# Food for the Soul: The Dynamics of Fishing and Fish Consumption in Anglo-Saxon England: c. A.D. 410-1066

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## Abstract

The taste for fish in England and the British Isles as a whole has fluctuated on several occasions and understanding the reasons behind these changes is vital, especially in light of the great importance fish held in later medieval diet and society. The beginnings of marine fishing have usually been thought to lie in the late Anglo-Saxon period and are believed to lie with economic changes. Indeed, most studies of fish in archaeology have centred around economic approaches. However it is extremely unlikely for economics to have been the sole reason. This thesis will attempt to fill in the gap currently extant in early medieval fish studies by taking a multidisciplinary approach to exploring the character of fishing and fish consumption in Anglo-Saxon England. Zooarchaeological data alongside isotope evidence, artefactual, structural and textual will be considered together to explore not just economic but also social factors, in effect, exploring the dynamics of fishing and fish consumption. This multidisciplinary approach will also hopefully highlight the fact that fish cannot just be studied in isolation; to gain a full understanding of the implications freshwater and marine fishing will have on communities and society as a whole all aspects of fishing must be considered.

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# Chapter 1: Introduction

The last decade has seen an upsurge of interest in research on the role of animals in Anglo-Saxon society. Studies have focussed on a diverse range of topics, such as the socio-economic importance of animals (Holmes 2011), and their use in the negotiation of social identities (Poole 2010) and funerary rites (Morris 2011; Worley 2008). Most of these works have concentrated on domesticates (e.g. Crabtree 1996, 2010), whilst some have also examined wild animal exploitation (Poole 2010; Sykes 2005a, 2007a, 2010a; Sykes and Carden 2011). The role of fish, however, has been largely ignored. This is largely due to the difficulties that surround the analysis of fish from archaeological sites. Barrett *et al.* (2004) revealed that a major increase in marine fish consumption occurred around AD 1000. Prior to this date, marine fish remains were found only in urban centres. Barrett *et al.* (2004) concluded that economic factors, and most importantly, an increasing demand from non-food producing settlements, were the drivers of marine fishing. This focus on economic factors is perhaps to be expected since "economics" have been at the heart of fish bone studies since the specialism developed 30 years ago. However, people rather than economics generate a market. Barrett *et al.* paid less attention to social motivations and, since then, no one has moved the discussion forward to consider how and, more importantly, *why* consumer demand arose in the first place. It is precisely these issues that this thesis sets out to address. In order to do so, however, it is first necessary to consider how fish studies have developed in recent years.

As a fairly new discipline within zooarchaeology, many of the earlier fish studies tackled methodological issues. Barrett (1995) developed a method for identifying butchery patterns related to the production of stockfish. Others (e.g. Jones 1991; Orchard 2003; Smith 1995) sought to establish regression equations for calculating the live lengths of fish from their skeletal remains, in order to understand the economic importance of the fish found on archaeological sites.

Zooarchaeologists studying medieval assemblages from around Europe suggested that where deposits demonstrate an absence of fish head-bones, this may indicate trade in preserved fish (Heindrich 1983, 1986a, 1986b, 1994; Locker 2001; Maltby 1979). This theory was reinforced by finds of large fish-dominated middens (containing many head-bones) in the Scottish isles, as well as in northern Norway; areas that appear to have played a role in the trade of preserved fish (Barrett 1995; Céron-Carrasco 2005; Colley 1983; Harland 2006; Perdikaris 1999). These finds sparked an interest in understanding the archaeological signatures of preserved fish, elucidating the implications of fish trade to the producer areas and establishing a chronology (Barrett 1995; Colley 1983; Harland 2006; Perdikaris 1999). Locker (2001) studied the role of preserved fish in feeding the populations of England during the later medieval period, and changes in taste towards this important food item. Coy (1996) compared fish species listed in port records with the zooarchaeological record of southern England, and Serjeantson and Locker (1997) studied general trends in fish consumption.

Barrett *et al.* (2004) found that the demand for preserved marine fish became significant around the 11th century and increased greatly afterwards. Previous work by Barrett (1995) in Caithness and Orkney suggested that an increase in demand of preserved marine fish coincided with an increase in Norse control. Before this fish, either preserved or fresh does not seem to have been consumed. Harland (2006) confirmed this pattern for a greater number of sites through the use of multivariate statistics. Human stable isotope signatures indicate an increase in the consumption of marine protein during the late Viking period compared to previous periods (Barrett *et al.* 2001, 2004).

Recent studies on the chronology of traded marine fish using oxygen isotopic signatures indicated that cod *(Gadus morhua)* consumed in English towns was caught locally in the North Sea until the 13th century, but imported from much further afield after this date (Barrett *et al.* 2011; Orton *et al.* 2014). Despite these significant advances in our knowledge on medieval fish trade once it had flourished, very little attention has so far been paid on establishing how fish were perceived in the centuries leading up to this period.

The social importance of fish and fish consumption in England has rarely been touched upon specifically. In medieval England, certain fish were seen as the property of elites (Serjeantson and Woolgar 2006), as indicated by the presence of fishponds at monasteries and elite secular houses (Aston 1988). In other countries the importance of fish as status indicators is becoming increasingly recognised (Ervynck *et al.* 2003; van Neer and Ervynck 2005). Fishing and fish consumption can have different impacts on different levels of society, as well as different implicit meanings as demonstrated by Mylona

(2008) for Classical Greece. Mylona's study integrated zooarchaeological, iconographic and material data, drawing heavily from Classical literary sources that describe the popular view of fish and fishermen.

Looking at assemblages from the Hebrides, Céron-Carrasco (2005) examined the different levels of marine exploitation. While that study is largely based on the zooarchaeological evidence, material and anthropological sources were considered to better understand the circumstances of fishing and its impact on the islands' inhabitants.

**1.1 Research Questions**

Since Barrett *et al.'s* (2004) survey, subsequent excavations have revealed further sites with remains of in particular marine fish. These have highlighted the need not only to re-evaluate the evidence concerning fish consumption in Anglo-Saxon England, but also to draw more attention to the social dynamics surrounding fishing and fish consumption. This thesis aims to answer six open questions concerning fishing and fish consumption in Anglo-Saxon England:

- When were people fishing and consuming fish? – The lack of significant amounts of marine fish remains before the mid and late Anglo-Saxon periods has led to the belief that fishing was rare or possibly non-existent during that period (Barrett *et al.* 2004; Sykes 2007). Recent excavations have identified new sites from the mid and late Anglo-Saxon periods (Reynolds 2009; Thomas 2012) and a small number of sites from the early Anglo-Saxon period, where both marine and freshwater fish were recovered (Dickens, Lucy and Tipper 2010).

Establishing the dates when fish remains appear in the archaeological record is important to help identify the period when a change in food taste and perception of fish took place. Similarly, it is vital to examine the isotopic evidence to confirm consumption of fish.

- What were they fishing? – The range of domestic and wild species found on archaeological sites has shown that this can reflect settlement status (Crabtree 1996; Sykes 2005a, 2007a). It is possible that remains of certain species of fish may also reflect the social status of the people who caught and/or consumed them. For example, larger fish may have been targeted by the elite for display.
- Where were they fishing? – Fish may be caught from rivers, estuaries, inshore waters and further out in deeper waters. The species which are caught will depend on the environments they inhabit. As each environment carries particular risks, the presence of various species of fish could shed light on the perception of fish. Certain sites may have acted as temporary fishing settlements from where fish were redistributed. Inhabitants of other settlements such as urban ones may have fished sporadically or on a more frequent basis. These activities are likely to have changed over time.
- How were they fishing? – Very few studies on fishing and fish consumption have also considered aspects related to fishing, yet both are closely related. The location of weirs and their role in socio-economic development have been relatively well studied in Ireland (O'Sullivan 2001; McErlean and O'Sullivan 2002) but less so in England (O'Sullivan 2004). Unfortunately, fish hooks and other fishing

material, as well as weirs have never been studied alongside fish remains.

- Who was fishing and consuming fish? – This question is closely related that of where the Anglo-Saxons were catching fish. It is possible that there existed professional fishermen as well as those who fished for recreation. Different members of society are likely to have consumed different species of fish for a variety of reasons.
- Why were they fishing and consuming fish? – The (lack of) consumption of particular food items can be due to multiple reasons, such as religious taboos, worldview perceptions but also status display. Anthropologists have often viewed fishing as an activity akin to hunting (Ingold 1994). Hamilakis (2003) points out that in farming societies, hunting and the wild are viewed in a different sphere and are often surrounded in ritual. It is possible that fishing was seen as an activity similar to hunting.

Addressing the six questions listed above requires a complex social analysis that generates a complete picture of fishing in Anglo-Saxon England. The present study achieves this by integrating the zooarchaeological evidence with iconographic material, place-name and isotope data. Fortunately, the Anglo-Saxon period provides evidence from all of these sources.

**1.2 Geographical and Chronological Scope of Research**

While this thesis focuses on the Anglo-Saxon period, data on fish consumption in the Iron Age and Romano-British period were also included (Allen 2011; Dobney and Ervynck 2007; Locker 2007). This was necessary in order to gain a full understanding of the factors that may have affected peoples' taste for fish and their desire to consume them in the Anglo-Saxon period.

All sites considered in this thesis are located in England. Sites from Wales or Scotland were not included in the dataset. Fishing and fish consumption in Scotland has received much attention, so that many zooarchaeological key studies on this topic are based on Scottish material (e.g. Barrett 1995; Céron-Carrassco 2005; Jones 1991; Harland 2006).

The dataset considered here shows a strong bias towards sites from Southern and Eastern England (Figure 3.1, 3.9 and 3.13). This is partly due to the lower acidity of soil in these regions when compared to the West and Northwest of England (Turner 2006: 4), which favours bone preservation. In addition, archaeological research has been more intense in Southern and Eastern England compared to other regions of England.

| **Period** | **Date Range** |
|---|---|
| Iron Age (encompassing middle and late Iron Age Periods) | c.400BC-AD50 |
| Roman | AD 43-410 |
| Early Anglo-Saxon | AD 400-650 |
| Mid Anglo-Saxon | AD 650-850 |
| Late Anglo-Saxon/Saxo-Norman | AD 850-1100 |

*Table 1.1 Names and date ranges of archaeological periods investigated*

The early medieval period in England is referred to as the Anglo-Saxon period, which is in turn divided into three sub-periods (Table 1.1). The chronology of these is debateable. The beginning of the early period is agreed to begin at the official date of Roman withdrawal. However, the extent of Roman influence after this date of course varies between regions.

This thesis investigates evidence up to the date of AD 1100. While the Norman Conquest took place in AD 1066, the end of the 11th century was chosen as the terminal date for practical reasons concerning dating phases from archaeological sites. Further to this, Sykes (2007a: 3) notes that late pre-Conquest and late post-Conquest assemblages tend to be very similar in their make-up. As a consequence, sites covering a period from AD 950 to AD 1200 are often labelled and referred to as "Saxo-Norman".

## 1.3 Sources of Evidence

This thesis will consider various sources of evidence - zooarchaeological, isotopic, textual and artefactual - to address the research questions.

### *1.3.1 Fish Bone Data*

The direct evidence for the consumption of fish is derived from the presence of fish bones at archaeological sites. Data on fish bones from the Anglo-Saxon periods were obtained from published and grey literature as well as through direct analysis of assemblages. Data on fish consumption during the Iron Age and Romano-British periods were gathered from recent surveys.

#### *1.3.1.i Data Collected from Published and Unpublished Sources*

Evidence for fish consumption during the Iron Age and Romano-British periods was gathered from the surveys undertaken by Allen (2011), Dobney and Ervynck (2007) and Locker (2007). Due to time restrictions, the original reports of the source-data feeding these three surveys could unfortunately not be consulted. The degree of sieving at each site is therefore not always known, which limits the discussion significantly. However, the authors of the three surveys have commented upon the limitations of their respective data due to lack of sieving, which has also been taken into account in the discussions of the present work.

An email was sent out to the zooarchaeological community via the ZOOARCH mailing list asking for published or unpublished data on fish bone assemblages from the Anglo-Saxon periods. Many surveys in the past (Barrett *et al.* 2004; Reynolds 2008) have concentrated only on sieved assemblages in order to minimise the recovery biases in the final analysis. However, as the present work aims at providing a complete picture of fishing and fish consumption in Anglo-Saxon England, fish finds from sites where no or only limited sieving was undertaken were also included in the dataset. This was achieved by consulting the list of sites presented in Poole's (2010) thesis.

If fish bones were recovered, the amount, species, method of recovery and context types where mentioned were noted. If a report did not mention any recovered fish bones, this was also noted along with the general methods of recovery and the contexts the other faunal remains came from; both of these factors can determine the survival and recovery of fish bones. A detailed description of the methods of recovery was rarely noted and thus, comments on sieving are based on the segments of information presented in the report. Similarly, the contexts where faunal remains were recovered from are not always discussed in great detail unless deposits are noted as being different from the rest. The types of deposits that recover animal bones are pits and cesspits (primarily fish), which are found at most archaeological sites. However, there is variation in the types of deposits found across the different Anglo-Saxon periods, which has shown to impact on the amount of fish recovered.

*1.3.1.ii Fish Remains from Studied Assemblages*

Fish bones from Lyminge, Kent (Appendix 2); Sedgeford, Norfolk (Appendix 3); Bishopstone, East Sussex (Appendix 4); and Staple Gardens, Winchester (Appendix 5) were studied by the author. The assemblages from Bishopstone and Lyminge were studied for previous research projects (Reynolds 2008, 2009). Both these assemblages were reanalysed as part of this doctoral study to ensure that the four assemblages were analysed and recorded in identical ways.

All four assemblages were analysed at the University of Nottingham Bioarchaeology Laboratory using the reference collection held there and that of the author. All assemblages were recorded in a Microsoft Excel Spreadsheet based on the York System (Harland *et al.* 2003).

