratory) as defined by Froese and Pauly (2011). Wild bird species were split into: goose and duck [given the inadequate methods for distinguishing between domestic and wild forms (Albarella 2005), those recorded as either were grouped together]; corvids (crow, jackdaw, raven, jay, magpie and rook); semi-wild species (swan, pigeon, dove, partridge, peafowl, quail, pheasant and grouse); raptors (owls, buzzard, falcons, goshawk, gyrfalcon, kestrel, hobby, kite, marsh harrier, osprey, peregrine, sparrowhawk, white tailed eagle and merlin); seabirds (cormorant, gannet, auk, guillemot, gulls, razorbill, shag, tern and kittiwake); field birds (blackbird, bunting, chaffinch, corncrake, fieldfare, finches, sparrows, larks, thrushes, pipit, starling, swift, tits, wagtail and yellowhammer); water birds (coot, crane, divers, grebe, heron, moorhen and stork); and waders (woodcock, bittern, curlew, dunlin, plovers, snipe, knot, lapwing, oystercatcher, redshank, ruff, spoonbill, whimbrel and sandpiper).

1.7.2 Age Profiles

The use of tooth wear, fusion and non-specific summary descriptions given in the text of site reports was combined. Tooth-wear data from sites with more than 10 mandibles present were analysed separately (Hambleton 1999, 64; Jones and Sadler 2012; Zeder 2006), while fusion ages were taken from Silver (1969) to provide broad age groups used to interpret the production of primary and secondary products (Table 1.5).

Table 1.5: Mortality profiles represented by raw data, summary descriptions and tooth wear

Production	Age groups	Tooth wear
Breeding/meat as a delicacy	Mostly juvenile	A–C
Meat	Mostly juvenile and prime meat	A–B and D–F
	Mostly immature	A–E (sheep and pig); A–F (cattle)
	Mostly juvenile and subadult	
	Mostly subadult	D (sheep and cattle); D–E (pig)
	Mostly subadult and young adult	D–E (sheep); D–F (cattle and pig)
	Mostly young adult	E (sheep); E–F (cattle); F (pig)
	Mostly subadult and adult	D–G
Meat and secondary products	Mostly adult	G–I
	Mostly young adult and adult	E–G (sheep and cattle); F–G (pig)
	Mostly sub/young adult and elderly	D–F and H–I
	All ages	A–I
Redistribution of meat age animals/secondary products	Mostly elderly	H–I
	Mostly adult and elderly	G–I

1.7.3 Sexing Data

Data pertaining to the sex of animals was taken from the site reports, therefore a mixture of methods and anatomical elements have been used. For example, while the morphology of the canine teeth was most often used to sex pigs, for cattle and sheep methods included metrical analysis of metapodial and/or horn core measurements and/or the morphology of the pelvis.

1.7.4 Carcass Parts

Both the raw data pertaining to the relative proportions of various parts of the carcasses of cattle, sheep and pigs, as well as descriptive data from the text of the specialist reports, were summarised according to basic groupings that may inform on the redistribution of carcass parts or makeup of the assemblage (Table 1.6). Pig's trotters contain more meat than cattle and sheep metapodials and are commonly consumed (Banham 2004, 59) rather than being discarded as butchery waste or used for bone working, so these elements are included as meat-bearing bones.

Table 1.6: Groupings of anatomical elements into major carcass groups taken from raw data and summary descriptions

Carcass groups	Potential use
All carcass parts (in order of expected preservation)	Animals and animal products culled and utilised on site
Mostly meat-bearing bones (upper limbs)	Meat
Mostly meat-bearing and head (upper limbs, mandible and skull)	
Dressed carcass (all parts except head and feet)	
Mostly head (mandible, skull and horn cores)	Primary butchery/display
Mostly lower limbs (metapodials and phalanges)	Primary butchery/skin-processing waste
Mostly lower limbs and head (metapodials, phalanges, mandible, skull and horn cores)	
Mostly horn cores	Horner/skin-processing waste
Mostly feet and horn cores (phalanges and horn cores)	Skin-processing waste

1.7.5 Symbolic, Working and Social Uses of Animals

The exploitation of animals as pets has been discussed elsewhere (for example Harcourt 1974; Harris 1986; O'Connor 1992; Serpell 1989; Smith 1998; Thomas 2005b), but some consideration of how their presence may be recognised in the dataset should be provided. A pet is defined in the Oxford English Dictionary as 'any animal that is domesticated or tamed and kept as a favourite, or treated with fondness' (Little *et al* 1973, 1564), and as such may be any species of animal. How can such an animal be identified in the archaeological record? Caution should be emphasised, as modern feelings towards, and treatment of, animals cannot be automatically associated with those of past populations.

One of the fundamental characteristics of a pet is its treatment as part of the family, and as such it may be expected that it would not be deliberately killed or eaten upon its demise (Harris 1986, 176; Serpell 1989, 14), although this may be

the case when meat is scarce (O'Connor 1992, 112). Accordingly, pets might reasonably be afforded a burial rather than being disposed of with everyday household refuse. Unfortunately, the identification of pet burials will be extremely difficult, as they will often be subject to incorporation into later features, particularly in towns where space was limited. In the majority of cases it will also be impossible to be certain of the behaviour behind the reason for burial: the possibility that the animal was deposited as a carcass following skinning, as a loved pet, as part of a ritual, or as a way of routine disposal (Broderick 2012). Nonetheless, where pets are buried, excepting any wholesale disasters, it is more likely that they will be solitary, so multiple burials and animals with butchery marks can be discounted as evidence of pet keeping. A single example, consisting of a Romano-British cat in a cist burial, was recorded at Silchester North Gate (Hamilton-Dyer 1997e).

Furthermore, it may be expected that pets would have received a greater degree of care and would therefore be more likely to survive into old age, perhaps even with an otherwise disabling disease, such as the arthritic elderly terrier type recovered from medieval Perth, Scotland (Smith 1998, 870). Unfortunately, the scope of this review did not include the collection of pathology data, so this cannot be included here as a criterion. Care of animals may also take the form of a privileged diet visible through isotope analysis, such as that of a cat at Bishopstone, Sussex, that had an exceptionally fishy diet (Poole 2011; *see* section 2.3).

It has been suggested that small dogs are more likely to have been kept as pets, as lap dogs (Harcourt 1974, 168), and so would be visible archaeozoologically through morphological analysis using bone measurements. However, small dogs would not have been exclusively used as pets or companions. The corgi, for example, while being small of stature and kept as lap dogs today, were originally used for wildfowling and herding (Combe 1987, 81). The most compelling archaeological evidence for pets may come from animals occurring within a grave context alongside a human burial. This has been implied from a Bronze Age barrow at Whitegrounds, Yorkshire, where a child was buried with what may have been a pet fox (Morris 2011b, 25). Similarly, an aged, arthritic dog accompanying an adolescent buried in a Roman cemetery outside Carthage (MacKinnon and Belanger 2006), a dwarf dog associated with a human grave in Roman Leicester (Baxter 2006) and a very small Roman dog buried in its own grave at Raunds, Northants, may have been companion animals (Worley 2016).

The use of animals for entertainment is a wide and diverse subject that includes many possible past-times. Evidence within the zooarchaeological record will be hard to identify, as engagement in entertainment by a population is largely tied up with social and ideological frameworks specific to time, place and culture. Nonetheless, some indication may be possible within faunal assemblages.

- Hunting may be carried out for pleasure or necessity, and could be reflected archaeologically by the presence of dogs (hounds), horses and birds of prey, as well as the likely hunted species themselves, wild birds and mammals such as deer, hare, rabbits and boar.

- Racing could involve horses or dogs, and may be associated with particular morphological traits such as the long-legged thoroughbreds and greyhounds/whippets used today.
- Cats were often the focus of torment for entertainment (Smith 1998, 881), and this treatment may be recognisable through injuries sustained as a consequence.
- Fighting may be represented by the pitting of dogs, cocks and/or other animals against each other in a fight to the death, and may be identified by trauma-related pathologies on the bones and multiple carcasses disposed of in one place. In the case of cock fights, spurs were often removed and replaced with metal ones (West 1982, 260), which may be recovered archaeologically, and there is also evidence of an association between large numbers of male birds at a settlement and cock fighting (Hodkinson 2013, 38).
- Finds of exotic species may represent the use of animals for display, for example in a park, pleasure garden, menagerie or zoo, or by a street entertainer (Harris 1986, 190,192; Hoage *et al* 1996, 13; Kohlstedt 1996, 3; Smith 1998, 881; Sykes 2007b, 97).

2 THE SAXON PERIOD (AD 410–1066)

2.1 Introduction and Background to Saxon Sites in the Study Area

The Saxon period spans the time from the end of the Roman occupation to the Norman conquest of Britain. To make analysis easier, the period has been divided into three phases (early, middle and late), each widely acknowledged, and summarised in Table 1.2. The 95 Saxon sites within the study area cluster in the central and eastern counties, and are particularly scarce in Devon and Cornwall where poor preservation is a problem (Fig 2.1).

The economic, political and social background to each phase will be briefly summarised. A number of sites spanned the late Saxon and early medieval period, corresponding to the time of the Norman conquest. These Saxo-Norman sites are included in Chapter 3.

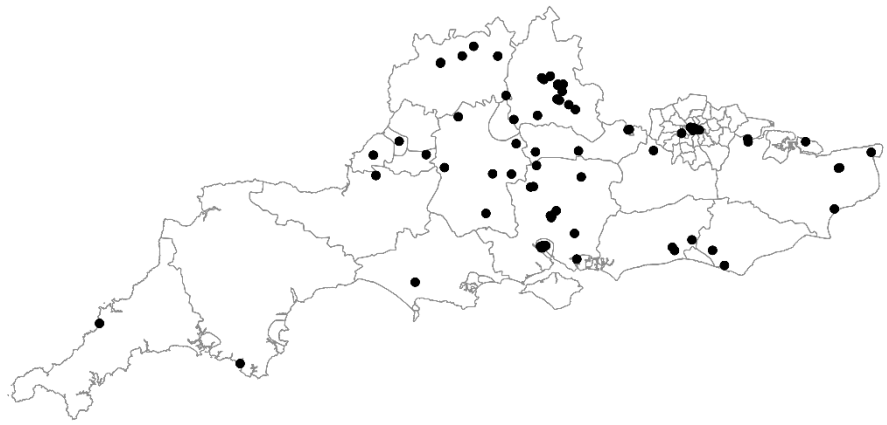

Fig 2.1: Location of Saxon sites within the study area

2.1.1 Early Saxon (AD 410–650)

With the abandonment of many Roman towns and decline of administrative networks, demands for surplus production to provide for urban and military consumption declined considerably. Following this economic change, the country was split into numerous territories. Each territory was controlled by opportunistic local leaders or Saxon warlords from Germanic countries, embroiled in a redistribution of power from the (now collapsed) Roman state to smaller kingdoms (Esmonde Cleary 2011, 26). This led to a three-tier society of nobility, freemen and slaves (Härke 1997, 141), where allegiance to the king and position in the hierarchy was symbolised through the giving of gifts, display of wealth and reward for service (Brookes 2007, 26–8). The majority of the population was required to provide enough food for themselves and their extended families, and tax for the king in return for protection at times of war threatened by or waged with neighbouring kingdoms.

Although there is evidence that some former Roman towns continued to be a focus for an elite (Gerrard 2007; Holmes 2014b, 61), there was little in the way of settlement hierarchy (Dyer 2003; Fowler 2002). The majority of the

population lived in small family-based settlements (Härke 1997, 157). This is reflected in the archaeology of assemblages available for this study, nearly all of which are from domestic rural settlements, with the exception of a trading site at Bantham, Devon, and a high-status site at Cadbury Congresbury 1968–73, Somerset (*see* Appendix 2).

Agriculturally, the population was largely self-sufficient, based on the intensive working of small fields close to a settlement, with some extensive cultivation further afield for animal grazing or non-intensive crops (Oosthuizen 2005, 166; Van der Veen 2005, 159). Although primarily a subsistence-based economy utilising close-range, intensive cultivation and stock-keeping, some surplus production would be required for times of shortage (Bogaard 2005, 179–80).

2.1.2 Middle Saxon (AD 650–850)

There was considerable change during this phase. Whereas the early Saxon period saw a move from the safety and influence of Rome to a largely self-sufficient, tribal society, the middle Saxon phase was a time of consolidation of territories into larger regions (Northumbria, Wessex, Mercia, East Anglia, Sussex and Kent), allowing relative political stability to exist (Bassett 2007, 53–7; Hinton 1990, 60). Society was largely tributary, where the peasant population had security to farm in return for the production of food renders or taxes for the king or queen, as well as their allegiance in battle when required. This led to a network of settlement hierarchies. Farmers provided food to estate centres, where food taxes were collected and used to provide for the royal household as it toured its territories (Richards 2007, 22). Each territory was divided into large ecclesiastical and royal estates, consisting of woods, farms, pasture and arable land and estate centres (Fowler 2002, 81; Richards 2007, 181). At the beginning of the 7th century Christianity began to be practised alongside the existing pagan religions; initially closely linked to the aristocracy, Christian religious communities became increasingly independent (Blair 2005, 204; Pluskowski 2011, 775).

A number of rural sites are included in the dataset (Abbots Worthy, Riverdene, Basingstoke, and Shavards Farm, Meonstoke, in Hampshire; Lower Slaughter, Gloucestershire; Cresswell Field, Dorchester-on-Thames 1972 and Worton in Oxfordshire; Lot's Hole, Berkshire; and Wilton, Salisbury, Wiltshire). Two ecclesiastical sites are recorded: the minster church at Eynsham Abbey, Oxfordshire, and the Benedictine nunnery at Minster on the Isle of Sheppey, Kent. Another minster, at Bishopstone, Sussex, spanned the middle and late Saxon phases. Estate centres or high-status sites are also rare, and recorded only at High St, Ramsbury, Wiltshire, and Lake End Rd, Berkshire. The paucity of Saxon high-status sites is common throughout the country (Ulmschneider 2011, 162); the reasons for this are many, and include an inability to identify high-status sites in the archaeological record and the likely multi-functionality of these sites (Hamerow 2011, 124).

The production of surplus afforded greater opportunities for trade and exchange. Markets under the control of estate centres and minsters were established, which would have provided a venue for exchange on a local level. As

well as these small markets, larger trading sites under the control of the secular elite emerge during this phase. Known as *wics* or *emporia*, they were located at coastal or riverine sites and provided a location for international trade, their patrons collecting tolls or taxes from all goods moving through the area (Astill 1991, 101; Hodges 1989, 56; Middleton 2005, 354). The majority of assemblages in the dataset are from trading settlements (*wics*) – Hamwic (Southampton) and Lundenwic (London) – classified as 'urban' in nature. The undertaking of craft and industrial activities within these settlements is reflected in the dataset. The Anderson's Rd, Southampton, and Lyceum Theatre, London, assemblages contained both craft and food waste, and SARC XIV, Southampton, was a bone-working site. Inland trading sites were less common, although Lot's Hole, Berkshire, provides such an example.

The presence of a non-agricultural population within *wics* and estate centres took the form of administrators, craft workers and merchants, and led to new net consumer sites, where the food and raw materials required by the population could not be provided by those living within. Rather, rural sites were required to fill the role of net producer sites, growing and rearing food to supply *wics* and estate centres. There is much debate about the topic, but it is likely that the estate centres acted as points of redistribution or middlemen, taking food provided as tax from the estate farmers to be reallocated to those living at high-status sites and *wics*. The majority of agricultural production continued to be carried out using the infield/outfield model, where more intensive cultivation of crops was carried out in fields close to the settlement, with more extensive use of land further away for grazing (Oosthuizen 2005, 188).

2.1.3 Late Saxon (AD 850–1066)

This phase saw further consolidation of the Saxon territories brought about by the need for a united defence against the Viking army. The function of *wics* declined under threat from Viking attack in the 9th century, and it has been suggested that there was a reduction in international trade at this time, with the emphasis turning towards domestic trade routes (Brookes 2003, 26; Naylor 2004, 13). By the late 9th century England was divided into three major areas: the Danelaw to the north, Mercia in the midlands and west, and Wessex in the south. Although there was much political wrangling, by the end of the period England was united under a succession of Danish kings until the Norman conquest of 1066 (Richards 2007, 26–48).

Socially there was a more defined hierarchy, with a new 'middle class' developing as land was reparcelled and given out to the Church and aristocracy (Ulmschneider 2011, 168; Williams 2008, 86). This required fragmentation of the large estates of the middle Saxon phase, and by the time of the Norman conquest the king was head of a population of peasant farmers living in villages tied to estates (Fleming 2000, 1; Hooke 1995, 99; Reynolds 1999, 83). These estates were run by a *thegn*, a minister of the royal court (Williams 2008, 16). A split in settlement patterns has been suggested by Roberts and Wrathmell (2000, 4), between nucleated villages within the 'central province' of southern England and a continuation of largely isolated farmsteads and hamlets in marginal areas to the south-west and east. The settlement at Mawgan Porth,

Devon, is within this marginal area to the south-west, and the villages of Steyning, Kintbury and Ufton Nervet are in the east, while Bishop's Cleeve, Gloucestershire, lies within the central province. Manors, the seat of the *thegn* or estate manager within a village, are represented by the site of Faccombe Netherton, while a possible royal residence has been identified at Cheddar Palaces.

Defence of Wessex and Mercia against the Vikings led to the construction of a new class of site. *Burhs* were constructed in the 9th century under Alfred, then King of Wessex (Hill 1969, 84), and the dataset is again dominated by assemblages from these urban domestic settlements. *Burhs* took many forms: some military (Portchester); some protecting existing estate centres (Oxford and Winchcombe); some located within redefended Roman towns (Exeter, Canterbury, Winchester, Gloucester, Bath and Chichester); others situated close to former *wics* (London and Southampton); some newly constructed (Lewes, Wallingford); and others formed at smaller, pre-existing settlements (Malmesbury). Although a number of Viking raids took place throughout the region (Cowie and Blackmore 2008, 165), the only Danish town in the dataset, situated on the edge of the Danelaw, is Banbury, from which no contemporary data have been recorded.

There was some decline in the prevalence of minster churches and monasteries following Viking raids, and in their place a network of local churches was established by both Saxon and Viking benefactors (Blair 2005, 506–7). Religious sites in the dataset are scarce, coming only from the minster church at Eynsham Abbey and Lewes Priory.

The move to coinage as the main means of tax collection, away from food renders, and the increasing urbanisation of *burhs* and early towns led to the need for a widespread distribution network between rural producers and consumers within *burhs* and towns. This took the form of a market economy (Hutcheson 2006, 73), where small-scale, local markets evolved into those with a larger, regional distribution from the late 9th century. The need for greater provision of food and raw materials from rural sites meant that the emphasis moved from sustainable to profitable farming. By the end of the phase open-field farming was in operation throughout much of the central province. This allowed for intensification of arable production through communal working of village farmers, with grazing on the edge of the cultivated lands (Oosthuizen 2005, 165–6). Farmers in more marginal areas continued to practise the infield/outfield agriculture of the earlier phase (Oosthuizen 2005, 185).

2.2 Animals as Food

2.2.1 Animals as Food: Beef, Pork and Mutton

During the early Saxon phase relative proportions of the main domesticates vary widely, although cattle are generally the most commonly occurring species, followed by sheep/goat then pigs; it is of note that the only high-status site in the dataset also contained unusually high numbers of cattle and pigs (Fig 2.2;

see Appendix 2). Sites with the greatest numbers of pigs are generally located on the chalklands in the east of the region (Northfleet and Springhead in Kent; Botolphs in Sussex) but also on the London clay (Saxon County School in Surrey) and sandstone valleys of the Mendips (Cadbury Congresbury 1968–73, Somerset) (Fig 2.3). With the possible exception of Saxon County School, all of these are close to wetland areas, and it is likely that pigs could take advantage of the forage in there. Although pigs are traditionally thought of as woodland animals, the season of pannage was only during the months from autumn to early winter, and they would have been kept in other areas outside this season, including marshland (Albarella 2004, 119; Hamilton and Thomas 2012, 235). Links have also been suggested between the high numbers of pigs recorded at Chestfield, Kent, nearby large wooded areas suitable for pannage, and a close association with the north Kent salt industry related to the wetlands, vital for the preservation of pork for trade (Allen 2004, 132). Sites with a high proportion of sheep/goats are also located on free-draining chalk and limestone vales, while clay areas were more likely to have assemblages with more cattle (Fig 2.3). It is likely that, given the reduced pressure on the population to produce a surplus during this phase, decisions regarding which animals to keep were environmentally determined to some degree, with greater numbers of sheep and pigs in areas where they were most suited (Holmes 2012, 58; Sykes 2007b, 29).

In the middle Saxon phase, the overall proportion of the main domesticates was similar to that of the preceding phase (Fig 2.4), although when considered in terms of environmental determinism (Fig 2.5) sheep are again recorded in high numbers on the chalk downlands and limestone vales (Shavards Farm and Abbots Worthy, Hampshire; Copeshill Rd, Lower Slaughter, Gloucestershire; and St Aldates, Oxfordshire). Exceptions occur, and they are also common on the clay at 27 James St, London, and SOU 19, Southampton. However, it should be noted that these sites are within *wics* and may have been subject to external provisioning (*see* section 2.5). Pigs and cattle also have a varied distribution, although there is a correlation between cattle and low-lying settlements (p=0.0015) (Fig 2.6). This has been linked with an association between cattle and agricultural production occurring in the valleys where water was abundant (Sykes 2007b, 29). However, environment was not the only determining factor in the types of animal recorded at a settlement. Increasing social differentiation exemplified by a greater range of site types brought about an opportunity for preferences for particular species to dominate the diets of distinct sectors of the population. The greatest numbers of cattle and pigs were recorded at many *wics* (Fig 2.7). This provides an alternative explanation for their predominance at low-lying settlements, as the coastal nature of *wics* meant they were situated close to sea-level (Holmes 2012, 57) while higher proportions of sheep were generally observed at rural sites. This implies the deliberate supply of cattle to *wics*, providing the most meat per animal, combined with the ease with which pigs could be raised within the urban environment (Holmes 2013a, 255). The high number of sheep at Eynsham Abbey and Bishopstone indicates a link between sheep and many monastic settlements that is widespread in the Saxon period (Holmes 2014b, 105). High-status sites (two phases at High St, Ramsbury, and Lake End Rd, Berkshire) all recorded over 30% pig, reflecting

the value of such an animal in rents paid to the *thegn* (McCormick 1991, 42; Sykes 2007b, 42).

The increase in sheep and decrease in cattle in the late Saxon phase (Fig 2.4) are statistically significant (p=0.001) when tested with a two-tailed t-test. This shift may reflect the move to open-field agriculture in the central area, as an increase in sheep for their use for fertiliser is often recognised in areas of new, more intensive agricultural practices (McCormick 1991, 46; Sykes 2007b, 34). There is certainly no strict environmental determinism in this phase as sheep are recorded in some of the highest numbers on clay areas (Fig 2.8), although sites with the greatest numbers of sheep continue to be on chalk or limestone. The central clay areas of the study region, where numbers of sheep are relatively high (Malmesbury and Cadley Rd, Collingbourne Ducis, Wiltshire; Ufton Nervet, Berkshire; North St, Winchcombe, Gloucestershire; Staple Gardens, Winchester; and St Aldates, Oxford), coincide with the 'central province', suggested to be the area where the move to open-field agriculture began (Roberts and Wrathmell 2000).

There is no distinction between urban and rural sites in this phase (Fig 2.9), although at both high-status and ecclesiastical sites the consumption of pigs remains high. Interestingly, many sites within *burhs* that show the highest numbers of sheep are from Oxford (Logic Lane, 79–80 St Aldates and Christ Church Cathedral Graveyard), and also Winchester (26–27 Staple Gardens) and Winchcombe (North St). The greatest numbers of cattle were recovered from Southampton (SOU 175, 30, 169, 177 and the French Quarter), perhaps indicating a preferential demand for the supply of specific foods by the populations of these early urban sites.

Summary

The main diet of the Saxon population varied considerably, both temporally and socially. The early Saxon phase was exemplified by the production of animals on an environmentally deterministic basis, where sheep were more common at settlements on chalk uplands in the east of the region. The high number of pigs recorded from coastal counties in the east could be indicative of the migration of Saxon settlers from across the channel, reflecting both a preference for pork and the nature of pigs as a quick growing, easily sustained 'larder' food (Crabtree 1989, 210; Holmes 2016). It is often cited that meat was only sporadically consumed by much of the Saxon population (for example Banham 2004, 53), and the well-documented cattle murrains would have frequently reduced the available sources of protein in the diet (Williams 2008, 88). However, results from isotope studies of the diet of an early Saxon population at Berinsfield, Oxfordshire, revealed that 'every individual tested consumed a significant amount of animal protein on a regular basis' (Privat *et al* 2002, 785), which indicates that, for some groups at least, meat was commonly available.

The emergence of different site types in the middle Saxon phase had an effect on the diet of the population, implying a relationship between producers and consumers that resulted in the production of animals on demand at rural sites, rather than those best suited to the environment. This took the form of a

predominance of cattle in *wics,* sheep at rural settlements and ecclesiastical sites, and pigs in the diet of the secular elite.

A striking increase in the number of sheep at late Saxon sites can be linked to the introduction of new agricultural practices, resulting in a change in diet to one relying more on mutton than previously. A higher degree of autonomy is evident between urban sites, albeit concurrent with the rise of markets, as the population of Oxford evidently consumed more sheep, and those from Southampton more cattle. Assemblages from elite sites (high-status and ecclesiastical settlements) suggest that their occupants enjoyed more pork than those of lower status in all phases.

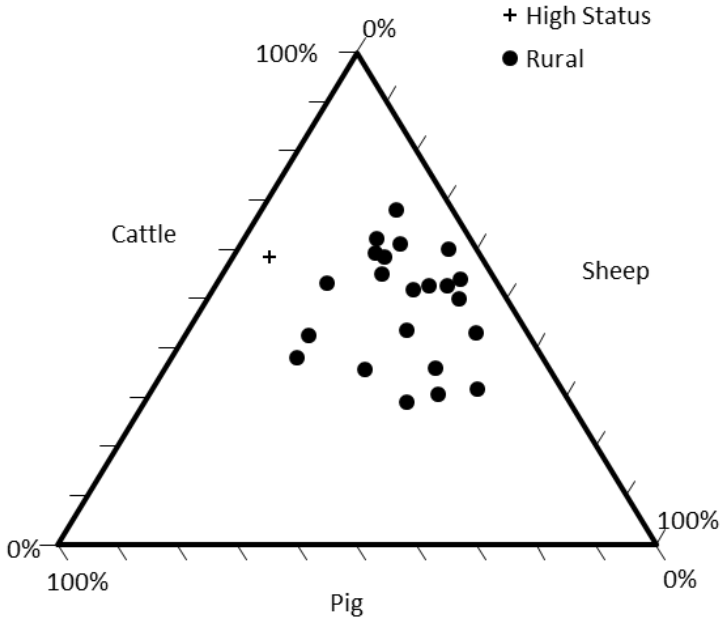

Fig 2.2: Relative proportions of cattle, sheep/goat (sheep) and pig bones from all early Saxon sites. Quantification based on NISP

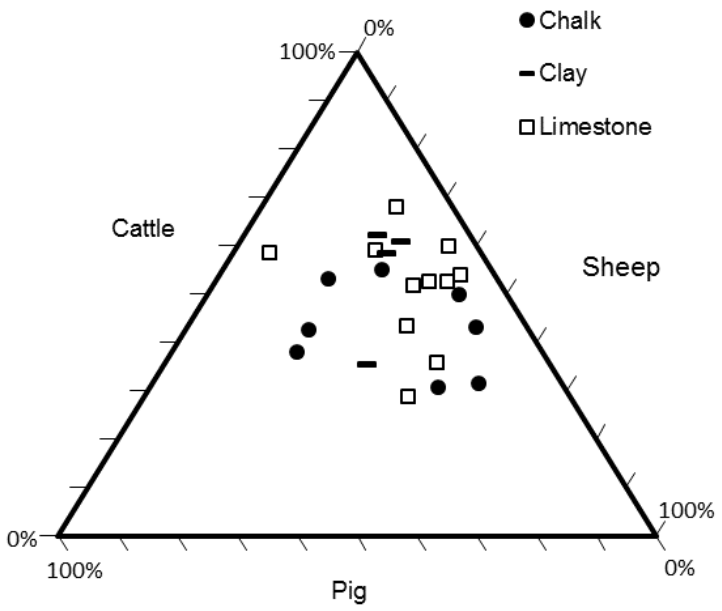

Fig 2.3: Relative proportions of cattle, sheep/goat (sheep) and pig on underlying bedrock geology for the early Saxon period. Quantification based on NISP

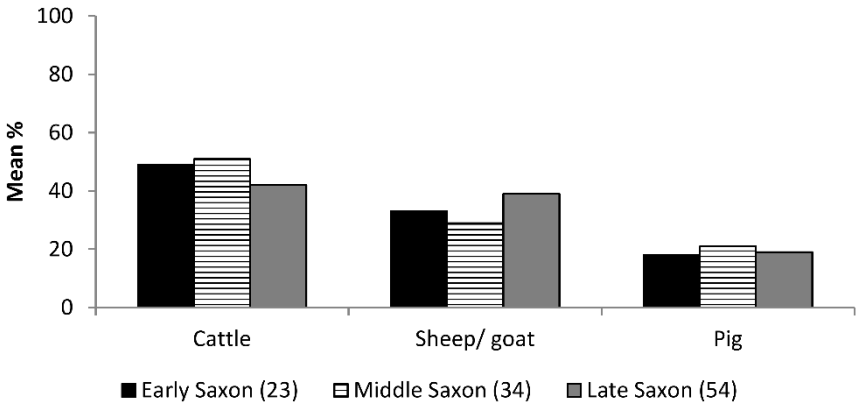

Fig 2.4: Mean proportion of the main domesticates recorded for each of the major Saxon phases. (n)= number of sites

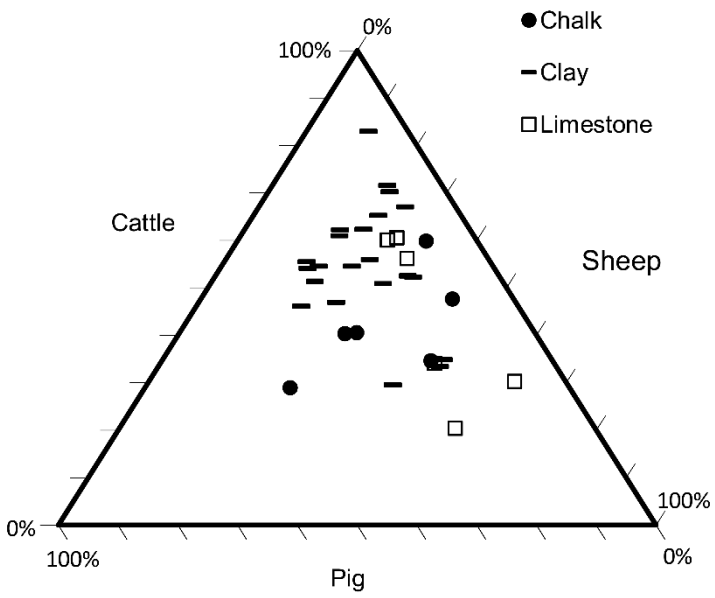

Fig 2.5: Relative proportions of cattle, sheep/goat (sheep) and pig on underlying bedrock geology for the middle Saxon period. Quantification based on NISP

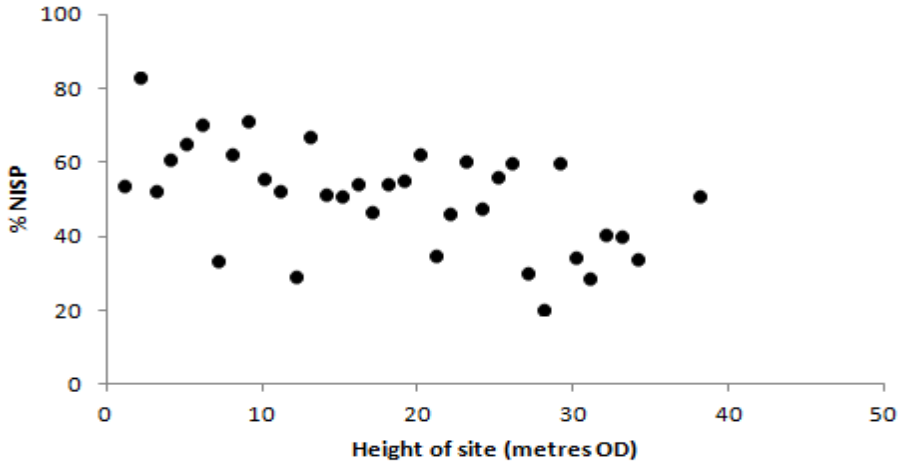

Fig2.6: Proportion of cattle recorded at each middle Saxon site (as % of cattle, sheep/goat and pig) by height of the site above ordnance datum (OD)

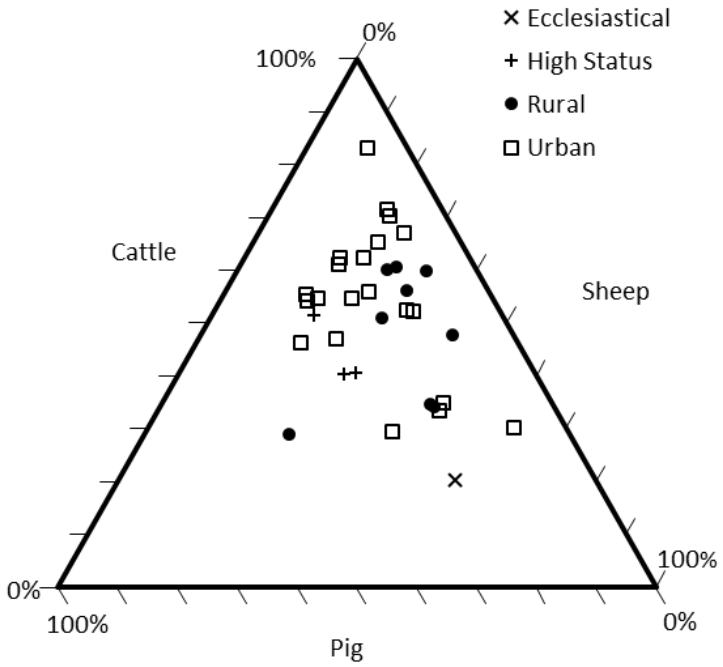

Fig 2.7: Relative proportions of cattle, sheep/goat (sheep) and pig bones from all middle Saxon sites. Quantification based on NISP

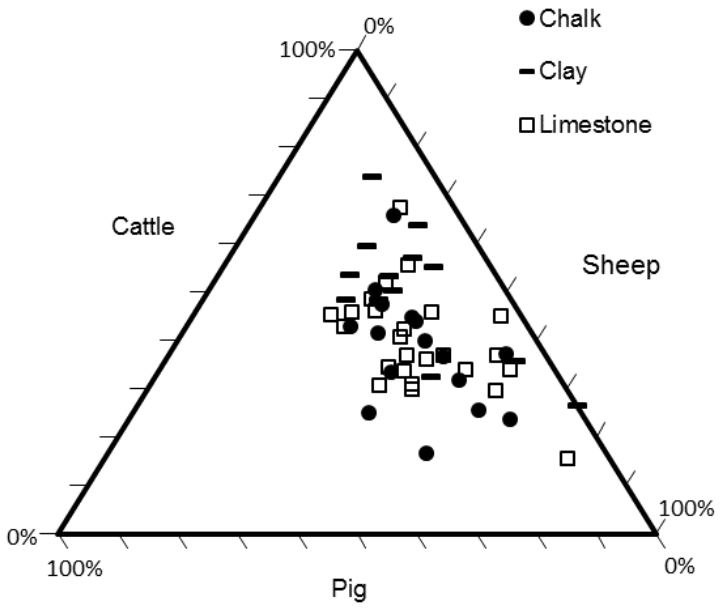

Fig 2.8: Relative proportions of cattle, sheep/goat (sheep) and pig on underlying bedrock geology for the late Saxon period. Quantification based on NISP

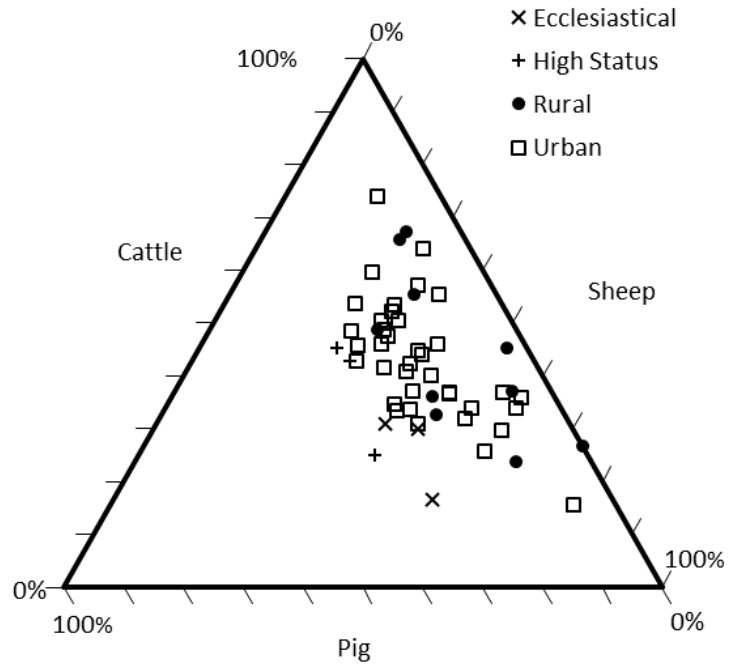

Fig 2.9: Relative proportions of cattle, sheep/goat (sheep) and pig bones from all late Saxon sites. Quantification based on NISP

2.2.2 Animals as Food: Birds

Neither domestic birds (chicken, goose and duck) nor wild birds were commonly recorded at Saxon sites, although both domestic fowl and wild bird numbers increased in the late Saxon phase, the former considerably (Fig 2.10; *see* Appendix 3). The predominance of goose over duck is also established from the beginning of the period, a phenomenon that has been interpreted as the domestication of geese, and exploitation of wild ducks at sites from central England (Albarella 2005, 256).

During the early Saxon phase bird taxa were recorded in rural assemblages only, so comparisons with other site types are not possible. Nonetheless, it can be seen that wild birds were extremely rare (Fig 2.11), with field birds the most commonly recorded (bunting, finches, sparrows and starlings), then semi-wild species (dove, partridge and pigeon). Raptors, waders and water birds were recovered in similar quantities, and corvids and seabirds are absent. All these taxa would have been present within the local environment, and were probably not commonly consumed. This is exemplified by the recovery of few wild birds, even from settlements close to areas of wetland habitat. By the end of the Roman period most marshland settlements were abandoned and large areas of formerly reclaimed land were once again under water (Rippon 2000, 139). There is no zooarchaeological evidence for wildfowling at settlements such as Springhead and Manston Rd, Ramsgate, in the area of the north Kent marshes, while only two bones (mallard and a diver species) were recovered from Northfleet, also close to the north Kent marshes, despite the implementation of sieving programmes.

In the middle Saxon period, bird bone assemblages are found at a wider range of site types, and in some cases in relatively high proportions (Figs 2.12 and 2.13). In particular, there is an abundance of chickens, geese and wild birds (particularly crane, lapwing, partridge and pigeon) recovered from the ecclesiastical site of Eynsham Abbey, Oxfordshire, in the middle Saxon phase, which has been explained as evidence for a high-status diet (Dodd and Hardy 2003, 475). The greatest number of bones came from corvids, more likely to be scavengers rather than contributors to the diet. By way of contrast, far lower numbers at other site types suggest that the general population of middle Saxon sites did not routinely consume birds, perhaps indicating a restriction in their use by the upper classes. It is unfortunate that few quantified data are available from high-status sites for comparison, yet at Lake End Rd a number of wild birds were recorded (teal, pigeon, woodcock, golden plover, white tailed eagle, corvid, jackdaw, *Turdus* species and passerine). It is likely, therefore, that wild birds were more commonly exploited at high-status sites, as well as religious houses, which is the case with other sites from outside the study area (Holmes 2014b).

In the late Saxon phase domestic and wild birds continued to be more common at ecclesiastical sites, including Bishopstone, Sussex, and Eynsham Abbey, than at other sites types (Figs 2.14 and 2.15). The absence of wild bird bones and low numbers of chicken, goose and duck at high-status sites in this phase is again due largely to poor recording and quantification of the bird assemblages. At Faccombe Netherton, a wide range of species was recorded for the site as a whole, but not broken down by period, although a goshawk bone was dated to this phase. The two high-status phases at Cheddar Palaces have only six and five bird bones, respectively. An increase in the proportion of chickens and some wild birds (particularly waders) at urban sites implies increased availability, either through markets or the opportunity to keep fowl within the settlement. Numbers of bird species remain low at rural sites, which may indicate the widening social divide resulting in a restriction of the diet. The exception to this is the assemblage from the rural site at Sandtun, West Hythe, within the Romney marsh. While not quantified, this site contained a considerable number of wild bird species, including diver, swan, crane, wader, gull, tern and guillemot. Despite considerable reclamation of the wetlands in this phase (Rippon 2000, 162), these birds could have lived on the river floodplains and areas of back fen within the marsh, suggesting that local resources were utilised by those of lower-status, where available.

Summary

Domestic and wild birds would not have featured highly in the Saxon diet, reflecting the ability of Saxon farmers to meet their protein needs through mammal husbandry (Sykes 2004, 99). There is evidence for chickens, geese and wild birds to have been more important at ecclesiastical and high-status sites from the middle Saxon phase, although the poorly quantified dataset for high-status sites means they are under-represented for this site type. This is unfortunate, as it makes interpretation of the use of wildfowl as a status symbol limited. Nonetheless, the presence of established high-status taxa (Sykes 2004) within the study area has been recorded. Birds associated with hawking, either

traditional falconry birds (sparrowhawk and goshawk) or their prey, are present (Table 2.1), but the data are again affected by the dearth of high-status sites from the assemblage list. From the middle Saxon phase there is an increasing trend for the presence of birds associated with capture during hawking (for example heron, crane and bittern) at ecclesiastical and urban sites, yet sparrowhawks and goshawks are only recorded at urban sites. This has been noted elsewhere (Dobney and Jaques 2002, 16–17; Holmes 2014b, 50) and may be linked to the movement of birds of prey as a commodity through urban markets. There is little evidence from this dataset for the restriction of particular taxa of game birds as high-status food, which is consistent with the likelihood that those other than the aristocracy were also allowed to hunt with birds as a means to procure food (Oggins 2004, 36).

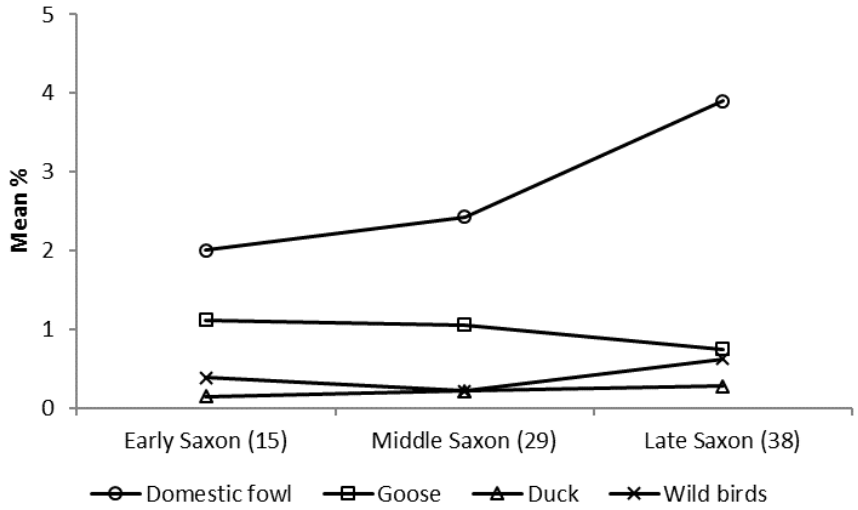

Fig 2.10: Mean proportion of domestic fowl, domestic and wild geese and ducks, and wild bird species (i.e. all birds except those noted as domestic fowl, goose or duck) from Saxon sites where birds were quantified (% of NISP cattle, sheep/goat and pig). Only sites (n) *with >300 NISP cattle, sheep/goat and pig included*

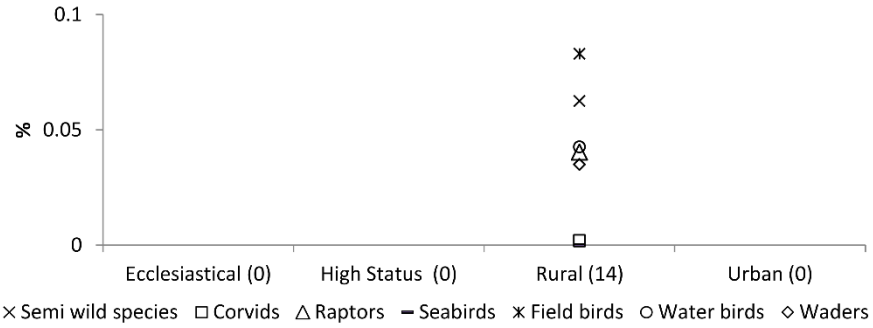

Fig 2.11: Mean proportion of early Saxon wild bird species recorded by site type (% of NISP cattle, sheep/goat and pig). Only sites (n) *with >300 NISP cattle, sheep/goat and pig included. For bird taxa included within each category* see *section 1.7.1*

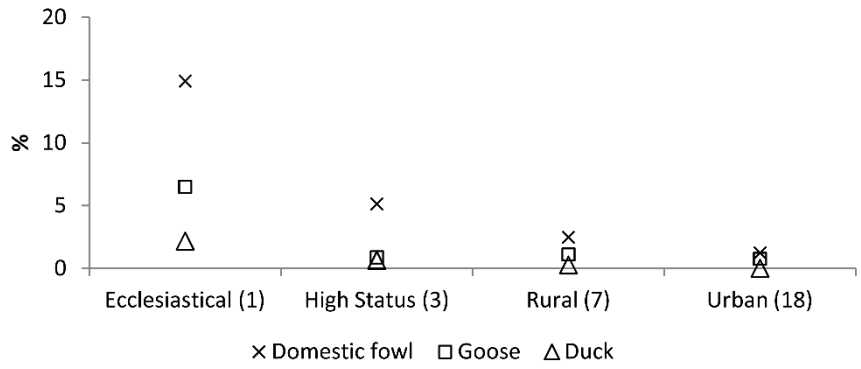

Fig 2.12: Mean proportion of middle Saxon chicken, duck and goose bones recorded by site type (% of NISP cattle, sheep/goat and pig). Only sites (n) *with >300 NISP cattle, sheep/goat and pig included. Bones recorded as both domestic and wild are included*

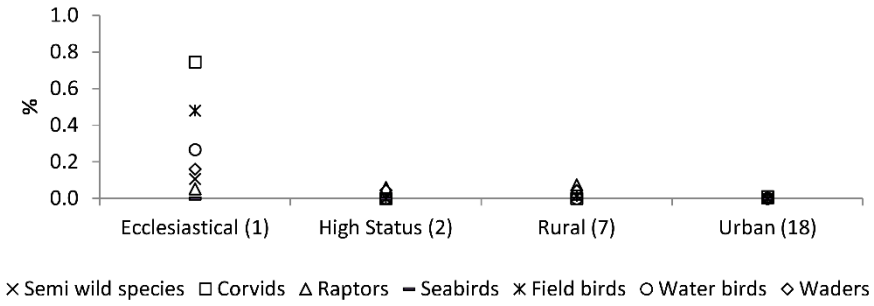

Fig 2.13: Mean proportion of middle Saxon wild bird species recorded by site type (% of NISP cattle, sheep/goat and pig). Only sites (n) *with >300 NISP cattle, sheep/goat and pig included. For bird taxa included within each category* see *section 1.7.1*

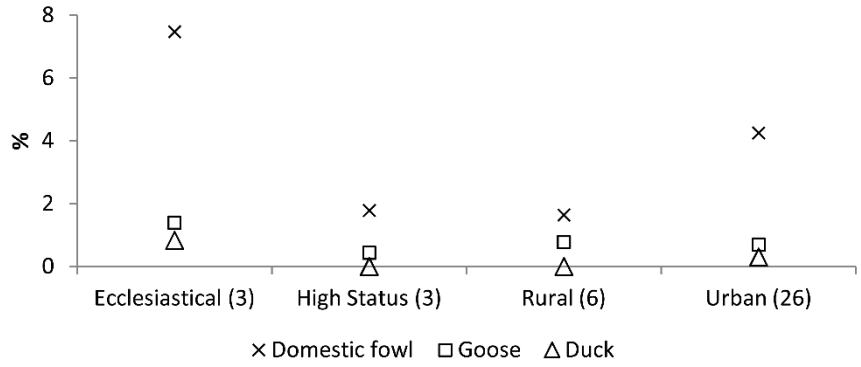

Fig 2.14: Mean proportion of late Saxon chicken, duck and goose bones recorded by site type (% of NISP cattle, sheep/goat and pig). Only sites (n) *with >300 NISP cattle, sheep/goat and pig included. Bones recorded as both domestic and wild are included*

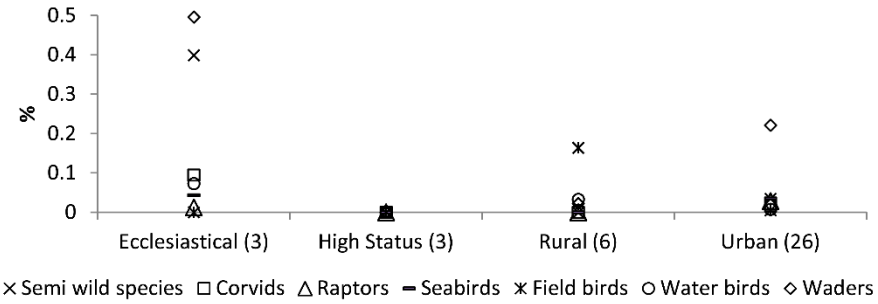

Fig 2.15: Mean proportion of late Saxon wild bird species recorded by site type (% of NISP cattle, sheep/goat and pig). Only sites (n) *with >300 NISP cattle, sheep/goat and pig included. For bird taxa included within each category* see *section 1.7.1*

Table 2.1: Presence of native birds of prey and their quarry at Saxon sites

Phase	Site type	Site	Grey heron	Heron	Crane	Bittern	Swan	Goshawk	Sparrowhawk
Early Saxon	Rural	Mill St, Wantage		*					
Early Saxon	Rural	Sherborne House, Lechlade			*				*
Early Saxon	Rural	Portchester Castle				*			
Early–late Saxon	Rural	Charlton Gym, Andover						*	
Middle Saxon	Ecclesiastical	Eynsham Abbey, Oxfordshire			*				
Middle Saxon	Rural	Worton							*
Middle Saxon	Urban	York Buildings, London							*
Middle–late Saxon	Ecclesiastical	Bishopstone	*		*				
Middle–late Saxon	Rural	Cadley Rd, Collingbourne Ducis			*				
Middle–late Saxon	Rural	Sandtun, West Hythe			*		*		
Middle–late Saxon	Urban	Portchester Castle				*			
Late Saxon	Ecclesiastical	Eynsham Abbey, Oxfordshire			*				
Late Saxon	High status	Faccombe Netherton						*	
Late Saxon	Urban	Dorter Undercroft, Westminster Abbey			*				
Late Saxon	Urban	French Quarter, Southampton						*	
Late Saxon	Urban	Staple Gardens, Winchester			*		*		
Late Saxon	Urban	26–27 Staple Gardens, Winchester		*			*		

2.2.3 Animals as Food: Game

As with bird taxa, wild mammals are rare at Saxon sites (Fig 2.16; *see* Appendix 2), yet that is not to suggest they were of little significance to the population. The predominance of wild animals depicted in early Saxon art and the presence of their pelts and furs as grave goods indicates their social importance as totems (Sykes 2011, 332). Wild mammal remains from Saxon sites include native and

introduced species, with interpretation of the latter problematic in some cases. For example, although it is likely that rabbits were not introduced into England until the end of the 12th century (Sykes 2007b, 85), one fragment was recorded at Southampton and has been interpreted as imported meat (Sykes and Curl 2010, 121). A similar problem arises with the presence of fallow deer remains. A recent multi-disciplinary programme utilising genetics, carbon dating and isotope research has established that it is likely that a small founder population of fallow deer was introduced into menageries in England prior to the Saxo-Norman period, and that these animals would have been highly prized and kept alive into old age (Sykes *et al* 2016). Fallow deer bones from the Isle of Wight and Faccombe Netherton fall into this category. A group of butchered and gnawed fallow limb bones positively identified at 26–27 Staple Gardens, Winchester, and dated to the late Saxon phase, may represent an imported joint of venison (Hamilton-Dyer and Hamilton-Dyer 2008).

All indigenous wild taxa reduce in number in the middle Saxon phase (Fig 2.16). Hare numbers remain exceedingly low throughout the remaining period and cannot have been widely exploited for food. While there is a subsequent increase in the proportion of roe deer remains in the late Saxon phase, red deer numbers do not recover to those of the early phase. There is little difference between the proportions of wild mammal species in early Saxon assemblages (Fig 2.17). The highest numbers of red and roe deer are recorded at a few early Saxon sites from the south of the study region (Cadbury Congresbury 1968–73, Somerset; Portchester Castle, Hampshire; Poundbury, Dorset; Springhead, Manston Rd, Ramsgate, and Northfleet, Kent), close to areas of woodland suitable for hunting deer (Roberts and Wrathmell 2000, 31). This suggests that an element of environmental determinism played a part in the inclusion of venison in the diet of the Saxon population, as seen earlier with domestic mammals (*see* section 2.2.1).

In the middle Saxon phase red and roe deer are recovered in far greater numbers from high-status and, to a lesser extent, ecclesiastical sites than at rural and urban settlements (Fig 2.18). Of particular note are roe deer, which are almost exclusively recorded from elite sites, and an association has been identified between roe deer and early hunting grounds from as early as the 8th century (Williams 2008, 124). The prevalence of hare remains at rural and urban settlements compared to their high-status contemporaries is also worthy of note, and may reflect a species harder to control access to, or not desired, by the elite.

In the late Saxon phase there is continuing prevalence of deer numbers at the high-status sites of Cheddar Palaces and Faccombe Netherton and the ecclesiastical sites of Eynsham Abbey and Bishopstone (Fig 2.19). This is consistent with the role of hunting as an elite past time, with evidence for structures built in woodland, and a change in the ritual breaking up and distribution of carcass parts indicative of the 'privatisation' of venison by the aristocracy (Sykes 2010, 186; Sykes 2011, 339; Williams 2008, 125). The increase in wild species at ecclesiastical sites is reflected in documentary evidence for deer hedges constructed on Church land (Williams 2008, 79), and the noble, chaste character of roe deer as one more fitting with religious

consumption (Sykes 2007b, 68). The overall predominance of roe deer over red is notable and widespread, reflected in place name evidence for features in the landscape associated with the hunt (Sykes 2011, 339). It can also be observed that the quantity of hare remains at lower status sites is reduced from that of the previous phase, which may reflect restricted access of the peasant classes to this species, as well as to deer. The hare becomes one of the most esteemed hunted animals in the medieval period (Almond 2003, 67), the roots of which seem to have occurred in the late Saxon phase, and an increase in hare bones is recorded in other contemporary sites throughout England, related to the increase in dedicated hunting areas (Sykes 2009c, 26).

Summary

The contribution of game to Saxon diet appears to have been minimal, yet full of social meaning. The consumption of venison was introduced as a method of setting the elite apart from the lower classes in the middle Saxon phase through restricted access and redistribution, which evolved into the structured control of a resource where property ownership and highly ritualised capture and butchery were instrumental in establishing the gap between elite and peasant (Faith 1997; Sykes 2010).

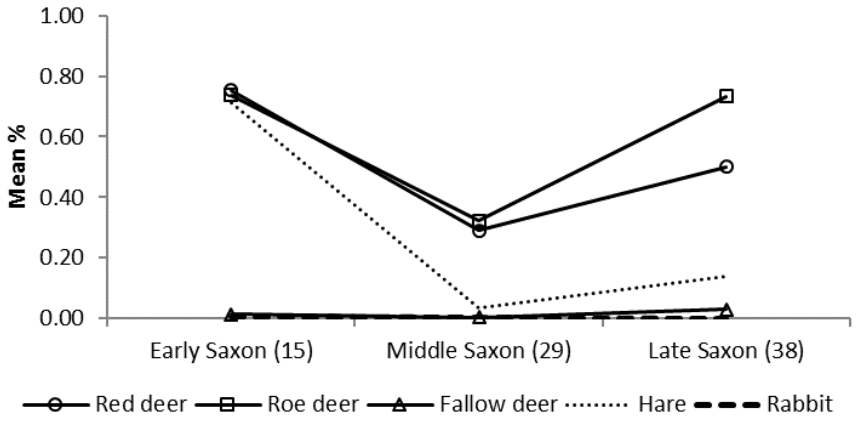

Fig 2.16: Mean proportion of the major game species from all sites for the Saxon period (% of NISP cattle, sheep/goat and pig). Only sites (n) *with >300 NISP cattle, sheep/goat and pig included*

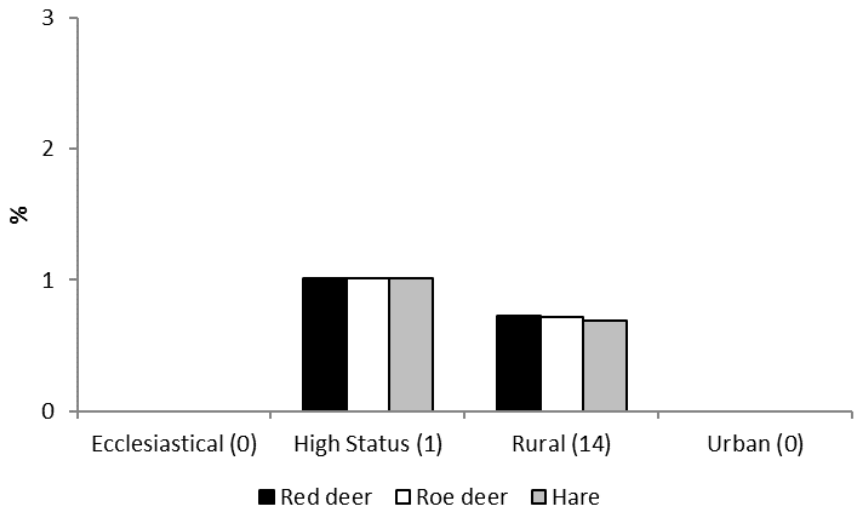

Fig 2.17: Mean proportion of wild mammals from various site types in the early Saxon phase (% of NISP cattle, sheep/goat and pig). Only sites (n) with >300 NISP cattle, sheep/goat and pig included

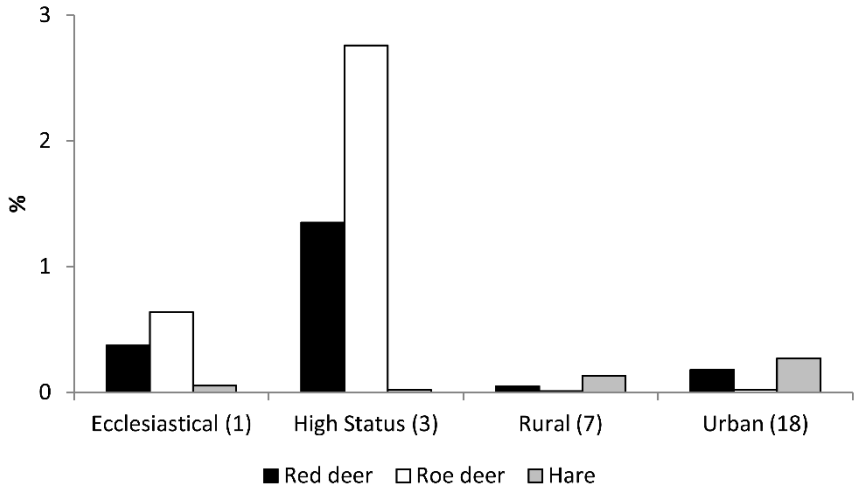

Fig 2.18: Mean proportion of wild mammals from various site types in the middle Saxon phase (% of NISP cattle, sheep/goat and pig). Only sites (n) with >300 NISP cattle, sheep/goat and pig included

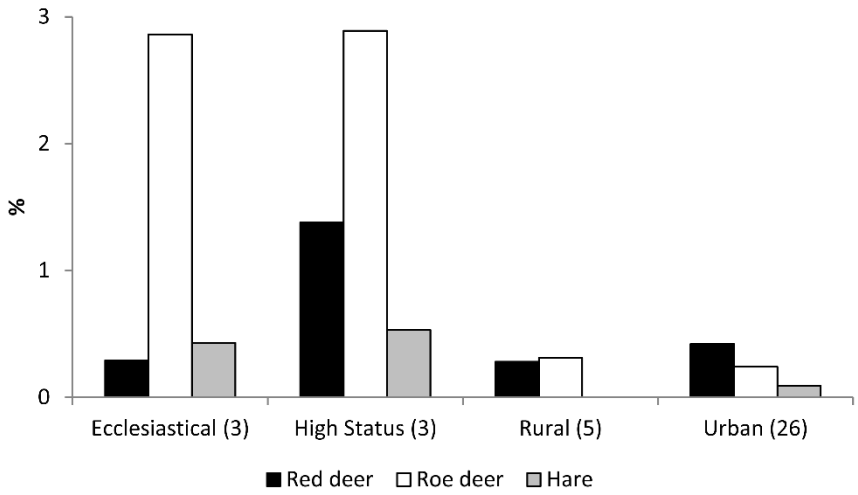

*Fig 2.19: Mean proportion of wild mammals from various site types in the late Saxon phase (% of NISP cattle, sheep/goat and pig). Only sites (*n*) with >300 NISP cattle, sheep/goat and pig included*

2.2.4 Animals as Food: Fish and Marine Mammals

Fish were recorded from a number of Saxon sites, both from sieved and hand-recovered assemblages (*see* Appendix 4). A wide range of species were present; most common were pike and roach from freshwater habitats, salmon and eel as migratory species, and cod, flatfish (especially plaice), herring and whiting from the sea. A comparison of the relative frequencies of freshwater, migratory and marine fish (Fig 2.20) shows that in the early and middle Saxon phases there was apparently no focus on the provision of fish from a particular habitat, and fish from all three environments were recorded at various sites, probably caught locally as required (Reynolds 2013, 106). The consumption of fish by the early Saxon population has been considered in a number of isotope studies. Marine food was likely to have played a minor part in the diet of early Saxon populations close to the coast, while their more inland contemporaries tended to consume freshwater fish if they lived close to riverine sources (Mays and Beavan 2012, 872–3; Privat *et al* 2002, 785). A decline in the amount of marine fish eaten from the Roman period is indicated by data from a number of Romano-British and early Saxon burials (Hull and O'Connell 2011, 682; Müldner and Richards 2007, 690). However, a significant increase occurred in the quantity of fish eaten by the middle Saxon population of East Anglia compared with that of the preceding phase (Hull and O'Connell 2011, 681). Although this study was based on middle Saxon samples from ecclesiastical cemeteries, the incumbents of which may be expected to eat more fish than their secular contemporaries (although see below), this is reflected in an increase in the number of sites where fish are recorded in the wider middle Saxon dataset (Fig 2.21). No differentiation between site types could be observed, particularly given the small dataset.

Despite small sample sizes, the late Saxon phase (including middle–late Saxon sites) sees an increase in saltwater fish, with a drop off in the proportion of migratory fish (Fig 2.20), indicating an increase in off-shore fishing, consistent

with the findings of larger scale studies (Barrett *et al* 2004a; O'Connor 1989b, 19; Reynolds 2013). The results of research conducted by Barrett *et al* showed an increase in deep-sea fishing for cod and herring in the decades before and after AD 1000 (Barrett 2008; Barrett *et al* 2004a, 2004b, 2008). This has recently been revised to take into account the role of the middle Saxon elite at the beginnings of a sea-fishing trade (Reynolds 2013, 105), evident in a new pattern in the quantity and type of fish consumed at high-status sites. Within the dataset, both ecclesiastical and lower status populations evidently had access to sea and freshwater fish (Fig 2.21).

There is evidence for fish to have travelled considerable distances. In the early Saxon phase 95% of the Market Lavington (in landlocked Wiltshire) fish assemblage was from dogfish, a species that inhabits areas of the ocean close to the coast. Middle Saxon sites with the greatest quantities of marine fish were from coastal *wic* settlements, although a small quantity of herring was recorded at inland Shavards Farm, Meonstoke, 23km from Southampton. In these phases it is likely that marine fish imported inland would have been a luxury food (Naylor 2004, 134; Van Neer and Ervynck 2002, 210). By the late Saxon phase, however, marine fish are recorded in relatively high quantities at all sites, including Oxford. The widespread movement of fish would have required its preservation, which was documented as either smoked, cured or salted herring, or salted and dried white fish (cod, haddock, hake and ling) (Serjeantson and Woolgar 2006, 105). If the relative proportion of these traditionally preserved fish is compared with other taxa (Fig 2.22), the increase in herring can be observed from the middle Saxon phase, while the introduction of gadids (cod species) does not occur until the subsequent phase. This phenomenon appears to coincide with the decline in both freshwater fishing and the consumption of eel in the late Saxon phase, and a narrowing of other marine species targeted for the catch. The increasing importance of herring fisheries and decline of eel have been recorded at other sites in England (Serjeantson and Woolgar 2006, 116). However, it has been suggested that early herring and white fish fishing industries would not have included their preservation, rather they would have been eaten fresh by the local population (Serjeantson and Woolgar 2006, 116), which is consistent with the prevalence of marine fish at sites near to the coast.

The paucity of fish assemblages in the dataset hampers a consideration of preference by site type. However, it is worth noting that, despite freshwater fish being a resource available to all, and with documentary and archaeological evidence for freshwater fisheries (Serjeantson and Woolgar 2006, 103), this was the most poorly represented type of fish in all phases (Fig 2.21). Migratory fish, mostly eels, were well represented at the majority of sites in the early and middle Saxon phases. Details of food rents from the *Laws of Ine* in the late 7th century record the provision of 100 eels as rent for 10 hides of land (Whitelock 1996). The considerable drop-off in the relative proportion of migratory species in the late Saxon phase at all site types occurs as marine fish, particularly herring, become more common. Little difference in the proportion of fish is evident at ecclesiastical and urban sites, which suggests less of a link between diet and monastic river fisheries and fishponds than the documentary evidence suggests (Fowler 2002, 241), with the increase in fish requirements by the ecclesiastical community not apparent until after the Conquest (Barrett *et al*

2004a, 629). However, a greater proportion of the total number of ecclesiastical sites (100%) includes fish assemblages compared with high status (33%), rural (9%) or urban (34%) sites, suggesting that, while the ecclesiastical population did not consume more fish than those at other sites, it was part of the diet for *all* monastic populations. Whether this is due to the link between fish and fasting by the monastic population, or better preservation and recovery of delicate fish bones from such settlements, could not be determined within the remit of this study. However, preferential survival from features associated with wealthy settlements such as cess pits may be a reasonable explanation (Serjeantson and Woolgar 2006, 106). The absence of high-status sites from the quantified dataset is regrettable (through low sample size and the recording of presence/absence rather than quantification). Despite this, fish were present in the assemblages at Lake End Rd in the middle Saxon phase and Faccombe Netherton in the late Saxon phase: just two trout bones in the case of the latter, and perch, pike, eel and plaice or flounder in the former. Reynolds' wider-ranging thesis on the fish remains from Saxon England shows that high-status sites may be expected to produce greater numbers and diversity of marine fish compared with other middle and late Saxon settlements (Reynolds 2013, 107).

The redistribution of meat (and probably oil) from whales is recorded from Dengemarsh, Lydd in Kent (Gardiner *et al* 1998), where two sites dated from the mid-9th to mid-11th centuries were the locations of stranded or dead whales washed ashore. Heavily butchered crania, vertebrae and ribs are indicative of the removal of meat, and suggest the opportune addition of this food to the diet of the local population. This was probably not an uncommon occurrence, as whale finds have been recorded from a number of coastal sites throughout the Saxon period, such as early Saxon SARC XIV and Melbourne St, Southampton; middle–late Saxon Sandtun, Bishopstone and West Quay, Southampton; and late Saxon Lewes Priory and the French Quarter, Southampton. The association between the French and a form of salted whale meat (*craspois*) imported into Saxon England from northern France has been observed by Sykes (2007b, 60), and the French Quarter in Southampton already existed in the late Saxon phase (Rance 1986, 31). Although in *Aelfric's Colloquy* (Watkins 2010) the fisherman says he does not catch whales as it is too dangerous, exploitation of other cetaceans was apparently relatively common, as a charter relating to food rents received by the estate at Tidenham, Gloucestershire, includes six porpoises (Lease of land to Aelfwig 1061x1065). The Tidenham estate included a large stretch of the Severn estuary, which may be the source of the porpoises (Morgan and Smith 1972, 50–62), and the opportune collection of stranded whales, porpoises and dolphins was probably the source of English whale meat.

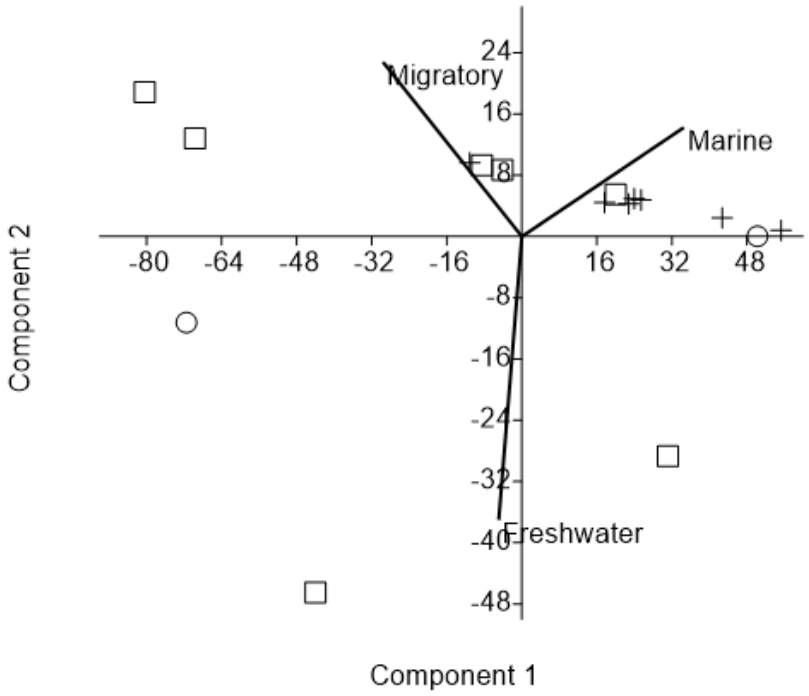

Fig 2.20: Principal component analysis of the relative proportions of freshwater, migratory and saltwater fish species from all sieved Saxon sites with a NISP >20 fragments. Circle= early Saxon; square= middle Saxon; cross= late Saxon

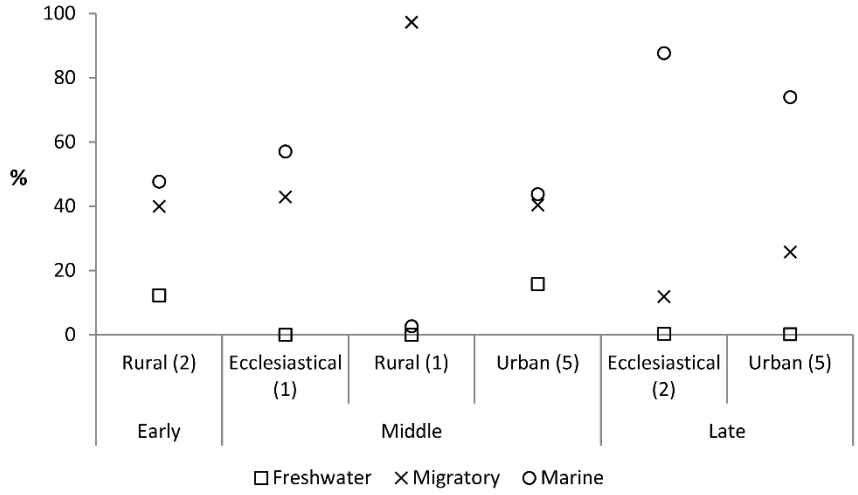

*Fig 2.21: Mean proportion of freshwater, migratory and marine fish recorded at various site types in the Saxon period. Only sites (*n*) with >20 fish bones included*

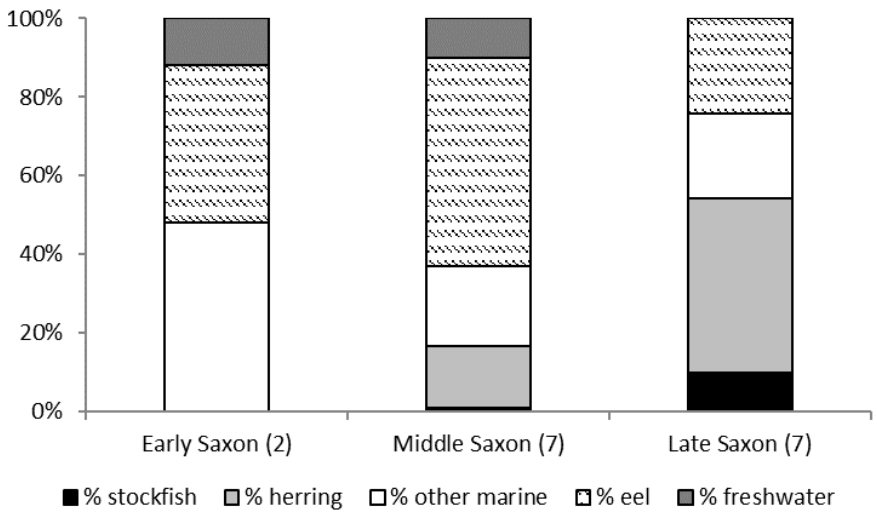

*Fig 2.22: Mean proportion of preserved and other fish recorded in the Saxon period. Only sites (*n*) with >20 fish bones included. Stockfish= cod, haddock, hake, ling and saithe*

2.3 Symbolic and Social Exploitation of Animals

2.3.1 Pets

The poem written around the 9th century by an Irish monk about his cat, *Pangur Bán*, in the *Reichenau Primer* (Green 1992), is testament to a close bond between animals and humans. Such a relationship has been implied from late Saxon Bishopstone, where isotope evidence revealed that a cat was fed a diet unusually high in fish. Poole (2011, 226) suggests that this indicates preferential treatment over other cats as a favoured pet.

Dogs would most likely have had a different relationship with humans than other domestic mammals, given their value for work, living in close contact with humans and subsequent long life span allowing a bond to grow between animal and owner (Morey 2006, 158). The presence of small 'lap' dogs has been recorded in Saxon England, at Winchester, Thetford, Ipswich and, most convincingly, in a grave at Minster Lovell, Oxfordshire, where a small dog accompanied a female burial, with further finds of dogs deliberately placed in companionship with humans in inhumation and cremation cemeteries (Bond 1996; Crabtree 2013; Poole 2011, 202–3). A dog that had received considerable trauma to one side of its body, resulting in broken front and back legs, yet had clearly been cared for enough to allow its wounds to heal, was recorded at Bishopstone, in the same feature as the fish-fed cat, which again points to a special dog–human bond (Poole 2011, 210).

Although a number of associated bone groups was recorded within the dataset, there are little data on their age or provenance. Several were likely the result of simple carcass disposal, as in the case of dog skeletons recovered from ditch deposits (Market Lavington and Yarnton) and puppies in pits (West Quay, Southampton, and Chester Rd, Winchester), while others could be ritual

deposits associated with the foundation or abandonment of buildings (Hamerow 2006, 8), such as the burials of dogs and cats in sunken featured buildings (Audlett Dr, Abingdon, and Cadley Rd, Collingbourne Ducis). Only two sites contained animals that were afforded a possible reverential burial: a partial skeleton of a dog recorded from the middle Saxon rural site of Shavards Farm, Meonstoke, and a complete, apparently unbutchered cat in a late Saxon pit from the French Quarter, Southampton.

2.3.2 Entertainment

In the Saxon context evidence for the use of animals for entertainment comes largely from hunting and cock fighting. During the middle Saxon phase the gap widened between elite and peasant as land ownership became a method of controlling production and labour (Faith 1997, 12). Hunting became a status symbol, tied into the nature of leadership through land rights and an interaction with wild spaces in ways that the majority of the population had no time or ability to exploit (Sykes and Carden 2011, 153). As a result, deer parks were established from the 8th century (Williams 2008, 124), and would have been places for the secular and ecclesiastical elite to cement their social status through the hunting of game as entertainment. An early grant made by Cenwulf, King of Mercia, to the abbess of Lyminge in 804 detailed land that included hunting grounds. Hunting was so important that, even while King Alfred was 'in the midst of wars and frequent hindrances of this present life, and also of the raids of the pagans and his daily infirmities of body, [he] did not cease, single-handed, assiduously and eagerly with all his might, to govern the kingdom, to practise every branch of hunting' (Whitelock 1996, 293 from Asser's *Life of King Alfred* written in 893), and by the early 11th century the laws of Cnut state that fines will be imposed on anyone who trespasses on royal hunting grounds.