While all four assemblages were subject to some degree of environmental sampling and sieving, the exact details of the sampling strategy at Sedgeford and Staple Gardens were unavailable. Similarly, specific dates and phases for these sites were not available. Sedgeford and Staple Gardens samples were thus assigned broad date ranges (i.e. mid Anglo-Saxon and late Anglo-Saxon respectively).

1.3.1.ii.a Elements and Species

The range of elements routinely recorded and identified varies between specialists. The situation is further complicated by the fact that species of several fish families cannot be distinguished using routine elements. There is however some consensus among most analysts working within the North Sea region as to what elements are most distinctive and should be recorded. The York System advises on routine identification of 18 cranial and appendicular elements (Table 1.2); these are generally fairly robust and therefore easily recognisable and identifiable to family and even species level. These elements are sided (after Barrett 2001), sized (see section 1.3.1.ii.b), and assigned a texture and completeness score (see section 1.3.1.iii.c). Measurements, butchery and taphonomic alteration are recorded when present. Some analysts such as Locker (2001) additionally record elements such as the epihyal, interopercular and sub-opercular. In this study, these three additional elements were not recorded with the exception of sub-opercular of herring *(Clupea harrengus)*, which have a very distinct form. Flatfish urohyals were recorded due to their distinctive shape and because they can be identified to species level (Wouters *et al.* 2007).

| | |
|---|---|
| Articular | Posttemporal |
| Basioccipital | Premaxilla |
| Ceratohyal | Preopercular |
| Cleithrum | Quadrate |
| Dentary | Scapula |
| Hyomandibular | Supracleithrum |
| Infrapharangyeal | Vomer |
| Maxilla | **Additional elements identified by author** |
| Opercular | Sub-opercular |
| Palatine | Urohyal |
| Parasphenoid | |

*Table 1.2 Elements routinely identified and recorded in full detail with the addition of two elements by the author*

Vertebrae often form a significant part of the assemblage of English and other European sites of the period under consideration. The York System was designed with the aim of facilitating interpretation of assemblages with regard to the production and consumption of preserved fish. To this end, vertebrae of cod can be placed into one of eight groups after Barrett (1995). In the assemblages studied by the author, vertebrae have not been recorded in such detail; only the categories of first, abdominal, caudal and ultimate were used. The vertebrae of several families are impossible to identify to species; this includes flatfish (such as plaice/flounder *(Pleuronectes platessa/Pleuronectes flesus*), sparids *(Sparidae*), gurnards *(Triglidae)*, mullet *(Mugilidae*) and, to a certain extent, clupeids. Vertebrae were not assigned texture and completeness scores. Butchery and taphonomic alterations were noted when present.

There are several elements that are specific to certain species, and in some cases, such as the dermal denticles of rays and skates, will often be the only indicator of a species' presence on an archaeological site. These "special" elements range from otoliths to scales (Table 1.3) and are recorded in as much detail as possible. As identification of scales requires an extensive reference collection, identification of scales to species was not always possible.

| **Element** | **Species** |
|---|---|
| 1st Anal Pterygiophore | Flatfish |
| Dermal denticles/Bucklers | Rays/Skates |
| Otic bulla | Herring |
| Otolith | All fish |
| Scales | All fish |

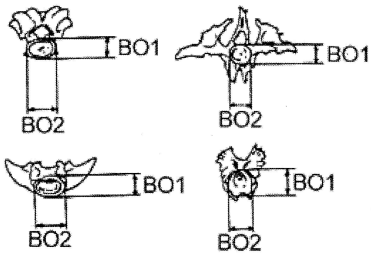
*Table 1.3 "Special" elements that are specific to certain species*

There are a large number of elements within a fish's body that cannot be identified, including fin rays, spines, branchiostegal rays and many other cranial fragments that fragment too easily and frequently. Fins and spines were counted along with branchiostegal rays, as these may provide additional contextual information due to their function in separating kitchen from table waste (Powell *et al*. 1996).

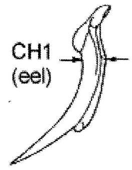
While it is not possible to separate the vertebra of flatfish, a recent set of criteria has been established to differentiate between certain elements of flounder, plaice and dab (*Limanda limanda*) (Wouters *et al*. 2007). A large number of reference collection specimens are vital when trying to separate these species, and every effort has been made to identify these three species. Members of other families such as the sparids, mullets and gurnards are notoriously difficult to separate. Whilst no definite criteria exist in this respect, it is agreed that species can sometimes be differentiated from certain cranial elements such as the maxilla and pre-maxilla. The cyprinids *(Cyprinidae)*, the family to which the vast majority of freshwater species of England belong, are even more difficult to separate. The infrapharangyeals are considered the most reliable element for differentiating cyprinid species, though it may be possible to separate them using other cranial elements (Wouters *pers. comm.*) as well as through DNA analysis (Collins and Harland *pers. comm.*).

1.3.1.ii.b Measurements and Sizes

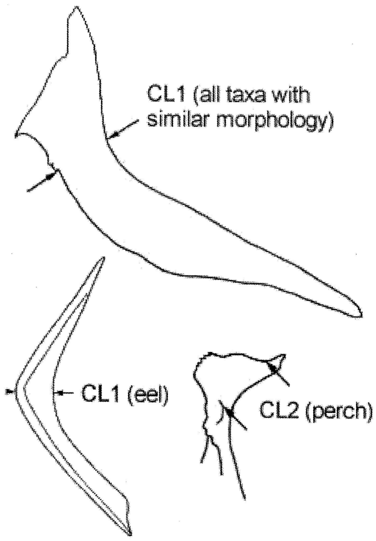
Morales and Rosenlund (1979) suggested a standard of measurements, consisting of a wide range of measurements mostly on cranial elements. The problem with Morales and Rosenlund's (1979) standard is that many of their suggested measurements require the element to be complete; a rare occurrence in archaeological assemblages. Nevertheless, the measurements proposed for the most robust elements are still widely used. Measurements were taken on elements when prompted by the York System (Figure 1.1) and derive from a variety of previous research (Jones 1991; Bødker Enghoff 1994).



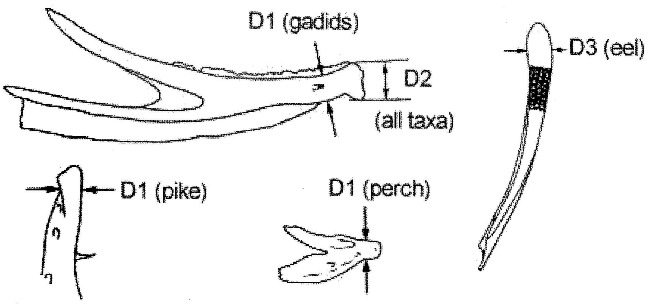

**Basioccipital** (after Morales and Rosenlund 1979)



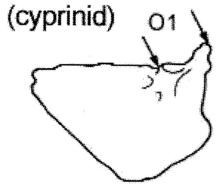

**Ceratohyal** (after Enghoff 1994)



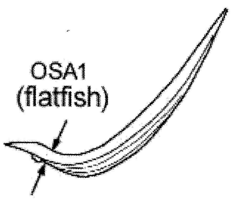

**Cleithrum** (after Jones 1991; Enghoff 1994)




**Dentary** (after Jones 1991; Enghoff 1994)




**Opercular** (after Enghoff 1994)




**1st anal pterygiophore** (after Enghoff 1994)

*Figure 1.1 Measurements taken on fish elements after those suggested by the York System*

In certain circumstances, it is possible to calculate the live length of the fish from the measurements taken using regression equations. Regression equations compare the length of a fish to specific measurements of skeletal elements where a high degree of correlation exists (represented by an r-squared value greater than 0.95). Regression equations have been calculated for a number of different species (Desse and Desse-Berset 1996; Jones 1991; Libois 1987; Rojo 1986; Rosello and Sancho 1994; Smith 1995; Sternberg 1994; Wheeler and Jones 1976) using a variety of measurements from different elements. Unfortunately, many of these measurements can rarely be taken on archaeological specimens. Furthermore, it is necessary to assess to what extent the reconstruction of live lengths of the species found on archaeological sites will further the research questions being posed. In several cases, the reconstruction of live lengths has been vital to understanding the fishing methods being used (Orchard 2003; Sternberg 1994). On the other hand, while a regression equation for reconstructing the length of whiting *(Merlangius merlangus)* exists (Wheeler and Jones 1976), this species does not reach substantial lengths, rendering the calculation of their live lengths from archaeological specimens not worthwhile (Jones *pers. comm.*).

Another problem of the regression method is that the degree of accuracy in reconstructing fish length decreases with the size of fish species. This is because archaeological specimens tend to be bigger than the modern day ones, which were used to calculate regression equations (Jones 1991; Orchard 2003). For a great number of fish, calculation of a regression equation would be rather worthless due to their habitats and method of capture. This is the case with herring, a pelagic fish that was of great economic and dietary importance in medieval Europe. As herring were caught using nets at particular times of year, the majority of the catch consisted of similarly sized individuals. However, considering that several populations of herring exist in the North Sea and English Channel, in certain cases, estimation of herring size from archaeological sites may help to understand seasonality and location of the fishery. This is done by visual comparison of elements from archaeological and modern specimens, after which the archaeological fragment is placed into a size category (Céron-Carrasco 2005; Harland 2006; Jones 1991; Locker 2001).

In the present thesis, size reconstruction using regression formulae were carried out only for cod. This was done using measurements and formula developed by Jones (1991). Elements of all other species were placed into size categories based on visual comparison with modern specimens. This approach has been widely used in Scotland with gadids, resulting in recognition of size categories that are used by a number of analysts (Barrett 1995; Céron-Carrasco 2005; Harland 2006). Placing of fish into size groups allows for an attempted reconstruction of fishing methods, as the size groups are adapted to the changing habitats of fish as they mature. Offering a range of sizes (Table 1.4), the York System was used for cod and any element identified as "gadid". While whiting is a gadid species, it is smaller than cod and generally lives in inshore waters. Elements identified as whiting were therefore not placed within the provided size groups. Similarly, all elements of other species were compared to specimens of the reference collection by the author and assigned to an approximate size range (i.e. bigger or smaller, usually in 10 centimetre increments than that held in the collection).

| | |
|---|---|
| Tiny (T) | <150mm |
| Small (S) | 150-300mm |
| Medium (M) | 300-500mm |
| Large (L) | 500-800mm |
| Very Large (X) | 800-1000mm |
| Extremely Large (XX) | >1000mm |

*Table 1.4 Size categories assigned to cod elements after Harland et al. (2003)*

Some analysts (Beech 2004) consider the maximum width of the vertebral centrum as another measure for determining the size of fish. Although application of this method was considered particularly with regard to the large numbers of herring vertebrae in the present study, this was not possible as many of the vertebral edges were chipped.

Regression formulae were used to calculate live lengths of cod from Bishopstone and Lyminge, as both assemblages contained large amounts of elements of this species. The resultant sizes were used to explore the possibility of fishing being an activity akin to hunting for certain elites. Cod can reach extremely large sizes and would have required a great deal of strength to catch, as well as venturing out into deep and perilous waters.

Unfortunately, very few reports dealing with fish from the Anglo-Saxon period have made use of reconstructed live lengths. Fish size estimations are based on visual comparisons only, and are not or only briefly discussed. This is largely due to the fact that cod, for which extensive live length regression research has been undertaken, is not a very common fish on Anglo-Saxon sites. Calculation of live sizes is also only useful when there is a large sample present and where the assemblage demonstrates a variety of sizes.

1.3.1.ii.c Condition

Texture was graded on a scale of 1 to 4 for all cranial and appendicular elements (Table 1.5) and a completeness score assigned (Table 1.6). This information was not recorded for vertebrae, though it was noted when a vertebra exhibited particularly bad texture. Any other alteration such as crushing, acid etching, burning or butchery was recorded for all elements. For butchery, a description of the location and type of mark was made. Pathologies are relatively rare in fish and when they are known, such as in the case of the hyperstosis exhibited by haddock *(Melongrammus aegelfinus)*, on elements such as the cleithrum and post-temporal, it is so frequent it is taken to be the norm (von den Driesch 1994).

| **Texture Score** | **Condition** |
|---|---|
| Poor | 1 |
| Fair | 2 |
| Good | 3 |
| Excellent | 4 |

*Table 1.5 Texture scores assigned to elements routinely identified after Harland et al. (2003)*

| **Completeness Score** | **Range** |
|---|---|
| 10 | 0-20% |
| 30 | 20-40% |
| 50 | 40-60% |
| 70 | 60-80% |
| 90 | 80-100% |

*Table 1.6 Completeness sccores assigned to fish elements routinely identified after Harland et al. (2003)*

1.3.1.ii.d Articulated Bones

In some cases, it is possible to find articulated elements. These may be clusters of bones, fins or scales that have remained in anatomical alignment, or elements that are articulated by the interdigitation of bone processes (such as the parasphenoid and basioccipital). When an articulation was found, each element was recorded individually in the database. The presence of an articulation was noted in a separate Excel spreadsheet along with the context and sample number.

### *1.3.2 The Problems of Data Synthesis Using Fish Remains and the Presence/Diversity Index*

The study of fish remains is plagued with problems caused by the fragility of bones as well as their variety in size. Extensive sieving has shown to be the most accurate method for recovering fish bones and achieving a representative sample (Jones 1982). The lack of a systematic method of recording fish elements also hampers comparisons between assemblages. In addition, published reports rarely include information on the general preservation of bones, the sampling strategy, the contexts sampled or the number of species found in each sample.

The survivorship of fish bones varies greatly between species. Smaller species such as herring and mackerel *(Scombrus scombrus)* exhibit very delicate cranial elements, although the vertebra of herring may be fairly sturdy. The same can be said of eel *(Anguilla anguilla)* vertebra. All elements of cod, on the other hand, are much more robust. Salmonid bones are known to have very low rates of survivorship, which is possibly due to their high fat content (Lubinski 1996). Due to their cartilaginous skeleton, elasmobranchs such as rays, sharks and skates, are only ever identified by their teeth, dermal denticles and under exceptional circumstances, vertebra. In England, extensive variation in soil acidity, directly impacts survivorship. For example, the lack of assemblages in Western England (Figs 3.1, 3.5, 3.9 and

3.13) is possibly due to the more acidic soil in that region (Turner 2006: 4). This affects mammal remains as well as fish (Poole 2010: 18). The type of deposit in which fish bones are found is also crucial to their survival and identification. Pits and middens may favour the survival of fish remains, as they are less likely to be trampled on by humans and other animals. Similarly, cesspits will also favour survival of fish bones, and especially small ones that have passed through digestive tracts. Surface deposits, on the other hand, are unlikely to reveal many fish bones with the exception of fish vertebrae rosaries or similar items that were deliberately placed there (Stallibrass 2005). Burning, charring and acid etching through human digestion will affect the taphonomy of fish remains (Nicholson 1991) as well as the analyst's ability to identify the species. All of these factors render quantification of fish remains difficult.

One of the simplest and most basic ways of representing zooarchaeological data is through the Number of Identified Specimens (NISP), i.e. the number of all identified fragments from each taxon. Drawbacks of this method include that it does not take into account the fact that fragments may come from the same individual, and particularly with regard to fishes, issues concerning the high interspecific variation of survival rates and the number of elements used to identify certain species. A prime example in this respect are the elasmobranchs (i.e. rays, sharks and skates), which have a cartilaginous skeleton. Along with teeth and dermal denticles, elasmobranch vertebrae survive only under exceptional conditions, elasmobranchs are regularly under-represented and notoriously difficult to quantify. Nevertheless, NISP remains the most common method of representing fish remains data and comparing assemblages at a basic level (see for example Céron-Carrasco 2005).

The Minimum Number of Elements (MNE) and Minimum Number of Individuals (MNI) methodologies were developed to account for the fact that multiple elements may be derived from single individuals. To allow for the calculation of MNE, zones (based on gadids) were established for 18 cranial and appendicular elements (Barrett 2001) and incorporated in the York System (Harland *et al.* 2003). Those elements for which such zones have been defined tend to be highly diagnostic at the species-level and derive from Barrett's preserved fish model (1995). Despite their high prevalence in European medieval assemblages, the use of vertebrae as a measure of species abundance is problematic, as very few species have a set number of vertebrae and correct identification of a vertebra's position within the vertebral column is very difficult. Calculation of the MNE or MNI may thus be beneficial if an assemblage consists largely of gadid cranial elements, but rather useless if assemblages are largely made up of vertebra.

The problem of quantifying remains based on the numbers of elements of each species identified can be solved by calculating the frequency or number of occurrences of a taxon in a group of samples or contexts (e.g. O'Connor 2000). As this figure is determined by the number of contexts or samples in which a taxon was recorded, it does not take into account the number of elements of each taxon in each sample or context.

Fish remains of different periods and sites are often compared by assessing differences in relative frequencies of species. However, this method is unable to depict if, for instance, an increase in relative abundance of cod and herring is indeed due to a real increase in their remains found or because the numbers of eel remains is declining.

Multivariate statistics are particularly useful for exploring spatial and temporal patterns (Barrett *et al.* 2004; Harland 2006). Harland's (2006) work was one of the first to apply multivariate and inferential statistics to analyse spatial and temporal patterns related to site type, status and function within Orcadian zooarchaeology. The use of inferential statistics allows determination of (the lack of) statistically significant differences of spatio-temporal patterns. It can further help to understand biases of preservation and recovery, so that they can be accounted for when undertaking broader analyses. Harland (2006) demonstrated the use and benefits of inferential and multivariate statistics for answering complex questions using complex data, however, this method was limited. For example, data could not be used at the context level within the comparative dataset, as this resulted in individual units that were too small or contained no data at all. While correspondence analysis is very useful for exploring complex datasets, it is limited by several factors. It is most useful for NISP data but not for element counts and can be used only for comparisons within a single class. Combination of mammal and fish data proved meaningless largely due to differential recovery of each class and NISP. Differences between analysts, as well as recovery and preservation biases must always be fully understood and taken into account.

Besides quantifying (relative) abundances of different species of fish, there have been various attempts at either understanding the value of fish as a protein or its role as a food source among the other classes of animals. Calculating meat weight from archaeological assemblages has often been used alongside other quantification methods as a way of gauging the contribution of each species to the overall diet of a site (Orchard 2003). The size of elements and the live weight and total length of a fish are curvilinearly related (Barrett 1993).A number of researchers developed equations that allow calculation of meat or protein weight of different fish species found on archaeological sites. Unfortunately, the use of such equations is quite limited for the following reasons.. Firstly, regression equations have only been calculated for a small number of species. While most of these are very important archaeologically, no such equations have yet been developed for many other fish species that are equally important. Secondly, this method cannot be used as a measure of protein and flesh available from the fish (Wheeler and Jones 1989), as not all parts of the fish are edible and edibility can also be culturally defined.

Determining the importance of fish in the overall diet requires comparison and integration of other classes of animal remains. However, accurate comparison of different classes of animal remains is very difficult, because of differences in preservation, recovery and numbers of bones between classes of animals. Combining bird, mammal and fish data has been attempted using multivariate statistics but did not reveal any significant patterns (Harland 2006).

Much of the analysis and discussion in this thesis uses NISP as a method of quantification due to its simplicity and availability. The frequency of species by sample would have been an equally useful measure but unfortunately, few published reports present data in this manner. With regard to unpublished reports, information on the number of samples taken and the number of samples containing fish was not available. Factors such as the recovery of fish remains were taken into account as much as possible to account for the limitations of NISP.

In the discussions of Romano-British and Anglo-Saxon fishing and consumption of fish, presence/diversity index charts are presented. Assemblages were thereby divided by periods and site type, and 22 species of fish were considered. Selection of these species was based on their abundance during the periods of interest, whilst allowing for small regional variations. The overall presence of a particular species is calculated as the percentage of the total number of sites at which it is present. The sums of "present" data points for each period or site type, respectively, were then divided by the number that would be obtained if all species were represented for that period group or site type. For example, as seen in Appendix 6, for rural sites from the 5th -7th centuries AD, different species of fish were recorded from overall 16 different sites. Across these sites and the selected species, 43 "presents" are noted, out of a possible 352. The presence/diversity index is obtained by dividing 352 by 43, i.e. 12.2. Presence/diversity indices of each period and site type can then be compared graphically as a proxy measure of fish species presence and diversity. The respective results are discussed in Chapter 3.

The above method was first used by Sykes (2007a) and Allen (2011) for Iron Age and Roman period fish. Presence/diversity indices are not perfect as they do not reflect absolute quantities of bones or the frequency of fish relative to other animal groups, nor are they able to reveal subtleties within individual assemblages. However, calculation of these indices allows for the comparison of large numbers of assemblages across different time periods and site types. Assemblages that have not been sieved have been included in order to gain as wide a picture of fishing as possible. This however does cause problems and therefore it is important to consult the raw data when interpreting the results.

Two presence/diversity charts were created. Appendix 6 compares all the sites from which fish remains were recovered, whereas Appendix 7 also includes the sites from Anglo-Saxon England from which no fish remains were recovered. In combination, these two tables present an overall picture of fish consumption throughout the various periods discussed.

### *1.3.3 Fish Bones in Graves*

The presence of fish bones in graves may represent grave goods or graveside feasts, and could thereby not only indicate the consumption of fish but also provide information on how fish were perceived by humans. A second email was sent to the ZOOARCH mailing list, asking for any known instances of fish bones being found in grave contexts. In addition, works dealing specifically with the presence of animals (Worley 2008) or food items (Lee 2007) in grave contexts were also consulted. Pictorial representations of fish are also commonly found in grave contexts as part of grave goods. The work by Dickinson (2005) and the references therein was the main source for such finds.

### *1.3.4 Isotope Data*

Stable isotope analyses has numerous uses in various archaeological subdisciplines, and particularly in the study of marine protein consumption and fishing. In the last 10 years, stable isotope studies of diet have become very popular, and many researchers have investigated the dietary role of fish (Barrett and Richards 2004; Barrett *et al.* 2011; Hull 2008; Müldner and Richards 2006; Schulting and Richards 2002). The exploration of diet through stable isotopes is now a vital tool for understanding not only subsistence strategies of ancient communities but also major changes in eating practices that may be linked to broader socio-economic or cultural changes. Stable isotope studies utilise the signatures of consumed foods, specifically the sources of protein, that remain in body tissues such as bone collagen, which has a very slow turnover depending on the skeletal element. These signatures provide evidence of the diet from the last ten years or more before death, depending from which element the collagen sample is taken (Müldner 2009). Two of the most useful and common isotopes analysed in this respect are carbon ($^{13}C$ and $^{12}C$) and nitrogen ($^{15}N$ and $^{14}N$). In stable isotope analysis, the ratios of these two sets of isotopes (δ13C and δ15N respectively) are assessed. As δ13C and δ15N varies between ecosystems, these isotope ratios will be transferred to plants, animals and ultimately humans through the food chain. Stable isotope values are calculated by measuring the proportion of the heavier over the lighter isotope in parts per mil (‰). The two values are compared within their end points and can be displayed graphically (Figure 1.2).

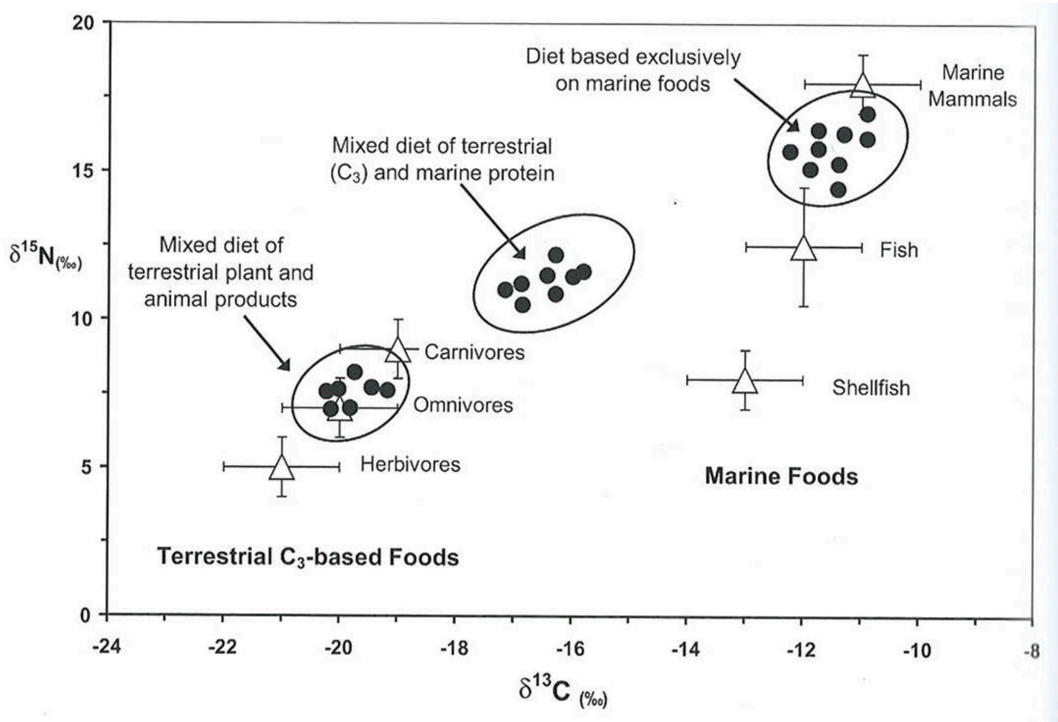



*Figure 1.2 Predicted stable carbon and nitrogen isotope values from different animal and human populations eating differing diets. From Müldner 2009: Figure 1.*

In general terms, carbon isotope ratios can identify the relative consumption of C3 and C4 plants, as well as the relative consumption of marine and terrestrial protein sources; marine environments are enriched in carbon. Since C4 plants are not common in Europe, stable carbon isotopes are mainly used to differentiate between marine and terrestrial diets. Stable nitrogen isotopes reflect the "trophic effect" of different sources of protein. Expected stable carbon isotope values for a 100% marine and 100% terrestrial protein diet lie at -12 ± 1‰ and -20 ± 1‰, respectively (Richards *et al.* 2006). Actual human bone collagen δ13C values fall between these two end points and are interpreted as reflecting relative marine versus terrestrial protein consumption. As sea mammals and fish are high up in the food chain, consumption of their protein will result in an increase of consumer δ15N values by 2-4‰. To enable accurate interpretation of stable isotope values of human bone collagen, it is vital to compare these to those of contemporaneous faunal remains (Richards *et al.* 2006). Humans that relied heavily on plant foods would have stable isotope signatures most similar to herbivores, whereas those that ate more significant amounts of animal protein would have isotope values closer to omnivores such as certain pigs or pure carnivores. While stable isotopes can help discriminate marine and terrestrial protein sources, it cannot be used to differentiate between different types of protein from the same animal (e.g. milk versus meat). In addition, food chains in freshwater ecosystems are longer than in terrestrial ones, which is why an enriched level of δ15N may reflect a diet that is heavily reliant on freshwater fish (Mays and Beavan 2012). Isotopical discrimination of freshwater, estuary and marine fish could potentially also reveal much about society and the provisioning of food (Mays and Beavan 2012). Sources of protein must form at least 20% of the dietary intake for there to be an isotopic signature (Müldner 2009).