Direct evidence for hunting exists in the dataset. It has already been established that game species, particularly roe deer, become increasingly common at high-status sites from the middle Saxon period (*see* section 2.2.3). Although hawking is documented as a high-status pursuit from the late Saxon phase (Oggins 1981), there is little archaeological evidence in the dataset to suggest that birds of prey were restricted to elite sites (*see* section 2.2.2), and a similar lack of evidence has been observed at other sites in England (Dobney and Jacques 2002, 15). The combination of evidence relating to a number of birds of prey within a single burial episode and pathologies on their bones at Faccombe Netherton indicates that falconry was practised by the early medieval inhabitants. Furthermore, the remains of a goshawk in a pit dated to AD 980–1070 at Faccombe Netherton suggest that falconry had roots prior to the Conquest of 1066 (Cherryson 2002, 311). The presence of wild birds traditionally hunted using birds of prey may also be indicative of falconry (Cherryson 2002, 312). Both crane and heron were recorded at ecclesiastical sites (Bishopstone and Eynsham Abbey) in the middle and late Saxon phases, which suggests the use of hawks, despite the restriction by the Church in Europe in the late 7th century on the clergy owning hunting birds (Oggins 2004, 37). The number of birds of prey and prey species at lower status sites is perhaps surprising, as independent fowlers (those not in service to the lord) are recorded in *Aelfric's Colloquy* dating from the end of the period,

where the fowler explains that the hawks 'feed themselves and me in winter', and that he 'know[s] how to catch others – not just one, but many more' (Swanton 1993, 111).

Other animals associated with hunting pursuits are horses and dogs. In almost all phases where data were available both dogs and horses were recorded in greatest quantities from high-status sites, the only exception to this being the early Saxon phase, where horses were prevalent at rural sites (Figs 2.23 and 2.24). It is likely that at least two types of horse were present in Saxon England, the native breeds cut from feral herds as required, and those bred by the aristocracy for their suitability for hunting and riding (Cathers 2002, 121; Fleming 2000, 11). Poole (2011, 189) has suggested that 'those in possession of the finest horses, and the means to become the best horsemen, were likely to have been the elites'. This would have been achieved using hunting to hone their skills, particularly in *par force* hunting, where red deer were chased with horses and dogs (Cummins 1988, 32). Sources from documents and artistic representations suggest that *bow and stable* methods of hunting were more common in Saxon England, where deer were herded into an enclosure before being shot with arrows (Sykes 2011, 339). This is referred to by the huntsman in *Aelfric's Colloquy* who mentions that he would 'urge on my dogs so that they chase the wild animals until they come into the nets unawares', and that 'I hunt for wild animals with fast dogs' (Swanton 1993, 109). These methods would have involved the close co-operation of hounds with hunters, and it is likely that many of the dog remains at high-status sites were from dogs used for hunting. Unfortunately, the use of metrical analysis to understand better the type of dogs present was outside the scope of this project. Large dogs possibly used for hunting have been identified at West Stow and Brandon (Crabtree 2013), and Poole suggests that 'through the elite associations with hunting that were developing at this time, the ownership of quality hunting hounds was one marker of status' (Poole 2011, 202). A large hunting dog was also identified at Marlow car park, Canterbury, dated to the late 7th century (Clutton-Brock and Burleigh 1995). The distinction between hunting dogs and those of the lower classes can be observed in contemporary documents; in the Laws of Hywel Dda in the 10th century it is recorded that the king's greyhound is worth 120 pence when trained, which may be compared with a common house dog valued at 4 pence (Jenkins 1986).

Another sport for which animals were used was that of cock fighting. It is likely that cock fighting itself was a heavily male-dominated sport, that 'the "warrior culture" of the early Medieval period would have embraced all displays of male aggression and dominance, and thus cock fighting would have been an acceptable pastime within secular settlements' (Hodkinson 2013, 47). Although direct evidence for the presence of cockerels in the dataset is not obvious, Hodkinson has shown that cock fighting was practised at the Saxon–medieval town of Lewes, based on a majority of old, male birds in the assemblage, while evidence was wholly absent from ecclesiastical sites at Lyminge, Kent, and Bishopstone, Sussex. Hodkinson concluded that the highly masculine association between cock fighting and the owners and spectators would not be fitting for those of a religious persuasion (Hodkinson 2013, 47).

2.3.3 Symbolism

There are no exotic species in the dataset that may have been used for display, which is consistent with the suggestion that the 'mental geography' of Saxon society was narrow, with little exploitation of animals on an international scale (Sykes and Carden 2011, 155). Nonetheless, the Saxon population must have been aware of exotic animals, as reference is made to camels, lions and elephants among others in *Aelfric's Glossary* written in the late 10th century (Phillipps 1938, 5). A number of unusual artefacts is also evident through other media, prized for their symbolism and raw materials rather than the physical presence of an animal. A good example of this is evidence for bear skins. Bears were alive in Saxon England, at least in the early Saxon phase (Hammon 2010, 100), and bones from the extremities that were originally attached to skins have been recovered at Coppergate, York, West Stow, Suffolk, and several burials (Crabtree 1985; O'Connor 1989a; Sykes 2011). Beaver and otter skin items have also been recorded within burial contexts (Sykes 2011, 332) and, while the animals themselves were certainly present in Saxon England (Coles 2010), their remains are extremely scarce. Beaver remains were recovered from High St, Ramsbury, and those of otter at Cadbury Congresbury 1968–73, both high-status sites, reflecting the apparent desirability of the fur from such creatures, noted only by their recorded presence as burial goods. Documentary evidence also indicates that beaver pelts were highly prized (Hooke 1998, chapter 2), and in 758 the abbot of Wearmouth and Jarrow sent a gift of a robe of otter skin to his student (Sawyer 2013, 64). The absence of the bones of such fur-bearing animals on archaeological sites is perhaps not surprising if they were skinned in the field (Fairnell 2008, 56).

Drinking vessels made from aurochs horns would also have been distinctive items given their grand appearance compared with those made solely of cattle horn. Aurochs were the larger progenitor to domestic cattle, and were alive in continental Europe during the early part of the Saxon period. Although horn does not usually survive archaeologically, the large mounts of such drinking vessels have been recorded within burials, as at Sutton Hoo, Suffolk, and Taplow, Buckinghamshire (Bruce-Mitford 1983; Stevens 1884). There is little evidence for drinking horns from the study area, although an 8th-century mount recorded from Lambeth, Middlesex, is detailed on the Portable Antiquities Scheme (https://finds.org.uk/database/artefacts/record/id/519973). These finds are rare, and would have conveyed status on the owner and user. In pagan Saxon culture drinking was a highly symbolic and masculine pastime, as portrayed in the poem *Beowulf,* 'The servants hurried from bench to bench with ox horns adorned with beaten gold and filled with heady mead' (Riggs 1933).

Animals would also have had a place within the pre-Christian pagan religion of the early and middle Saxon period. They were considered important enough to accompany burials and cremations, not just as feasting remains or joints of meat for the afterlife, but through the sacrifice of whole animals, or representations of whole animals through disarticulated bones. At Roundway Down, Wiltshire, a woman's grave was scattered with the bones of cat, dog, boar and horse. Other remains likely utilised for their symbolism include the teeth

from horse, cattle, boar, beaver, dog and wolf, some of which were perforated, suggesting they were worn in life (Hicks 1993, 24) as decoration or talismans. The use of animals as totems can be seen in the adornment of warrior burials. Swords, shield mounts and other fittings decorated with boars, eagles, dragons and bears 'must have represented an emotional degree of protection as powerful in its own way as the physical protection of the weapons they adorned' (Hicks 1993, 64). Fish and birds were commonly portrayed on shields, with examples of the former found at Buckland Dover, Kent, and the latter from Mill Hill and Shelford Farm, Kent (Dickinson 2005, table 1).

Problems exist in determining the types of cult practised by the pagan Anglo-Saxons before and during the Christian conversion. Most notable are the poor documentary sources, lack of identification of shrines or cult foci, and the inability to distinguish intention of placement (Pluskowski 2011). Nonetheless, some deposits, such as the skull stack at Yeavering (Hope-Taylor 1977), have been associated with a temple (Crawford 2004, 96; Pluskowski 2011, 767), and it is argued that the abandonment of animal burials associated with humans following the uptake of Christianity distinguishes it as a religious ritual rather than one simply representing social status (Pluskowski 2011, 768). For example, while animals are far more likely to accompany adult cremations, and males in particular, specific taxa are not linked with males or females: various species are recovered with both genders (Bond 1996). Furthermore, in the context of cremations, the process by which the animal accompanied the dead on the pyre, through cremation and then deliberately placed together in the urn, suggests 'the aim of the animal sacrifice may not have been to "represent" the deceased's social identity, but to contribute to its transformation and reconfiguration' (Williams 2001, 199).

A range of animals are represented in Saxon burial contexts, and some aspects of their complex symbolism can be inferred. Burials of complete horses and dogs or their skulls is proportionally far more common than their presence in domestic contexts (Hamerow 2006, 8; Poole 2011, 186 and fig 4.5). Horses are the predominant accompanying animal in both cremation and inhumation burials. For example, at the cemetery at Spong Hill, Norfolk, almost half the cremations contained animal remains, and horse bones were identified from nearly a quarter (Bond 1996; Hicks 1993, 23; Williams 2001, 197). Within the Christian Saxon period the rituals of interring animal remains with the dead largely came to a halt, although the zoomorphic depictions within pagan and Christian art continued to ease the transition (Hicks 1993, 79).

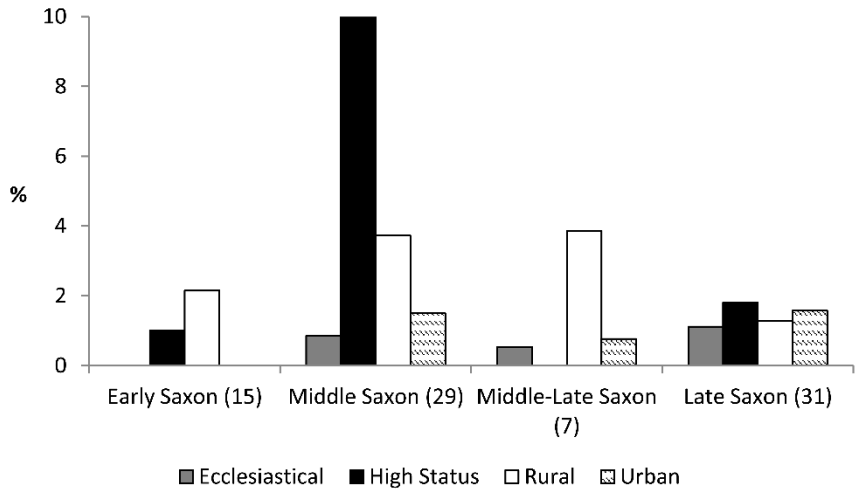

*Fig 2.23: Mean proportion of horse remains at all sites (% of NISP cattle, sheep/goat and pig). Only sites (*n*) with >300 NISP cattle, sheep/goat and pig included*

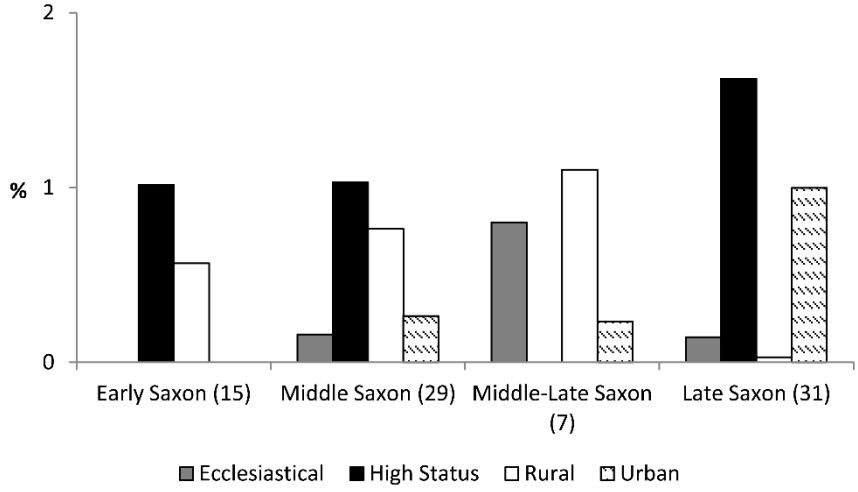

*Fig 2.24: Mean proportion of dog remains at all sites (% of NISP cattle, sheep/goat and pig). Only sites (*n*) with >300 NISP cattle, sheep/goat and pig included*

2.4 Animal Husbandry

As well as providing meat, marrow, bone and skins after death, the main domestic animals would have contributed in other ways to the economy, through the provision of secondary products (milk, wool and power) while still alive. By considering the ages at which animals died, and the proportion of males and females in the herd structure, the extent to which they were used for secondary products may be implied.

2.4.1 Cattle

At the majority of early Saxon sites for which ageing data were available cattle were used for a combination of products – meat and small-scale secondary use

– with both young adult and adult animals most commonly recorded in the fusion and summary data (Table 2.2), and culled before reaching tooth-wear stage H (elderly animals) (Fig 2.25). Non-specific culls such as these are consistent with a self-sufficient economy where animals are produced largely to fulfil the needs of the settlement, with some surplus for times of stress. At Oxford Science Park, Eynsham Abbey and Portchester Castle, however, there is a predominance of adult or elderly cattle, suggesting they were of more value for secondary products such as traction, milk or breeding, or that younger animals at prime meat age had been removed, possibly as render to the king. Conversely, at Barton Court Farm, Sherborne House and Cadbury Congresbury 1968–73, more young cattle were culled, implying an emphasis on meat. Of these sites, the latter is the only high-status site with ageing data available, consistent with the provisioning of such sites with the best meat from young animals. A lack of comparable sites for sexing data makes further understanding of herd profiles unreliable (Fig 2.26). The presence of a largely self-sufficient economy in the early Saxon phase is to be expected at a time when the majority of the population was living in small, kin-based farmsteads, providing enough for themselves and to feed the king and his retinue when he was touring the region (Bogaard 2005, 187; Crabtree 2010, 126; Sykes 2006b, 61).

During the middle Saxon phase cattle continue to be utilised for meat and small-scale secondary production, with a predominance of subadult and young adult animals as well as adults recorded in the fusion and tooth-wear data (Table 2.2 and Fig 2.25). This is the case at all ecclesiastical and high-status sites, and all but one rural site. At Dorchester-on-Thames 1972 more adult and elderly animals are recorded, possibly indicating a greater reliance on secondary products, or the marketing of younger animals to urban sites. At many sites within London and Southampton the tooth-wear and fusion data reflect animals culled at prime meat age, although the fusion data also indicate that older animals, those in the adult and elderly categories, predominate at 27 James St, London, and Graveyard Site, SOU 19 and SOU 17, Southampton. The variation observed in the animal economy implies a range of modes of production, which is consistent with the move to surplus production to supply urban sites with meat and raw materials (Holmes 2013a). However, there is no evidence for a predominance of very old animals at any site, suggesting that there was no demand for the intensive production of milk or traction from cattle (O'Connor 2010, 11).

Sexing data (Fig 2.26) come from four urban sites, of which two include predominantly female cattle (Melbourne St and 21–24 Maiden Lane), one predominantly male (Peabody Site) and one with similar numbers of both (St Mary's Stadium). This is a rather inconclusive attempt to elucidate the use of older animals, but given that the milk yield of Saxon cows was probably seasonal (Banham 2004, 54), it is likely that older animals were kept for breeding, traction and small-scale milk production.

Older animals were more common in the middle–late and late Saxon phases, with a predominance of animals used for secondary products recorded at urban sites in Portchester, Winchester and Southampton, as well as the high-status site at Faccombe Netherton and religious sites of Eynsham Abbey and

Bishopstone. Animals culled at prime meat age were recorded at isolated urban sites within Malmesbury and Winchcombe, as well as rural Yarnton. Both young, prime meat animals, and older animals were observed at Oxford, London, Bath and Winchester and the rural sites of Trowbridge and Collingbourne Ducis. Again there are contradictory data from the sexing of cattle: at middle–late and late Saxon phases at Portchester Castle, male animals predominated, while at all other sites (French Quarter, Southampton, Yarnton and Bishopstone) there were more cows. This may reflect an increase in milk production, and dairy farms are referred to in AD 858 by King Ethelbert (Whitelock 1996, 530). Older cattle would also be useful for ploughing, which would be particularly pertinent given the increase in intensive agricultural production in this phase when the beginning of a change to open-field farming occurs (Hamerow 2002, 152; Hooke 1998, 114).

2.4.2 Sheep

The picture painted by much of the fusion (Table 2.3) and all of the tooth-wear data (Fig 2.27) for the early Saxon sheep assemblages is one of a reliance on meat and the small-scale production of wool and milk. Several exceptions exist in the fusion data: at the high-status site of Cadbury Congresbury 1968–73, and rural sites of Barton Court Farm and Oxford Science Park, sheep are all immature, indicating a focus on meat, while at the trading site at Bantham the majority of animals are elderly, having been used for breeding, wool or milk. There were no data available for investigating the sex of animals in this phase, though documentary evidence for the milking of ewes comes from the *martyrology* of Eosterwine (Nelson *et al* 2014), who died in AD 686. Similarly, the use of wool for weaving is reflected archaeologically in the large quantities of spindle whorls commonly recorded throughout the period (Fowler 2002, 171).

Middle Saxon assemblages also reflect varied husbandry strategies (Table 2.3 and Fig 2.27). Only young/subadult animals, culled exclusively for meat, are present in both phases of the high-status site at High St, Ramsbury, and urban sites of 21–22 Maiden Lane and James St in London, and Cook St, Southampton. Animals were most often used for a mixed strategy to produce both meat and some wool and milk. Examples are recorded at rural settlements (Shavards Farm and Dorchester-on-Thames 1972) as well as urban sites within Southampton and London. Predominantly old sheep are present elsewhere in Southampton and London, as well as at the ecclesiastical site of Eynsham Abbey. A number of discrepancies are evident between the tooth-wear and fusion data. At the London site of 27 James St and Southampton sites of St Mary's Stadium and Melbourne St, more juvenile animals are represented in the tooth-wear data. This may indicate either that poor preservation of juvenile post-cranial bones led to an over-representation of juvenile mandibles (whose teeth may be expected to survive better post-depositionally), or that the heads of juvenile sheep were brought in to those sites. Given that there were no adult mandibles within the tooth-wear data, the latter suggestion is more likely, indicating redistribution of carcass parts throughout the settlement (*see* section 2.5). Sexing data were only reported from three urban sites, all of which indicate a predominance of male animals (Fig 2.28). This suggests that wool production

was becoming important to the economy: if dairying or breeding were the only goals of secondary products, there would be no use for older males in the rural economy. The increase in international trade in this phase is often associated with wool as a bulk commodity for export (Campbell 2003, 12; Crabtree 2010; Naylor 2004, 134; Sawyer 2013, 60), which is consistent with the dataset.

With few exceptions all middle–late and late Saxon assemblages at urban, rural, ecclesiastical and high-status sites record sheep culled largely at a mixture of prime meat and mature ages, suggesting that the production of meat and secondary products was important. This is reflected in the non-specific culls of both males and females at the late Saxon sites where such data were recorded. Animals at prime meat age were observed at a number of urban sites (1 Westgate St, Gloucester, and Victoria Rd and Chester Rd, Winchester). Wool increased in importance as a part of the export trade at this time (Sawyer 2013, 105), and several clips of wool could have been taken from the adult sheep evident in the data.

2.4.3 Pigs

At most sites pigs were culled at optimal ages for their use for meat (Table 2.4 and Fig 2.29). This is not surprising, as pigs are good converters of fodder to meat, and have little value for secondary production with the exception of manure, which is produced by animals of all ages and so requires little specialisation. The majority of animals identified to sex, however, were male (Fig 2.30), suggesting either some selective culling of females early on, or that young males were deliberately provided to middle and late Saxon urban sites; unfortunately, there are no rural sites represented in the sexing data. Exceptions occur at the early Saxon sites of Northfleet and Springhead in Kent and late Saxon Bath, where animals are mostly adult and may reflect breeding populations.

2.4.4 Other Animals

The widespread presence of dogs and horses at all site types (Figs 2.23 and 2.24) throughout the Saxon period relates to the use of these animals for labour, such as transport and haulage (horses) and protection of property and herding (dogs), as well as for hunting.

Documentary evidence indicates that riding as a means of transport was important to those living in the Saxon countryside. Although much of the literature dates from towards the end of the period, the use of horses by *thegns*, clergy, lords and their servants to travel and deliver messages is documented in laws, poems, stories, charters and artwork (Cathers 2002, 169–95; Clunies Ross 1990, 36; Hicks 1993, 67). The *Rectitudines Singularum Personarum* details that the bee-keeper was to be given a horse by the lord in order to transport honey, and the swine-herd was also to be given a horse, although the reason is not clear (Cathers 2002, 208). Within the dataset the best evidence for the use of horses for transport and haulage by the peasant community comes from the high proportion, in rural assemblages, of animals that died when mature (Table

2.5), although it is likely that horses were predominantly important for riding, rather than traction (Langdon 1986, 26).

The presence of young animals at a number of rural sites may indicate their use for meat, an inference that would be made of other domesticates, and indeed butchery marks indicative of disarticulation, jointing and filleting are also recorded (Table 2.6). However, horse bones are generally less fragmented, and butchery marks less commonly recorded, than with cattle, suggesting that they did not form a major part of the diet. When the frequency of sites from which butchered horse bones have been observed is compared with recorded occurrences of cattle butchery (Fig 2.31), the data suggest an increase in possible hippophagy at middle Saxon sites. A wider study proposes that the consumption of horsemeat was more common at early Saxon sites (Poole 2013, 330), yet within the dataset the number of sites from which horse butchery is recorded is at its lowest in the early Saxon period. A report to Pope Hadrian in AD 786 from his legates in England mentions the consumption of horsemeat by 'many among you' (Whitelock 1996, 838). Of interest are the butchered horse remains at Eynsham Abbey in the middle and late Saxon phases, particularly given the ban on the consumption of horseflesh under Benedictine law introduced from the 8th century (Simoons 1994, 187). Although Poole suggests that this is due to the use of horse bones for bone working (Poole 2013, 330), there is also evidence for disarticulation and skinning, which is more consistent with the use of horseflesh as food, either for dogs or humans (Ayres *et al* 2003, 353).

The presence of young horses at a number of rural sites also suggests breeding. Although studs – farms where horses would be bred specifically by the aristocracy – are referred to in both legal documents and place names in the Saxon period (Cathers 2002, 145, 149; Langdon 1986, 26), there is no direct archaeological evidence for them. It is more likely that horses used by the lower classes, and for menial tasks, were bred as required by the rural population, possibly using a local, 'mobile' stallion (Cathers 2002, 160). The presence of a large proportion of 'mostly young' horse remains at Barton Court Farm (Table 2.5), suggestive of a specialist breeding site, is misleading, coming from a very small sample.

Although dogs would inevitably have been used for guarding and herding, as well as hunting, there is little direct evidence for any specific function. A well-documented decline in the variety of dogs has been observed between the Roman and Saxon periods (K Clark 1995; Harcourt 1974, 168). Harcourt discerned two types in Saxon England, and a large type has been observed in Saxon East Anglia that may have been suitable for either hunting or guarding (Crabtree 2013). In *Aelfric's Colloquy* the shepherd tells how he would 'stand over them [the sheep] with dogs, lest wolves devour them' (Swanton 1993, 109). The laws of Hywel Dda of *c* AD 945 note other types of dogs; as well as the shepherd's dog there were lap dogs, greyhounds and house dogs (Menache 2000, 47). Given the close social bonds between dogs and people, they are not traditionally eaten in England (Simoons 1994, 240). This is reflected in the butchery evidence (Table 2.6), which is very rare even when compared with horses, which were themselves only occasionally consumed.

Chickens and geese would have been important for eggs and feathers, and monastic texts refer to the regular consumption of eggs (Williams 2008, 134). Indirect evidence can be implied from numerous food rents that specify the supply of hens, such as that from the *Laws of Ine*, including 10 geese and 20 hens in the rent for 10 hides (Whitelock 1996, 406).

Summary

A change in the husbandry of cattle and sheep can be observed in the Saxon data. The early phase is characterised by a self-sufficient economy where animals were kept for a mixture of meat and small-scale secondary production. The increasing use of some sheep for secondary products is implied in the middle Saxon phase, where an emphasis on wool production may reflect opportunities for international trade at this time. This was short-lived, and sheep husbandry strategies indicate a mixture of non-specialised products in the late Saxon phase. A number of cattle assemblages show an increase in the age of herds in the late Saxon phase, a development coinciding with the beginnings of open-field agriculture.

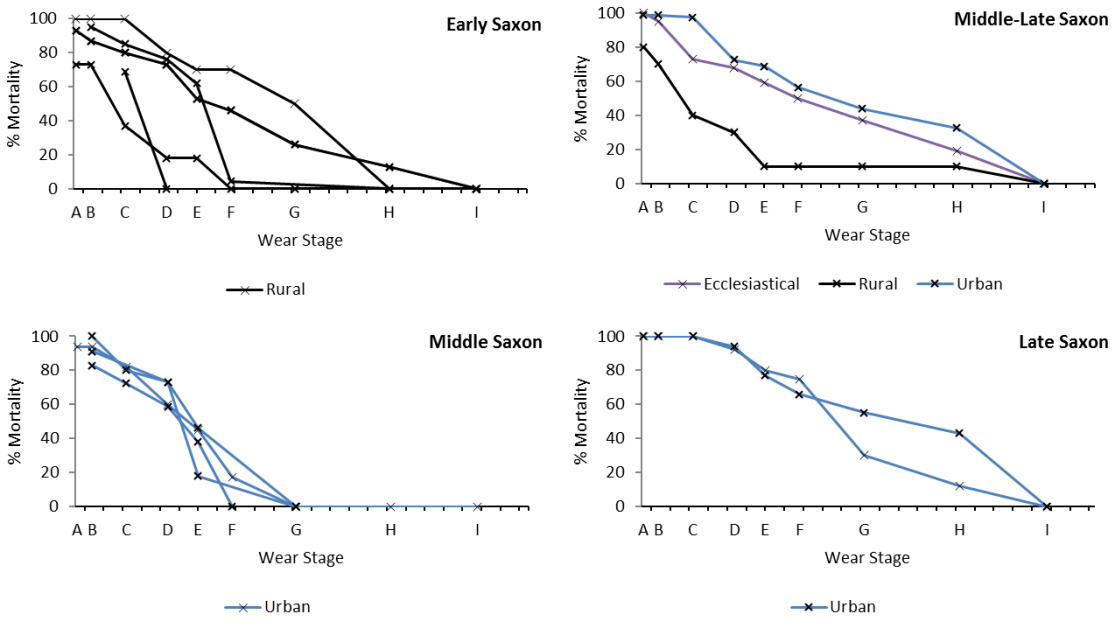

Fig 2.25: Saxon cattle tooth-wear data (after Hambleton 1999). Each line represents a separate site

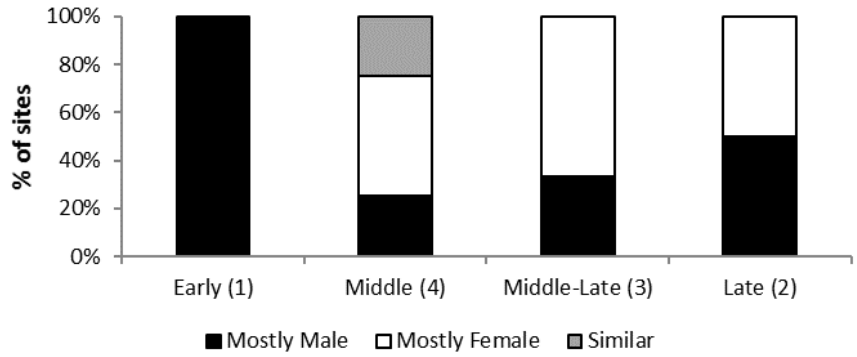

Fig 2.26: Proportion of cows and bulls/castrates recorded from Saxon sites. (n)= *number of sites where such information was available.* See *section 1.7.3 for methods used*

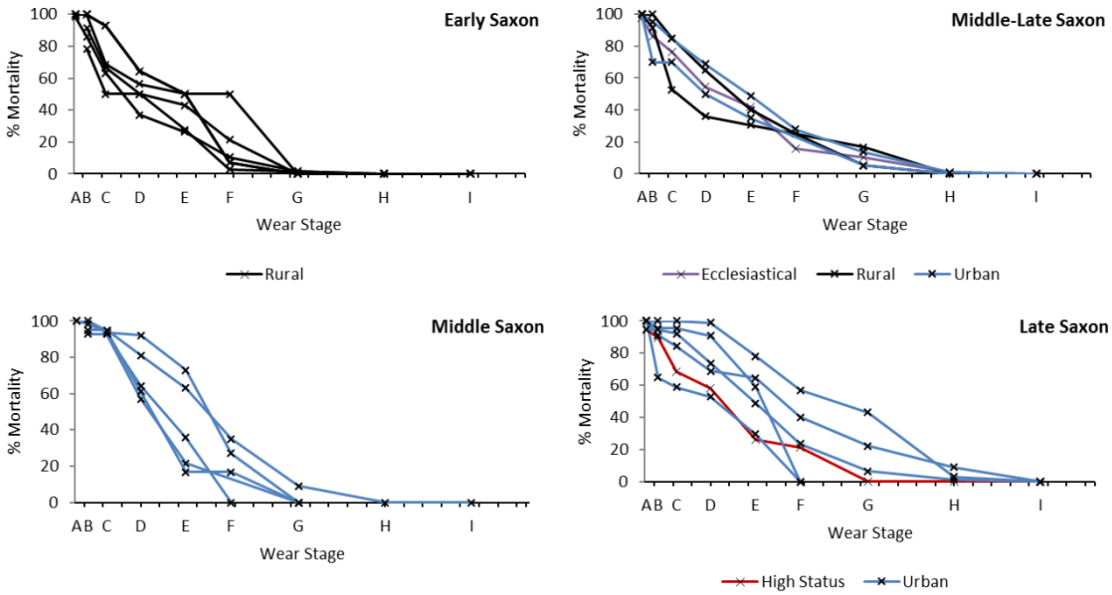

Fig 2.27: Saxon sheep tooth-wear data (after Hambleton 1999). Each line represents a separate site

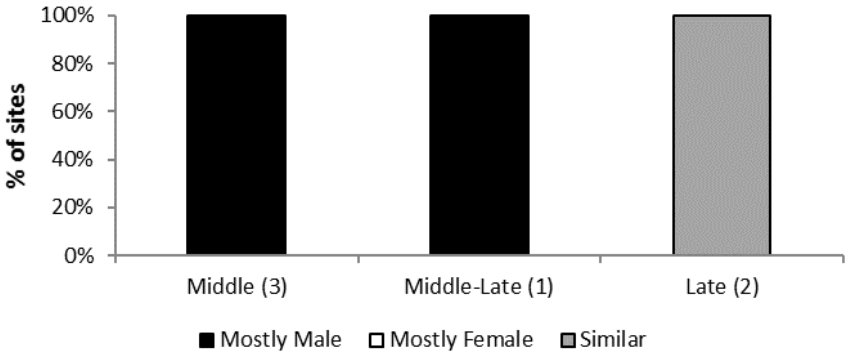

Fig 2.28: Proportion of ewes and rams/wethers recorded from Saxon sites. (n)= *number of sites where such information was available.* See *section 1.7.3 for methods used*

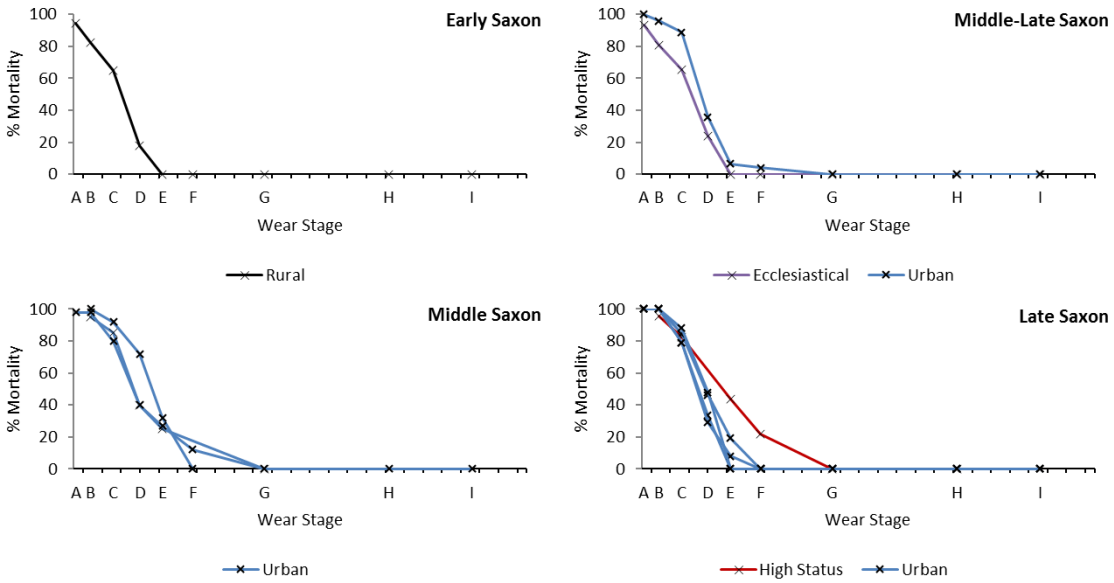

Fig 2.29: Saxon pig tooth-wear data (after Hambleton 1999). Each line represents a separate site

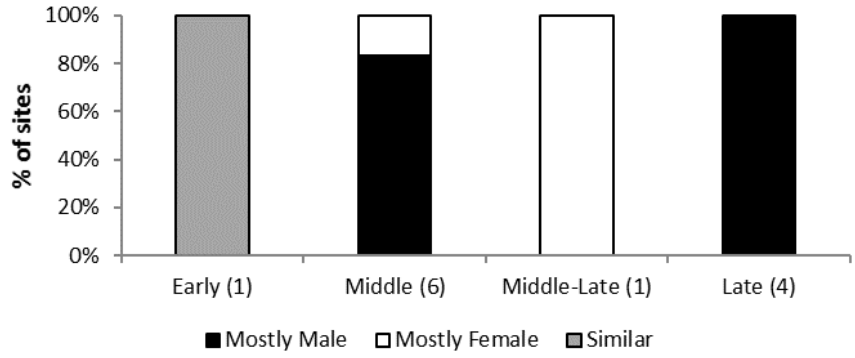

Fig 2.30: Proportion of boars and sows recorded from Saxon sites. (n)= *number of sites where such information was available.* See *section 1.7.3 for methods used*

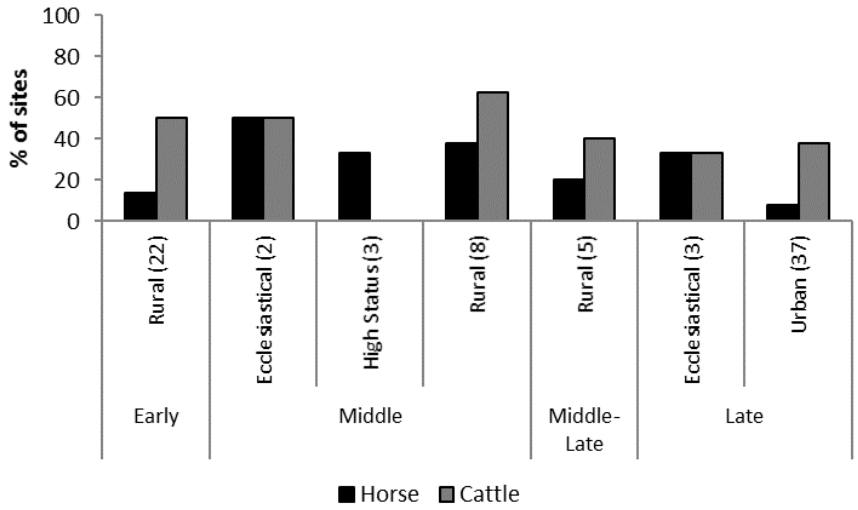

Fig 2.31: Proportion of all Saxon sites in the database with evidence for butchery of horse and cattle remains. Only chop and cut marks relating to disarticulation, jointing and filleting are included; marks indicative of skinning or bone working are excluded. (n)= *total number of assemblages with butchery data in the database*

Table 2.2: Cattle age data for the Saxon period taken from fusion data and summaries within the text of site reports. E= ecclesiastical; HS= high-status; R= rural; U= urban. Records of neonatal/calf bones and teeth are isolated, as they were often recorded separately, and may not be evident in fusion or tooth-wear data due to preservation and recording methods

	Early Saxon		Middle Saxon				Middle–late			Late Saxon		
Age group	HS	R	E	HS	R	U	E	R	U	E	HS	U
Mostly calves and young adult	1											
Mostly subadult and young adult												1
Mostly young adult						1						1
All ages		1										1
Mostly adult		2	1		1	1		2				2
Mostly sub/young adult and elderly		1			1							
Mostly subadult and adult				2	1							
Mostly young adult and adult		2				3						2
Mostly adult and elderly					1	5				1	1	1
Mostly elderly		2					1	1	2			2
Neonatal	1	1				1						1
Calf	1	4				6	1	2	1		1	2

Table 2.3: Sheep/goat age data for the Saxon period taken from fusion data and summaries within the text of site reports. E= ecclesiastical; HS= high-status; R= rural; U= urban. Records of neonatal/lamb bones and teeth are isolated, as they were often recorded separately, and may not be evident in fusion or tooth-wear data due to preservation and recording methods

	Early Saxon		Middle Saxon				Middle–late			Late Saxon		
Age group	HS	R	E	HS	R	U	E	R	U	E	HS	U
Mostly immature		1										1
Mostly lambs and young adult	1											
Mostly subadult		1				1						
Mostly young adult				2								
All ages		2				1						
Mostly adult		2			1	3		1		1		1
Mostly sub/young adult and elderly					1							
Mostly subadult and adult												1
Mostly young adult and adult		1				1	1	1	2		1	5
Mostly adult and elderly			1			3						
Mostly elderly		1										
Neonatal	1	1										3
Lamb	1	4	1			5	1	1	2	1	1	3

Table 2.4: Pig age data for the Saxon period taken from fusion data and summaries within the text of site reports. E= ecclesiastical; HS= high-status; R= rural; U= urban. Records of neonatal/piglet bones and teeth are isolated, as they were often recorded separately, and may not be evident in fusion or tooth-wear data due to preservation and recording methods

	Early Saxon		Middle Saxon				Middle–late			Late Saxon		
Age group	HS	R	E	HS	R	U	E	R	U	E	HS	U
Mostly immature		2		2	1							1
Mostly juvenile	1	1				2						1
Mostly juvenile and subadult								1				2
Mostly subadult			1		1	7	1		2	1		2
Mostly young adult		2									1	
Mostly young adult and adult						1						
All ages					1							
Mostly adult		2										1
Neonatal	1	2				1						2
Piglet	1	5	1		1	9	1		2	1	1	2

Table 2.5: Age of horses where given

Phase/site	Site type	Mostly young	Mostly/all adult	Some juvenile
Early Saxon				
Barton Court Farm, Abingdon	Rural	*		
Market Lavington	Rural		*	*
Poundbury	Rural		*	*
Northfleet	Rural		*	
Oxford Science Park	Rural		*	
Middle Saxon				
High St, Ramsbury	High status		*	
Cresswell Field	Rural		*	*
Worton	Rural		*	*
Melbourne St, Southampton	Urban		*	
Middle–late Saxon				
Bishopstone	Ecclesiastical		*	
Yarnton	Rural		*	*
Trowbridge	Rural		*	
West Quay, Southampton	Urban		*	
Late Saxon				
French Quarter, Southampton	Urban		*	

Table 2.6: Incidence of butchery on non-food species. B= butchery; S= skinning; ?= indeterminate evidence. Only sites recording butchery of horse, dog and cat are presented

	Site type	Horse		Dog		Cat
		?	B	B	S	S
Early Saxon						
Eynsham Abbey, Oxfordshire	Rural		*			
Market Lavington	Rural		*	*		*
Old Down Farm, Andover	Rural		*			
Shrivenham Rd, Ashbury	Rural	*			*	
Middle Saxon						
Abbots Worthy	Rural		*			
Cresswell Field	Rural		*			
Eynsham Abbey, Oxfordshire	Ecclesiastical		*			
High St, Ramsbury	High status		*			
Shavards Farm, Meonstoke	Rural					*
Worton	Rural		*			
Middle–late Saxon						
Yarnton	Rural		*			
Late Saxon						
Dorter Undercroft, Westminster Abbey	Urban		*			
Eynsham Abbey, Oxfordshire	Ecclesiastical		*			
French Quarter, Southampton	Urban		*			
Victoria Rd, Winchester	Urban		*			

2.5 Redistribution of Animals and Animal Products

2.5.1 Meat and Raw Materials

The suggestion that the early Saxon phase was one of largely subsistence settlements where the population grew enough food to provide for themselves and their families has so far been borne out by the animal husbandry data (*see* section 2.4). This is also reflected in the carcass part representation of the major domesticates (Tables 2.7–2.9), where cattle, sheep and pigs are represented at most sites by findings either consistent with the processing of the entire animal on site (anatomical elements from all areas of the carcass were recorded), or with the use of spatially separate areas for butchery (greater numbers of primary butchery elements) and consumption of meat (the main meat-bearing bones). Sykes (2010, 188) suggests that the redistribution of the carcasses of domestic animals within a community was a way of reinforcing definitions of social status, age and gender. Greater variation in the anatomical elements recorded for cattle and pig may therefore indicate these animals as particularly useful for such purposes; alternatively, the larger carcasses of cattle and pig may have required butchery away from domestic areas. The predominance of cattle skulls (Market Lavington), sheep skulls (Portchester Castle), pig skulls (Northfleet and St Helen's Ave, Benson) and sheep and pig skulls together

(Poundbury) may result from symbolic deposition if the heads of animals were considered important spiritually or to represent the complete animal through display. The best evidence for such a phenomenon comes from the high-status site of Yeavering, Northumbria, where a large number of cattle skulls was recorded within one particular building (Hope-Taylor 1977); within the study area a number of cattle and horse skulls were recovered from a sunken feature building at Yarnton, described as a 'special deposit' (Hamerow 2006, 7).

The analysis of carcass parts in middle Saxon assemblages suggests that cattle, sheep and pigs were frequently brought to urban sites 'on the hoof', as all parts of the carcass are commonly found at both Southampton and London. However, four of the five sites from which dressed carcasses are recorded (following the removal of heads and feet) were also within urban settlements (sheep/goat at SOU 17, cattle from Graveyard Site and Peabody Site, and both sheep/goat and cattle from St Mary's Stadium), suggesting that some form of butchery was carried out on these animals prior to distribution at a household level. A corresponding abundance of head and foot bones likely to have been discarded at the primary butchery stage is recorded at high-status (High St, Ramsbury, and Lake End Rd) and rural (Worton, Abbots Worthy and Lot's Hole) sites, which implies that some joints of meat were distributed between rural, high-status and urban sites. The only ecclesiastical site with carcass part data, Eynsham Abbey, recorded all three of the major domesticates with a predominance of meat-bearing bones, suggesting either that joints were brought in, or that butchery occurred elsewhere. A continuing predominance of pig heads is evident at all high-status sites (Lake End Rd and High St, Ramsbury) (Table 2.9), but the reason for this is not clear. If there was redistribution of food from rural sites through high-status estate centres to those working in urban settlements under royal patronage, the possibility remains that pork was sent to *wics* as joints of meat or hams, as was the case at the estate centre at Wicken Bonhunt, Suffolk (Crabtree 1989). It is also possible that pig heads were a delicacy, and bought in to the elite sites.

Deposits of horn-, bone- and antler-working waste have been recorded at numerous middle Saxon urban sites, including Southampton (Melbourne St, St Mary's Stadium, Anderson's Rd and SARC XIV) and London (27 James St, 21–22 Maiden Lane, Jubilee Hall), and the rural site at Trowbridge has a corresponding deposit of cattle skulls with the horn cores missing, suggesting they were removed for horn-working. Most craft-working waste is characterised as small deposits mixed in with domestic waste, indicative of household-level activity. An exception can be observed at SARC XIV, Southampton, where large-scale bone-working debris was recovered. There are no recorded incidences of craft or industrial waste utilising bone, horn or antler as raw materials from any rural site, suggesting that *wics* were instead the centres of production. However, the high proportion of horn cores recorded at high-status sites (Fig 2.32) suggests that these sites may either have acted as collection centres for horns as a raw material for distribution to urban sites, or that they, too, were centres of craft activity. This suggestion is consistent with common finds of metal working debris at estate centres such as Ramsbury (Thomas 2011). Furthermore, the symbolism of drinking horns within Saxon culture (*see* section 2.3.3) may have led to the production of these vessels as high-status objects.

Redistribution of meat and carcass parts between sites in middle–late and late Saxon assemblages is hard to identify as there are very few rural sites in the dataset. Nonetheless, the only evidence for primary butchery deposits (head and/or lower limbs) comes from rural and urban sites (Tables 2.7–2.9). Ecclesiastical and high-status sites are either represented by complete carcasses or a predominance of meat-bearing bones. This is perhaps indicative of the widening of the social hierarchy as late Saxon elites began to reject the use of redistribution of animal parts to signify social structure, starting instead to demonstrate it through control of access to resources (Sykes 2010, 189). There is far greater variation of carcass parts recorded at urban sites, which implies an increasing redistribution of animal parts within *burhs*, although cattle and sheep continue to be best represented as complete carcasses. Several deposits of horn-working waste are recorded from Winchester (Western Suburb, 26–27 Staple Gardens, Chester Rd and Victoria Rd), West Quay, Southampton and also Malmesbury. To investigate this further, the presence of horn cores at various site types was analysed (Fig 2.32), revealing the consistent and deliberate supply of late Saxon *burhs* with horn, though it is not clear whether they were sent there attached to skins or as a raw material. As in the middle Saxon phase, there was no direct indication for the working of bone, horn or antler at rural sites from craft-working offcuts.

2.5.2 Butchery

The carcasses of the main domesticates are intensively butchered in all phases, exemplified by the high proportion of sites where long bones are consistently split open for marrow extraction. During the late Saxon phase, the first indication of specialised butchery occurs. This takes the form of the increasingly widespread occurrence of splitting carcasses through the vertebrae into sides of meat (Table 2.10) (Sykes 2006b, 69). Furthermore, this was apparently done by chopping through the vertebrae in a paramedial plane, where one side of the vertebra was removed, rather than being chopped through the middle (Table 2.11).

Summary

Evidence for the redistribution of carcass parts in Saxon England is by no means ubiquitous, yet it does provide some insights into social and economic changes throughout the period. During the early Saxon phase sharing of food was important for demarking social position. By the middle Saxon phase there is an apparent link between high-status and rural sites and the provisioning of urban sites with meat and raw materials for craft-working. Another change occurs in the later part of the period; as a market economy emerges high-status and ecclesiastical sites begin to buy in more meat, with greater redistribution of carcass parts to towns, although, as noted, the dearth of rural sites makes identification of foodways less clear for this phase.

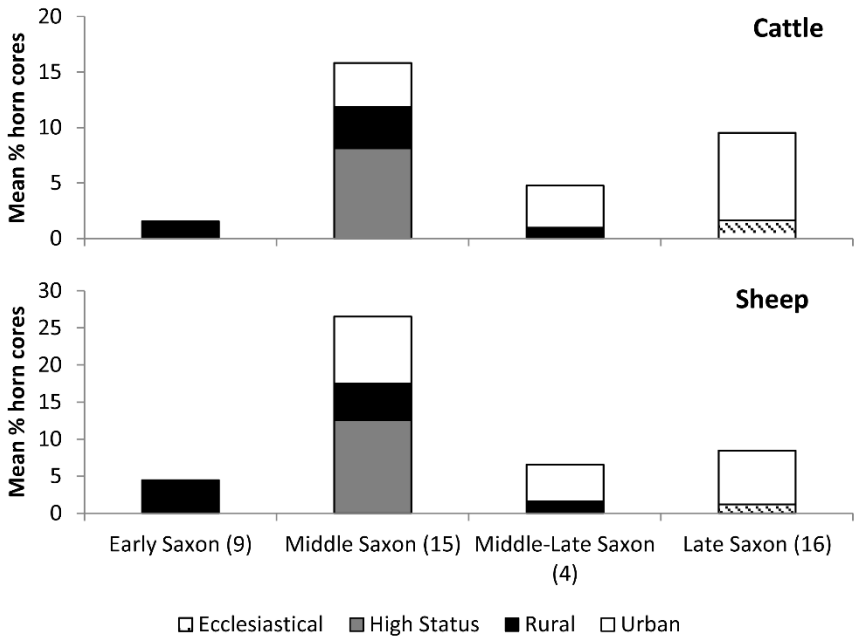

Fig 2.32: Proportion of horn cores (as a % of all body parts) from various site types. (n)= *number of sites where element representation was recorded*

Table 2.7: Cattle carcass parts represented at Saxon sites. E= ecclesiastical; HS= high-status; R= rural; U= urban. See *section 1.7.4 for descriptions of carcass parts*

Anatomical elements	Early Saxon	Middle Saxon				Middle–late			Late Saxon		
	R	E	HS	R	U	E	R	U	E	HS	U
All carcass parts	5		1	1	5	1	1	2		1	8
Mostly meat-bearing and head	4	1		1	1		1		1		1
Mostly meat-bearing bones	2								1	1	3
Dressed carcass	2			1	3						2
Mostly horn cores											1
Mostly lower limbs											1
Mostly lower limbs and head			2	1							5
Mostly head and horn cores	1										

Table 2.8: Sheep/goat carcass parts represented at Saxon sites. E= ecclesiastical; HS= high-status; R= rural; U= urban. See *section 1.7.4 for descriptions of carcass parts*

Anatomical elements	Early Saxon	Middle Saxon				Middle–late			Late Saxon		
	R	E	HS	R	U	E	R	U	E	HS	U
All carcass parts	6			1	5		1	1			10
Mostly meat-bearing and head	1			1	1				1		1
Mostly meat-bearing bones	3	1				1			1	2	2
Dressed carcass					2						1
Mostly lower limbs				1							
Mostly lower limbs and head	2		3	1			1				3
Mostly head and horn cores	2						1	1			4

Table 2.9: Pig carcass parts represented at Saxon sites. E= ecclesiastical; HS= high-status; R= rural; U= urban. See *section 1.7.4 for descriptions of carcass parts*

Anatomical elements	Early Saxon	Middle Saxon				Middle–late			Late Saxon		
	R	E	HS	R	U	E	R	U	E	HS	U
All carcass parts	1			1	4	1	1	1	1	1	5
Mostly meat-bearing and head	3				4						4
Mostly meat-bearing bones	1	1							1	1	2
Mostly lower limbs and head	3		1		1						4
Mostly head	3		2	3			2	1			3

*Table 2.10: Proportion of butchery marks recorded at Saxon sites. *Due to the highly variable nature of the recording of butchery, records may be reported at site level and summarised for each period, or they may be detailed by sub-phase, and therefore more than one account may be made available for a single site*

Butchery	Early Saxon	Middle Saxon	Late Saxon
n records*	11	19	17
Chop/knife	73%	58%	47%
Saw	36%	16%	35%
Long bones split	36%	32%	41%
Vertebrae split	9%	21%	82%

Table 2.11: Number of records of specific vertebral butchery

Location of chop	Early Saxon	Middle Saxon	Late Saxon
Paramedial	1	2	11
Midline	1	1	1
Bilateral	1		2

2.6 Inter-Site Analysis

The early Saxon phase is represented by a large number of rural sites with animal bone assemblages consistent with an environmentally determined subsistence economy. The absence of any high-status sites means that no understanding is possible of the extent to which the kings or the elite of the regions were provided for by the population in the surrounding area. At the majority of sites where metrical data were discussed, most animals were described as similar in size to those from contemporary sites (Market Lavington, Sherborne House, Bantham, Eynsham Abbey and Portchester Castle), although smaller animals were noted at Old Down Farm, and smaller sheep at Market Lavington and Bantham. This suggests that there was no mingling of larger breeds with those already present at the time, or that there was widespread movement of animals between sites for breeding purposes, leading to fairly homogeneous types of livestock. This is consistent with a wider study, although some larger animals have been recorded at Barnsley Park, Gloucestershire, possibly reflecting a continuation of larger Roman stock from a villa at the site (Holmes 2014a, 86). The only direct zooarchaeological evidence of the types of animals present is of short-horned cattle, recorded at Cadbury Congresbury 1968–73. There is some suggestion of the symbolic use of animal remains, from drinking horns to the exhibition of skulls from cattle and pigs, although few secure examples exist within the study area (*see* section 2.3.3).

During the middle Saxon phase there is evidence to indicate the provision of food to *wics* from rural sites, through high-status estate centres. Examples of primary butchery at rural and high-status sites and of dressed carcasses in urban assemblages imply the movement of joints of meat to the latter. The movement of food to high-status sites occurred through the transfer of food rents. These are mentioned in numerous documentary sources, including the *Anglo-Saxon Chronicle*, *Laws of Ine* and several charters (Nelson *et al* 2014; Whitelock 1996), detailing animals and animal products to be paid to the estate centre, for example, '30 ambers of ale, 300 loaves, 50 of which shall be white loaves, a wey of lard and cheese, a full-grown bullock, 4 sheep, a pig, 6 sheep, 1 pig, 6 sheep, 6 geese, 10 hens' (repetition of taxa from document) were to be given annually as food rent to Christ Church, Canterbury as a bequest by Heregyth (Sawyer 1968, S70).

Certain aspects of the zooarchaeological record suggest a specific role for those living at particular site types. Ecclesiastical settlements were characterised by high numbers of pigs and birds, and the presence of wild mammals. Despite their connections to rural sites through the redistribution of food rents, high-status sites can be distinguished by the consumption of pork, wild birds and wild mammals, especially roe deer, by the inhabitants. Rural sites were defined by higher numbers of sheep and very few examples of wild species or domestic birds. The specific role of *wics* as production centres is implied by numerous deposits of horn-, antler- and bone-working refuse (offcuts), and the dearth of similar craft deposits at any other site types, which suggest the likely movement of horns from rural sites to estate centres and *wics*.

As with the preceding phase, the majority of middle Saxon animals were recorded as being similar in size and shape to those from contemporary sites

(Abbots Worthy, Copsehill Rd, Cresswell Field, Worton, Eynsham Abbey, High St, Ramsbury, Dorchester-on-Thames 1972, Shavards Farm, 27 James St, Cook St, SOU 19, St Mary's Stadium and Peabody Site, London). However, a number of assemblages suggest some regional variation: cattle and sheep at Peabody Site, London, were taller than those from York, and cattle at Cresswell Field and Worton were similar to those from other East Anglian sites, yet smaller than those from Hamwic. There is also some variation in the size of animals within *wics*. Cattle and pigs in London were larger at 21–22 Maiden Lane than their contemporaries, and cattle at James St were larger than those at the National Gallery and National Portrait Gallery. Such intra-settlement differences may reflect the disposal of bones selected for their size for bone working, as recorded at Hamwic (Driver 1984, 402). Medium-horned cattle are positively identified, as well as short-horned animals, at James St and 27 James St, London. Only short-horned animals were observed in the preceding phase, albeit from a single site, so this may suggest the introduction of a new breed. At High St, Ramsbury, both polled and medium-horned cattle are recorded, and it may be expected that elite sites such as this would be the first to display new stock.

The majority of sites in the late Saxon phase are within *burhs*. There are very few rural sites, and just four high-status and ecclesiastical sites. Wild birds are recorded in greatest numbers at the ecclesiastical sites, and both ecclesiastical and high-status sites have far greater numbers of deer and falconry birds in their assemblages than any other site types, indicating that the sport of hunting played a role differentiating the inhabitants of these sites from those of lower status. The foodways that may have existed between possible producer and consumer sites in this phase are hard to gauge, but there is some suggestion for the secular and religious elite to have bought meat in as joints. There is no evidence for the continuation of redistribution of animals or their products through estate centres, even though the provision of food renders is documented into the medieval period (Stone 2006, 153). Urban data indicate far greater movement of carcasses, implying the presence of specialist butchers and a market for pre-jointed meat. There was greater variety in the types of meat consumed at lower status sites, with relative proportions of cattle, sheep and pig fairly homogeneous between rural and urban sites, possibly reflecting the increased freedom of rural producers to sell products at market, rather than being tied to the provisioning of food rents.

As with the early and middle Saxon sites, animals from contemporary late Saxon sites were generally of similar stature (26–27 Staple Gardens, Eynsham Abbey, Faccombe Netherton and Portchester Castle), although smaller sheep were observed at Western Suburb, Winchester. Although a decline in the size of animals between the early and middle Saxon phases was observed in a wider ranging study (Holmes 2014a, 34), it was not apparent from the limited data in this review. Short- and medium-horned cattle are recorded at Western Suburb, Winchester.

3 THE MEDIEVAL PERIOD (AD 1066–1500)

3.1 Introduction and Background to Medieval Sites in the Study Area

Thanks largely to a better surviving, more comprehensive historical record, the political, social, agricultural and economic aspects of the medieval period are better understood than those of the preceding period. There is not scope in this summary to detail the vast resource available, though some of the major issues that may be expected to influence the archaeozoological record will be highlighted. A few sites could not be recorded to phase, but spanned the entire medieval period; these include a convent at Romsey Abbey, a hamlet at Brighton Hill South and an urban site at Bath, which will not be considered in this analysis but are included in the online database.

Within the study area 276 medieval sites (388 phased assemblages) are recorded, this being the best represented period of the dataset. They are found in all counties (Fig 3.1), the majority clustered in Oxfordshire, Middlesex (London), Hampshire, East Sussex and Somerset.

Fig 3.1: Location of medieval sites within the study area

3.1.1 Saxo-Norman (AD 850–1100)

The Saxo-Norman phase spans the transition from the late Saxon phase to the start of the medieval period. The late Saxon phase has been described in the preceding chapter, characterised by the start of an open-field agriculture and the beginnings of urbanism through the creation of *burhs* and subsequent market economy. The Saxo-Norman transition includes the effect of the Norman conquest, which will be more formally summarised, coming as it does at the beginning of the early medieval phase. The Saxo-Norman phase has its own designation within this review, given the large number of sites that span the Norman conquest.

This phase is characterised by urban assemblages, the majority from rubbish pits, and there are signs of increasing infrastructure in these early towns with assemblages from the excavations of a waterfront area (Fennings Wharf,

London), construction activity (Dorter Undercroft, Westminster Abbey), and defences (Old Erringham, Shoreham). The majority of urban sites are recorded as *burhs* (Winchester, Oxford, Chichester, Exeter, Southwark, Lewes and Bath), while others were established as late Saxon new towns (Shoreham, London and Southampton), monastic towns (Canterbury) and small towns (Banbury). Within Winchester both ecclesiastical (St Mary's Abbey) and iron-working (Henley's Garage) sites are recorded. A small number of rural settlements (Brent Knoll and The Mound, Glastonbury, in Somerset; Easton Lane, Winchester, Hampshire; Harlington, London; Market Lavington and Wilton, Wiltshire; Old Erringham, Sussex; and Wraysbury, Berkshire), and two high-status manorial sites at Trowbridge and Emwell St, Warminster, are also included.

3.1.2 Early Medieval (AD 1066–1150)

The early medieval period starts with the Norman conquest of 1066. It brought with it many changes to the political structure of England, largely through the imposition of Norman aristocrats on the lands of the indigenous Saxon population and removal of much of the Saxon elite (Dyer 1997, 147). The new aristocracy set themselves apart from those of lower status and the remaining Saxon lords in a number of ways, from the serving of sumptuous feasts, to the insistence on a new etiquette both during the hunt and at the table, as well as imposing a network of castles throughout the country (Dyer 1997, 148; Platt 1994, 2; Sykes 2007b, 92). High-status sites within the study area include castles at Portchester, Guildford, Launceston, Oxford and Carisbrooke on the Isle of Wight, and a manor at Faccombe Netherton.

The rule of St Benedict prevailed at monastic houses at the end of the late Saxon phase, and in the early medieval phase monasteries and churches were given new bishops and abbots and put under the control of the Norman elite (Leyser 1997, 187). Ecclesiastical sites of Eynsham Abbey, Oxfordshire, and St Saviour, Bermondsey, are recorded in the dataset.

Urban sites are again the most commonly occurring site type, incorporating excavations of both houses and features, mostly rubbish pits but also a waterfront (Trill Mill Stream, Oxford), bridge (The Thames Crossing, Oxford), road (Linacre Garden, Canterbury) and construction at the sub-vault of Westminster Abbey. As well as towns established in the Saxon period (Oxford, Canterbury, Guildford, London, Southampton and Winchester), a number of new towns are included, such as the port at Bristol, the market town of Wantage and castle town of Windsor.

The vast majority of the population still lived in the countryside. Although villages were the norm in much of midland England, the south-west and south-east continued to be characterised by isolated settlements, which remains the case to the present day (Williamson 2003, 7). Despite rural settlements becoming easier to spot archaeologically with the use of masonry in the construction of village buildings from *c* 1200 (Reynolds 1999, 182), only two such sites (Northfleet and Bickley) are included in the dataset.

It is likely that agricultural practices changed little (Reynolds 1999, 182), although the Norman conquest did bring about an increase in feudal, open-field agriculture, with slaves, peasants and freemen obliged to provide labour and goods to the lord of the manor (Platt 1994, 1; Rigby 1995, 18). Production would have included enough to feed the manor, with some grain and most of the wool sold to produce revenue and supply the cloth and grain export industry (Dyer 2003, 98). Increasing division of land into smaller manorial estates required the expansion of crop production into previously uncolonised areas (Dyer 1997, 146). Another major change that occurred in rural areas was the creation of royal parks and forests. These were restricted spaces constructed by the new Norman elite for hunting, and from which the rural population was prohibited from taking wild animals (Dyer 2003, 82; Sykes 2007b, 96; Sykes 2009c, 27).

3.1.3 High Medieval (AD 1150–1350)

A number of sites span the early–high medieval phase, including urban sites (in Canterbury, Eton, Southampton, Bath, Exeter, Oxford, Lewes, Malmesbury, Gloucester and Bristol), the villages of Eckweek, Hungerford and Bampton, and high-status sites including a hunting lodge at Cheddar Palaces and castles at Portchester, Pevensey and Lewes. Assemblages from these sites will be included in the discussion of high medieval data.

The social hierarchy of the high medieval period was by now established, with the king at the head and numerous royal servants (barons and earls) acting as the aristocratic landlords of estates granted to them in return for their loyalty and service in war. In the 1290s, wars with Scotland and France commenced, which continued intermittently throughout the medieval period. In response, there was considerable expansion in the number of lords holding land in England to cover the need for a fighting population (Dyer 1997, 147; Given-Wilson 1997, 110). Wealthy landowners also set about emparkation of the countryside to provide good hunting grounds (Platt 1994, 47). High-status sites comprise rural manors (Faccombe Netherton, Stretham, Wickham Glebe, Chalgrove and Witney), a grange (Cumnor), a moated house (Shapwick), and numerous castles (Banbury, Windsor, Oxford, Taunton, Southampton, Launceston, Trowbridge, Middleton Stoney, Okehampton, Carisbrooke on the Isle of Wight and Portchester).

Agricultural surpluses were increasing, making landlords wealthy and accelerating the growth of the Church and urban development (Platt 1994, 30). There was a sharp rise in the establishment of new Benedictine monasteries in the 12th century, as well as a continuation of pre-existing ones (Westminster Abbey, Battle Abbey, Eynsham Abbey and Glastonbury Abbey), but by the end of this phase a greater variety of monastic orders existed, including Cistercians (Cleeve Abbey), Augustinians (Keynsham Abbey, St Gregory's Priory, Canterbury and St Mary Spital, London), Dominicans (Dominican Priory, Oxford) and Franciscans (Leyser 1997, 194; Platt 1994, 70). Ecclesiastical sites also include a vicarage (St Andrews, Sonning), church (St Saviour, Bermondsey) and two hospitals (St Bartholomew's, Bristol and St Nicholas, Lewes).

Although the aristocracy still acquired much of their food as tribute, they required goods and services that were becoming more readily available within towns. This demand resulted in a considerable non-agrarian, urban population that required food and raw materials traded through urban markets (Dyer 1997, 157; Hindle 1990, 7; Rigby 1995, 176). As well as market places, towns began to separate areas for the use of a particular group of trades or shops, such as butchers (Dyer and Lilley 2012, 83; Yeomans 2007, 104). By 1300 most towns that exist today had been founded by aristocratic and ecclesiastical land owners (Dyer 1997, 155; Dyer and Lilley 2012, 84; Hindle 1990, 6). London, York and Coventry became centres of international trade, with London the largest town of the period. The urban dataset for this phase is dominated by domestic sites from Southampton, Gloucester, Malmesbury, Windsor, Oxford, Battle, Abingdon, Newbury, Reading, Taunton, Exeter, London, Canterbury, Staines, Alton, Uxbridge, Seaford, Hastings, Steyning, Shoreham, Lewes, Winchester, Bath, Winchcombe and Dover. Other site types include a fish market (St Michael's, Southampton), tannery (Tanner's Hall, Gloucester) and mill (Postern Mill, Malmesbury), waterfronts (Jennings Yard, Windsor, the Old Gaol, Abingdon, Crane Wharf and Abbey Wharf, Reading, Exe Bridge, Exeter, Dundas Wharf, Bristol, and The Thames Crossing, Oxford), defences (Aldersgate, London, and 24a St Michael's St, Oxford) and a pond (Priory Barn, Taunton).

Rural markets were also commonplace, instigated by lords, bishops or the rural community they served, and acted as a means to disperse goods, food and raw materials produced by those in the countryside (Dyer and Lilley 2012, 88). Rural sites include a mining settlement (Cadbury Congresbury 1968–73) as well as a number of farms and villages (Lydd, Dorchester, Brighthampton, Tetsworth, Eckweek, Upton, Stoke Gifford, Reigate, Ramsbury, Seacourt, Shepperton, Gomeldon and Market Lavington). The increase in population in the early part of this phase led to the expansion in the amount of arable land under cultivation. This was done by assarting previously uncultivated land such as marshland, uplands and woodland (Rigby 1995, 70). Furthermore, it meant a decline in the amount of land under pasture in favour of crop production, with existing arable farmed more intensively (Rigby 1995, 76). By the early 13th century rising grain prices meant that many landlords took the running of estates into their own hands. Previously, tenant farmers leased land to farm themselves, providing money or a proportion of their produce as payment, but as their leases ended landlords put designated officials in direct control of running the estate as a whole, rather than allowing individuals to farm individual plots (Campbell 2000, 5; Dyer 2003, 122). While peasant farmers continued to pay rent, it also provided opportunities for itinerant workers to be employed by the lord.

By the late 13th century England's major exports were wool and grain, rather than manufactured commodities. During this period the wealth of England lay in the exploitation of rural resources: production of grain, dairy and livestock and, most importantly, of wool for the growing textile industry. So much so that by the end of this phase the great cloth industries of Flanders were reliant upon English wool (Given-Wilson 1997, 111). There was an inequality between the pastoral-based north and west of the country, which were far poorer than the wealthy arable areas of the south and east, which included many of the major

cloth-manufacturing towns and ports of trade (Platt 1994, 102). Although England was an extremely wealthy and prosperous country, between 1300 and the mid-1350s it suffered a series of catastrophes. These included a combination of population increase, decline in trade, a Europe-wide famine caused by harvest failures between 1315 and 1322, sheep and cattle murrain, the black death of 1346–1353 that killed a substantial proportion of the population, and two wars fought within Britain (Campbell 2000, 4; Dyer 1997, 160; Platt 1994, 91; Rigby 1995, 78).

3.1.4 Late Medieval (AD 1350–1540)

England remained at war throughout much of this period and, although there was some recovery from the crisis at the end of the preceding phase, population numbers did not increase significantly. The survivors were afforded better opportunities; with a reduced population the workforce demanded higher pay and was able to choose who they worked for; peasants could move away, starting a new life as freemen (Dyer 1997, 163; 2003, 268; Platt 1994, 129). Furthermore, the peasants revolt of the late 14th century led to lower rents and taxes and increased freedoms (Dyer 2003, 291). In order to continue to make their land pay, the aristocracy adapted their agricultural methods to those best suited to the land they had to farm, returning arable to pasture and only cultivating the best land (Dyer 1997, 148; Platt 1994, 81). By the end of the 14th century wool exports declined, but increased production of cloth within the country meant that England rapidly became one of the leading textile exporters by the 15th century (Dyer 2003, 296). Living conditions and the standard of diet improved considerably, increasing trade for butchers and brewers (Dyer 2003, 296; Platt 1994, 191). Industry on a household scale was widespread, ranging from cloth making to iron working, allowing innovative persons to advance up the social ladder (Dyer 2003, 309). By the 15th century wealthy landowners were starting to break with the direct management of their manors, once again leasing land to tenant farmers who had control of their own plots in return for a fixed rent paid in cash (Dyer 2003, 333). Agricultural life moved to an emphasis on pastoral, animal-dominated farming, less labour intensive than the previous arable-based practice (Dyer 1997, 169). Within the dataset rural sites are recorded at Chippenham, Chalgrove, Portchester, Cumnor, Lydd, Alton, Bush Marsh, Old Maldon and Bishop's Cleeve.

Within the urban setting workers had greater opportunity to choose an occupation and an employer, and demand a higher wage (Dyer 2003, 279). Urban sites in the dataset became more specialised: sites include a boat yard at The Foundry, Poole; a fish market at St Michael's, Southampton; and a mill at Malmesbury; buildings such as a kitchen in Oxford; a prison at 14 Farringdon St, London; stables in Reading and Oxford; and university buildings in Oxford; and waterfront sites at The Foundry, Poole; Abbey Wharf, Reading; Fennings Wharf, London; King Stable St, Eton; The Thames Crossing, Oxford; Jennings Yard, Windsor; Narrow Quay, Bristol; and Exe Bridge, Exeter. Many domestic sites are also included: Andover, Abingdon, Battle, Bristol, Canterbury, Christchurch, Exeter, Gloucester, Kingston-Upon-Thames, Lewes, London,

Oxford, Poole, Reading, Salisbury, Seaford, Southwark, Southampton, Trowbridge, Winchester, Winchelsea and Uxbridge.

The wealth of the nation remained largely in the south of England, particularly in the counties of Kent, Middlesex and Surrey in the east, and Somerset, Bristol and Bath in the west of the study area (Dyer 2003, 359, map 11). By the middle of the 15th century the wealthy elite, both secular and ecclesiastical, were living in mansions and castles that required provisioning with large quantities of food and goods that were sourced both locally and from further afield (Platt 1994, 185). Fishponds became common additions to the estates of the aristocracy in the 15th century (Platt 1994, 186–7). Castles are represented at Pevensey, Bristol, Okehampton, Launceston, Oxford and Carisbrooke, Isle of Wight; manors at Little Pickle, Sutton Park, Guildford, Wickham Glebe, Cheddar Palaces, West Drayton, Middleton Stoney, Chalgrove and Faccombe Netherton; a grange at Cumnor; and a palace at Southwark.

Although monastic houses of all denominations saw a decline in numbers, abbeys at Weston-Super-Mare (Steep Holm Priory), Eynsham, Keynsham, Winchester, London, Oxford, Bermondsey and Canterbury (St Gregory's Priory) are included in the dataset. There was a rebuilding programme as the Church became wealthy through endowments and the sale of indulgences (Leyser 1997, 204; Platt 1994, 138, 166), and hospitals were founded, often in conjunction with the Church, including those of St Bartholomew's, Bristol, St Mary of Ospringe, Kent, and St Mary Spital, London (Platt 1994, 151).

3.2 Animals as Food

3.2.1 Animals as Food: Beef, Pork and Mutton

In the Saxo-Norman phase the vast majority of sites, urban and rural alike, had between 30% and 60% cattle, 25% and 60% sheep and 5% and 25% pigs (Fig 3.2; *see* Appendix 2). Exceptions to this include assemblages from the ecclesiastical site of St Mary's Abbey, Winchester, and Hinxey Hall, Oxford, with 48% pig; the high-status site of Emwell St, with the greatest proportion of cattle bones (70%); and high numbers of sheep at the rural sites of Easton Lane, Winchester (79%), and Old Erringham (67%). A link between geology and animal husbandry can be observed (Fig 3.3). All but one settlement on the chalk downlands yielded over 39% sheep, suggesting that the keeping of sheep on the downs and vales was well established.

A slight decrease in the numbers of cattle and pigs can be observed from the late Saxon period, proportional to a rise in the number of sheep (Fig 3.4). Following the establishment of Norman rule in the early medieval period there is a considerable rise in the number of pigs relative to both cattle and sheep. This has been observed by Sykes (2007b, 34) and explained as a preference for pork by the French, recorded at both contemporary French sites and in English documentary evidence.

The early medieval phase sees an increase in the number of high-status sites, consistent with the building of castles and manorialisation of estates following

the Norman conquest. All such sites except Portchester Castle (Fig 3.5) record low numbers of cattle combined with either high numbers of pigs (both Carisbrooke Castle assemblages on the Isle of Wight; Launceston Castle; and the manor at Faccombe Netherton) or sheep (Oxford Castle and Guildford Castle). The two ecclesiastical sites (Eynsham Abbey and St Saviour, Bermondsey) have high numbers of pigs in their assemblages consistent with the trend noted in the late Saxon phase, but now also characterised by high numbers of cattle, marking a change from the preceding period when sheep were commonly recorded in greater numbers at ecclesiastical sites.

Although only two rural sites were available for comparison in this phase, both had greater numbers of cattle in their assemblages than the majority of urban sites, again contrasting with many Saxon sites, where cattle were more common in the urban context, and sheep in the countryside. Similarities in the high numbers of cattle at rural and ecclesiastical assemblages continue the Saxon trend, suggesting that both populations held a similar agricultural role. Urban sites are largely characterised by high numbers of sheep (32–61%) and low numbers of pigs (6–23%) and cattle (18–40%), although cattle are far more common at St Mary Spital, London (87%), The Thames Crossing, Oxford (62%), Linacre Garden, Canterbury (49% and 52%), St Mary's, Wantage (54%) and French Quarter, Southampton (49%), and pigs at Hinxey Hall, Oxford (36%), St Magnus and Sir John Cass Primary School, London (both 28%). Once again the majority of sites on the chalk and limestone downlands included higher numbers of sheep in their assemblages (Fig 3.6), implying that the role of the environment was a consideration for the early medieval population when adopting husbandry strategies for sheep.

In the high medieval phase the abundance of assemblages makes trends hard to observe when all sites are plotted together, so high-status and ecclesiastical sites are represented separately from those of lower status. The early medieval increase in pig numbers does not continue into this phase, relative proportions of cattle, sheep and pigs returning to the Saxo-Norman levels (Fig 3.4). Secular and ecclesiastical elite sites are split between those with characteristically high numbers of pigs and sheep, and those with low numbers of pig, but more sheep and cattle (Fig 3.7). This divide is associated with the location of sites, rural elite sites having greater numbers of pig.

The size of the sample makes trends in urban and rural sites harder to discern (Fig 3.8), although the majority of both have low numbers of pigs with a few exceptions (notably Market Lavington; Charnham Lane, Hungerford; Harry Stoke, Stoke Gifford; The Old Vicarage, Reigate; Cadbury Congresbury 1968–73; Copt Hay, Tetsworth; Lydd Quarry; Saxon County School, Shepperton; and Southampton Excavations 1966–9). Both rural and urban sites vary greatly in the proportion of sheep (9–71% urban and 6–78% rural) and cattle (21–78% urban and 18–89% rural) that would have contributed to the diets of the inhabitants, although sites with over *c* 55% cattle tend to be urban in nature. While this is consistent with the preferential supply of beef to towns to meet the urban demand for meat, it also reflects the lower costs of keeping sheep for the peasantry, as well as the rapidly increasing demand for wool to supply the international market (Dyer 1983, 207). Cattle required extra fodder and pasture

and needed to be kept in closer proximity to the village, which made them more labour intensive and costly to keep (Hammond 1993, 9). There was some suggestion of environmental determinism (Fig 3.9), as many of the sites with the greatest numbers of cattle were on clay geology, while sheep were more likely to be recovered from assemblages on chalk and limestone.

During the late medieval phase the number of cattle recorded increases, with a corresponding decrease in sheep and pig (Fig 3.4). There is little evidence for husbandry being dictated by environment, although all but 3 out of 15 sites with over 60% cattle are located on clay geology (Fig 3.10). Pigs are less prevalent at all site types, but remain in greatest quantities at elite sites (Fig 3.11). This has been linked to an increase in pastoral agriculture in the aftermath of the crisis at the end of the preceding period, reducing the profitability of pigs compared with cattle and sheep, which now had fewer limitations on grazing (Albarella 2004, chapter 5; Thomas 2005a, 24). The majority of ecclesiastical sites are characterised by high numbers of sheep and low numbers of cattle, although individual phases at St Mary Spital and Eynsham Abbey have greater quantities of cattle (87% and 67%, respectively). Again, lower status rural and urban sites have little to separate them in the quantity of beef and mutton consumed, and they generally have less access to pork than those in elite sites, with the exception of Chalgrove and Victoria Rd, Winchester.

Summary

In all phases there is little to distinguish the diet of the general populations of urban and rural settlements: cattle and sheep bones are recorded in widely varying proportions, although cattle are often more common at urban sites. By way of contrast, pigs are most common at high-status and ecclesiastical sites. The role of the environment in the choice of animal husbandry is most evident in the early half of the period, where sheep were kept on the dry chalk hills and vales of the study region, and cattle on the heavy clay soils. As the wool trade expanded and the value of sheep increased they became more common on all geologies.

The increase in pigs at all sites in the early medieval phase is indicative of cultural change, being a feature of the Norman diet, though still not consumed in the quantities recorded at French sites (Sykes 2007b, 34). A subsequent decrease in pig numbers has been attributed to a decline in woodland, a restriction of pannage rights and increasing profitability of cattle and sheep to the rural economy (Albarella 2006, 79; Thomas 2005a, 24; Thomas 2007, 143). One further temporal change is the increase of cattle in the late medieval phase, possibly reflecting better living standards of the urban lower classes, for whom meat became more accessible (Albarella 1997; Hammond 1993, 92).