As stable isotopes give an indication of whether the protein consumed came from terrestrial or marine sources, studies have tended to look for changes in the general diet and often taken a long-term approach (Müldner 2009). In Great Britain, several studies have concentrated on the Mesolithic to Neolithic transition, which is characterised by the complete abandonment of a marine-based diet (see for example Richards and Schulting 2006). This trend seems to continue throughout the rest of the prehistoric period and only begins to change during the Roman period. Isotopic data was gathered from published studies, i.e. data syntheses focussing on certain periods and individual site reports that included isotopic research as part of the post-excavation analysis. Many of the publications consulted presented raw isotopic data for each sample studied, which were used to illustrate isotopic signatures for the Iron Age, Romano-British and Anglo-Saxon periods. Unfortunately, some published studies do not include such raw data. This includes the synthesis by Hull and O'Connell (2010), and the work this synthesis is based on (i.e. Hull 2008) is currently not available for consultation (Hamerow *pers. comm.*, University of Oxford *pers. comm.*). Similarly, a work looking at the diet and its social implications in later Roman Britain (Cummings 2008) was also not available. In addition, many of the articles consulted present unpublished data from unpublished sites. While this brings to light new information, unfortunately one is limited to the information presented in the article concerning the context and interpretation of the burials. As a result, the discussions of isotopes is very limited in terms of the contexts of the samples.

### *1.3.5 Catching Fish*

Fish weirs recorded from several rivers and estuaries of England are listed and discussed in Chapter 4. Other materials such as weights and net floaters are equally important for catching fish. All site reports that were consulted for fish remains were thus also scanned for the recovery of fish hooks, line weights, net sinkers and floaters. A catalogue of these finds, detailing site, county, material, description and original catalogue number of each object is presented in Appendix 1. While contexts in which objects were found can reveal much about taphonomic processes, uses and disposal patterns, these were rarely provided in original reports. The catalogue is organised in alphabetical rather than chronological order, as some recovered objects came from sites with different phases or from unstratified contexts.

### *1.3.6 Place-names*

English place-names contain a wealth of information but, until recently, have remained untapped by archaeologists. This is largely due to the complex linguistics required to unpick and interpret place-names. Traditionally, place-name scholars focussed on unravelling the origins and meanings of the compounds that form place-names. More recently, the focus lies on the location of place-names in the landscape with the aim of elucidating past perceptions of the landscape (Gelling and Cole 2000). Place-names have also been used to reconstruct past landscapes, such as vegetation cover and the distribution of wetlands (Murillo 2001; Sousa and García-Sousa *et al*. 2010; Sweeney *et al*. 2007), former distributions of trout in Swedish lakes in conjunction with habitat types to inform reintroduction projects of this species (Spens 2006) and the past distribution of wild animals across the United States (Cox *et al.* 2002).

In England, animal-related place-names have been used to explore the past distribution and importance of cranes (Boisseau and Yalden 1998), ravens (Moore 2002), pine marten (Webster 2001) and birds (Yalden, 2002). Others have used place-names to reconstruct the former status of beavers and wolves (Aybes and Yalden 1995), and to argue for or against the presence of fallow deer in England during the Anglo-Saxon period (Sykes and Carden 2011). Yalden and Sykes have both incorporated zooarchaeological evidence into their research into place-names. The use of place-name evidence can be of great benefit to the archaeologist as shown in recent works (Jones, Cullen and

Parsons 2011; Jones and Semple 2012). The importance of understanding past distributions of animal species as well as their status and how they were perceived is becoming ever more evident, yet place-name evidence relating to fish or the sea has received very little attention. Given the importance of fish in the medieval diet and the debate surrounding the development of intensive marine fishing, it is hoped that place-name evidence may shed more light on this matter.

Two English place-name dictionaries, i.e. *A Dictionary of British Place-Names* (Mills 2003) and *The Cambridge Dictionary of English Place-Names* (Watts *et al.*, 2011), were consulted to find place-names containing fish- and weir-elements. As this exercise was based on a limited number of rather general resources, only major place-names were extracted. Further research aiming at extracting minor place-names is therefore recommended to complement the current dataset.

The six research questions set out above will thereby be addressed adopting the following structure:

### 1.4 Thesis Structure

Throughout the history of the British Isles, levels of fish consumption have not been constant. To put Anglo-Saxon fish consumption in the context of previous situations and perceptions of fish, aspects of fishing and fish consumption from the Iron Age and Roman periods are discussed in Chapter 2. The bulk of studies concerning fish in Anglo-Saxon England have concentrated on zooarchaeological data; these are discussed in Chapter 3. Chapter 4 presents the different ways in which fish may have been caught.

The chapter begins with presenting the evidence for weirs in Anglo-Saxon England and places them within wider studies of the landscape. The presence of weirs in the landscape is likely to have had an impact on people's memories and orienteering abilities. These factors are discussed in relation to place-names. Subsequently, material remains such as hooks and sinkers are discussed. Understanding who was involved in the processes of production, distribution, consumption and disposal is very important to understand the role of fishing in society and the Anglo-Saxon mind-set. The way fishing and fish consumption may have helped define identities in Anglo-Saxon England is discussed in Chapter 5. Chapter 6 brings together all the sources of evidence discussed in previous chapters and places them within the wider framework of Anglo-Saxon England. This is done thematically in order to reveal the dynamics of fishing and fish consumption. Chapter 7 summarises the findings and proposes directions for future research.

# Chapter 2: The Iron Age and Roman Taste for Fish

A good understanding of the levels of fish remains in the Anglo-Saxon period requires a good knowledge and understanding of the situation during the preceding periods. This chapter will discuss the evidence for fish exploitation (zooarchaeological data) and consumption (isotope studies) during the Iron Age and subsequently, the Romano-British periods. It will also examine how the Romans perceived fish both as consumables and as animals.

## 2.1 Iron Age England

### *2.1.1 Fish Remains*

Dobney and Ervynck (2007) undertook an extensive survey of Iron Age and Roman period assemblages to try to explain the lack of fish remains at Iron Age sites in England. Out of 117 sites, only 11 exhibited fish remains. A more recent survey by Allen (2011) found that fish bones remained rare in the mid Iron Age to late Roman period (Figure 2.1). The lack of fish during this periods could be associated with a number of factors including preservation, underlying geology and recovery; extensive sieving is vital for the recovery of fish remains to ensure the recovery of both large and small bones. Dobney and Ervynck (2007) found that only two assemblages, for which some degree of sieving was performed, revealed fish bones. This is despite the fact that a numbers of other small animal bones were found that would also have been missed through lack of sieving. In addition, recovered fish bones generally tended to be very small in numbers, with exception of the settlement at

Glastonbury Lake Village (Bulleid and Gray 1917; Coles and Minnit 2005) and the well at Skeleton Green (Partridge 1981).

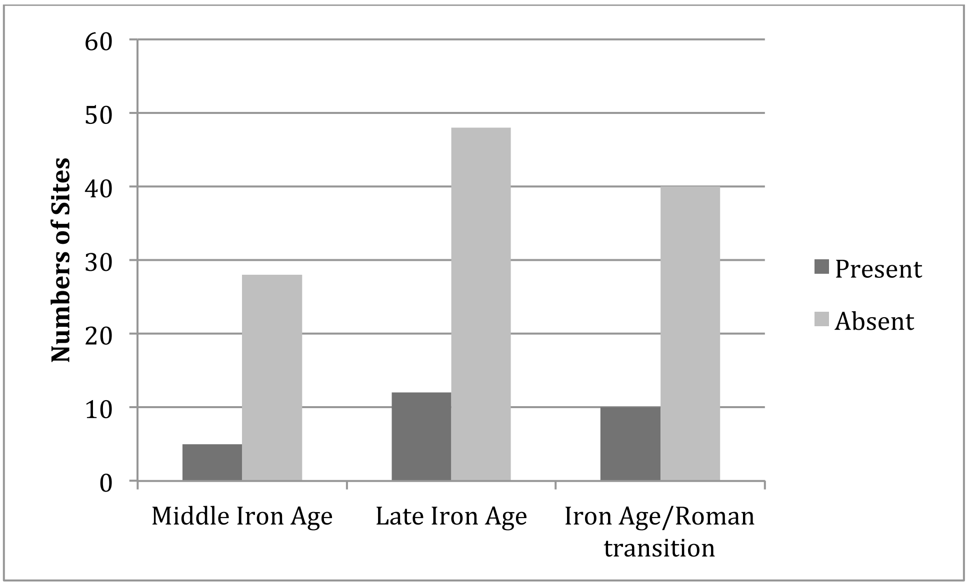



*Figure 2.1 Presence/absence of fish remains from middle Iron Age to transition period sites. Data from Allen (2011).*

Excavations at Glastonbury Lake Village revealed a settlement located in a wetland area, which had been built on an artificial terrace made of timber stilts. The faunal assemblage was very rich in fish remains along with a large number of aquatic birds. The well at Skeleton Green revealed an assemblage comprising six taxa and 46 identifiable fragments. Although many of the species recovered could have been caught in the local rivers, the presence of flatfish and Spanish mackerel (*Scomber japonicus*) suggests trade with the Thames Estuary and the Southwest coast, respectively (Wheeler 1981). In addition, finds of Roman ceramics at this settlement suggest trade with the Roman world (Partridge 1981). Other culinary finds such as amphorae used to transport wine and Roman coins increase between the Late Iron Age (Creighton 2006; Cunliffe 1984; Mattingly 2006:56, 68-80) and immediately before the invasion. This indicates that a particular interest for fish was also "traded".

Fish are rarely found at minor-rural sites but occur slightly more frequently at rural-nucleated sites and hillforts, where they are, however, represented by only one or two specimens (Allen 2011: 315). While their presence at nucleated sites and hillforts may be a result of growing contact with the Roman Empire, (especially in the Late Iron Age), their absence from all other sites suggests a deliberate lack of marine or freshwater fish consumption. During this period, wild animals such as deer and birds are also low in numbers, but these become more numerous in the Late Iron Age (Allen 2011: 315). King (1991: 17) proposed the possibility of a taboo surrounding the consumption of wild animals, and the zooarchaeological evidence does seem to support this hypothesis. Fish, in particular salmon and trout, are revered in Celtic mythology; in Irish contexts they are perceived as wise creatures and are associated with sacred wells (Ross 1992: 436-437). It seems that perceptions of the natural world in the Iron Age were very different to those in the Roman period. Various scholars suggested that the prehistoric landscape represented a network of settlements and monuments that were linked to natural features, of which animals formed an important part (Barrett 1999; Tilley 1994; Jones 1998; Sykes 2010b). Hill's (1995) work on Iron Age deposits from Wessex showed that the deposition of animals is laden with meaning and that many of these deposits are not just "waste". Excavations at Haddenham V, Cambridgeshire (Serjeantson 2006), revealed an extensive assemblage of wild birds that included swans and mallards. Like Glastonbury Lake Village, Haddenham was built around a watery environment and was likely occupied seasonally. Fish deposits at Glastonbury and Skeleton Green represent exceptional deposits in an exceptional landscape - an area of Iron Age wilderness. The general lack of evidence for fish consumption is probably down to a complex belief system centred around watery environments.

### *2.1.2. Human Stable Isotopic Evidence from the Iron Age*

Fish remains are sparse at archaeological sites from the Iron Age. The stable isotopic evidence from human burials is equally sparse, as inhumation burials seem to be rare, and human remains tend to be deposited disarticulated in various contexts (Jay 2005: 60). Nevertheless, isotopic evidence was recovered from middle Iron Age sites covering a wide geographic range, including Wetwang and Garton Slack, East Yorkshire (Jay 2005; Jay and Richards 2006), Winnall Down and Micheldever Wood, Hampshire (Jay 2005; Jay and Richards 2007), Harlyn Bay and Trethellan Farm, Cornwall (Jay 2005; Jay and Richards 2007), and Glastonbury Lake Village (Jay 2008) and Yarnton, Oxfordshire (Lightfoot *et al.* 2009). A number of samples come from late Iron Age sites in Dorset, including Alington Avenue, Fordington Bottom, Tolpuddle Barn and Manor Farm (Redfern *et al.* 2010). Finally, 13 individuals from the multi-period cemetery at Poundbury Camp, Dorchester, and dating from the late Iron Age/early Roman period (1st century AD) (Richards *et al.* 1998), were analysed. It is important to differentiate these sites as there is archaeological evidence to support a level of trade and influence with the Roman Empire that may have had an impact on diet.