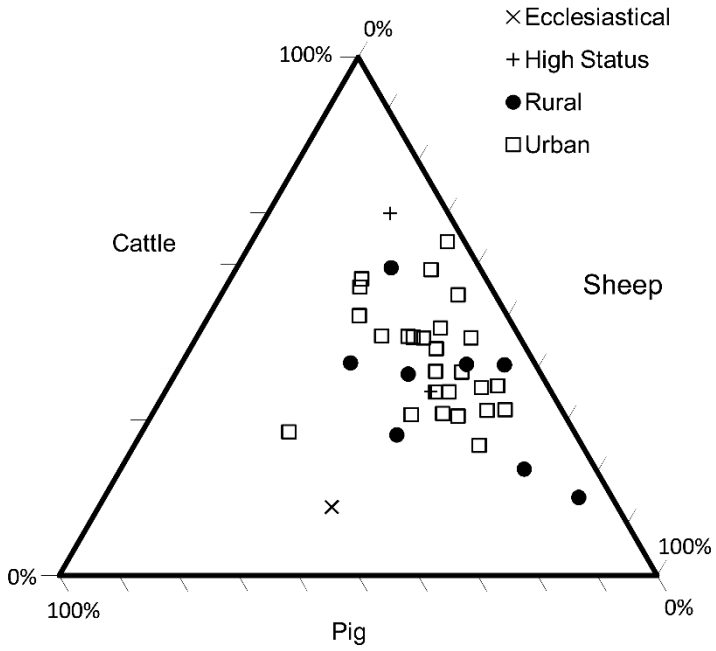

Fig 3.2: Relative proportions of cattle, sheep/goat (sheep) and pig recorded from all Saxo-Norman sites. Quantification based on NISP

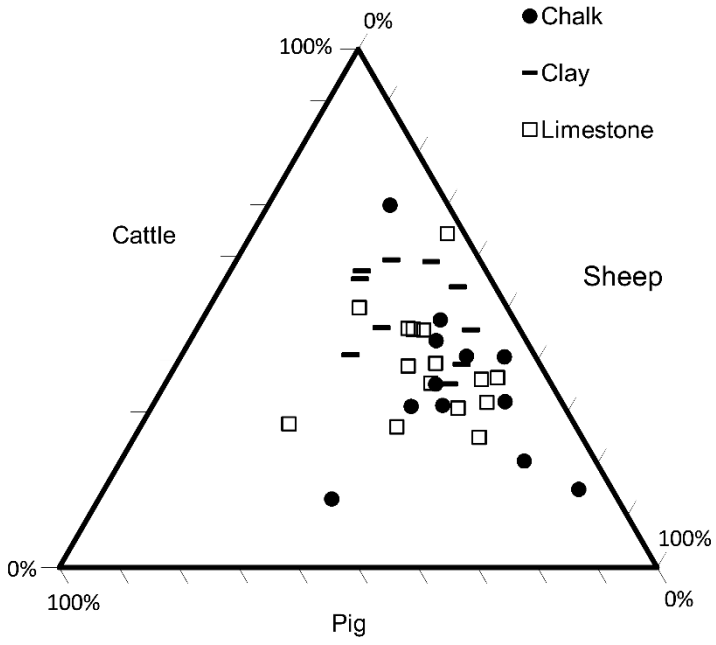

Fig 3.3: Relative proportions of cattle, sheep/goat (sheep) and pig on underlying bedrock geology for the Saxo-Norman period. Quantification based on NISP

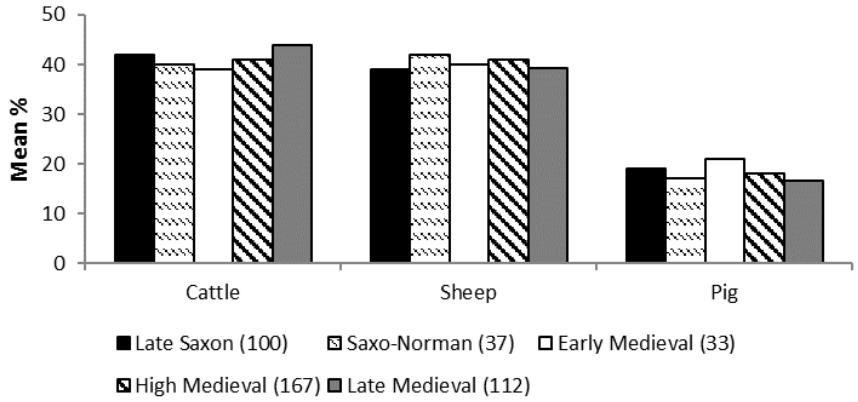

Fig 3.4: Mean proportion of the main domesticates recorded for each of the major medieval phases. (n)= number of sites

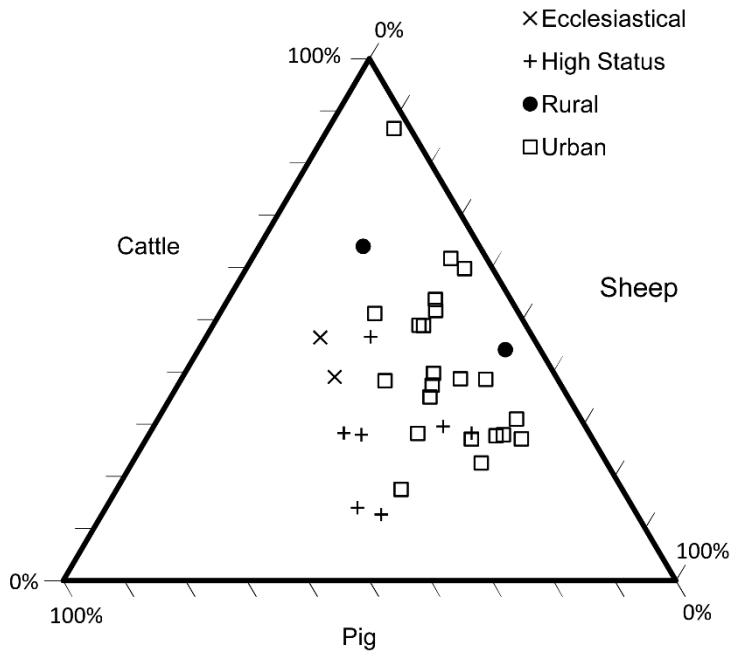

Fig 3.5: Relative proportions of cattle, sheep/goat (sheep) and pig recorded from all early medieval sites. Quantification based on NISP

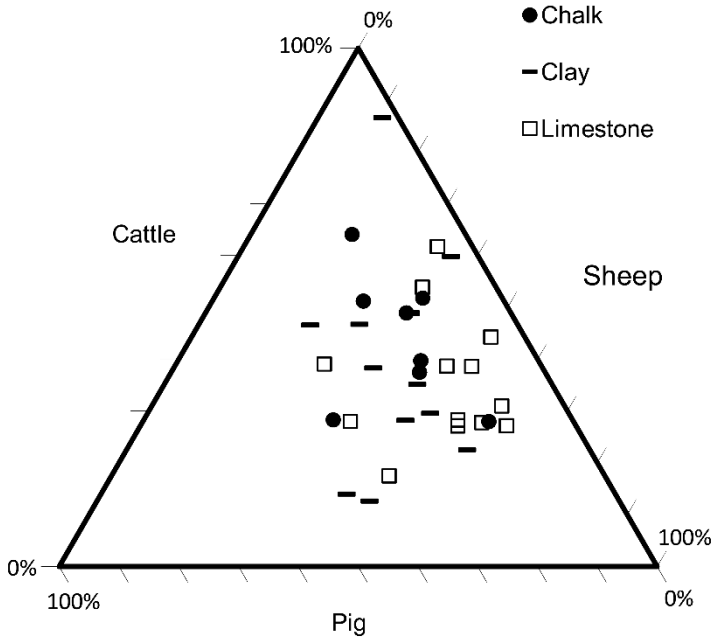

Fig 3.6: Relative proportions of cattle, sheep/goat (sheep) and pig on underlying bedrock geology for the early medieval period. Quantification based on NISP

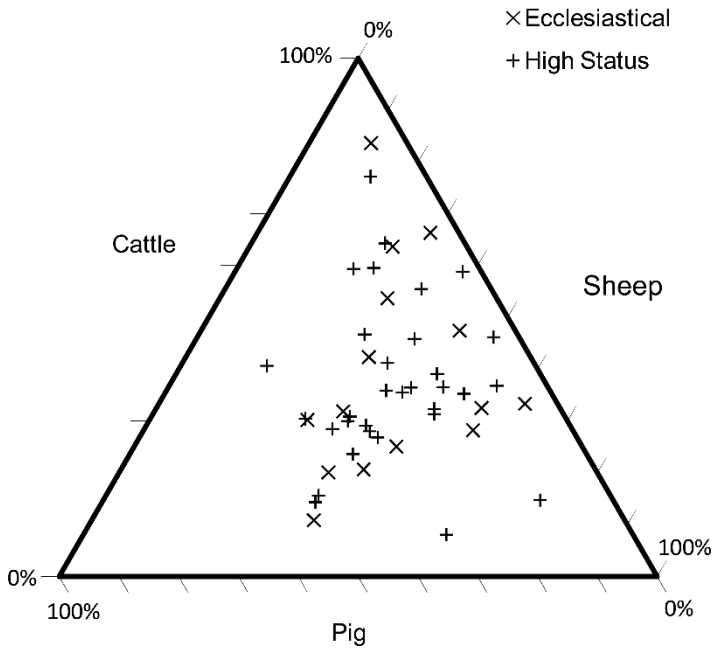

Fig 3.7: Relative proportions of cattle, sheep/goat (sheep) and pig recorded from high-status and ecclesiastical high medieval sites. Quantification based on NISP

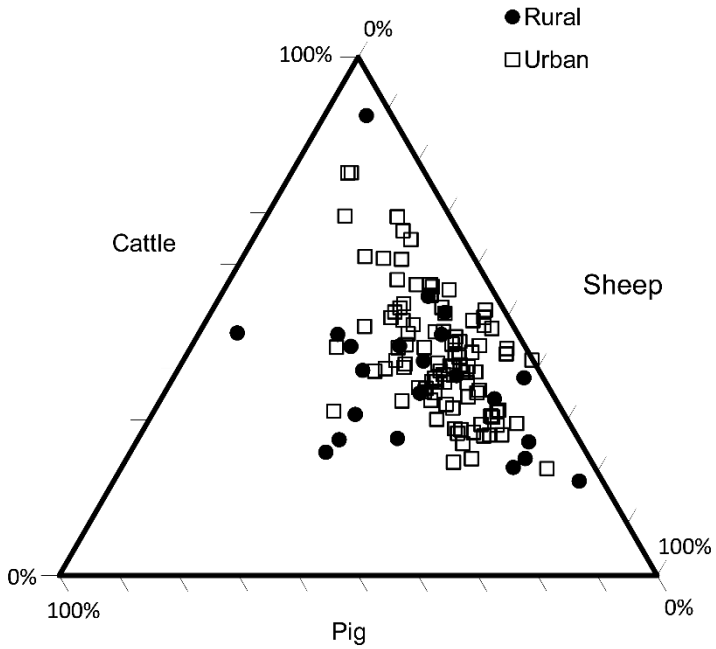

Fig 3.8: Relative proportions of cattle, sheep/goat (sheep) and pig recorded from urban and rural high medieval sites. Quantification based on NISP

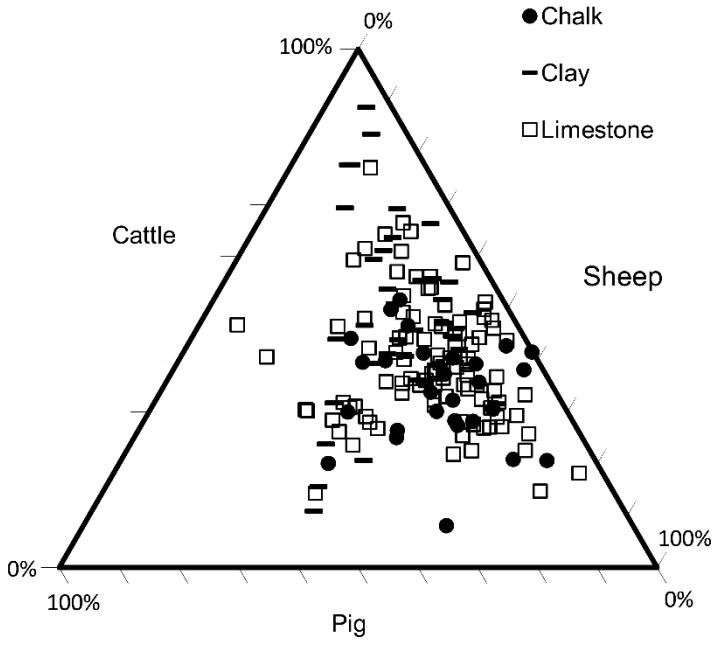

Fig 3.9: Relative proportions of cattle, sheep/goat (sheep) and pig on underlying bedrock geology for all sites in the high medieval period. Quantification based on NISP

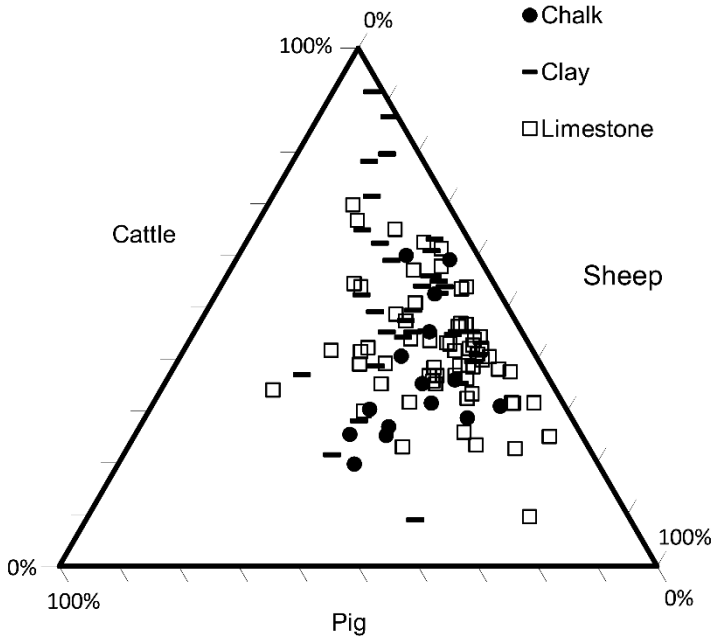

Fig 3.10: Relative proportions of cattle, sheep/goat and pig on underlying bedrock geology for the late medieval period. Quantification based on NISP

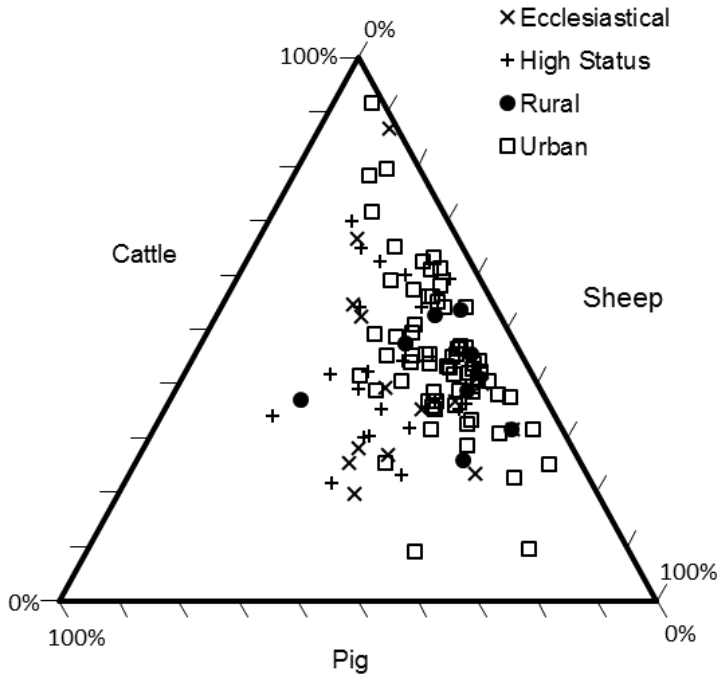

Fig 3.11: Relative proportions of cattle, sheep/goat and pig recorded from all late medieval sites. Quantification based on NISP

3.2.2 Animals as Food: Birds

An increase in the numbers of domestic fowl, geese and wild birds occurs in early medieval assemblages, following a small drop in numbers in the Saxo-Norman phase (Fig 3.12). This phenomenon, as well a decrease in the relative frequency of domestic ducks, has been noted by Sykes (2007b, 28). As with pigs, the increase in domestic fowl can be attributed to French tastes for chicken and pork, as suggested by the greater numbers of domestic fowl recorded at contemporary French sites. There is also a documented avoidance of ducks by the French. Further increases in the quantity of domestic fowl, geese and wild taxa from the early medieval phase suggest a general widening of the diet base of the population. A continuation of the Saxon trend for geese to predominate over ducks is also apparent, becoming more striking from the high medieval phase, which reflects documentary evidence for a peak in the keeping of large flocks of geese in the 13th to 14th centuries (Albarella 2005, 255). A number of high-status signature species have been identified (Albarella and Thomas 2002; Sykes 2004) and these taxa, along with selected others, will be considered in more detail for their presence at a variety of site types.

Proportions of domestic birds in Saxo-Norman assemblages show little variation between urban and rural sites (Fig 3.13). Domestic fowl and geese are more common at the high-status site of Trowbridge, while only one chicken bone was recorded at the ecclesiastical site of St Mary's Abbey, Winchester. Investigation of the relative proportions of wild taxa (Fig 3.14) is hampered by small sample sizes, particularly for elite sites, and poor quantification. Although the presence of a wide range of water and semi-wild birds was recorded at Trowbridge, they were not quantified. The apparently high proportion of semi-wild birds recorded at rural sites comes from two bones (pigeon and peafowl) recorded at the Mound, Glastonbury, while other wild birds are more common in urban contexts.

In the early medieval phase greater social distinction can be observed between site types and relative proportions of both domestic (Fig 3.15) and wild birds (Fig 3.16). Rural sites have the poorest avian representation, indicating a paucity in the diet resulting from the introduction of forest law by the Norman elite, and contrasting with the major increase in birds at high-status sites (Albarella and Thomas 2002, 24; Sykes 2004, 88). Domestic fowl and geese are particularly common at high-status sites (for example Faccombe Netherton and Carisbrooke Castle). Despite greater numbers of wild taxa at high-status sites (Fig 3.16), and the association of birds such as pigeon/dove, peafowl and woodcock with high-status assemblages, wild birds are by no means ubiquitous (Fig 3.17). These trends are consistent with the introduction of dovecotes and peafowl by the Norman elite, these birds being visible for the first time at the high-status sites of Carisbrooke Castle and Faccombe Netherton (Serjeantson 2006, 142; Sykes 2007a, 63). Interestingly, despite indications that heron was most common at elite sites in the early medieval phase (Sykes 2004, 94), within the study area they are only recorded at the urban site of Western Suburb, Winchester (Fig 3.17). Similar proportions of domestic fowl, geese and ducks were recorded at urban and ecclesiastical sites (Fig 3.15), although Eynsham Abbey has a considerable range of wild birds including pigeon/dove, crane,

woodcock, waders and *Turdus* spp., indicative of a luxury, highly varied diet. Wild birds are less common in urban contexts, although ducks and waders are recovered in proportions similar to those of elite sites (Fig 3.17). Despite wild ducks being unpopular with the aristocracy following the Norman conquest, in the early medieval phase they are found at a similar proportion of urban, secular and ecclesiastical elite sites, indicating that, although perhaps not targeted as a hunted species, when available, they were eaten (Fig 3.17). It has been suggested that ducks were more valued for their eggs than their meat, which could also explain their presence at high-status sites (Thomas 2005a, 72). One final pattern of interest is the range of wild taxa occasionally observed at urban sites, indicating a trade in wildfowl through urban centres, or the spatially indistinct disposal of refuse from the urban elite.

The high medieval phase sees a continuing predominance of domestic fowl and wild birds at high-status sites (Figs 3.18 and 3.19), also becoming more common at ecclesiastical settlements. Indeed, the use of chickens and their eggs as render against rent on estates continued into this phase when payment by other food means had largely come to an end (Stone 2006, 153). The addition of more rural sites in this phase indicates the presence of a small number of wild taxa. Ducks are most common at secular and ecclesiastical elite sites, indicating their continued consumption (Fig 3.20). Pigeon/dove, woodcock and *Turdus* spp. are most commonly recorded in high-status and ecclesiastical assemblages, while pheasant, partridge, swan and waders are more common at high-status sites only. Reasons for this difference may be found in the methods of procurement: pigeons and doves would be kept in a dovecote, and small blackbirds and thrushes could be caught with nets, requiring a less violent method of capture more fitting to the clergy, whereas hawks and falcons were used to catch other game birds. The increasing presence of birds at ecclesiastical sites follows the establishment of Benedictine law in the early medieval phase, leading to a preference for the consumption of birds and fish at times in the religious calendar when other meat was forbidden (Grant 1988b, 145). Urban settlements remain places where a wide range of wild taxa are available as occasional additions to the market (Fig 3.20). This may reflect the status of individual sites within towns, as recorded at Winchester, where greater numbers of wild bird bones were recovered from the wealthier western suburbs, compared with the lower status extra-mural areas to the north and east (Serjeantson 2006, 144). It was legal for peasants to trap wild birds on common and waste land (Grant 1988a, 168), and the documentary evidence indicates a thriving peasant trade. Despite this, the relative dearth of these, and all other bird, species at rural sites indicates they were not common additions to the diet of the rural population. Birds such as geese, doves, hens and their eggs are documented as being widely available, for example to the nuns of Wilton Abbey, Wiltshire, at their local market (Stone 2006, 152), even if the peasants themselves did not consume them.

By the late medieval phase there is an increase in the proportion of domestic and wild birds recorded at ecclesiastical and lower status sites (Figs 3.21 and 3.22). Proportions of domestic fowl and geese are similar at secular and religious elite settlements for the first time. The exclusivity of pigeons, woodcock and waders observed at elite sites in preceding phases is no longer the

case (Fig 3.23), as they are found in increasing numbers at rural settlements. However, peafowl, crane, gulls and *Turdus* spp. are recovered from more high-status assemblages than any other site type, while pheasant and swan are more common at ecclesiastical sites. Certain taxa remain largely in the domain of both the ecclesiastical and secular elite, particularly wild ducks and partridge. Documentary evidence indicates that, whereas wild birds were consumed as an occasional luxury in the preceding phase, by the second half of the 14th century they were more commonly eaten, even with some taxa (for example cranes) being hunted to the point of extinction (Serjeantson 2010, 149; Stone 2006, 156). This trend is reflected in the increase of dovecotes, swanneries and heroneries in this phase (Stone 2006, 158). Consequently, the provisioning of birds by the rural population through urban markets gave the lower classes greater access to birds as a food source, to such an extent that, by the 15th century, laws were passed to restrict access to wild birds by the peasantry, and to stop the over-exploitation of endangered taxa (Stone 2006, 160).

Summary

There is a general increase though time in the quantity of birds recorded at all sites, and the consumption of avian fauna at elite sites. The number of birds contributing to the diet at rural sites is minimal throughout the period, until the late medieval phase when they become far more common, consistent with the increase in living standards at the end of the high medieval phase. Consequently the upper echelons of society used a greater range of wild birds, rather than quantity, to symbolise their status (Albarella and Thomas 2002, 29; Sykes 2004, 89).

Geese were increasingly used in the medieval period for meat, eggs and feathers for both down and quills (Serjeantson 2002), which is evident in the dataset from the early medieval phase onwards. Domestic fowl, too, were important for several uses: meat and eggs as well as fighting, which would have required taxa bred for specific traits (Stephenson 1987, 378). Size increases in domestic fowl within the London area occurred between the 15th and 16th centuries (Thomas *et al* 2013, 3314), which may be related to the growing importance of meat, and increase in the caponisation of chickens to produce larger birds (Slavin 2009, 40).

A number of very young domestic fowl bones recorded at urban sites throughout the medieval period indicates that they were bred in towns, although there was no similar indication for the rearing of geese in urban contexts (Serjeantson 2006, 140). There was a documented increase in the popularity of pigeons throughout the period, including the consumption of large numbers of young birds, or squabs (Stone 2006, 155).

Although wildfowling is apparent both from wild bird remains and documentary evidence (Stone 2006, 149), when the proportion of wildfowl (seabirds or water birds such as ducks, geese and waders) is considered, there is nothing to indicate that areas of marsh were exclusively or intensively exploited by those living nearby (Fig 3.24). Exceptions exist, particularly at late medieval Pevensey Castle; high and late medieval phases of the ecclesiastical site of Silver St, Glastonbury; urban sites of Linacre Garden, Canterbury, and Narrow Quay,

Bristol, in the late medieval phase, and high medieval Dundas Wharf, Bristol. More striking is the absence of zooarchaeological evidence for those living at rural sites local to wetlands to have taken advantage of the rich bird life as a resource.

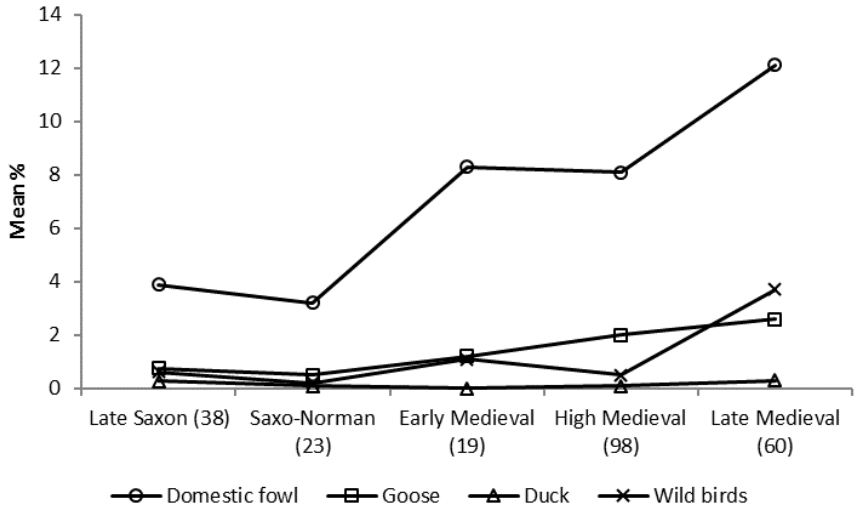

*Fig 3.12: Mean proportion of birds recorded at medieval sites (% of NISP cattle, sheep/goat and pig). Only sites (*n*) with >300 NISP cattle, sheep/goat and pig included*

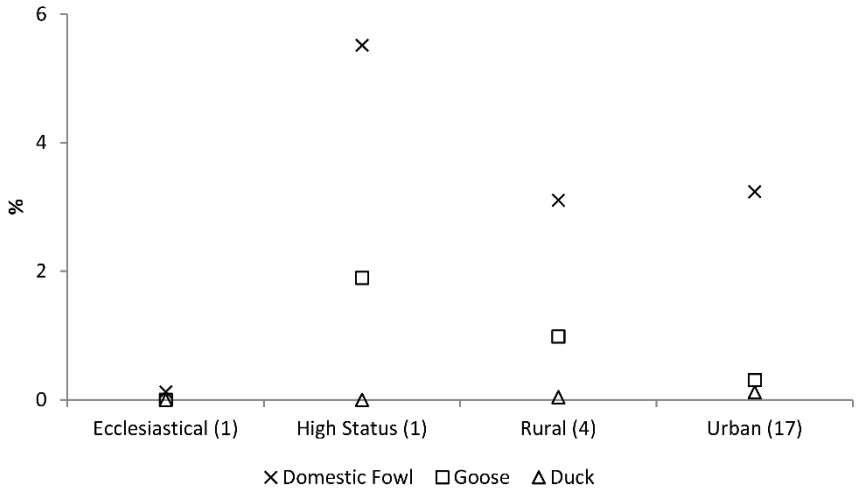

*Fig 3.13: Mean proportion of domestic fowl (chicken), geese and ducks recorded by site type for the Saxo-Norman phase (% given as proportion of NISP cattle, sheep/goat and pig). Only sites (*n*) >300 NISP cattle, sheep/goat and pig are included*

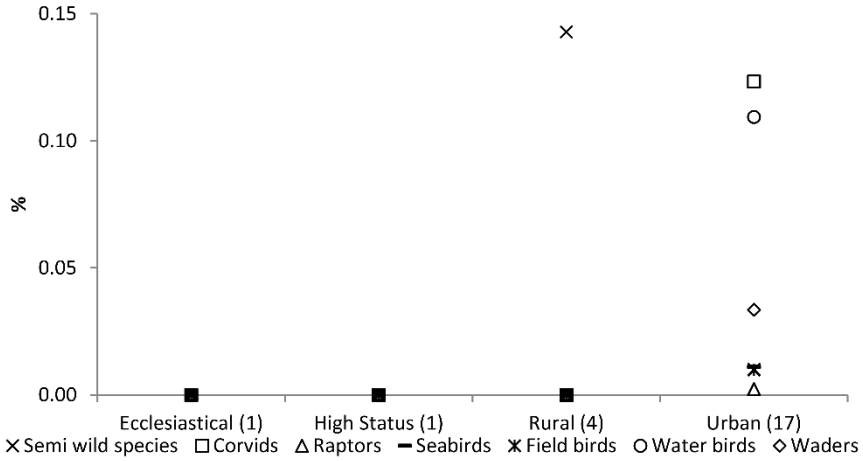

Fig 3.14: Mean proportion of wild birds recorded by site type (% given as proportion of NISP cattle, sheep/goat and pig) for the Saxo-Norman phase. Only sites (n) *>300 NISP cattle, sheep/goat and pig are included. For bird taxa included within each category* see *section 1.7.1*

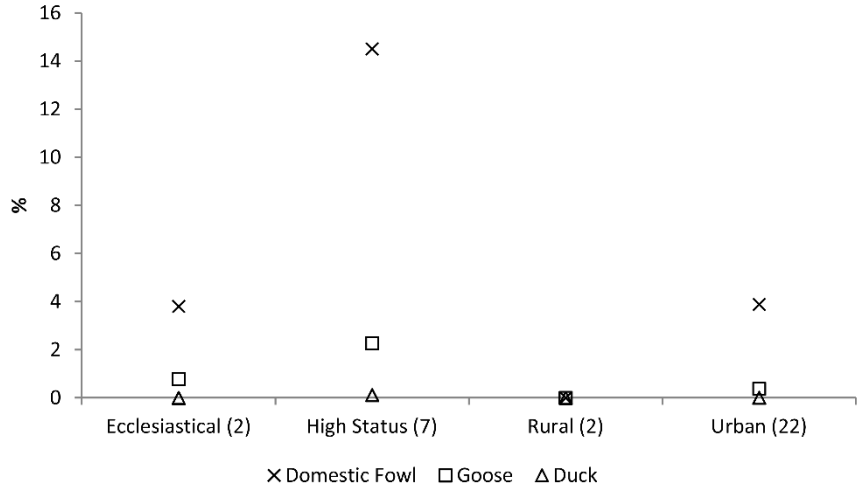

Fig 3.15: Mean proportion of domestic fowl (chicken), geese and ducks recorded by site type (% given as proportion of NISP cattle, sheep/goat and pig) for the early medieval phase. Only sites (n) *>300 NISP cattle, sheep/goat and pig are included*

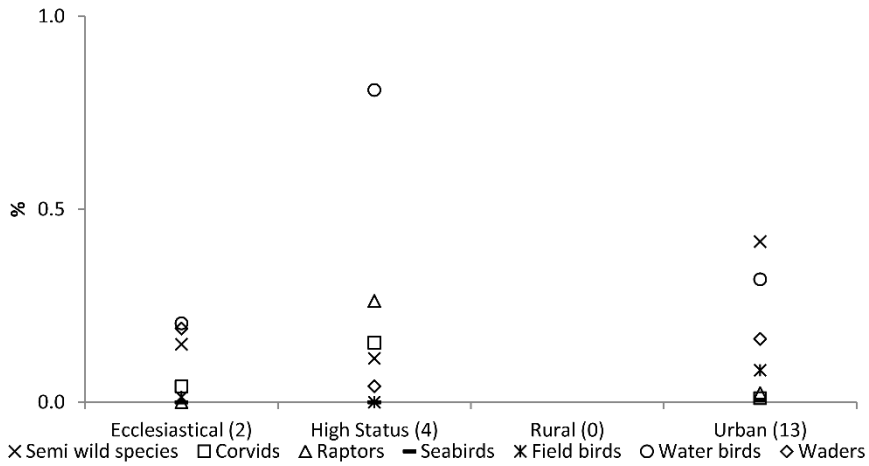

Fig 3.16: Mean proportion of wild birds recorded by site type (% given as proportion of NISP cattle, sheep/goat and pig) for the early medieval phase. Only sites (n) *>300 NISP cattle, sheep/goat and pig are included. For bird taxa included within each category* see *section 1.7.1*

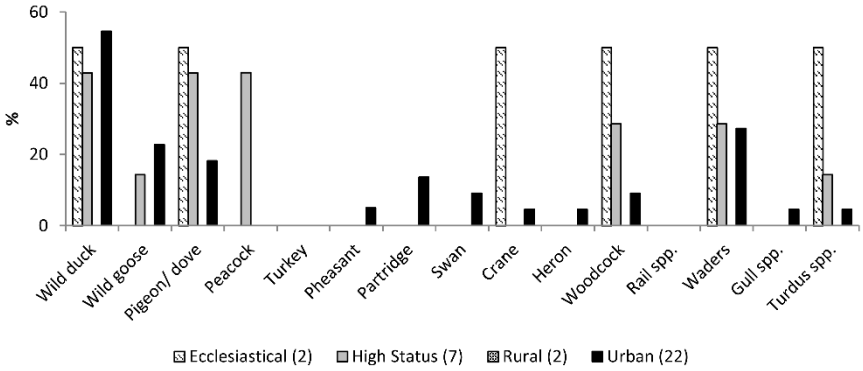

Fig 3.17: Proportion of all early medieval sites (n) *at which high-status wild bird signature species and selected other taxa were present (after Albarella and Thomas 2002; Sykes 2004). NB: Rail* spp.*= crakes, waterhen/moorhen and coot; waders= plovers, snipe, lapwing and oystercatcher; gull* spp.*= Laridae; Turdus* spp.*= thrush and blackbird; wild ducks= teal and mallard; wild goose= brent goose and barnacle goose*

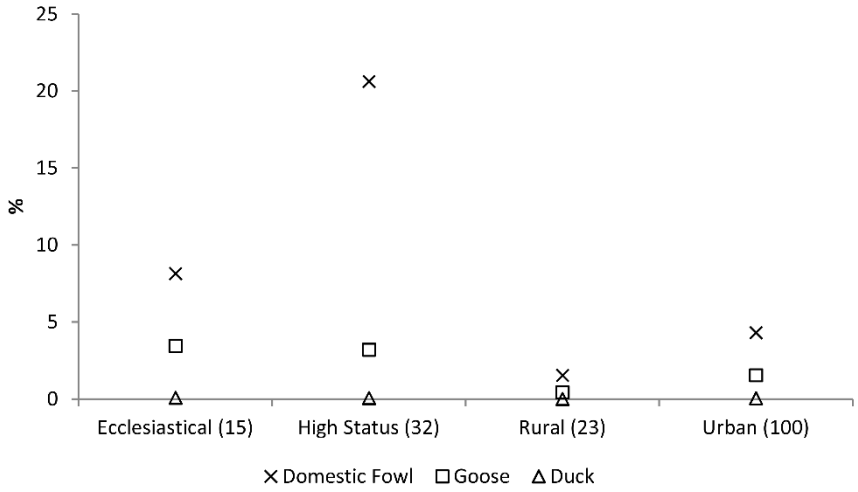

Fig 3.18: Mean proportion of domestic fowl (chicken), geese and ducks recorded by site type for the high medieval phase (% given as proportion of NISP cattle, sheep/goat and pig). Only sites (n) *>300 NISP cattle, sheep/goat and pig are included*

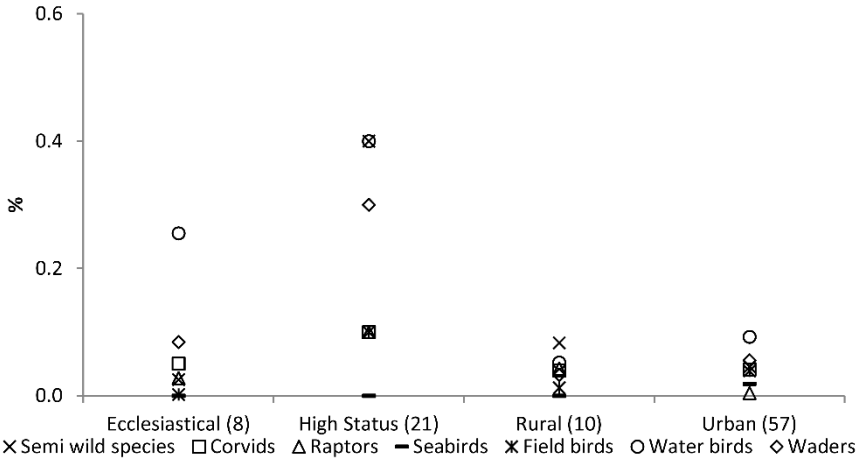

Fig 3.19: Mean proportion of wild birds recorded by site type for the high medieval phase (% given as proportion of NISP cattle, sheep/goat and pig). Only sites (n) *>300 NISP cattle, sheep/goat and pig are included. For bird taxa included within each category* see *section 1.7.1*

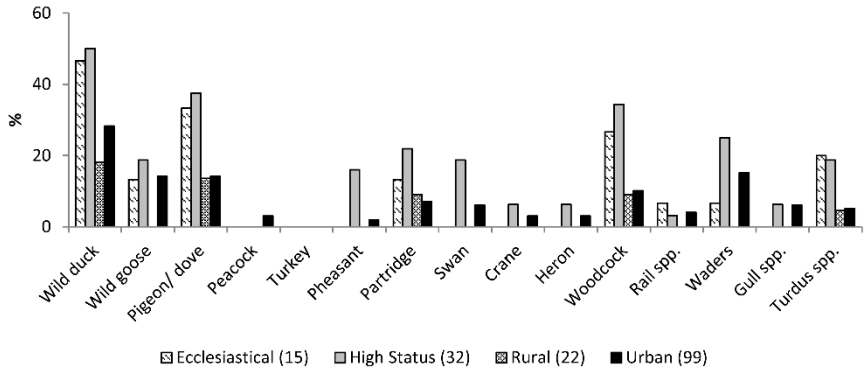

Fig 3.20: Proportion of high medieval sites at which high-status wild bird signature species and selected other taxa were present (after Albarella and Thomas 2002; Sykes 2004). NB: Rail spp.*= crakes, waterhen/moorhen and coot; waders= plovers, snipe, lapwing and oystercatcher; gull* spp.*= Laridae; Turdus* spp.*= thrush and blackbird; wild ducks= teal and mallard; wild goose= brent goose and barnacle goose. Only sites* (n) *>300 NISP cattle, sheep/goat and pig are included*

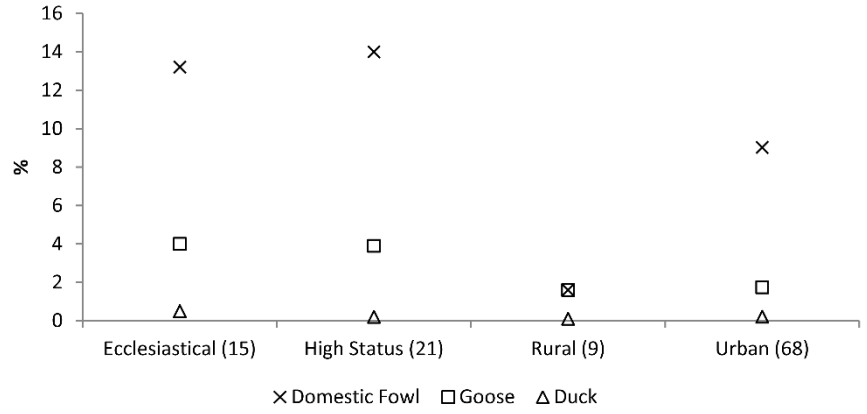

Fig 3.21: Mean proportion of domestic fowl (chicken), geese and ducks recorded by site type for the late medieval phase (% given as proportion of NISP cattle, sheep/goat and pig). Only sites (n) *>300 NISP cattle, sheep/goat and pig are included*

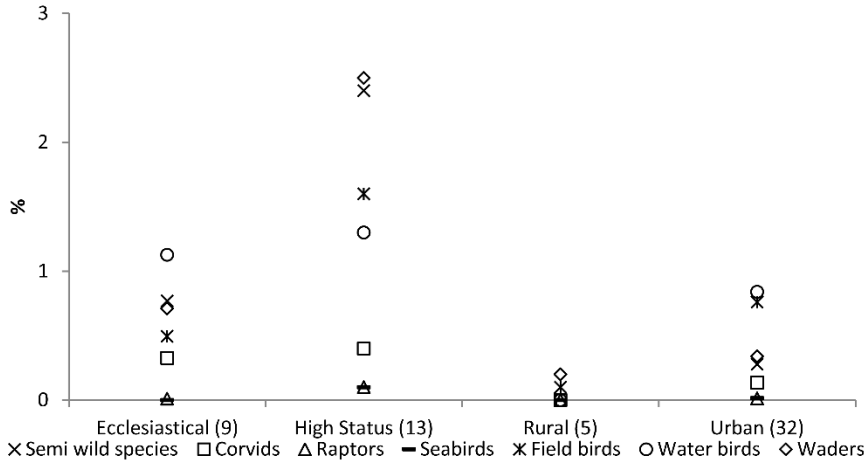

Fig 3.22: Mean proportion of wild birds recorded by site type for the late medieval phase (% given as proportion of NISP cattle, sheep/goat and pig). Only sites (n) *>300 NISP cattle, sheep/goat and pig are included. For bird taxa included within each category* see *section 1.7.1*

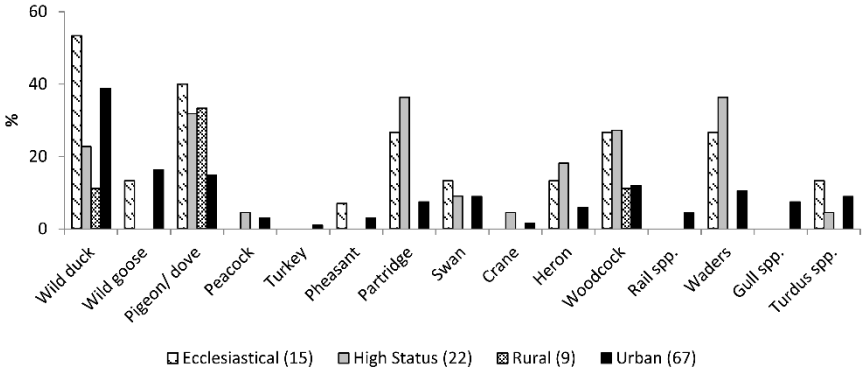

Fig 3.23: Proportion of late medieval sites at which high-status wild bird signature species and selected other taxa were present (after Albarella and Thomas 2002; Sykes 2004). NB: Rail spp.= *crakes, waterhen/moorhen and coot; waders= plovers, snipe, lapwing and oystercatcher; gull* spp.= *Laridae; Turdus* spp.= *thrush and blackbird; wild ducks= teal and mallard; wild goose= brent goose and barnacle goose. Only sites* (n) *>300 NISP cattle, sheep/goat and pig are included*

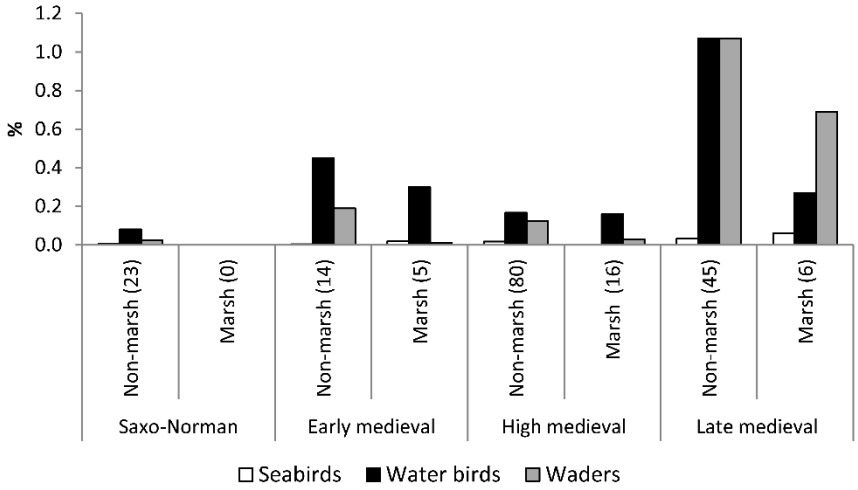

Fig 3.24: Mean proportion of wildfowl remains at sites local to wetlands (% given as proportion of NISP cattle, sheep/goat and pig). Only sites (n) *>300 NISP cattle, sheep/goat and pig are included. For bird taxa included within each category* see *section 1.7.1*

3.2.3 Animals as Food: Game

As in the Saxon phase, quantities of wild mammals are low in comparison with the main domesticates. Relative proportions of the major game species are similar for fallow deer, hare and rabbit throughout much of the medieval period (Fig 3.25), with a considerable increase in the proportions of rabbit and fallow deer in the late medieval dataset. In the early medieval phase red and roe deer are recorded in the greatest proportions, which subsequently decrease. A decline in red deer has been linked to the increase in sheep pasture, reducing their natural habitat (Almond 2003, 64; Grant 1988b, 142). But it is more likely that this reduction in numbers is linked to that of roe deer following a change in hunting methods and over-hunting by the new Norman elite, causing their populations to be compromised, combined with the establishment of herds of the newly imported fallow deer (Sykes 2006c, 169; Sykes and Putnam 2014, 278). This is particularly pertinent when combined with DNA evidence from roe deer that has revealed a reduction in their genetic diversity, a 'bottlenecking' that resulted from over-hunting, most markedly in the south of England (Baker 2011, 124).

When the frequency of species is considered by site type, it can be observed that the Saxo-Norman phase is typified by very low numbers of game species at all sites, with none present in over 1% of assemblages (Fig 3.26). This trend is consistent with the late Saxon results (Fig 2.19), albeit in even lower quantities in the Saxo-Norman phase. Red and roe deer and hare are recorded in greatest numbers at ecclesiastical and high-status sites.

By the early medieval phase, distinction of the elite from the rest of the population is well illustrated by the high proportion of deer and hare at high-status sites (Fig 3.27). A few deer and rabbit remains were recovered from urban and ecclesiastical assemblages, and none from rural settings. This is consistent with the restriction of hunting rights to the elite (Sykes 2006c, 175), similar to the restriction in wild bird numbers at rural sites. Furthermore, the method of

hunting changed with the establishment of Norman culture, to a more open environment for the elaborate, exhibitionist chasing of game than the enclosed woodland environments preferred by the late Saxon elite. This open environment was more conducive to the hunting of red deer, and partly explains the decline of roe, which were more suited to a wooded habitat (Sykes 2007b, 68).

As observed at late Saxon sites (*see* section 2.2.3), the relationship between roe deer and religious settlements continues, a trend also noted throughout France, reflecting the association of the gentle traits of the roe deer with the pious clergy that is firmly rooted in humoral theory (Jones *et al* 2016; Sykes 2006c, 168). The newly established fallow deer species is very rare at any site except for those of high-status, manifesting its importance as a highly prized animal used to distinguish the Norman elite from the indigenous population (*see* section 3.3.2). A similar case can be made for rabbit, which was most likely introduced slightly later as a luxury food source, from the late 12th century (Sykes and Curl 2010, 125). Occasional finds of rabbit bones are recorded at rural and urban sites in the Saxo-Norman and early medieval phases, examples that are likely to be intrusive or from imported luxuries, as the documentary evidence indicates that rabbits were limited to off-shore colonies on the Isles of Scilly and Lundy during this phase (Sykes and Curl 2010, 123; Veale 2003, 210). Hare numbers, too, increase dramatically, particularly at elite sites, reflecting the perceived nature of hares as 'kyng of venery' (the hunt) as they were the hardest creature to outwit (Cummins 1988, 111), and they would also have been emparked (Sykes and Putnam 2014).

Game species are recorded in lower numbers in the high medieval phase (Fig 3.25), with the exception of rabbits and, to a lesser extent, fallow deer, which continue to increase in number. The status of fallow deer, hare and rabbits as luxury commodities and foods is observed in their overwhelming presence at high-status sites (Fig 3.28). Fallow deer themselves became increasingly important for venison, both as food and currency through gifting, observed by an increase in younger animals at contemporary sites (Sykes *et al* 2016). Red deer are still ubiquitous in high-status and ecclesiastical assemblages, but become increasingly common at rural sites as they are gradually replaced by fallow deer as a status symbol. Indeed, it has been suggested that, 'in the late medieval world hunting was a universal activity … most of the population hunted in some way' (Almond 2003, 5), and in the high medieval phase rural assemblages contrast strongly with those from the preceding phase, where no wild taxa were recorded at rural sites (Fig 3.27). This illustrates the proliferation of poaching, evident in the court rolls of the time (Birrell 1982, 1996). It is during the high medieval phase that the rabbit becomes more commonly recorded, which coincides with its introduction on mainland England in the late 12th century (Sykes and Curl 2010, 128; Veale 2003, 212).

By the late medieval phase the decline in red and roe deer and considerable increase in fallow numbers is a trend recognised elsewhere in England (Thomas 2005a, 20), and the loss of status of the former is illustrated by findings of red and roe deer remains at all site types in small numbers, while fallow deer continue to be recorded in extremely high numbers only at high-status sites (Fig

3.29). High numbers of fallow deer remains at rural sites are likely to have been the spoils of poaching, although they may have resulted from gifts given to estate workers who took part in the hunt as beaters or hunt servants (Birrell 2006, 177). Rabbits are recorded at all site types in far greater numbers than hare and, although they continued to be kept in warrens by the aristocracy, they are most common at rural and ecclesiastical sites. This most likely reflects the inability of the elite to contain such a prolific breeder and burrower on their own properties, with it becoming fair game at all levels of society (Hammond 1993, 17; Williamson 2006, 7).

Summary

The distinction between elite and lower classes is considerable in the early medieval phase, observed not just in the proportion of game, but also pork and domestic and wild bird taxa, as the new Norman elite imposed forest law throughout England, by which they made their social superiority clear. However, throughout the remaining medieval period social division is less clear. In none of the medieval phases do ecclesiastical populations consume venison in comparable proportions to those from the late Saxon phase. Changes to Church statute, bringing monastic houses into Benedict rule following the Norman conquest, must have had an effect on the hunting and consumption of deer by the clergy.

The distribution of fallow deer, hare and rabbits at primarily high-status sites throughout the period is consistent with their introduction as luxury items, distinguishing those who could afford to procure and hunt these new species from those who could not. As a result of over-hunting and habitat destruction, numbers of roe and red deer decreased, in the case of the former to such an extent that new breeding populations had to be established in the 19th century because of the threat of extinction (Baker 2011, 15).

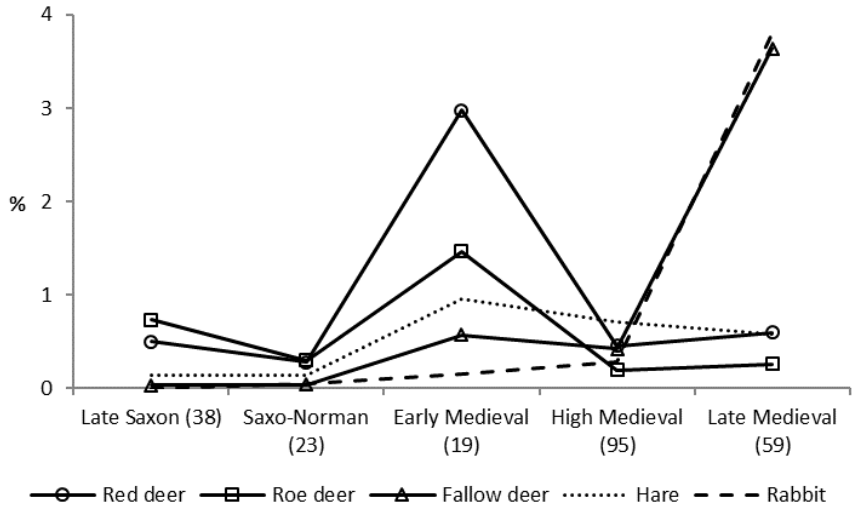

Fig 3.25: Mean proportion of the major game mammals recorded from medieval sites (% of NISP cattle, sheep/goat and pig). Only sites (n) *with >300 NISP cattle, sheep and pig included*

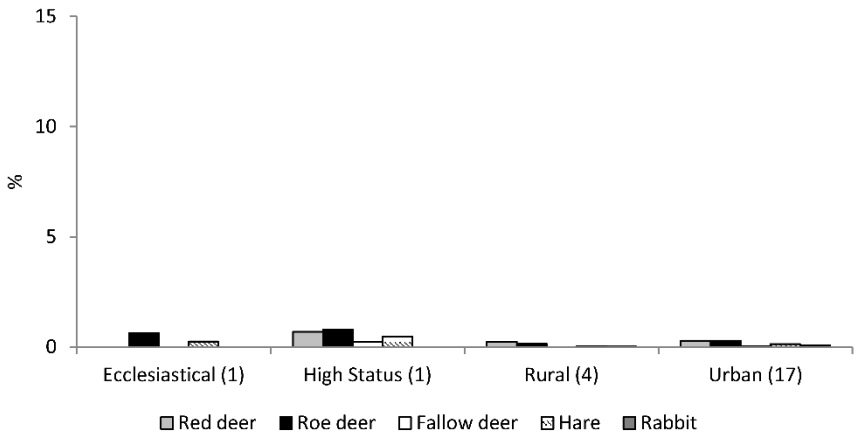

Fig 3.26: Mean proportion of the major game species from various site types in the Saxo-Norman phase (% given as a proportion of NISP cattle, sheep/goat and pig). Only sites (n) *with >300 NISP cattle, sheep/goat and pig included*

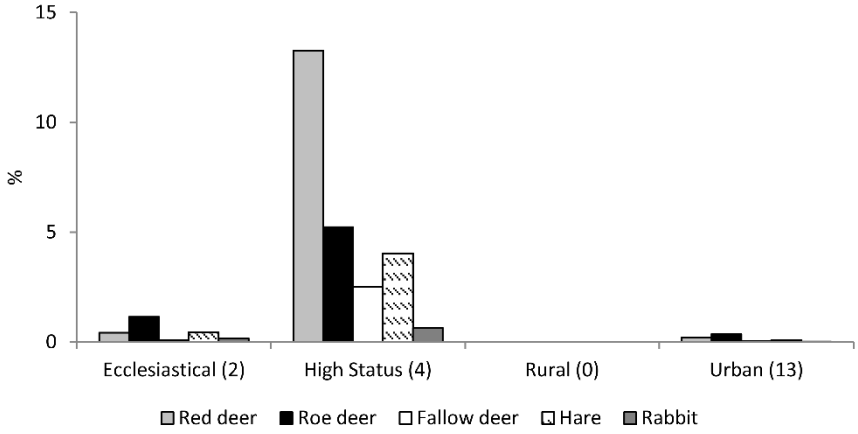

Fig 3.27: Mean proportion of the major game species from various site types in the early medieval phase (% given as a proportion of NISP cattle, sheep/goat and pig). Only sites (n) *with >300 NISP cattle, sheep/goat and pig included*

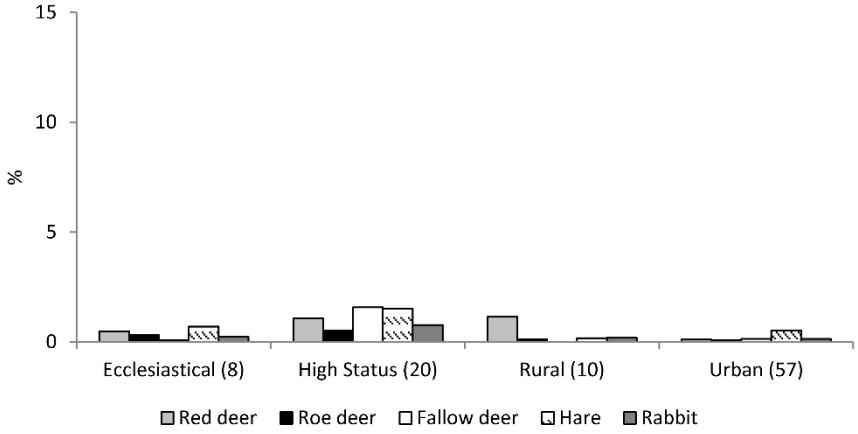

Fig 3.28: Mean proportion of the major game species from various site types in the high medieval phase (% given as a proportion of NISP cattle, sheep/goat and pig). Only sites (n) *with >300 NISP cattle, sheep/goat and pig included*

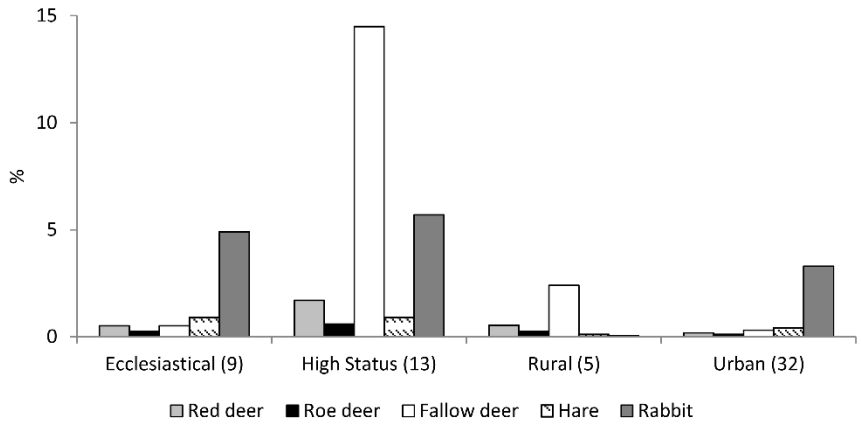

*Fig 3.29: Mean proportion of the major game species from various site types in the late medieval phase (% given as a proportion of NISP cattle, sheep/goat and pig). Only sites (*n*) with >300 NISP cattle, sheep/goat and pig included*

3.2.4 Animals as Food: Fish and Marine Mammals

As in the Saxon period, pike and roach are two of the most commonly observed freshwater fish in the medieval dataset, along with cyprinids (carp family) and perch (*see* Appendix 4). Eels are by far the most frequent migratory fish, but salmonids are also commonly cited, and from the sea come cod species, conger eel, flatfish, mackerel, haddock, herring and whiting, indicating a continuity in the deep-sea fishing industry of the late Saxon period (Serjeantson and Woolgar 2006, 115–16). When the relative proportions of freshwater, saltwater and migratory fish are considered (Fig 3.30), in all phases marine taxa are recorded in far greater proportions than those from other habitats, with migratory species slightly more common than freshwater. There is little difference between relative proportions throughout the period, even from the late Saxon phase, consistent with the perceived 'fish horizon' of *c* AD 1000 (Barrett 2008; Barrett *et al* 2004a, 2004b, 2008). There is a slight drop in the number of marine and migratory fish recorded in the Saxo-Norman phase, alongside a rise in freshwater numbers, which, when considered with the drop in other taxa such as pigs, game and birds, may have been caused by the turbulence resulting from the Norman conquest (*see also* section 3.2.3), requiring a move to locally procured sources. An increase in commonly preserved stockfish (cod, haddock, hake and ling) and herring observed between the middle and late Saxon phases (Fig 2.22) peaks in the early medieval period (Fig 3.31), providing a source of fish all year round (Dyer 2006, 205). The decline of eel in the late Saxon phase also continues in the early medieval period.

The majority of Saxo-Norman sites have a prevalence of marine fish (Fig 3.32). However, higher numbers of migratory taxa, particularly eel, are recorded at the high-status site of Trowbridge, and urban sites of Dorter Undercroft, Westminster Abbey (with exceptionally high numbers of smelt), Queen's College, Oxford, and Victoria Rd, Winchester. At Billingsgate, London, freshwater roach were most common. The early medieval sample is too small for any trends to be discerned (Fig 3.33), although it is pertinent that a considerable quantity of freshwater fish, particularly pike and stickleback (the latter possibly

the gut contents of the pike; Ayres *et al* 2003, 387) are recorded at the ecclesiastical site of Eynsham Abbey. It was from the 12th century that fishponds began to be constructed, particularly at religious houses (Serjeantson and Woolgar 2006, 124). It is also of note that the only rural site for which fish remains were recorded in this phase is at Pepper Hill Lane, Northfleet, close to the North Kent marsh, where fish would have been an abundant local resource (Rippon 2000, 220).

By the high medieval phase a preference for particular species at certain site types becomes apparent (Fig 3.34). Although marine fish remain common at most sites, a greater proportion of eel are recorded at high-status sites (notably Southampton Castle, Mount House, Witney, and Trowbridge), while marine species including herring and cod are more in demand at ecclesiastical sites. The two sites where freshwater fish (pike) are recorded in greatest numbers are both from Oxford (Stert St and 7–8 Queen St). Pike may have been locally caught in the Thames or Cherwell rivers, but they were also commonly stocked in fishponds, for example in 1265 the constable of Windsor was ordered to provide 300 pike for the 'stew' or pond in Windsor park (Hammond 1993, 25). Although a decline in herring is documented in historical sources from the 15th century (Serjeantson and Woolgar 2006, 126), it can be observed in the dataset from the high medieval phase (Fig 3.31). The period between the Conquest and 1300 was one where attempts were made by the aristocracy to lay claim to stranded marine mammals, and have greatest access to their meat as a high-status food (Gardiner 1997, 187). In the dataset, bones of whale and dolphin have been recorded at high-status sites (Table 3.1), while porpoise and sturgeon are found in assemblages from religious houses. Finds of marine mammal bones from a number of urban sites may indicate illegal stripping of meat from stranded whales, which has been well documented (Gardiner 1997, 176) and may relate to the use of bones for craft working. As the bones of large marine mammals would have been heavy and cumbersome to transport any distance it is unlikely that they derive directly from food waste. The most diverse assemblage of both marine mammals and fish came from the low-status, sea-front settlement of Townwall St, Dover, which was likely home to a fishing community.

In the late medieval phase, although the use and upkeep of fish ponds began to decline (Beveridge and Little 2002, 18), they remained a symbol of status (Williamson 1997, 95), and freshwater fish are found in greatest proportions at high-status Harding's Field, Chalgrove (Fig 3.35). There appears to be a move towards the consumption of more migratory fish by urban populations, seen as a shift towards the migratory component of the principal component analysis. The mean proportion of migratory fish in this period at urban sites is 21%, compared with 13% in the high medieval phase and 11% in the early medieval phase. This change in food source is exemplified at Lincoln College, Oxford, and Ivy St and Brown St, Salisbury, where high numbers of eels are recorded, and contrasts with the higher proportion of marine fish (particularly cod taxa, herring, plaice and whiting) recovered at ecclesiastical sites and freshwater fish (cyprinids) at high-status sites. The change in predominant freshwater species in this phase to cyprinids from pike is pertinent, as it coincides with documentary evidence for the introduction of carp to England in the 15th century, when they would have been a rare and luxury item (Hoffman 1995, 72;

Serjeantson and Woolgar 2006, 126). A decline in the favour of whale meat is documented from *c* 1300 (Gardiner 1997, 188), although porpoises and dolphins remained high-status foods. This is reflected in the dataset (Table 3.1), whereby dolphin, porpoise or sturgeon remains came exclusively from high-status and ecclesiastical sites. A single fragmentary whale vertebra recorded from Launceston Castle was most likely scavenged from a carcass and used as a chopping block (Albarella and Davis 1996).

Summary

Since the increase in the sea-fishing industry at the end of the Saxon period (Barrett *et al* 2004a), large marine fish, particularly cod, and herring but also whiting, haddock and flatfish, dominate medieval fish assemblages, which is consistent with wider trends and historical sources (Serjeantson and Woolgar 2006). Certain fish were perceived as luxury foods, as with the newly introduced carp in the late medieval phase. Large eels, also considered a luxury, have been observed at ecclesiastical sites between the 14th and 16th centuries, with documentary evidence to show that some, particularly the larger female eels, were imported from France (Serjeantson and Woolgar 2006, 123). Sturgeon, too, were luxury fish and, although they are documented as being caught in rivers, and therefore accessible to the lower classes, they are most often recorded at elite sites (Table 3.1).

Although direct comparisons of fish assemblages are unreliable due to differential preservation, retrieval and recording (Colley 1990), some idea of the relative proportion of sites to produce fish assemblages, and the number of taxa recorded at various site types, is given in Tables 3.2 and 3.3. Fish were less often consumed by the lower status rural population (Serjeantson and Woolgar 2006, 128), and it is these sites that have a lower proportion of fish bone assemblages, particularly from the high medieval phase, and lowest diversity of fish species. The exception to this can be observed in the Saxo-Norman phase, where over 50% of rural sites contained fish bone, more than any other site type (Table 3.2). From the early medieval phase, fish were most commonly recorded at ecclesiastical sites, and in the greatest diversity. This is not surprising given the historical and theological link between fish and the Church and the substitution of meat with fish on days of abstinence (Barrett *et al* 2004a, 629), although specific rules varied between the different monastic orders (Woolgar 2006, 134). This is reflected in isotope studies for the period, which indicate that monastic populations had high nitrogen isotopes consistent with the consumption of high quantities of fish (Müldner 2006, 236). One further observation is that sites with the most diverse numbers of fish taxa, after monastic houses, are urban in nature (Table 3.3), resulting from the trade in fish through urban markets (Barrett *et al* 2004a).

The provision of marine mammals as food was less ubiquitous, as there was no English whale fishing industry. Despite this, there was demand for it and documentary evidence records that a large amount of whale meat was imported from France (Gardiner 1997, 180). With the exception of these imports, most whale meat came from stranded animals, and it is not surprising that many of the sites are in coastal areas or on large river estuaries such as the Thames.

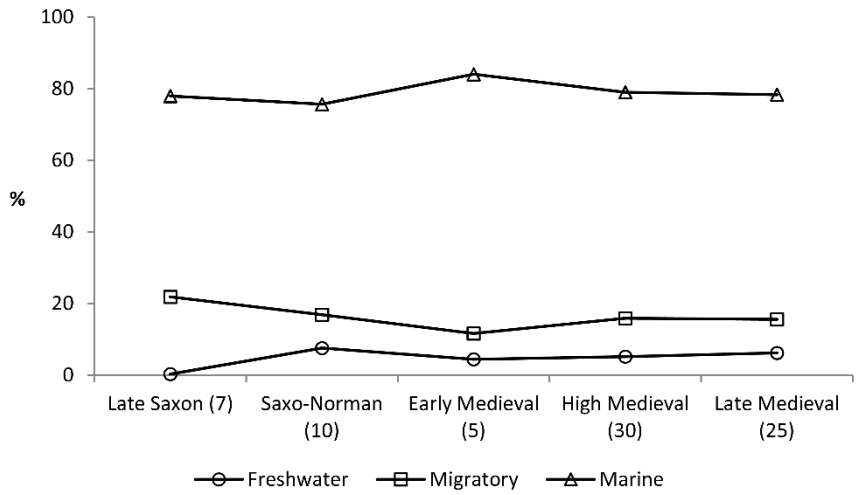

*Fig 3.30: Mean proportion of fish NISP recorded at medieval sites. Only assemblages (*n*) with >20 fish bones included*

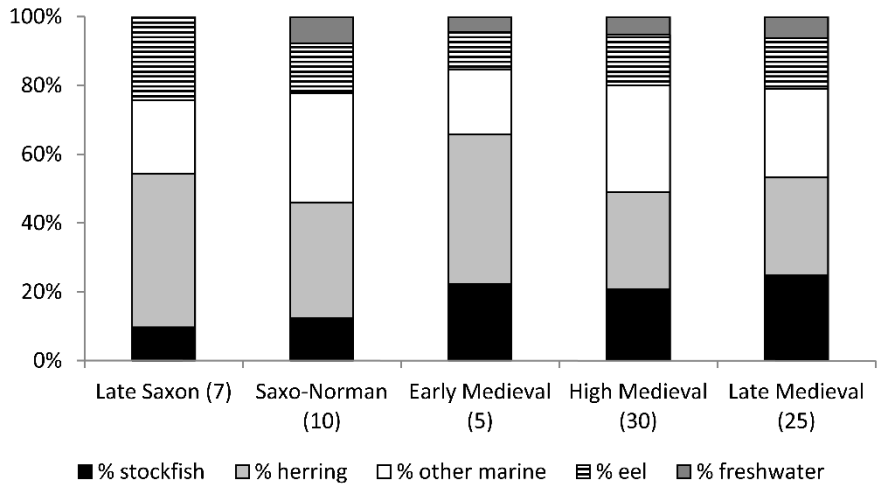

*Fig 3.31: Mean proportion of preserved and other fish recorded at various site types. Only assemblages (*n*) with >20 fish bones included. Stockfish= cod, haddock, hake, ling and saithe*

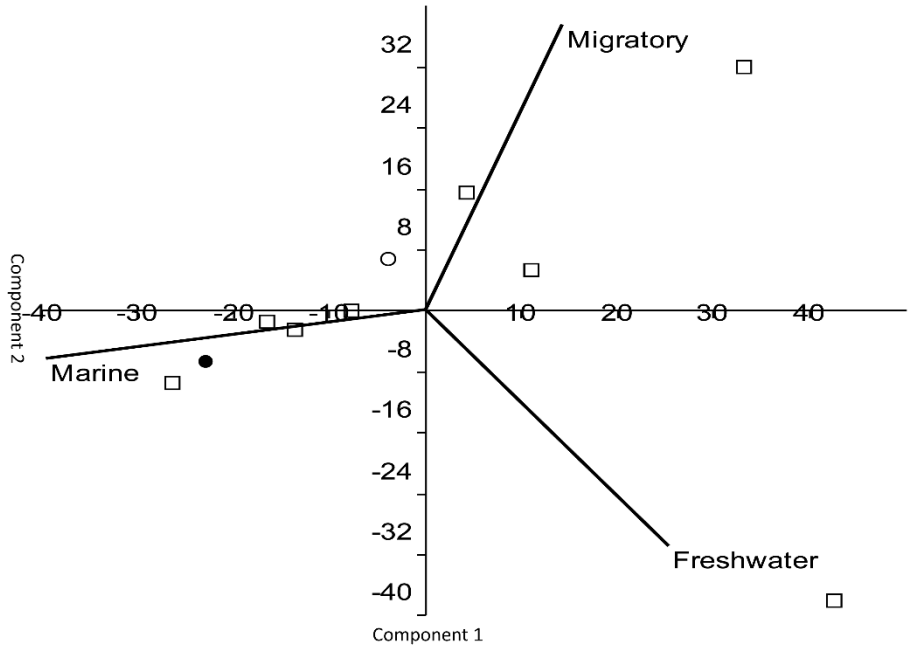

Fig 3.32: Principal component analysis of the relative proportions of freshwater, migratory and saltwater fish species from sieved Saxo-Norman sites. Only assemblages with >20 fish bones included. Dot= rural; square= urban; circle= high-status

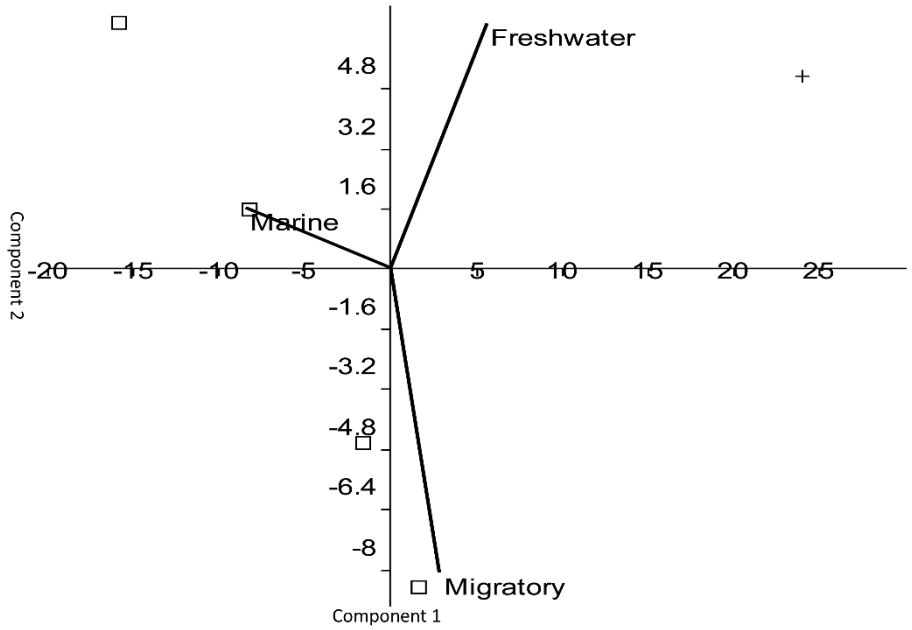

Fig 3.33: Principal component analysis of the relative proportions of freshwater, migratory and saltwater fish species from sieved early medieval sites. Only assemblages with >20 fish bones included. Square= urban; cross= ecclesiastical

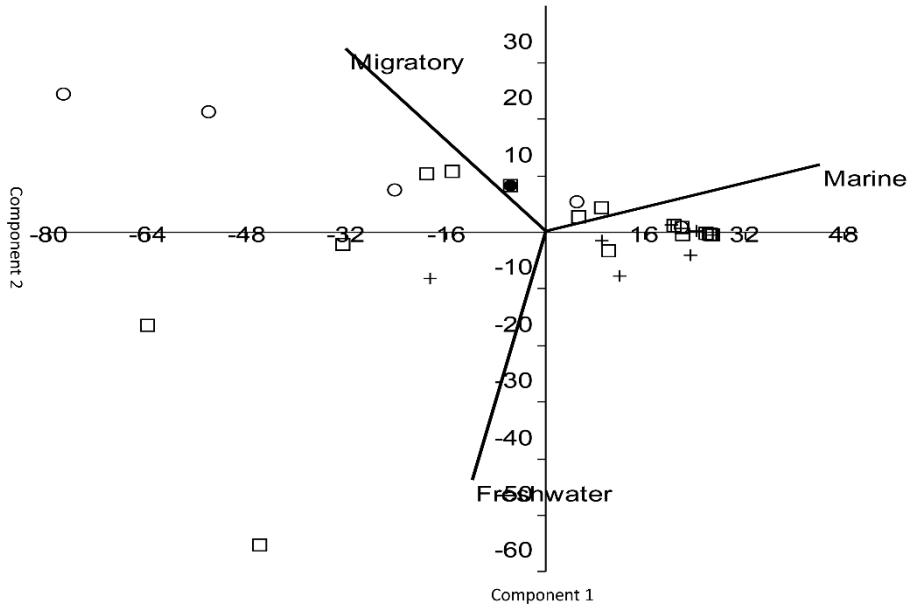

Fig 3.34: Principal component analysis of the relative proportions of freshwater, migratory and saltwater fish species from sieved high medieval sites. Only assemblages with >20 fish bones included. Dot= rural; square= urban; cross= ecclesiastical; circle= high-status

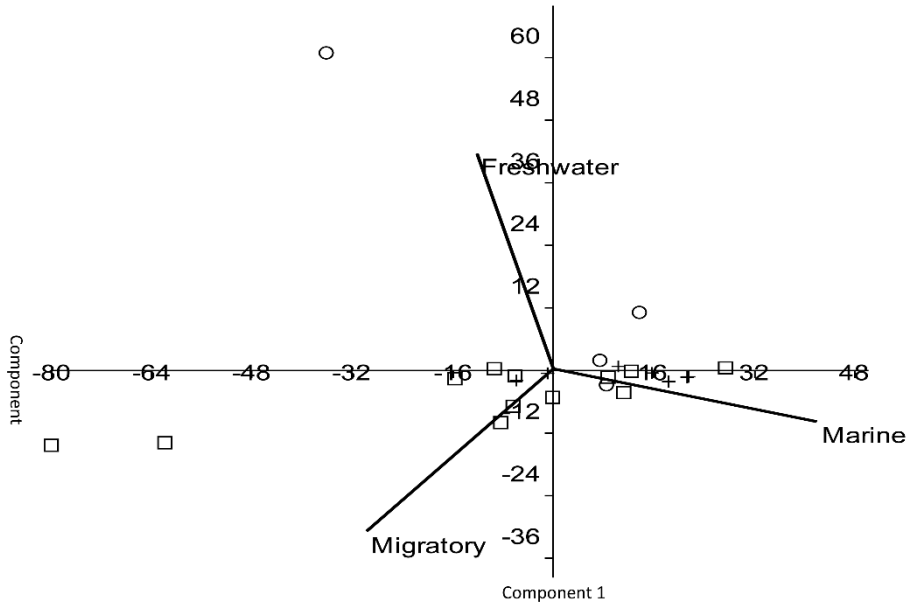

Fig 3.35: Principal component analysis of the relative proportions of freshwater, migratory and saltwater fish species from sieved late medieval sites. Only assemblages with >20 fish bones included. Square= urban; cross= ecclesiastical; circle= high-status

Table 3.1: Sites from which marine mammals and sturgeon have been recorded

	Site type	Cetacean	Whale	Dolphin	Porpoise	Sturgeon
Saxo-Norman						
Dorter Undercroft, Westminster Abbey	Urban			*		*
Early medieval						
Eynsham Abbey, Oxfordshire	Ecclesiastical					*
Carisbrooke Castle, Isle of Wight	High status		*			
Launceston Castle	High status		*			
Linacre Garden, Canterbury	Urban	*				
High medieval						
St Mary Spital, London	Ecclesiastical					*
St Saviour, Bermondsey	Ecclesiastical				*	
Sub-vault of Westminster Abbey	Ecclesiastical				*	*
Carisbrooke Castle 2006–8, Isle of Wight	High status		*			
Launceston Castle	High status		*	*		
Linacre Garden, Canterbury	Urban	*				
Phoenix Brewery, Hastings	Urban		*			
Townwall St, Dover	Urban	*	*		*	
Western Suburb, Winchester	Urban					*
Late medieval						
St Mary's Abbey, Winchester	Ecclesiastical	*				
St Mary Spital, London	Ecclesiastical					*
St Saviour, Bermondsey	Ecclesiastical					*
Winchester Palace, Southwark	High status					*
Launceston Castle	High status		*	*		
Oxford Castle	High status				*	
Little Pickle, Bletchingley	High status					*

Table 3.2: Proportion of all site types where fish bones are recorded. N= *total number of assemblages in the dataset;* Nf= *total number of assemblages with fish bones; %= proportion of assemblages with fish bones*

	Saxo-Norman			Early medieval			High medieval			Late medieval		
	N	*N*f	%	*N*	*N*f	%	*N*	*N*f	%	*N*	*N*f	%
Ecclesiastical	1	0	0	2	1	50	18	13	72	15	8	53
High status	2	1	50	7	2	29	35	13	37	25	12	48
Rural	7	4	57	3	1	33	22	6	27	9	3	33
Urban	30	12	40	23	8	35	109	43	39	73	22	30

Table 3.3: Mean count of taxa by site type. Nf= *number of sites with fish;* Nt= *mean number of taxa (total number of taxa/*Nf*)*

	Saxo-Norman		Early medieval		High medieval		Late medieval	
	*N*f	*N*t	*N*f	*N*t	*N*f	*N*t	*N*f	*N*t
Ecclesiastical	0	0	1	28	13	9	8	14
High status	1	5	2	4	13	5	12	9
Rural	4	3	1	3	6	3	3	2
Urban	12	9	8	26	43	8	22	12

3.3 Symbolic and Social Exploitation of Animals

3.3.1 Pets

The dogma of the Catholic Church in the medieval period considered that humankind had dominion over all other animals, a world view at odds with the keeping of animals as pets, given the requirement for a reciprocal, intimate relationship (Cohen 1994, 68; Menache 2000, 45; Pluskowski 2010, 202; Thomas 1983, 22). Nonetheless, there is plenty of iconographic and documentary evidence for pet-keeping in medieval Europe; there seems to have been no restriction on the type of animal, pets could be anything from a badger to a lapdog, an elephant to a squirrel (Walker-Meikle 2012). The *Boke of St Albans* mentions, 'fmale ladies popis that beere a Way the flees ' (Hubbard 1949, 10), revealing the reciprocal relationship between a lady and her dog.