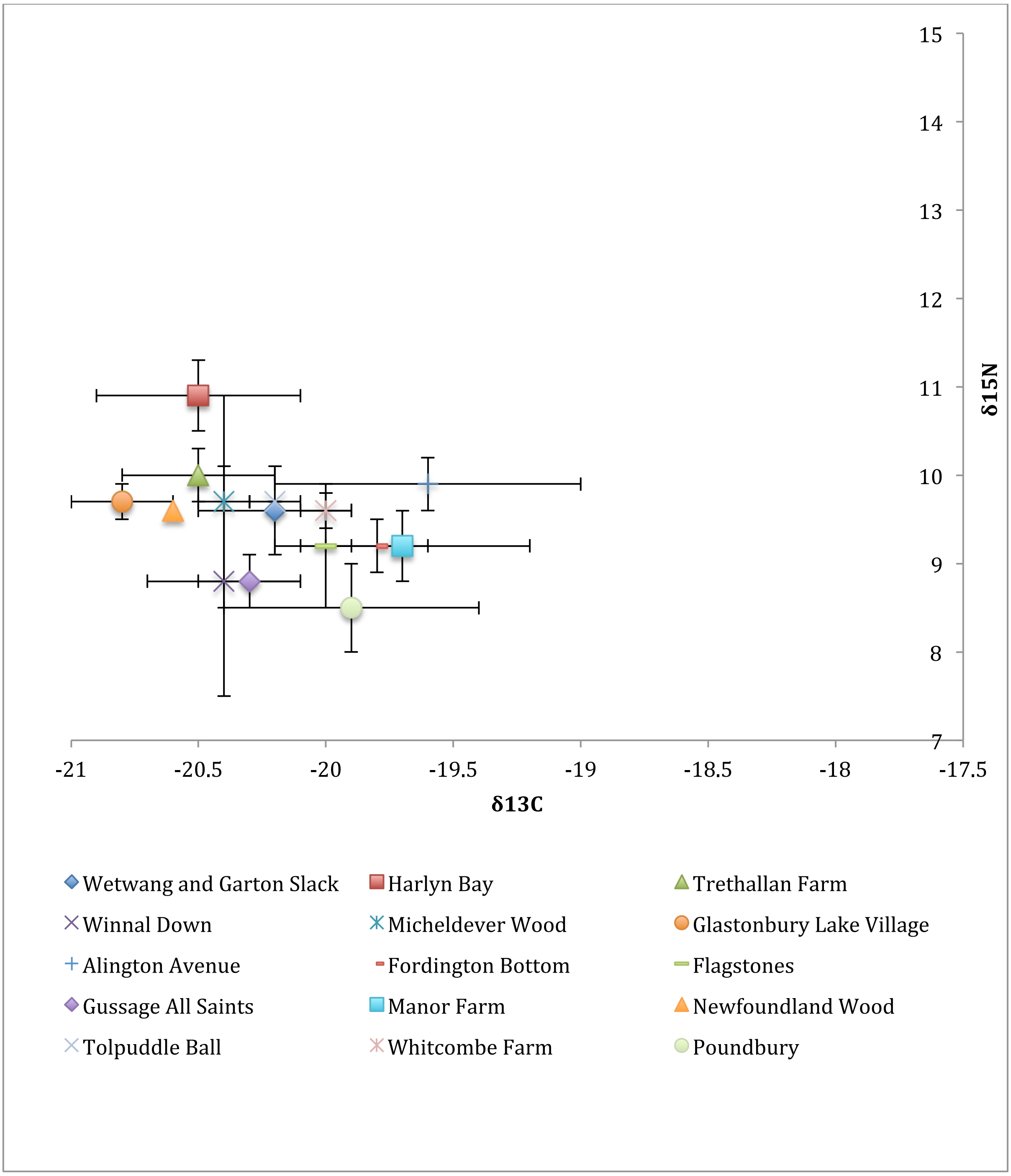



*Figure 2.2 Carbon and nitrogen isotope values from Iron Age sites in England. Wetwang and Garton Slack (Jay and Richards 2006), Harlyn Bay, Trethallan Farm, Winnal Down, Micheldever Wood (Jay and Richards 2007), Glastonbury Lake Village (Jay 2008), Alington Avenue, Fordington Bottom, Flagstones, Gussage All Saints, Manor Farm, Newfoundland Wood, Tolpuddle Ball, Whitcombe Farm (Redfern et al. 2010), Poundbury (Richards et al. 1998).*

The isotopic evidence suggests that in general, human diet during the Iron Age was largely based on terrestrial organisms (Fig. 2.2). Harlyn Bay is noticeable as its nitrogen average is slightly higher than at other sites. However, Jay and Richards (2007: 179) noted that this was due to only two individuals that showed elevated nitrogen values. No accompanying archaeological evidence was found to suggest any marine resource exploitation. In addition, if marine fish had been consumed in significant amounts, we would also expect carbon isotope values to be higher than those observed (Fig. 2.2). It is therefore likely that fish - whether marine or freshwater - were only very occasionally consumed. Inter-site comparisons from Devon by Redfern *et al.* (2010) show that some sites, such as Alington Avenue, exhibit slightly higher levels of δ13C and δ15N, suggesting a very low level of fish consumption.

For each settlement, one or more outlier values were observed. For Winnal Down and Micheldever Wood, such individuals were interpreted as migrants that may have originated from a site of higher environmental nitrogen "baseline" (Jay and Richards 2007: 182). At Yarnton, all isotopic nitrogen values from all periods were higher than average values from other sites. As nitrogen levels of herbivores follow a similar trend, it is possible that the local environment of that site exhibited higher nitrogen levels (Lightfoot *et al.* 2009: 315).

The first excavations at Glastonbury Lake Village recovered some fish bones among other wild wetland animals such as mallard (Jay 2008). However, as at other Iron Age sites, isotopic evidence does not indicate that these aquatic resources were consumed.

Across England, isotopic evidence for the middle to late Iron Age suggests that neither freshwater nor marine fish were consumed, at least not to an extent that would leave an isotopic trace. At all sites, variation in δ13C and δ15N was very low, indicating that individuals at each given site had very similar diets. Outliers at each site were interpreted as migrants.

### *2.1.3. Discussion*

Wetlands and estuaries were often perceived as marginal or liminal areas, and were therefore not always used or inhabited to the same extent as other habitats (van der Noort and O'Sullivan 2006). Throughout the Bronze and Iron Age, certain natural features, for example rivers and marshlands, held special ideological meanings to which people deposited what seems to be votive offerings in the form of metalwork, human and animal bones (Bradley 2000: 148; Field and Parker Pearson 2003). The few excavated sites that have been found in wetland areas exhibit special characteristics. The assemblages of Haddenham V and Glastonbury Lake Village, for example, revealed high numbers of wild birds. To reach either site would have required the crossing of water, which could have signified travelling from one realm to another (Allen 2011: 318-319, 323). Allen (2011) further suggested that ramparts at hillforts may have fulfilled a similar purpose. The presence of fish bones at hillforts may suggest that different activities took place at these and wetland sites compared to the remaining, "normal" landscape (2011: 317). As an animal that lives in that part of the landscape that has to be traversed, fish may have been considered as "other-worldly" and not to be touched. The consumption of fish is a taboo in several modern cultures, and it is very likely that this was also the case in the past. Simoons (1994) mentions that the Zuni, Hopi, Navajo and Apache avoid fish because they believe water to be sacred. Despite being surrounded by water, at the point of European contact, the Tasman Aborigines refused to eat fish despite eating other aquatic animals (Simoons 1994). From a zooarchaeological perspective, animal bone assemblages and isotopic studies from the Mesolithic and Neolithic in Britain suggest a very clear shift in dietary habits. While the Mesolithic period was characterised by a heavy reliance on aquatic sources such as fish and crustaceans, fish consumption was completely abandoned and replaced by terrestrial foodstuff in the Neolithic (Richards and Schulting 2006; Richards *et al.* 2003; Schulting and Richards 2002). The onset of the Neolithic may have been accompanied by a cultural change as well, during which watery environments were perceived differently (Thomas 2003). It seems possible that a similar shift occurred during the onset of the Roman period: increasing contact with the Roman Empire during the Late Iron Age may have triggered a change in perceptions of the landscape.

## 2.2 Roman England

### *2.2.1 Fish Remains*

The arrival of the Romans in Britain not only resulted in architectural and agricultural alteration of the landscape but also a change in the consumption and preparation of foods. New animals, such as domestic fowl and hare, were consumed, and fallow deer was introduced (see Allen 2011; Sykes 2010b; Sykes *et al.* 2011), as were new methods of food preparation as evidenced by a greater array of ceramic and metal cooking ware (Cool 2006; Alcock 2001).

Early analyses of zooarchaeological assemblages by King (1984) showed that different places demonstrated different approaches towards the consumption of animals in the Roman period. Military sites tend to contain a much higher number of cattle bones than non-Roman sites, where sheep and goat are more abundant. This pattern changes with time, which King (1984: 190) suggests was brought about by emulation of the new military and administrative elite. King showed that variations in diet were very common throughout Roman Britain and particularly in the military, which consisted of men from across the Empire who came with their own culinary traditions (1984: 201). Variations in the military diet further occurred due to the fact that the camps provisioned themselves from food available from the surrounding areas (Mattingly 2006: 221; Stallibrass and Thomas 2008).

While relative frequencies of wild mammal and bird bones do not change significantly from the Iron Age, some small differences are apparent. Red deer, roe deer and hare are best represented at urban and military sites, which Allen (2011: 324) interprets as indicative of regional and imperial control by the Romans. However, occurrence of these species is determined by the cultural and economic groups that existed in these nucleated settlements (Allen 2011: 324). Certain villa sites, such as Fishbourne Palace, show a significant number of wild animals, but are considered an exception from the rule (Sykes 2005; Allen 2011). While the zooarchaeological evidence for the hunting of wild animals is small, Cool (2006: 111-114) argues that hunting imagery is prolific in Roman Britain. Much of Roman ideology was focussed on bringing order to chaos, and hunting occupied the liminal space between civilisation and barbarism. Wild animals were captured and transported across the Empire and pitted against one another in arenas. These *venationes* epitomised human superiority over animal species that were newly discovered with the expanding territories (Gilhus 2006: 34). Similarly, the construction of villas with their surrounding land and gardens, often incorporating ponds and aviaries, demonstrated order and represented the "focal part of the ancient cosmos and the 'landscape of production'" (Marzano 2007: 233).

The zooarchaeologial evidence suggests a strong change in the perceptions of the wild following the Roman invasion (Allen 2011; Sykes 2010b). However, fish, often in the form of fish sauce, were an important part of the Roman diet (Curtis 1991). The question then is, "Is it possible for some of these new tastes to have had an effect on the levels of fish consumption?" Allen (2011: 331, Figure 2.3) showed that fish numbers were low at rural-minor sites, increased at rural-nucleated, urban, military and religious sites, and decreased again in the Late Roman period (Figures 2.3 and 2.4). Locker's (2007) survey of fish remains from Roman sites showed that fish bones were recovered from a great number of sites all across England, with a strong bias towards the South and most notably along the Thames Estuary and the Southern coasts of England. Locker (2007) further identified regional differences in the recovered fish assemblages. In general, eel were the most commonly found species, with salmon being common in some regions such as the North. Most fish remains came from urban centres and regions with a large number of villas and farms, such as the South and Southeast. Excavations in London also revealed several fish assemblages. Several new forms of cookware appear after the Roman invasion, one of which is thought to have been used for cooking fish due to its large diameter (Alcock 2001: 107, Figure 48).

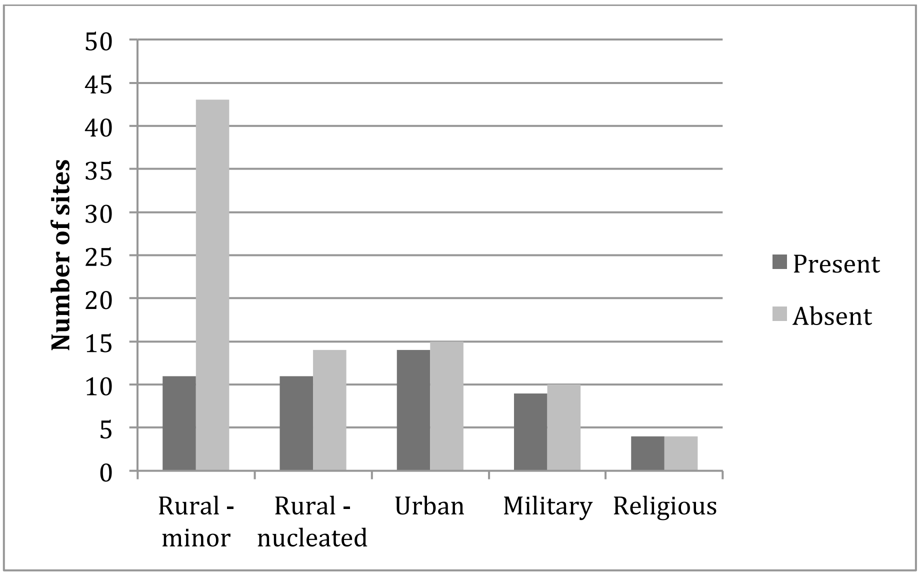



*Figure 2.3 Presence/absence of fish remains across different site types of the early Roman period.Data from Allen (2011).*

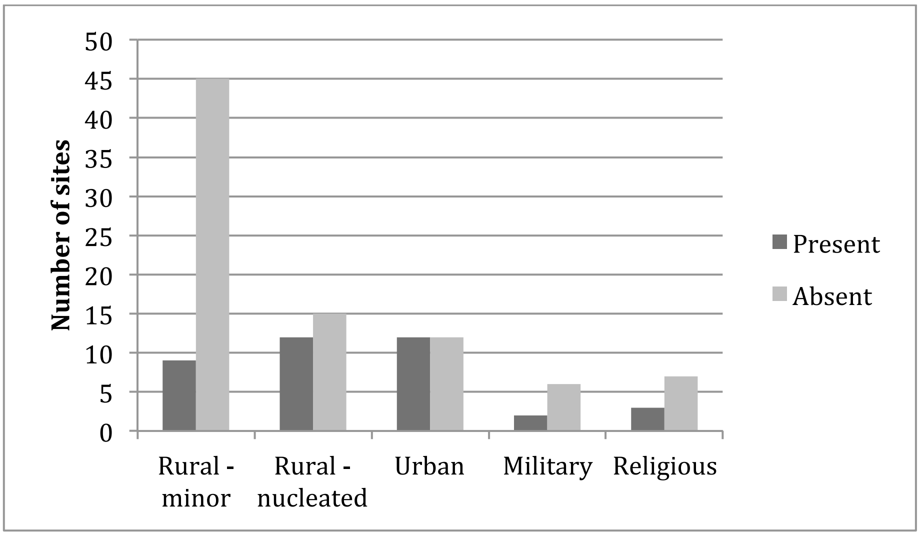



*Figure 2.4 Presence/absence of fish remains across different site types of the late Roman period. Data from Allen (2010).*

Recovered fish species are primarily freshwater, estuarine and inshore species, suggesting an exploitation of fish that were close to hand. Settlements that are close to the shore or rivers showed varying quantities of fish remains. For instance, excavations at Dorchester revealed several marine species (Locker 2007: 153), while excavations in Leicester and London held a combination of freshwater and marine species, which were probably preserved in some way (Nicholson 1999; Locker 2007: 150-153).