The keeping of a pet was, to a large extent, dependant on the status of the owner, and iconographic and documentary sources suggest they were largely kept by aristocratic women, clerics and lay scholars (Walker-Meikle 2012, 110). This is exemplified by the types of animals given and received as gifts: men would be given animals with masculine traits, such as hounds, falconry birds, horses and exotic species; women are documented as receiving small dogs, kittens, parrots and monkeys; and members of the clergy took gifts of dogs and birds despite ecclesiastical law forbidding the keeping of pets by the religious community (Serpell 1986, 49; Serpell and Paul 1994, 133; Walker-Meikle 2012, 25). While the historical evidence is strongly in favour of the elite being the dominant pet-keepers, it is likely that the lower classes also kept companion animals, as the acquisition of pets such as dogs or cats would not have been costly (Walker-Meikle 2012, 109). It is also important to remember that the vast majority of animals were not afforded companion status. Many instances that may imply that an animal was considered a pet are ambiguous, for example the presence of an animal – often a dog or a lion – at the foot of the figure in an effigy may be interpreted as a pet by modern thinking, yet it is equally possible that it symbolised power or protection in the afterlife (Gilchrist 2012, 199).

Archaeozoological evidence for pets in this phase remains elusive, largely due to the ambiguity associated with distinguishing potential companion taxa from their working or fur-bearing contemporaries, the majority of animal burials being more characteristic of the simple opportune disposal of animal carcasses,

sometimes following butchery and/or skinning. It has been suggested that the only definite pet identifications in the archaeological record that can be made with any certainty are exotic species (Thomas 2005b, 95), such as the Barbary ape recovered from a pit related to a merchant's house in high medieval Southampton. However, even this distinction may confuse the close relationship between a pet and its owner and the more distant relationship of an animal kept for display. The ape at Southampton may have resulted from the transport of live exotica, rather than the use of the animal as a companion, Southampton being at the end of a trade route from the Mediterranean (Dyer 1983, 207; Pluskowski 2004, 307). Of the domestic animals, the most likely contender for a companion is a partial dog skeleton found in the bottom fill of a pit at the high medieval urban site of Testers, Steyning, that came from a large, elderly dog (Table 3.4). Elsewhere in England the remains of a parrot from Castle Mall, Norwich (Albarella *et al* 1997), were also possibly from a pet (or display animal), but no confirmed discoveries of companion animals have so far been made.

A number of associated bone groups identified in the dataset may be from animals that were treated with some degree of care, being buried individually in pits or described as burials in the site report, and therefore are more likely to be candidates for pets (Table 3.4). With the exception of the assemblage from the village of Upton, all potential pet dog or cat skeletons are identified at lower class urban sites. This illustrates likely differences in deposition between urban sites (where space was limited and pit-digging prolific, affording associated bone groups more protection), and refuse from rural sites (including associated bone groups), which was often collected in middens and scattered as manure on the land. Thus, the absence of discrete animal burials in rural sites may not reflect a real dearth of pets amongst the rural lower classes.

Table 3.4: Potential burial of companion animals. Mixed deposits and skeletons with butchery/skinning marks are not included. Descriptions are taken from the report text

	Site type	Description
Saxo-Norman		
31–34 Church St, St Ebbes, Oxford	Urban	Cat skeleton
Trickhay St, Exeter	Urban	Cat burial
Goldsmith St III, Exeter	Urban	Dog burial
Queen's College, Oxford	Urban	Dog burial in backyard
High medieval		
Upton	Rural	Dog skeleton
Exeter	Urban	Sparrowhawk and raven partial skeletons
Exeter	Urban	Dove and raven partial skeletons
Goldsmith St III, Exeter	Urban	Cat burial
Goldsmith St I-II, Exeter	Urban	Cat burial
Chantry St, Andover	Urban	Cat skeleton in pit
Goldsmith St III, Exeter	Urban	Cat burial
French Quarter, Southampton	Urban	Cat skeleton in pit
Goldsmith St I-II, Exeter	Urban	Partial dog burial
18–20 High St, Alton	Urban	Partial dog skeleton in pit
Broad St, Abingdon	Urban	Partial dog skeleton in pit
Late medieval		
Chantry St, Andover	Urban	1 cat skeleton *c* 6months in pit
King Stable St, Eton	Urban	Partial dog skeleton in pit
Merton College, Oxford	Urban	2 rabbit skeletons in pit

3.3.2 Symbolism

Animals were used by the medieval elite as symbols of power, separating them from other social classes; animals, particularly wild species, could be transformed into a 'socially distinct material culture' (Pluskowski 2007, 32). The symbolic role of animals has been described by Pluskowski (2007), who defines a number of ways in which animals become material culture (hunting deer, importing fur, receiving or giving gifts of exotic animals or animal products), and argues that the symbolic nature was not necessarily with the animals themselves, but in their subsequent use. Furs would be used out of necessity to keep warm. The lower classes commonly used rabbit, while the elite used furs imported from Russia, Scandinavia and other Baltic areas (Pluskowski 2007, 36; Veale 2003, 2). The merchant class gradually acquired access and the means to purchase these furs, so a sumptuary law was passed in the 14th century limiting access to the most desirable furs [ermine, vair (squirrel) and sable, and exotics such as leopard] to the aristocracy, allowing fox, wild cat, lamb and rabbit to be worn by the affluent middle class (Pluskowski 2007, 36; Veale 2003, 4). Although the use of fur is recorded in medieval art and literature (Veale 2003, 5), archaeological evidence for furs is ambiguous: fur does not survive, and garments utilising fur containing the bones of the extremities often came from creatures so small they would be easily missed when excavated.

A study of the zooarchaeological representation of fur-bearing animals (Fairnell 2003) has shown that a wide range of taxa was used for fur during the medieval period, including badger, bear, cat, dog, fox, hare, polecat, squirrel, stoat and otter (Fairnell 2003, 69). A number of fur-bearing animals are included in the dataset (Table 3.5). Fox and mole are the most commonly occurring taxa, and direct evidence of their use for fur comes from skinning marks recorded on the bones of four foxes from 31–34 Church St, Oxford, and a scrape mark on a mole bone from High St, Uxbridge. Badger, stoat and weasel bones increase in frequency throughout the period, while polecat and squirrel are only recorded in the early and high medieval phases. The greatest diversity of taxa comes from the high medieval phase, though it must be remembered that this phase also has the greatest number of assemblages in the dataset. Of interest are the site types at which these animals are recorded (Fig 3.36): in the Saxo-Norman phase many different species are recorded at over half of all rural settlements, including the last occurrence of a beaver, from Wraysbury, in the dataset. Although beavers existed in the wild in England until the end of the 19th century (Coles 2010, 115), they are extremely scarce in the faunal record. The presence of fur-bearing animals at over 70% of all high-status sites in the early medieval phase is consistent with the Norman love of hunting, observed in the dominance of the elite over other wild mammals and birds. It may be unlikely that the wearing of fur by the aristocracy would result from the conversion of pelt to fur at the elite residences themselves. However, pelts were sent to furriers from the rural areas where they were caught, therefore it may be expected that the bones of small mammals would remain in rural areas as most likely they were skinned in the field (Fairnell 2003, 70). Peasants would send the pelts of fox, cat, otter, lamb and rabbit to tawyers via a pedlar, who would act as an intermediary between villager and urban market (Veale 2003, 59). Outside the study area, a large assemblage of cat bones from Bene't Court, Cambridge, came from animals killed for their pelts (Luff and Moreno-García 1995), and other examples are known from Lincoln and York (O'Connor 1992). From the late medieval phase, minor wild species become more common at a range of site types, their presence in urban contexts possibly relating to furriers. In the early part of the 15th century it is noted that the skins of rabbits eaten on the estate were, 'delivered to the Lady' (Hammond 1993, 70), again reinforcing the association of rabbits with women, but also suggesting that she would have dealt with furriers. By the end of the period a combination of over-hunting, changes in fashion, political problems in the Baltic region and deforestation in Europe and Russia led to a collapse of the English fur trade, limiting the skins used largely to rabbit and lamb, products widely available on the domestic market (Veale 2003, 156).

Other socially symbolic uses of animals were associated with the hunt and the wild, from their representation in pictures commissioned by the aristocracy in the 14th to 16th centuries, to the consumption of exclusive foods procured by hunting. Some animals, such as peafowl and swan, were re-dressed following cooking (Hammond 1993, 136; Pluskowski 2007, 39). An example of careful butchery to the feet of a peafowl from Carisbrooke Castle on the Isle of Wight may be interpreted as the result of just such a culinary masterpiece (Serjeantson 2006, 143). As well as being depicted in tapestries and wall paintings, there is

documentary and pictorial evidence for the brief display of heads of animals following the hunt (Pluskowski 2007, 41), and an antler trophy was recorded from the 12th- to 13th-century Bishop's Palace, Sonning, Berkshire (Hamilton-Dyer 2003a). However, there is no evidence for the permanent use of animal parts as ornamentation following the hunt, such as that observed in the post-medieval period (*see* section 4.3).

Exotic creatures were represented on heraldic emblems, particularly predatory animals, of which the lion was prevalent. Evidence for the display of live animals by the elite began in the medieval period (Pluskowski 2007, 43), 'a prince who owned ferocious and awe-inspiring animals would himself come to be regarded as ferocious and awe-inspiring' (Ringmar 2006, 380). William the Conqueror established a menagerie at his palace in Woodstock, Oxfordshire, which was later expanded by Henry I to include camels, a polar bear, an elephant, lions, leopards and a porcupine (O'Regan 2002, 13; Walker-Meikle 2012, 25). This collection was later rehoused at the Tower of London for the remainder of the medieval period. The only direct evidence of these exotica comes from the skulls of two lions and a leopard from an excavation associated with the Tower of London (O'Regan *et al* 2006). Other exotic animals include a Saxo-Norman pelican recovered at The Mound, Glastonbury, and a monkey from high medieval Southampton (*see* section 3.3.1). The close proximity of the pelican to Glastonbury Abbey is a tantalising link to a bird associated with charity in the medieval bestiaries (Cohen 1994, 60). Medieval parks were established as bounded spaces where recently introduced animals such as pheasants and peafowl as well as fallow deer and rabbits could be kept and displayed, placing such animals firmly within the ownership and domain of the elite (Sykes 2007a, 56; Sykes 2009b, 27). Fallow deer kept in early medieval parks were relatively old, and it has been suggested that this illustrates the high regard in which they were kept, being used primarily for display rather than venison (Sykes *et al* 2016).

The founding of dovecotes was a right given to the gentry in medieval England, symbolising manorial privilage, and the keeping of doves and pigeons was a prominent representation of wealth and status (Williamson 1997, 95–6). It has already been established (*see* section 3.2) that, when first introduced, fallow deer, rabbits, peafowl, pheasants and pigeons/doves were recorded in the greatest proportions at high-status settlements, reflecting the use of these animals as symbols of the wealth and worldliness of the landed elite, through their ability to display new and unusual species. Furthermore, the giving and receiving of exotic animals was used to cement relationships between the elite (Pluskowski 2004, 307).

The symbolic role of animals was not limited to the aristocracy. The Church used animals as exemplars of theological preaching by giving them anthropomorphic characteristics, to aid understanding by the congregation. For example, the otter (representing a pure soul) was said to attack and detest the crocodile (the devil) (Cohen 1994, 61). The laity also imposed human aspects on animals, sometimes for more humerous purposes: the cockerel and squirrel represented the penis, and were used for male innuendo (Cohen 1994, 62; Gilchrist 2012, 106). By wearing a part of the animal whose qualities were

required, it was thought possible to transmit those qualities to the wearer (Cohen 1994, 63; Gilchrist 2012, 168). Animals could be sacrificed to cleanse a community of bad fortune, or to protect property. This is a reasonable explanation for the inclusion of animals, particularly cats, within the structure of medieval buildings, for example the remains of a cat in the foundations of a medieval church at St Marks, Lincoln (Cohen 1994, 66–8; Gilchrist 2012, 230), as well as cat burials in the foundation trench of the late 15th- to early 16th-century Bedern foundry, York (Thomas 2005b, 96). Such a range of representational uses for animals highlights the importance of not just taking a functional view of the animal record. The possibility exists that animal remains were the result of sacrifice or ritual, or had totemic powers, even in Christian medieval England. While there are no examples of animals or animal parts used for sacrifice or amulets in the dataset, in the future consideration of the biography of a deposit (Morris 2011b) may help with their identification.

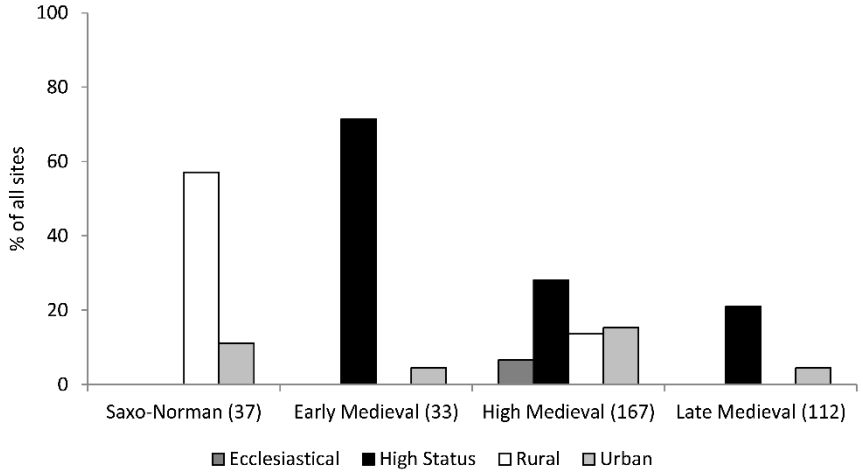

*Fig 3.36: Proportion of sites from which fur-bearing animals were recorded. Only sites (*n*) >300 NISP cattle, sheep/goat and pig are included*

Table 3.5: Recorded presence of fur-bearing animals at medieval sites

	Site type	Fox	Badger	Beaver	Mole	Otter	Pine Marten	Wild cat	Squirrel	Stoat	Weasel	Polecat	Ferret
Saxo-Norman													
Brent Knoll, Somerset	Rural										*		
Harlington, London	Rural	*											
The Mound, Glastonbury	Rural				*	*							
Wraysbury	Rural	*		*									
31–34 Church St, St Ebbes, Oxford	Urban	*											
Banbury Castle	Urban									*			
Northgate House, Winchester	Urban		*				*						
Winchester Palace, Southwark	Urban				*								
Early medieval													
Carisbrooke Castle 2006–8, Isle of Wight	High status	*											
Carisbrooke Castle, Isle of Wight	High status	*											

	Site type	Fox	Badger	Beaver	Mole	Otter	Pine Marten	Wild cat	Squirrel	Stoat	Weasel	Polecat	Ferret
Faccombe Netherton	High status	*	*		*							*	
Guildford Castle	High status	*											
Launceston Castle	High status	*											
Northgate House, Winchester	Urban	*							*	*		*	*
High medieval													
St Mary Spital, London	Ecclesiastical											*	
Bridewell Lane, Shapwick	High status									*			
Dean Court, Cumnor	High status				*								
Faccombe Netherton	High status	*	*					*	*			*	
Launceston Castle	High status	*											
Lewes Castle	High status											*	
Mount House, Witney	High status				*								
Pevensey Castle	High status	*											
Trowbridge	High status	*											
Wickham Glebe	High status						*						
Alington Ave, Dorchester	Rural				*								
High St, Ramsbury	Rural		*										
Market Lavington	Rural				*								*
113–119 High St, Oxford	Urban									*			
31–34 Church St, St Ebbes, Oxford	Urban	*	*										
Dundas Wharf, Bristol	Urban										*		
Fletcher's Croft, Steyning	Urban	*											
Goldsmith St I-II, Exeter	Urban									*			
High St, Uxbridge	Urban											*	
Northgate House, Winchester	Urban								*				
Quilter's Vault, Southampton	Urban		*										
Southampton Excavations 1966–9	Urban				*								*
St Aldates, Oxford	Urban					*							
Testers, Steyning	Urban	*			*								
The Vineyard, Abingdon	Urban				*								
Townwall St, Dover	Urban	*											
Western Suburb, Winchester	Urban				*								
Late medieval													
Harding's Field, Chalgrove	High status				*					*			
Launceston Castle	High status	*	*										
Okehampton Castle	High status				*						*		
31–34 Church St, St Ebbes, Oxford	Urban	*	*										
High St, Uxbridge	Urban				*								
Poole	Urban				*								

3.3.3 Entertainment

This section will consider animals used for entertainment during the medieval period, chiefly hunting and cock fighting. Although hunting was established towards the end of the Saxon phase as a sport for the elite, its use as a social mechanism to expand the gap between rich and poor was increasingly apparent following the Norman conquest. The Norman love of the hunt has already been observed in the considerable increase in game and wild birds at high-status sites

in the early medieval phase, and social restrictions are evident from the scarcity of such animals in lower status assemblages (*see* section 3.2.2). Additionally, the use of birds of prey for falconry, newly introduced species as prey and hunter, and horses and dogs for the chase may be reflected archaeologically.

The presence in the dataset for the first time of gyrfalcons (Table 3.6) serves to exemplify the hierarchical sport of falconry given the traditional association of the gyrfalcon as a bird used by the king (Cherryson 2002, 308), although it should be noted that the strictness to which such recommendations were adhered to is debatable (Yalden and Albarella 2009, 136). The increasing use of imported birds such as the gyrfalcon is an indicator of trade, evidence for which comes from Gottfried von Strasburg's *Tristan*, written in the 13th century, whose protagonist mentions the cargo of a merchant ship from Norway as including 'peregrines in plenty, merlins, sparrow hawks, hawks that had mewed, and read-feathered eyassess – of all there were ample stock' (von Strassburg 1974, 70). Imported birds were almost certainly used for falconry, but what of native taxa? Cherryson (2002, 311) has suggested that, given the preference of hawks for woodland habitats, the presence of goshawk and sparrowhawk in urban contexts are most likely to be falconers' birds. The peregrine falcon is more adaptable in its choice of habitat, and may be seen in urban environments today, nesting on tall buildings. The absence of such high buildings in medieval England means that most urban peregrines in the past were also probably used for falconry. Findings of falconry birds in urban environments need not indicate the presence of high-status sites, as urban centres would have been likely places for the trade of such birds. Other markers of the use of birds of prey for hunting include the presence of partial or complete skeletons in rubbish pits (for example sparrowhawks from Middleton Stoney, Faccombe Netherton, Exeter and Canterbury, gyrfalcon from Winchester, goshawks from Portchester Castle and Faccombe Netherton, and peregrine from Faccombe Netherton) and pathological changes such as those recorded on goshawk skeletons of Faccombe Netherton (Cherryson 2002). One final indicator of the use of birds of prey for falconry is their association with high-status sites, illustrated in Table 3.6. Therefore, all of the potential falconry birds fulfil at least one of Cherryson's criteria. The absence of birds of prey from rural assemblages is another indication that falconry was an exclusively high-status activity.

The introduction of new prey species such as fallow deer in the 11th century and rabbits in the 12th century has been established in discussions (*see* section 3.2.3). Ferrets and polecats are also recorded for the first time in the early medieval phase at a number of sites, both high-status and urban in nature (Table 3.5), despite documentary evidence that these animals were not introduced until the 13th century (Sykes and Curl 2010, 124). Ferrets and polecats are considered to be part of the 'rabbit package' for hunting burrowing animals, a much less masculine activity than other blood sports, and iconography and documentary evidence links this sport and its associations (rabbits, ferrets and small dogs) with women and the ecclesiastical community (Cummins 1988, 236; Sykes and Curl 2010, 124). The increasing presence of rabbits, ferrets and polecats in urban contexts (Table 3.5 and Figs 3.28 and 3.29) implies various social and economic changes: that they were increasingly caught and used by those of lower status; were traded through urban markets,

as with the birds of prey; and/or that they were increasingly valued for their fur or 'fitch' and represent the remains of skinned animals (Sykes and Curl 2010, 125; Williamson 2006, 7–9).

Horses and dogs are recorded at the majority of sites in all phases (Fig 3.37). As with other taxa related to hunting, they were more often recorded at high-status sites in the early medieval phase, both in the number of sites at which they were recorded, and the proportion of animals in the assemblages (Fig 3.38). From the high medieval phase both horses and dogs increase considerably in number at rural sites, perhaps indicating their increasing use for rural activities, such as herding, guarding, transport and draught (*see* section 3.4.4).

Numerous types of horse are described in the late 14th-century poem *The Canterbury Tales* by Geoffrey Chaucer, including the knight's, whose 'hors was good', probably meaning a destrier or war horse, the most expensive type of horse, limited to the aristocracy (Hewitt 1983, 1). A number of destriers and coursers (horses used for jousting) were imported from France and Spain in the 14th century, at great cost (Hewitt 1983, 26).

The high number of dogs recorded at high-status sites in the late medieval phase (Fig 3.38) is largely due to the Cheddar Palaces assemblage (no explanation or elucidation as to the nature of the data is given in the report) which, if removed, brings the mean to 1.25%, consistent with their decreasing frequency with time at elite sites. As well as the working dogs used for shepherding and guarding, a number of other breeds are recognised and recommended for medieval hunting (Cummins 1988, 13), from Irish wolfhounds and deerhounds used to hunt large animals, to mastiffs for hunting medium-sized prey such as pigs and badgers (Phillips *et al* 2009, 59). The *Boke of St Albans*, written in the late 15th century, mentions a number of breeds used for hunting, including 'Grehownd, a Baftard. a Mengrell. a Maftyfe. a Lemor [a scent dog]. a Spanyell. Rachys [hunting hound]. Kenettys [beagle]. Teroures. Bocheris houndes. Myddyng dogges. Tryndeltayles [possibly long-tailed shepherd dogs]. and Prikherid curris', a list that remained current into the post-medieval period, when Shakespeare makes reference to it in *King Lear* written in 1606 (Hubbard 1949, 10). In a statute of 1390 it was written that any unlanded person 'shall not keep any greyhound, or any other dogs, if they are not fastened up or leashed, or have had their claws cut, on pain of imprisonment for a year' (Myers 1996, 1004). This strengthened the attempt of the elite to claim the exclusive use of dogs for hunting and reduce the temptation of the lower classes to poach.

Accessible forms of entertainment for the lower classes, for whom hunting was not a legitimate pastime, were nonetheless just as violent. Bear baiting is recorded in historical literature, where a bear was tethered and people or dogs would strike the bear while trying to be fast enough to keep from being hurt (Wilkins 2002, 123). An illustration of a bear being baited is given in the *Luttrell Psalter* from the 14th century (http://www.bl.uk/onlinegallery/sacredtexts/luttrellpsalter.html). Although no bear bones are recorded in the dataset, they have been recovered from Plantation House and Seal House in London, as well as further afield in Cumbria, Yorkshire, Herefordshire and Cheshire, and interpreted as imported

animals used for baiting and display as exotica (Hammon 2010, 100 and table 7). Dogs such as mastiffs were pitted against each other and other animals (Jesse 1866, 16; Phillips *et al* 2009, 62), but again actual faunal evidence remains elusive. A more fruitful line of evidence is the identification of cock fighting. Data from medieval Lewes and Western Suburb, Winchester, have been interpreted as the remains of such a pastime (Hodkinson 2013, 47; Serjeantson 2006, 139), which is also a possible explanation for an increase in the number of cocks recorded in London in the 14th to 15th centuries (Thomas *et al* 2013, 3318).

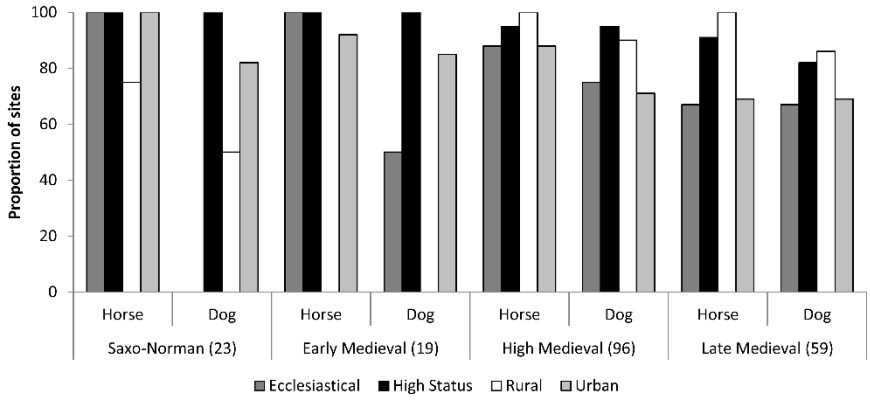

Fig 3.37: Proportion of medieval sites from which horse and dog remains have been recorded. Only sites with (n) *>300 NISP cattle, sheep/goat and pig included*

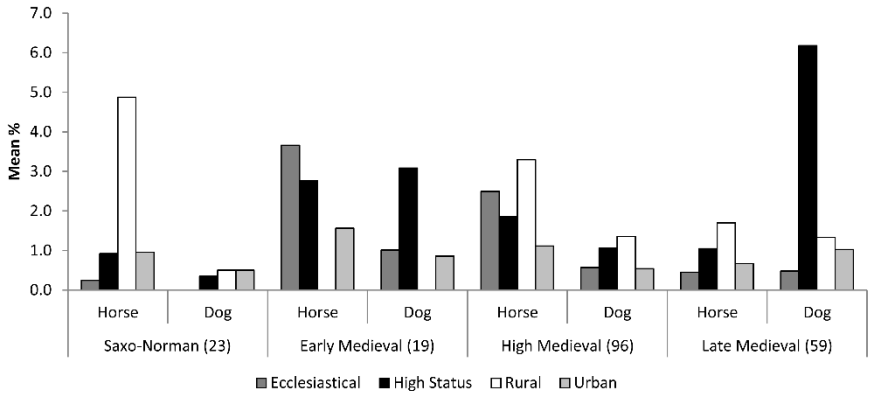

Fig 3.38: Mean proportion of horse and dog remains in medieval assemblages (% of NISP cattle, sheep/goat and pig). Only sites with (n) *>300 NISP cattle, sheep/goat and pig included*

Table 3.6: Recorded presence of falconry birds from medieval sites within the study region

	Site type	Goshawk	Peregrine	Sparrowhawk	Gyrfalcon
Early medieval					
Faccombe Netherton	High status	*	*	*	
Linacre Garden, Canterbury	Urban			*	
High medieval					
Middleton Stoney	High status			*	
Portchester Castle	High status	*		*	
Windsor Castle	High status	*		*	
Southampton Excavations 1966–9	Urban			*	
Exeter	Urban			*	
Western Suburb, Winchester	Urban				*
Late medieval					
Eynsham Abbey, Oxfordshire	Ecclesiastical	*			
French Quarter, Southampton	Urban		*		*
Baynards Castle, London	High status		*	*	

3.4 Animal Husbandry

3.4.1 Cattle

The mortality data (Table 3.7 and Fig 3.39) show that considerable variation occurred in the production of cattle. Saxo-Norman data are similar to those recorded for the late Saxon phase (*see* section 2.4.1), where a combination of meat and secondary products are of importance. The dearth of data from elite and rural sites is unfortunate, as it makes inter-site comparisons unreliable. However, urban assemblages include those with younger cattle at prime meat age (31–34 Church St and Queen's College, Oxford; Fennings Wharf, London; Northgate House, Winchester; Pallant House Gallery, Chichester), and those with a greater proportion of older animals (Dorter Undercroft and Winchester Palace in London; Bath 1984–1989; Elizabeth House, Oxford). Only at North St Car Park, Lewes, and Aldersgate, London, did very old animals predominate. Sex profiles are recorded from two assemblages (Northgate House, Winchester, and 31–34 Church St, Oxford), both of which include mostly females (Fig 3.40). Although the small sample sizes should be considered with caution, it is consistent with findings from other sites in England (Sykes 2007b, 52), suggesting there may have been a continued focus on dairy production from the late Saxon phase at some sites.

At the majority of sites in the early medieval phase there is a move away from cattle used purely for meat, with an increase observed in the number of old animals (Fig 3.39 and Table 3.7). Younger animals continue to be found at isolated ecclesiastical (Eynsham Abbey) and rural (Pepper Hill Lane, Northfleet) sites, as well as two urban sites at Northgate House, Winchester, and Linacre Garden, Canterbury. The high number of cattle killed before 2–3 years of age at Lincoln College, Oxford, may represent a particular demand for young animals.

Again, the majority of sites where sexing data were available indicate a predominance of females (Fig 3.40). This is slightly at odds with the ageing data, as the absence of earlier culls of animals for meat implies that males and females would be present in similar numbers. The use of cattle for ploughing in response to an increased need for arable production has been suggested as the reason behind the increased age at death (Grant 1988a, 156; Sykes 2006b, 58).

The notable predominance of older animals continues into the high medieval phase, although the larger sample size indicates slightly more variation. Nonetheless, at nearly all sites adult and/or elderly cattle can be observed, indicating more emphasis on secondary products such as milk or traction. Despite this, at half the rural sites (Cadbury Congresbury 1968–73; Charnham Lane, Hungerford; Seacourt, Oxfordshire; and The Orchard, Brighthampton) and 17% of urban sites (Postern Mill, Malmesbury; 1 Westgate St, Gloucester; and North St, Winchcombe) cattle were culled purely for meat. This suggests that the peasant population were more likely to consume animals at prime meat age, perhaps indicating less demand from urban markets. Neonatal and calf remains become more common at a range of sites, with 30% of sites containing the bones of these young animals. However, they continue to be recorded most often at rural sites, which is consistent with the expected first-year breeding mortalities at producer settlements.

Female animals continue to predominate in the sexing data (Fig 3.40), although male-dominated assemblages are recorded at three of the four high-status sites (Benham's Garage and Harding's Field, Chalgrove). The presence of males at high-status sites may be linked to the use of the largest animals as status symbols, reflecting the ability of the owner to procure and keep big cattle.

The late medieval phase sees a slight reduction in the culling age. This is most notable in the tooth-wear data (Fig 3.39), where a high number of calves and young cattle at wear stages E and F were culled at the high-status site of Harding's Field and urban site of The Foundry, Poole. Even at other urban sites (Battle Bridge Lane, Southwark, and East Gate, Gloucester), cattle were all culled largely at prime meat age. Data from fusion and mortality summaries within site reports, however, continue to give the impression of an economy largely based on the use of cattle for secondary products (Table 3.7). Nonetheless, assemblages with a predominance of younger animals in the fusion data exist at isolated ecclesiastical (St Frideswide's Cloister, Oxford), high-status (Faccombe Netherton and Little Pickle, Bletchingly) and urban sites (Linacre Garden, Canterbury), and of particular interest is the presence of very young cattle at Queens College Buttery and two phases of Merton College, both in Oxford, possibly indicating an early move towards a preference for veal. Indeed, this is the first time that the proportion of assemblages containing neonatal cattle and calves is greater at urban, rather than rural, sites, where they may be expected as breeding casualties. A preference for veal in the urban diet has been observed in England from the mid-14th century (Albarella 1997, 22; Grant 1988a, 156), although some data may derive from other sources, for example breeding casualties on urban farms such as Elizabeth House, Oxford (Holmes 2010b). The lowest incidence of very young cattle occurs at high-status

sites, consistent with many high-status households buying in at least some, if not all, of their meat (Hammond 1993, 63 and 70).

Female animals again predominate in the assemblages (Fig 3.40), with the exception of the high-status site of Harding's Field, Chalgrove, implying the exhibition of status through the keeping of larger, male cattle. The increase in younger cattle may be indicative of the late medieval rise in dairy farming (Campbell 2000, 143), which resulted in a greater number of male calves surplus to requirement. These excess animals would have been produced for meat, culled either as veal calves or around maturity (Sykes 2006b, 59). In combination, an increase in dairy production and increased availability of pasture would have allowed the production of cattle at younger ages for meat (Albarella 1997, 22; Sykes 2006b, 59).

Short- and medium-horned cattle are present throughout the period (Table 3.8), while those with long horns are recorded only from high and late medieval phases at 14 Farringdon St, London. It is possible that the long-horned remains in the earlier phase are intrusive, although the remains of long-horn cattle have been recovered elsewhere from the mid-14th century (Armitage 1980).

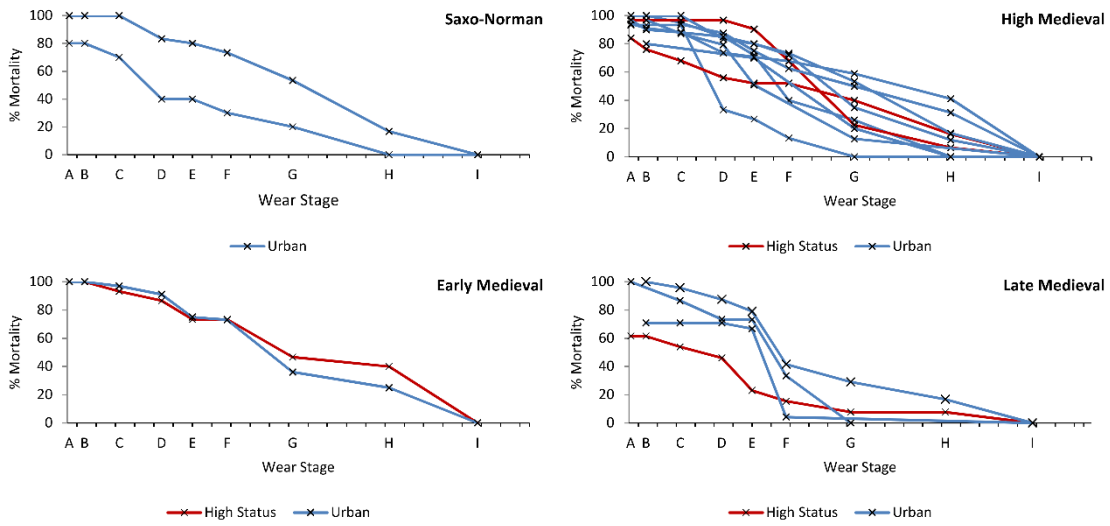

Fig 3.39: Medieval cattle tooth-wear data (after Hambleton 1999). Each line represents one site

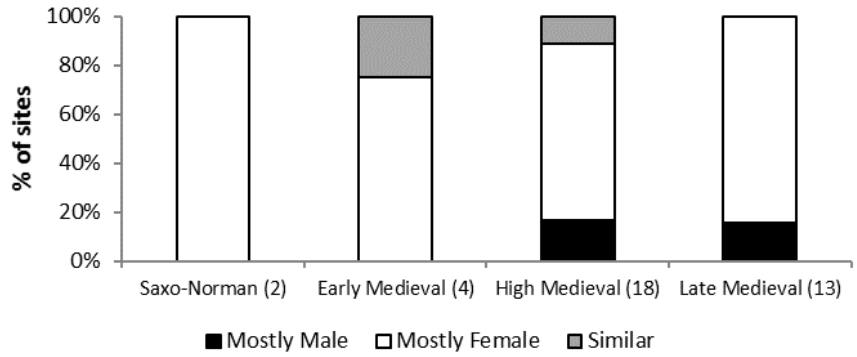

*Fig 3.40: Proportion of bulls and cows recorded from medieval sites. (*n*)= number of sites where such information was available.* See *section 1.7.3 for methods used*

Table 3.7: Cattle age data for the medieval period taken from fusion data and summaries within the text of site reports. E= ecclesiastical; HS= high-status; R= rural; U= urban. Records of neonatal/calf bones and teeth are isolated, as they were often recorded separately, and may not be evident in fusion or tooth-wear data due to preservation and recording methods

	Saxo-Norman				Early medieval				High medieval				Late medieval			
		H				H				H				H		
Age group	E	S	R	U	E	S	R	U	E	S	R	U	E	S	R	U
Mostly juvenile																3
Mostly immature								1			1	1	1			
Mostly calves and young adult				1							2					
Mostly juvenile and subadult												1		2		
Mostly subadult and young adult				1							2					
Mostly young adult				2							1	1				1
Mostly subadult and adult				1								3				3
Mostly young adult and adult			1	2			1			1		3	2		1	3
All ages		1									2	5			1	
Mostly adult				2	1			2	3	5	1	5	2	3		3
Mostly sub/young adult and elderly									1		2	2	1	1		
Mostly adult and elderly				2		2		5	2	4		6		4	1	7
Mostly elderly	1			1		1		2	1	3	1	9	2	1	1	8
Neonatal								1	1		1	3				5
Calf				1	1			2	2	2	5	6	4	5	1	12

Table 3.8: Recorded incidences of different types of cattle for the medieval period

	Polled	Small-horned	Short-horned	Medium-horned	Long-horned
Saxo-Norman	1		1	1	
Early medieval		1	2	2	
High medieval	2	4	11	7	1
Late medieval			9	4	1

3.4.2 Sheep

As in the late Saxon phase, a number of Saxo-Norman assemblages include animals culled for both meat and secondary products (Table 3.9), although predominantly younger sheep are present at a number of urban and elite sites, visible both in the fusion and tooth-wear data (Table 3.98 and Fig 3.41). Increasing numbers of young animals are visible in the early medieval phase, where sheep culled at ages suitable only for meat production can be observed at high-status Portchester Castle and Faccombe Netherton and numerous urban sites (Finzel's Reach, Bristol; St Magnus, London; French Quarter, Southampton; Northgate House, Winchester; Linacre Garden, Canterbury; and St Mary's, Wantage). A high proportion of all sites, however, still record both subadult and adult sheep, including the ecclesiastical site of Eynsham Abbey and rural site of Pepper Hill Lane, Northfleet. Urban sites exhibit most variation, and assemblages from Linacre Garden, Canterbury, and Lincoln College, Oxford, are dominated by adult and elderly animals.

In the high medieval phase the use of sheep for both meat and secondary products is again the most common husbandry strategy (Table 3.9 and Fig 3.41), although assemblages with older animals become more common at all site types. The increasing age of sheep is consistent with the rise of the wool trade, and the corresponding need to keep sheep to an older age to maximise yields (Albarella 1997, 24; Sykes 2006b, 60). A further increase in the number of older sheep occurs in the late medieval phase, the number of assemblages with adult animals rising from 79% in the high medieval phase to 86% in the late medieval phase. This is consistent with the increased production of animals for wool, and the need to replace stock following the sheep murrains of the beginning of this phase (Sykes 2006b, 60). As well as documentary evidence for the increasing importance of wool in England's economy throughout the medieval period (Ryder 1983, 456), the sex profiles of flocks include a high proportion of male sheep, or wethers (Fig 3.42), best suited for wool production as they are slightly larger than females, and said to produce better quality fleeces (Davis 2002, 23; Grant 1988a, 153; Ryder 1983, 135). Greater numbers of ewes are recorded at the ecclesiastical site of St Gregory's Priory, Canterbury, high-status sites of Faccombe Netherton (similar to the numbers of wethers) and Benham's Garage, Taunton, as well as the urban site at the French Quarter, Southampton. By the late medieval phase ewe-dominated assemblages are largely urban in nature.

Grant (1988a, 153) observed that there was a discrepancy between the documented importance of the wool trade and absence of widespread intensive use of older sheep in the archaeological record, which remains the case in this study. In the absence of a large enough dataset, she suggested that the greater proportion of young animals at urban sites implied an older breeding and wool-producing population at the rural producer sites. However, this wider study does not support this. Perhaps the demand for meat was so great that, rather than keep the majority of animals into old age, a greater quantity of sheep was kept, so that once they reached prime meat age, giving probably two or three clips of wool, the wethers were marketed for meat. An increase in the size of flocks in the late medieval phase has been observed in demesne records (Stone 2003, 1). This would have reduced the number of sheep to overwinter, as well as producing manure, wool and meat, leaving the ewes to produce the next year's lambs. The existence of specialised, intensive production of animals and animal products is a more recent phenomenon, with husbandry strategies in the past more consistent with the production of more than one commodity (Albarella 1997, 24).

Although present at most site types, lambs are recorded at the majority of ecclesiastical and high-status sites throughout the period (Table 3.9). When combined with the higher than normal numbers of ewes, and older animals at elite sites, in this phase, the data suggest that it was these sites that were breeding sheep. Indeed documentary evidence suggests that during the 14th century, manors were split between those that bred sheep, and were mainly populated by ewes, and those that produced wool, with flocks of wethers (Stone 2003, 12). Alternatively, they may have been considered a delicacy and therefore higher numbers were supplied by, but not consumed in, the rural community. As with calves, lambs become increasingly common at urban sites from the early medieval phase, which implies either the breeding of sheep in towns, or again that there was a demand for very young sheep as a delicacy.

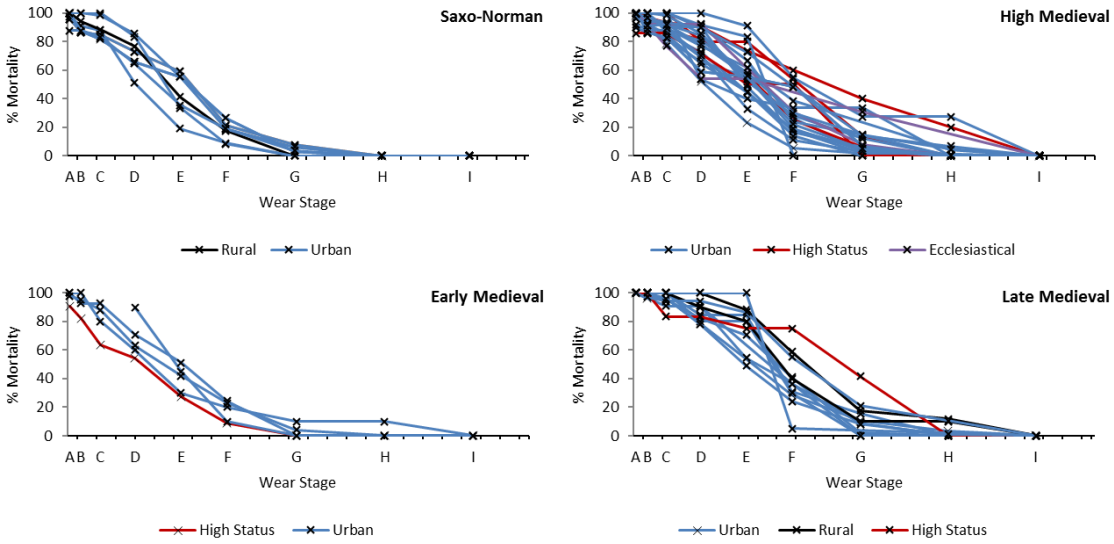

Fig 3.41: Medieval sheep tooth-wear data (after Hambleton 1999). Each line represents one site except for the high medieval chart, which includes two phases from sites at 31–34 Church St and The Hamel, Oxford; Exe Bridge, Exeter; and Finzel's Reach, Bristol

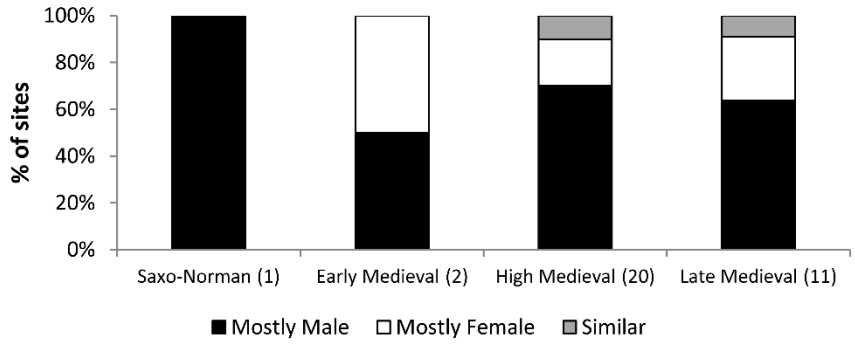

*Fig 3.42: Proportion of rams and ewes recorded from medieval sites. (*n*)= number of sites where such information was available.* See *section 1.7.3 for methods used*

Table 3.9: Sheep/goat age data for the medieval period taken from fusion data and summaries within the text of site reports. E= ecclesiastical; HS= high-status; R= rural; U= urban. Records of neonatal/lamb bones and teeth are isolated, as they were often recorded separately, and may not be evident in fusion or tooth-wear data due to preservation and recording methods

	Saxo-Norman				Early medieval				High medieval				Late medieval			
Age group	E	HS	R	U	E	HS	R	U	E	HS	R	U	E	HS	R	U
Mostly juvenile											1					
Mostly immature		1		1						1	2	2				2
Mostly lambs and young adult								1	1		1					
Mostly juvenile and subadult														1		
Mostly subadult	1					1						1			1	
Mostly subadult and young adult				1						1						2
Mostly young adult				1				2		2	1	1				1
Mostly subadult and adult				1							1	2				4
Mostly young adult and adult				1	1	2		1	3	5	3	11	3			5
All ages				1			1					2				1
Mostly adult				1				2	2		1	7	1	5		5
Mostly sub/young adult and elderly				1							1	1				
Mostly adult and elderly			1	1				3	1	1	1	5	2		1	4
Mostly elderly									1	3		3	2	5	2	4
Neonatal		1	1	1				1		1		2		1		7
Lamb			1	1	1	3		4	7	10	2	20	6	5	2	14

3.4.3 Pigs

All pig assemblages derive from young animals or those nearing maturity (Fig 3.43 and Table 3.10) that would have provided good quantities of meat without being fed further than necessary. As in the Saxon period, the majority of animals were male, or present in similar numbers to those of females (Fig 3.44).

From the early medieval phase a change in provisioning high-status sites can be observed, whereby elite secular and ecclesiastical assemblages and, to a lesser extent, urban sites, consistently include the bones of neonatal or piglet remains. While this could imply that pigs were bred at such sites, the very low numbers at rural sites indicate that there may have been some deliberate provisioning of these sites with suckling pig.

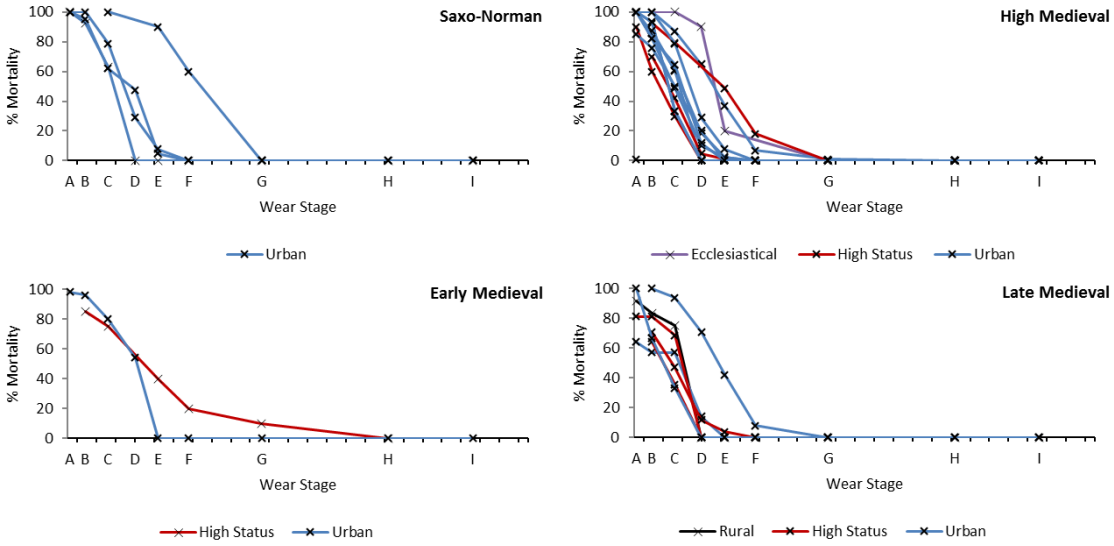

Fig 3.43: Medieval pig tooth-wear data (after Hambleton 1999). Each line represents one site

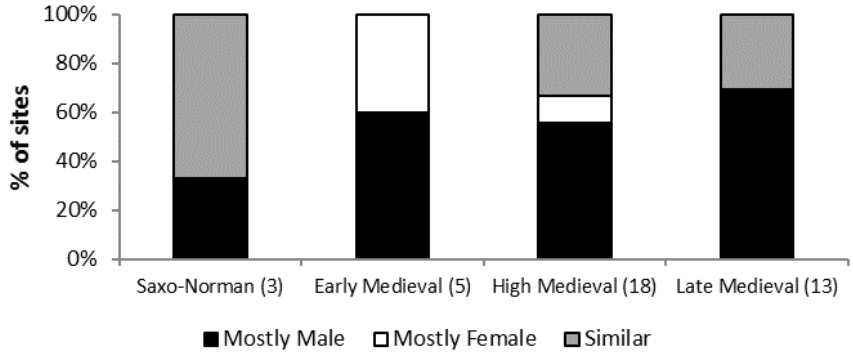

Fig 3.44: Proportion of boars and sows recorded from medieval sites. (n)= *number of sites where such information was available.* See *section 1.7.3 for methods used*

Table 3.10: Pig age data for the medieval period taken from fusion data and summaries within the text of site reports. E= ecclesiastical; HS= high-status; R= rural; U= urban. Records of neonatal/piglet bones and teeth are isolated, as they were often recorded separately, and may not be evident in fusion or tooth-wear data due to preservation and recording methods

	Saxo-Norman				Early medieval				High medieval				Late medieval			
Age group	E	HS	R	U	E	HS	R	U	E	HS	R	U	E	HS	R	U
Mostly juvenile						1				1	3	1	1			1
Mostly immature				1			1	2	2		4	12			1	6
Mostly juvenile and subadult	1	1		2				1	1	2	1	3				1
Mostly subadult			1	3	1	2		2	5	10	1	11	7	7		7
Mostly subadult and young adult								4				1				1
Mostly young adult												1			1	1
All ages				1												
Neonatal				1					1			2				5
Piglet				2	1	3		6	4	10	4	12	7	6		8

3.4.4 Other Animals

Horses and dogs provided traction, transport and protection in the medieval economy. Their other various uses as pets, and for entertainment and hunting, have been considered in section 3.3, but what of their roles in day-to-day working life? A survey of historical sources by Langdon (1986) has shown that during the 12th and 13th centuries horses became increasingly important for traction, replacing oxen as plough and draught animals in many areas, and this is reflected in the increasing frequency of horses at rural sites in the high medieval phase (Fig 3.38). Horses were nearly always adult when they died (Table 3.11), which is consistent with their importance for hauling, ploughing and pulling carts. Indeed, by the end of the 13th century horses, which had previously been of greatest use as riding and pack animals, became of great value for draught (pulling carts and wagons), replacing oxen almost completely; this represented a step that was crucial to the rise in market transactions by the small-scale peasant producer, increasing both the speed and distances of journeys to market (Langdon 1986, 270–1).

The two sites with mostly juvenile bones come from very restricted samples: Faccombe Netherton includes a nearly complete foetal horse skeleton buried in a pit, while Chantry St, Andover, recorded just two fragments. A number of immature horse bones were also recovered alongside predominantly adult bones at other sites (Table 3.11), of which the majority were rural or high-status in nature. Of interest are the urban sites with young horse remains, including Chantry St, Andover; Northgate House, Winchester; and SOU 29, Southampton; a neonatal animal is evidenced at the latter, from a single porous bone. There is no evidence for the specialised breeding of horses at any site in the dataset, although stud farms are referred to in the documentary evidence, albeit infrequently (Hewitt 1983, 11; Langdon 1986, 86). Examples within the study area include a 12th-century stud at Walton, Somerset, and another at Stoneham, Sussex, in 1422 (Langdon 1986, 40; Mate 1987, 531). As with dogs, a number of types of horse are documented in the historic record for the medieval period,

from the warhorse or destrier to peasant *stott* (plough mare) and draught horse (J Clark 1995, 4–7; Hewitt 1983, 9). A review of the evidence from London indicates that the majority of remains came from small, well-built horses suitable for riding, draught or traction, although a taller, more slender animal was also observed (Rackham 2004).

The vast majority of horse remains were from mature animals valued for their working potential rather than their meat. For much of the medieval period, there is far less evidence of horse butchery than for butchery of cattle (Fig 3.45). This is consistent with the prohibition on the consumption of horseflesh by the Church, suggesting that, by the early medieval phase, the reluctance of the population to eat horseflesh was widespread. A poem about the Siege of Rouen (1418–1419) by John Page indicates how desperate times must have been in order to resort to the consumption of horsemeat:

Their bread was very nearly gone,
And flesh save horsemeat had they none.
They ate up dogs, they ate up cats;
They ate up mice, horses and rats.
For a horse's quarter, lean or fat,
One hundred shillings it was at.
A horse's head for half a pound,
A dog for the same money round

(Myers 1996, 219–20)

The number of Saxo-Norman rural assemblages exhibiting horse butchery was relatively high (28%; Fig 3.45) and may indicate that some of the peasantry resorted to hippophagy. Although the sample is small – cut marks were recorded on individual bones from two of seven possible rural assemblages – evidence exists for disarticulation, jointing and filleting of carcasses, as well as purely skinning-based processing (Table 3.12). While this may have been for consumption by dogs, the documented diet of hunting dogs suggests that meat was rarely included, 'so that they [dogs] will associate meat only with the *curee*, and hunt more keenly', with bread being the staple (Cummins 1988, 26). Less is known of the diet of other types of dogs, which may well have been fed horsemeat. One further reason for butchering horse carcasses may simply have been to aid disposal: if they were not to be eaten, getting rid of a whole horse carcass would have been difficult, requiring a large pit or ditch, so roughly chopping it up would be a practical solution (Grant 1979b, 105).

The description of mastiffs, shepherd dogs, butcher's dogs and midden hounds in the *Boke of St Albans* (*see* section 3.3.3) suggests that dogs would have been used variably for guarding, working with sheep and protecting the household. However, there is a lack of analysis regarding the identification of types of medieval dogs represented zooarchaeologically. Some small syntheses have been published, that of Smith (1998) on the dogs in medieval Scottish towns describes animals between 23cm and 62cm tall, with the majority in the range 30–50cm, and similar types are recorded by O'Connor (1992), who suggests that animals were mostly in the mid-range of heights, 'roughly consistent in size and build with a modern collie'.

Summary

Considerable changes in the husbandry of animals occurred in the medieval period. High medieval cattle were culled at an older age than in the preceding phase, indicating a shift from an economy based on a mixture of meat and small-scale secondary production, to one where they became increasingly important for traction within crop-based regimes. Similarly, from the high medieval phase sheep were culled when older as wool became a vital export commodity; their use for manure was also of great importance for arable production. Following the period of crisis at the end of the high medieval phase, cattle were culled at younger ages as milk production became more important, allowing the production of animals used for veal and beef to increase. An increase in lambs is also evident at the end of the period, as well as a further emphasis on wool production.

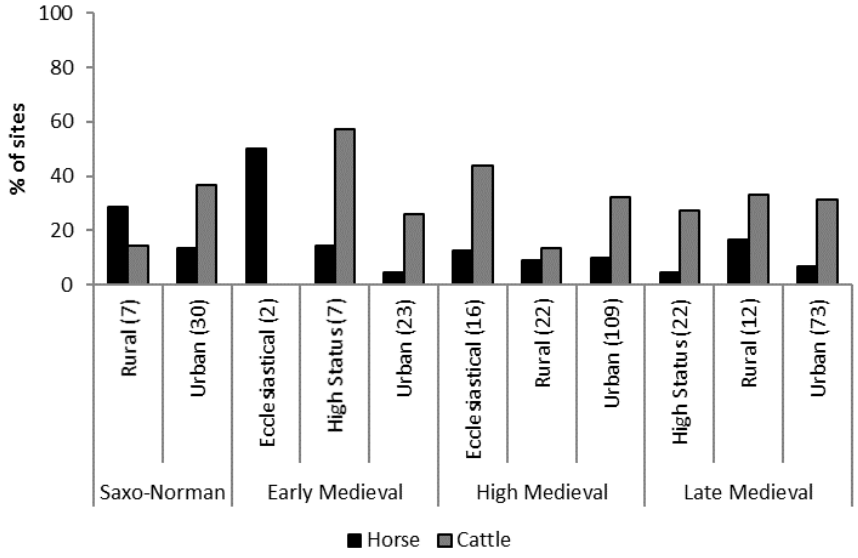

Fig 3.45: Proportion of all medieval sites in the database with evidence for butchery of horse and cattle remains. Only chop and cut marks relating to disarticulation, jointing and filleting are included, excluding those indicative of skinning or bone working. (n)*= total number of sites in the butchery database*

Table 3.11: Age of horses where given

	Site type	Mostly young	Mostly adult	Some juvenile
Saxo-Norman				
Trowbridge	High status		*	
Market Lavington	Rural		*	*
Northgate House, Winchester	Urban		*	
Early medieval				
Faccombe Netherton	High status	*		
Finzel's Reach, Bristol	Urban		*	
French Quarter, Southampton	Urban		*	
Northgate House, Winchester	Urban		*	*
High medieval				
Hospital of St Nicholas, Lewes	Ecclesiastical		*	
Silver St, Glastonbury	Ecclesiastical		*	
Church Field, Shapwick	High status		*	*
Middleton Stoney	High status		*	*
Trowbridge	High status		*	
Market Lavington	Rural		*	*
Chantry St, Andover	Urban	*		
Finzel's Reach, Bristol	Urban		*	
French Quarter, Southampton	Urban		*	
Townwall St, Dover	Urban		*	
Late medieval				
Hospital of St Mary of Ospringe	Ecclesiastical		*	
Silver St, Glastonbury	Ecclesiastical		*	
Abingdon West Central Redevelopment	Urban		*	
Finzel's Reach, Bristol	Urban		*	
French Quarter, Southampton	Urban		*	
SOU 29, Southampton	Urban		*	*
The Foundry, Poole	Urban		*	
Trowbridge	Urban		*	

Table 3.12: Incidence of butchery on non-food species. B= butchery; S= skinning; ?= indeterminate evidence

		Horse			Dog	Cat		
	Site type	?	B	S	B	?	B	S
Saxo-Norman								
Brent Knoll, Somerset	Rural		*					
Wraysbury	Rural	*						
Victoria Rd, Winchester	Urban							*
Aldersgate, London	Urban		*		*			
Dorter Undercroft, Westminster Abbey	Urban		*					
Henley's Garage, Winchester	Urban		*					
Northgate House, Winchester	Urban		*					
Early medieval								
St Saviour, Bermondsey	Ecclesiastical		*					
Launceston Castle	High status	*						
Hinxey Hall, Oxford	Urban							*
Northgate House, Winchester	Urban					*		
French Quarter, Southampton	Urban		*					

	Site type	Horse ?	Horse B	Horse S	Dog B	Cat ?	Cat B	Cat S
High medieval								
Silver St, Glastonbury	Ecclesiastical		*					
Hospital of St Nicholas, Lewes	Ecclesiastical		*					
Mount House, Witney	High status				*			
Charnham Lane, Hungerford	Rural		*					
Market Lavington	Rural		*					
Canterbury Police Station	Urban		*					*
King Stable St, Eton	Urban		*					
Merton College, Oxford	Urban		*					
Victoria Rd, Winchester	Urban	*						*
St John's St, Winchester	Urban							*
52–54 Thames St, Windsor	Urban							*
Finzel's Reach, Bristol	Urban						*	
51–57 High St, Windsor	Urban				*			
North St, Winchcombe	Urban		*					
18–20 High St, Alton	Urban			*				
St Aldates, Oxford	Urban			*				
Townwall St, Dover	Urban		*					
Fletcher's Croft, Steyning	Urban	*						
French Quarter, Southampton	Urban		*					
Exe Bridge, Exeter	Urban		*					
Late medieval								
Launceston Castle	High status			*				*
Gatehouse Nurseries, West Drayton	High status				*			
Harding's Field, Chalgrove	High status				*			
Little Pickle, Bletchingley	High status		*		*			
Lydd Quarry	Rural		*					
31–34 Church St, St Ebbes, Oxford	Urban						*	
Victoria Rd, Winchester	Urban							*
SOU 29, Southampton	Urban			*				
Jennings Yard, Windsor	Urban			*				
Merton College, Oxford	Urban			*				
St Aldates, Oxford	Urban			*				
Exe Bridge, Exeter	Urban		*					

3.5 Redistribution of Animals and Animal Products

3.5.1 Body Parts

Several diachronic, social and economic trends emerge when the distribution of carcass parts is considered, although poor sample sizes for Saxo-Norman and early medieval elite and rural assemblages may make comparisons for these phases unreliable. In all phases representation of the whole carcass is observed at many, if not all, site types (Tables 3.13– 3.15). This can be taken to indicate that the remains of butchery, preparation and consumption were deposited with little net redistribution of carcass parts away from or into the site. In the cattle assemblage, this type of deposition is common at all sites until the high

medieval phase, when high-status sites, and a smaller proportion of urban sites, begin to be more commonly supplied with joints of meat from predominantly meat-bearing bones (Fig 3.46), a trend that continues into the late medieval phase. The increasing redistribution of carcasses can also be observed in sheep assemblages from the high medieval phase (Table 3.14 and Fig 3.47). In all phases sheep carcasses are subject to more processing than cattle, with fewer assemblages demonstrating the presence of complete carcasses. More incidences of butchery and skin-processing waste occur, particularly in urban settlements from the early medieval phase. In cattle this increase in specific processing waste is less notable but can be observed from the high medieval phase.

There is some indication that pork was subject to different distribution pathways than beef and lamb, probably related to the husbandry of pigs, which were kept by wealthy and poor alike, aided by the increase in sty husbandry (Albarella 2006, 84). The proportion of sites with evidence of whole carcasses increases slightly in the late medieval phase, reflecting the likelihood that pigs were more often culled and consumed on site. Also, in contrast with the cattle and sheep assemblages, the high number of sites with a predominance of meat-bearing bones (Fig 3.48) suggests that, although a small number of pigs were kept on a household level in all phases, this was not enough to provide all their pork supplies, so considerable redistribution of joints of meat took place. The nature of this is most notable in the late medieval phase, where processing waste is most often recorded at rural sites, indicating the movement of joints of meat from rural to elite and urban settlements.

3.5.2 Butchery

The proportion of butchery marks recorded (knife, chop and saw marks) increases until the late medieval phase, when they become less common (Table 3.16). There is a decrease in the observed fragmentation of bones from the early medieval period, with fewer recorded incidences of longitudinal and transverse butchery to long bones, or even deliberate marrow extraction (although there is an increase in the observations of marrow removal in the late medieval phase). This represents a less intensive approach to butchery, implying either that meat was easier to purchase at the end of the medieval period, and so the need to utilise even the marrow was less important, or that the cooking of soups or stews that would be enriched by marrow was less common than in the previous phase, meat instead being roasted on the bone or filleted prior to cooking, which perhaps reflects changing tastes. Cooking of young animals, which increase at the end of the period (*see* section 3.4), would also require less intensive butchery.

Specialist butchery is best observed in records of splitting the carcass through the vertebrae into two sides of meat (Table 3.16). This practice increased at the end of the Saxon phase (Table 2.11), and throughout the medieval period, from 30% in the Saxo-Norman phase to 56% by the late medieval phase. All three methods of longitudinal butchery of vertebrae continue to be recorded (paramedial, medial – or midline – and bilateral), with an emphasis on paramedial butchery in the early and high medieval phases and a slight increase

in the frequency of midline and bilateral methods in the subsequent phase (Table 3.17). Although documentary evidence indicates some acknowledgement of the role of butchers by the 11th century, the Guild of Butchers was not formalised until the 14th century (Seetah 2007, 21). Legislation relating to the nuisance caused by butchers in large towns such as Winchester and London, for example throwing entrails on the pavement, is apparent at this time (Hammond 1993, 46). Regulation by the guilds allowed the methods used to disarticulate and prepare meat to become standardised, changing with the needs of the population (Seetah 2007, 29).

3.5.3 Craft and Industrial Processing

Specific deposits indicative of the use of animals for skin or horn working are rare, and overwhelmingly from urban sites (Table 3.18). Following the removal and distribution of meat, butchers would control the movement of raw materials for bone- and horn-working and skin-processing (Yeomans 2007). The data from this study serve to highlight the difficulty in allocating a specific trade to refuse deposits: ambiguous assemblages including feet and lower legs may be interpreted as either butchery or skin-processing waste, and those including horn cores may result from skin-processing or horn-working (see also Rátkai 2011; Rielly 2011). Nonetheless, the organised movement of raw materials from butchers to other workers can be implied.

A whole range of activities are represented: antler- and horn-working, butchery, furriers and skin-processing. The latter may be illustrated by the number of deposits that represent skin-processing in Winchester (Table 3.18) at a time when Winchester was a centre for book production (Leyser 1997, 187), which would have required the provision of considerable amounts of parchment. Bones are also recorded for the first time as building materials: at late medieval 67–69 St Thomas' St, Oxford, a knucklebone floor made of metapodials is described as being constructed using waste from a tanner or butcher working in the vicinity (Poole 2006).

As well as urban sites, two high-status assemblages from the south-west region are included (antler-working waste from Okehampton Castle, Devon; and horn-working waste from Benham's Garage, Taunton), indicating that artisan production continued under the patronage of the aristocracy in this region as it had in the preceding period (*see* section 2.5).

The use of pelts from cats and dogs was widespread throughout medieval England (Albarella 1999, 872), and skinning marks on cat bones are well-represented in the dataset, yet they are absent from descriptions given for dogs (Table 3.12). Other butchery marks are also rare on both dogs and cats, which is not surprising for animals that were not typically eaten. Evidence for the removal of horse hides is apparent in the dataset from the high medieval phase, and then almost exclusively at urban sites (Table 3.12), implying their contribution to the thriving leather-working industry within towns. An association between horse remains and medieval tanneries has been observed elsewhere (Albarella 2003, 82; Baxter 1996). A group of horses from Kingston-

Upon-Thames (Serjeantson *et al* 1992) bore skinning marks, and it is likely that they were used for their skins prior to burial.

Summary

There is a notable change in the provisioning of high-status sites from the high medieval phase. As the aristocracy become increasingly divorced from production, their role as consumers is apparent from the procurement of joints of meat from rural and urban markets. This is synonymous with the greater redistribution of cattle and sheep carcass parts at all sites, the utilisation of whole carcasses becoming less common. There is evidence for the increased role of the market and change in production from an arable-based economy to one where meat was increasingly in demand. The role of pigs is rather different to that of cattle and sheep, whereby an increase in sty husbandry in the late medieval phase can be implied from the greater proportion of animals apparently culled and consumed on site, particularly in the urban context. Less intensive butchery throughout the period suggests a change in cooking methods, although there is an increase in the utilisation of marrow in the late medieval period.

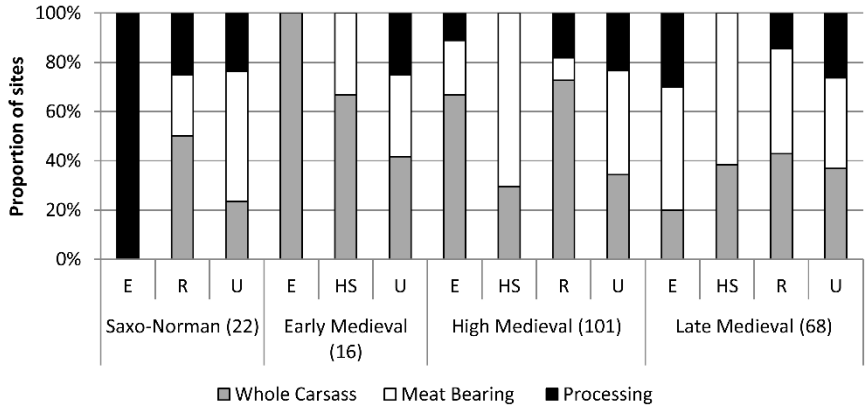

Fig 3.46: Cattle carcass part representation by medieval phase and site type. Processing waste= predominance of horn cores, head and/or feet. As a % of all recorded anatomical elements. E= ecclesiastical; HS= high status; R= rural; U= urban; (n)*= number of sites included*

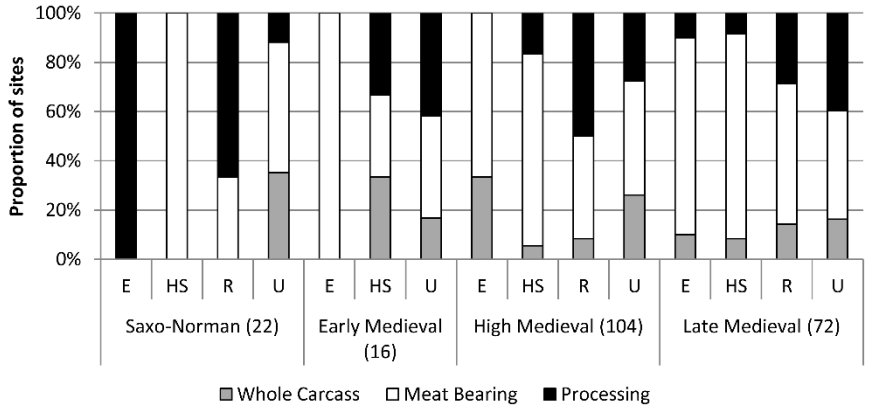

Fig 3.47: Sheep carcass part representation by medieval phase and site type. Processing waste= predominance of horn cores, head and/or feet. As a % of all recorded anatomical elements. E= ecclesiastical; HS= high status; R= rural; U= urban; (n)*= number of sites included*

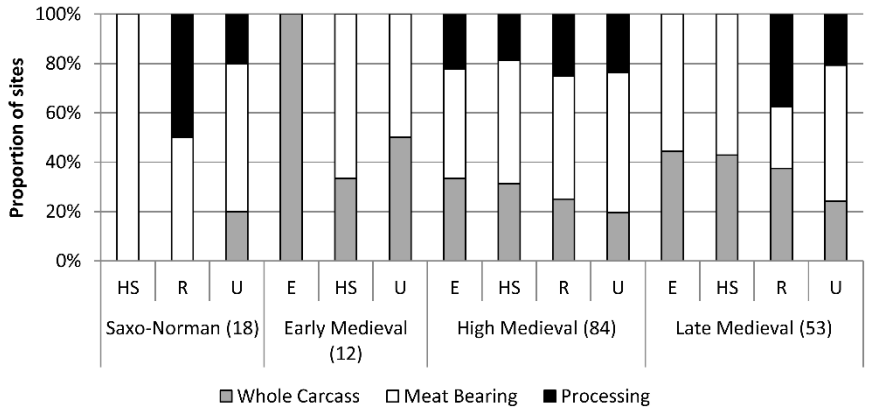

Fig3.48: Pig carcass part representation by medieval phase and site type. Processing waste= predominance of head. As a % of all recorded anatomical elements. E= ecclesiastical; HS= high status; R= rural; U= urban; (n)*= number of sites included*

Table 3.13: Cattle carcass parts represented at medieval sites. See *section 1.7.4 for descriptions of carcass parts*

	Saxo-Norman				Early medieval			High medieval				Late medieval			
Anatomical elements	E	HS	R	U	E	HS	U	E	HS	R	U	E	HS	R	U
All carcass parts			2	4	1	2	5	6	5	8	22	2	5	3	14
Mostly meat-bearing and head				4			1	1	4		11	2			6
Mostly meat-bearing bones				2		1	3	1	6	1	11		7	3	6
Dressed carcass			1	3					2		5	3	1		2
Mostly horn cores				1			1				5				1
Mostly feet and horn cores											1				
Mostly lower limbs				1							4			1	
Mostly lower limbs and head	1		1	2			2	1		1	3	3			8
Mostly head and horn cores										1	2				1

Table 3.14: Sheep/goat carcass parts represented at medieval sites. See *section 1.7.4 for descriptions of carcass parts*

	Saxo-Norman				Early medieval			High medieval				Late medieval			
Anatomical elements	E	HS	R	U	E	HS	U	E	HS	R	U	E	HS	R	U
All carcass parts				6		1	2	3	1	1	17	1	1	1	7
Mostly meat-bearing and head			1	4	1		1	1	2	2	16	2	2	1	4
Mostly meat-bearing bones		1		4		1	3	5	9	3	10	6	8	3	14
Dressed carcass				1			1		3		4				1
Mostly horn cores				1							2				1
Mostly lower limbs	1					1			2	2	6		1		4
Mostly lower limbs and head			1	1			4			1	7			2	10
Mostly head and horn cores			1				1		1	3	3	1			2

Table 3.15: Pig carcass parts represented at medieval sites. See *section 1.7.4 for descriptions of carcass parts*

	Saxo-Norman				Early medieval			High medieval				Late medieval			
Anatomical elements	E	HS	R	U	E	HS	U	E	HS	R	U	E	HS	R	U
All carcass parts				3	1	1	4	3	5	2	10	4	3	3	7
Mostly meat-bearing and head				6		1	2	2		2	11	2	1	1	3
Mostly meat-bearing bones		1		1			1		3		8				7
Dressed carcass								1							
Mostly lower limbs and head			1	1		1	1	1	5	2	7	2	3	1	5
Mostly lower limbs				1							3	1			1
Mostly head			1	3				2	3	2	12			3	6

*Table 3.16: Proportion of butchery marks recorded at medieval sites. *Due to the highly variable nature of the recording of butchery, records may be reported at site level and summarised for each period, or they may be detailed by sub-phase, and therefore more than one account be made available for a single site*

Butchery	Saxo-Norman	Early medieval	High medieval	Late medieval
N records*	20	11	63	36
Knife	20%	36%	37%	28%
Chop	40%	45%	48%	33%
Saw	10%	9%	14%	8%
Long bone chopped longitudinally	15%	18%	13%	8%
Long bone chopped transversely		18%	10%	6%
Marrow	10%	9%	8%	17%
Vertebrae split	30%	55%	56%	56%

Table 3.17: Number of records of specific vertebral butchery

Location of butchery	Saxo-Norman	Early medieval	High medieval	Late medieval
Paramedial		2	13	4
Midline		1	6	4
Bilateral	1	1	2	3

Table 3.18: Recorded presence of craft and industrial activity from site reports

	Site type	Antler	Horn	Skin	Horn/Skin	Butchery	Butchery/Skin	Other
Saxo-Norman								
Aldersgate, London	Urban				*			
Aldersgate, London	Urban				*			
Henley's Garage, Winchester	Urban						*	
Northgate House, Winchester	Urban							Fur-processing
St Magnus	Urban		*					
Early medieval								
Finzel's Reach, Bristol	Urban				*			
Northgate House, Winchester	Urban		*					Furrier
St Magnus	Urban		*					
Early–high medieval								
King Stable St, Eton	Urban						*	
Malmesbury 2000	Urban		*					
Merton College, Oxford	Urban							
The Vineyard, Abingdon	Urban			*		*		
High medieval								
Benham's Garage, Taunton	High status		*					
14 Farringdon St, London	Urban		*			*		
140 Bartholomew St, Newbury	Urban	*	*					
Aldersgate, London	Urban				*			
Classics Centre, Oxford	Urban				*			
Finzel's Reach, Bristol	Urban				*			
Jennings Yard, Windsor	Urban			*				
Postern Mill, Malmesbury	Urban						*	
St John's St, Winchester	Urban						*	
Tanner's Hall, Gloucester	Urban			*				
The Hamel, Oxford	Urban		*					
Victoria Rd, Winchester	Urban				*			
High–late medieval								
60–63 Fenchurch St	Urban						*	
Abingdon West Central	Urban			*				
King Stable St, Eton	Urban						*	

	Site type	Antler	Horn	Skin	Horn/Skin	Butchery	Butchery/ Skin	Other
Late medieval								
Okehampton Castle	High status	*						
14 Farringdon St, London	Urban		*			*		
54–55 St Thomas's St, Oxford	Urban				*			
67–69 St Thomas' St, Oxford	Urban							Knucklebone floor
Aldersgate, London	Urban	*						
Battle Bridge Lane, Southwark	Urban				*			Pinner
High St, Uxbridge	Urban		*			*		
Jennings Yard, Windsor	Urban				*			
Old Clothing Factory, Abingdon	Urban					*		
SOU 29, Southampton	Urban	*						
Twickenham House, Abingdon	Urban				*			
Victoria Rd, Winchester	Urban					*		

3.6 Inter-Site Analysis

The limited number of elite and ecclesiastical sites in the Saxo-Norman dataset makes apparent trends in inter-site relationships hard to identify. The distinction between elite sites and those of more humble populations observed in the late Saxon phase through the evidence for hunting and hawking continues, but is far less apparent at Saxo-Norman settlements. In the late Saxon period there are clear differences in the supply of urban sites with cattle, and the consumption of sheep in rural areas. This effect is also less pronounced in Saxo-Norman deposits, although assemblages with the greatest proportion of cattle are urban in nature. The majority of assemblages continue to indicate little in the way of redistribution of carcass parts, and there is little difference in the animal husbandry practised between sites: both cattle and sheep were important for meat and small-scale secondary products. Although there are few recorded metrical analyses, it is noted that animals at the urban sites of Western Suburb, Winchester, and 31–34 Church St, Oxford, were smaller than their contemporaries.