Evidence suggests that fish consumption was linked to social status. Very few fish bones have been found in rural areas, which indicates that transport links outside of urban centres or military settlements were expensive or difficult. Cool (2006: 106) notes that associated finds may help to identify fish as a luxury food item. For example, a small number of cod bones were found at Bishopsgate in London among other luxury foodstuffs. Sturgeon *(Acipenser sturio)* bones were found in another London deposit associated with numerous chicken bones, which are also thought to indicate elite consumption (Cool 2006: 106). Literary sources indicate that rare and unusual catches such as the visually and physically impressive cod and sturgeon, were suitable gifts in the Mediterranean world (Purcell 1995a: 143). It seems likely that the same was believed in other provinces. Other fish such as Spanish mackerel may also be a luxury food item. Although the Southwest coast of England is the northernmost area for Spanish mackerel, this species has not been found in this region and period (Locker 2007: 155). In fact, Spanish mackerel have only been found at a handful of sites, all of which are thought to be elite settlements. The rare finds of Spanish mackerel in England are often thought to be remains of *salsamenta* – a form of preserved fish -, and its scarcity may indicate its status. Locker (2007: 150), however, notes that Spanish mackerel was found at Great Holts Farm, along with imported plants and animals but lacking the trappings usually associated with a villa. The author concludes that that site may be an example of local emulation and evidence for Spanish mackerel becoming more readily available.

### *2.2.2 Human Stable Isotope Evidence*

Compared to the Iron Age, the isotopic evidence for the Roman period is plentiful. However, the majority of cemeteries date from the late Roman period, making it difficult to trace a gradual change in fish consumption in England.

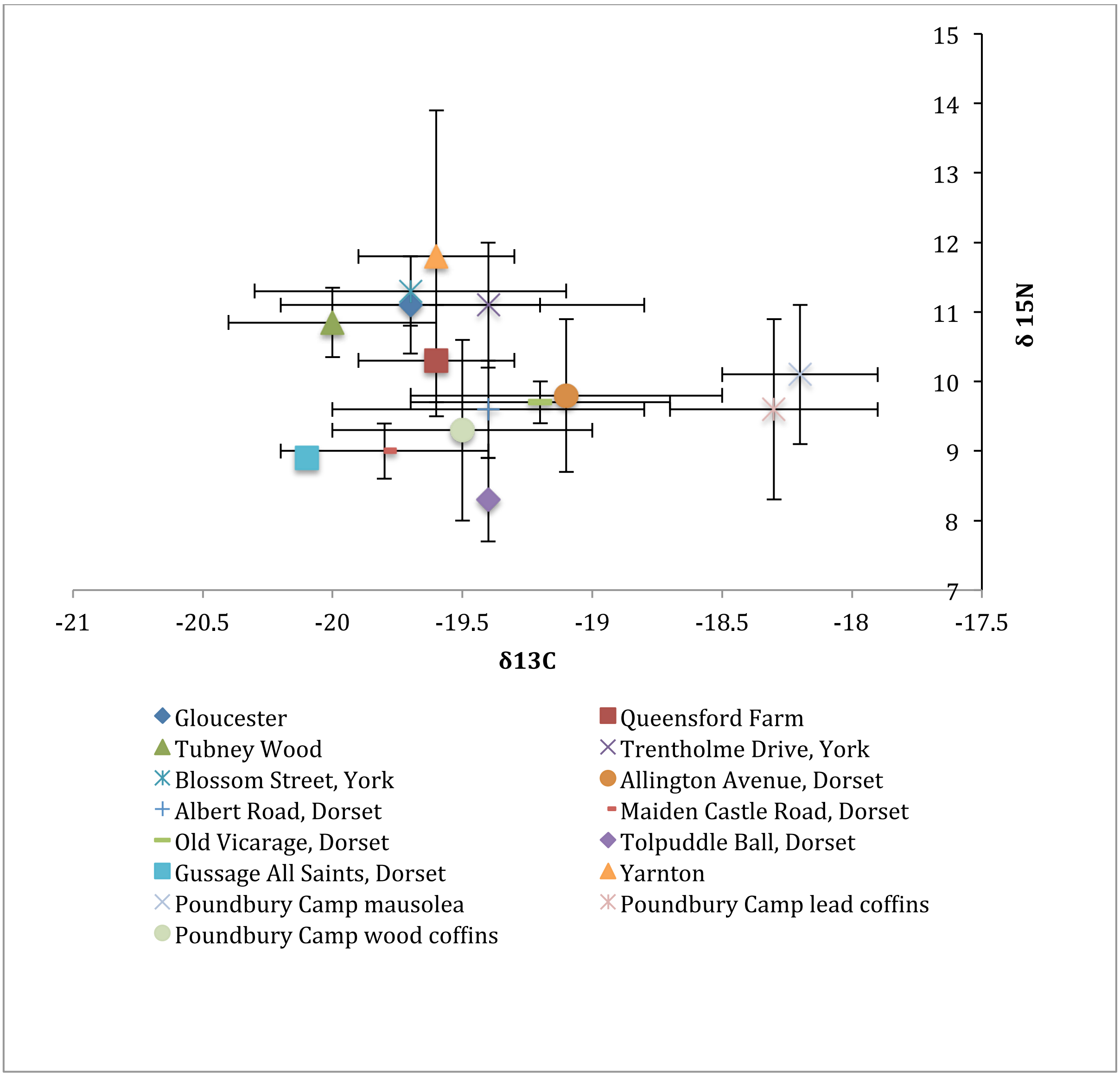



*Figure 2.5 Carbon and nitrogen isotopic values from Roman sites in England. Gloucester (Chenery et al. 2010), Queensford Farm (Fuller et al. 2006), Tubney Wood (Nehlich et al. 2010), Trentholme Drive and Blossom Street, York (Müldner and Richards 2007a), Allington Avenue, Albert Road, Maiden Castle Road, Old Vicarage, Tolpuddle Ball, Gussage All Saints (Redfern et al. 2011), Yarnton (Lightfoot et al. 2009), Poundbury Camp (Richards et al. 1998).*

Isotopic values from Roman England show a greater range than those from the Iron Age, and some evidence for fish consumption (Fig. 2.5). At the earliest site, i.e. the mass grave at Gloucester, δ13C and δ15N values average -19.7‰ and 11.1‰, respectively. Only 11 skeletons were analysed, rendering this a rather small sample and highlighting the slightly enriched nitrogen values (Chenery *et al.* 2010). Gloucester became a *vicus,* i.e. a settlement associated with soldiers and their families, and thus, origins of its population are likely to have changed throughout its time. The first phases of the cemetery are likely to be dominated by people from the southern regions of the empire, explaining the higher nitrogen levels. These coupled with higher oxygen levels from dentine reflect a population originating from lower latitudes.

As the cemeteries of Trentholme Drive and Blossom Street from York showed no statistically significant differences in isotopic values, Müldner and Richards (2007a) grouped them as one population in further analyses. These found average δ13C and δ15N values to be -19.5‰ and 11.3‰, respectively. The enriched nitrogen levels are thought to root in marine fish consumption. Although very few marine fish were found in York, inhabitants may have consumed *garum* or fish supplied from the Humber Estuary.

Elevated nitrogen values at Yarnton may suggest a small level of marine fish consumption, though a higher nitrogen environmental baseline as in the Iron Age is a more likely explanation for this pattern (see Section 2.1.2).

Sites in Dorset studied by Redfern *et al.* (2010) show some variation in average δ15N values but not δ13C values (Fig. 2.5). This suggests that some individuals, e.g. from Alington Avenue, may have consumed a small amount of fish. While δ15N values do not support a great degree of consumption of marine fish, consumption of freshwater fish may have created the slight elevation in nitrogen.

The burials at the cemetery at Queensford Farm, Oxfordshire, dating from the 4th to 6th centuries, were studied by Fuller *et al.* (2006). Average δ13C was -19.6‰, and there was a difference in average δ15N of males (10.6‰) and females (9.9‰). Nehlich *et al.* (2011) analysed stable sulphur isotopes of skeletons from this cemetery and the cemetery at Tubney Wood Quarry. Sulphur isotopes have the potential to indicate levels of freshwater fish consumption (Privat *et al.* 2007) as sources of protein. The cemetery at Tubney Wood Quarry is made up of two phases: the first from the 2nd century AD and the second from the 4th to 6th centuries. Combined average δ13C and δ15N are -19.7‰ and 10.4‰, respectively. Although sulphur isotope values show some degree of variation across skeletons, high nitrogen values and low sulphur values are generally interpreted as freshwater fish consumption. Levels of freshwater fish consumption also appear to vary across individuals, indicating a variety of diets. Further investigations revealed that a special weaning diet of infants identified at Queensford Farm may in fact have consisted of freshwater fish (Nehlich *et al.* 2011: 4973).

The δ13C and δ15N values of individuals from the cemetery at Poundbury dating from the late Iron Age/early Roman period averaged -19.9‰ and 8.5‰, respectively. Several skeletons from the late Roman mausolea and other specimens showed considerably different values. Values of mausolea individuals were higher, i.e. -18.2‰ δ13C and 10.1‰ δ15N. Within the main cemetery, isotopic values varied. Values of individuals buried in lead coffins were very similar to those found in the mausolea (i.e. -18.3‰ δ13C and 9.6‰ δ15N). Skeletons from wooden coffins showed greater variation, with an average δ13C of 19.5‰ and an average δ15N of 9.3‰. Two of the wooden coffin-specimens showed δ13C values similar to those from the mausolea and lead burials, and some individuals consumed no animal protein while others consumed exceptionally large amounts. The similarity of the isotopic values between the mausolea burials and lead coffins suggest that both groups may represent the elite, who wished to separate themselves from the rest of the population. These individuals also consumed some levels of marine protein on a regular basis (Richards *et al*. 1998: 1250). The level of variation in isotopic values from the wooden coffins reflects a diet that was much more diverse than during the Iron Age and a level of diversity that would be expected in burials associated with an urban centre (Richards *et al*. 1998: 1250).

The overall isotopic data for the Roman period in England shows an enrichment of δ13C and δ15N values compared to the Iron Age, which indicates a diet largely based on terrestrial protein but supplemented by marine protein (Müldner 2013). The isotopic evidence is supported by the presence of fish remains, which are often marine. At some sites and areas, fish was more often consumed than at others, and people may have also consumed wetland birds and marine shellfish, especially oysters. While shellfish was not considered in this thesis, the consumption of shellfish was very popular in Roman Britain (Cool 2006). Freshwater fish may also have been consumed, but this is difficult to establish using methods other than zooarchaeology. The study of stable sulphur isotopes may help in this respect and has been applied successfully for two cemeteries in Oxfordshire. However, considerably more research has to be done especially with regard to establishing environmental base levels, which in the case of sulphur may be problematic as it can be easily affected by pollution (Privat *et al.* 2007).

### 2.3 Fish ponds

During the last century BC and the first century AD, the art of keeping fish in ponds was very popular in Italy and an intrinsic part of the maritime villa (Higginbotham 1997; Kajava 1998; Marzano 2007). Classical authors such as Columella (*De Re Rustica.* 3. 16. 1) provide instructions on how to build fishponds and explain which fish are best suited to be kept there (*De Re Rus.* 8.17.7-9). Varro explains that salt-water ponds are the reserve of the elite (*De Re Rus*. 3. 17. 2-3). However, only a very small proportion of these writings are concerned with ponds. As Marzano points out, the title of the works were land-focussed (2007: 19), which suggests that fishponds were not considered a worthy economic endeavour. Despite this reticence, aviaries and fishponds were common features of villas across the Empire, as both could be signs of status and economics: while fish could be consumed by the villa owner, thus making him self-sufficient, any surplus could be sold. This formed part of the ethos of high-status living (Purcell 1995b: 158; Marzano 2007). Some examples of fish being perceived as pets, called by their names and fed by hand, also exist. In some cases, fish were even given jewels, such as the female *murena* in Aelian's story that wore earrings and a necklace (Kajava 1998).

In Britain, only a small number of ponds dating from the Roman period have been found: Lynch Farm, Cambridgeshire, Shakenoak, Oxfordshire, and Fishbourne Palace, West Sussex. The complex at Shakenoak was made up of three ponds, one of which included a feeder stream, probably suggesting the breeding of coarse fish (Zeepat 1988; Alcock 2001: 53-54).

The ponds at Fishbourne were part of an extensive complex that included underground pipes and a deep-water channel, which was probably used to transport water from the estuary (Figure 2.6) (Cunliffe *et al.* 1996). Many of the fish species found in the assemblage from Fishbourne, e.g. bass, mullet and wrasse, would have been suited to pond life (Higgenbotham 1997: 46-48). These species would also have been familiar to people from the Mediterranean. The complex at Fishbourne also included an extensive garden at the centre of the palace and an aviary (Fig. 2.6). The aviary and fishponds functioned as both a part of the villa but also part of the wider landscape. The ponds probably attracted wetland birds, in particular ducks, thus encouraging wildlife.