The establishment of the new Norman elite in society is exemplified in the early medieval zooarchaeological record in numerous ways. Perhaps the most striking is the importance of hunting, significant for the symbolic, physical and legal barriers that separated the elite and lower classes, brought about by forest law and the introduction and exhibition of new taxa such as falcons, fallow deer, peafowl and pheasants. Social differences are illustrated in the variety of food consumed by the elite, and the increase in pig and chicken production to satisfy the Norman taste. It must be highlighted that this is not always the case, and while such species are prolific at Faccombe Netherton, Carisbrooke Castle and Launceston Castle, far fewer such species are recorded at Oxford Castle and

Portchester Castle. Some similarities exist at ecclesiastical settlements, such as the high proportion of pig and birds in the diet, and the predominance of roe deer, linking those of aristocratic and clerical standing in society.

Although it is widely accepted from historical documents that the peasant population in early and high medieval England generally had a diet lacking in meat protein (Dyer 1983, 209; Hammond 1993, 26), isotope analysis of human remains from a small study in the north of England indicated no difference in diet between various sections of the cemetery (Müldner 2006, 231; Müldner 2009, 339). This may be explained by the relatively high dairy intake of the peasantry (Müldner 2006, 235), consistent with documentary evidence (Dyer 1983, 207). An early 14th-century text from the *Shepherd's Play* describes a list of food eaten by the shepherds, including bread, bacon, onions, garlic, leeks, butter and green cheese, ale, hot meat (supplied as part of their wages), a pudding and a sheep's head soused in ale and curds (Hammond 1993, 28). The change in provisioning of elite sites with greater numbers of pigs and sheep may be related to the predominance of cattle at rural sites, the early medieval aristocracy unwilling to be associated with peasant diets. Indeed, while evidence for peasant diets from maintenance agreements and poems suggests that foods such as cheese, milk, eggs, vegetables and bacon made up the staples of lower status diet, it also indicates that the aristocracy actively avoided these foods, consuming large quantities of meat and fish instead (Dyer 1983; Sykes 2006b, 65). Although the general urban population was also consuming far less game than their aristocratic contemporaries, the presence of a considerable range of wild birds, birds of prey and animals such as ferrets and polecats is indicative of the importance of urban markets as trade centres for luxury items.

Increased arable production in this phase sees cattle kept alive for longer, in their capacity as draught and plough animals, while sheep continued to be used largely for meat, with small-scale milk and wool production. Poor sample sizes mean there is little to indicate redistribution of meat or raw materials between sites. Again little difference is noted in the sizes of cattle, sheep and pigs between sites, although animals from the high-status site at Portchester Castle and urban site of Finzel's Reach, Bristol, and sheep from Eynsham Abbey, were all recorded as smaller than those from contemporary sites.

There is less distinction between site types in the high medieval period, with elite, rural and urban sites exhibiting varied proportions of lamb, pork and beef. The predominance of pigs, birds, deer and game species at elite sites continues, with fallow deer retaining its close relationship with high-status and ecclesiastical settlements. Evidence from the accounts of the Bishop of Hereford indicate that, in 1289 for 3 days over Christmas, he and his party of 70 consumed '1 boar, 2.3/4 cattle carcasses, 2 calves, 4 does, 4 pigs, 60 fowls, 8 partridges and 2 geese' (Hammond 1993, 65). A more rigorous following of Benedictine teaching is evident through an increase in the consumption of birds and fish at ecclesiastical settlements. Despite a documented trade in wildfowl by the rural population (Stone 2006, 152) very few game animals are recorded in rural assemblages, although higher numbers and greater diversity of wild birds in urban contexts indicates the importance of such trade to the urban market. Historical evidence details the presence of cook shops in 14th-century London

that sold cooked food, including thrushes, finches, geese, hens, plover, woodcock, teal, pheasant, heron, bittern and rabbit (Hammond 1993, 50). Evidence for cock fighting and an increasing variety of trades also exists for urban centres. It is in the high medieval phase that the redistribution of carcass parts becomes more common; particularly pertinent is the relatively high number of high-status sites at which a predominance of meat-bearing bones is recorded, indicating that joints of meat were more commonly bought in, rather than whole animals being culled and consumed on site. Conversely, there is evidence for more processing waste at rural and urban settlements, suggesting they were produced for market by both town and country populations. The intensification of grain and wool production in this phase is evident in the age and sex profiles of cattle and sheep. The predominance of male cattle at high-status sites has been suggested as an indicator of status, where larger animals are synonymous with greater wealth and power. This is exemplified by the metrical data, with sheep and cattle larger than their contemporaries recorded at high-status Wickham Glebe and Harding's Field, Chalgrove. Smaller animals found at rural Eckweek and urban assemblages at Aldersgate, London, Townwall St, Dover, Western Suburb, Winchester, 31–34 Church St, Oxford, and The Hamel, Oxford, strongly suggest that the largest animals were preferred by the aristocracy, while smaller animals were marketed to towns. However, it must be considered that the presence of 'larger' or 'smaller' animals as recorded in site reports is generally taken from a comparison of means and ranges from other sites. Conclusions may therefore be biased depending on the data used by each specialist. One further trend that may elucidate inter-site relationships is the possible identification of elite sites producing larger numbers of old ewes and lambs (for example Faccombe Netherton, Launceston Castle and Church Field, Shapwick), which may reflect their provisioning from manorial farms specialising in sheep-breeding within the estate.

Following the improvement in living conditions for much of the peasantry in the late medieval phase came a small increase in birds and wild mammals at rural sites, and the consumption of better joints of meat. A 14th-century law detailed the recommended diet of servants, which included meat or fish at least once a day, milk and cheese (Hammond 1993, 61). High-status and ecclesiastical sites persist in the maintenance of more varied diets, combining pork, mutton and bird species. Following greater access of the lower classes to meat in their diet, the emphasis of the luxury diet changed from one of quantity to one of diversity, with vast numbers of bird and wild mammal taxa consumed by the aristocracy (Thomas 2007, 145). This is exemplified in the food served at a banquet given for the coronation of Richard III in 1483, of which the three courses comprised 16 dishes of birds, 12 of meat and 5 of fish, including egrets, rail, crane, bittern, heron, capons, partridge, suckling rabbits and pigeons, venison, beef and mutton (Hammond 1993, 135), contrasting in the variety of taxa with that of the Bishop of Hereford described. The diet of ecclesiastical and high-status communities evidenced in the dataset was highly varied, and is reflected in documentary evidence. The accounts of two mid-15th-century priests (Hammond 1993, 62) suggests that they ate comparatively frugally, with a diet not much different from their peasant contemporaries, with the exception of fish, which was frequently included throughout the week. It is suggested that the

daily diet of much of the aristocracy was also relatively frugal, comprising bread and meat or fish (Hammond 1993, 63–75). The quantity of meat eaten, however, was considerable, and in 1512 the household accounts of the Earl of Northumberland indicate that in that year 123 cows, 667 sheep, 25 pigs, 28 veal calves, 60 lambs, 49 deer and rabbits and birds would be consumed (Hammond 1993, 76). Within the dataset, a remarkable assemblage comes from an early 16th-century pit at Little Pickle (Bourdillon 1992), from which a considerable range of birds (woodcock, lapwing, ducks, golden plovers, pigeon, heron, partridge, snipe and curlew) and very large number of rabbit bones were recovered alongside the bones from veal calves. Furthermore, the nature of the deposit suggests that it resulted from kitchen waste, in preparation for serving a considerable feast.

Two major economic changes are exemplified in this phase: the intensification of sheep husbandry for wool production is reflected by a higher number of old animals at all site types; a move towards dairy production is evident in the increasing proportion of cows and veal calves and greater numbers of horses utilised for traction and draught purposes. The increase in veal calves, lambs and piglets is notable in elite and urban assemblages, indicating their deliberate supply to meet a new demand. When combined with the increase in joints of meat and processing waste indicative of specialist trades, there is evidence for a considerable organised movement of animals, joints of meat and raw materials between settlements and within towns. The suggested move to sty husbandry (Thomas 2005a, 54) is also represented in the pig data, with a greater proportion of whole carcasses butchered and consumed at individual sites within towns, consistent with them being kept at a household level.

There is evidence for greater variation in animal morphologies, although it must again be reiterated that recording of raw metrical data was not possible in this study. Nonetheless, comparisons made by individual specialists relating to the size of animals indicate the presence of smaller animals at a number of urban and rural sites (Stoke Rd, Bishop's Cleeve; SOU 29; Canterbury Police Station; 31–34 Church St, Oxford; and The Hamel, Oxford), as well as larger animals (Reading Abbey Stables and 67–69 St Thomas' St, Oxford). Larger animals were also observed at the high-status sites of Wickham Glebe and Harding's Field, Chalgrove. The increase in medium- and long-horned cattle and decrease in short-horned animals also implies a change in the type of animals present in this phase.

4 THE POST-MEDIEVAL PERIOD (AD 1500–1901)

4.1 Introduction and Background to Post-Medieval Sites in the Study Area

Post-medieval archaeology is often cited as being overlooked in favour of the abundant historical sources for the period (for example Newman 2005, 206; Pennell 1999, 38; Thomas 2009, 20), and the lack of zooarchaeological evidence for the period following 1850 has specifically been identified as one of particular paucity (Coy 1983a, 91; Thomas 2009). This is exemplified by the dataset from the southern region. Of the more closely dated sites, 76 fall within the range 1500–1750, while only 11 are specifically dated post-1750. The remaining 53 sites either span both phases or have no specific dating identified. Figure 4.1 shows the location of sites in the post-medieval dataset, where it can be seen that, as with preceding periods, a number of counties are only sparsely represented (Dorset, Gloucestershire, Hampshire, Wiltshire, Kent and Cornwall).

This period is one of increasing urban density. Between the late 15th and mid-17th centuries the population of Britain doubled (Crossley 1990, 7), causing greater demand by urban centres for provisioning from increasingly further afield. Livestock used to supply London came from as far away as Wales and Scotland (Wilkie 2010; Yeomans 2006, 26). Between the 1650s and 1750s the population stabilised, bringing about a period of economic growth. The Industrial Revolution led to an emphasis on the production of manufactured goods, with previously hand-made items such as cloth being industrialised through the use of spinning wheels and looms to produce greater quantities of textiles. In 1700 approximately 80% of the population was employed in agriculture, but only 20% by 1850 (Courtney 1997, 10; Turner *et al* 2001, 214). Unsurprisingly for a period that ends with the majority of the population living in towns, sites group around major urban conurbations, notably Oxford and London, but excavations from Windsor, Reading, Eton, Totnes, Wimborne, Plymouth, Exeter, Christchurch, Poole, Bath, Gloucester, Bristol, Andover, Winchester, Romsey, Southampton, Canterbury, Abingdon, Taunton, Bath, Guildford, Lewes, Winchelsea, Hastings, Salisbury and Shoreham are also featured. Many individual sites are multi-phase, reflecting changes to buildings and property boundaries resulting from successive phases of rebuilding and alteration to the structure of urban settlements. The nature of these sites is highly varied, including households and tenements, kitchens, inns, a suburban farm (Elizabeth House, Oxford), rubbish pits, waterfront areas, town walls and gardens. Industrial sites consist of tanneries (Tanner's Hall, Gloucester; Albany and Greyhound Hotel Site, Fordingbridge; and 67–69 St Thomas' St, Oxford), the latter of which may also contain butchery waste, a lime kiln (Staff College, Bracknell), pottery workshop (Fulham) and a whaling station (Rainbow Quay, Rotherhithe).

This period was one of upheaval and innovation including the reformation, civil war, industrial and agricultural revolutions and the expansion of international trade routes through enterprises such as the East India Company. Henry VIII's

reformation led to the dissolution of the monasteries from 1536, which saw an end to the large medieval monastic houses. The only extant ecclesiastical site in the dataset is the Church at Romsey Abbey, Kent, although assemblages from Eynsham Abbey, St Mary Spital, St Gregory's Priory and the Hospital of St Mary of Ospringe are included in this category, consisting largely of demolition layers dating to the dissolution. The aristocracy increased their landholdings through the redistribution of former monastic lands, and it became fashionable to build large houses in landscaped grounds (Williamson 1997, 104). Such developments included royal palaces and houses of the gentry that would have incorporated gardens, parks, moats and, occasionally, medieval deer parks (Crossley 1990, 71). High-status sites in the dataset include mansions (Mount House, Witney, Oxfordshire; Nonsuch Palace, Surrey; Battle Abbey and Michelham Priory in Sussex; Berry Pomeroy Castle, Devon; St Saviour, Bermondsey; and the latest phases of St Mary Spital, London; and Shapwick House, Somerset), manors (Wickham Glebe, Hampshire, and Middleton Stoney, Oxfordshire), palaces (Winchester, London, and a change of status at Nonsuch Palace, Surrey) and castles (Camber, Sussex; Okehampton, Devon; Carisbrooke, Isle of Wight; and Benham's Garage, Taunton).

Disputes between the monarchy and parliament led to a number of conflicts throughout the period, and the English civil war of the 1640s is characterised by purpose-built fortifications such as those at Camber Castle. Nonetheless, in the 16th and 17th centuries profits from market-led farming made many farmers wealthy and improved living standards.

The timing of the Agricultural Revolution is much disputed (Turner *et al* 2001, 11), but took effect between the 15th and 19th centuries, following the need to feed the increasing population in the centuries after the black death (Crossley 1990, 7). Animal husbandry at the beginning of the period was based on mixed farming in the open-field system, where arable production was carried out alongside the husbandry of animals that produced the power and traction to work the land, and the manure to fertilise it. Greater controls were placed on ownership of land from the mid-16th century, as it became increasingly enclosed and placed in private hands, with the loss of common rights in many villages and obsolescence of the open-field method of farming in many areas. In order to feed the increasing population much of the land was given over to arable production, with pasture relegated to marginal areas and the uplands (Crossley 1990, 12). Yet by the 18th century the effects of enclosure meant that individual farms became increasingly specialised to meet the demands for meat and milk from urban populations. Rural sites in the dataset include villages (Shapwick, Foxcotte and Alton), farms (Elstree Hill South and Dean Court, Cumnor) and a garden (Silver St, Glastonbury). The reduced need for a rural labour force as a result of the Agricultural Revolution allowed greater movement of the population away from the land, which (at the risk of producing a circular argument) was one of the factors influencing the Industrial Revolution from around 1760 as the increase in urban populations created a workforce for the new mills and factories.

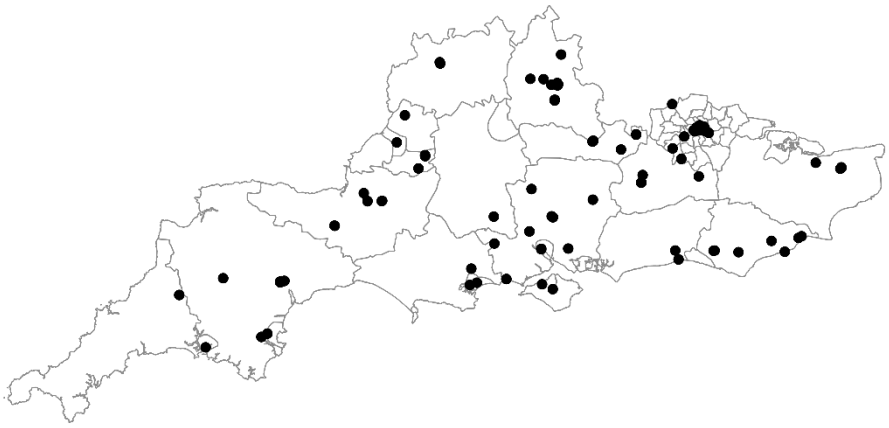

Fig 4.1: Location of post-medieval sites within the study area

4.2 Animals as Food

4.2.1 Animals as Food: Beef, Pork and Mutton

There is considerable change in the mean pig numbers between the late medieval and post-medieval periods (Fig 4.2), coinciding with a considerable increase in the number of sheep recorded. This may be related to the move to maximising arable production, where sheep were necessary for manure, and of continuing importance for the wool trade (Albarella 1997, 24), while pigs would not have been as easy to keep as land became increasingly enclosed and in private hands. This would have inevitably brought about a reduction in pannage, which is evident in the reduced diversity of diet of late medieval pigs (Hamilton and Thomas 2012).

There is considerable variation in the relative proportions of the main domesticates at all site types (Fig 4.3). However, these variations are consistent between site types, with two major exceptions. Firstly, sheep are generally more common at rural settlements (between *c* 35% and 60%) compared with ecclesiastical, high-status and urban sites (*c* 20% and 60%). Secondly, while pigs are relatively uncommon at all sites, generally between *c* 2% and 20%, all ecclesiastical settlements contained 20–45% pig except St Mary Spital, suggesting a link between the diet of those living in and around monastic houses at the time of the dissolution and the consumption of pigs. It is possible that the monastic estates were still able to provide enough land to keep larger herds of pigs. With these exceptions, it seems that if status is conferred by food in the post-medieval period it is done with other sources of meat, which will be explored in the following sections.

Major outliers exist within the data, nearly all of which come from urban sites related to specific industries. For example, high numbers of cattle bones are recorded in deposits related to tanneries (Tanner's Hall, Gloucester, and Bridge St East, Reading) and similarly a high number of sheep bones from tawyers waste at Tudor St, Exeter. The waterfront site at Abbey Wharf, Reading, is recorded as including industrial waste; although the nature of this is not

specified, it does include a high number of cattle bones. The assemblage from the whaling station at Rainbow Quay, Rotherhithe, consisted of 81% cattle, suggesting that the workers were rewarded for their duties with a largely beef-based meat diet. The nature of craft and industrial working will be considered further in section 4.5, but it is worth noting the effect of industrial processes on the archaeological record, with regard to the preferential redistribution of specific taxa, which will bias relative proportions at some sites.

There is some degree of environmental determinism in the dataset (Fig 4.4). As in much of the medieval period, the chalk vales and downs contain considerable quantities of sheep (many over 45%), while the greatest proportions of cattle are recorded on clay and, to a lesser extent, limestone geologies. This may reflect the move to specialisation in this period, where production focused on what was most profitable on the land available.

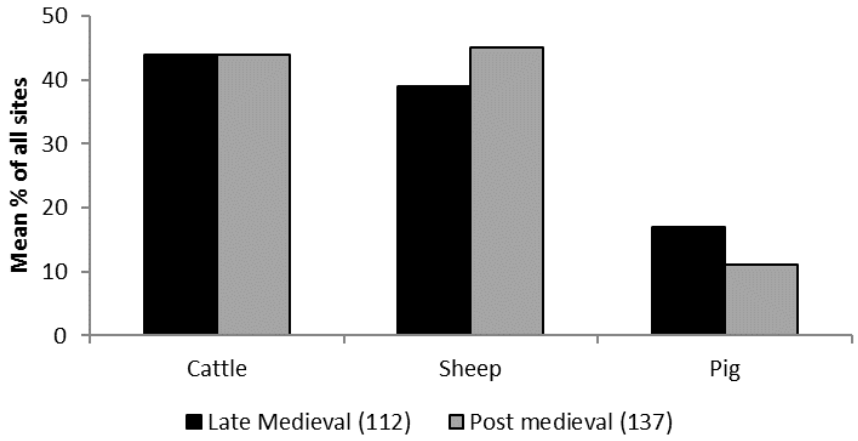

*Fig 4.2: Mean proportions of the main domesticates between late medieval and post-medieval periods. (*n*)= number of sites included*

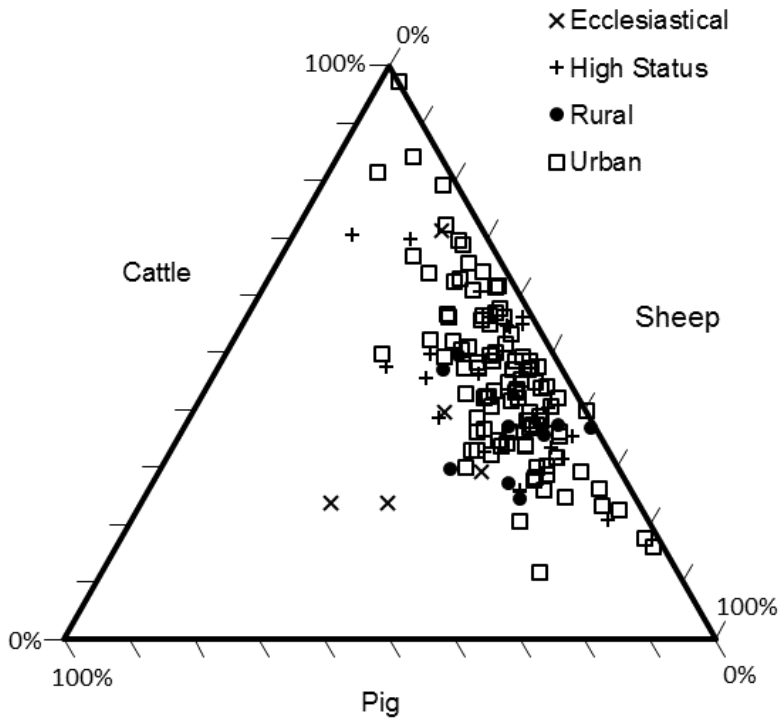

Fig 4.3: Relative proportions of cattle, sheep/goat (sheep) and pigs from all post-medieval sites. Quantification based on NISP

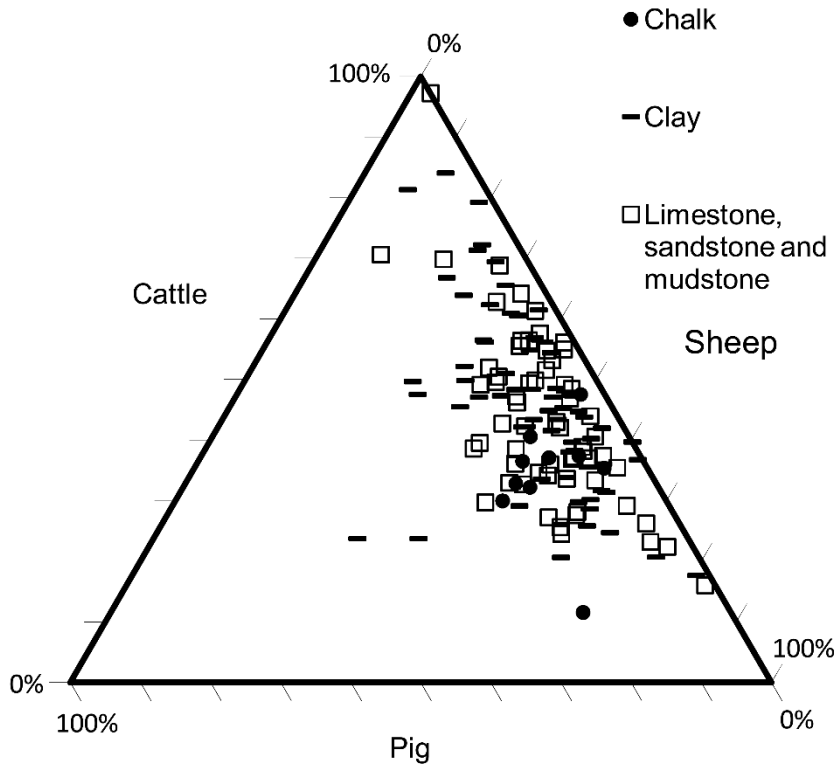

Fig 4.4: Relative proportions of cattle, sheep/goat (sheep) and pig on underlying bedrock geology for the post-medieval period. Quantification based on NISP

4.2.2 Animals as Food: Birds

Despite the increase in chicken remains at the end of the medieval phase (Fig 3.12), by the post-medieval period mean numbers fall dramatically to *c* 5% (Fig 4.5), a level similar to that of the early medieval phase. Proportions of geese, duck and wild taxa also decrease, although domestic fowl remain the most commonly consumed bird, followed by wild birds, geese and, less often, domestic duck.

When the relative proportions of domestic bird taxa at particular site types are considered, there is little difference in the consumption of ducks and geese, although ducks are slightly more common at high-status sites, increasing from the previous phase with a proportional decrease in goose numbers (Figs 3.21 and 4.6). Domestic fowl remain in greatest proportions in high-status settlements, although if the exceptional assemblages from Nonsuch Palace (54% and 57% domestic fowl in the two phases) are removed from the calculations, numbers are more consistent with those recorded at lower status rural and urban sites (4.4%). Relative quantities of domestic birds at urban sites are also similar to the late medieval data. There is an apparent increase in domestic fowl and goose numbers at both ecclesiastic and rural sites from the preceding phase. These numbers are inflated by the inclusion of assemblages from Eynsham Abbey (15.9% domestic fowl and 7% goose) and the rural site of Alton (4.4% goose), although it seems that the increase in domestic fowl in rural assemblages is a real phenomenon at all three of the sites in the dataset. One other site of note is the Old Bakery, Shapwick (60% domestic fowl), which is associated with a poultry yard (Gidney 2007, 920). This site is not included in the illustrated data as the size of the cattle, sheep/goat and pig assemblage is less than the 300 NISP threshold.

Numbers of semi-wild bird taxa are recorded far more commonly at ecclesiastical and high-status sites (Fig 4.7). This is largely due to high numbers of pigeon/doves and swan in ecclesiastical assemblages (Fig 4.8), peafowl and partridge at both elite site types, and pheasant at high-status sites. The paucity of many of these semi-wild taxa (particularly peafowl, pheasant and partridge) at lower status sites suggests their acquisition and husbandry were restricted by the elite population. The same may be true of a number of other taxa traditionally associated with high-status signatures (Fig 4.8); certainly water birds are more common at these sites (Fig 4.7), particularly wild ducks, geese, crane, heron and rails, but waders such as woodcock, gulls and *Turdus* spp. are also more prolific at elite sites. The increase in small birds such as thrushes and blackbirds at ecclesiastical sites, from the previous phase, may be related to the perception that they were good for the health (Serjeantson 2006, 146). The increase in swans in this phase, particularly at ecclesiastical sites, but also in high- and low-status assemblages, can be related to the decrease in swanneries at the end of the medieval phase, requiring greater supply of birds such as swans and water taxa by professional fowlers (Stone 2006, 159). Indeed, by the beginning of the post-medieval phase statutes were becoming more common regulating the hunting and trade of wild birds, a measure necessary as a number of taxa, such as cranes, became extinct by the end of the period (Stone 2006, 159). The existence of professional wildfowlers and the use of decoys

(Williamson 1997, 106) may be observed in the increase in seabirds and water birds (ducks, divers, cranes, rails, swan and storks) in wetland areas (Table 4.1), although wading birds (for example woodcock, lapwing and plovers) are more common in areas away from the wetlands. This is the first time period in which any suggestion can be made relating to greater numbers of wildfowl in wetland areas directly from the data, which may reflect the documentary evidence for an increase in the number of wildfowlers. Numbers of wetland birds remain virtually absent at nearby rural sites, which may result from taphonomic differences (*see* section 1.3.2), the trade of wildfowl away from the area, or a restriction of wildfowling.

Turkeys appear for the first time in this phase and, although they are considered to be more common at high-status sites in the early years following their introduction (Fothergill 2014, 208; Poole 2010, 161), Fothergill (2012, 43) notes that they were rapidly farmed on a fairly large scale, becoming widely available by the late 16th century. In the dataset the earliest examples come from the urban sites of St Mary Spital, London (1538–1620), and East Gate, Gloucester (16th to 17th century), which may relate to their importation through towns at the end of the trade routes from the New World. Turkeys are found at the high-status sites of Camber Castle, Nonsuch Palace and Wickham Glebe in the 17th to 18th centuries. They are also recorded at the Old Bakery, Shapwick, in the 19th century, the same site noted as a poultry yard, and it is likely that by this date turkeys were available to all.

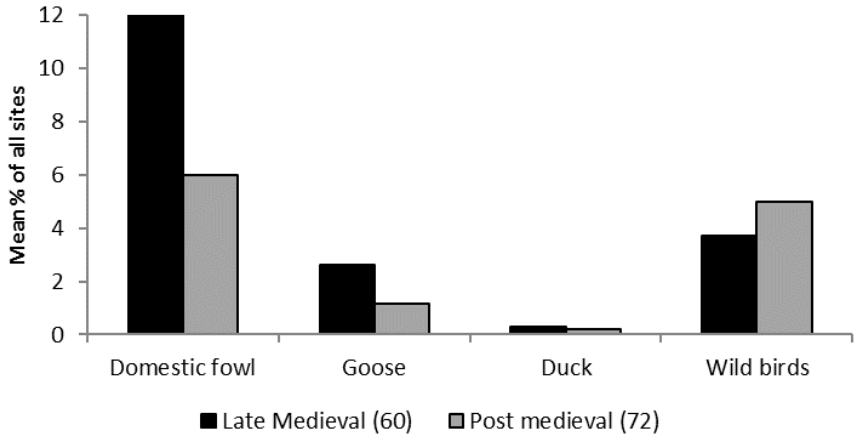

Fig 4.5: Mean proportion of birds recorded at late medieval and post-medieval sites (% of NISP cattle, sheep/goat and pig). Only sites (n) *with >300 NISP cattle, sheep/goat and pig included*

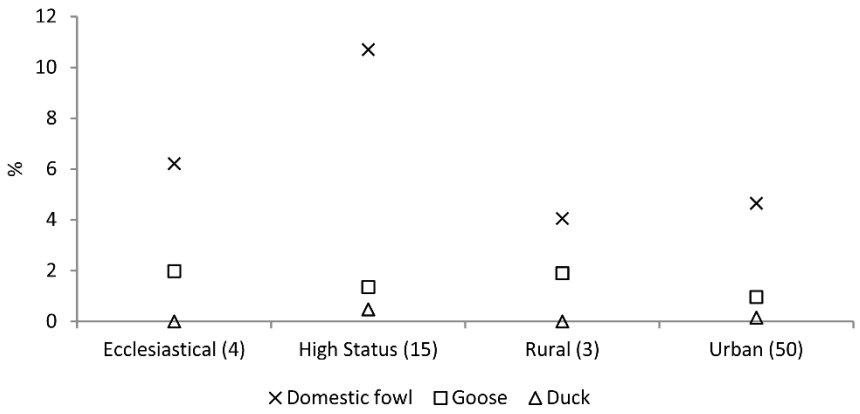

Fig 4.6: Mean proportion of domestic fowl (chicken), geese and ducks recorded by site type for the post-medieval phase (% given as a proportion of NISP cattle, sheep/goat and pig). Only sites (n) *>300 NISP cattle, sheep/goat and pig are included*

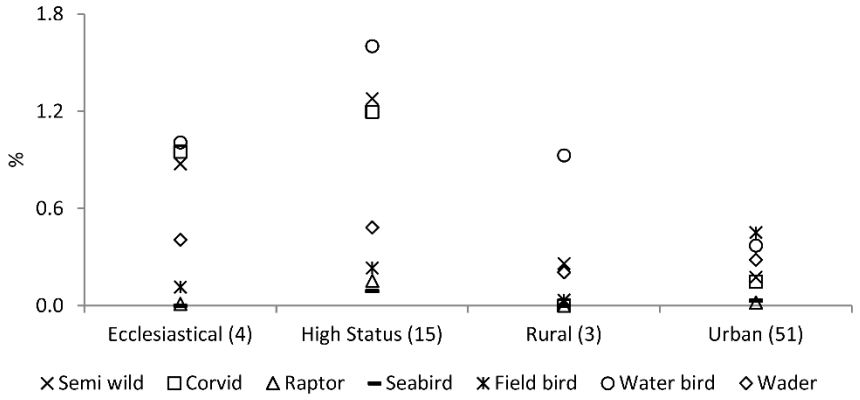

Fig 4.7: Mean proportion of wild birds recorded by site type for the post-medieval phase (% given as proportion of NISP cattle, sheep/goat and pig). Only sites (n) *>300 NISP cattle, sheep/goat and pig are included. For bird taxa included within each category,* see *section 1.7.1*

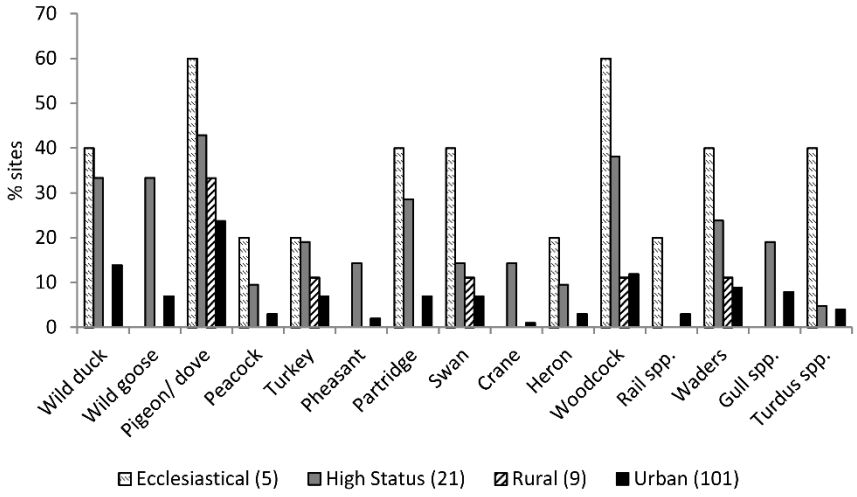

*Fig 4.8: Proportion of all post-medieval sites (*n*) at which high-status wild bird signature species and selected other taxa were present (after Albarella and Thomas 2002; Sykes 2004). NB: Rail* spp.*= crakes, waterhen/moorhen and coot; waders= plovers, snipe, lapwing and oystercatcher; gull* spp.*= Laridae; Turdus* spp.*= thrush and blackbird; wild ducks= teal and mallard; wild goose= brent goose and barnacle goose*

*Table 4.1: Proportion of birds likely to inhabit wetland areas recovered in assemblages (*n*) close to historic wetlands (Hume 2008, map 1), and those from other sites*

	Seabird	Water bird	Wader
Wetland sites (11)	0.19	0.97	0.01
Other sites (62)	0.01	0.63	0.39

4.2.3 Animals as Food: Game

Relative proportions of deer and hare decrease in this phase from late medieval numbers (Fig 4.9), while rabbits appear to increase considerably. The decline in habitat and subsequent reduction in red and roe deer numbers that began in the early medieval phase was such that by the post-medieval period these native deer were extremely rare. When the nature of wild mammal exploitation is considered by site type (Fig 4.10), a number of trends becomes apparent. Rabbits and fallow deer are observed at all site types, but are significantly more common at high-status sites, due largely to the inclusion of consecutive phases at Nonsuch Palace, where rabbit remains were more common than all cattle, sheep and pigs combined, and also Camber Castle, where rabbits were present as 42% of the total number of cattle, sheep and pigs. The apparent preference for fallow deer is also largely due to the Nonsuch Palace assemblage (11% and 33%), but unusually high numbers are recorded at Okehampton Castle as well (22%). Excluding the exceptional assemblage of Nonsuch Palace, mean post-medieval numbers of rabbits (2%) fall below late medieval numbers (3%), suggesting that there was a decline in the utilisation of all wild mammals in the diet of the southern population. Red and roe deer and hare are also recorded at ecclesiastical sites, albeit in low numbers.

Although not included in the data discussedpreviously, because it has a NISP of less than 300 fragments from cattle, sheep/goat and pig, a high number of rabbit bones are recorded from the Old Bakery, Shapwick (12%), which dates to the later part of the period, the 19th century. It is suggested that by this time rabbits were kept at a household level (Williamson 2006, 10), as they became harder for the aristocracy to contain in warrens and parks solely for their consumption (Gidney 2007, 919).

The re-establishment of game as the preserve of the rich was increasingly defined in statute, so much so that by 1723 being caught even with the intention to poach was a hanging offence (Williamson 1997, 110). This is clearly reflected in the animal bone assemblages, as wild mammals once again become most commonly procured by the elite, in stark contrast to the late medieval phase, where wild taxa were more common at a greater range of site types (Fig 3.29).

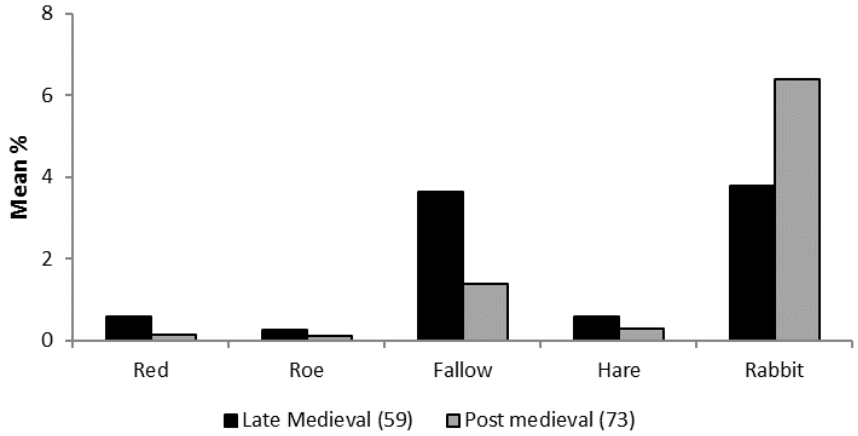

Fig 4.9: Mean proportion of major wild mammals recorded between phases (% given as proportion of NISP cattle, sheep/goat and pig). Only sites (n) *>300 NISP cattle, sheep/goat and pig are included*

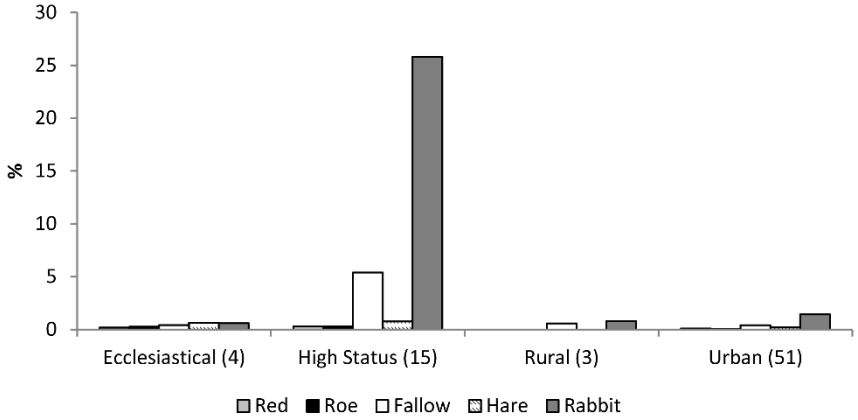

Fig 4.10: Mean proportion of the major wild mammals by site type (% given as proportion of NISP cattle, sheep/goat and pig). Only sites (n) *>300 NISP cattle, sheep/goat and pig are included*

4.2.4 Animals as Food: Fish and Marine Mammals

The relative proportions of freshwater, marine and migratory fish remain as they were at the end of the medieval period (Fig 4.11), with marine taxa dominating assemblages. Cyprinid species are the most common freshwater fish recorded at post-medieval sites, and eel and salmonid the most common migratory species, again continuing the previous trend (*see* Appendix 4). However, the nature of marine taxa recorded changes considerably (Fig 4.12). While levels of stockfish and freshwater fish remain fairly constant, and there is a small decrease in eel numbers, there is a considerable decline in the proportion of herring bones recovered. Instead, the range of other marine fish increases, including conger, flatfish, gad, gurnard, haddock, ling, mackerel and plaice amongst those most often recorded. The decline in herring has been blamed on several factors: the dwindling of fish stocks close to shore, greater competition from fishermen from other countries, and an increase in prices (Alsford 2013).

The relative proportions of fish recorded at various site types (Fig 4.13) suggest that fish from all three sources were consumed by all levels of society. At many urban sites marine taxa are most common, and at high-status sites migratory fish are more often consumed. Although there was a decline in the use and upkeep of fish ponds at the end of the medieval period, they were often reinstated in the post-medieval period by the aristocracy, and kept well-stocked with carp, pike and bream (Williamson 1997, 105). The proportion of assemblages containing fish increases at all site types from the late medieval period (Table 4.2), although there is a reduction in the number of taxa recorded at both ecclesiastical and urban sites. The removal of the Catholic Church following the reformation, and consequently the rules governing the consumption of meat, may explain the reduction in the quantity of fish species eaten. A different pattern can be observed at high-status and rural sites, at which the number of taxa increases from the previous phase. In the case of the former, this is consistent with the consumption of a greater quantity of species by the aristocracy, while at rural sites it may reflect greater purchasing power and better supply networks.

Although whale meat became less popular by the end of the medieval period, porpoises remained common, particularly at the table of the aristocracy (Gardiner 1997, 187). The dataset, however, includes only whale remains, from high-status (Camber Castle) and urban (Launceston Castle; The Foundry, Poole; and Rainbow Quay, Rotherhithe) sites. Rainbow Quay was a whale-processing plant dated to the 18th century, and it was at this time that the English finally turned to whaling as an industry to provide bones (for corsetry) and oil, which was a vital energy source in the post-medieval period (Douglas 1998, 188).

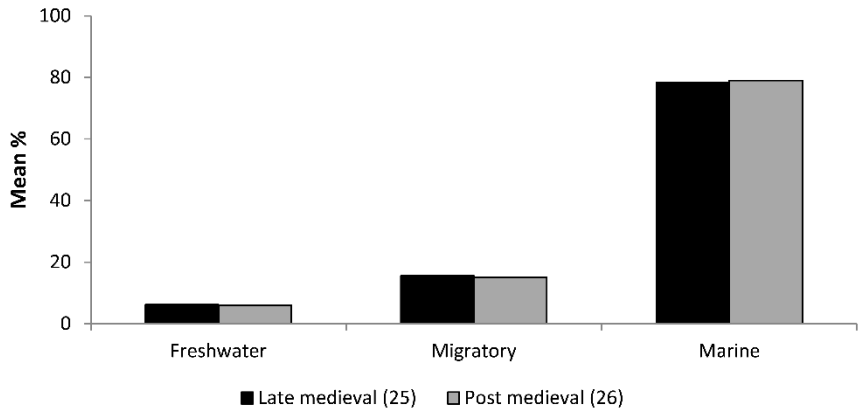

*Fig 4.11: Mean proportion of fish recorded at late medieval and post-medieval sites (*n*) with a NISP >20 identified fragments*

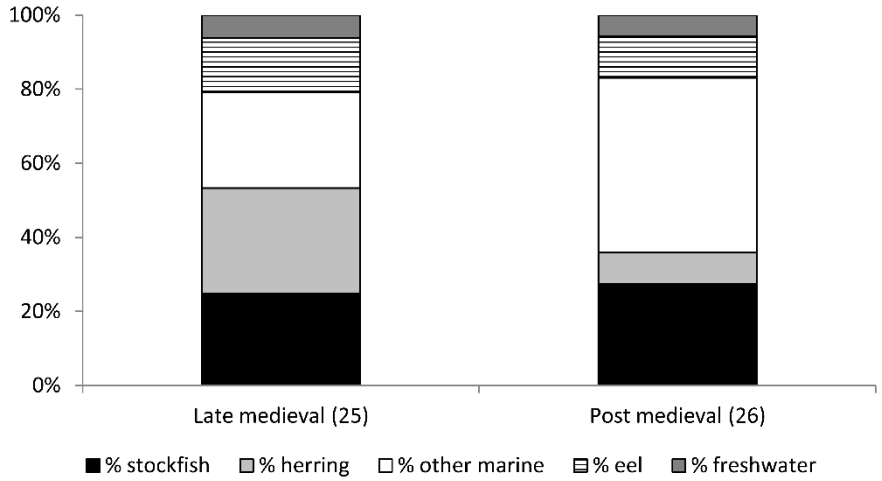

*Fig 4.12: Mean proportion of preserved and other fish recorded at late medieval and post-medieval sites. Only sites (*n*) with >20 identified fish bones included. Stockfish= cod, haddock, hake, ling and saithe*

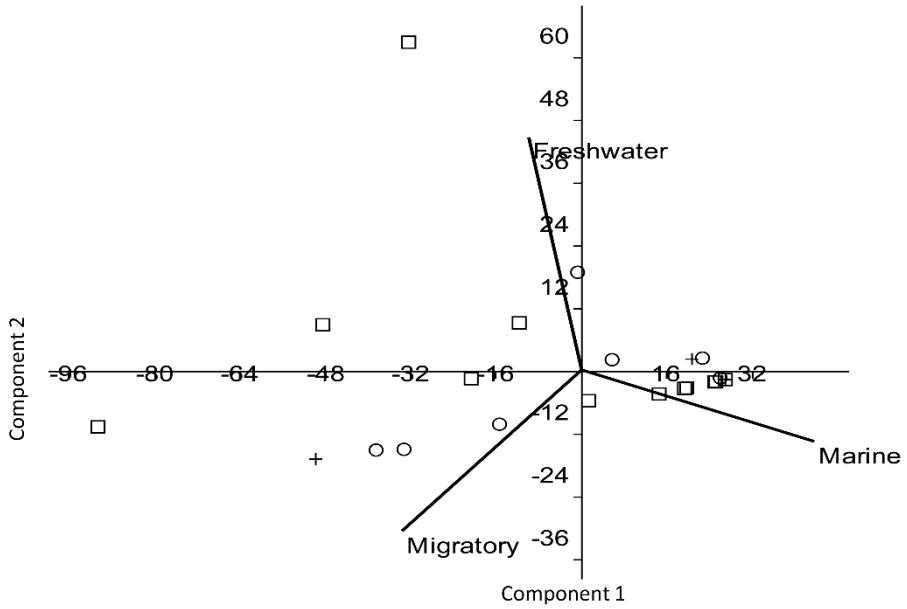

Fig 4.13: Principal component analysis of the relative proportions of freshwater, migratory and saltwater fish species from sieved post-medieval sites. Only assemblages with >20 fish bones included. Square= urban; circle= high-status; cross= ecclesiastical

*Table 4.2: The abundance of fish assemblages in the dataset (as a % of all post-medieval sites), and the diversity of taxa (total number of taxa/total number of assemblages with fish remains) by site type. (*n*)= number of assemblages*

	% of all sites		Mean count of taxa	
Site type	Late medieval (122)	Post-medieval (140)	Late medieval (45)	Post-medieval (62)
Ecclesiastical	53	80	14	11
High status	48	57	9	12
Rural	33	11	2	8
Urban	30	43	12	7

4.3 Symbolic and Social Exploitation of Animals

4.3.1 Pets

Attitudes towards animals change in the post-medieval period to such an extent that by the end of the period the foundations were set for the modern animal rights movement. The medieval view that humans were superior to animals, and could therefore use them as they wished, was exacerbated during the 17th century. The influential suggestion by Descartes that animals were machines without a soul led to the accepted view that they could therefore not feel pain, and could be experimented on without sensation (Maehle 1994, 87; Thomas 1983, 33). From the early 18th century increasing philosophical and theological movements gathered support, publicly asserting that animals did have souls, narrowing the gap between humanity and the animal world (Maehle 1994, 88; Thomas 1983, 180) and that creatures should therefore not be harmed. Maehle (1994, 100) suggests that it was the increase in pet keeping in the 17th and 18th

centuries that influenced changes in ethical boundaries, and by the early 19th century the Society for the Prevention of Cruelty to Animals was established in London, along with the first laws on animal protection.

Literary and pictorial sources also indicate an increasing trend for the keeping of pets, particularly lap dogs, stimulated by the creation of a middle class in the 16th century (Raber 2007; Thomas 2005b, 94). By the 18th century animals were treated with greater sentimentality and poems affectionately describing the behaviour of cats and dogs became common (Raber 2007, 94; Thomas 2005, 94). The depiction of animals also changed considerably throughout the period, from the illustration of new, exotic creatures imported into menageries, to comparative anatomical studies, to portraits of favourite pets (Pinault Sorensen 2007). This symbolises changes in attitudes from one of curiosity and superiority, to the 'improvement' of breeds, to open affection becoming widely socially acceptable.

Against this background, it is pertinent that it is only during this phase that the most likely candidates for pet burials are recorded in the dataset. There are two incidences that are likely to relate to the burial of companion animals: at Taunton Priory, where three dogs were buried close to each other in separate graves; and at Camber Castle, where two small dogs were also buried separately, one with a serious pulmonary infection (Table 4.3). A number of other dog and cat associated bone groups that may be construed as pet burials are recorded in site reports, but they were not recorded in enough detail to be more certain. The importation of exotic animals that began at the end of the medieval period continues, many of which may have been used as pets, such as a tortoise recovered from Stafford Castle along with numerous cat and dog remains, that probably represent animals kept by the caretakers (Albarella 2007; Thomas 2010).

Table 4.3: Potential burial of companion animals. Mixed deposits and skeletons with butchery/skinning marks are not included. Descriptions are taken from the report text

Site	Site type	Description
Eynsham Abbey, Oxfordshire	Ecclesiastical	At least 3 cat skeletons
Camber Castle	High status	2 small dog partial skeletons buried separately; one kitten partial skeleton
Middleton Stoney	High status	Dog skeletons
Alton	Rural	Cat skeleton in layer
Abingdon West Central	Urban	Partial cat skeleton(s)
Christchurch 1969–80	Urban	Dog skeleton
Christchurch 1969–80	Urban	2 dog skeletons
Goldsmith St III, Exeter	Urban	Cat burial
The Hamel, Oxford	Urban	Cat skeleton in pit
Goldsmith St I-II, Exeter	Urban	Dog burial
Poole	Urban	Dog partial skeleton
Steward St, Spitalfields	Urban	Partial cat skeleton (9–12 months) in a pit
Chester Rd, Winchester	Urban	Partial dog skeleton
Exe Bridge, Exeter	Urban	Partial skeleton of cat
Exeter	Urban	Sparrowhawk partial skeleton
East Gate, Gloucester	Urban	2 partial cat skeletons
French Quarter, Southampton	Urban	Cat skeleton from cess pit
Aldersgate, London	Urban	Dog and cat partial skeletons thrown into ditch
Exeter	Urban	Goose and raven partial skeletons
High St, Guildford	Urban	Partial horse skull, cat skeleton and pig skull from separate pits
Goldsmith St I-II, Exeter	Urban	Partial pig burial; dog burial
Crown Hotel, Wimborne	Urban	Partial skeleton of dog; pig burial in pit *c* 2–4 months
Poole	Urban	Partial skeletons of 2 dogs, 10 cats, 3 kittens in pit
5–8 Fore St, Taunton	Urban	Partial skeletons of a puppy and mature dog found in separate pits
Mark Browns Wharf, London	Urban	2 dog skeletons
Taunton Priory	Urban	3 near complete dog skeletons buried close to each other in separate graves

4.3.2 Symbolism

The giving of symbolic animals as gifts has been observed in the historical literature for the Saxon and medieval phases, and it continues into the modern era (Albarella 2007, 143). Such gifts could encompass any type of animal, and their identification in the archaeological record can be ambiguous. However, the ownership of more exotic taxa would convey status and social power, of both the provider and recipient (Albarella 2007, 148). Examples of exotic animals gifted to recent British monarchs include a cheetah (from India to George III in 1764), and a giraffe (from the Pasha of Egypt to George IV in 1827), and gifts to Queen Elizabeth II include a canary from Germany, jaguars and sloths from Brazil, two beavers from Canada, two young giant turtles from the Seychelles and an elephant called Jumbo from the Cameroon, all of which were donated to London Zoo. The expansion of exploration and discovery in 16th century Europe was fundamental to a changing world view of the post-medieval population, and

the exhibition of exotic animals allowed this to be demonstrated to the wider public (Thomas 1983, 277). From the 16th century live exotica were commonly imported into menageries, the capture of wild animals, and removal from their natural home, symbolising man's dominion over the natural world (Albarella 2007, 144). This included the display of animals for pleasure and education in zoos, the power to ridicule using monkeys, and even to inflict death in the bear-baiting arena.

Once dead, animals could continue to be displayed, either through taxidermy, which emerged as an industry in the 19th century, or as a trophy (Pluskowski 2007, 44), preserving parts of a hunted animal to represent symbolically the size of, or danger presented by, the animal concerned. A series of antler trophies were discovered from post-medieval Castle Rising Castle, Norfolk (Jones *et al* 1997), which were identified from specific butchery marks. As well as the physical remains of animals, beloved pets were often immortalised through elegy, graves and memorials (Toms 2006; Walker-Meikle 2012, 102). The use of medieval parks as symbols of elite wealth, culture and access to natural resources has been observed in section 3.3. However, subtle changes took place during the post-medieval period, altering the nature of the use and symbolism that parks and their resources represented. The period of economic decline at the beginning of the late medieval phase made parks expensive to maintain and stock, leading to a reduction of deer numbers, and many went out of use (Williamson 1997, 93). From the later part of the 16th century the re-establishment of parks commenced, close to the home of the landowner (rather than as a hunting reserve as part of a disparate estate), where they could be enjoyed as a vista. An increase in the ages of fallow deer at this time has led to the supposition that they were again used as objects of imperialism and to exhibit control of the wild by the aristocracy (Sykes *et al* 2016). This is exemplified by the restriction of parkland to the elite, alongside increasing changes in the law to guard against poaching from deer parks, rabbit warrens and fish ponds (Williamson 1997, 100). Venison continued to be used as a marker of status, used for gift-giving by the elite, and as a symbol of their ability to eat 'varied and exotic food in abundance' (Williamson 1997, 106). It was not only parks that were brought closer to the aristocratic residence; dovecotes, fishponds and, to a lesser extent, rabbit warrens, were all constructed nearby, as features with aesthetic appeal, symbolising the perceived familiarity of the elite with the management of their estates (Williamson 1997, 109). However, by the end of the 18th century this outlook had changed, as the aristocracy became more influenced by industrialisation, consumerism and production. As a result the trimmings of animal husbandry such as dovecotes, warrens, fishponds and deer parks were removed from the gardens of the house, and managed landscape parks were constructed around the houses of the aristocracy (Williamson 1997, 109). This change is apparent in the dataset (Fig 4.14), where a decline in numbers of deer is considerable after the 18th century.

Although the post-medieval period had its religious roots firmly embedded in Christianity, some evidence exists for continuing ritual deposition of animal remains as closure deposits associated with lime kilns. Within the study area an assemblage of horse bones from a series of lime kilns at Staff College, Bracknell, was originally described as the remains of horses butchered to provide meat for

dogs. However, a series of similar 17th to 19th century deposits from Yorkshire (Catling 2008, 215) indicate that there may have been a more symbolic reason for this practice.

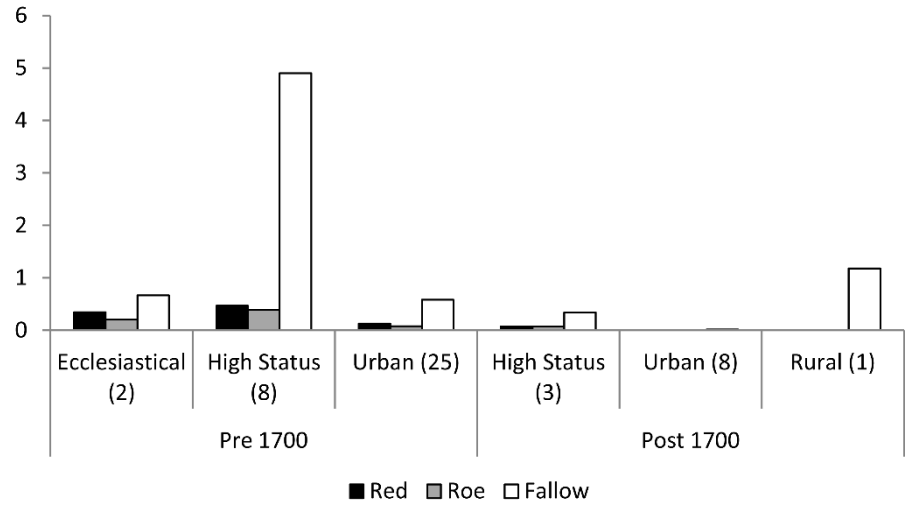

*Fig 4.14: Mean % of deer recorded at various site types pre- and post-1700. % given as a proportion of NISP cattle, sheep/goat and pig. Only sites (*n*) with >300 NISP cattle, sheep/goat and pig included*

4.3.3 Entertainment

Blood sports continued to play a vital role in the entertainment of the post-medieval population. Although absent from the dataset, a number of assemblages from London represent the remains of dog fights: dog skulls have been found at the Tower of London, one of which had two puncture marks in its cranium, suggesting it died as a result of fighting (O'Regan *et al* 2006, 392). Historical and archaeological sources at Benbow House, Southwark (Liddle 2000), indicate that this was the site of a building used for dog baiting, and a number of large dog skeletons morphologically consistent with mastiff-type animals were recorded, alongside many horse bones resulting from preparation of meat to feed dogs. At Rosherville, Gravesend, in Kent, recent discoveries have unearthed a bear pit in the Victorian pleasure gardens complete with cages and access for the keepers, and historical documents indicate that there was also a parrot house within the garden (Brown 2014, 7). There are numerous references to dog fights in London, with opponents including a panther, bears, bulls, an ass, a polar bear and a tiger (Jesse 1866, 358–9); however it is notable that the remains of the more exotic creatures are largely missing from the archaeological record. Cock fighting is evidenced at Greyfriars, Oxford, by a tarsometatarsal bone with a sawn-off spur that may have been replaced with one made of metal (West 1982, 258).

During the 18th century many estate owners had their own menageries (O'Regan 2002), but there is little direct evidence for them in the zooarchaeological record. By the 19th century the combination of an increase of the educated middle classes and the global expansion of the British Empire led to the establishment of the Zoological Society of London. This led to the foundation of London Zoo in 1830, stocked with animals from the Tower of

London menagerie (Brown 2014; O'Regan 2002). Numerous (short-lived) zoos and zoological gardens followed, including those in Surrey, Brighton, Gloucestershire and Kent within the study area. While the display of animals here was for observation and education, rather than sport, a number of the smaller zoological gardens continued to put on spectacles such as bear baiting. Related to the theme of public education is the deposit of exotic species including raccoon and manatee recorded at the First Ashmolean Museum site, the former of which may have been on public display (Hamilton-Dyer 2003b, 18). Despite documentary evidence for diverse animals such as camels, monkeys, lizards, turtles, buffaloes, macaws, zebra, tigers, lions, rhinoceros and elephants (Thomas 1983, 277), very few have been recorded zooarchaeologically. The remains of exotic animals within the dataset include a Barbary ape recorded in post-medieval London and a capuchin monkey from 17th-century Brooks Wharf, London (Armitage 1981), as well as the 19th-century tortoise from Stafford Castle discussed in section 4.3.1 (Thomas 2010), and the manatee and raccoon that are more likely to represent the emergence of scientific endeavour (*see* section 4.3.4).

Hunting, too, remained an important part of the aristocratic lifestyle, and successive forest and game laws were passed to make it increasingly inaccessible to those of lower status (de Belin 2013, 8). At the beginning of the period deer continued to be hunted in royal forests and private parks, with dogs and horses and on foot (de Belin 2013, 6–23). However, the disappearance of habitats suitable for deer, and their over-hunting, meant that, by the middle of the 18th century, fox hunting took over as the most common form of the hunt (de Belin 2013, 58). This move was related to the changing nature of the estates of the aristocracy, and is reflected in the decline in deer remains from this period (Fig 4.14).

Although the advent of fox hunting led to an increasing emphasis on horses as the prized animal, there is little in the archaeological record to reflect this. The proportion of horse remains at high-status sites increases dramatically (Fig 4.15) but this is due to the very high proportion of bones from The South Lawn, Michelham Priory, which were largely from working horses used instead of cattle on the estate, and Mount House, Witney, which are related to a deposit of animals fed to hounds (*see* section 4.4.4). With these two unusual sites removed, the proportion of horses at high-status sites is similar to that at other site types. Dogs, too, appear more common at high-status sites, although there is a considerable decrease in numbers from the preceding phase (Fig 4.15). However, if the assemblage from Mount House, Witney, from which a number of butchered dog bones were found in association with the horse bones describedpreviously (Wilson and Edwards 1993, 54), is excluded, there is no difference between the proportion of dogs at ecclesiastical or high-status sites, dogs instead being more common in urban contexts.

Hunting with birds of prey may also have remained solely in the domain of the elite, as all traditional falconry birds are recorded at high-status sites (Table 4.4). Related to this is the recovery of commonly hunted wild birds in greatest proportions at high-status and ecclesiastical sites (Figs 4.7 and 4.8), as are deer, hare and rabbit (Fig 4.10).

The final consideration given to entertainment in this section relates to horse racing. It is in the post-medieval period that this sport developed into a form similar to that practised today (de Belin 2013, 111). It coincided with the period when the 'improvement' of breeds came to the fore, with horses selectively bred for racing. The *Fower Chiefest Offices Belongyng to Horsemanshippe* by Blundeville (1565) recommended the use of Turk or Barb stallions for breeding race horses. Breeding programmes were encouraged and often taken up with enthusiasm by the aristocracy, and eventually led to the development of the thoroughbred breed in the 18th century (de Belin 2013, 113–14).

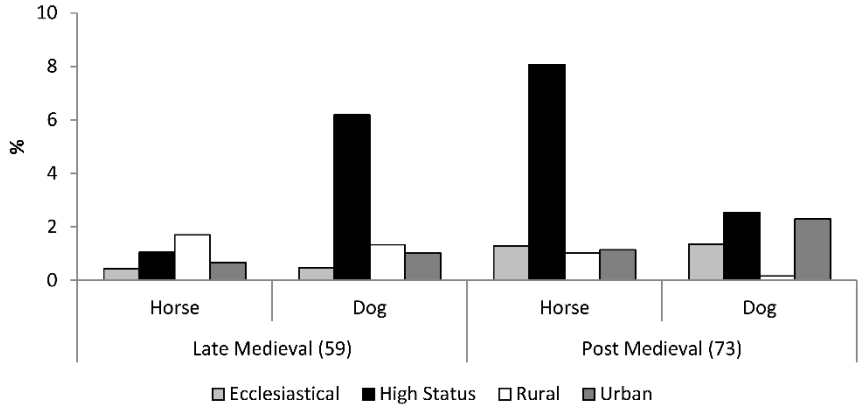

*Fig 4.15: Mean proportion of horse and dog remains (% given as proportion of NISP cattle, sheep/goat and pig). Only sites (*n*) >300 NISP cattle, sheep/goat and pig are included*

Table 4.4: Recorded presence of falconry birds from post-medieval sites within the study region

Site	Site type	Goshawk	Peregrine falcon	Sparrowhawk
Middleton Stoney	High status			*
Nonsuch Palace	High status		*	
Nonsuch Palace	High status		*	
Battle Abbey	High status	*		

4.3.4 Scientific Enquiry

One of the distinctive areas of advancement in the post-medieval period was the sphere of natural philosophy, which played a considerable role in the emergence of the age of enlightenment. Animals were crucial in the exploration of and experimentation on the workings of the body, made easier by the view in the earlier part of the period that animals were 'beast-machines' that could not feel pain (Thomas 1983, 33) (*see* section 4.3.1). This is exemplified by the experiments of William Harvey, who was one of the first to apply scientific method to medicine, correcting the understanding of blood circulation in the early 17th century (Guerrini 2007, 123). Dissection was also common at this time, and became a form of entertainment in the early part of the period,

advertised in the newspapers, although it fell from favour in the 18th century following changes in attitudes towards animal rights (Guerrini 2007, 136). Excavations at the Royal London Hospital, the site of a medical college and anatomy school in the 19th century, produced a considerable assemblage of animal remains bearing marks of dissection (and probably vivisection) (Morris *et al* 2011). Finds from this site include the associated bone groups of a large number of dogs, cattle, sheep, horse, cat, monkey, hare, rabbit, hedgehog, tortoise and plaice, with frequent evidence for scalpel marks. A large assemblage of dog bones from the First Ashmolean Museum were also possibly from the subjects of experiments, and they and the manatee bone (most likely from a prepared specimen) (*see* section 4.3.3) are more likely to have been used in the anatomy school than in the museum (Hamilton-Dyer 2003b, 18).

Scientific exploration of animals was not restricted to the anatomy schools, but took place in the countryside in the form of the Agricultural Revolution. Although the timing of this phenomenon is disputed (Albarella 1997, 20–1; Thomas 2005c, 77), it led to the selective breeding of the main domesticates (cattle, sheep and pigs) with an emphasis on meat production (Raber 2007, 83), which will be explored further in section 4.6.

4.4 Animal Husbandry

4.4.1 Cattle

Highly varied mortality data were recorded, particularly at urban sites, with evidence ranging from mostly adult and elderly animals that would have been important for secondary products, to assemblages where very young cattle, even calves, predominate (Fig 4.16 and Table 4.5). At ecclesiastical and high-status sites younger animals are more common, either as assemblages where animals were largely culled for meat, or, more often, where a mixture of prime meat age and older animals used for secondary products were recorded. At two sites (Carisbrooke Castle and Winchester Palace) elderly animals predominated. The proportion of sites with old animals increases at lower status settlements, with all but one assemblage (Sutton Park, Guildford) containing mostly adult and/or elderly cattle. The only evidence for neonatal animals came from high-status and urban settlements and, although this may imply that animals were bred at these sites, it is possible that this represents a move towards the consumption of very young animals as a delicacy. If the proportion of sites where calves are recorded is also considered, there is a definite trend towards their recovery at elite (46% of ecclesiastical and high-status) and urban (67%) sites, while they are noted in only 17% of rural assemblages. This is consistent with a similar increase observed in the late medieval period (*see* section 3.4.1), whereby a change in husbandry regimes occurs. The use of cattle as plough animals gives way to use where dairy production becomes more important to the economy, producing veal calves as a result (Albarella 1997, 22). This is reflected by the predominance of cows in all but one assemblage (Fig 4.17).

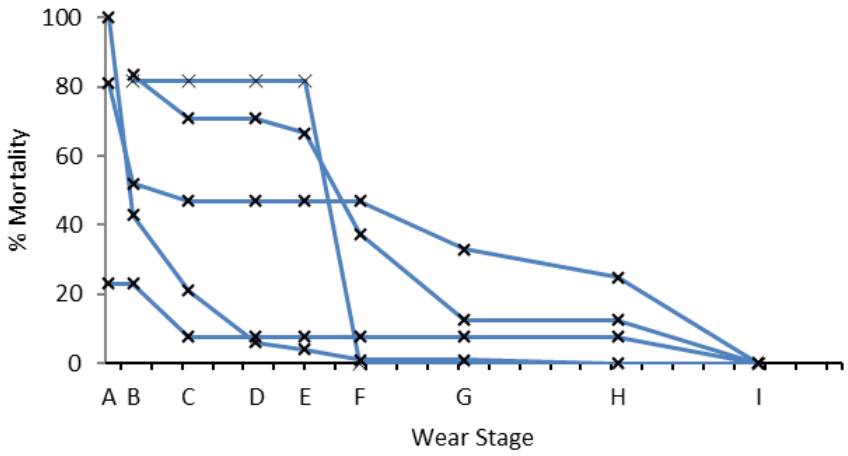

Fig 4.16: Post-medieval cattle tooth-wear data (after Hambleton 1999). Each line represents a single urban site

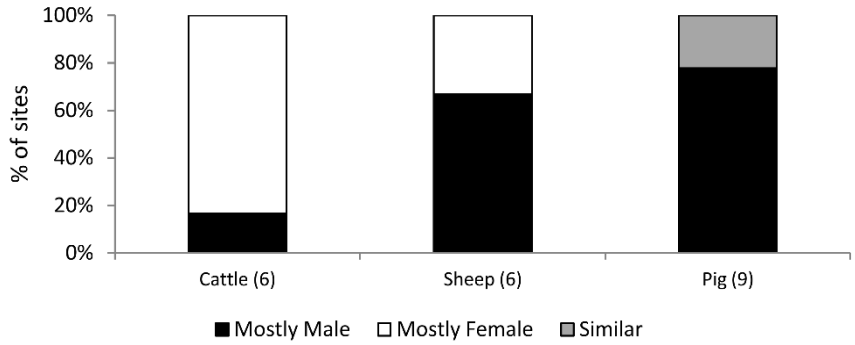

Fig 4.17: Proportion of bulls and cows, rams and ewes, boars and sows recorded from post-medieval sites. (n)*= number of sites where such information was available.* See *section 1.7.3 for methods used*

Table 4.5: Cattle age data for the post-medieval period taken from fusion data and summaries within the text of site reports. Records of neonatal/calf bones and teeth are isolated, as they were often recorded separately, and may not be evident in fusion or tooth-wear data due to preservation and recording methods

Age group	Ecclesiastical	High status	Rural	Urban
Mostly juvenile				3
Mostly immature				2
Mostly calves and young adult		1		2
Mostly juvenile and subadult				1
Mostly young adult	1			1
Mostly young adult and adult	1			5
Mostly subadult and adult				4
All ages		3		2
Mostly adult	1	5	2	4
Mostly sub/young adult and elderly		1	1	2
Mostly adult and elderly			1	6
Mostly elderly		2	2	7
Neonatal		1		7
Calf	3	4	1	26

4.4.2 Sheep

There is less inter-site variation in the sheep mortality data than observed for cattle. At elite and urban sites animals were apparently culled either as adults (after providing wool, milk and/or manure for many years), or as a mixture of adults and sub/young adults at prime meat age (Table 4.6 and Fig 4.18). This is not a particularly surprising strategy, given the continued importance of the wool trade in England (Albarella 1997, 24). Rural settlements did not follow this trend, instead two (Silver St, Glastonbury, and the Old Bakery, Shapwick) of the five with relevant data exhibited a predominance of young animals suitable for meat production, and at another two (Glastonbury Great Barn and Shapwick Park) elderly animals that would have produced several years' worth of wool or milk were dominant. These sites were in close proximity to each other, and it perhaps highlights the extent of local variation in rural husbandry strategies. The exploitation of sheep for wool is reflected in the predominance of male animals in four out of the six available sites (Fig 4.17).

Despite the importance of sheep for wool, neonatal and young lambs are recorded at nearly all elite (95%), 50% of urban and 40% of rural sites (Table 4.6). Given the likely consumer demand for veal, it may also indicate an increase in the consumption of very young lambs.

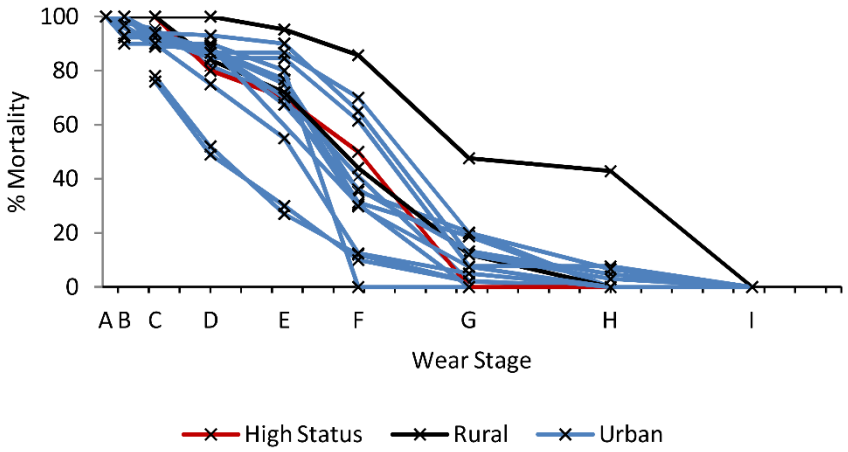

Fig 4.18: Post-medieval sheep tooth-wear data (after Hambleton 1999). Each line represents a single site

Table 4.6: Sheep/goat age data for the post-medieval period taken from fusion data and summaries within the text of site reports. Records of neonatal/lamb bones and teeth are isolated, as they were often recorded separately, and may not be evident in fusion or tooth-wear data due to preservation and recording methods

Age group	Ecclesiastical	High status	Rural	Urban
Mostly juvenile				1
Mostly immature			1	
Mostly young adult			1	
Mostly subadult and adult				2
Mostly young adult and adult	2	1	1	5
All ages		1		
Mostly adult		2		7
Mostly sub/young adult and elderly		2		3
Mostly adult and elderly	1	4		6
Mostly elderly			2	9
Neonatal		1		3
Lamb	3	9	2	17

4.4.3 Pig

With the exception of Shapwick House Moat, where there was evidence for older pigs, possibly used for breeding, pigs were always culled for meat (Fig 4.19 and Table 4.7). Seven of the nine sites with sexing data recorded a predominance of male animals (Fig 4.19). It is possible that this represents the marketing of young boars to towns for people to fatten at home, with breeding sows and younger females kept back by the producers. The two sites where males and females are present in similar numbers are both rural (Sutton Park, Guildford, and Silver St, Glastonbury), all other sites where males are predominant being urban. This has also been observed at Wallingford, Oxfordshire (Holmes 2013b, 370).

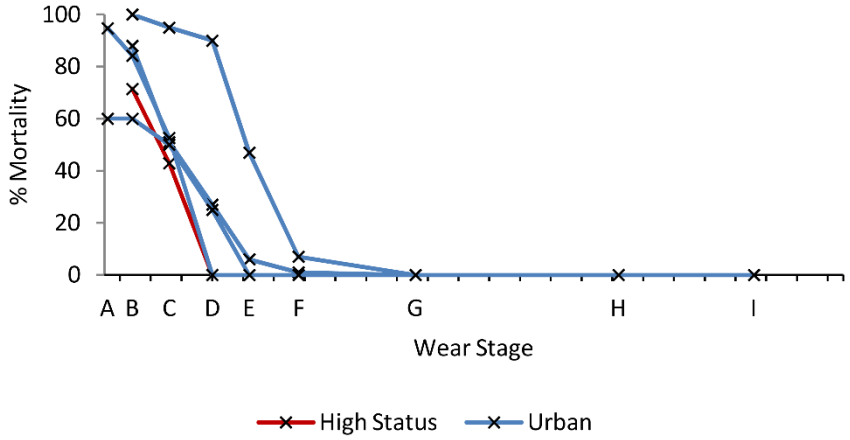

Fig 4.19: Post-medieval pig tooth-wear data (after Hambleton 1999). Each line represents a single site

Table 4.7: Pig age data for the post-medieval period taken from fusion data and summaries within the text of site reports. Records of neonatal/piglet bones and teeth are isolated, as they were often recorded separately, and may not be evident in fusion or tooth-wear data due to preservation and recording methods

Age group	Ecclesiastical	High status	Rural	Urban
Mostly juvenile				5
Mostly immature				4
Mostly juvenile and subadult		1		1
Mostly subadult	3	5	3	9
Mostly subadult and young adult				1
Mostly young adult		4	1	1
Mostly young adult and adult		1		
Neonatal	1	1		2
Piglet	3	5	3	12

4.4.4 Other Animals

Where such data were available, horses were generally all mature at death (Table 4.8). A small number of juvenile animals was recorded, including those

from two high-status sites (Michelham Priory and Middleton Stoney) that may relate to the increasing interest in horse breeding by the aristocracy (Clutton-Brock 1992, 173). The trend for largely mature horses is consistent with their continuing use for transport, ploughing, draught and traction. Henry VIII was particularly interested in improving the horse stock in England, and set breeding restrictions on mares and stallions that were below minimum sizes of 13 hands and 15 hands, respectively (Clutton-Brock 1992, 156), suggesting that at the beginning of the post-medieval period animals were still not very large by today's standards. It is likely that the majority of horses were of a similar type, useful for warfare, hunting and travelling (Abrehart 2014, 29). By the end of the period, however, there was greater variation: Shire horses bred in the midlands were considerably larger, and were particularly valued for their role in ploughing and pulling carts (Clutton-Brock 1992, 159); riding horses became lighter and faster; carriage horses were tall and strong; and the modern thoroughbred was developed for racing (Abrehart 2014, 30). Animals over 16 hands were recovered from Witney Palace in the 18th century, and a recent study by Abrehart has shown a significant increase in the size of horses in London from the 17th century (Abrehart 2014, 13).

Although the consumption of horsemeat has a long history of being rejected in England (Harris 1986, 103), there is historical evidence that in the 19th century there was a short-lived, ineffective movement to promote horsemeat, *chevaline*, with sponsored dinners and the formation of a Society for the Propagation of Horseflesh as an Article of Food (Harris 1986, 103; Simoons 1978, 181). Within the dataset butchery of horse bones is rarely observed, although it is recorded in similar proportions at high-status and urban sites in both late and post-medieval phases, while declining at rural sites in the latter period (Fig 4.20). Of the butchered bones noted, only one from The South Lawn, Michelham Priory, was dated to the 19th century, so the attempt to make *chevaline* culturally acceptable is (perhaps unsurprisingly) not obvious from the archaeological record. Many butchery marks noted on horse bones are consistent with disarticulation and filleting (Table 4.9) and, while some may relate to the human consumption of horseflesh, others more likely reflect their use for dog food. For example, the probable knackering of carcasses for hounds is represented by assemblages from Witney Palace, Oxfordshire (Wilson and Edwards 1993), Dudley Castle, West Midlands (Thomas and Locock 2000), and possibly at Staff College, Bracknell, Berkshire (Holmes 2007c; but *see* section 4.3.2).

Dogs were distinguished by their uses, and by 1576 Dr John Caius wrote of a number of types in his treatise *Of Englishe Dogges*. These included hounds (terriers, bloodhounds), hunting dogs (greyhounds), hawking or falconry dogs (spaniels, setters), country dogs (mastiffs, sheepdogs) and degenerates (Rottweilers, turnespite, which was a small dog with short legs used to power a wheel to turn meat on a spit). In 1613 Markham also wrote of the diverse numbers of dog types common in England in his book *Country Contentments*, noting additional types such as the beagle, and advising on the type of animals best suited to hunting specific game. It is of note that one of the criteria for selecting dogs for the kennels of the elite included the animals' colour (Jesse 1866, 323). By the end of the period the Kennel Club was founded, which

defined the makings of recognised breeds through coat type, colour and temperament, as well as conformation: variables that zooarchaeological analyses are unable to take into account. Nonetheless, a small study of three post-medieval dogs from Cambridgeshire and Birmingham using discriminant analysis indicated animals similar to Great Dane, wolfhound and mastiff breeds (Phillips *et al* 2009). Small dogs, too, are often recorded, many described as lap dogs, which are historically documented (*see* section 4.3.1). Small types of hunting dogs were also developed by the end of the 19th century, such as the Sealyham and West Highland terrier, both of which would have stood under 30cm tall (Sadler 1994).