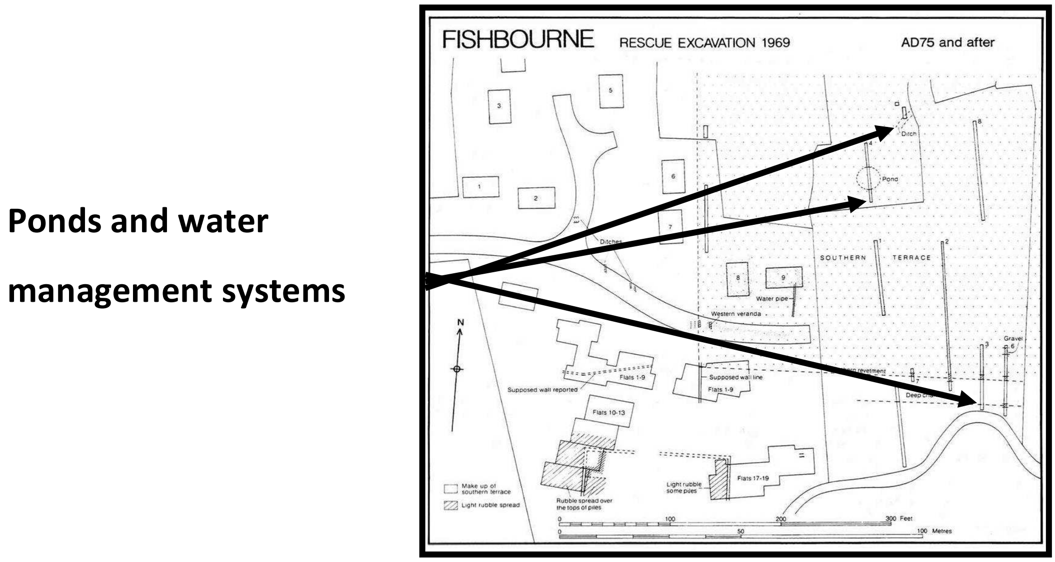



*Figure 2.6 Plans of the trial trench excavations in the Southern garden at Fishbourne, indicating the pond and sub-surface piping. From Allen 2011, figure 225.*

Villas were constructed in coastal areas so as to take full advantage of the potential and improve on the productive surroundings (Purcell 1996: 197). Villas were meant to broaden the landscape by including the seashore and the sea itself (Higginbotham 1997: 31-32), but also had aesthetic purposes as ponds were meant to be expressions of luxury and enjoyed. Placement of the ponds at Fishbourne exemplifies this perfectly. The watery landscape of the estuary is very prominent but also adds another dimension: the religious association of wetlands prevalent in the Iron Age seems to have continued in the early Romano-British period (Allen 2011: 374). For many years, academics noticed that there was a decline in the popularity of fish ponds in Italy after the first century AD. This was likely a result of political and social restructuring, and increasing popularity of smaller freshwater ponds, and probably resulted in a loss of the exclusivity of the larger saltwater ponds of large villas (Higginbotham 1997:20-21, 61-63). However, Marzano pointed out that many of the existing ponds show continued use and repair. While the political system and elite modes of display were changing, existing ponds were not abandoned and no new ponds were constructed (2007: 59-60). The scarcity of fishponds in Britain may simply be due to the developments taking place in Italy.

Evidence suggests that angling was considered a recreational sport for the elite but considered inappropriate by others (Donald-Hughes 2009: 55). Fishhooks were found at Fishbourne Palace (Allen 2011: 331), and it is likely that the elite was fishing here. Fishhooks were also found in London;, at Richborough fort, Kent;, the villa of Keynsham, Somerset;, the settlement at Stockton, Wiltshire, and the forts of Wroxeter and Corbridge (Alcock 2001:51). The fishhooks found in London may have been used by local inhabitants to catch fish in the Thames, as is evidenced by the various finds of fish bones. However, it is not known if fish remains were recovered from the other sites where fishhooks were found. It is possible that military officers practiced recreational fishing (Alcock 2001: 51), which may explain the finds of fishhooks. While some regarded fishing as a sport, others such as Oppian considered it inferior to hunting (Alcock 2001:51), i.e. "a gathering of food by men sustained by a precarious existence" (Alcock 2001:50). However fishing from one's private supply of fish from a pond may have been more acceptable, as it did not involve any of the perils associated with the sea. The fishhooks from Fishbourne may have been associated with such an activity.

Villas represent another example of fish being associated with high-status settlements. Several villas such as those at Great Witcombe Villa, Gloucestershire; Rudston, Yorkshire; Lufton, Somerset (Figure 2.8); Sparsholt, Hampshire (Figure 2.9), and Southwell, Nottinghamshire, exhibit fish-depicting mosaics particularly in bathrooms (Davey and Ling 1982). However, as Alcock (2001:52) notes, these fish seem to be generic. While up to the 3rd century AD, fish are naturalistically shown on mosaics, they become standardised after this date (Toynbee 1973: 212). Other pictorial representations of fish in Britain include a number of 2nd century AD spoons with fish design, several silver ladles from the Mildenhall hoard depicting a fish on the handle (Figure 2.7), a bronze strip from Lydney depicting two fishermen standing in a river hauling a line, and a relief from Chester showing a winged *amorino* holding a fish by its tail (Alcock 2001:51).

*Figure 2.7 Silver ladle from the Mildenhall Hoard, Suffolk.(www.britishmuseum.org).*

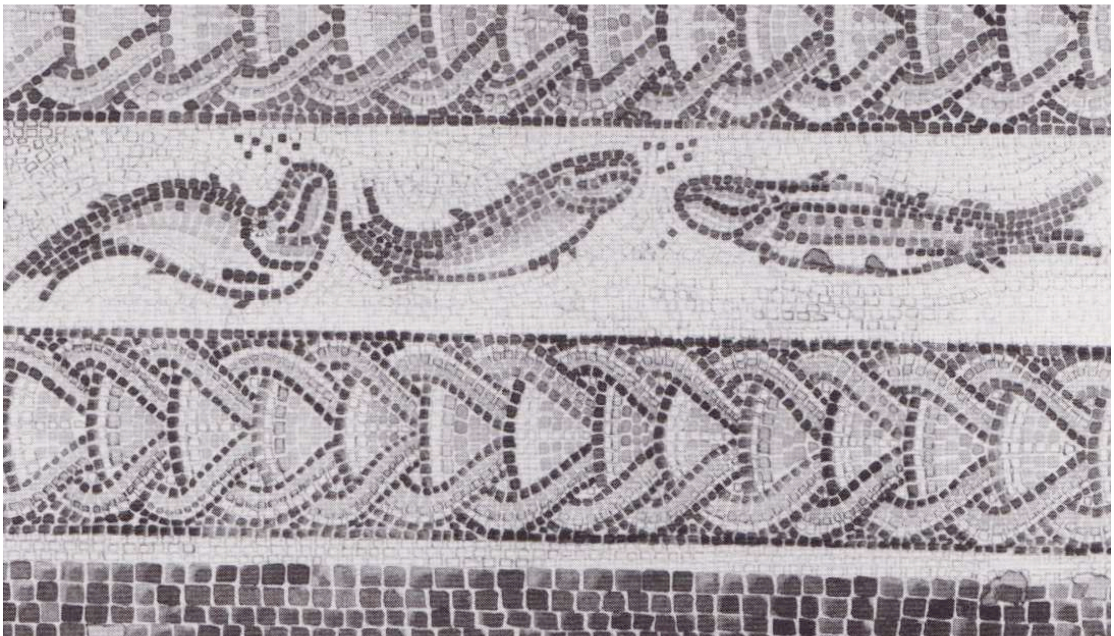


*Figure 2.8 Fragment of a mosaic border from Lufton Villa, Somerset, 4th century (Alcock 2001: Figure 22).*

*Figure 2.9 Restored wall painting fragment depicting a fish from Sparsholt Villa baths, Hampshire, 3rd or 4th century, (Davey and Ling 1982: Plate LXXV).*

**2.4 Fish sauce**

Fish sauce was a very important product that was consumed throughout the Empire and used instead of salt in many Classical recipes (Alcock 2001: 79). It was also thought to hold various important medical properties and to cure countless ailments (Curtis 1991: 29). The Romans produced four different types of fish sauce: *garum*, *liquamen*, *allec*, and *muria.* According to Curtis (1991: 7), *garum* was a clear fish sauce that was drained off a mixture of salt and fish. The residue of this was called *allec* and most likely contained many fish bones. The terms *liquamen* and *muria* seem to have been used interchangeably and their precise definitions are unknown. However, it is most likely they represented a different type of fish sauce that was produced and consumed earlier on. *Salsamenta* was the term for preserving fish with salt. When pressed, *salsamenta* could be made into *garum*, inextricably linking the two products (Curtis 1991: 6). The production of *garum* required a precise ratio of salt to fish, but other ingredients such as wine and spices could also be added. This mixture was then be left to ferment in the sun or heated up (Curtis 1991: 12). It seems that *garum* could be made with any type of fish, using either the whole fish or just its viscera. According to Pliny, mackerel *(Scombrus scombrus)* worked best in this respect, though tunny *(Scombridae)* and anchovies (*Engraulis encrasicolus)* could also be used (Alcock 2001: 79).

Fish sauce production is known from various parts of the Empire stretching from the Red Sea (van Neer and Parker 2008) to the coasts of Portugal (Gabriel *pers. comm.*). Due to the requirement of salt in its production, fish sauce was probably very closely related to salteries (Curtis 1991). Souter (2007) points out that many sites in Lusitania that specialised in the production of fish sauce were also closely associated with pottery kilns, which provided the amphora for transportation. Spain and the province of Lusitania represented one of the most important regions for fish sauce production, trade and transport, and various studies noted that Spanish and Lusitanian amphorae, and in particular, the Dressel Forms 7-14, were frequently used (Curtis 1991; Souter 2007). Much of the Atlantic and Mediterranean coasts of France appear dotted with salteries. In addition, some excavations, such as those at the Gallo-Roman villa at Villepey-le-Reydissard and Antipolis, have revealed vats along with fishhooks and heating vessels, which suggest the former presence of a salting and fishing industry that was accompanied by fish sauce production (Curtis 1991: 72-77).

Trade in fish sauce was extensive. This can be seen through the presence of amphora that were used for its transportation, as well as numerous food lists from forts such as those found at Vindolanda (Alcock 2001: 81). While particular amphora were used to transport particular foodstuffs, on numerous occasions, amphora were reused to transport a different product and are therefore not the most reliable indicators for the presence of fish sauce. Some amphora bore labels indicating their contents. This includes an amphora from London, which bears the inscription "Lucius Tettius Africanus" ("finest fish sauce from Antinopolis") and was found with bones of mackerel inside (Cool 2006: 105). Although these bones most likely represent the remains of *allec*, *salsamenta* (salted fish) also contained bones. One must therefore exercise caution in interpreting fish bones in an amphora as evidence for fish sauce. Fish sauce amphorae sherds have been found on a number of British sites. During the 1st and 2nd centuries, there is a preponderance of military and urban sites (Cool 2006: 61), which diminish dramatically in the 3rd and 4th centuries. There are two possible routes by which fish sauce could have been brought into Britain: from the Mediterranean and through the rivers of Gaul such as the Rhone or the Garonne, Loire, Saone and Seine, or up the Atlantic coast of the Iberian Peninsula and France (Curtis 2006: 81; Alcock 2001: 80). After the 2nd century, fish sauce amphora become rarer, but production centres in Spain and Gaul seem to flourish and trade in fish sauce to other northerly provinces continues (Curtis 2006: 83). This change may thus perhaps be due to a local development in Britain or reflect significant changes in the Roman economy. Mattingly explains that the workings of the Roman economy in relation to the British province are highly complex and not always clear. Though a large proportion of exports will have been goods and foodstuffs for the army, many other goods were also transported alongside these, which reduced the subsidy on transport costs (2006: 513). Levels of imports to England substantially decrease by the 3rd century (Mattingly 2006: 500), with imports of olive oil ceasing completely. Transport of wine from the Rhine in barrels continues (Mattingly 2006: 514), and barrels may also have been used to transport fish sauce. The reduction in the levels of imports seems to be part of a wider trend that saw diminishing Roman presence in the province, reduction of garrison size and lack of rebuilding in urban centres (Mattingly 2006).

Regional fish sauce variations have been identified across the Empire and in the 3rd and 4th centuries, Britain may have begun to supply itself with locally made fish sauce. To date only three sites have revealed evidence for sauce production in Britain. A deposit of herring bones from Peninsular House, London, with associated amphorae and timber vats could be evidence of local fish sauce production (Alcock 2001: 81; Locker 2007: 151). A large salt-working site in Essex has revealed large deposits of small fish bones that also seems to be linked with local fish sauce production (Nicholson *pers. comm.*). These three examples of fish sauce production all date from the Late Roman period. Curtis suggests that part of the reason why there is so little evidence of fish sauce production in Britain is because less durable timber structures such as those found at Peninsular House were more commonly used (1991: 80). However, evidence from the preceding periods suggest that the distribution of fish sauce amphorae in Britain was limited to urban and military sites. Hardly any amphorae are found at rural sites. However, as stated above, the reduction in the quantities of fish sauce amphora fragments may be due to changes in import levels or the switch to barrels. It is therefore possible that the taste for fish sauce never became widespread, but was only accepted by a few, predominantly from the urban areas such as London. The locally produced fish sauce may also have been transported in a variety of vessels, making it impossible to identify its trade within Britain.

### 2.5 Roman perceptions of fish

In the title of his chapter on Greek and Roman fish consumption, Purcell (1995a) perfectly sums up the situation: "Eating fish: the paradoxes of seafood". While the evidence presented above does not provide a clear picture of fish consumption in Roman Britain, it seems that the attitudes towards fish consumption in ancient Italy were just as confusing. The importance of fish sauce in the diet is obvious and as a consequence, so is the presence of production centres that caught fish out at sea and processed it on land. However, men working in these salteries and fish sauce production centres were not highly regarded (Curtis 1991: 152-158). Fishponds for the wealthy have also received the attention of academics and are interpreted as ostentatious displays of wealth and means of making money (Higginbotham 1997; Marzano 2007; Marzano and Brizzi 2009). A greater understanding of Roman attitudes to fish and the exploitation of the sea will be gleaned from Annalisa Marzano's forthcoming *Harvesting the sea: the exploitation of marine resources in the Roman Mediterranean*. However, for the moment, only the limited evidence is available.