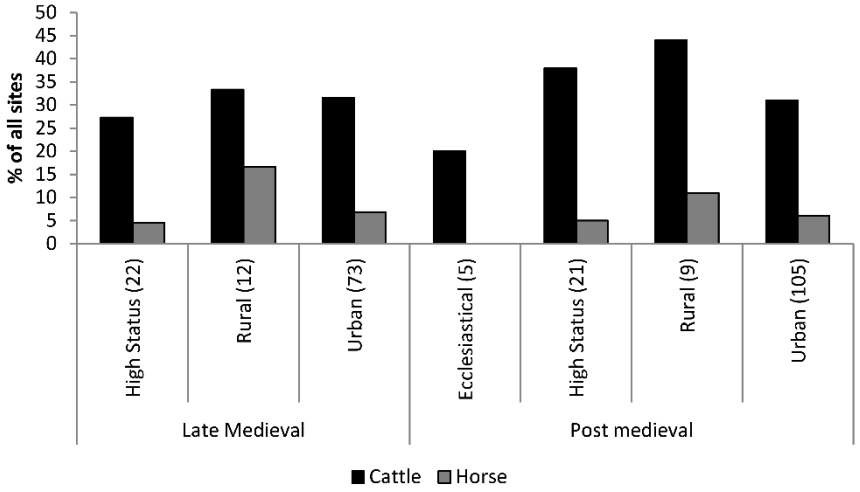

*Fig4.20: Proportion of all sites in the database with evidence for butchery of horse and cattle remains. Only chop and cut marks relating to disarticulation, jointing and filleting are included, excluding those indicative of skinning or bone working. (*n*)= total number of sites in the butchery database*

Table 4.8: Age of horses where given

Site	Site type	Mostly adult	Some juvenile
Hospital of St Mary of Ospringe	Ecclesiastical	*	
The South Lawn, Michelham Priory	High status	*	*
Middleton Stoney	High status	*	*
Silver St, Glastonbury	Rural	*	
Staff College, Bracknell	Rural	*	
Charter Quay, Kingston-Upon-Thames	Urban	*	
French Quarter, Southampton	Urban	*	
Mark Browns Wharf, London	Urban	*	
Abingdon West Central Redevelopment	Urban	*	*

Table 4.9: Incidence of butchery on non-food species. B= butchery (i.e. disarticulation and/or filleting); S= skinning

Site	Site type	Horse		Dog		Cat
		B	S	B	S	S
Battle Abbey	High status			*	*	
Camber Castle	High status	*			*	*
Middleton Stoney	High status	*				
The South Lawn, Michelham Priory	High status	*				
Mount House, Witney	Rural			*		
Staff College, Bracknell	Rural	*				
Charter Quay, Kingston-Upon-Thames	Urban	*	*			
Chester Rd, Winchester	Urban		*			
East Gate, Gloucester	Urban	*		*		
Exe Bridge, Exeter	Urban	*				
Exe Bridge, Exeter	Urban	*				
Finsbury Pavement, London	Urban	*		*		
First Ashmolean Museum, Oxford	Urban			*		
Launceston Castle	Urban			*		
Mark Browns Wharf, London	Urban	*				
Taunton Priory	Urban			*		

4.5 Redistribution of Animals and Animal Products

4.5.1 Body Parts

The majority of post-medieval cattle and sheep assemblages were dominated by meat-bearing limb bones, particularly at ecclesiastical and high-status sites (Figs 4.21 and 4.22, and Tables 4.10 and 4.11). Rural and urban settlements were more likely to contain processing waste and evidence for the use of whole carcasses. This suggests that there was a considerable increase in the redistribution of carcass parts at all sites from the late medieval phase (Figs 3.46 and 3.47), and the role of elite sites as consumers became more pronounced. The move away from processing live animals or complete carcasses was well-established, even at rural sites, as specialist butchers, craft workers and industrial processes became more common (see 4.5.2 and 4.5.3).

As in the medieval period, pigs appear to be treated differently (Fig 4.23). This is most likely to do with the high utility value of these animals, whereby all carcass parts have some food value, from the head to the trotters. Indeed, the predominance of pig heads at seven out of nine high-status sites (Table 4.12) implies that they were particularly sought after by the secular elite. While an alternative explanation could be the differential preservation of body parts, the assemblages are recorded from a number of regions (Little Pickle, Surrey;

Carisbrooke Castle, Isle of Wight; Shapwick, Somerset; Linacre Garden, Canterbury; and Battle Abbey, Sussex) and a variety of underlying geologies (clay and limestone/sandstone), which suggests that there may be a real preference for pig heads by the aristocracy.

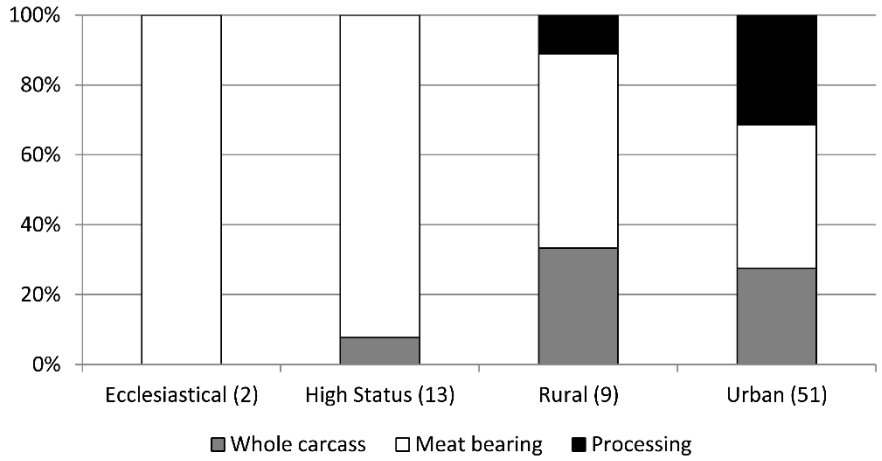

*Fig4.21: Cattle carcass part representation by phase and site type. Processing waste= predominance of horn cores, head and/or feet. As a % of all recorded anatomical elements. (*n*)= number of sites included*

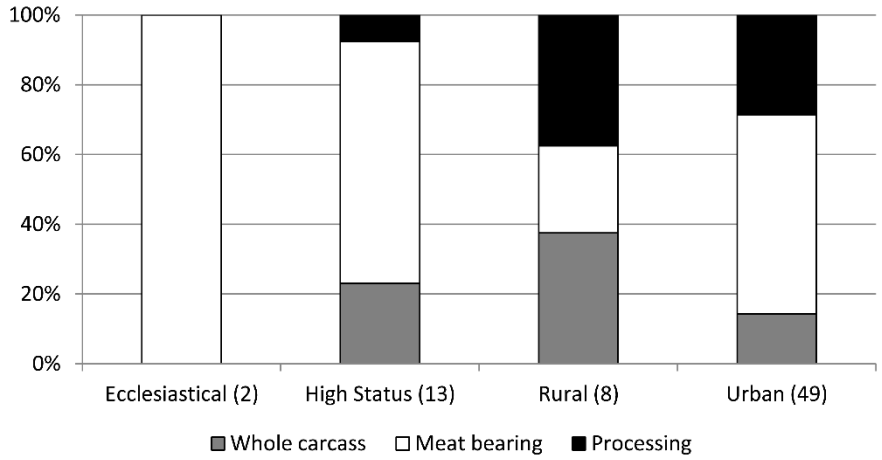

*Fig4.22: Sheep/goat carcass part representation by phase and site type. Processing waste= predominance of horn cores, head and/or feet. As a % of all recorded anatomical elements. (*n*)= number of sites included*

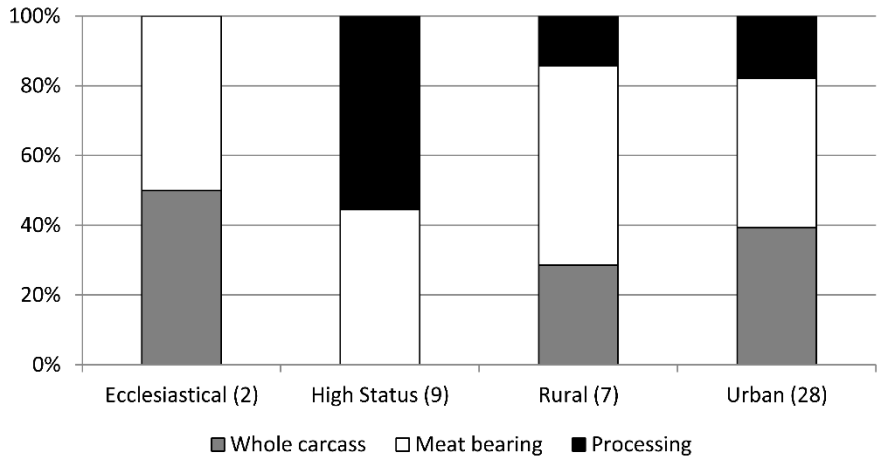

*Fig4.23: Pig carcass part representation by phase and site type. Processing waste= predominance of horn cores, head and/or feet. As a % of all recorded anatomical elements. (*n*)= number of sites included*

Table 4.10: Cattle carcass parts represented at post-medieval sites. See *section 1.7.4 for descriptions of carcass parts*

Anatomical elements	E	HS	R	U
All carcass parts		1	3	14
Mostly meat-bearing and head		7	2	9
Mostly meat-bearing bones		2	3	9
Dressed carcass	2	3		3
Mostly horn cores				3
Mostly lower limbs				4
Mostly feet and horn cores				1
Mostly lower limbs and head			1	7
Mostly head and horn cores				1

Table 4.11: Sheep/goat carcass parts represented at post-medieval sites. See *section 1.7.4 for descriptions of carcass parts*

Anatomical elements	E	HS	R	U
All carcass parts		3	3	7
Mostly meat-bearing and head	2	5	1	12
Mostly meat-bearing bones		3		9
Dressed carcass		1	1	7
Mostly lower limbs		1		4
Mostly feet and horn cores				1
Mostly lower limbs and head			1	7
Mostly head and horn cores			2	2

Table 4.12: Pig carcass parts represented at post-medieval sites. See *section 1.7.4 for descriptions of carcass parts*

Anatomical elements	E	HS	R	U
All carcass parts	1		2	11
Mostly meat-bearing and head		1		4
Mostly meat-bearing bones		1	4	4
Mostly lower limbs		1		
Mostly lower limbs and head	1	1		4
Mostly head		5	1	5

4.5.2 Butchery

As well as specific deposits of butcher's waste, some information may be inferred directly from bones of a more domestic origin. There is a small increase in this period in the proportion of saw marks (Table 4.13), which implies a greater reliance on these implements in the butchery process. Interestingly, although the proportion of long bones recorded as split longitudinally increases from the late medieval phase, the number of reports that record this as marrow extraction declines, perhaps suggesting a reluctance for specialists to identify this practice in later periods.

The splitting of vertebrae is less often observed than in previous phases (Table 4.14). Of those cases specifically recorded to direction and location, midline butchery was most common, suggesting that paramedial splitting of the carcass was slightly in decline.

*Table 4.13: Proportion of butchery marks recorded at post-medieval sites. *Due to the highly variable nature of the recording of butchery, records may be reported at site level and summarised for each period, or they may be detailed by sub-phase, and therefore more than one account be made available for a single site*

Butchery	Late medieval	Post-medieval
N records*	36	70
Knife	28%	26%
Chop	33%	30%
Saw	8%	14%
Longitudinal	8%	11%
Transverse	6%	3%
Marrow	17%	9%
Vertebrae split	56%	36%
Skull Split	42%	24%

Table 4.14: Number of records of specific vertebral butchery

Vertebral butchery	Late medieval	Post-medieval
Paramedial	4	3
Midline	4	4
Bilateral	3	1

4.5.3 Craft and Industrial Processing

As in the late medieval phase, evidence for the redistribution of carcass parts relating to primary butchery, skin-processing and horn-working waste comes largely from urban contexts (Tables 4.10–4.12 and 4.15). Exceptions occur at rural Dean Court, Cumnor (cattle metapodials and heads and sheep heads), and Staff College, Bracknell (primary butchery waste), high-status Wickham Glebe (sheep and pig lower limbs) and ecclesiastical St Gregory's Priory, Canterbury (large numbers of cattle metapodials), all of which are indicative of either primary butchery or skin-processing waste. The presence of antler- and horn-working waste at Okehampton Castle and Benham's Garage, respectively, implies a continuation of artisan production at these sites from the medieval period (*see* section 3.5.3), or possibly a mixing of deposits.

Specific, discrete, industrial assemblages have been described at a number of sites, although interpretations vary depending on context and the specific nature of the assemblage. Large deposits of horn cores at Aldgate 1974 and Aldersgate in London, and Benham's Garage, Taunton, have been interpreted variably as skin-processing and/or butchery refuse, as were the large number of cattle heads recorded at The Foundry, Poole. Possible skin-processing or horner sites are identified from high numbers of horn cores from Exe Bridge, Exeter, Albany and Greyhound Hotel Site, Fordingbridge, and Tudor St, Exeter. At 14 Farringdon St and Cutler St Warehouses, London (not in the data set), horn cores also predominate, and the focus is said to be on horn-working, particularly as the latter came from a known horn-working area (Armitage 1979c). Concentrations of horn cores have also been recorded at Church St, West Ham (Jones 1993), 2–4 Colchester St, London (Sygrave 2005), and Silver St and High St, Taunton (Burrow 1988a, 1988b), whose site reports were either not available to the author to catalogue, or contained assemblages less than the 100 NISP.

Varied interpretations are also given to explain the excavation of large numbers of metapodials and phalanges: those from Staff College, Bracknell, Victoria Rd, Winchester, King Stable St, Eton, Finsbury Pavement, London, and the Old Clothing Factory, Abingdon, are described as skin-processing and/or butchery sites, while those recovered at Exe Bridge, Exeter, Abingdon West Central Redevelopment, Tanner's Hall, Gloucester, Charter Quay, Kingston-Upon-Thames and Dorchester (Davis 1987b) are described as purely skin-processing waste. Excavations at Elverton St, Westminster, uncovered a horse burial ground that indicates some form of organised burial in London, probably used by the butchers of Westminster (Cowie and Pipe 1998). A number of bones bore skinning marks, and it is likely that horse hides were widely utilised for leather. Within the dataset a number of dog and cat bones from urban sites exhibited skinning marks (Table 4.9), and it is likely that their skins were also processed.

A link between the processing of horse and cattle hides has recently been established at a number of tanning sites (Yeomans 2006, 38), and various horse bones are typically found associated with cattle horn cores (for example Baxter 1996, 79). Different disposal pathways are evident for cattle and horse carcasses. A greater range of horse bones are commonly recorded at skin-processing sites, which probably relates to the nature of horsemeat as taboo; carcasses were therefore less likely to have been disarticulated and used for food as was the case with cattle. Although the trade in furs from the Baltic declined at the end of the medieval period, the 17th and 18th centuries saw vast amounts of fur imported from America and Canada (Richards 2003, 492). The few fur-bearing wild taxa recorded in the dataset may also have been utilised for their pelts, or killed as pests (Table 4.16).

Other industrial processes are represented by antler offcuts at Aldersgate, London; bone working offcuts at Aldgate 1974, London; manufacturing of pinners bones at Battle Bridge Lane, Southwark, and Creedy's Yard, Greenwich; and dice-making refuse from 199 Borough High St, London. A 17th- to 18th-century fan-makers workshop has also been identified at Blackfriars, London, from bone, ivory and tortoiseshell offcuts (Crossley 1990, 221).

The use of animal bone and horn as building materials is peculiar to the post-medieval period between the 17th and 18th centuries (Armitage 1989b, 154). It is recorded throughout Oxfordshire and the south-east, where horns and bones recovered from cattle, horses and sheep following butchery, skin-processing and horn-working were utilised in a number of imaginative ways. Examples of metapodials used for flooring are prolific throughout Oxford (Antiquity Hall, 19 Holywell St, Broad St, The Hamel, Logic Lane, George St and St Aldates), the village of Cumnor (Armitage 1989a), The Thames Crossing (Wilson *et al* 1984) and Hollybush Row, Oxfordshire. They are also recorded at King John's House, Romsey (Bourdillon 1990), 151–153 Bermondsey St, Southwark (Wooldridge 2003), Wantage, Salisbury, and Downton, Wiltshire (Armitage 1989a). Horn-core lined pits are noted at Greyfriars, Oxford, 100–104 Bermondsey St, Southwark (Killock 1999), Cutler's Gardens, Cresswell, and Mansell St, Gardners Cottage and 6–7 Crescent in London (Armitage 1989a). Horn cores have also been used for walling at Cutler St Warehouses, London (Armitage 1979c), and St Albans, Hertfordshire (Armitage 1989a). Land drains constructed from a large quantity of horse limb bones at Fishbourne, West Sussex (Manly 2001), horn cores at Greyfriars, Oxford, Greenwich High Rd, London (Salvagno 2012), and 28–32 Upsdell Ave, London, and horse and cattle limb bones at Calcot Park, Hertfordshire (Armitage 1989a), have also been recorded.

Table 4.15: Recorded presence of craft and industrial activity from site reports

Site	Site type	Antler	Horn	Skin	Horn/skin	Butchery	Butchery/skin	Bone	Notes
Benham's Garage, Taunton	High status		*						
Okehampton Castle	High status	*							
Staff College, Bracknell	Rural					*			
14 Farringdon St, London	Urban		*			*			
199 Borough High St, London	Urban							*	Dice
67–69 St Thomas' St, Oxford	Urban			*		*			
Abingdon West Central Redevelopment	Urban			*					
Albany and Greyhound Hotel, Fordingbridge	Urban			*					
Aldersgate, London	Urban	*			*				
Aldgate 1974, London	Urban				*			*	
Battle Bridge Lane, Southwark	Urban							*	Pinner
Bridge St East	Urban				*				
Charter Quay, Kingston-Upon-Thames	Urban			*					
Creedy's Yard, Greenwich	Urban							*	Pinner
Finsbury Pavement, London	Urban					*			
King Stable St, Eton	Urban				*				
Old Clothing Factory, Abingdon	Urban					*			
Postern Mill, Malmesbury	Urban						*		
Tanner's Hall, Gloucester	Urban			*					
Tudor St, Exeter	Urban			*					
Victoria Rd, Winchester	Urban						*		

Table 4.16: Sites from which minor wild fur-bearing species were recorded

Site	Site type	Fox	Badger	Mole	Ferret	Weasel	Stoat	Polecat
Eynsham Abbey, Oxfordshire	Ecclesiastical	*		*				
Camber Castle	High status	*		*	*			
Wickham Glebe	High status	*						
Mount House, Witney	High status		*					
Battle Abbey	High status		*					
Nonsuch Palace	High status			*	*	*	*	
Berry Pomeroy Castle	High status						*	
Launceston Castle	Urban	*	*					
14 Farringdon St, London	Urban	*						
East Gate, Gloucester	Urban	*						
Mill Rd, Winchelsea	Urban	*						
First Ashmolean Museum, Oxford	Urban		*					
The Hamel, Oxford	Urban			*				
Lewes Castle	Urban							*
31–34 Church St, St Ebbes, Oxford	Urban							*

4.6 Inter-Site Analysis

The redistribution of meat and raw materials is widespread in this period. Both secular and ecclesiastical elite populations appear to have predominantly brought in joints of beef and lamb, while rural and urban assemblages show more variation, with deposits of predominantly meat-bearing bones, whole carcasses or processing waste all recorded at towns and villages. This reflects the increase in commercial trade, where the elite, and some sections of urban society, could distance themselves from the production of food. This is also exemplified by the expanding trade in very young animals: veal, lamb and piglets at urban and high-status sites.

In terms of diet, although pork, beef and mutton were widely available to all levels of the population, the aristocracy showed their status through the use of particular cuisines, from the number of courses to be served to the use of new and expensive spices (Albala 2003, 164–84). The traditional sports of hunting and falconry remained popular with the secular elite (albeit with a change in emphasis towards fox hunting), and wild and domestic birds, fallow deer and rabbits were more often recorded at high-status sites. A few sites stand out as exceptional, such as the high-status Nonsuch Palace, Surrey, Carisbrooke Castle on the Isle of Wight, and St Gregory's Priory, Canterbury, all of which have animal bone assemblages consistent with feasting, in the quantity and diversity of wild animals and birds consumed. As with certain bird species in the previous phase, the presence of rabbits in the post-medieval period saw a shift from largely high-status sites to lower status settlements such as the Old Bakery, Shapwick, as they became increasingly available, and therefore less of a status symbol.

The increase in sheep in the economy is notable, and represents the continuing reliance on sheep for their wool as well as their suitability to be used in conjunction with arable-based agriculture, being valuable for manure, whilst amenable to living on marginal lands. Cattle decline in abundance as land was taken over for crop production to feed the growing population.

Flourishing urban trades and industries are well documented in this period (Crossley 1990, 84), exemplified by the numerous deposits of waste from horn- and bone-working, skin-processing and butchery in the dataset. Yeomans (2006, 229–31) has written on the relationships between butchers, skin-processers and horners, and it is apparent that skins and hides would most often be bought from local butchers, but also fellmongers, supplying them from further afield. Horn-workers would buy horn from tanners, who would have first removed the horn core. In the 16th century there was considerable movement of industrial activities from within the city of London to the suburbs, as the population increased in central areas and the suburbs expanded, a phenomenon that can be observed in numerous other towns, for example Leicester and Northampton (Yeomans 2007, 99).

Although small-horned cattle were not recorded from late medieval sites, they are again present in the post-medieval period, though not as often as short-, medium- and long-horned animals (Table 4.17). The increase in long-horned animals is consistent with the recorded production of such animals in newly emerging selective breeding programmes (*see* section 5.5). It was observed in the high and late medieval phases that high-status sites were more likely to yield larger animals than sites of lower status. In the post-medieval period, high-status sites at Wickham Glebe and Camber Castle contain cattle and sheep considered to be larger than those from contemporary sites, but this is no longer a trend peculiar to high-status sites, as larger animals are also observed at urban sites (29 Thames St and Aldgate 1974, London, and East Gate, Gloucester). The documented 'improvement' in stock that took place elsewhere in Britain in this period (Davis and Beckett 1999, 14; Thomas 2005c, 82) can be observed in the study area. The animals from a number of sites are recorded as being larger than those from earlier phases (for example Exe Bridge, East Gate, Gloucester; Christchurch 1981–83; French Quarter, Southampton; Exeter; The Hamel, Oxford; 31–34 Church St, Oxford; Aldersgate, London; Citizen House, Bath; Creedy's Yard, Greenwich; Camber Castle; and Launceston Castle). When comparing the relative size of animals between sites or periods, it is important to consider that the selective breeding of animals documented historically may not have produced larger animals, but animals that matured faster. A study carried out by Turner *et al* (2001) used historical farm records and evidence from agricultural manuals to suggest that modern breeds took just 2 years to get to market weight, rather than the 4 years previously required (Turner *et al* 2001, 193). However, Clutton-Brock (1976b) describes novel contemporary scale models sponsored by the Board of Agriculture and made by George Garrard, which give some idea of the 'improved' types of cattle, sheep and pigs resulting from the programme of selective breeding in the 18th century.

Table 4.17: Number of records of different types of cattle for the post-medieval period

Period	Polled	Small-horned	Short-horned	Medium-horned	Long-horned
Late medieval			9	4	1
Post-medieval		3	8	7	8

5 REVIEW OF THE MAJOR THEMES

This chapter will consider the major historical, archaeological and zooarchaeological themes described in preceding chapters, and diachronic modifications in diet, social and economic status and animal husbandry, based on the available data from the study region.

5.1 Provisioning and Foodways

During the early Saxon phase there was apparently little demand on the population to produce a surplus above and beyond its own needs and security. Farmers produced animals that were best suited for local conditions, using them largely for meat, but also small-scale secondary products such as wool and traction. This is typified as a non-specialised, mixed husbandry regime that continued in many areas into the middle Saxon phase. However, a move to specialist production of surplus animals is evident at some rural sites in the middle Saxon phase, to provide for those living and working in *wics*. As a result, the diet of those living in *wics* was based largely on beef, while rural populations would have eaten more mutton.

The role of high-status sites as redistribution centres of tax surplus from rural sites to *wics*, and the reliance of those living in *wics* on such provisioning, are evident in historical documents. Zooarchaeological evidence is ambiguous, particularly given the low number of high-status sites in the dataset. However, standardised diet and low species diversity in *wics* is notable, particularly when compared with late Saxon *burhs*, and this has been suggested as an indicator of such a redistributive system (O'Connor 2001). An alternative explanation, that the lack of choice within *wics* was because they were early, under-developed markets for game from the hinterland has also been proposed (Sykes 2006b, 63). However, the quality of other goods marketed through *wics* on an international scale suggests that the market was extremely well developed, '[e]ngaging in trade at many levels' (Blackmore 2002, 295). This is supported by the considerable deposits of craft-working waste at *wics*, otherwise missing at rural sites (Holmes 2014b, 118).

An increase in coinage, a move towards a market economy, and subsequent reduction in the payment of food rents in the late Saxon phase led to an urban population that could demand more variety in their diet. This is reflected in greater diversity in the amount of beef and mutton consumed, an increase in the range and abundance of bird taxa recorded and the provision of fresh and preserved fish to urban sites. There was also greater variation in the distribution of carcass parts, implying the presence of consumers and butchers in the urban setting. While late Saxon *burhs* provided for a local market, typified by the presence of small-scale bone-, antler- and skin-processing debris, as well as evidence for specialist butchers, there was no continuation of the production of goods for international trade on the scale seen in the *wics* of the middle Saxon phase.

Expanding market opportunities from the early medieval phase resulted in a wide variation in the proportion of mutton, beef and pork at all site types.

Markets were provisioned with food from manorial and ecclesiastical estates, supplemented by surplus provided by peasant farmers (Hammond 1993, 40). During the high medieval period greater redistribution of carcass parts can be observed at rural and urban sites, and high-status sites begin to buy in much of their meat as joints, particularly beef and mutton. However, it is not until the better wages and working conditions of the peasant population in the late medieval period that a change in the provisioning of sites occurs. The increase in game such as rabbit, hare and deer, as well as wild and domestic birds, and the increased redistribution of joints of meat at urban sites in this phase is testament to the increased buying power of the lower classes. The provisioning of sites with veal calves from the late medieval phase has been linked to the expansion of the rural dairy industry and marketing of excess male calves to town, and rise of the draught horse in agriculture. This occurs alongside an increase in the provisioning of very young sheep and pigs from rural sites to elite and urban sites, which indicates changing tastes.

The post-medieval period sees considerable variation of species proportions between sites, reflecting an accessible market, although some wild taxa remain protected by the aristocracy. The spectacular growth in specialist workers of bone, horn and leather in this period is evident in the increase of assemblages resulting from such processes, and the use of bones and horn cores for building purposes.

5.2 Social Hierarchies

Social differentiation can be observed in a variety of aspects of the faunal material. It ranges from the procurement of animals that are hard to obtain, either through scarcity, cost or prohibition by law, to the availability of leisure time to practise sports such as hunting or racing, to the range of taxa consumed. Furthermore, the mechanisms by which such animals were kept in the domain of the privileged before becoming more widespread have been well illustrated (for example deFrance 2009; Ervynck *et al* 2003; Van der Veen 2003).

There is little evidence for social hierarchy in the animal economy of the early Saxon phase. This probably reflects the nature of society itself, where the court would be very mobile, travelling the kingdom and taking food and hospitality as tax. It is likely that fealty would be shown to the king through the redistribution of carcasses, with the more favoured joints given to the most powerful people, as observed in anthropological studies, such as the Khoikhoi of southern Africa (Ferrano and Andreatta 2014, 198). There is some suggestion that special consideration was given to the heads of animals, evidenced in the skull stack at Yeavering and special deposits at Anglo-Saxon settlements, as well as in ethnographic examples (Hamerow 2006; Morris 2011b; Wilson 1999). From the middle Saxon phase some distinction between the elite and those of lower status begins to be apparent, with pork, wild mammals and birds consumed in greatest proportions in high-status sites (Fig 5.1). While it is likely that the means of confirming social status through sharing continued, it is during this phase that the mechanism of procurement also becomes important, and hunting related artefacts such as knives and drinking horns would also have served to set the elite apart (Sykes 2010). This is tied in with the uptake of hunting and the

emergence of deer parks acting as a very visual claim by the aristocracy to ownership of land.

High-status sites in the late Saxon phase continue to be typified by greater numbers of pigs, birds and wild mammals (Fig 5.1), and the abundance of roe deer at ecclesiastical sites begins an association between the clergy and this animal that lasts well into the medieval period (Sykes 2007b, 68). With the reduction of food renders, there is greater evidence for the role of the elite as consumers, in the redistribution of joints of meat to high-status and ecclesiastical sites from rural and urban producer sites. The practice of hunting continues, alongside falconry, which also becomes integral to aristocratic life. From the late Saxon phase, evidence for the use of birds of prey to catch wild birds is restricted to secular and ecclesiastical high-status sites. Furthermore, the wild birds that would have been caught through falconry are most commonly recorded at such settlements.

While the use of hunting as a means of defining the place of the elite in the social hierarchy began in the Saxon phase, this increased considerably in the early medieval period, with evidence for the consumption of wild animals and birds increasing at high-status and ecclesiastical sites, alongside a comparable absence of such taxa at rural sites (Fig 5.1). Roe deer did not fare well from the changes in habitat (restriction of territory and the gradual removal of woodland) and began to be over-hunted in this period, although they remained most common in ecclesiastical assemblages. The use of animals as indicators of cultural identity may also be identified in an increase in the numbers of pigs, domestic fowl, geese and wild birds that occurs during the Norman conquest. The ownership of major game species – deer and rabbit – by the aristocracy was defined in statute from at least the early medieval phase (Grant 1988a, 165), and controlled by the elite through increased emparkation. In the late medieval period an increase in numbers of deer, hare/rabbits, domestic and wild birds at lower status sites may be linked to a lapse in the vigour by which poaching was dealt with at this time, before being reinforced once again in law in the 17th century (Kirby and Kirby 1931, 240; Williamson 1997, 100), at which time there is a renewed relative dearth of game at lower status sites.

During the earlier part of the medieval period the diet of those at lower status sites shows clear ties to the animals produced for maximum economic gain (Dyer 1983, 215; Sykes 2006b, 65). This is borne out in the high medieval data, where sheep are less common at elite sites, as they become highly valued for their wool, and feature prominently in the peasant diet. Furthermore, it has been suggested that the aristocracy deliberately distinguished themselves from those of lower status by eating mutton and beef at ages not typically consumed by the latter (Sykes 2006b, 65). This is illustrated by the greater number of lambs, calves and piglets recorded at high-status, ecclesiastical and urban sites throughout the medieval and post-medieval periods. From the late medieval phase, the increased buying power of the lower classes meant that there was some blurring of lines between the diets of all classes (Dyer 1983, 210). In the southern region this is reflected in the homogeneity of the proportion of beef, pork and mutton in the diets of those living in town and country, and the increasing quantities of birds, hare and rabbits recovered from lower status sites

(Fig 5.1). Although venison remained a signature of high-status diet, the aristocracy distinguished their dietary identity from the rest of society by consuming more: more bird and fish taxa, more courses at feasts, and more young animals (for example Thomas 2007).

By the 17th century, rather than sheer quantities of food affirming status and social events, the type of food, and how it was cooked, became more important (Pennell 1999, 45). As meat became more accessible to many outside the aristocratic sphere, a new 'cuisine' was introduced to distinguish those who could read recipes and cookbooks, attain and use new cooking utensils, afford new spices, condiments and ingredients, had knowledge of new techniques from France, and could afford to eat and drink outside the home (Albala 2003, 178–80; Pennell 1999). The more refined tastes of this new cuisine included delicacies that are occasionally observed in the archaeozoological record. A good example is the veal and boar heads that were especially sought after (Albala 2003, 62 and 63), and is consistent with the increased recovery of calf and pig crania in high-status post-medieval assemblages (Linacre Garden, Canterbury; Shapwick House Moat, Shapwick; and Battle Abbey). The post-medieval phase also saw a change in the nature of hunting, with foxes becoming a more common prey than deer (de Belin 2013). This reflects the changing use of the countryside by the aristocracy, who become less interested in the production of animals and arable than in the aesthetic appeal of the landscape. Heavily landscaped vistas that could be enjoyed from a country house may have been conducive to the sight of grazing deer, but the highly managed environments led to a decline in tree cover, which could not sustain the animals in their previous quantities, and the number of deer parks reduced in number as a result (Williamson 1997).

Historically, the Church has always had close ties to the secular elite, from the invitation of the middle Saxon kings to establish monasteries, to the reformation led by Henry VIII, and some aspects of zooarchaeology may reflect this. Certainly there are similarities in the evidence for affluence and feasting between ecclesiastical and high-status sites, with some of the highest numbers of pigs recorded at these settlements from the late Saxon to post-medieval sites. However, a distinction between the secular and ecclesiastical aristocracy occurs from the early medieval phase, apparent in nuanced differences, such as the preference for red and fallow deer at high-status sites and roe at ecclesiastical settlements (Sykes 2007b), and a general move away from the relatively high numbers of birds and game at the latter. This may have been in response to the Church law stating that members of the ecclesiastical community should not hunt. In reality, however, many of the priesthood were of noble background and would have regarded hunting as a legitimate pursuit; indeed the higher orders are recorded as hunting by Chaucer, and in permissions granted by the crown (Almond 2003, 131; Cummins 1988, 10). Despite the presence of a number of new religious orders from the high medieval phase, there is no notable difference between them in the zooarchaeological record. From the high medieval phase, ecclesiastical sites were observed to contain greater proportions of food species that were acceptable sources of meat on fast days than in previous periods, suggesting greater adherence to monastic rule. These animals included fish, birds and newborn animals, as foetal and neonatal animals were

considered equal to fish, given the water environment they grow in (Sykes 2006b, 69).

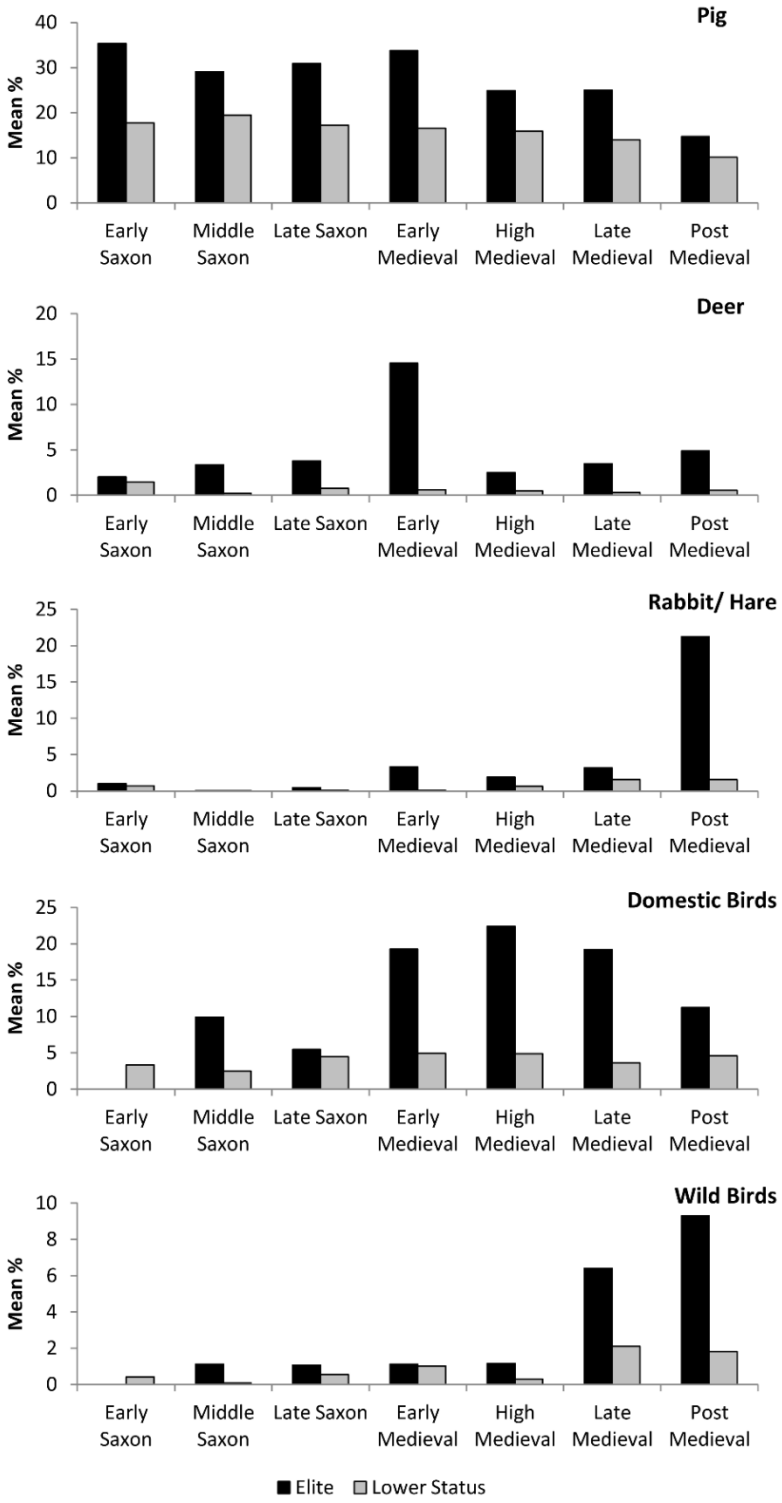

Fig 5.1: Mean proportion of selected taxa recorded from elite (high-status and ecclesiastical) and lower status (rural and urban) assemblages. Assemblages >300 NISP cattle, sheep/goat and pig were included for counts of wild species and birds, while all sites were included for pigs

5.3 Rise and Fall of Indigenous and Introduced Animals

The introduction of fallow deer prior to the Norman conquest and rabbit at the beginning of the high medieval phase are clearly visible in the zooarchaeological record (Sykes and Curl 2010, 125; Sykes *et al* 2016). These animals demonstrated the status of those who could afford them, on many levels: from procurement of a scarce and wonderful resource; to the privatisation of land for forest or warrens; to having the time and means to hunt them; and, in the case of fallow deer, to be able to kill, prepare and eat them according to Norman etiquette (Sykes 2007b, 92). Recent research by the *Dama* International project (Sykes *et al* 2016) has identified early examples of fallow deer bones using carbon dating from Carisbrooke Castle, Isle of Wight (11th to 13th centuries), Faccombe Netherton, Hampshire, and Goltho, Lincolnshire (both 11th to 12th centuries). However, a combination of genetic and isotope data suggests that these animals came from a founder population, implying that there was an earlier, hitherto unrecorded, existing population of fallow deer within Britain prior to this Saxo-Norman date (Sykes *et al* 2016, 118).

The introduction of a 'rabbit package' including other species to aid in their capture can also be observed, such as the increase in ferrets from the 12th century. The ability of rabbits to rapidly increase in numbers once they had become acclimatised to the more temperate environment of England must have made them hard to contain, even in purpose-built warrens. By the late medieval phase rabbits are recorded at all site types, and by the post-medieval phase they are commonly recorded at high- and low-status sites alike, illustrating the changing nature of luxury foods (Van der Veen 2003, 409). Other notable introductions include the peafowl, again used by the Norman elite to distinguish themselves from those of lower standing, and carp in the high medieval period, which replaced pike in the fish ponds of the aristocracy (Hoffman 1995, 72; Williamson 1997, 94). Pheasants, too, were introduced at around the time of the Norman conquest or early medieval period, and are also initially associated with high-status sites (Poole 2010, 159). A later introduction, in the 16th century, was the turkey, again used to display status and power. However, in this case the birds were quickly democratised as their domesticated nature meant they would have been easy for anyone to breed, keep and cook (Fothergill 2012, 22; Fothergill 2014).

The keeping of new, wild and exotic animals in menageries and parks by the aristocracy from the Norman conquest was not merely functional: 'Animals were not simply kept to be looked at, they also symbolised the importance of their owners, and in later periods our colonial dominance over other countries – and therefore over their animals' (O'Regan 2002, 18). Similarly, parks served to exclude the lower classes and provide another way for the aristocracy to distinguish themselves and their place in society (Sykes 2007a, 62; Williamson 1997, 93). This gradually changed with time, and by the end of the post-medieval period numerous zoos were established for commercial purposes to entertain the new middle classes. Furthermore, the spectacle provided by exotic animals would have emphasised to the British public national developments in exploration, travel and trade, helping to expand their world view.

In contrast to the time and effort spent on the introduction of fallow deer, rabbits and other, more exotic, animals, numerous species became casualties of over-hunting, extirpation and a reduction in their habitat (Fig 5.2). Some, such as the wolf, beaver, wild boar and crane, became extinct during the post-Roman period (for good accounts of these see O'Connor and Sykes 2010), and others, such as the roe deer and polecat, in the post-medieval period (Baker 2011; Yalden 1999).

One final consideration concerns the reduction in the number of pigs from the high medieval period. This has variously been related to the increasing woodland clearance that took place before 1350 (Thomas 2007, 142), the return of arable land to pasture (Grant 1988a, 159) and increase in sty husbandry (Albarella 2006, 85). It is pertinent that this decline occurs alongside an increase in calf bones (Fig 5.3), and in the late medieval period changes in agricultural technology and the increase in dairy production may have provided the stimulus for the consumption of veal to replace that of pork.

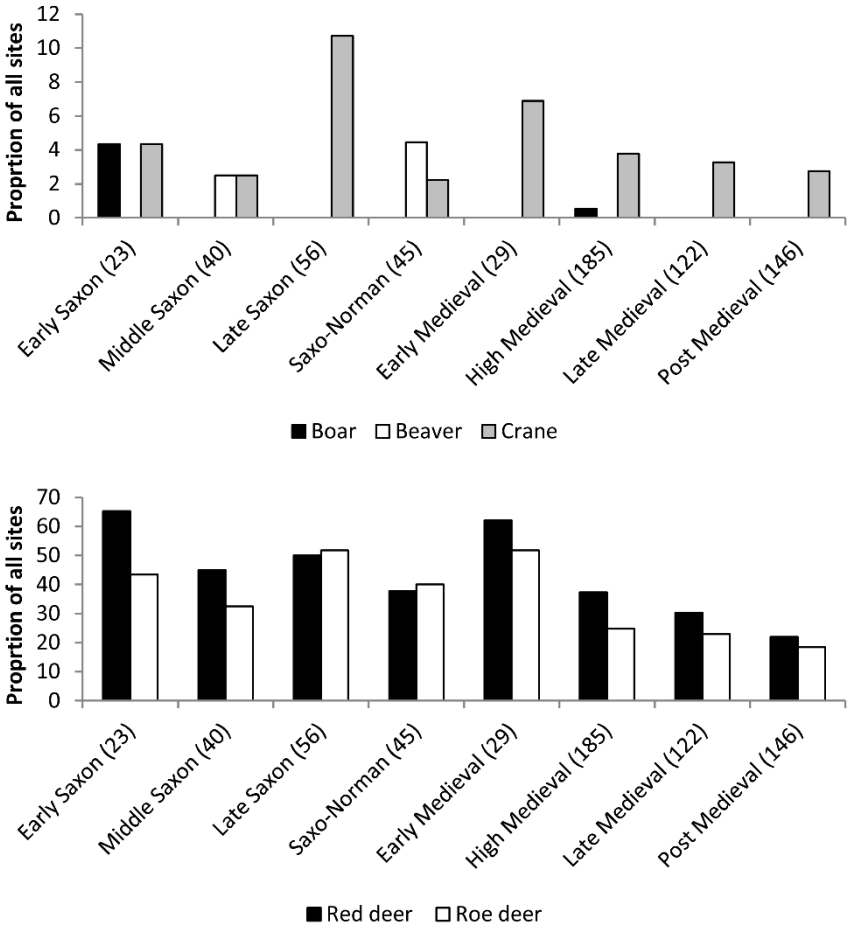

Fig 5.2: Proportions of taxa recorded within the study area that suffer extinction or severe decline in the post-Roman period. (n)*= number of sites*

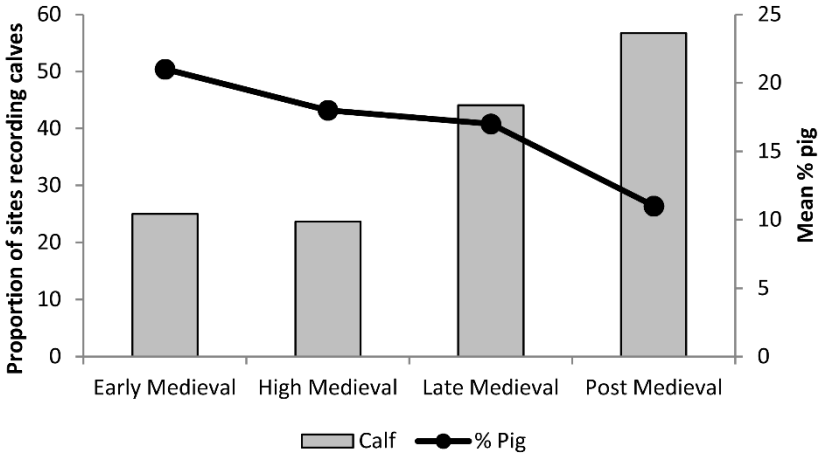

Fig 5.3: Comparison of the relationship between the decline in pig numbers and increase in calves recorded from all sites in the medieval and post-medieval periods

5.4 The Animal Economy

The start of the study period is one of a largely subsistence agriculture, where self-sufficient isolated farmsteads of the early Saxon phase relied on animals for meat and small-scale secondary products such as traction, wool and milk (Figs 5.4 and 5.5). While there is no evidence for intensive arable or wool production, data from the middle Saxon phase suggest that the need to supply *wics* with food and raw materials led to more specialised modes of production at some sites. Sheep were increasingly kept for wool and manure, and cattle to provide traction for arable farming. Rather than the production of animals purely to meat age for the *wic* population, it seems that the urban population was supplied with older animals, the younger cattle and sheep being more commonly recovered from elite and rural sites, perhaps suggesting that those living in *wics* had little power to demand animals that would provide the most tender meat. The increase in older sheep is consistent with historical and archaeological data that record the importance of wool as a commodity. Spindle whorls used in the making of woollen cloth are common features of many middle Saxon rural sites, and a letter dated to the late 8th century documents the reputation of English wool for good cloaks (Ryder 1983, 188).

A cautionary note should be sounded here, as the tooth-wear data from *wics* is contrary to the fusion data. Rather it indicates the presence of younger sheep and cattle. There are several potential explanations for this. It may represent a trade in the skins (including the heads) of subadult animals from rural sites to the proto-urban consumer sites, which would be consistent with the supply of horn to *wics* from rural areas (Holmes 2014b, 100). It may also be a factor of recovery and/or preservation bias, as the bones of very young animals may easily be missed during excavation or are subject to poor preservation, making them under-represented in the fusion data. Finally, it is possible that this represents a high number of female animals, as recent studies have shown that the bones of ewes fuse earlier than those of rams and castrates, while tooth wear shows less variation between sexes (Popkin *et al* 2012; Worley *et al* 2016).

In the late Saxon phase the trend for an emphasis on older cattle becomes more widespread (Fig 5.4), and reflects an increased need for traction and dairy. This coincides with the intensification of agriculture, the nucleation of villages and beginning of the open-field system. By the early medieval phase this increases further, alongside a move towards wool production, with sheep also exhibiting older mortality profiles (Fig 5.5). This husbandry continues into the high medieval phase, but from the late medieval period the number of sites where cattle are culled at prime meat age, alongside those kept for secondary products, increases, in line with a demand from the urban market for meat (Sykes 2006b, 59). The limited data for herd profiles suggest a predominance of cows over bulls and castrates at the majority of sites in all phases. Although this could be suggested as evidence for early dairy production, there is no historical evidence for intensive exploitation of cattle for milk between the early Saxon and high medieval periods (Banham 2004, 54; Grant 1988a, 156). It is just as likely that cows were used for traction. Indeed, it may be good husbandry to keep the number of bulls and castrates to a minimum for easier handling.

Between the early and post-medieval phases the number of sites with older sheep increases, indicating a focus on secondary products, with a corresponding reduction in assemblages with younger sheep, kept purely for meat (Fig 5.5). This is entirely in line with the recorded flourishing of the English wool trade that peaked in the mid-14th century. A major increase in the numbers of sites at which older sheep, indicative of wool production, are recorded occurs in the late medieval period, sustained into the post-medieval period.

Horses become more common in the rural economy of the high medieval phase, and there is evidence from late medieval assemblages that cattle began to be less important in agriculture, enabling the increased production of beef and milk, and resulting in the increase in veal calves at many sites in the post-medieval period.

It must be noted, however, that at no time were animals consistently and universally kept until very old, or culled as subadults. Both cattle and sheep, although important for their various secondary products and meat, died at a range of ages at nearly all sites, consistent with a mixed agriculture. Intensive exploitation, whereby animals are kept in high numbers on a small area of land (usually with restricted movement) for the production of meat, milk or eggs, is not a phenomenon that appears until modern farming methods were developed (Albarella 1997, 24).

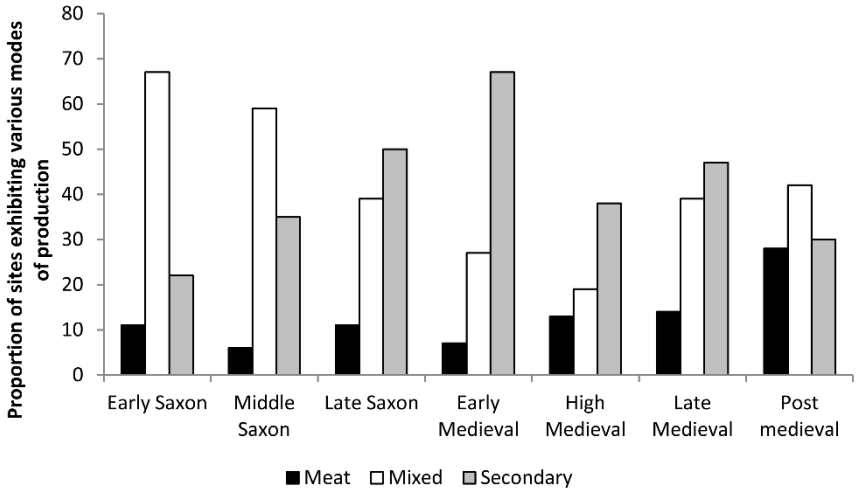

Fig 5.4: Cattle modes of production from all sites

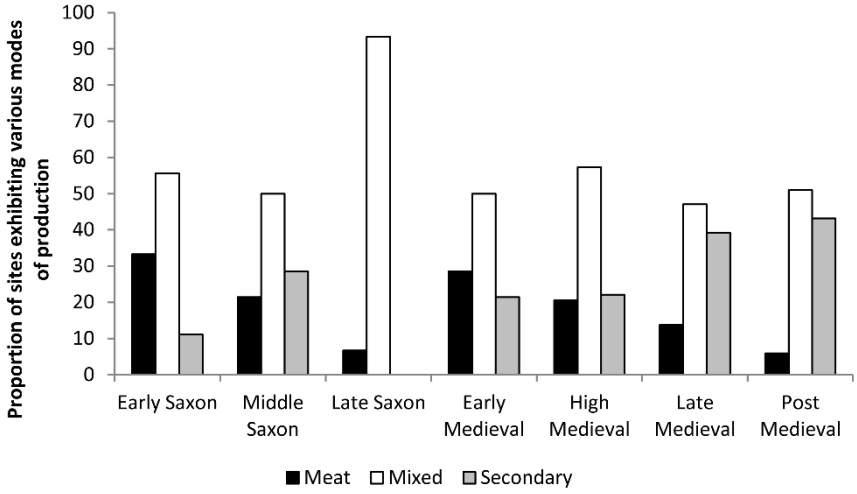

Fig 5.5: Sheep modes of production from all sites

5.5 Agricultural Revolution

The Agricultural Revolution has traditionally been considered a mid-18th-century phenomenon, featuring technological innovation, enclosure of fields and an improvement in livestock breeding to increase production (Turner *et al* 2001, 215). However, there is the suggestion that livestock improvement began earlier than this, as far back as the mid-14th century, albeit with some regional variation (Albarella and Davis 1996; Thomas 2005c). Evidence for breed improvement may be observed in size increases in the main domesticates, and the presence of faster growing individuals that would have given greater yields of meat, wool or milk at younger ages, resulting in younger animals in mortality curves (Davis and Beckett 1999, 4; Thomas 2005c, 73).

By the mid-14th century there was already an increase in the availability of milk and/or traction from cattle and wool from sheep. The production of wool

increased dramatically in the late medieval phase. This reflected the growth in available pasture land resulting from a reduced population and therefore less demand on the countryside for arable production. At the same time as this intensification of agricultural methods to produce wool and grain, some farmers took the initiative to improve the size of their animals through selective breeding. A recent study into the animal economy of London has shown an increase in the size of cattle and sheep in the mid-14th century, and another in sheep and domestic fowl from the 15th century, following the period of crisis at the end of the high medieval period (Thomas *et al* 2013). Consistent with this are the first signs of cattle and sheep that are larger than their contemporaries, observed at late medieval urban sites in Reading and Oxford.

There is a suggestion that a new type of fast-maturing pig was introduced in the post-medieval period, based on a combination of size increase and a reduction in the age of death (Albarella 1997, 25). Assemblages from Exeter (Maltby 1979b), Castle Mall, Norwich (Albarella *et al* 1997), and Lincoln (Dobney *et al* 1996; Holmes 2014c) have shown a considerable increase in the proportion of first-year deaths. Only the tooth-wear data are sufficiently nuanced to distinguish first- and second-year deaths (Fig 5.6), and these indicate that an increase in the proportion of first-year culls occurred between high and late medieval assemblages, particularly noticeable at southern sites, although the sample size means that this is a tentative first impression. It is possible that a change in diet as pigs became increasingly confined to sties (Hamilton and Thomas 2012) could have produced reduced tooth wear in similar aged animals. However, the combined data from tooth wear and bone fusion also indicated an increase in juvenile pigs in the post-medieval period, increasing to 13% from 6% in the late medieval phase, 8% in the high medieval phase and 7% in the early medieval phase, corresponding to a decrease in immature animals that were recorded at 10% of sites in the post-medieval period from 21%, 31% and 21%, respectively, in preceding phases.

The post-medieval initiative for stock improvements is evident in numerous studies, with larger animals recorded in the 17th century (Thomas *et al* 2013), and from high-status sites of Camber Castle and Wickham Glebe and urban sites in Gloucester, Christchurch, Southampton, Oxford, London, Bath, Greenwich and Launceston Castle in the study region. The increase of long-horned cattle in the post-medieval period indicates the presence of new phenotypes at this time, and contemporary documentary evidence records an uptake of selective breeding techniques and the development of new breeds to establish animals of significantly larger proportions than those from preceding periods. One such pioneer was Robert Bakewell, an 18th-century stockbreeder, who selected the most desirable traits from his herds to 'improve' existing breeds of cattle, sheep and horses (Wood and Orel 2001).

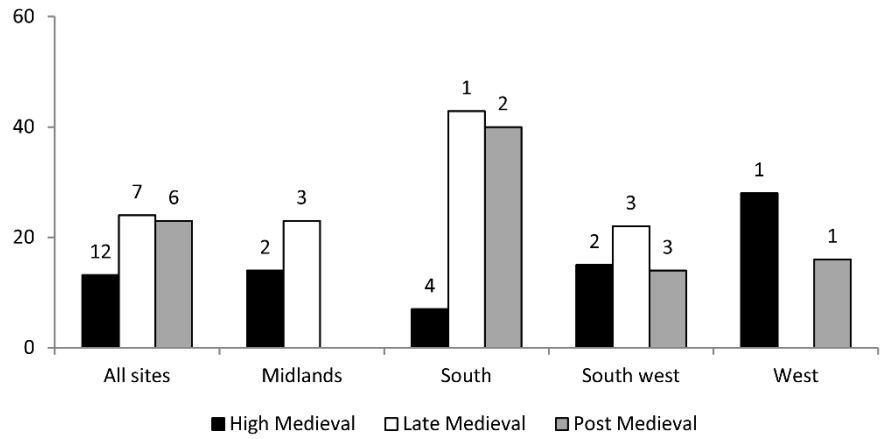

Fig 5.6: Mean % of pigs culled in their first year (tooth-wear stage A-B) in the tooth-wear data for each region. Numbers above the bar = number of assemblages in the sample

5.6 Urbanisation

The function of towns as markets and centres for specialised production developed from the early medieval phase. Guilds, which regulated trades within towns, are documented from 1130 (Britnell 1993), indicating the increase in specialisation. However, it was not until the post-medieval period that the majority of the population began to live in towns. Growing urbanisation is evident in the increasing variation in the availability of minor taxa, such as domestic fowl from the late Saxon period, geese and wild mammals from the high medieval period and wild birds from the late medieval period (Fig 5.7). The nature of this change in provisioning is not clear, but suggests either increasing demand from the urban population, or increasing availability from their suppliers. Urbanisation also led to an intensification of agriculture in the surrounding areas (Schofield and Vince 1994, 190), yet this had to be integrated with the increased demand for meat. The greater consumption of beef by urban populations led to an increasing reliance on horses for traction and draught purposes in the rural economy (Langdon 1986). This can be recognised by a rapid increase in the number of horse remains in the post-medieval period (Fig 5.8), coinciding with the increase in assemblages where cattle were kept purely for their meat. It is interesting to note that the rise in calves (Fig 5.3), (related to an emerging dairy industry producing an excess of veal calves for meat) occurred in the preceding late medieval period. This suggests that the move to horses working the land may have resulted from the burgeoning dairy industry.

Another aspect of urbanisation is the increasing availability of detritus for scavenging animals, particularly dogs and cats. Cats were important for hunting mice and rats (Grant 1988a, 184), and would have found plenty of employment in towns. This is reflected in an increase in the number of cats in urban assemblages throughout the medieval period (Fig 5.9). What is very interesting is the synchronicity implied, between increases and decreases in the cat and rat populations at both urban and rural sites. It may be that people instinctively kept, or at least tolerated, cats in direct proportion to the perceived rodent population. Alternatively, the cat population could have been directly affected

by the availability of food to scavenge from, as the rodent numbers would have done. The proportion of dog remains at urban sites increases considerably in the post-medieval period (Fig 5.10), which again may reflect increased opportunities for feral dogs to scavenge. Greater acceptance of pet-keeping in this phase may also be a reason for this rise. Alternatively, the increased population within urban centres may have necessitated the use of dogs for guarding property and possessions. One other explanation may be in the value of dogs for their skins. The importance of cat and dog skins in the medieval leather industries has been documented zooarchaeologically (Albarella 1999, 873; Albarella 2003; Luff and Moreno Garcia 1995, 110; O'Connor 1992, 110; Serjeantson 1989, 129), yet the proportion of assemblages from which cat and dog bones with evidence of cut marks consistent with skinning are recorded decreases with time (Fig 5.11).

Also of note is the high proportion of dog remains recorded at rural sites in the early and late medieval phases (Fig 5.10), with peaks at rural high-status sites. This may reflect the documented emphasis placed by the aristocracy on hunting, both in statute and through consumption during these periods, to distinguish themselves from the lower classes.

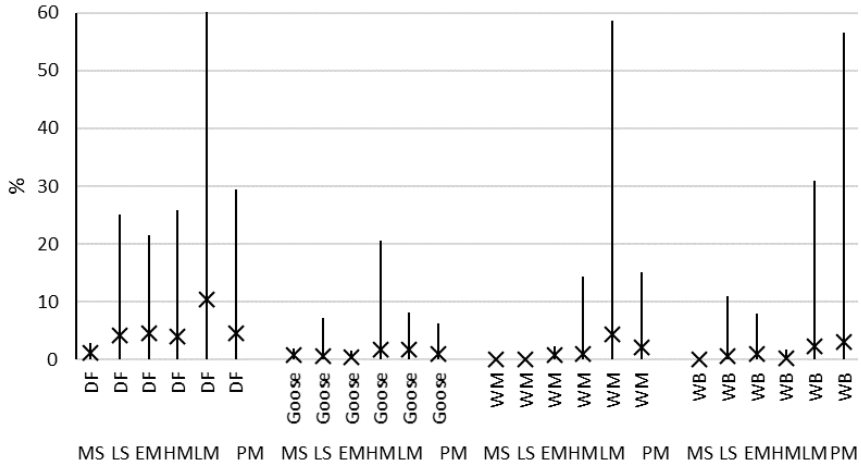

Fig 5.7: The range of variation recorded for the minor taxa from urban sites. MS= middle Saxon (n=18); LS= late Saxon (n=26); EM= early medieval (n=13); HM= high medieval (n=59); LM= late medieval (n=33); PM= post-medieval (n=50); DF= domestic fowl; WM= wild mammal; WB= wild bird (% given as a proportion of total NISP cattle, sheep/goat and pig). Only assemblages >300 NISP cattle, sheep/goat and pig included

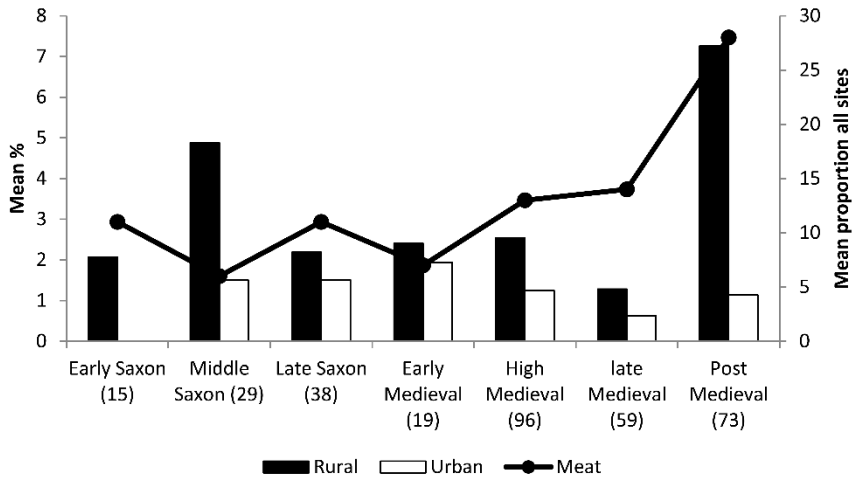

Fig 5.8: Relative proportion of horse bones from rural and urban sites, plotted alongside the proportion of sites from which cattle exhibited a mortality profile consistent with the production of meat (% given as a proportion of total NISP cattle, sheep/goat and pig). Only sites (n) *with a NISP>300 cattle, sheep/goat and pig included*

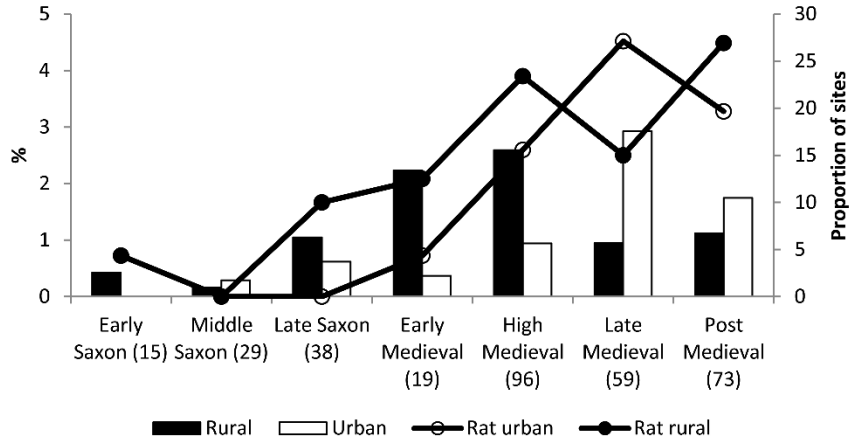

Fig 5.9: Proportion of cat bones recorded in rural and urban assemblages through time, against the proportion of sites where rats were recorded. % cat given as a proportion of total NISP cattle, sheep/goat and pig. Only assemblages (n) *>300 NISP cattle, sheep/goat and pig included*

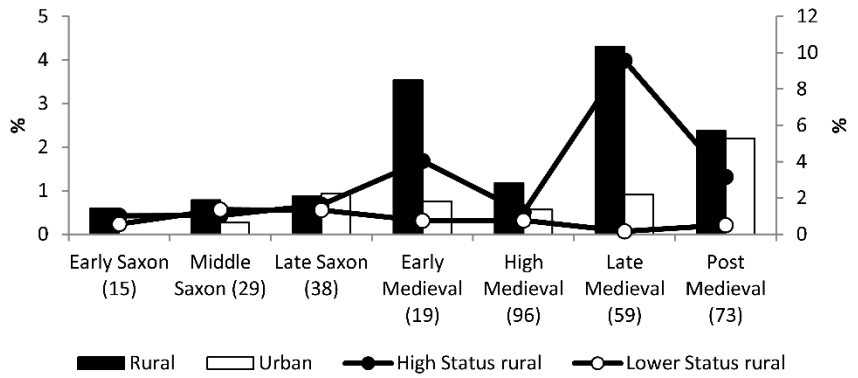

Fig 5.10: Proportion of dog bones recorded in rural and urban assemblages through time, against the mean % of dogs recovered from high- and low-status rural sites. % dog given as a proportion of total NISP cattle, sheep/goat and pig. Only assemblages (n) *>300 NISP cattle, sheep/goat and pig included*

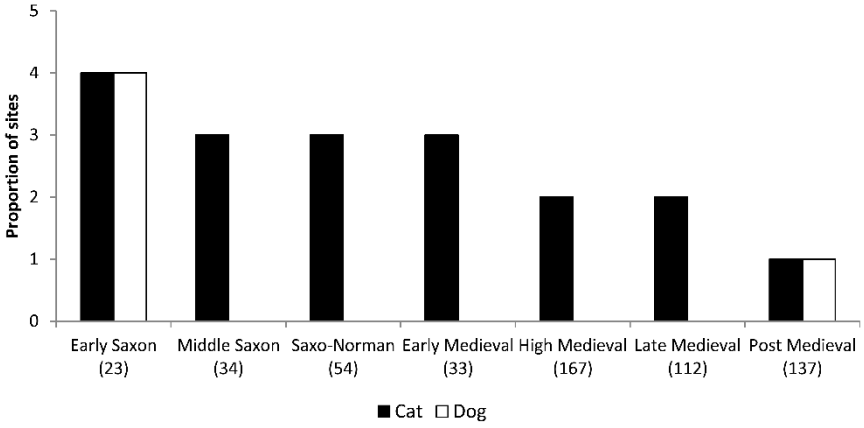

Fig 5.11: Proportion of all sites (n) *where cut marks indicative of skinning have been recorded on dog and cat bones*

5.7 Regional Differences

Geology and topography are perhaps the fundamental factors affecting the decisions farmers make regarding which animals to keep, and which agriculture regimes to follow. The effects of various geological areas (chalk, limestone/sandstone and clay lands) and the local environment have been observed in previous sections (*see* sections 2.2.1, 3.2.1 and 4.2.1). The early Saxon phase showed considerable correlation between the keeping of sheep on chalk and cattle on clay lands, to which they are best suited. The effect of *wics* on the foodways in the middle Saxon period suggests that environmental determinism had little place in this phase (Holmes 2013a). Although there was some indication of low-level environmental determinism from the late Saxon to post-medieval periods (many of the assemblages with greatest numbers of cattle were on clay, and greatest numbers of sheep were kept on chalk and limestone), there is nothing to suggest that it was an overriding factor in the choice of agricultural production.

Regional differences in agriculture also exist. One such region is the 'central province' defined by Roberts and Wrathmell (2000). This consists of a 'champion' area (including the counties of Dorset, Gloucestershire, Oxfordshire, Somerset and Wiltshire) of villages and open-field agriculture, that contrasts with a more highly wooded, traditional infield/outfield agriculture characterised by isolated farmsteads and hamlets in the 'peripheral' region (including Cornwall, Devon, Berkshire, Hampshire, Surrey, Sussex, Middlesex and Kent). These areas have been distinguished in Saxon place names, the Domesday Book and by the location of deserted medieval villages (Roberts and Wrathmell 2000, 28). Differences in these settlement types may therefore have been established from the late Saxon phase, with the beginning of the open-field system (Oosthuizen 2005), and it is possible that they may reflect different husbandry strategies. Late Saxon assemblages with greater proportions of sheep are most commonly recorded in, or close to, this central area (Fig 5.12). This is pertinent as sheep would have been essential to the open-field system, providing manure for the fields (McCormick 1991, 46). Trends are harder to recognise in the early medieval phase, as there are very few rural sites (Fig 5.13), although sites with over 50% sheep/goat are recorded more often in, or close to, the central area. This pattern continues into the high medieval period (Fig 5.14), but a change occurs in the late medieval period (Fig 5.15). Sheep are less likely to make up the bulk of an assemblage, cattle instead become more common as the growing urban population, and increased wealth for many of the lower classes, demanded more meat from rural producers.

It has been suggested that the use of horses for traction was taken up on a regional basis, beginning in East Anglia in the early medieval period and becoming more popular in the south and east of England (Langdon 1986, 43 and 275). Cattle continued to make greater contributions to the agricultural economy on heavy clay soils, and in areas of poor pasture, such as the midlands and south-west (Langdon 1986, 159). Within the dataset there is some supporting evidence for horses to be more common at sites in the central and eastern areas of the region located on chalk and limestone geology (Figs 5.16–5.18). Caution must be sounded regarding the presence of horses in towns, where they were likely sent to contribute to the skin-processing and bone-working industries, although the general distribution is consistent with the historical data used by Langdon. The high proportion of horses observed on clay geologies in the late medieval phase is largely due to urban concentrations at London, Christchurch, Southampton and Portchester Castle, which are most likely related to skin-processing.

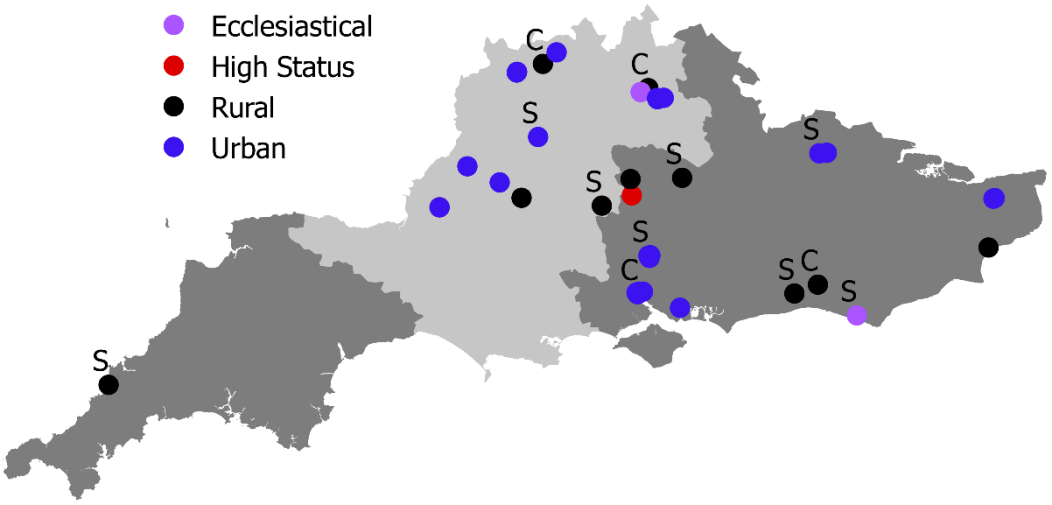

Fig 5.12: Plot of late Saxon assemblages that contain >50% sheep/goat (S) or >55% cattle (C) remains throughout the region. Lightly shaded area indicates the general position of a 'central province' (after Roberts and Wrathmell 2000)

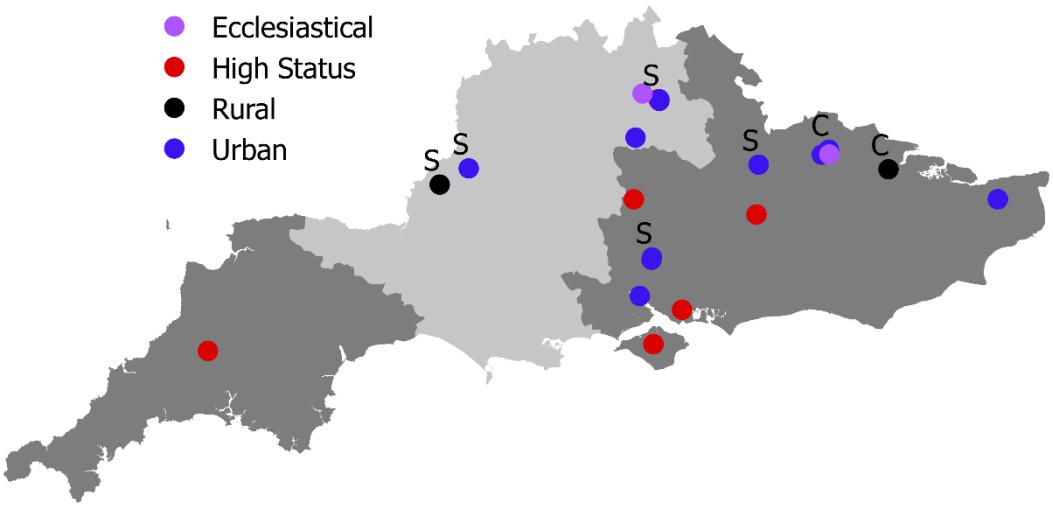

Fig 5.13: Plot of early medieval assemblages that contain >50% sheep/goat (S) or >55% cattle (C) remains throughout the region Lightly shaded area indicates the general position of a 'central province' (after Roberts and Wrathmell 2000)

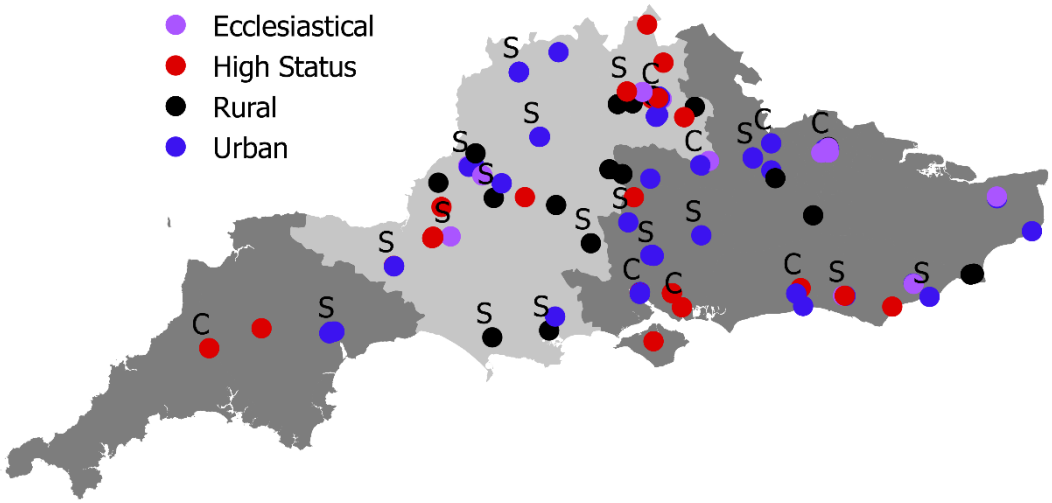

Fig 5.14: Plot of high medieval assemblages that contain >50% sheep/goat (S) or >55% cattle (C) remains throughout the region. Lightly shaded area indicates the general position of a 'central province' (after Roberts and Wrathmell 2000)

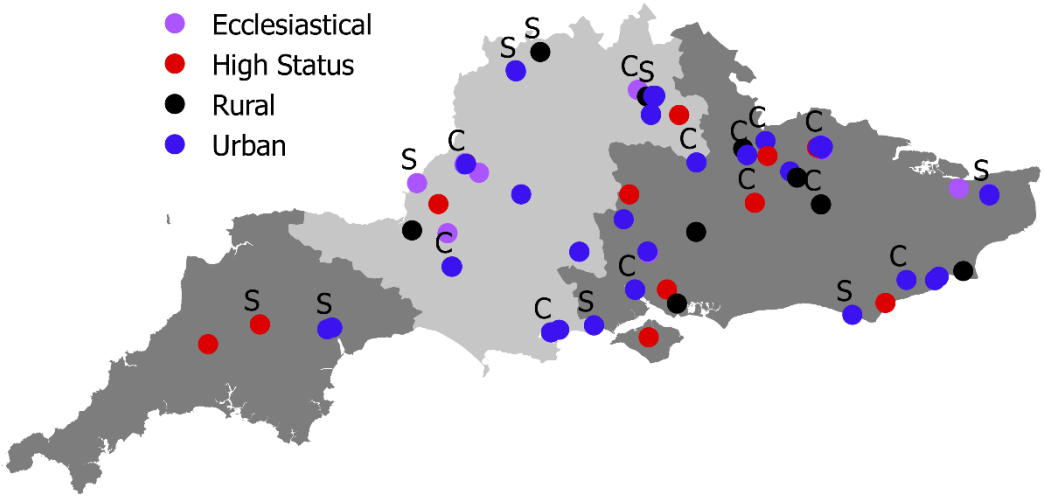

Fig 5.15: Plot of late medieval assemblages that contain >50% sheep/goat (S) or >55% cattle (C) remains throughout the region. Lightly shaded area indicates the general position of a 'central province' (after Roberts and Wrathmell 2000)

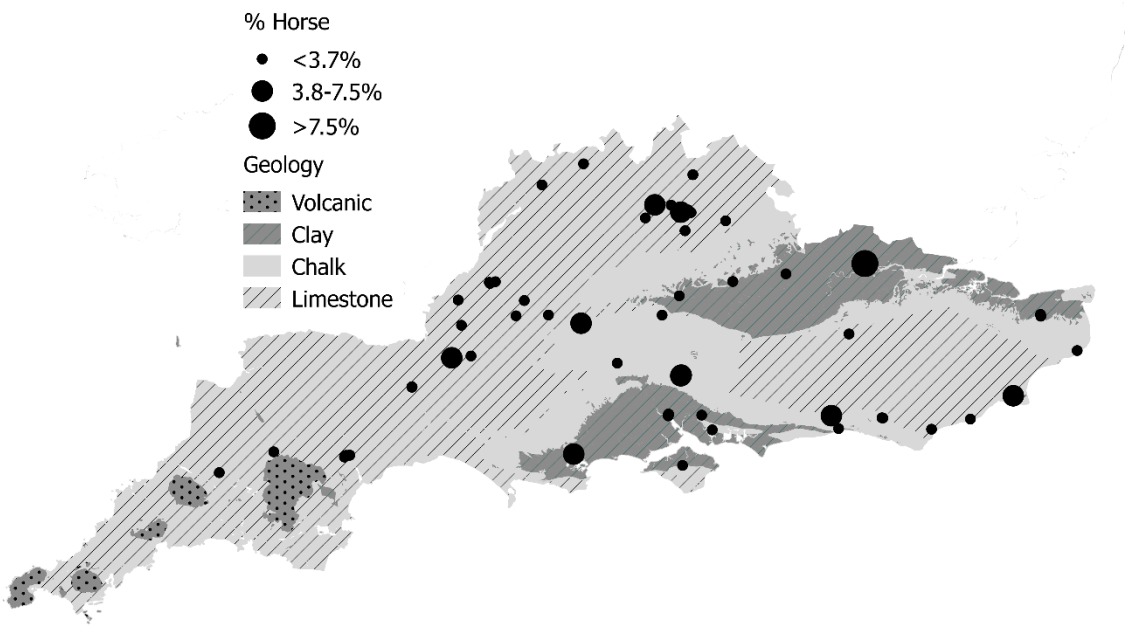

Fig 5.16: Comparison of the proportion of horse bones in high medieval assemblages (% given as proportion of NISP cattle, sheep/goat and pig). Only sites >300 NISP cattle, sheep/goat and pig are included

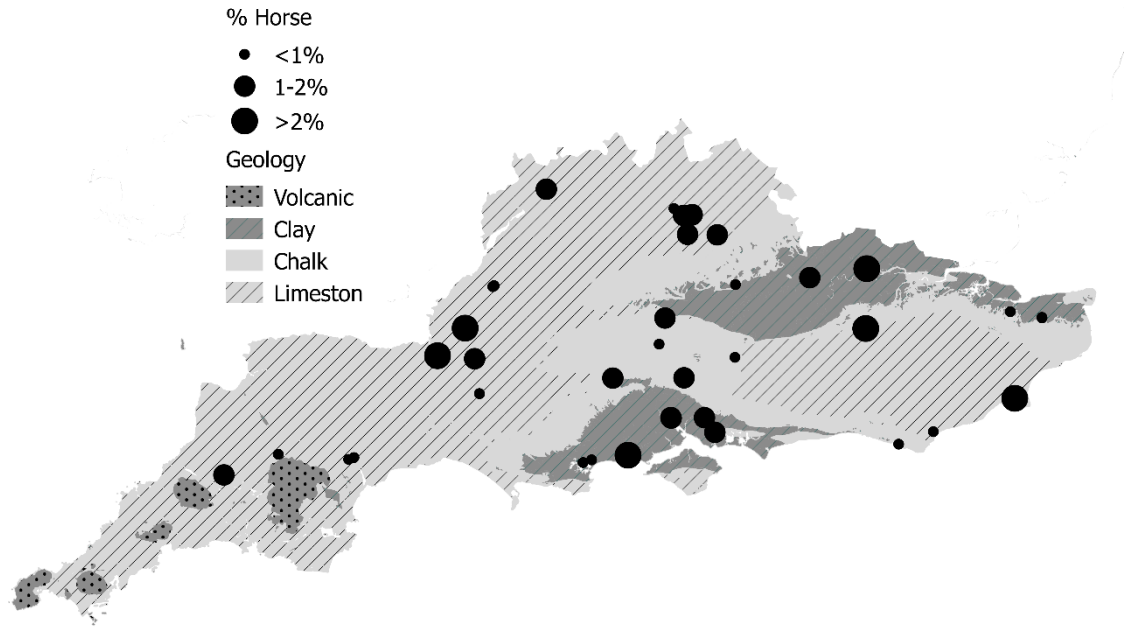

Fig 5.17: Comparison of the proportion of horse bones in late medieval assemblages. Given as a % of cattle, sheep/goat and pig. Only sites with >300 NISP cattle, sheep/goat and pig are included

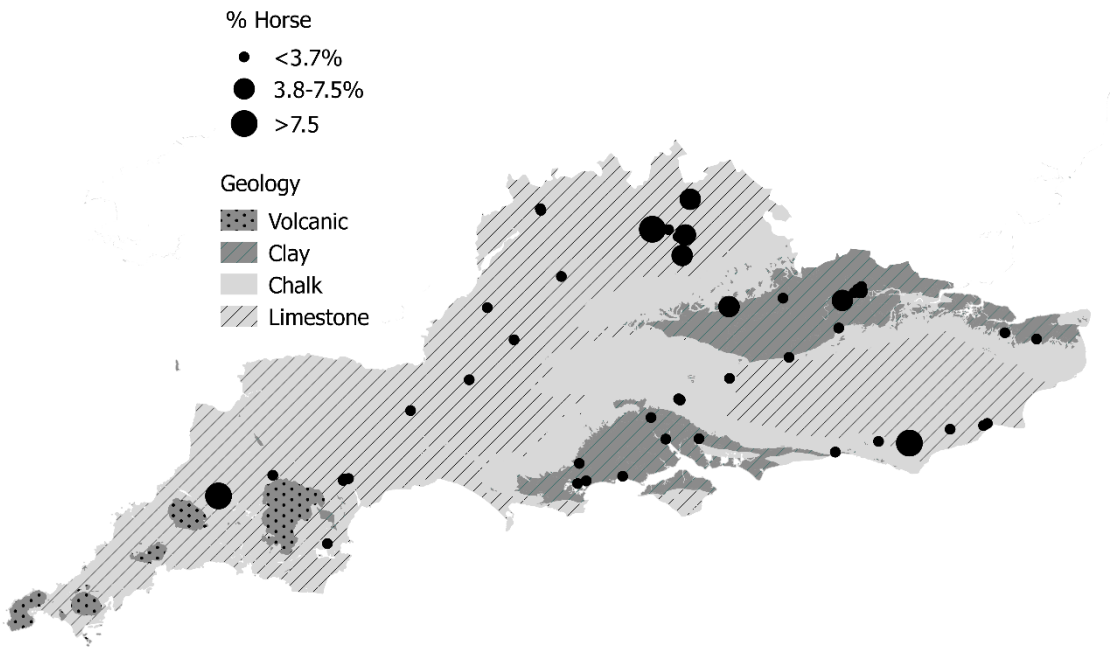

Fig 5.18: Comparison of the proportion of horse bones in post-medieval assemblages. Given as a % of cattle, sheep/goat and pig. Only sites with >300 NISP cattle, sheep/goat and pig are included

5.8 Coastal Exploitation

Given that much of the southern region is close to the coast, the extent of the exploitation of marine resources – seabirds, fish and marine mammals – should be considered.

Birds that live in the coastal environment (auks, cormorants, gannet, guillemot, gulls, razorbill, shags and terns) are not commonly recorded (Fig 5.19). There is a peak in frequency in the late Saxon phase, which may be related to the increase in sea fishing (see Barrett *et al* 2004a, 2004b), allowing greater access to the abundant resources of the ocean. There is a drop in the number of observances in the early medieval period before attaining previous levels in the high medieval phase. At the end of the medieval period the number of sites where seabirds are recorded again increases, continuing into the post-medieval period (Fig 5.19). The nature of this increase becomes apparent when the sites from which these birds are recorded are investigated (Fig 5.20). Between the middle Saxon and post-medieval phases, seabirds are fairly consistently recorded at around 10% of urban sites. No seabirds were recorded either at rural or ecclesiastical sites, with the exception of the late Saxon ecclesiastical site at Bishopstone, Sussex. Yet from the high medieval phase they begin to increase in frequency at high-status sites (Mount House, Witney, Oxfordshire; Benham's Garage, Taunton, Somerset; and Pevensey Castle, Sussex). From this phase onwards the changing nature of seabird utilisation becomes more pronounced, and they are found at a number of other high-status houses (Harding's Field, Chalgrove, Oxfordshire; Okehampton Castle and Berry Pomeroy Castle, both in Devon; and Camber Castle and Battle Abbey in Sussex), which may relate to their becoming a delicacy. The keeping of gulls over winter in pens to allow the

underlying fishy taste to disperse is recorded in the 17th century (Fisher 1997, 293). The movement of preserved manx shearwaters from the Isles of Scilly in the 14th century (Albarella and Thomas 2002, 35), while not in evidence in the southern region, implies the existence of a trade in seabirds. Greatest numbers of these taxa come from coastal assemblages: late Saxon Portchester Castle (NISP 18) and Bishopstone (7); high medieval Townwall St, Dover (49), and Ropetackle, Shoreham by Sea (4); late medieval Okehampton Castle (9); and post-medieval Poole (11), Camber Castle (25) and French Quarter, Southampton (6). This suggests that at many sites they were either a local resource occasionally taken advantage of for food, or that they were the accidental deaths of scavenging birds within an urban environment. It must be noted that these sites had extremely large assemblages (with NISPs varying between 749 and 11,986 cattle, sheep/goat and pig), which may affect the expected species diversity, whereby larger assemblages will be more likely to contain a greater variety of taxa.

Few early Saxon sites have marine fish assemblages (Table 5.1), although a considerable number of taxa are recorded from Bantham, Devon, and Springhead, Kent. Although most sites with marine fish are near to the coast, dogfish were recorded at Market Lavington, Wiltshire, *c* 60km from the sea, suggesting some form of trade. In the middle Saxon phase marine fish are recorded more often, contributing to the observed decline in freshwater taxa and eels as international trade and the markets presented by *wics* enabled greater opportunities for procuring and distributing fish. Indeed, the sites from which marine fish are recorded in the middle Saxon phase are mostly within *wics* (Southampton and London), although they are found at a number of other site types too (ecclesiastical Eynsham Abbey, Oxfordshire, and Minster, Isle of Sheppey, Kent; high-status Lake End Rd, Berkshire; and rural sites Wilton, Salisbury, Wiltshire, and Shavards Farm, Meonstoke, Hampshire). Some of these sites are landlocked, and illustrate small-scale trade in fish from the coast (Reynolds 2013, 238). In the late Saxon and early medieval phases, while the majority of marine fish are recorded at urban sites, there is also an increase in inland sites, consistent with the rapid rise in the procurement of marine fish at the end of the 10th century, and an accompanying inland network enabling the distribution of fresh and/or preserved fish throughout the southern region (Barrett *et al* 2004b, 2420). From the high medieval phase, marine fish are commonly recorded at inland and coastal sites alike, with an increase in those recovered from high-status sites (Fig 5.21). As with seabirds, this would have afforded a greater diversity of food to be served at the table of the aristocracy. Their presence at ecclesiastical sites in all phases may be explained by the monastic rule where fish were more acceptable to eat on fast days than meat from quadrupeds (Dyer 1983, 193; Schofield and Vince 1994, 192).

Cetacean remains (whale, dolphin and porpoise) are recorded in low numbers in most phases, and generally decrease with time (Fig 5.22). This is interesting, as there is no evidence that Anglo-Saxons caught whales, rather it was the early medieval French and post-medieval English fishermen that were brave enough to attempt to catch such a prey (Gardiner 1997). The origin of bones from stranded animals in the Saxon period is perhaps a more likely scenario. However, if the nature of whale remains is considered, it is likely that their

bones would not have been taken to a site along with the meat; instead, they would represent those brought back as a curiosity, for building or as a raw material for craft working (Mulville 2002). This is not the case with dolphin and porpoise remains, as these smaller animals would be more likely to be brought back to a site whole, or following primary butchery, and their bones incorporated into the archaeological record as a result of their consumption. Laws giving the Crown first claim to stranded cetaceans were introduced from the 12th century, which explains the almost exclusive recovery of dolphin and porpoise remains at elite sites, representing animals eaten (Table 5.2). The peak in the proportion of sites with whale bones at a wider variety of sites is more likely to reflect the nature of these bones as raw materials, rather than the consumption of meat, although the historical record indicates that stranded cetaceans were not always given to the king or queen (Gardiner 1997, 177). The increase in whale bones in the early medieval period reflects the Norman preference for whale meat, and there is documentary evidence that French whalers were supplying England at that time (Gardiner 1997, 175). The decline in whales in the late medieval period in favour of dolphin and porpoise remains is consistent with the fashion of the time, when whale meat was not as sought after, while the smaller cetaceans remained common at high-status sites (Gardiner 1997, 188). The subsequent rise in whale remains in the post-medieval period coincided with commercial whale hunting from the late 16th century, exemplified by the whaling station at Rainbow Quay, Rotherhithe (Gardiner 1997, 188). The concentration of whale remains around the south and south-eastern coastal area reflects the largely opportune acquisition of whale meat on a local level, and trade in cetacean meat from Europe. At only two late medieval inland sites were cetacean bones recorded (Oxford Castle and St Mary's Abbey, Winchester).

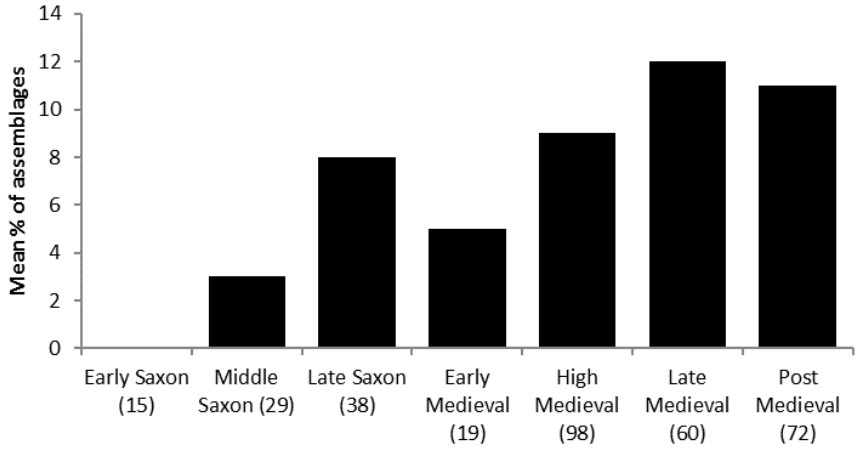

*Fig 5.19: Proportion of bird assemblages containing seabirds. (*n*)= number of assemblages. Only sites >300 NISP cattle, sheep/goat and pig are included*

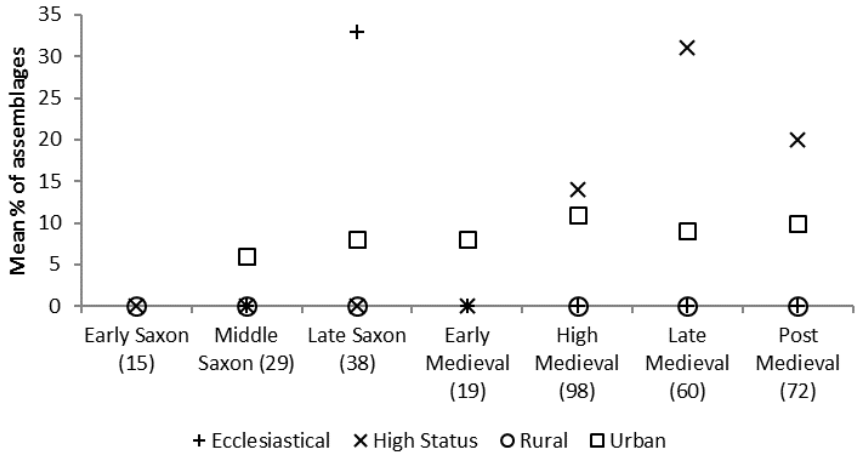

Fig 5.20: Proportion of bird assemblages containing seabirds from various site types. (n)= *number of assemblages. Only sites >300 NISP cattle, sheep/goat and pig are included*

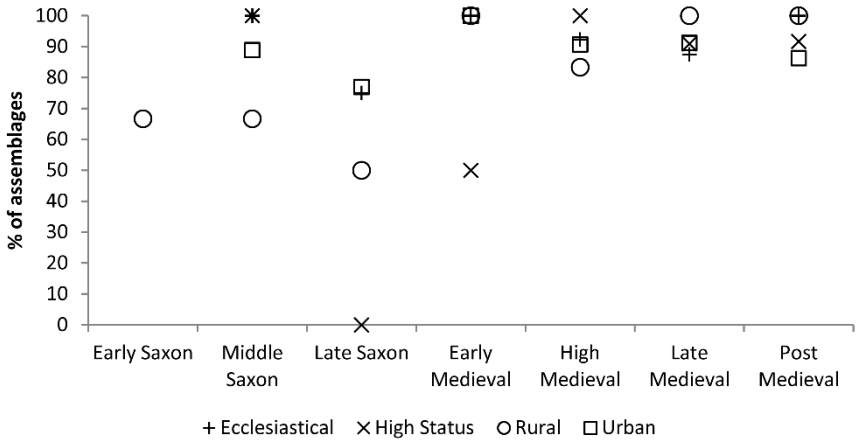

Fig 5.21: Proportion of fish assemblages containing marine fish

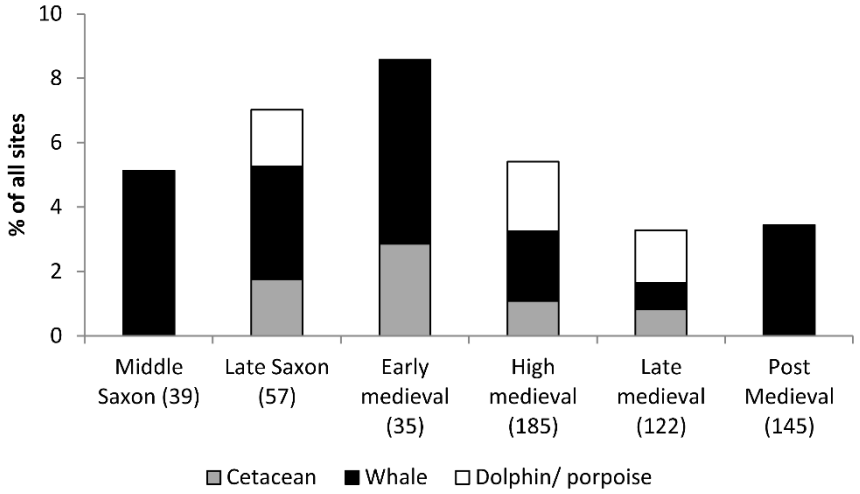

Fig 5.22: Proportion of assemblages containing cetacean remains. (n)= *number of assemblages*

Table 5.1: Sites from which marine fish have been recorded, showing the number of taxa present. Multiple site records are shown for sub-phases defined by a letter

	County	Site type	*N* taxa
Early Saxon			
Bantham	Devon	Rural	6
Springhead	Kent	Rural	5
Manston Rd, Ramsgate	Kent	Rural	3
Distillery site, Hammersmith	London (Middlesex)	Rural	2
Rookery Hill, Bishopstone	Sussex	Rural	2
Harlington, London	London (Middlesex)	Rural	1
Market Lavington	Wiltshire	Rural	1
Middle Saxon			
Minster, Isle of Sheppey	Kent	Ecclesiastical	8
Eynsham Abbey, Oxfordshire	Oxfordshire	Ecclesiastical	3
Lake End Rd	Berkshire	High status	1
Shavards Farm, Meonstoke	Hampshire	Rural	1
Melbourne St, Southampton	Hampshire	Urban	14
21–22 Maiden Lane, London	London (Middlesex)	Urban	11
Peabody Site, London	London (Middlesex)	Urban	10
Cook St, Southampton	Hampshire	Urban	5
National Gallery Basement, London	London (Middlesex)	Urban	5
St Mary's Stadium, Southampton	Hampshire	Urban	3
Jubilee Hall, London	London (Middlesex)	Urban	2
Late Saxon			
Eynsham Abbey, Oxfordshire	Oxfordshire	Ecclesiastical	1
Lewes Priory	Sussex	Ecclesiastical	6
Bishopstone	Sussex	Ecclesiastical	14
Sandtun, West Hythe	Kent	Rural	16
113–119 High St, Oxford	Oxfordshire	Urban	1
79–80 St Aldates, Oxford	Oxfordshire	Urban	1
Chester Rd, Winchester	Hampshire	Urban	1
Dorter Undercroft, Westminster Abbey	London (Middlesex)	Urban	1
Malmesbury 2000	Wiltshire	Urban	1
Victoria Rd, Winchester	Hampshire	Urban	5
Western Suburb, Winchester a	Hampshire	Urban	6
Western Suburb, Winchester b	Hampshire	Urban	11
West Quay, Southampton	Hampshire	Urban	12
French Quarter, Southampton	Hampshire	Urban	15
Early medieval			
Eynsham Abbey, Oxfordshire	Oxfordshire	Ecclesiastical	17
Carisbrooke Castle, Isle of Wight	Isle of Wight	High status	7

	County	Site type	*N* taxa
Pepper Hill Lane, Northfleet	Kent	Rural	3
7–8 Queen St, Oxford	Oxfordshire	Urban	1
79–80 St Aldates, Oxford	Oxfordshire	Urban	1
Hinxey Hall, Oxford	Oxfordshire	Urban	1
St Mary Spital, London	London (Middlesex)	Urban	1
Sub-vault of Westminster Abbey	London (Middlesex)	Urban	3
Lincoln College, Oxford	Oxfordshire	Urban	4
Western Suburb, Winchester	Hampshire	Urban	10
French Quarter, Southampton	Hampshire	Urban	34
High medieval			
St Mary Spital, London a	London (Middlesex)	Ecclesiastical	2
St Saviour, Bermondsey	London (Middlesex)	Ecclesiastical	2
St Mary Spital, London b	London (Middlesex)	Ecclesiastical	3
St Gregory's Priory, Canterbury a	Kent	Ecclesiastical	5
St Gregory's Priory, Canterbury b	Kent	Ecclesiastical	7
Reredorter, Cleeve Abbey	Somerset	Ecclesiastical	8
Battle Abbey	Sussex	Ecclesiastical	9
Dominican Priory, Oxford	Oxfordshire	Ecclesiastical	10
Eynsham Abbey, Oxfordshire	Oxfordshire	Ecclesiastical	10
Hospital of St Nicholas, Lewes	Sussex	Ecclesiastical	10
St Mary Spital, London d	London (Middlesex)	Ecclesiastical	10
Sub-vault of Westminster Abbey	London (Middlesex)	Ecclesiastical	14
Benham's Garage, Taunton	Somerset	High status	1
Dean Court, Cumnor	Oxfordshire	High status	1
Lewes Castle	Sussex	High status	1
Harding's Field, Chalgrove	Oxfordshire	High status	2
Mount House, Witney a	Oxfordshire	High status	2
Mount House, Witney b	Oxfordshire	High status	2
Trowbridge	Wiltshire	High status	2
Middleton Stoney	Oxfordshire	High status	3
Pevensey Castle	Sussex	High status	3
Wickham Glebe a	Hampshire	High status	4
Wickham Glebe b	Hampshire	High status	4
Southampton Castle	Hampshire	High status	5
Faccombe Netherton	Hampshire	High status	9
Market Lavington	Wiltshire	Rural	1
The Old Vicarage, Reigate	Surrey	Rural	1
Lydd Quarry d	Kent	Rural	2
Holywell Priory, London	London (Middlesex)	Rural	3

	County	Site type	*N* taxa
Lydd Quarry a	Kent	Rural	4
Lydd Quarry c	Kent	Rural	6
14 Farringdon St, London	London (Middlesex)	Urban	1
Gardiner's Corner, London	London (Middlesex)	Urban	1
High St, Uxbridge	London (Middlesex)	Urban	1
Malmesbury 2000	Wiltshire	Urban	1
51–57 High St, Windsor	Berkshire	Urban	2
52–54 Thames St, Windsor	Berkshire	Urban	2
Chantry St, Andover	Hampshire	Urban	2
Friar St, Reading	Berkshire	Urban	2
Quilter's Vault, Southampton b	Hampshire	Urban	2
5–8 Fore St, Taunton a	Somerset	Urban	3
7–8 Queen St, Oxford	Oxfordshire	Urban	3
79–80 St Aldates, Oxford	Oxfordshire	Urban	3
Broad St, Abingdon	Oxfordshire	Urban	3
Crane Wharf, Reading	Berkshire	Urban	3
Friars Walk, Lewes	Sussex	Urban	3
113–119 High St, Oxford e	Oxfordshire	Urban	4
113–119 High St, Oxford f	Oxfordshire	Urban	4
Chester Rd, Winchester	Hampshire	Urban	4
Quilter's Vault, Southampton a	Hampshire	Urban	4
Church St, Seaford 1976	Sussex	Urban	5
Classics Centre, Oxford	Oxfordshire	Urban	5
Dundas Wharf, Bristol	Gloucestershire	Urban	5
Priory Barn, Taunton	Somerset	Urban	5
1–3 High St, Seaford	Sussex	Urban	6
5–8 Fore St, Taunton b	Somerset	Urban	6
Stert St, Oxford	Oxfordshire	Urban	6
Aldersgate, London	London (Middlesex)	Urban	7
Phoenix Brewery, Hastings	Sussex	Urban	8
Lewes House, Lewes c	Sussex	Urban	9
Exeter b	Devon	Urban	11
Lewes House, Lewes d	Sussex	Urban	11
St Michael's, Southampton	Hampshire	Urban	11
Victoria Rd, Winchester	Hampshire	Urban	12
Lewes House, Lewes b	Sussex	Urban	13
Exeter a	Devon	Urban	14
Western Suburb, Winchester	Hampshire	Urban	14
Ropetackle, Shoreham by Sea	Sussex	Urban	24
French Quarter, Southampton	Hampshire	Urban	29
Townwall St, Dover	Kent	Urban	31

	County	Site type	*N* taxa
Late medieval			
Hospital of St Mary of Ospringe a	Kent	Ecclesiastical	5
St Saviour, Bermondsey	London (Middlesex)	Ecclesiastical	7
Hospital of St Mary of Ospringe b	Kent	Ecclesiastical	8
Eynsham Abbey, Oxfordshire g	Oxfordshire	Ecclesiastical	10
St Gregory's Priory, Canterbury	Kent	Ecclesiastical	11
St Mary Spital, London	London (Middlesex)	Ecclesiastical	13
Eynsham Abbey, Oxfordshire h	Oxfordshire	Ecclesiastical	17
Gatehouse Nurseries, West Drayton	London (Middlesex)	High status	1
Faccombe Netherton	Hampshire	High status	2
Wickham Glebe	Hampshire	High status	2
Arundel House, London	London (Middlesex)	High status	3
Harding's Field, Chalgrove c	Oxfordshire	High status	4
Harding's Field, Chalgrove d	Oxfordshire	High status	4
Dean Court, Cumnor d	Oxfordshire	High status	5
Pevensey Castle	Sussex	High status	7
Winchester Palace, Southwark	London (Middlesex)	High status	15
Okehampton Castle	Devon	High status	20
Dean Court, Cumnor b	Oxfordshire	Rural	1
Lydd Quarry	Kent	Rural	3
Alton	Hampshire	Rural	5
Little Pickle, Bletchingley	Surrey	Rural	14
54–55 St Thomas's St, Oxford	Oxfordshire	Urban	1
67–69 St Thomas' St, Oxford	Oxfordshire	Urban	1
Fennings Wharf, London	London (Middlesex)	Urban	1
Lincoln College, Oxford b	Oxfordshire	Urban	1
Chantry St, Andover	Hampshire	Urban	2
Broad St, Abingdon	Oxfordshire	Urban	3
Charter Quay, Kingston-Upon-Thames	London (Middlesex)	Urban	3
Christchurch 1969–80	Dorset	Urban	3
Christchurch 1981–83	Dorset	Urban	3
Hinxey Hall, Oxford	Oxfordshire	Urban	3
14 Farringdon St, London	London (Middlesex)	Urban	4
79–80 St Aldates, Oxford	Oxfordshire	Urban	4
Aldersgate, London	London (Middlesex)	Urban	4
60–63 Fenchurch St, London	London (Middlesex)	Urban	6
Abbey Wharf, Reading	Berkshire	Urban	6
Ivy St and Brown St, Salisbury	Wiltshire	Urban	7

	County	Site type	*N* taxa
Poole	Dorset	Urban	7
Victoria Rd, Winchester	Hampshire	Urban	7
Battle Bridge Lane, Southwark	Surrey	Urban	8
Exeter	Devon	Urban	8
The Foundry, Poole d	Dorset	Urban	8
Lincoln College, Oxford c	Oxfordshire	Urban	9
The Foundry, Poole e	Dorset	Urban	9
The Foundry, Poole f	Dorset	Urban	9
SOU 29, Southampton	Hampshire	Urban	11
St Michael's, Southampton	Hampshire	Urban	11
Trinity Chequer, Salisbury	Wiltshire	Urban	11
Abingdon West Central Redevelopment	Oxfordshire	Urban	12
Lewes House, Lewes	Sussex	Urban	13
North St, Winchelsea	Sussex	Urban	13
French Quarter, Southampton	Hampshire	Urban	23
Post-medieval			
Hospital of St Mary of Ospringe	Kent	Ecclesiastical	1
St Gregory's Priory, Canterbury	Kent	Ecclesiastical	9
St Mary Spital, London g	London (Middlesex)	Ecclesiastical	10
Eynsham Abbey, Oxfordshire	Oxfordshire	Ecclesiastical	13
St Saviour, Bermondsey	London (Middlesex)	High status	1
Berry Pomeroy Castle	Devon	High status	2
Wickham Glebe	Hampshire	High status	5
St Mary Spital, London h	London (Middlesex)	High status	7
Inner Courtyard, Berry Pomeroy Castle	Devon	High status	8
Winchester Palace, Southwark	London (Middlesex)	High status	9
St Mary Spital, London i	London (Middlesex)	High status	12
Battle Abbey	Sussex	High status	15
Nonsuch Palace a	Surrey	High status	15
Nonsuch Palace b	Surrey	High status	15
Camber Castle	Sussex	High status	19
Alton	Hampshire	Rural	7
Aldersgate, London f	London (Middlesex)	Urban	1
Aldgate 1974, London	London (Middlesex)	Urban	1
Bridge St East	Berkshire	Urban	1
Chester Rd, Winchester	Hampshire	Urban	1
Christchurch 1969–80 d	Dorset	Urban	1
First Ashmolean Museum, Oxford	Oxfordshire	Urban	1

	County	Site type	*N* taxa
Ivy St and Brown St, Salisbury	Wiltshire	Urban	1
Lewes Castle	Sussex	Urban	1
Quilter's Vault, Southampton	Hampshire	Urban	1
129 Lambeth Rd, London c	London (Middlesex)	Urban	2
Cliffe, Lewes	Sussex	Urban	2
Crane Wharf, Reading	Berkshire	Urban	2
Lewes House, Lewes	Sussex	Urban	2
Mark Browns Wharf, London	London (Middlesex)	Urban	2
Rainbow Quay, Rotherhithe	London (Middlesex)	Urban	2
129 Lambeth Rd, London b	London (Middlesex)	Urban	3
14 Farringdon St, London	London (Middlesex)	Urban	3
16 Tunsgate, Guildford	Surrey	Urban	3
199 Borough High St, London	London (Middlesex)	Urban	3
Charter Quay, Kingston-Upon-Thames	London (Middlesex)	Urban	3
Christchurch 1969–80 c	Dorset	Urban	3
Classics Centre, Oxford	Oxfordshire	Urban	3
Creedy's Yard, Greenwich	London (Middlesex)	Urban	3
Aldersgate, London e	London (Middlesex)	Urban	4
Battle Bridge Lane, Southwark	Surrey	Urban	4
Broad Sanctuary, London	London (Middlesex)	Urban	4
Fulham Pottery	London (Middlesex)	Urban	4
East Gate, Gloucester	Gloucestershire	Urban	5
St John's St, Winchester	Hampshire	Urban	5
Poole c	Dorset	Urban	7
Victoria Rd, Winchester	Hampshire	Urban	7
Lincoln College, Oxford	Oxfordshire	Urban	8
Phoenix Brewery, Hastings	Sussex	Urban	8
Poole b	Dorset	Urban	8
Chantry St, Andover	Hampshire	Urban	9
Church St, Romsey	Hampshire	Urban	9
5–8 Fore St, Taunton	Somerset	Urban	11
Mill Rd, Winchelsea	Sussex	Urban	11
Abingdon West Central Redevelopment	Oxfordshire	Urban	12
Finsbury Pavement, London	London (Middlesex)	Urban	12
Exeter d	Devon	Urban	14

	County	Site type	*N* taxa
39 Fore St, Totnes	Devon	Urban	16
Exeter e	Devon	Urban	16
French Quarter, Southampton	Hampshire	Urban	24

Table 5.2: Recorded cetacean remains

	Site type	Cetacean	Whale	Dolphin	Porpoise
Middle Saxon					
SARC XIV, Southampton	Urban		*		
Melbourne St, Southampton	Urban		*		
Late Saxon					
Bishopstone	Ecclesiastical		*		
Lewes Priory	Ecclesiastical				*
West Quay, Southampton	Urban		*		
French Quarter, Southampton	Urban	*			
Early medieval					
Carisbrooke Castle, Isle of Wight	High status		*		
Launceston Castle	High status		*		
Linacre Garden, Canterbury	Urban	*			
High medieval					
St Saviour, Bermondsey	Ecclesiastical				*
Sub-vault of Westminster Abbey	Ecclesiastical				*
Carisbrooke Castle 2006–8, Isle of Wight	High status		*		
Launceston Castle	High status		*	*	
Linacre Garden, Canterbury	Urban	*			
Phoenix Brewery, Hastings	Urban		*		
Townwall St, Dover	Urban	*	*		*
Western Suburb, Winchester	Urban				
Late medieval					
St Mary's Abbey, Winchester	Ecclesiastical	*			
Launceston Castle	High status		*	*	
Oxford Castle	High status				*
Post-medieval					
Camber Castle	High status		*		
Launceston Castle	Urban		*		
Rainbow Quay, Rotherhithe	Urban		*		
The Foundry, Poole	Urban		*		

5.9 Diet

While this chapter has served to illustrate social and economic differences in the utilisation of animals, little consideration has been given to the diet of past populations, although the suggestion that the majority of animals were consumed has been implicit throughout this study. The understanding of what was actually eaten by the population as a whole, and certain subsets within, has been made easier by the increased use of isotope studies in recent years. The Saxon period has been best studied, and the results broadly show that the population enjoyed a largely terrestrial diet, with greater exploitation of marine

resources in the later Saxon period, and earlier in areas closer to the coast (Hull and O'Connell 2011; Mays and Beavan 2012; Privat *et al* 2002). Local exploitation of freshwater fish also occurred further inland (Mays and Beavan 2012, 873), which is generally in agreement with the zooarchaeological evidence. Synthetic reviews of isotopic evidence have shown little indication of gender differences, and mixed results in the comparison of social status, although results from three middle Saxon religious houses all show greater input of marine resources to the diet, a trend that is also apparent in a later medieval monastic cemetery in York (Hull and O'Connell 2011, 675; Müldner 2009, 339; Privat *et al* 2002, 786). Similarly, there is some indication that the medieval elite had a greater intake of marine resources, indicating a more varied diet than those of lower status, again consistent with the zooarchaeological evidence (Müldner 2009, 339).

Isotope data from the end of the Saxon period is similar to that from many early medieval sites, although more nuanced work has indicated that during the early medieval period there was greater access to marine resources for a high proportion of the population, consistent with the increase in the trade in stockfish at this time (Müldner 2009, 333; Müldner and Richards 2007, 691). The consumption of fish in late medieval coastal ports and inland towns again increases as marine resources became integral to the diets of most of the population (Hull and O'Connell 2011, 683; Mays and Beavan 2012, 872; Müldner 2009, 337; Müldner and Richards 2007, 693).

6 A RESEARCH FRAMEWORK FOR THE FUTURE

The preceding chapters have described the analysis of a large proportion of the existing zooarchaeological record of the southern region. The basic findings from this have been considered and the most salient points set in the wider context described by earlier studies. The aims of this chapter are two-fold, first to establish areas that require further work, and second to suggest recommendations for future directions.

6.1 When and Where? Deficiencies of the Available Record

Some aspects of the various periods, site types and regions are well represented in the dataset, with others less so, and these will be summarised here.

6.1.1 Period

The rise in rescue excavations in the 1980s and developer-funded sites from the 1990s has led to a significant increase in the number of sites available since earlier reviews were undertaken (*see* section 1.2). The Saxon period is the most poorly represented in the archaeological record, with only 18% of all sites recorded from this period, despite it covering the greatest time frame of 650 years. In contrast, the 450 years of the medieval period delivered the most abundant dataset, accounting for nearly 60% of all sites. Post-medieval sites were relatively profuse, although the majority were dated to the first 250 years, the period between the mid-18th and 20th centuries being under-represented.

6.1.2 Site Types

Although this review used a very broad-brush approach when describing site types, including only four major categories of 'urban', 'rural', 'high-status' and 'ecclesiastical', the myriad, nuanced characteristics within these groupings should be reiterated. To suggest that a certain classification of site is abundantly represented in the zooarchaeological record is therefore a misconception. For example, medieval household deposits from large urban settlements make up the largest group of sites within the dataset, yet these deposits are in no way homogeneous, there being so many differing variables in their makeup that must be considered at an inter-site level.

The dearth of particular site types in some phases, high-status and ecclesiastical sites in the Saxon period, and ecclesiastical and rural sites in both early medieval and post-medieval periods (Table 6.1), is notable, and the zooarchaeological record is all the poorer for it. Other inequalities are more reflective of social, economic and political developments. For example, the increase in high-status sites follows the Conquest and establishment of the Norman elite. Following the advent of proto-urban settlements in the middle Saxon phase, the proportion of rural assemblages in the dataset falls considerably in comparison with those from *wics*, *burhs* and towns. Reasons for this are probably three-fold: urban sites become more common in relation to rural settlements; assemblages are more frequently excavated in urban areas

that are subject to more development than rural areas, particularly as in many cases these sites lie beneath existing urban conurbations; and finally, the organisation of refuse disposal within towns concentrates assemblages close to habitation areas, while those living within farmsteads, villages and hamlets, were less constrained and so their refuse is more likely to have been distributed over the fields as manure, or discarded in a midden away from the settlement.

Table 6.1: Percentage of assemblages from each broad site-type category recorded by phase

Phase	Ecclesiastical (%)	High status (%)	Rural (%)	Urban (%)	Total (*n*)
Early Saxon		4	96		23
Early–middle Saxon			100		1
Middle Saxon	5	8	21	66	38
Middle–late Saxon	11		56	33	9
Late Saxon	6	6	10	77	48
Saxo-Norman	3	5	20	73	40
Early medieval	6	20	9	66	35
Early–high medieval		17	13	70	23
High medieval	11	19	12	57	162
High–late medieval	13	16	9	62	45
Late medieval	12	19	10	58	77
Late medieval–post-medieval				100	8
Post-medieval	4	15	7	74	137
Saxon			100		1
Medieval	17		33	50	6
Medieval–post-medieval			33	67	3

6.1.3 Regional Variation

Some counties within the study area were poorly represented, largely Cornwall, Devon (outside Exeter), Dorset and Kent. Problems in the recovery of bone from the west and south-east, where soils make preservation a problem, have been identified previously (Baker and Worley 2014, 3; Coy 1987, 25), and remain valid here.

6.1.4 Recommendations

The remedy for a lack of physical evidence for particular periods, regions or site types is hard to resolve. In an ideal world it would be suggested that more such sites should be excavated, but it goes without saying that this is nonsensical, as 'cherry-picking' the archaeological record is not feasible. Instead, it becomes more important at the planning stage for recognition to be given to the importance of such sites, and best practice implemented for the recovery and recording of representative animal bone assemblages. Greatest emphasis should be placed on assemblages from:

- Saxon and later post-medieval sites
- Saxon ecclesiastical and high-status sites

- early medieval and post-medieval rural and ecclesiastical sites
- areas of poor preservation.

However, every assemblage has the potential to be significant in its own right, depending on the nature of the record and associated archaeology or history (Baker and Worley 2014, 25).

6.2 Future Directions

Following on from the quantifiable omissions of the zooarchaeological record are the less tangible areas of methodologies and research.

6.2.1 Recovery and Retention

Problems in the analysis and retention of large urban assemblages of animal bones are increasingly being raised. Discussions centre around the sheer quantity of material retrieved from some counties in relation to the limitations imposed by the commercial sector on time for recording and analysis, and the provision of adequate space for storage (Rainsford *et al* 2016). The potential usefulness of some assemblages has also been brought into question, but the lack of a clear agenda seems to fly in the face of that which is desirable: the Institute for Archaeologists (IfA) guidelines suggest that at all levels the processes from excavation to storage of zooarchaeological materials should 'create(s) a stable, ordered, well documented, accessible material archive which should act as a resource for current and future research' (Institute for Archaeologists 2008, 2). However, with increasing requirements from those funding many excavations to deliver quality work in a restricted time frame, the pressures on the specialist are ever-increasing.

It may be an easy alternative to suggest that animal bones be discarded, or only recorded to assessment level, and with some assemblages it is likely that this is already the case. For example, while compiling the dataset, it was noted that the post-medieval phase (particularly from the 18th century) is often characterised by industrial deposits that did not conform to the criteria for inclusion (that is had fewer than 100 NISP cattle, sheep/goat and pig), although many were noted and have been referred to in the text (*see* section 4.4). Although this is due in part to the increase in production using bone, horn and antler as raw materials that occurred with industrialisation, it is also likely that it represents selective excavation, analysis and publication of unusual deposits. Is such a discriminating process valid? It may be the case that the existence of an abundant historical record is perceived to render the archaeological record less valuable. Yet this provides a good opportunity to compare documentary data with that of the faunal record to identify and study further areas where discrepancies lie, such as those regarding the timing of 'breed improvements' associated with the Agricultural Revolution (*see* section 5.5). Results can also be applied to previous phases to help recognise what animal bones are telling us from periods without such good, or even any, documentary evidence, '... perhaps the key development of the post-medieval period is the Agricultural Revolution ... The importance of post-medieval rural assemblages of faunal and plant remains cannot be over-estimated' (Gilman *et al* 2000, 33).

However, certain caveats could be applied: the usefulness of unstratified material is minimal and so could legitimately be discarded following basic recording and photography depending on the nature of the deposit. Furthermore, the analysis of a number of sites with large quantities of residual material has been misleading (for example post-medieval phases of ecclesiastical sites such as St Mary Spital, London, St Gregory's Priory, Canterbury, and Hospital of St Mary of Ospringe, Kent, following the reformation, where quantities of game and wild birds in demolition contexts have indicated continuing high-status occupation). Unsecure contexts could therefore also possibly be discarded following assessment, recording and photographing if reliable phasing is not possible. A good start to future discussions on retention policies has been described by Rainsford *et al* (2016). Further considerations regarding the retention and discard of zooarchaeological material are discussed in the guidelines for best practice (Baker and Worley 2014, 24). To improve the rigour of any decision, the involvement of other specialists and archaeologists working on that site and within the region should also be sought, as well as a consideration of wider research possibilities.

Differences in the abundance of bird and fish between sieved and hand-collected assemblages are also notable, and the practice of bulk sieving and appropriate sampling (Campbell *et al* 2011, 8–12) should continue to provide a more complete picture of past human–animal relationships and diet. It is also important to provide more consistent details of sampling strategies and context information, to help minimise problems of fragmentation, the calculation of minimum numbers and improve comparability (Reynolds 2013, 29).

6.2.2 Recording

Methodologies used by various specialists to record and analyse animal bone assemblages are highly varied, depending on experience, time pressures and site-specific questions. Recent guidelines on best practice by Baker and Worley (2014) describe commonly used techniques in zooarchaeology and provide advice on the selection of appropriate methods, and rigour in the publication of methods, data and metadata. Such rigour will hopefully make comparison between sites more reliable and valid in the future.

Beyond basic data (taxa, anatomy, taphonomy, fusion, tooth wear and site information), certain aspects of zooarchaeological material are more ambiguous in their recording, analysis and/or dissemination. Examples include butchery, pathology and non-metric traits, whose identifications are subjective and often require non-standardised recording methods. Nonetheless, they have considerable potential for interpretation and analysis, and improved recording is to be recommended.

6.2.3 Formation Processes

One of the major discrepancies encountered in this review has been the tying together of mortality profiles from urban sites. Contradictions between the suggested presence of older animals from fusion data and a prevalence of younger animals from their tooth wear have been observed in cattle and sheep

profiles (for example *see* section 2.4.2). A number of suggestions for the causes of this have been made in the text: the consumption of lamb and calves heads on a household level with larger skulls and mandibles from older animals discarded with primary butchery refuse; the supply of skins (with skulls) to urban sites; poor preservation and recovery of the porous and smaller bones from very young animals; the representation of animals of different sex; and the provision of urban sites with dressed carcasses (without heads or feet) of older animals. It is therefore important that both sources of data are utilised if possible.

Another challenge related to the way the archaeological record is formed lies in the relative scarcity of primary butchery deposits. From the early medieval phase this may be due to the reuse of filleted bones and horns by craft workers and the association of heads and feet with skins, leading to their deposition in tertiary contexts. Butchery deposits remain relatively rare and extra care and emphasis should be placed on the identification and explanation of them, as this could help understand the complexity of a settlement and nature of the butchery process itself.

6.2.4 Research Questions

Over 30 years of modern recording methods of the British zooarchaeological profession have resulted in the production of a considerable data resource. The focus of early research and interpretation was largely one of economy, diet and husbandry, yet the expansion of the available dataset and increased understanding of wider archaeological issues has recently led to the establishment of a new research agenda. This is an exciting time in zooarchaeology! There is potential for an emphasis on interpretation to go beyond purely positivist, processual methodologies, to allow zooarchaeologists to consider the wider context of human–animal relationships. The role of animals in the understanding of less tangible aspects of past society, such as beliefs, gender roles, interaction of people and animals within a landscape and attitudes towards animals, is becoming possible. Recent work on this 'social zooarchaeology' has begun to illustrate how this can be attained by (for example Overton and Hamilakis 2013; Russell 2012; Sykes 2014). It must be emphasised, however, that this still demands sufficient data and rigour in analysis.

The social zooarchaeology framework requires the integration of a wide-ranging set of tools by the researcher, some of which are outlinedhere.

Scientific Techniques

The increasing use of scientific techniques in zooarchaeology has the potential to enhance significantly our knowledge of past human–animal relationships. The three most commonly used methods are biomolecular work (DNA analysis) and isotope and lipid analysis. Recommendations can be made for the use of DNA in the identification of animals to species and to understand better the origins of non-indigenous animals. One example of successful genetics-based doctoral research involved roe deer, centring on their decline and re-establishment in the late medieval and post-medieval periods (Baker 2011).

Isotope analysis is potentially a source of valuable information concerning the geological area that species grew up in. This could be of use when considering the wider hinterlands that urban markets may have drawn upon, or when investigating the origins of new breeds or types of stock. Research on the importation of medieval fish stocks used isotope analysis to distinguish locally caught and imported fish (Barrett *et al* 2011), and changes in the ratio of strontium isotopes in the teeth of fallow deer have identified an animal at Fishbourne that was imported to England as a calf (Sykes *et al* 2006). Also of prime importance to the consideration of the role of animals and animal products is the analysis of isotopes in the human diet, which has been particularly useful to identify the role of marine foods (for example Müldner 2009). Furthermore, they can be used to investigate the diet of animals living at different site types or used for different roles. As scientific analyses become more commonly utilised in the interpretation of human–animal relationships, it becomes imperative that specific research questions are identified as a focus for study (O'Connor 2014).

The identification of lipids is another potential source of information regarding the past use of animals. A study of pottery from Raunds, Northamptonshire, revealed a mixing of fats from various animals, implying cooking methods involving the collection of fat (Evershed *et al* 2002).

Interdisciplinary Collaboration

In past societies the lives of humans and animals were more closely intertwined than today. As a result animals were depicted in a wide range of materials: from artefacts such as shield bosses to legal documents; from portraits of pets to symbols of belief; and from gifts to alterations in the landscape to enclose them. Therefore, specialists in other fields have the potential to add to our knowledge and interpretation of the relationships people had with animals in the past. Zooarchaeological research involving other sources of evidence provides some compelling insights into diverse social interactions (for example Cross 2011; Morris and Jervis 2011; Pluskowski 2011; Sykes 2010). In one case study, the collaboration between zooarchaeological and ceramic specialists has increased understanding of the nature of settlement deposits in Saxon England, leading them to suggest that, rather than considering deposits as 'ritual' or 'rubbish', they should be seen in the context of wider beliefs that affected all aspects of domestic deposition (Morris and Jervis 2011).

Other wide-ranging, multi-disciplinary projects also have potential to contribute to future zooarchaeological investigations. Current examples include the Historic England-funded National Mapping Programme and Heritage Landscape Characterisation Project; the Leverhulme project on the Rural Settlement of Roman Britain (Allen *et al* 2015); *Dama* International (investigating fallow deer from 6000 BC to AD 1600, http://www.fallow-deer-project.net/home); Chicken Coop (an AHRC-funded interdisciplinary project http://www.chickenco-op.net/home); and the Livestock and Landscape project funded by AHRC involving collaborations between University of Sheffield and Historic England.

6.2.5 Dissemination of Site Reports

The recovery, recording and analysis of substantial animal bone assemblages is now embedded within the post-excavation phase of most archaeological projects. However, dissemination of the results of faunal reports is highly variable. The greatest problem facing contemporary specialists is the move away from the publication of raw data, towards greater integration of reports consisting largely of a site narrative (Department for Communities and Local Government 2009). The relegation of primary data to the archive or appendices is a move that will affect the employment of such data as comparanda. It is therefore imperative that, in addition, specialist reports and data are made available, either as an easily accessible appendix or online.

There is an extant large resource of published animal bone assemblages from archaeological sites in regional journals, as stand-alone volumes, and within series such as the British Archaeological Reports (BAR) and Council for British Archaeology (CBA) research reports. The inclusion of bone reports in journals is not always consistent, the journal of the Oxford region, *Oxoniensia*, being exemplary of a good publication strategy, while others could be improved upon.

In the modern internet-based working environment the traditional paper-based resource is increasingly being substituted by the use of digital media. In theory this is as it should be, and will increase the availability of reports to interested parties. The Historic Environment Record (HER), Archaeological Investigation Project (AIP) and the Environmental Archaeology Bibliography (EAB) have great potential as gazetteers of sites and reports, to enhance research in the first steps of investigation. It is, however, dependant on the uptake of such a system by all archaeological commissioning bodies. Such records should signpost the availability of specialist reports, and of the data, which are not always indicated/included with the description of the site itself.

As far as access to specialist reports themselves is concerned, while assessment and evaluation reports are increasingly made available via the Archaeological Data Service (ADS) and Online AccesS to the Index of archaeological investigationS (OASIS) by independent archaeological units, the full analysis and final report are less readily available, as commercial units often make valuable income from the sale of site reports as monographs. One solution to this is for animal bone specialists to take it upon themselves, with relevant permissions, to make their reports available to colleagues through the OASIS database. Minimum training is required, at no expense to the specialist, and it is an easy way of making specialist reports available to a wide audience through ADS and the HER. Social networking sites such as ZooBook (http://zooarchaeology.ning.com) and BoneCommons (https://alexandriaarchive.org/bone-commons/) are also becoming useful for the deposition of stand-alone specialist reports.

Other, more specialised resources are available, such as the presentation of metrical data from animal bones through the Animal Bone Metrical Archive Project (ABMAP; University of Southampton 2003) and Wessex Archaeology Metric Archive Project (WAMAP; Grimm 2008a) projects, and species-specific projects such as *Dama* International (http://www.fallow-deer-

project.net/home) and the Cultural and Scientific Perceptions of Human–Chicken Interactions (http://www.chickenco-op.net/home). Poor access to raw metrical data has long been lamented: '[m]easurements of bones have been made in attempts to make assessments about the relative sizes of the stock, to distinguish between the sexes and to monitor the possible importation of new stock. Unfortunately, such work has not produced the results that it has the potential to obtain' (Maltby 1981, 185), and resources such as ABMAP will be vital in addressing this imbalance.

Datasets such as those compiled for the Historic England regional reviews are an excellent resource, providing a comprehensive source of raw data vital to the interpretation of new animal bone assemblages, and wider research projects. Unfortunately, these datasets quickly become incomplete as new sites come to publication. Thus, all these online resources (ABMAP, WAMAP, *Dama* International the Chicken Coop project and the various regional reviews) require updating as new data become available. Provision for the employment of a specialist, perhaps every 5 years, to add data from subsequent site reports, would maintain the resource as a fundamental, current dataset, trusted by the zooarchaeological community.

6.3 Conclusion

The recording and handling of zooarchaeological data have become more and more standardised, although there are a number of areas to improve upon. Care should be taken to be rigorous in the selection of methods used for recording, analysing, publishing and archiving zooarchaeological data. The debate concerning the selective recording and retention of animal bones is one that is just beginning, but the role of archaeologists as custodians of a non-renewable resource is paramount. A number of specific recommendations have been made that can be easily implemented, while others are more relevant to future research. Perhaps most important is the potential for greater dissemination of specialist reports using the online resource, and inclusion of reports in bibliographies or digital repositories.

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Ag	Agricultural	Natur	Natural
Anthropol	Anthropological	Osteoarchaeol	Osteoarchaeological
Antiq	Antiquaries	Proc	Proceedings
Archaeol	Archaeological	Quat	Quaternary
Brit	British	Rep	Report
Collect	Collection	Res	Research
Counc	Council	Rev	Review
Curr	Current	Sci	Scientific
Engl	England	Scotl	Scotland
Fld	Field	Ser	Series
Hist	Historical	Soc	Society
Int	International	Spelaeol	Spelaeological
J	Journal	Trans	Transactions
Mag	Magazine	Univ	University
Monogr	Monograph		

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APPENDIX 1: LIST OF SITES INCLUDED IN THE DATASET BY COUNTY

ES= early Saxon; MS= middle Saxon; LS= late Saxon; SN= Saxo-Norman; EM= early medieval; HM= high medieval; LM= late medieval; PM= post-medieval; M= medieval; S= Saxon

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Berkshire																	
140 Bartholomew St, Newbury	Coy 1986											*					
29 Thames St, Windsor	Hamilton-Dyer 2005a															*	
51–57 High St, Windsor	Rielly 2005											*					
52–54 Thames St, Windsor	Hamilton-Dyer 2005a											*					
Abbey Wharf, Reading	Coy 1997											*		*		*	
Bridge St East, Reading	Coy 1997															*	
Brook Farm, Cippenham, Slough	Rielly 2003												*				
Charnham Lane, Hungerford	Lovett 2002										*						
Crane Wharf, Reading	Coy 1997											*				*	
Friar St, Reading	Hamilton-Dyer 2005a											*					
Jennings Yard, Windsor	Bourdillon 1993b											*		*			
King Stable St, Eton	Charles 2000b										*		*			*	
Kintbury Square, Kintbury	Hamilton-Dyer 1997b						*										
Lake End Rd	Powell and Clark 2002				*												
Lot's Hole	Powell and Clark 2002				*												
Reading Abbey Stables	Coy 1990													*			
St Andrews church vicarage, Sonning	Hamilton-Dyer 2003a											*					
Staff College, Bracknell	Holmes 2007c															*	
The Manor, Old Windsor	Anthony 2005									*							
Ufton Nervet	Westley 1974						*										
Windsor Castle	Baker 2010											*					

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Wraysbury	Coy 1989							*									
Cornwall																	
Launceston Castle	Albarella and Davis 1996									*		*		*		*	
Mawgan Porth	Bruce-Mitford 1997						*										
Devon																	
39 Fore St, Totnes	Bovey 1984; Colley 1984d															*	
Bantham	Coy 1981a		*														
Berry Pomeroy Castle	Clark and Locker 1996															*	
Crown Hotel, Wimborne	Coy 1983b															*	
Dung Quay, Plymouth	Higbee 2003															*	
Eastern Terrace, Berry Pomeroy Castle	Clark and Locker 1996															*	
Exe Bridge, Exeter	Levitan 1984c											*		*		*	
Exeter	Maltby 1979b										*	*		*		*	
Goldsmith St III, Exeter	Maltby 1979b							*			*	*		*		*	
Goldsmith St I-II, Exeter	Maltby 1979b							*			*	*		*		*	
High St, Exeter	Maltby 1979b										*						
Inner Courtyard, Berry Pomeroy Castle	Clark and Locker 1996															*	
Okehampton Castle	Maltby 1982											*	*	*		*	
Trickhay St, Exeter	Maltby 1979b							*			*	*				*	
Tudor St, Exeter	Higbee 2009															*	
Dorset																	
Alington Ave, Dorchester	Maltby 1988											*					
Christchurch 1969–80	Coy 1983a												*			*	

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Christchurch 1981-83	Coy 1983c												*			*	
Cornmarket, Wimborne	Coy 1983b											*					
Poole	Coy 1985b												*			*	
Poundbury	Buckland-Wright 1987		*														
The Foundry, Poole	Bourdillon 1994; Bullock 1994													*		*	
Gloucestershire																	
1 Westgate St, Gloucester	Maltby 1979a						*				*						
Bristol Castle	Noddle nd						*						*				
Church Rd, Bishop's Cleeve	Lovell *et al* 2007						*										
Citizen House, Bath	Grant 1979a											*				*	
Copsehill Rd, Lower Slaughter	Hambleton 2006				*												
Dundas Wharf, Bristol	Jones and Watson 1987											*					
East Gate, Gloucester	Maltby 1983												*			*	
Eckweek	Davis 1991										*	*					
Harry Stoke, Stoke Gifford	Serjeantson 1995											*					
Mary-Le-Port, Bristol	Noddle 1985										*						
Narrow Quay, Bristol	Levitan 1987b													*		*	
North Gate, Gloucester	Maltby 1983												*				
North St, Winchcombe	Levitan 1985						*					*					
Sherborne House, Lechlade	Maltby 2003		*														
St Bartholomew's Hospital, Bristol	Barber 1998											*		*			
Stoke Rd, Bishop's Cleeve	Maltby 2002												*				
Swallow Hole, Alveston	Clarke and Levitan 1987																*
Tanner's Hall, Gloucester	Sykes 2009a						*					*				*	
Upton	Yealland and Higgs 1966											*					

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Hampshire																	
18–20 High St, Alton	Hamilton-Dyer 2007														*		
26–27 Staple Gardens, Winchester	Hamilton-Dyer and Hamilton-Dyer 2008						*					*					
27 Jewry St, Winchester	Bourdillon 2009						*										
Abbots Worthy	Coy 1991				*												
Albany and Greyhound Hotel Site, Fordingbridge	Hamilton-Dyer 2003c															*	
Alton	Coy 1981b													*		*	
Anderson's Rd, Southampton	Knight 2006				*												
Brighton Hill South	Coy 1995								*								
Chantry St, Andover	Hamilton-Dyer 1994											*	*			*	
Charlton Gym, Andover	Hamilton-Dyer 1997c	*															
Chester Rd, Winchester	Bourdillon 2009; Serjeantson and Smith 2009						*										
Church St, Romsey	Hamilton-Dyer 1991														*		
Cook St, Southampton	Bourdillon 1993c				*												
Cook St SOU 823, Southampton	Hamilton-Dyer 2001c				*												
Easton Lane, Winchester	Maltby 1989							*									
Faccombe Netherton	Sadler 1990						*			*		*		*			
Foxcotte	Coy 1985c								*								
French Quarter, Southampton	Bates and Nicholson 2011						*			*		*		*		*	
Graveyard Site, Southampton	Colley 1984c				*												
Henly's Garage, Winchester	Serjeantson and Smith 2009							*									

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Melbourne St, Southampton	Bourdillon and Coy 1980				*												
Northgate House, Winchester	Strid 2011							*		*		*					
Old Down Farm, Andover	Bourdillon 1980		*														
Portchester Castle	Grant and Eastham 1976		*			*	*										
Portchester Castle	Grant and Eastham 1977									*	*	*		*			
Quilter's Vault, Southampton	Bourdillon 1979											*				*	
Riverdene, Basingstoke	Hamilton-Dyer 2003e				*												
Romsey Abbey	Hamilton-Dyer 1996								*							*	
SARC XIV, Southampton	Driver 1984				*												
Shavards Farm, Meonstoke	Hamilton-Dyer and Bourdillon 1991				*												
Six Dials study, Southampton	Bourdillon 1985				*												
SOU 117 study, Southampton	Bourdillon 1985						*										
SOU 169 study, Southampton	Bourdillon 1985						*										
SOU 17, Southampton	Colley 1984a				*												
SOU 175 study, Southampton	Bourdillon 1985						*										
SOU 177 study, Southampton	Bourdillon 1985						*										
SOU 19, Southampton	Colley 1984b				*												
SOU 29, Southampton	Bourdillon 1986b											*		*			
SOU 30 study, Southampton	Bourdillon 1985						*										
SOU 25, Southampton	Driver 1987							*									
Southampton Castle	Hamilton-Dyer 1986; Bourdillon 1986a											*					
Southampton Excavations 1966–9	Noddle 1975a										*	*				*	

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Southampton study	Bourdillon 1985											*					
St John's St, Winchester	Serjeantson and Smith 2009											*				*	
St Mary's Abbey, Winchester	Brown 2011							*					*				
St Mary's Stadium, Southampton	Hamilton-Dyer 2005c				*												
St Michael's, Southampton	Hamilton-Dyer 2003d											*		*			
Staple Gardens, Winchester	Holmes 2011b						*	*									
Victoria Rd, Winchester	Serjeantson and Smith 2009; Bourdillon 2009							*				*		*	*		
West Quay, Southampton	Hamilton-Dyer 2003f					*											
Western Suburb, Winchester	Coy 2009						*			*		*					
Wickham Glebe	Coy 1985a											*		*		*	
Isle of Wight																	
Carisbrooke Castle 2006–8, Isle of Wight	Ayton 2011									*		*	*			*	
Carisbrooke Castle, Isle of Wight	Smith 1994									*							
Key Close, Newtown	Wood 2011															*	
Kent																	
Canterbury Castle	King 1982b					*	*									*	
Canterbury Defences	King 1982a					*										*	
Canterbury Lane, Canterbury	Marples 1983						*										
Canterbury Police Station	Bendrey 2005										*			*			
Hospital of St Mary of Ospringe	Wall 1980												*	*		*	
Linacre Garden, Canterbury	Driver 1990									*		*		*		*	
Lydd Quarry	Sibun and Jaques 2008											*		*			
Manston Rd, Ramsgate	Hamilton-Dyer 1997d		*														
Minster, Isle of Sheppey	Hamilton-Dyer 2000c				*												

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Northfleet	Grimm *et al* 2011		*														
Pepper Hill Lane, Northfleet	Charles 2001b; Ingrem 2001b									*							
Sandtun, West Hythe	Murray and Hamilton-Dyer 2001					*											
Springhead	Grimm *et al* 2011		*														
St Gregory's Priory, Canterbury	Powell *et al* 2001											*		*		*	
Townwall St, Dover	Bendrey *et al* 2006											*					
London (Middlesex)																	
103–106 Shoreditch High St	Rielly 2011															*	
129 Lambeth Rd, London	Locker 1996								*							*	
14 Farringdon St, London	Rielly and Yeomans 2008											*		*	*	*	
199 Borough High St, London	Locker 1996								*						*		
21–22 Maiden Lane, London	Locker 1988; West 1988				*												
27 James St, London	Rielly 2010				*												
60–63 Fenchurch St	Hamilton-Dyer 2009												*				
Aldersgate, London	Armitage 2001							*				*		*		*	
Aldgate 1974, London	Armitage *et al* 1984															*	
Arundel House, London	Clutton-Brock 1975; Cowles 1975; Wheeler 1975													*			
Billingsgate Buildings, London	Levitan *et al* 1980							*									
Broad Sanctuary, London	Locker 1982a															*	
Charter Quay, Kingston-Upon-Thames	Hamilton-Dyer 2004b													*		*	
Creedy's Yard, Greenwich	Hamilton-Dyer 2002															*	
Distillery site, Hammersmith	Ainsley *et al* 2008		*														

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Dorter Undercroft, Westminster Abbey	Locker 1995; Pipe 1995						*	*									
Fennings Wharf, London	Rielly 2001							*					*				
Finsbury Pavement, London	Locker 1997															*	
Fulham Pottery	Armitage 1999															*	
Gardiner's Corner, London	Locker 1984											*		*		*	
Gatehouse Nurseries, West Drayton	Locker 1985b													*			
Harlington, London	Grimm 2009		*					*									
High St, Uxbridge	Liddle 2004											*		*			
Holywell Priory, London	Morris 2011a											*					
James St, London	Armitage 2004				*												
Jubilee Hall, London	Locker 1988; West 1988				*												
Lyceum Theatre, London	Rackham and Snelling 2004				*												
Mark Browns Wharf, London	Locker 1996															*	
National Gallery Basement, London	Locker 1989; West 1989b				*												
National Gallery Extension, London	Rackham 1989				*												
Peabody Site, London	Locker 1989; West 1989a				*												
Rainbow Quay, Rotherhithe	Rielly 1998															*	
Sir John Cass Primary School, London	Armitage 1979b									*							
St Magnus	Armitage 1979a							*		*							
St Mary Spital, London	Pipe and Locker 1997									*		*		*		*	
St Saviour, Bermondsey	Pipe *et al* 2011						*			*		*		*		*	
Stepney High St, London	Locker 1982a															*	
Steward St, Spitalfields	Holmes 2007a															*	

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Sub-vault of Westminster Abbey	Jones 1976; Locker 1976									*		*					
Tower of London 1955–77	Nicolaysen 1985									*							
Upper Thames St, London	King 1980															*	
Winchester Palace, Southwark	Rielly and Locker 2006							*					*			*	
York Buildings, London	Rackham 1988				*												
113–119 High St, Oxford	Hamilton-Dyer 2000b; Maltby 2000						*					*					
23–26 Queen St, Oxford	Wilson 1992						*			*							
24a St Michael's St, Oxford	Wilson 2003											*					
31–34 Church St, St Ebbes, Oxford	Wilson *et al* 1989						*					*		*		*	
44–46 Cornmarket St, Oxford	Marples 1971										*						
54–55 St Thomas' St, Oxford	Wilson and Locker 1996											*	*	*			
67–69 St Thomas' St, Oxford	Poole 2006													*		*	
7–8 Queen St, Oxford	Wilson 2003						*			*		*					
79–80 St Aldates, Oxford	Marples 1977				*		*			*		*		*			
Abingdon West Central Redevelopment	Nicholson 2007; Strid 2007a												*		*		
All Saints Church, Oxford	Wilson 2003						*										
Ashmolean Museum Forecourt, Oxford	Hamilton-Dyer 1997a															*	
Audlett Dr, Abingdon	Levitan 1992		*														
Banbury Castle	Gamble 1983							*				*					
Barton Court Farm, Abingdon	Wilson *et al* 1986		*														
Broad St, Abingdon a	Wilson *et al* 1975											*		*			
Checker Walk, Abingdon	Wilson 1984											*					
Christ Church Cathedral Graveyard,	Charles 2001a						*										

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Oxford																	
Church View, Bampton	Charles 2000a										*						
Clarendon Hotel, Oxford	Jope 1958						*										
Classics Centre, Oxford	Nicholson 2008; Poole 2008											*				*	
Copt Hay, Tetsworth	Bramwell 1973; Pernetta 1973											*					
Cresswell Field	Mulville and Ayres 2004				*												
Dean Court, Cumnor	Jones and Jones 1994											*		*		*	
Dominican Priory, Oxford	Harman and Bramwell 1985; Wilkinson 1985											*					
Dorchester-on-Thames 1972	Grant 1978				*												
Elizabeth House, Oxford	Holmes 2010b							*				*				*	
Eynsham Abbey, Oxfordshire	Ayres *et al* 2003		*		*		*			*		*	*	*		*	
First Ashmolean Museum, Oxford	Hamilton-Dyer 2003b															*	
Greyfriars, Oxford	Wilson 1984															*	
Harding's Field, Chalgrove	Wilson *et al* 2005											*		*			
Hinxey Hall, Oxford	Wilson *et al* 1983							*		*		*		*			
Hollybush Row, Oxford	Wilson 1996												*				
Lincoln College, Oxford	Charles 2002; Charles and Ingrem 2002									*			*	*		*	
Logic Lane, Oxford	Banks 1962						*										
Merton College, Oxford	Worley and Evans 2006										*	*		*		*	
Middleton Stoney	Levitan 1984b											*				*	
Mill St, Wantage	Maltby 1996		*														
Mount House, Witney	Ayres and Serjeantson 2002											*				*	

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
New Wintles	Noddle 1975b		*														
Old Clothing Factory, Abingdon	Wilson 1989													*		*	
Old Gaol, Abingdon	Wilson *et al* 1975											*					
Old Gaol, Oxford	Wilson *et al* 1975											*					
Oxford Castle	Marples 1976									*			*				
Oxford Science Park	Ingrem 2001a		*														
Queens College Buttery, Oxford	Strid 2008												*				
Queen's College, Oxford	Nicholson 2010; Strid 2010							*									*
Seacourt, Oxfordshire	Jope 1962											*					
Shrivenham Rd, Ashbury	Rielly 1998		*														
St Aldates, Oxford	Armour-Chelu 2003											*		*			
St Frideswide's Cloister, Oxford	Stallibrass 1990												*			*	
St Helen's Ave, Benson	Hamilton-Dyer 2004a		*														
St Mary's, Wantage	Holmes 2009									*							
Stert St, Oxford	Wilson and Bramwell 1980											*				*	
The Hamel, Oxford	Wilson and Bramwell 1980											*	*	*		*	
The Orchard, Brighthampton	Rielly 2002											*					
The Thames Crossing, Oxford	Wilson *et al* 1984									*		*		*			
The Vineyard, Abingdon	Strid 2007b										*						
Trill Mill Stream, Oxford	Wilson 2003						*			*		*					
Twickenham House, Abingdon	Wilson and Wallis 1991													*			
West Gate, Oxford Castle	Wilson and Locker 2003											*		*		*	
West St Helen St, Abingdon	Wilson and Bramwell 1975												*			*	

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Worton	Mulville and Ayres 2004				*												
Yarnton	Mulville and Ayres 2004					*											
Somerset																	
5–8 Fore St, Taunton	Adams 1988											*				*	
Bath 1984–1989	Barber 1999						*	*								*	
Benham's Garage, Taunton	Levitan 1984a; Wheeler 1984											*				*	
Bickley, Cleeve, Somerset	Skinner 2001									*							
Brent Knoll, Somerset	Higbee 2008							*									
Bridewell Lane, Shapwick	Gidney 2007											*					
Bush Marsh Village	Noddle 1978												*				
Cadbury Congresbury 1968–73	Noddle 1992		*									*					
Cheddar Palaces	Higgs *et al* 1979						*				*		*				
Church Field, Shapwick	Gidney 2007											*					
Finzel's Reach, Bristol	Strid nd									*		*		*			
Glastonbury Great Barn	Gidney 2007															*	
Ilchester Manor House	Levitan 1987a												*				
Kingshams, Ilchester	Levitan 1982a												*				
Limington Rd South, Ilchester	Levitan 1987a												*				
New Royal Baths, Bath	Higbee *et al* 2007								*							*	
Old Bakery, Shapwick	Gidney 2007															*	
Priory Barn, Taunton	Levitan 1984a; Wheeler 1984											*					
Reredorter, Cleeve Abbey	Locker 1998											*					
Shapwick House Moat, Shapwick	Gidney 2007											*				*	

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Shapwick Park, Shapwick	Gidney 2007															*	
Silver St, Glastonbury	Levitan 1982b											*	*			*	
Steep Holm Priory, Weston-Super-Mare	Levitan 1983												*				
Taunton Priory	Langley 1978															*	
The Mound, Glastonbury	Darvill and Coy 1985							*									
The Park, Keynsham	Barber 1996											*		*			
Surrey																	
16 Tunsgate, Guildford	Smith and Serjeantson 1997															*	
Battle Bridge Lane, Southwark	Rielly 2000													*		*	
Friends Burial Site, Staines	Chapman 1984											*					
Guildford Castle	Sykes 2005									*							
High St, Guildford	Holmes 2007b															*	
Little Pickle, Bletchingley	Bourdillon 1992													*		*	
Little Pickle, Bletchingley	Bullock 1998													*			
Nonsuch Palace	Locker 2005															*	
Saxon County School, Shepperton	Ayres 2005		*									*					
St John's Vicarage, Old Malden	Hamilton-Dyer 2001b												*				
Sutton Park, Guildford	Ayres 2011													*		*	
The Old Vicarage, Reigate	Done 1986											*					
Sussex																	
1–3 High St, Seaford	Jaques 2004											*					
Battle Abbey	Locker 1982b, 1985a											*				*	
Bishopstone	Poole and Reynolds 2010					*											
Blackfriars Barn, Winchelsea	Kyllo 2004												*				

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
Botolphs, Bramber	Stevens 1990		*														
Camber Castle	Connell and Davis 2001															*	
Church St, Seaford	Wood 1995												*				
Church St, Seaford 1976	Bedwin 1978											*					
Cliffe, Lewes	Stevens 1991a															*	
Fletcher's Croft, Steyning	Ridout Sharpe 1986											*					
Friars Oak, Hassocks	Stevens 2000					*											
Friars Walk, Lewes	O'Shea and Somerville 1990										*						
Hospital of St Nicholas, Lewes	Brown 2010											*					
Lewes Castle	O'Shea 1992										*					*	
Lewes House, Lewes	Jaques 2009							*			*	*	*			*	
Lewes Priory	Stevens 1997						*										
Market Field, Steyning	O'Shea 1993						*										
Mill Rd, Winchelsea	Kyllo 2004														*		
Mount St, Battle	Sibun 2008											*		*			
North St Car Park, Lewes	Holmes 2010a							*									
North St, Winchelsea	Kyllo 2004													*			
Old Erringham, Shoreham	Westley 1980							*									
Pallant House Gallery, Chichester	Knight 2008							*									
Pevensey Castle	Powell and Serjeantson 2011										*		*				
Phoenix Brewery, Hastings	Clements 1993											*				*	
Rookery Hill, Bishopstone	Gebbels 1977		*														
Ropetackle, Shoreham by Sea	Ayton and Jaques 2011											*				*	
Stretham, West Sussex	Bedwin 2009											*					
Testers, Steyning	Parfitt 1988											*					

	Reference	S	ES	ES-MS	MS	MS-LS	LS	SN	ME	EM	EM-HM	HM	HM-LM	LM	LM-PM	PM	M-PM
The South Lawn, Michelham Priory	Stevens 1991b															*	
Wiltshire																	
Cadley Rd, Collingbourne Ducis	Hamilton-Dyer 2001a					*											
Emwell St, Warminster	Freke *et al* 1997							*									
Gomeldon	Harcourt 1986											*					
High St, Ramsbury	Coy 1980				*							*					
Ivy St and Brown St, Salisbury	Hamilton-Dyer 2000a												*			*	
Malmesbury 2000	Sykes 2006a						*				*						
Market Lavington	Bourdillon 2006		*					*				*					
Postern Mill, Malmesbury	Currie 1993											*			*		
Trinity Chequer, Salisbury	Hamilton-Dyer 2005b												*				
Trowbridge	Bourdillon 1993a					*		*				*	*				
Wilton, Salisbury	Grimm 2008b			*				*									

APPENDIX 2: QUANTIFICATION OF THE MAJOR DOMESTIC AND WILD TAXA

N= total number of cattle, sheep/goat and pig; All other quantities are given as a percentage of *N*.

B= bos; O= ovicaprid; S= suid; E= equid; C= canid; F= felid; L= lagomorph; D= deer; G= galliform (domestic fowl); A= anser (domestic goose); AN= anas (domestic duck)

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Saxon													
Charlton Gym, Andover	Rural	127	33	54	13	2	0	0	0	0	2.4	0	0.8
Early Saxon													
Cadbury Congresbury 1968–73	High Status	8172	59	6	35	1	1	1	1	2	0	0	0
Audlett Dr, Abingdon	Rural	173	53	39	9	2	1	0	0	0	1.2	0.6	0
Bantham	Rural	922	43	37	20	1	2	0	0	*	3.8	0	0
Barton Court Farm, Abingdon	Rural	1304	29	44	27	1	1	1	0	0.4	4.6	3.5	0
Botolphs, Bramber	Rural	266	42	21	37	0	0	0	0	3.4	0.8	0.4	0
Distillery site, Hammersmith	Rural	154	61	27	12	3	0	0	0	1.3	1.3	0	0
Eynsham Abbey, Oxfordshire	Rural	642	36	45	19	3	1	0	0.3	1.9	2.5	2.8	0
Harlington, London	Rural	255	58	25	16	2	4	0	0	0	3.1	0.4	0
Manston Rd, Ramsgate	Rural	316	32	54	14	4	0	0	0	1.3	3.8	1.6	0
Market Lavington	Rural	1040	55	27	18	1	2	0	0	0.3	1	1.1	0
Mill St, Wantage	Rural	174	54	40	6	9	3	0	0	0.6	1.1	0.6	0
New Wintles	Rural	827	53	36	12	0	0	0	0	0.6	0.5	0.5	0
Northfleet	Rural	772	53	19	28	6	1	0	0.1	2.6	0.3	0	0
Old Down Farm, Andover	Rural	290	43	48	9	3	0	0	0	0	4.8	0	0
Oxford Science Park	Rural	515	59	23	17	2	0	0	5.8	1.4	0.6	0.6	0
Portchester Castle	Rural	888	62	22	16	2	0	0	0	3.5	3.5	3.6	0
Poundbury	Rural	3432	50	42	8	1	2	1	0.9	7.5	0	0	0
Rookery Hill, Bishopstone	Rural	114	31	48	21	3	0	1	0	0.9	5.3	2.6	0
Saxon County School, Shepperton	Rural	312	36	34	31	1	0	0	1.9	0	2.2	0	0
Sherborne House, Lechlade	Rural	427	60	35	5	3	0	3	0	0	3.7	2.3	0.2
Shrivenham Rd, Ashbury	Rural	212	68	23	9	7	7	0	0	0.5	0	0	0
Springhead	Rural	306	38	21	41	0	0	0	0.7	1.3	0.7	0	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
St Helen's Ave, Benson	Rural	438	52	34	15	3	0	0	0	0.7	3	0.7	0
Early–middle Saxon													
Wilton, Salisbury	Rural	738	60	32	9	0	0	0	0.1	0.4	0.3	0.4	0
Middle Saxon													
Eynsham Abbey, Oxfordshire	Ecclesiastical	1876	20	56	23	1	0	0	0.1	1	14.9	6.5	0
High St, Ramsbury	High Status	835	41	30	30	8	0	0	0	7.4	3	0.1	0
High St, Ramsbury	High Status	1107	40	28	32	18	2	0	0	4.2	7.6	1	0
Lake End Rd	High Status	4100	51	17	31	4	1	0	0	0.7	4.8	1.6	1.6
Abbots Worthy	Rural	1053	48	42	10	2	0	1	0.1	0	6.6	1.6	0
Copsehill Rd, Lower Slaughter	Rural	325	34	46	20	4	1	0	0	0.3	3.7	1.5	1.5
Cresswell Field	Rural	354	56	30	14	9	1	0	0.6	0	1.1	3.1	0
Dorchester-on-Thames 1972	Rural	878	61	26	13	1	1	0	0.2	0.1	0	0	0
Lot's Hole	Rural	385	51	29	20	6	2	0	0	0	2.6	1	0.3
Riverdene, Basingstoke	Rural	169	29	24	47	2	1	0	0	3	0.6	0.6	0
Shavards Farm, Meonstoke	Rural	1076	35	45	20	0	0	0	0	0.1	3.1	0.1	0
Worton	Rural	168	60	25	15	0	1	0	0	0	2.4	0.6	0
21–22 Maiden Lane, London	Urban	5306	55	16	29	0	0	1	0	0.5	1.5	1.1	0.1
27 James St, London	Urban	315	35	47	18	0	0	0	0	0	1.6	1	0
27 James St, London	Urban	708	46	18	36	0	0	0	0	0	2.1	1.6	0
79–80 St Aldates, Oxford	Urban	376	30	61	9	2	0	0	0.3	0.3	2.7	0	0
Anderson's Rd, Southampton	Urban	618	83	10	7	18	0	0	0	*	0.2	0.2	0
Cook St, Southampton	Urban	4702	61	16	23	0	0	0	0	0.2	2.1	1.3	0
Cook St SOU 823, Southampton	Urban	369	65	21	14	2	1	2	0	0	0	0.3	0
Graveyard Site, Southampton	Urban	291	56	24	20	1	0	0	0	0.3	1.4	0.3	0
James St, London	Urban	1684	56	14	31	0	0	0	0	0.7	0.6	0.2	0
Jubilee Hall, London	Urban	1544	55	22	24	0	2	0	0	0.5	1.6	0.9	0
Lyceum Theatre, London	Urban	3981	62	16	22	0	0	0	0	0.4	0.5	0.5	0
Melbourne St, Southampton	Urban	45455	53	32	15	0	0	0	0	0	1.8	0.8	0
National Gallery Basement, London	Urban	1606	30	41	29	0	0	0	0	0.2	2.8	1.9	0
National Gallery Extension, London	Urban	462	67	24	8	1	1	1	0	0.4	0	0.2	0
Peabody Site, London	Urban	4878	47	23	30	0	0	0	0	0	1.2	1.5	0
SARC XIV, Southampton	Urban	8910	70	20	9	4	0	0	0	*	0.9	0.3	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Six Dials study, Southampton	Urban	12511	52	33	15	0	0	0	0	0.1	1	0.8	0
SOU 17, Southampton	Urban	532	72	19	9	0	0	0	0	0	0	0	0
SOU 19, Southampton	Urban	221	33	47	19	0	0	0	0	0	0.5	0	0
St Mary's Stadium, Southampton	Urban	3891	62	20	18	0	0	0	0	0.9	2.1	1.3	0
York Buildings, London	Urban	144	54	15	31	0	0	0	0	0	0	0	0
Middle–late Saxon													
Bishopstone	Ecclesiastical	5371	17	53	30	1	1	2	0.3	0.4	15.1	0.7	0
Cadley Rd, Collingbourne Ducis	Rural	1016	37	56	6	2	0	10	0	4.6	7.3	2.1	0
Friars Oak, Hassocks	Rural	411	66	23	11	4	0	0	0	1	0	0	0
Sandtun, West Hythe	Rural	251	36	43	20	0	3	*	0	0	12.4	5.2	0
Trowbridge	Rural	1475	49	28	23	2	0	0	0	2	1.4	0.5	0
Yarnton	Rural	659	56	31	14	7	4	0	0	0	1.2	2.1	0
Canterbury Defences	Urban	160	40	41	19	1	3	0	0	4.4	0	0	0
Portchester Castle	Urban	9488	53	28	18	1	0	0	0.3	5.5	0.0	0.0	0.0
West Quay, Southampton	Urban	3902	54	22	25	1	0	3	0.1	0.4	7.6	0.4	0.0
Late Saxon													
Eynsham Abbey, Oxfordshire	Ecclesiastical	843	31	38	31	1	0	0	0.9	6.0	3.4	1.3	0.0
Eynsham Abbey, Oxfordshire	Ecclesiastical	1381	30	44	26	2	0	0	0.1	3.0	3.9	1.7	0.0
Lewes Priory	Ecclesiastical	7	0	71	29	0	0	0	0.0	0.0	128.6	0.0	0.0
Cheddar Palaces	High Status	919	45	23	32	1	0	0	0.0	2.8	0.0	0.0	0.0
Cheddar Palaces	High Status	3239	43	26	31	2	1	0	0.0	3.0	0.0	0.0	0.0
Faccombe Netherton	High Status	1138	25	39	36	2	3	0	1.6	7.4	5.4	1.3	0.0
Church Rd, Bishop's Cleeve	Rural	251	67	24	9	*	0	*	0.0	0.0	0.0	0.0	0.0
Kintbury Square, Kintbury	Rural	229	33	46	21	2	0	0	0.0	0.9	6.1	0.4	0.0
Market Field, Steyning	Rural	3394	24	64	13	1	0	0	*	*	0.0	0.0	0.0
Mawgan Porth	Rural	1120	45	52	3	2	0	0	0.0	0.0	0.0	0.0	0.0
Ufton Nervet	Rural	142	27	73	0	8	0	0	0.0	0.0	0.0	0.0	0.0
1 Westgate St, Gloucester	Urban	179	35	38	27	0	0	0	0.0	0.6	1.7	1.7	0.0
113–119 High St, Oxford	Urban	552	52	29	19	1	1	0	0.0	0.4	2.0	0.7	0.2
23–26 Queen St, Oxford	Urban	526	37	40	23	0	0	0	0.0	0.2	5.1	0.8	0.0
26–27 Staple Gardens, Winchester	Urban	475	26	57	17	0	0	1	0.0	0.4	0.0	0.0	0.0
27 Jewry St, Winchester	Urban	314	45	37	18	2	1	0	0.0	0.6	6.4	0.0	0.0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
7–8 Queen St, Oxford	Urban	178	34	41	25	0	1	0	0.0	0.0	4.5	0.6	0.0
79–80 St Aldates, Oxford	Urban	997	34	58	8	0	0	0	0.0	0.0	0.9	0.0	0.0
All Saints Church, Oxford	Urban	815	31	44	25	1	0	1	0.2	0.4	8.7	0.6	0.2
Bath 1984–1989	Urban	436	42	37	21	4	1	0	0.0	0.7	0.9	0.0	0.0
Bristol Castle	Urban	328	46	26	28	1	*	*	0.0	0.0	0.0	0.0	0.0
Canterbury Castle	Urban	234	33	39	28	9	3	0	0.0	0.0	0.0	0.0	0.0
Canterbury Lane, Canterbury	Urban	208	48	30	22	0	0	0	0.0	4.8	4.8	0.5	0.0
Chester Rd, Winchester	Urban	1128	42	33	26	3	2	0	0.4	0.2	5.9	0.2	0.0
Christ Church Cathedral Graveyard, Oxford	Urban	142	15	77	7	0	0	0	0.0	0.0	3.5	0.7	0.0
Clarendon Hotel, Oxford	Urban	200	46	30	24	1	1	1	0.0	0.0	10.0	0.0	0.0
Dorter Undercroft, Westminster Abbey	Urban	2719	36	59	6	1	0	0	0.0	0.2	0.8	0.1	0.0
French Quarter, Southampton	Urban	1707	60	22	19	2	0	0	0.2	1.5	2.3	0.1	0.0
Logic Lane, Oxford	Urban	283	30	58	12	10	4	0	0.0	0.0	24.4	2.1	0.0
Malmesbury 2000	Urban	203	34	51	15	0	0	0	0.0	0.0	1.0	0.5	0.0
North St, Winchcombe	Urban	931	37	55	8	0	0	0	0.0	0.2	3.9	0.5	0.0
Portchester Castle	Urban	2040	50	31	19	2	2	2	0.2	5.0	25.0	7.2	0.0
SOU 117 study, Southampton	Urban	534	49	29	22	0	1	0	0.0	0.6	3.0	0.0	0.0
SOU 169 study, Southampton	Urban	2355	57	31	12	0	0	1	0.0	0.0	1.2	0.3	0.0
SOU 175 study, Southampton	Urban	1307	74	15	11	1	0	2	0.0	0.0	1.1	0.2	0.0
SOU 177 study, Southampton	Urban	1215	55	35	10	0	0	0	0.0	0.1	0.6	1.2	0.0
SOU 30 study, Southampton	Urban	946	64	28	8	0	0	0	0.0	0.1	1.8	0.0	0.0
St Saviour, Bermondsey	Urban	394	48	24	28	7	0	0	0.0	0.8	2.3	3.3	0.3
Staple Gardens, Winchester	Urban	2421	32	51	17	1	0	*	0.5	0.3	9.3	0.8	0.5
Tanner's Hall, Gloucester	Urban	124	46	40	15	3	2	0	0.0	0.0	2.4	0.0	0.0
Trill Mill Stream, Oxford	Urban	103	41	37	22	3	0	0	1.0	1.0	1.0	3.9	0.0
Trill Mill Stream, Oxford	Urban	192	37	46	17	4	1	0	0.0	1.0	5.2	2.1	0.0
Victoria Rd, Winchester	Urban	1736	44	38	18	3	1	0	0.1	0.3	4.1	0.2	0.0
Western Suburb, Winchester	Urban	693	37	46	17	5	1	1	0.1	0.0	3.8	0.7	0.0
Western Suburb, Winchester	Urban	1472	50	28	22	2	10	3	0.0	0.0	6.8	0.3	0.0
Western Suburb, Winchester	Urban	3245	43	27	30	1	0	0	0.1	0.1	7.0	0.2	0.0
Saxo-Norman													

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
St Mary's Abbey, Winchester	Ecclesiastical	809	13	39	48	0	0	0	0.2	0.9	0.1	0.0	0.0
Emwell St, Warminster	High Status	236	70	20	10	2	11	*	0.0	0.8	2.5	0.0	0.0
Trowbridge	High Status	1740	36	44	20	1	0	1	0.5	1.7	5.5	1.9	0.0
Brent Knoll, Somerset	Rural	126	39	39	22	6	2	2	0.0	0.8	5.6	1.6	0.0
Easton Lane, Winchester	Rural	232	15	79	6	3	1	0	0.0	0.0	0.4	0.0	0.0
Harlington, London	Rural	675	59	26	15	8	2	0	0.1	0.9	0.1	0.0	0.0
Market Lavington	Rural	130	41	48	12	3	0	0	0.0	0.0	4.6	1.5	0.0
Old Erringham, Shoreham	Rural	292	21	67	12	1	1	0	0.0	0.0	0.0	0.0	0.0
The Mound, Glastonbury	Rural	350	27	43	30	11	0	0	0.0	0.6	3.7	2.3	0.0
Wilton, Salisbury	Rural	1183	41	54	5	1	0	*	0.1	0.1	2.3	0.3	0.2
Wraysbury	Rural	4720	41	28	31	0	0	0	0.0	0.0	6.3	1.4	0.0
31–34 Church St, St Ebbes, Oxford	Urban	2165	25	58	17	1	0	1	0.2	0.5	0.0	0.0	0.0
Aldersgate, London	Urban	144	59	33	8	10	15	6	0.0	0.0	4.2	2.1	0.0
Aldersgate, London	Urban	829	54	40	6	2	4	1	0.0	0.1	0.6	0.8	0.2
Banbury Castle	Urban	315	50	25	25	4	0	0	0.0	2.2	0.0	0.0	0.0
Bath 1984–1989	Urban	1771	36	52	11	0	0	0	*	1.1	5.0	0.1	0.0
Billingsgate Buildings, London	Urban	214	39	48	13	0	0	0	0.5	0.0	1.4	0.9	0.0
Dorter Undercroft, Westminster Abbey	Urban	2542	35	47	17	0	0	0	0.3	0.6	6.8	0.3	1.4
Elizabeth House, Oxford	Urban	104	64	33	3	4	2	0	*	0.0	5.8	1.0	0.0
Fennings Wharf, London	Urban	109	46	46	8	0	0	1	0.0	0.0	4.6	2.8	0.0
Goldsmith St III, Exeter	Urban	585	31	51	18	0	0	10	1.2	0.2	0.0	0.0	0.0
Goldsmith St III, Exeter	Urban	902	46	36	18	1	0	1	0.4	0.3	0.0	0.0	0.0
Goldsmith St I-II, Exeter	Urban	502	32	56	13	1	0	1	0.2	1.0	0.0	0.0	0.0
Goldsmith St I-II, Exeter	Urban	698	46	38	16	0	0	1	0.0	0.0	0.0	0.0	0.0
Henly's Garage, Winchester	Urban	530	44	41	15	1	1	7	0.0	0.0	3.8	0.0	0.0
Hinxey Hall, Oxford	Urban	155	28	25	48	0	1	0	0.0	1.3	1.3	0.6	0.0
North St Car Park, Lewes	Urban	238	31	43	26	0	1	1	0.0	0.0	12.2	0.0	0.0
Northgate House, Winchester	Urban	2922	31	48	20	1	1	0	0.1	0.3	13.1	0.3	0.0
Pallant House Gallery, Chichester	Urban	113	48	40	12	0	1	0	0.0	0.9	0.9	0.9	0.0
Queen's College, Oxford	Urban	131	37	55	8	4	26	0	0.0	3.1	3.8	2.3	0.0
SOU 25, Southampton	Urban	2026	56	22	22	1	0	1	0.1	1.8	9.5	0.9	0.0
St Magnus	Urban	634	57	22	21	0	0	0	0.0	0.8	0.0	0.0	0.0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Staple Gardens, Winchester	Urban	1811	35	45	19	2	0	*	0.3	0.5	10.4	1.8	0.4
Trickhay St, Exeter	Urban	236	39	43	17	1	0	1	0.4	0.4	0.0	0.0	0.0
Trickhay St, Exeter	Urban	821	46	35	19	0	1	1	0.2	0.0	0.0	0.0	0.0
Victoria Rd, Winchester	Urban	1278	32	59	9	0	0	1	0.4	0.0	1.3	1.0	0.0
Winchester Palace, Southwark	Urban	374	46	31	23	1	0	0	0.0	1.1	4.5	0.0	0.0
Medieval													
Romsey Abbey	Ecclesiastical	189	32	45	23	0	0	1	*	0.0	7.4	1.1	0.0
Brighton Hill South	Rural	2170	28	57	15	9	10	4	39.2	13.2	12.4	6.5	0.0
Foxcotte	Rural	643	36	39	25	2	0	0	1.9	0.9	3.9	0.5	0.0
129 Lambeth Rd, London	Urban	147	38	56	6	0	5	0	4.1	0.7	8.8	1.4	1.4
199 Borough High St, London	Urban	154	53	36	12	1	1	0	1.3	0.0	8.4	0.0	0.6
New Royal Baths, Bath	Urban	960	29	56	15	1	1	1	0.8	0.4	11.3	0.7	0.4
Early medieval													
Eynsham Abbey, Oxfordshire	Ecclesiastical	3665	39	25	36	1	2	0	0.9	3.3	5.9	1.3	0.0
St Saviour, Bermondsey	Ecclesiastical	354	47	19	35	6	0	0	0.3	0.0	1.7	0.3	0.0
Carisbrooke Castle 2006–8, Isle of Wight	High Status	1254	13	46	42	2	5	0	8.0	1.8	16.7	0.6	0.8
Carisbrooke Castle, Isle of Wight	High Status	2290	14	41	45	1	3	1	5.7	2.7	15.1	0.3	0.0
Faccombe Netherton	High Status	1176	28	32	40	6	5	7	5.0	80.6	53.5	13.9	0.0
Guildford Castle	High Status	267	30	47	23	1	2	0	0.0	0.7	4.1	0.0	0.0
Launceston Castle	High Status	150	28	35	37	3	1	0	0.7	2.7	2.7	0.7	0.0
Oxford Castle	High Status	484	28	52	19	2	0	0	0.0	0.0	6.0	0.4	0.0
Portchester Castle	High Status	291	47	27	26	1	20	4	0.0	0.7	3.4	0.0	0.0
Bickley, Cleeve, Somerset	Rural	140	44	50	6	0	0	0	3.6	5.0	0.0	0.0	0.0
Pepper Hill Lane, Northfleet	Rural	142	64	17	19	8	6	0	7.7	0.0	0.0	0.0	0.0
23–26 Queen St, Oxford	Urban	385	39	45	16	0	0	0	0.0	0.3	1.3	0.0	0.0
7–8 Queen St, Oxford	Urban	313	27	53	20	1	0	0	0.0	0.0	6.7	1.6	0.0
79–80 St Aldates, Oxford	Urban	171	31	58	11	0	0	0	0.0	0.0	4.1	0.0	0.0
Finzel's Reach, Bristol	Urban	272	39	50	12	0	*	*	*	0.4	0.0	0.0	0.0
French Quarter, Southampton	Urban	2641	49	34	17	2	0	1	0.2	1.7	3.0	0.0	0.0
Hinxey Hall, Oxford	Urban	651	18	46	36	0	0	0	0.5	1.8	21.5	0.6	0.0
Linacre Garden, Canterbury	Urban	650	51	25	24	0	1	0	0.0	1.1	0.9	0.3	0.0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Linacre Garden, Canterbury	Urban	1007	49	34	17	1	1	0	0.0	0.9	2.5	0.2	0.0
Linacre Garden, Canterbury	Urban	1193	40	41	20	1	0	2	0.0	0.6	3.8	0.8	0.0
Linacre Garden, Canterbury	Urban	1417	52	35	13	0	0	0	0.0	0.6	1.3	0.1	0.0
Lincoln College, Oxford	Urban	868	27	61	12	0	0	0	0.0	0.1	3.6	0.3	0.1
Northgate House, Winchester	Urban	5073	28	58	14	3	0	0	0.1	0.3	6.2	0.9	0.0
Sir John Cass Primary School, London	Urban	120	38	33	28	0	0	0	0.0	0.0	0.0	0.0	0.0
St Magnus	Urban	471	28	44	28	0	0	0	0.4	0.2	0.0	0.0	0.0
St Mary Spital, London	Urban	10028	87	11	3	11	6	0	0.0	0.5	0.1	0.1	0.0
St Mary's, Wantage	Urban	154	54	34	12	3	1	0	0.6	0.6	3.2	2.6	0.0
Sub-vault of Westminster Abbey	Urban	142	35	42	23	0	0	0	0.0	0.0	10.6	0.0	0.0
The Manor, Old Windsor	Urban	195	23	57	21	1	0	0	0.5	0.0	0.0	0.0	0.0
The Thames Crossing, Oxford	Urban	136	62	32	6	1	0	2	0.0	0.0	1.5	0.0	0.0
Tower of London 1955–77	Urban	239	60	36	5	13	0	0	0.0	0.4	0.4	0.0	0.0
Trill Mill Stream, Oxford	Urban	252	28	57	15	2	0	0	0.0	0.4	7.5	0.4	0.0
Western Suburb, Winchester	Urban	3163	37	41	21	1	2	1	0.0	0.0	7.2	0.4	0.0
Early–high medieval													
Cheddar Palaces	High Status	426	64	22	13	2	1	0	0.0	4.0	0.0	0.0	0.0
Lewes Castle	High Status	2017	8	61	31	0	*	*	*	8.0	0.0	0.0	0.0
Pevensey Castle	High Status	998	29	37	34	0	0	1	0.6	1.0	4.9	2.8	0.9
Portchester Castle	High Status	243	39	44	17	10	16	1	0.0	2.9	57.2	4.9	0.0
Charnham Lane, Hungerford	Rural	207	40	31	29	8	2	0	0.0	1.0	1.0	0.0	0.0
Church View, Bampton	Rural	510	34	56	10	3	0	0	0.0	0.2	1.2	0.4	0.0
Eckweek	Rural	279	26	66	9	5	0	0	0.0	0.0	2.9	0.7	0.0
1 Westgate St, Gloucester	Urban	337	48	27	25	1	0	1	0.0	0.0	0.0	0.0	0.0
44–46 Cornmarket St, Oxford	Urban	236	61	27	12	1	0	0	0.0	0.0	3.8	0.8	0.0
Canterbury Police Station	Urban	707	50	31	20	1	0	0	0.0	0.1	0.0	0.0	0.0
Exeter	Urban										*	*	*
Friars Walk, Lewes	Urban	1191	21	71	8	1	0	1	0.0	0.0	3.9	0.8	0.0
Goldsmith St III, Exeter	Urban	2290	41	43	16	1	0	2	0.1	0.4	0.0	0.0	0.0
Goldsmith St I-II, Exeter	Urban	2025	37	50	13	0	0	2	1.0	0.2	0.0	0.0	0.0
High St, Exeter	Urban	134	49	33	18	0	0	1	0.7	0.7	0.0	0.0	0.0
King Stable St, Eton	Urban	190	32	57	11	7	0	0	0.0	0.5	1.6	0.0	0.0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Malmesbury 2000	Urban	229	34	51	14	2	0	0	0.0	0.4	4.4	0.9	0.0
Mary-Le-Port, Bristol	Urban	1488	44	48	8	1	0	0	0.0	0.0	0.0	0.0	0.0
Merton College, Oxford	Urban	324	56	34	10	3	0	0	1.2	0.0	2.8	0.9	0.3
Southampton Excavations 1966–9	Urban	329	44	24	32	2	0	1	0.6	0.9	1.8	0.6	0.6
The Vineyard, Abingdon	Urban	231	38	44	18	4	4	1	0.0	0.9	8.7	2.2	0.0
Trickhay St, Exeter	Urban	742	47	39	14	1	0	0	0.8	0.3	0.0	0.0	0.0
High medieval													
Battle Abbey	Ecclesiastical	258	30	26	43	2	2	0	1.6	0.8	5	4.7	0
Dominican Priory, Oxford	Ecclesiastical	449	47	43	9	1	0	1	0.4	0.2	10	16	0
Eynsham Abbey, Oxfordshire	Ecclesiastical	1478	32	32	37	0	0	0	2.8	3.3	9	4.6	0
Hospital of St Nicholas, Lewes	Ecclesiastical	287	28	55	17	2	0	0	1.7	0.3	11.1	5.9	0
Silver St, Glastonbury	Ecclesiastical	1483	33	54	13	1	0	0	0.1	0.1	3.2	0.7	0
St Andrews church vicarage, Sonning	Ecclesiastical	175	54	28	18	3	0	0	0	4	0.6	2.9	0
St Bartholomew's Hospital, Bristol	Ecclesiastical	402	33	61	5	0	0	0	1.2	0	14.2	6.5	0
St Gregory's Priory, Canterbury	Ecclesiastical	267	25	44	31	1	0	0	0.7	1.9	7.5	1.9	0
St Gregory's Priory, Canterbury	Ecclesiastical	358	20	35	45	1	0	1	2.2	0.8	7.8	2.2	0
St Mary Spital, London	Ecclesiastical	3920	64	24	12	3	0	0	0.2	0	0.6	0.2	0
St Mary Spital, London	Ecclesiastical	5479	84	10	6	2	1	0	0	0	0.2	0.2	0
St Mary Spital, London	Ecclesiastical	6271	66	29	5	13	3	0	0.3	2.6	0.7	0.1	0
St Saviour, Bermondsey	Ecclesiastical	248	11	37	52	0	0	4	2.4	2.8	20.6	4.8	1.2
Sub-vault of Westminster Abbey	Ecclesiastical	116	21	41	39	0	0	0	0.9	1.7	31	0	0
The Park, Keynsham	Ecclesiastical	170	42	31	27	0	12	0	4.7	0.6	0.6	1.2	0
Banbury Castle	High Status	132	28	38	34	0	0	0	9.8	0.8	0	0	0
Benham's Garage, Taunton	High Status	636	59	38	3	0	0	0	0	0.2	0.2	0	0
Benham's Garage, Taunton	High Status	2913	46	50	4	1	0	1	0	0	1	0.4	0
Bridewell Lane, Shapwick	High Status	148	36	41	23	1	1	1	0	0	4.7	0	0
Carisbrooke Castle 2006–8, Isle of Wight	High Status	1036	16	36	49	0	0	2	3	1.3	13.1	0	0.7
Church Field, Shapwick	High Status	1613	32	46	21	4	1	0	0.2	0.4	1.9	0.2	0
Dean Court, Cumnor	High Status	508	37	55	8	7	0	0	0	0	3	1.2	0
Faccombe Netherton	High Status	2052	30	33	37	2	1	2	11.2	9.6	24.3	6.1	0.1
Harding's Field, Chalgrove	High Status	209	41	14	45	4	1	1	1.9	1.4	7.2	3.8	0
Harding's Field, Chalgrove	High Status	266	30	26	44	0	2	0	4.5	1.1	48.9	23.3	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Launceston Castle	High Status	123	59	20	21	2	5	0	1.6	8.1	17.1	1.6	0
Launceston Castle	High Status	1289	31	33	36	1	1	1	3.3	7.3	36.6	4	0
Middleton Stoney	High Status	330	24	37	39	2	2	24	*	*	319.7	29.1	0
Middleton Stoney	High Status	1255	37	46	18	1	3	0	*	*	6.3	1.6	0
Mount House, Witney	High Status	334	14	36	50	2	3	19	16.5	2.7	3.9	1.5	0
Mount House, Witney	High Status	588	27	40	33	4	0	2	0.3	4.6	5.6	1.4	0
Mount House, Witney	High Status	590	15	73	12	2	1	12	0.8	1.7	6.8	2	0
Okehampton Castle	High Status	1342	28	31	40	0	2	0	1.8	14.6	13.3	1.1	0.3
Portchester Castle	High Status	566	60	23	18	3	3	0	*	3.9	2.3	0	0
Shapwick House Moat, Shapwick	High Status	134	31	47	22	3	3	0	6.7	0.7	0.7	0.7	0
SOU 29, Southampton	High Status	366	55	33	12	1	1	10	0.3	1.9	2.7	0.3	0
Southampton Castle	High Status	170	46	36	18	1	14	15	0.6	2.4	5.3	0.6	0
Stretham, West Sussex	High Status	149	77	13	9	5	0	1	0	2	2	0	0
Trowbridge	High Status	857	36	40	25	3	0	1	0.5	2.5	3.9	1.1	0
West Gate, Oxford Castle	High Status	136	35	50	15	1	0	0	2.2	5.9	2.9	2.2	0
West Gate, Oxford Castle	High Status	248	36	37	27	1	0	0	0.4	1.2	6.5	1.6	0
Wickham Glebe	High Status	216	41	34	25	0	0	0	13	5.1	15.7	4.2	0
Wickham Glebe	High Status	426	47	28	26	1	0	0	7	8	42.3	6.6	0
Alington Ave, Dorchester	Rural	186	38	59	3	28	1	0	0	1.1	0.5	0	0
Cadbury Congresbury 1968–73	Rural	521	47	6	47	1	1	0	0	4.2	0	0	0
Copt Hay, Tetsworth	Rural	569	31	34	35	3	1	1	1.1	0.4	0	0	0
Copt Hay, Tetsworth	Rural										*	*	*
Eckweek	Rural	500	23	67	11	3	1	1	0.4	0	4.8	2.2	0
Gomeldon	Rural	417	21	65	14	1	0	0	0	2.2	0	0	0
Harry Stoke, Stoke Gifford	Rural	202	47	23	30	6	0	0	0	0	5.4	2.5	0
High St, Ramsbury	Rural	239	41	40	18	5	2	0	0	2.5	0	0	0
Holywell Priory, London	Rural	187	89	7	4	6	3	0	0	0	0.5	0	0
Lydd Quarry	Rural	167	44	35	21	7	1	0	0	0	0	0	0
Lydd Quarry	Rural	167	54	35	11	3	3	0	0	0	0	0	0
Lydd Quarry	Rural	202	26	34	40	5	0	0	0	0	0	0	0
Lydd Quarry	Rural	565	35	43	22	7	6	2	0.2	0.4	0	0.4	0
Market Lavington	Rural	789	44	27	29	7	3	1	0.1	4.6	1.6	0.1	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Saxon County School, Shepperton	Rural	147	24	33	44	1	0	0	1.4	0	2.7	0	0
Seacourt, Oxfordshire	Rural	187	47	41	13	3	1	1	0	1.1	5.9	0.5	0
Seacourt, Oxfordshire	Rural	329	39	47	14	2	0	0	0.3	3.3	3.6	0	0
The Old Vicarage, Reigate	Rural	529	26	43	30	1	2	0	1.3	0.9	0	0	0
The Orchard, Brighthampton	Rural	128	51	39	10	3	0	0	0	0.8	1.6	1.6	0
Upton	Rural	581	18	78	4	5	0	0	0.2	0	0	0	0
113–119 High St, Oxford	Urban	521	37	44	19	2	2	0	0	0	1.2	1.9	0
113–119 High St, Oxford	Urban	650	40	38	22	1	0	0	0.5	0.5	7.2	2	0.6
14 Farringdon St, London	Urban	344	52	38	10	3	5	1	0.6	0.6	2.6	4.7	0
140 Bartholomew St, Newbury	Urban	449	46	43	11	2	0	0	0.4	1.1	1.6	2.2	0
18–20 High St, Alton	Urban	168	39	50	11	15	1	0	0.6	1.2	6	0.6	0
24a St Michael's St, Oxford	Urban	111	54	35	11	2	1	1	0	0	2.7	0.9	0
26–27 Staple Gardens, Winchester	Urban	526	32	50	18	0	0	1	0	1.7	0	0	0
31–34 Church St, St Ebbes, Oxford	Urban	3993	23	58	20	1	0	1	0.2	0.2	0	0	0
31–34 Church St, St Ebbes, Oxford	Urban	4707	27	58	14	2	0	1	0.1	0.3	0	0	0
51–57 High St, Windsor	Urban	147	41	37	22	3	4	1	0.7	2	8.8	3.4	0
52–54 Thames St, Windsor	Urban	193	36	42	22	2	0	9	1.6	1.6	3.1	5.7	0
54–55 St Thomas' St, Oxford	Urban	133	45	44	11	2	1	0	0	0	2.3	1.5	0
5–8 Fore St, Taunton	Urban	281	67	24	9	1	0	1	0	0	3.9	0	0.7
5–8 Fore St, Taunton	Urban	309	28	53	19	0	0	2	0	0	4.9	0.3	0.6
7–8 Queen St, Oxford	Urban	178	34	40	26	1	0	1	1.7	0	32.6	5.1	0
79–80 St Aldates, Oxford	Urban	353	41	45	14	0	0	0	1.1	0	25.8	6.5	0
Abbey Wharf, Reading	Urban	341	78	9	13	0	0	0	0	0	0	0	0
Abbey Wharf, Reading	Urban	723	78	10	12	0	0	0	0	*	0	0	0
Aldersgate, London	Urban	256	49	45	6	0	12	7	1.2	0.8	7.8	1.6	0
Broad St, Abingdon a	Urban	382	40	48	12	1	0	0	0	0	5.8	0	0
Chantry St, Andover	Urban	151	36	52	12	1	2	1	1.3	0	2	0.7	0
Checker Walk, Abingdon	Urban	182	62	20	18	14	1	2	0.5	0.5	0	0	0
Chester Rd, Winchester	Urban	839	40	35	26	1	0	2	*	2.6	8.7	3.1	0
Citizen House, Bath	Urban	611	27	60	12	0	1	1	0	0.7	0	0	0
Classics Centre, Oxford	Urban	239	65	26	9	7	0	1	1.7	0	7.9	4.2	0.4
Cornmarket, Wimborne	Urban	109	39	33	28	1	0	0	0	0	0	0	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Crane Wharf, Reading	Urban	169	69	22	9	*	0	*	0	0	0	0	0
Dundas Wharf, Bristol	Urban	2718	39	47	15	0	0	1	0.4	0.1	20.2	20.6	0
Elizabeth House, Oxford	Urban	465	56	32	12	2	0	0	*	0.4	9.5	3	0
Exe Bridge, Exeter	Urban	934	48	47	5	0	0	1	1.3	*	5.6	1.9	0
Exe Bridge, Exeter	Urban	5388	51	46	3	0	0	0	0.1	*	0.8	0.6	0
Exeter	Urban										*	*	*
Finzel's Reach, Bristol	Urban	1244	45	36	20	0	*	*	*	0.2	0	0	0
Finzel's Reach, Bristol	Urban	1938	44	39	17	0	*	*	*	0.1	0	0	0
Fletcher's Croft, Steyning	Urban	1049	34	45	21	4	1	0	0	0.2	1.2	0.5	0
French Quarter, Southampton	Urban	3076	44	35	21	1	1	2	1.1	1.6	7.4	0.1	0
Friar St, Reading	Urban	217	35	43	21	0	0	0	0.5	0	8.3	4.6	0
Friends Burial Site, Staines	Urban	250	61	24	15	14	7	0	0	0.8	0	0	0
Gardiner's Corner, London	Urban	234	55	38	7	2	3	3	0	0.4	0	0	0
Goldsmith St III, Exeter	Urban	115	37	44	18	1	0	3	0	0	0	0	0
Goldsmith St III, Exeter	Urban	151	22	55	23	1	0	3	0	0	0	0	0
Goldsmith St III, Exeter	Urban	200	42	36	23	1	0	2	0	1	0	0	0
Goldsmith St III, Exeter	Urban	504	36	43	21	0	0	2	0.6	0	0	0	0
Goldsmith St III, Exeter	Urban	2489	39	45	16	1	0	3	1.2	0.1	0	0	0
Goldsmith St I-II, Exeter	Urban	185	31	57	12	0	0	5	1.1	0	0	0	0
Goldsmith St I-II, Exeter	Urban	332	32	58	11	1	1	2	0.3	0	0	0	0
Goldsmith St I-II, Exeter	Urban	500	51	39	10	1	0	2	0.6	0.4	0	0	0
Goldsmith St I-II, Exeter	Urban	854	43	47	9	1	0	1	0.6	0.2	0	0	0
High St, Uxbridge	Urban	113	56	35	10	6	0	0	0	0.9	0.9	0.9	0
Hinxey Hall, Oxford	Urban	157	39	44	17	1	1	0	0.6	0.6	5.1	1.9	0
Jennings Yard, Windsor	Urban	883	47	41	12	1	0	1	0.1	1.6	2.8	0.9	0
Linacre Garden, Canterbury	Urban	2696	47	35	18	1	1	2	0.1	0.7	5	0.6	0
Merton College, Oxford	Urban	289	48	35	17	2	1	0	0.3	1.7	5.2	6.2	0
Mount St, Battle	Urban	254	57	28	15	2	0	0	0	0.4	0.8	0	0
North St, Winchcombe	Urban	562	50	46	4	0	0	1	0.5	0.4	2	0	0
Northgate House, Winchester	Urban	787	28	52	20	1	0	1	1.1	0.3	8.1	2.3	0
Old Gaol, Abingdon	Urban	163	39	48	12	2	1	5	0	0	20.2	3.1	0
Old Gaol, Oxford	Urban	163	39	48	12	0	0	0	0	0	20.2	0	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Phoenix Brewery, Hastings	Urban	558	42	58	0	0	5	1	1.8	0	1.4	0	0
Postern Mill, Malmesbury	Urban	167	27	57	16	1	0	1	0	0	2.4	0	0
Priory Barn, Taunton	Urban	678	29	62	9	0	0	0	0	0	0	0	0
Quilter's Vault, Southampton	Urban	173	51	31	18	0	0	1	4.6	1.2	19.1	2.3	0.6
Quilter's Vault, Southampton	Urban	978	42	46	12	0	0	0	0.1	0.2	2	0.5	0.1
Ropetackle, Shoreham by Sea	Urban	3897	43	53	4	0	0	0	0	0	4.5	1.6	0
Southampton Excavations 1966–9	Urban	230	32	30	38	2	28	80	36.5	1.3	0	0	0
Southampton study	Urban	2956	45	43	12	1	1	1	0.2	0.2	5.3	1.2	0
St Aldates, Oxford	Urban	184	35	45	20	1	0	1	0	0.5	0	0	0
St Aldates, Oxford	Urban	248	45	44	10	2	0	0	0	0.4	0	0	0
St Aldates, Oxford	Urban	441	29	59	12	3	0	0	0	0	0	0	0
St John's St, Winchester	Urban	543	27	53	20	2	0	2	2.4	0	16.4	4.6	0
St Michael's, Southampton	Urban	245	69	13	18	3	0	1	0.4	0.4	0	0	0
Stert St, Oxford	Urban	923	25	55	20	0	0	1	0	0.2	12.4	4.9	0.5
Tanner's Hall, Gloucester	Urban	130	48	48	4	1	2	0	0	0	3.1	0.8	0
Tanner's Hall, Gloucester	Urban	153	44	53	3	0	0	0	0	0	0	0	0
Testers, Steyning	Urban	360	52	31	17	5	1	2	0.3	0.3	0	0	0
The Hamel, Oxford	Urban	931	28	55	17	1	2	0	0.1	0.8	6.2	5.5	0
The Hamel, Oxford	Urban	999	33	48	19	1	0	1	0.4	0.1	10.6	7.2	0.3
The Thames Crossing, Oxford	Urban	204	52	31	16	2	0	0	0	0	5.4	3.9	0
Townwall St, Dover	Urban	11986	40	46	14	0	0	1	0	0	5	1.1	0
Trickhay St, Exeter	Urban	306	43	45	12	1	0	2	1.3	0.3	0	0	0
Trickhay St, Exeter	Urban	696	41	47	13	1	0	2	0.7	0.1	0	0	0
Trill Mill Stream, Oxford	Urban	839	35	52	13	2	0	0	0.1	0	5.1	1	0
Victoria Rd, Winchester	Urban	856	30	48	22	6	0	0	13.2	1.2	13.2	14	0
Western Suburb, Winchester	Urban	229	31	57	12	4	1	2	0.4	0	5.2	0.4	0
Western Suburb, Winchester	Urban	4502	37	46	17	4	4	3	0.9	0.9	5.8	1.4	0
High–late medieval													
Eynsham Abbey, Oxfordshire	Ecclesiastical	1623	55	22	23	1	0	3	2.8	2	10.8	4.1	0
Hospital of St Mary of Ospringe	Ecclesiastical	178	27	42	31	2	0	3	1.1	0.6	16.3	2.8	0
Silver St, Glastonbury	Ecclesiastical	331	37	48	15	2	0	2	0	1.8	5.1	3	0
St Frideswide's Cloister, Oxford	Ecclesiastical	193	40	51	9	1	0	0	0	0.5	0	0	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
St Mary's Abbey, Winchester	Ecclesiastical	1963	20	39	41	0	0	1	3.3	1	1.8	0.7	0
Steep Holm Priory, Weston-Super-Mare	Ecclesiastical	183	23	58	19	2	0	0	0	0	0	0	0
Bristol Castle	High Status	3168	39	31	30	1	*	*	0	0	0	0	0
Carisbrooke Castle 2006–8, Isle of Wight	High Status	227	22	35	44	0	0	0	4.4	3.1	20.3	1.3	0.9
Cheddar Palaces	High Status	393	30	36	34	3	58	0	0	20.4	0	0	0
Oxford Castle	High Status	124	54	23	23	3	11	3	0	0	0	3.2	0
Pevensey Castle	High Status	576	23	46	31	1	1	2	0.5	0.5	7.6	4.2	1
Winchester Palace, Southwark	High Status	147	44	35	20	1	3	0	7.5	2.7	23.1	8.2	0
Brook Farm, Cippenham, Slough	Rural	127	37	22	41	10	0	0	2.4	3.9	0	4.7	0
Bush Marsh Village	Rural	1372	54	40	6	2	1	0	0.1	0.3	0	0	0
St John's Vicarage, Old Malden	Rural	158	47	34	18	16	1	0	0.6	0.6	1.9	0.6	0
Stoke Rd, Bishop's Cleeve	Rural	234	32	60	9	7	2	0	0	1.7	1.3	0.4	0
54–55 St Thomas' St, Oxford	Urban	172	44	40	16	0	0	0	0	0	0.6	1.7	0
60–63 Fenchurch St	Urban	610	45	36	18	3	0	1	0.5	0.5	2.8	2.3	0.3
Abingdon West Central Redevelopment	Urban	1035	42	45	13	2	0	2	0.4	0.3	18.3	3.9	0.2
Blackfriars Barn, Winchelsea	Urban	202	54	41	5	0	0	0	1.5	0	4	0	0
Chantry St, Andover	Urban	511	36	48	16	1	0	0	0.2	0	3.1	0.6	0
Christchurch 1969–80	Urban	100	9	55	36	0	0	4	7	1	30	3	0
Christchurch 1969–80	Urban	465	55	36	9	3	0	0	0.4	1.7	2.2	2.2	0
Christchurch 1981–83	Urban	194	45	44	11	7	2	0	0	0	1.5	1.5	0
Church St, Seaford	Urban	759	31	58	11	0	0	0	1.4	0	5.5	0	0
East Gate, Gloucester	Urban	2444	39	50	12	2	3	0	0	0.2	2	0.5	0
Fennings Wharf, London	Urban	136	45	43	12	0	0	1	0	1.5	5.9	0.7	0
Hollybush Row, Oxford	Urban	152	37	43	20	3	1	0	0	0.7	15.8	2	0
Ilchester Manor House	Urban	155	63	30	8	1	*	*	0	0	0	0	0
Ilchester Manor House	Urban	173	57	31	12	1	0	0	0	0	0	0	0
Ivy St and Brown St, Salisbury	Urban	168	32	46	22	0	0	0	*	0	15.5	4.2	0
King Stable St, Eton	Urban	172	40	49	11	1	0	0	0	1.2	1.7	0	0
Kingshams, Ilchester	Urban	3347	44	48	7	0	*	*	0	0	0	0	0
Limington Rd South, Ilchester	Urban	390	58	35	7	1	*	*	0	0	0	0	0
Lincoln College, Oxford	Urban	582	25	69	5	0	0	0	0	0.3	1.5	0.7	0
North Gate, Gloucester	Urban	191	49	32	19	1	1	3	0.5	0	4.2	2.1	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Poole	Urban	893	49	28	23	0	0	9	7.6	0.7	7.4	2.4	0
Queens College Buttery, Oxford	Urban	304	37	45	18	1	11	1	57.2	1.3	46.7	0	0
The Hamel, Oxford	Urban	788	36	45	20	0	0	0	0.5	0.4	17.9	7.2	1.3
Trinity Chequer, Salisbury	Urban	404	41	37	23	1	0	1	5	0.5	11.6	3.2	0
Trowbridge	Urban	206	43	43	14	1	0	2	1	0	16	1.5	0
West St Helen St, Abingdon	Urban	153	41	52	8	0	0	1	0	0	4.6	5.9	0
Late medieval													
Eynsham Abbey, Oxfordshire	Ecclesiastical	2051	67	16	17	0	0	0	0.8	4.3	4.4	1.9	0
Hospital of St Mary of Ospringe	Ecclesiastical	2351	35	43	22	1	1	1	1	0.9	4.3	0.8	0
St Bartholomew's Hospital, Bristol	Ecclesiastical	178	41	49	10	0	1	0	1.1	1.1	15.2	12.9	0
St Bartholomew's Hospital, Bristol	Ecclesiastical	289	31	60	8	0	0	0	0.3	0.3	10	5.5	0
St Gregory's Priory, Canterbury	Ecclesiastical	561	25	36	39	0	0	1	2	1.8	17.6	5.9	0
St Mary Spital, London	Ecclesiastical	2914	87	12	1	0	0	0	0.1	0	0	0.3	0
St Mary Spital, London	Ecclesiastical	4804	52	24	23	0	0	0	0.2	0	0.7	0.3	0
St Saviour, Bermondsey	Ecclesiastical	494	28	36	36	0	3	4	42.1	0	110.5	21.5	7.5
The Park, Keynsham	Ecclesiastical	255	39	35	26	2	4	0	1.2	0.8	1.2	0.4	0
Arundel House, London	High Status	637	53	37	10	0	0	0	0.9	1.1	0	0	0
Arundel House, London	High Status										*	*	
Dean Court, Cumnor	High Status	106	70	14	16	3	1	0	1.9	0	3.8	6.6	0
Faccombe Netherton	High Status	346	30	37	33	2	6	0	4.3	3.5	5.5	6.1	0.3
Gatehouse Nurseries, West Drayton	High Status	122	54	34	12	0	1	1	12.3	0	18.9	1.6	0
Gatehouse Nurseries, West Drayton	High Status	1068	65	18	17	1	0	0	1.2	0	0.1	0.2	0
Harding's Field, Chalgrove	High Status	760	34	19	47	0	1	0	5	1.4	35.9	9.1	0
Harding's Field, Chalgrove	High Status	1275	42	25	34	1	1	1	5.1	1.5	27.3	11.1	0
Launceston Castle	High Status	2805	42	30	27	1	1	0	2.5	13	17.7	2.7	0
Okehampton Castle	High Status	749	35	36	29	0	0	0	3.6	47.5	57.4	5.6	0.4
Okehampton Castle	High Status	1348	36	50	14	0	1	1	5.6	100.7	27.1	4.8	0.8
Sutton Park, Guildford	High Status	125	62	22	15	5	0	0	0.8	4	0.8	0	0
West Gate, Oxford Castle	High Status	246	32	43	26	1	0	0	0.4	0.8	4.1	1.6	0
Wickham Glebe	High Status	266	35	49	15	2	0	0	6	6.4	10.2	1.5	0
Little Pickle, Bletchingley	High Status	429	59	36	5	3	7	1	8.2	25.6	9.8	3	0
Little Pickle, Bletchingley	High Status	1419	60	28	12	0	0	0	49	3.5	19	7.6	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Alton	Rural	806	53	36	11	1	0	1	0.4	0.6	4	2.5	0
Dean Court, Cumnor	Rural	147	39	49	12	3	1	1	0.7	0	0.7	2.7	0
Dean Court, Cumnor	Rural	382	26	55	19	2	0	0	0.5	0	1.3	1.8	0
Lydd Quarry	Rural	506	47	34	18	3	1	4	0	0.2	2.6	0.2	0
Portchester Castle	Rural	377	45	46	8	1	0	0	*	14.6	2.4	1.1	0.5
14 Farringdon St, London	Urban	180	49	34	16	2	2	1	1.1	0	18.9	5.6	0
31–34 Church St, St Ebbes, Oxford	Urban	2108	35	45	19	0	0	0	0.4	0.2	0	0	0
54–55 St Thomas' St, Oxford	Urban	189	38	57	6	0	0	0	1.6	0.5	1.1	1.6	0
67–69 St Thomas' St, Oxford	Urban	239	38	54	8	0	0	0	1.7	2.5	3.3	1.7	2.9
79–80 St Aldates, Oxford	Urban	216	42	50	8	0	0	0	0.9	0	28.7	10.6	0
Abbey Wharf, Reading	Urban	2050	72	16	12	0	0	0	*	*	0	0	0
Aldersgate, London	Urban	572	54	37	9	0	5	13	0.3	0.5	5.2	1.7	0.2
Battle Bridge Lane, Southwark	Urban	333	41	50	10	0	2	0	0.6	0.6	1.8	0.3	0
Broad St, Abingdon	Urban	287	46	44	10	1	1	0	0.3	0.7	39.7	3.5	2.1
Canterbury Police Station	Urban	181	45	39	15	4	1	0	0.6	0.6	0	0	0
Charter Quay, Kingston-Upon-Thames	Urban	190	45	32	23	1	0	0	8.9	0.5	14.2	3.7	0
Exe Bridge, Exeter	Urban	1196	43	48	10	0	0	0	1.8	*	10.5	1.4	0
Exeter	Urban										*	*	*
Finzel's Reach, Bristol	Urban	399	51	34	15	0	0	*	*	0	0	0	0
Finzel's Reach, Bristol	Urban	405	44	37	19	0	0	*	*	0.2	0	0	0
French Quarter, Southampton	Urban	745	46	39	16	1	2	4	5.8	2.8	19.7	0.9	0
Gardiner's Corner, London	Urban	274	39	34	28	1	0	0	0.4	0.4	0	0	0
Goldsmith St III, Exeter	Urban	1656	33	52	14	0	3	27	8.7	1.9	0	0	0
Goldsmith St I-II, Exeter	Urban	183	42	48	10	1	1	1	2.2	0	0	0	0
Goldsmith St I-II, Exeter	Urban	1393	44	48	9	1	1	1	1.5	1.1	0	0	0
High St, Uxbridge	Urban	106	63	31	6	0	0	0	0	0	0	0	0
High St, Uxbridge	Urban	215	92	7	2	2	0	0	0	0	0	0	0
Hinxey Hall, Oxford	Urban	187	10	74	17	0	0	0	39	0	22.5	1.1	0
Jennings Yard, Windsor	Urban	192	61	32	7	561	0	0	0	1	1.6	1.6	0
Linacre Garden, Canterbury	Urban	516	29	54	17	0	0	45	10.1	1.2	100.4	2.9	0
Lincoln College, Oxford	Urban	269	32	64	5	0	0	0	9.3	0	3.3	0	0.7
Merton College, Oxford	Urban	121	43	44	13	3	1	3	0	1.7	19.8	5	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Merton College, Oxford	Urban	375	38	43	18	2	1	1	6.1	0.5	32.3	6.1	2.1
Mount St, Battle	Urban	106	65	24	11	6	0	0	0	0	0.9	0	0
Narrow Quay, Bristol	Urban	766	61	33	5	0	1	0	0.5	0	6.9	6	0
North St, Winchelsea	Urban	278	47	45	9	0	1	0	1.8	0	3.2	2.2	0
Old Clothing Factory, Abingdon	Urban	145	23	65	12	1	0	0	0	0	0	0	0
Reading Abbey Stables	Urban	381	59	26	15	0	1	0	3.4	0.5	2.4	1	0.3
SOU 29, Southampton	Urban	1828	56	34	10	1	0	0	1.3	1.1	2.1	1.1	0
St Aldates, Oxford	Urban	183	39	48	14	1	1	0	0	0.5	0	0	0
St Michael's, Southampton	Urban	110	78	13	9	7	0	3	0.9	0	0	0	0
The Foundry, Poole	Urban	663	56	34	10	0	0	0	1.4	0.8	5	0.8	0
The Foundry, Poole	Urban	1429	80	15	5	0	0	0	0.3	1	0.6	0	0
The Hamel, Oxford	Urban	533	32	52	16	0	0	0	1.1	0.2	20.6	8.1	3.4
The Thames Crossing, Oxford	Urban	135	41	30	29	0	0	0	1.5	0	6.7	3	0
Twickenham House, Abingdon	Urban	181	47	44	9	0	1	4	0	0	5.5	0	0
Victoria Rd, Winchester	Urban	538	25	42	33	2	0	6	2.2	13.2	2.4	0.6	
Late medieval–post-medieval													
14 Farringdon St, London	Urban	242	48	39	12	1	1	1	0.4	1.2	2.9	2.5	0
199 Borough High St, London	Urban	309	32	60	8	1	3	0	3.2	0.3	3.2	0.3	0.3
Abingdon West Central Redevelopment	Urban	1832	52	42	6	4	1	5	0.5	0.2	2.3	0.5	0.2
Church St, Romsey	Urban										*	*	*
Mill Rd, Winchelsea	Urban	475	52	34	14	0	0	0	1.1	0.2	0	0	0
Postern Mill, Malmesbury	Urban	495	23	71	6	1	0	0	0	0	0.6	0	0
Victoria Rd, Winchester	Urban	890	30	47	23	0	1	1	0.7	1	0	0	0
Medieval–post-medieval													
Swallow Hole, Alveston	Rural	48	100	0	0	23	0	0	10.4	170.8	0	0	0
Queen's College, Oxford	Urban	460	42	41	16	0	1	0	66.3	1.3	47.4	3.5	2
Post-medieval													
Eynsham Abbey, Oxfordshire	Ecclesiastical	2174	40	39	22	0	1	0	4.1	2.4	15.9	7	0
Hospital of St Mary of Ospringe	Ecclesiastical	1564	24	29	47	3	2	1	0.8	0.4	2	0.1	0
Romsey Abbey	Ecclesiastical	360	29	49	21	1	1	3	*	0.6	6.9	0.3	0
St Gregory's Priory, Canterbury	Ecclesiastical	265	24	38	38	1	0	20	9.4	0.4	17.4	7.9	0
St Mary Spital, London	Ecclesiastical	23233	71	22	6	3	2	0	0	0	0	0.5	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Battle Abbey	High Status	1160	39	38	23	1	3	2	5.3	2.3	5.1	3.9	0
Benham's Garage, Taunton	High Status	280	55	43	2	4	1	0	0	0	2.1	0	0
Berry Pomeroy Castle	High Status	420	35	60	4	0	0	0	*	0.7	0	0	0.2
Camber Castle	High Status	2720	33	58	8	0	3	1	43.3	0.9	8.5	1.9	1.3
Carisbrooke Castle 2006–8, Isle of Wight	High Status	206	48	26	27	0	0	0	3.4	5.8	18	2.4	0.5
Eastern Terrace, Berry Pomeroy Castle	High Status	130	56	42	2	0	1	0	*	1.5	1.5	0	0.8
Inner Courtyard, Berry Pomeroy Castle	High Status	224	37	55	8	0	0	0	*	0.9	*	*	*
Linacre Garden, Canterbury	High Status	1083	40	54	6	0	0	1	1	0	0	0	0
Little Pickle, Bletchingley	High Status	219	70	18	12	1	1	0	0	283.1	0.9	1.8	0
Middleton Stoney	High Status	1466	46	41	13	4	5	2	*	*	2.9	1	0
Mount House, Witney	High Status	526	26	57	17	15	15	2	2.3	8.6	0	0	0
Nonsuch Palace	High Status	574	21	73	6	1	1	2	113.8	11.7	54.2	1.7	2.1
Nonsuch Palace	High Status	866	31	61	8	3	3	4	218.8	34.3	56.8	0.1	2.7
Okehampton Castle	High Status	1152	55	41	5	0	1	0	4.5	24.5	6.4	1	0
Shapwick House Moat, Shapwick	High Status	278	33	48	19	1	1	2	4.3	2.2	1.4	0.4	0
St Mary Spital, London	High Status	4778	54	41	4	0	0	0	0.6	0.9	1	0.1	0
St Mary Spital, London	High Status	19726	61	33	6	0	0	2	0.3	0.3	0.3	0.4	0
St Saviour, Bermondsey	High Status	341	50	31	19	2	0	0	4.4	0	7.6	2.1	0.9
The South Lawn, Michelham Priory	High Status	446	71	9	20	76	0	0	0.2	0.4	0	0	0
Wickham Glebe	High Status	2803	26	57	17	1	0	0	2.7	3.1	6.5	0.6	0
Winchester Palace, Southwark	High Status	369	46	33	22	0	1	0	*	3.3	11.4	7.6	0
Alton	Rural	970	37	50	13	0	0	0	0.6	0.5	5.8	4.5	0
Dean Court, Cumnor	Rural	357	50	36	15	2	0	0	0.3	0	1.7	0.6	0
Elstree Hill South, London	Rural	225	36	56	8	4	0	0	0	0	0	0	0
Glastonbury Great Barn	Rural	110	27	55	18	5	1	1	1.8	0	6.4	0	0
Old Bakery, Shapwick	Rural	185	30	44	26	3	3	4	12.4	0	60	2.2	0
Shapwick Park, Shapwick	Rural	175	25	58	18	3	4	1	2.3	0	1.1	0.6	0
Silver St, Glastonbury	Rural	339	37	57	5	1	0	4	1.5	1.2	4.7	0.6	0
Staff College, Bracknell	Rural	144	37	63	1	238	0	0	0	0.7	0	0	0
Sutton Park, Guildford	Rural	242	47	35	18	4	0	0	4.5	68.6	1.2	0	0
103–106 Shoreditch High St	Urban	329	56	31	13	2	1	0	0.6	0.6	16.7	0.6	0
129 Lambeth Rd, London	Urban	238	30	58	13	0	3	1	3.8	0	4.2	0	1.3

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
129 Lambeth Rd, London	Urban	293	29	60	12	0	1	1	11.3	1	6.5	1.4	0.7
14 Farringdon St, London	Urban	142	55	38	7	2	15	4	2.1	0	1.4	3.5	0
14 Farringdon St, London	Urban	146	44	51	5	3	1	1	0.7	0.7	1.4	7.5	0
14 Farringdon St, London	Urban	157	47	45	8	3	0	1	1.9	1.9	7	0	0
14 Farringdon St, London	Urban	698	40	52	9	1	4	3	4.3	0.4	4.2	1.6	0
16 Tunsgate, Guildford	Urban	194	43	40	17	0	1	6	1.5	0.5	20.1	25.3	0
29 Thames St, Windsor	Urban	225	45	46	9	0	0	0	0	1.3	1.3	3.1	0
29 Thames St, Windsor	Urban	233	56	39	4	0	0	0	0.9	0.4	0	0.4	0
29 Thames St, Windsor	Urban	1107	45	48	7	0	0	0	0.6	1.4	1.4	0.5	0
31–34 Church St, St Ebbes, Oxford	Urban	1572	34	54	12	0	1	0	2.9	0.3	29.5	6.3	0
39 Fore St, Totnes	Urban	269	63	29	8	0	0	0	*	0	0	0	0
5–8 Fore St, Taunton	Urban	1301	56	37	6	0	0	0	0.1	0.6	18.8	1.9	1.2
67–69 St Thomas' St, Oxford	Urban	118	58	38	4	1	0	0	0.8	0	5.9	0.8	0.8
67–69 St Thomas' St, Oxford	Urban	155	34	51	15	0	1	0	1.3	0	3.2	0.6	0.6
Abbey Wharf, Reading	Urban	232	67	20	13	0	0	0	0	0	0	0	0
Abbey Wharf, Reading	Urban	560	64	24	12	0	0	0	0	0	0	0	0
Abbey Wharf, Reading	Urban	638	72	23	5	0	0	0	0	0	0	0	0
Abbey Wharf, Reading	Urban	986	84	11	4	0	0	0	0	0	0	0	0
Albany and Greyhound Hotel Site, Fordingbridge	Urban	250	48	42	10	2	0	0	4	2	3.6	0.8	0
Aldersgate, London	Urban	281	57	38	5	1	2	4	1.8	0	3.9	1.4	0.4
Aldersgate, London	Urban	668	69	26	5	1	1	1	0.1	0.1	2.7	1.6	0
Aldersgate, London	Urban	700	66	29	5	0	2	2	0.7	0.3	2.6	1.4	0
Aldgate 1974, London	Urban	209	18	80	2	0	0	0	3.3	0	4.8	1.9	0
Aldgate 1974, London	Urban	1449	36	58	6	0	1	2	1	0	1.1		
Ashmolean Museum Forecourt, Oxford	Urban	138	69	27	4	0	0	0	0	0	0.7	0	0
Bath 1984–1989	Urban	191	33	46	21	1	1	0	*	0.5	9.9	0.5	0
Battle Bridge Lane, Southwark	Urban	435	43	48	9	0	0	0	0.7	0.5	0.9	0.5	0
Bridge St East	Urban	140	49	45	6	*	0	0	0	0	0	0	0
Bridge St East	Urban	473	79	19	2	7	*	*	0	*	0	0	0
Broad Sanctuary, London	Urban	1046	45	50	5	0	2	1	1.7	0.4	2.5	0.8	0.4
Canterbury Defences	Urban	208	21	60	20	3	2	0	0	0	0	0	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Chantry St, Andover	Urban	170	41	45	14	1	0	0	4.1	0	8.8	0.6	0
Charter Quay, Kingston-Upon-Thames	Urban	178	62	29	9	6	0	0	18	2.8	15.2	2.2	0
Chester Rd, Winchester	Urban	676	32	49	18	1	0	0	1.5	1.3	2.7	1.5	0
Christchurch 1969–80	Urban	236	34	54	12	15	0	2	3	0	3.4	1.3	0
Christchurch 1969–80	Urban	478	38	52	10	1	2	0	2.5	2.3	3.3	1.3	0
Christchurch 1981–83	Urban	173	42	43	14	5	0	1	0	0.6	4	0.6	0
Citizen House, Bath	Urban	251	43	48	9	0	0	0	1.2	0.4	0	0	0
Classics Centre, Oxford	Urban	411	50	41	9	4	0	1	0.5	0.2	8.5	1.2	0
Cliffe, Lewes	Urban	113	35	58	6	1	4	4	0	0	4.4	0.9	0
Crane Wharf, Reading	Urban	113	52	30	18	0	0	0	0	*	0	0	0
Creedy's Yard, Greenwich	Urban	161	61	36	2	4	0	0	0.6	1.9	2.5	0.6	1.9
Crown Hotel, Wimborne	Urban	441	56	36	8	1	0	0	0	0	0	0	0
Dung Quay, Plymouth	Urban	113	47	48	5	0	0	0	0	0	3.5	0	0
East Gate, Gloucester	Urban	3791	47	40	13	3	0	1	0.8	0.3	4.6	1.6	0
Elizabeth House, Oxford	Urban	108	36	45	19	1	0	0	2.8	0	2.8	0	0
Elizabeth House, Oxford	Urban	122	39	44	17	2	0	0	*	0	3.3	2.5	0
Post-medieval continued													
Exe Bridge, Exeter	Urban	547	64	32	4	0	0	0	0.9	*	1.5	0	0
Exe Bridge, Exeter	Urban	1263	48	47	4	0	0	1	1.7	*	7.1	1.7	0
Exeter	Urban									*	*		*
Exeter	Urban									*	*		*
Finsbury Pavement, London	Urban	1836	51	37	12	*	*	*	*	*	0	0	0
First Ashmolean Museum, Oxford	Urban	76	46	50	4	14	832	12	1.3	0	3.9	3.9	0
French Quarter, Southampton	Urban	1863	30	59	11	0	1	4	2.5	1.1	8.3	0.2	0
Fulham Pottery	Urban	370	40	60	0	6	1	4	*	0	0	0	0
Gardiner's Corner, London	Urban	167	50	24	26	1	0	9	0.6	0	0		
Goldsmith St III, Exeter	Urban	236	36	50	14	0	0	13	44.9	0	0	0	0
Goldsmith St I-II, Exeter	Urban	165	41	55	5	1	0	1	0	0	0	0	0
Goldsmith St I-II, Exeter	Urban	573	39	54	8	0	1	1	3.1	0.2	0	0	0
Goldsmith St I-II, Exeter	Urban	947	37	53	10	0	1	2	3.1	0.6	0	0	0
Greyfriars, Oxford	Urban	1175	28	58	14	0	1	2	0.4	0.2	4.6	1.4	0
High St, Guildford	Urban	300	42	44	14	2	3	1	0.3	0	0.7	0	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Ivy St and Brown St, Salisbury	Urban	197	37	46	17	0	2	5	*	1	10.2	4.6	0
Key Close, Newtown	Urban	125	34	50	16	2	0	0	3.2	0	0.8	0	0
King Stable St, Eton	Urban	250	42	55	3	9	1	1	0	0.4	0.8	0	0
Launceston Castle	Urban	1145	50	36	14	9	5	0	1.4	4.8	3.5	1	0
Launceston Castle	Urban	1398	49	41	10	4	4	0	0.6	2.6	2.8	0.1	0
Lewes Castle	Urban	982	12	67	21	1	*	*	*	4.2	0	0	0
Lincoln College, Oxford	Urban	377	26	69	5	1	0	1	4.2	0.5	0	0.5	0
Mark Browns Wharf, London	Urban	1369	25	65	11	4	17	1	3.4	0	2.9	0	0.2
Merton College, Oxford	Urban	380	29	65	6	0	1	1	1.3	1.3	7.9	1.6	0.3
Narrow Quay, Bristol	Urban	5620	56	36	8	0	0	0	4.5	0.4	0.1	0.1	0
New Royal Baths, Bath	Urban	182	35	49	16	2	1	1	1.1	0.5	7.7	0.5	0
Old Clothing Factory, Abingdon	Urban	735	28	58	14	2	1	1	2	0.1	2.2	2.4	0
Phoenix Brewery, Hastings	Urban	132	61	36	3	0	4	0	2.3	0	1.5	0	0
Poole	Urban	1090	47	38	15	1	0	4	3.4	1.6	8	2	0
Poole	Urban	1434	57	31	13	2	4	23	0.8	0.8	4.8	1	0
Quilter's Vault, Southampton	Urban	112	26	61	13	6	0	0	6.3	0	32.1	2.7	0
Rainbow Quay, Rotherhithe	Urban	161	81	7	11	0	2	0	0	0	0	0.6	0
Ropetackle, Shoreham by Sea	Urban	637	48	49	3	0	0	0	0	0	0	0	0
Ropetackle, Shoreham by Sea	Urban	671	37	54	9	0	0	0	0	0	0	0	0
Southampton Excavations 1966–9	Urban	113	42	48	11	2	38	12	19.5	0	0	0	0
St Frideswide's Cloister, Oxford	Urban	165	22	74	4	0	0	2	3	0.6	0	0	0
St Frideswide's Cloister, Oxford	Urban	257	44	52	4	0	0	0	1.6	1.2	0	0	0
St John's St, Winchester	Urban	803	33	47	20	0	0	0	9.2	1.1	9.5	6.2	0.7
Stepney High St, London	Urban	171	47	48	5	1	1	0	1.8	0	0	0	0
Stert St, Oxford	Urban	263	37	53	10	0	1	0	0.8	0	1.9	0	0
Steward St, Spitalfields	Urban	106	43	44	12	0	2	7	1.9	0.9	14.2	4.7	0
Tanner's Hall, Gloucester	Urban	403	97	3	0	0	0	0	0	0	0	0	0
Taunton Priory	Urban	788	53	42	5	1	0	1	0.1	0.1	10.3	0.8	0.9
The Foundry, Poole	Urban	643	61	32	7	0	0	1	1.1	1.6	2	0	0
The Hamel, Oxford	Urban	1212	38	54	8	0	0	0	0.5	0.3	4.4		
Trickhay St, Exeter	Urban	416	42	49	9	0	64	29	14.4	0.7	0	0	0
Tudor St, Exeter	Urban	274	16	82	1	2	0	0	0	0	0	0	0

	Site type	*N*	B	O	S	E	C	F	L	D	G	A	AN
Upper Thames St, London	Urban	116	42	44	14	0	3	0	5.2	0	0	0	0
West Gate, Oxford Castle	Urban	244	49	46	5	1	0	1	0	0	0	0	0
West St Helen St, Abingdon	Urban	118	49	34	17	2	0	0	0.8	0	5.1	5.1	0.8

APPENDIX 3: NUMBER OF SITES WHERE WILD BIRD SPECIES HAVE BEEN RECORDED

ES= early Saxon; MS= middle Saxon; LS= late Saxon; SN= Saxo-Norman; ME= early medieval; MH= high medieval; ML= late medieval; PM= post-medieval; M= medieval; S= Saxon

Phase	S	ES	ES-MS	MS	MS-LS	LS	SN	M	EM	EM-MH	MH	HM-LM	LM	LM-PM	M-PM	PM
Number of sites	1	3	1	33	9	46	40	3	29	15	152	40	72	3	5	135
Ducks																
Duck spp.		2		6	3	9	8	1	9	2	31	9	21	2	1	39
Diver		1			1		1				2		1			1
Gadwall											1					
Garganey						1					1		1			
Goldeneye							1									1
Goosander										1						
Great Northern Diver				1		1										
Mallard		4		4		10	7	1	5		21	1	10	1		12
Merganser		1				1					1					
Pintail						1	1									1
Pochard		1							1		1		1			1
Redshank					1	1										2
Redwing				1							1		1			
Shelduck						1					1					
Spoonbill											1					1
Teal		1		3	1	2	5		7	1	14	3	16		1	15
Tufted Duck							1				1		1			1
Wigeon				1					1	1		1				1
Geese																
Goose		1		2	1	6	2		5	3	18	3	9	1		11
Barnacle Goose						1					2					
Brent Goose									1			1				2
Semi-wild																
Dove		2			1	1	1				5	1	7			9
Pheasant						1	1		1		4		4			5
Pigeon				3	2	5	3	3	3	1	15	5	12	1	1	16
Pigeon/dove						2	2		4		6	2	3			6
Stock dove											1	1	2			
Woodpigeon		2		1	1	2					2					5
Corvids																
Corvid spp.		1		2	2	5	4	1	6		13	1	9			16
Crow					2	1	1		2	3	5	1	7	1	1	8
Jackdaw				2		1		2	2		11		9			14
Jay											3		1			3
Raven				2	1	2	1		3		8	1	4			6
Rook										1	4	1	2			6

Phase	S	ES	ES-MS	MS	MS-LS	LS	SN	M	EM	EM-HM	HM	HM-LM	LM	LM-PM	M-PM	PM
Number of sites	1	3	1	33	9	6	40	3	29	15	2	40	72	3	5	135
Water birds																
Bittern		1			1				1							1
Coot					1						1	1	2			3
Corncrake							1									
Crane		1		1	3	3	1		2	1	3	2	2			4
Curlew		1			2	2	1	1	1	1	5		5			4
Grebe													1			
Grey heron					1		1				2	1	5			2
Heron		1				1					2	1	3			3
Jacksnipe																1
Knot																1
Moorhen											3		1			2
Mute swan								1			1	1	2			2
Oystercatcher				1	1				1		2	1				2
Ruff											1					
Snipe				1		1	2		3		7	1	13		1	10
Stork						1	1									1
Swan					1	3	1		2		10	4	5		1	12
Wader spp.					2			1	4		9		5		1	7
Water rail				1		1										
Waterhen											1					
Whimbrel						1							1			
Game birds																
Golden plover		1		1	1	2	1		2		5	1	3			2
Green plover																1
Grey Partridge											2	1	2			
Partridge		1		1	1	1	2	1	3	1	13	3	11		2	11
Plover				1					2			1	1			
Red grouse									1		1					3
Woodcock				4	2	6	7		4		26	4	16		1	20
Seabirds																
Auk											1					2
Cormorant					1	1			1		4					3
Gannet											1		3			
Great auk																1
Guillemot					1						2					3
Gull				1	3	2	2		1	1	7	2	6			7
Razorbill											2	1				
Shag											1					
Tern					1	1										
Field birds																
Lapwing				1		1	2		1		7	1	5		1	3
Lark											1					
Quail													3			1
Skylark											2					1
Fieldfare													1			

Phase	S	ES	ES-MS	MS	MS-LS	LS	SN	M	EM	EM-HM	HM	HM-LM	LM	LM-PM	M-PM	PM
Number of sites	1	3	1	33	9	6	40	3	29	15	2	40	72	3	5	135
Birds of prey																
Barn owl								1					1			
Buzzard				1	1		1		3		4	1	2			4
Falconidae							1									
Goshawk						2	2		1		2		1			1
Gyrfalcon											1		1			
Hobby											1		1			1
Kestrel													1			3
Kite				2	1	1					3	1	1			1
Marsh harrier											1					
Osprey							1									
Peregrine Falcon									1		1		1			2
Sparrowhawk		1		1	1			1	1		4		1			1
Tawny owl					1	1			3		3		2			3
White tailed eagle		2		2		1			1		3		1			1
Garden birds																
Blackbird						1		1								2
Bunting		1											1			
Chaffinch																1
Dunlin					1	1					2					1
Finch												1				
Greenfinch																1
Hawfinch		1										1				
House sparrow											1					
Linnet											1		1			1
Magpie											1	2	5		1	4
Mistle thrush				1												
Passerine		2		4	2		2	1	4		13	3	13		1	7
Pipit											1		2			1
Songthrush				1												1
Sparrow		2									1		1			2
Starling		2		2							3		3			2
Swift											1		2			1
Thrush						1			2		2		4			4
Tit													1			
Turdus				2	1				1		10	1	9			4
Wagtail													1			
Yellowhammer											1		1			1
Exotics																
Peafowl								1	3		4	1	4			5
Pelican							1									

APPENDIX 4: NUMBER OF SITES WHERE FRESHWATER, MIGRATORY AND SALTWATER FISH SPECIES HAVE BEEN RECORDED

ES= early Saxon; MS= middle Saxon; LS= late Saxon; SN= Saxo-Norman; ME= early medieval; MH= high medieval; ML= late medieval; PM= post-medieval; M= medieval; S= Saxon

Species habitats are as given in Froese and Pauly (2011).

	ES	ES-MS	MS	MS-LS	LS	SN	EM	EM-HM	HM	HM-LM	LM	M	M-PM	PM
N sites	9	1	14	4	16	17	12	6	69	19	43	3	1	63
Freshwater														
Barbel			1			1							1	1
Burbot													1	
Carp	1						1				2			4
Chub						1	1		5	1	6		1	3
Cyprinid	1		2	2		5	4	1	11	4	13	1	1	12
Dace					1	2	2		2	3	3	1	1	2
Freshwater bream											1			
Grayling													1	
Gudgeon										1	1			
Minnow										1				
Perch	1		2	1	1	1	2		5		7		1	4
Pike	1		4		3	3	3		9	4	8		1	8
Roach	1		5			3	1		5	1	7		1	2
Rudd	1		1							1				
Ruffe									1				1	
Stickleback						1	1	1	1	2	5	1		
Tench					1	1					2			1
Trout					2	1	1		1					2
Wolf fish									1				1	
Migratory														
Eel	3		10	4	5	13	7	4	38	11	21	1	1	20
Salmon	1		3	2	1	1	1	1	3				1	2
Salmonid	1		2	1	2	2	3	2	6	2	9		1	8
Shad			1			1	2		2		1			
Smelt	1			1	1	2	2		3	1	4	1		4
Sturgeon			2			1	1		6	2	4	1	1	2
Marine														
Angler														2
Bass			5	2	1	2	1	2	8	2	3			2
Bib				1			1		2	1				
Bleak														
Bogue									1					
Brill			3			2			1	1				2
Brill/turbot									1					
Bullhead				1										
Bullrout			1				1							
Clupeidae					1		1		5	1	3			2

	ES	ES-MS	MS	MS-LS	LS	SN	EM	EM-HM	HM	HM-LM	LM	M	M-PM	PM
N sites	9	1	14	4	16	17	12	6	69	19	43	3	1	63
Cod	2	1	5	3	4	8	9	4	40	12	28	1	1	38
Conger	1		1	2	1	2	3	3	24	10	21		1	25
Cottidae											1			1
Dab									1					1
Dogfish	1					1	1		2	1	2			3
Dory									1	1				3
Dragonet									2					
Elasmobranch			1	1	2	3	4	1	7	4	10			4
Flatfish	3		7	2	3	4	5	3	24	9	17	2	1	18
Flounder			2	1	3	1	1	1	4	1	7			9
Gadidae			2	2	4	7	5	4	28	6	25	1	1	29
Garfish			1	2		1	1	1	5		4			4
Goby				1			1		1	1	1			
Gurnard			2	2		1	2	1	16	3	14		1	18
Haddock	2		1	2		4	3	2	23	10	13		1	16
Hake			2	1			1	1	11	4	5			9
Halibut										1				1
Herring	3		5	3	8	13	7	2	37	9	21	1	1	21
Horse mackerel	1		1	1	1				1					
John dory									1					1
Ling			1	1		2	2	1	20	5	18	1	1	18
Lythe									1					
Mackerel			1	3	4	7	3	1	15	5	13		1	11
Mullet			2	1	1	2	1		3		5			7
Pandora										1				
Pilchard							1		1	1	2			1
Piper										1				
Plaice			6	1	4	4	3		15	2	12	1	1	17
Plaice/flounder	1		3		3	2	3		10	5	7		1	16
Pollack	1		1				2	1	4	1	3		1	3
Ray	1		3	2	3	1	4		13	3	6		1	4
Red mullet														
Rockling							2							
Roker						2	1		3		4			4
Saithe									2		1			
Sandeel							1		2					
Sardine									1					1
Scad			2	1			1	2	4	2	1			2
Scombridae				1							1			
Seabass	1			1			1		2					1
Seabream	1		3	2		1	3	1	5	2	8		1	9
Serranid						1								
Shark				1					1	1				1
Skate				1										
Sole					1	1	1		6	1	3		1	7
Sparidae														1
Sprat						1	1		4	1	1		1	5

	ES	ES-MS	MS	MS-LS	LS	SN	EM	EM-HM	HM	HM-LM	LM	M	M-PM	PM
N sites	9	1	14	4	16	17	12	6	69	19	43	3	1	63
Spurdog									1					
Thick lipped mullet										1				
Thornback			1	1	1	2	1	2	8	2	5		1	2
Tope							1							1
Tunny											1			
Turbot					1	1	1	1	5	3	2			8
Whiting	1		4	1	2	6	2	2	26	8	17		1	19
Wrasse	1		2	1	1		2	1	3	4	5			6

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