Fish remains are not discussed in MacKinnon's (2004) survey of zooarchaeological remains from the Italian peninsula from the Republic to the late antique period, but small bits of relevant information can be gleaned from his study. He noted that very few reports give details on the methods of recovery: from a total of 117 sites, at 66% no sieving was performed; at 25% some form of sieving, and at only 5% wet sieving took place. No details are provided on the mesh sizes used. In those cases where sieving did take place, this seems to have been done only on selected samples, which is insufficient to provide an accurate picture of the assemblage (MacKinnon 2004: 43-46). With regard to the actual sample size and composition, fish were very rarely recorded. For the majority of sites, no fish were recorded, and with the exception of a handful of sites, the numbers of fish are extremely low (MacKinnon 2004: 54-56). While numbers of bird bones tend to be higher than those of fish, numbers of reptile and amphibian finds are generally smaller. These results may be a result of the lack of sieving that would have ensured the recovery of small fish along with reptiles and amphibians. In addition or alternatively, the excavators may have been more familiar with the appearance of bird bones than that of fish. Unfortunately, no details were provided on the species of fish that were recovered. MacKinnon (2004) concluded that wild mammals such as red deer, wild boar and hare were most common at central Italian sites and were clear indicators of elite consumption.

Fishponds are largely found on elite settlements, and evidence suggests that fish from these ponds were occasionally consumed (Higgenbotham 1997; Marzano 2007). However, fish do not seem to have formed a crucial part of the population's diet. Considering the association of fish with ponds and their ostentatious display, with fish sometimes even being treated as pets, the consumption of fish symbolised the wealth and gluttony of the rich (Kajava 1998: 267).

Diocletian's Price Edict notes that marine fish could fetch double the price of freshwater fish, rendering it affordable only to the wealthy (Alcock 2001: 49). The high price of marine fish was possibly a result of the dangers associated with marine fishing. In both Greek and Roman literature, the sea was seen as mysterious, unforgiving and dangerous, as fish could also catch and eat fishermen (Purcell 1995a: 133-134). Fishermen were portrayed as poor and were not even considered part of society, as their livelihoods were not based on what was considered acceptable; soil was where wealth came from (Purcell 1995a: 135). These conflicting ideas of an "inferior" marine environment *versus* desirability of marine fish can perhaps help understand the thinking behind the establishment of popular fishponds that are associated with coastal villas. Building fishponds would have been a way of "controlling" a wet environment that is otherwise uncontrollable and dangerously wild. Although the dangers associated with catching marine fish were appealing in a way that is similar to hunting wild land mammals, holding and rearing fish in a pond showed intelligence and skill, and was consequently desirable (Purcell 1995a: 140). Purcell (1995a: 140) also explains how the feeding of fish was a further way of separating the wealthy from the poor. Pond fish would be fed on smaller fry, which the poorer local population sought for themselves. When small live fry was no longer available, the villa owner bought preserved fish to feed his fish (that would eventually get eaten), while the poor would starve.

Fish, like the seasons can be unpredictable, which according to Purcell (1995a: 139) is why fish consumption was paradoxical; a metaphor for life in the Mediterranean. The consumption of whole fish was reserved for the elite, who could afford to buy or keep fish in their own pond. Fish sauce, which did not resemble fish, was perhaps more acceptable and also more widely available. The consumption of shellfish, on the other hand, was a very different matter. Shellfish are regularly depicted on mosaics alongside debris of other foods. Oysters, especially from England, were highly regarded and known even in Rome (Cool 2006: 108). Perhaps because shellfish could be collected from the shore and – at least in the case of oysters - farmed and harvested at certain times of year, they were more acceptable to eat.

Literary sources are another form of evidence that can help understand Roman attitudes to fishkeeping and consumption. Galen (*De Alimentorum Facultatibus*, Powell and Wilkins 2003) discusses the properties of different fish for one's health. Most of the species mentioned can only be found in the Mediterranean, though several species are also found in the waters surrounding England. Galen's preference for marine fish is clearly evident. Although the author described a great number of fish, their translation to current names is very difficult due to extreme differences in the classification method of fish at the time and today. For instance, tunnies used to have many different names, most likely due to their size and popularity. Our inability to match ancient to current names of fish also hampers our understanding of which fish were best suited to pond life. Numerous writers such as Pliny the Elder, Ovid, Plutarch and Oppian wrote specifically about fish.

Higginbotham (1997: 41-54) tried to identify the species mentioned by these Classical authors and match them with modern equivalents. Several fish species found in British waters would have been very familiar to Romans. *Murenae*, which seems to have included the common eel alongside the conger eel *(Conger conger)* and the moray eel *(Muraenidae)*, are the species most commonly mentioned when discussing fishponds. Eel are very common in Britain and would have been extremely easy to catch, as they travelled down rivers to the sea. The popularity of eels among the Romans helps to explain its widespread presence across Roman period sites in Britain. Sea bass (*Dicentrachus labrax*), another species that would have been familiar, to the Romans in Britain was called *lupus* by the Romans, a term that also included species from the *Labridae* family such as the wrasse. The name *Auratae* corresponds to the modern gilthead (*Sparus aurata*) and is likely to have included other bream species that can be found throughout the Mediterranean and in some cases, along the south-western coasts of England. *Rhombi* denoted flatfish such as the turbot (*Scophthalmus maxima*) and some species of sole (*Solea*), which are very common in the Mediterranean and British waters. *Scari* or parrot fish seem to have been very popular and are common in the Mediterranean but absent from the Channel and North Sea. Other species of fish such as sturgeon, called *acipenser* and *helops*, hake *(asellus*), mackerel and tunny, are mentioned but not in relation to fishponds. Mackerel and tunny are most commonly referred to when discussing fish sauces, and sturgeons and hake are likely to have been fascinating because of their size and appearance (including their array of big teeth).

Curious looking fish were prized and considered appropriate gifts (Purcell 1995a: 143). Finds of sturgeon and cod, another fish that can reach an impressive size, have been associated with elites in Roman Britain, who possibly used them as gifts (Cool 2006: 106). Interestingly, the Romans understood that whales and dolphins are true mammals (Toynbee 1973: 205).

Symbolically, fish alongside whales and dolphins have funerary associations and represent immortality (Toynbee 1973: 212). This symbolism is likely taken from Celtic beliefs where fish were sacred (Ross 1992: 436-437). With the arrival of Christianity, however, the symbolic meaning of fish took on a new meaning. Fish are often mentioned when miracles happen, such as the feeding of thousands from what appeared to be only a very small number of fish. Jensen (2000: 50-51) notes that fish are so prevalent in "Christological, eschatological, eucharistic and baptismal symbolism" that it is almost impossible to separate these symbolisms. Gilhus (2006: 181) raised the very important point that Christian animal symbols were used as "symbolic capital" of teachers and preachers. The metaphorical fish and fishermen were thus much more valuable than real-life fish. As such, the importance placed on fish in Christian belief is unlikely to have had an impact on fish consumption levels.

It seems that several of the fish species found in British waters would also have been familiar to the Romans, both in terms of consumption and for fish keeping. It is also possible that the Romans in Britain encountered several new species, which may have caused confusion. Several of the familiar species were found in varying abundances across different sites including Dorchester and Fishbourne Palace. The appearence of other fish species on sites such as herring, which were common in the North Sea but absent from the Mediterranean, may to a degree be explained by a developing taste for fish. The same may perhaps be said for the limited evidence for fish sauce production in Britain . The lack of fishponds in Britain may be explained by the decreasing popularity of fishponds in Italy after the $1^{st}$ century and their overall lack of popularity among the general population; hunting of wild mammals was more appealing and steadily became more popular.

### 2.6 Summary

There is very little evidence for the consumption of fish during the Iron Age in Britain. Relevant excavations rarely involved extensive sieving, but at those few sites where sieving did take place, the number of recovered fish bones was not always elevated. Ample evidence suggests that during the Iron Age, the deposition of animals was highly structured. Deposited fish bones may still require further investigation. Where present, it seems that fish bones had not necessarily been consumed but were associated with sites of ritual importance. Interestingly, evidence from the opposite side of the Channel, i.e. the Netherlands, suggests that fish were part of the Iron Age diet (Dobney and Ervynck 2007: 407).

The situation in Roman Britain was different to that of the Iron Age. Fish bones appear at several settlements. The taste for fish appears to have slowly developed, which was probably largely driven by the Romans, considering that finds of fish bones become scarcer with increasing distance from centres of Roman influence. A similar trend can be observed with regard to the taste for fish sauce. At the start of this period, relevant finds are most commonly associated with amphora sherds found at military settlements and urban centres. The decrease in recovered amphora sherds dating from after the 2nd century is still poorly understood, but may be due to the development of a local fish sauce industry. Alternatively, fish sauce possibly never got popular with the local population, and thus the need for imported fish sauce may have disappeared with changes in the military and administrative structures. The low number of excavated fishponds in England may be associated with a decreasing popularity of fishponds in Italy. Though the relevant evidence is yet fairly inconclusive, it is very possible that a large proportion of the fish were initially consumed by the elites, which later on were emulated by others.

The lack of evidence for fish consumption during the Iron Age along with the lack of exploitation of other wild animals suggests that fishing and hunting was deliberately avoided. Fish are found at far more Roman period than Iron Age sites, though the respective evidence is hampered by recovery and identification issues. Although fish seem to be consumed at more sites, this tends to be caused by a strong Roman influence and does not seem to spread to the majority of the population. Evidence suggests that much of the taste for fish remained within the upper echelons of society, though this requires further investigation. If that was the case, the withdrawal of the Roman Empire and departure of the elites may have resulted either in a return to pre-Roman attitudes to fish or in new elite habits. These hypotheses will be discussed in the next chapter.

# Chapter 3: The Evidence for Fishing and Fish Consumption in Anglo-Saxon England

### 3.1 Introduction

Having discussed the evidence for fish consumption during the Iron Age and Romano-British periods (Chapter 2), this chapter investigates the zooarchaeological evidence of fish from the Anglo-Saxon period. Despite the limitations of fish remains in zooarchaeological reconstructions, it is hoped that by considering the complete zooarchaeological data from all Anglo-Saxon periods, a more comprehensive understanding of fishing and fish consumption during this period can be achieved.

The early, mid and late Anglo-Saxon periods are each discussed individually, with a focus on the number of sites with fish remains, method of recovery and range of recovered species. Analysis is largely descriptive, as this allows more straightforward consideration of taphonomic and recovery biases than quantitative analyses which can result in biased or skewed results In addition to descriptive analyses, patterns in remains from and across all periods will be assessed by relative percentages and presence/diversity indices in order to understand the underlying causes and dynamics of fish remains.

As explained in 1.3.2, the presence/diversity index is used as a proxy for the diversity of caught fish species and excavated site types during different periods of Anglo-Saxon England. A number of species were selected based on their frequency of occurrence at archaeological sites. The presence/diversity index also includes sites that were not sieved, which ensures that fish remains recovered at non-sieved sites are also represented. Outliers values for the presence/diversity index are discussed in detail.

### 3.2 Early Anglo-Saxon Period

Figure 3.1 illustrates all early Anglo-Saxon sites with faunal assemblages known to the author (see Table 3.1 for references). Sites with recovered fish remains are not limited to the coast, but include locations as far inland as Bonners Lane, Leicester; Higham Ferrers and Kings Meadow Lane, Northampton; and several sites in Oxfordshire and Cambridgeshire.


*Figure 3.1 Map of England showing all early Anglo-Saxon sites with faunal remains. Red numbers indicate sites with recovered fish remains. For detailed information on the names of sites and literature references see Table 3.1.*

| No | Early Anglo-Saxon Sites | Reference | No | Early Anglo-Saxon Sites | Reference |
|---|---|---|---|---|---|
| | **Bedfordshire** | | 20 | Kilverstone Norfolk | Higbee 2006 |
| 1 | Puddlehill, Dunstable | Mathews and Chadwick Hawkes 1985 | 21 | Melford Meadows, Brettenham Norfolk | Powell and Clarke 2002 |
| | **Buckinghamshire** | | 22 | Spong Hill Norfolk | Bond 1995 |
| 2 | Pitstone | Hambleton 2005 | 23 | Brandon Road, Thetford | Baxter n.d. |
| 3 | Walton, Aylesbury | Bramwell 1976; Noddle 1976 | 23 | Redcastle Furze, Therford | Nicholson 1995; Wilson 1995 |
| | **Cambridgeshire** | | 24 | Gosberton 16 | Baker 2002, 2005 |
| 4 | Godmanchester | Baxter 2003 | | **Northamptonshire** | |
| 5 | High Street, Fowlmere | Baxter n.d. | 25 | Higham Ferrers | Evans 2007; Ingrem 2007 |
| 6 | Station Road, Gamlingay | Roberts 2005 | 25 | Kings Meadow Lane, Higham Ferrers | Evans 2007; Ingrem 2007 |
| 7 | Stonea Grange | Stallibrass 1996 | | **Oxfordshire** | |
| 8 | Orton Hall Farm | King 1996; Harman 1996 | 26 | Audlett Drive/Barton Court Farm | Levitan 1992; Wilson 1986 |
| 9 | Hillside Meadow, Fordham | Baxter n.d. | 27 | Dorchester-on-Thames | Grant 1981 |
| | **Devon** | | 28 | Chapel Street, Bicester | Smith 2002 |
| 10 | Bantham | Coy 1981 | 29 | Eynsham 2a | Mulville 2003 |
| | **Hampshire** | | 30 | Mill Street, Wantage | Maltby 1996 |
| 11 | Old Down Farm, Andover | Bourdillon 1980 | 31 | Littlemore, Oxford | Ingrem 2001 |
| 12 | Porchester Castle | Grant 1975; Easton *pers. comm.* | 32 | Shrivenham Road, Ashbury | Reilly 1998 |
| | **Kent** | | 33 | St. Helen's Avenue, Benson | Hamilton-Dyer 2003 |
| 43 | Site A: St. Mary Cray | Cowie and Blackmore 2008 | | **Somerset** | |
| 43 | Site B Keston | Cowie and Blackmore 2008 | 34 | Cadbury Congresbury | Noddle 1992 |
| 13 | Lyminge | Personally collected | | **Suffolk** | |
| 14 | Marlowe, Canterbury | Locker n.d. | 35 | West Stow | Crabtree 1989, 1996 |
| | **Leicestershire** | | 36 | Bloodmoor Hill, Carloton Colville | Parks and Barrett 2009 |
| 15 | Bonners Lane, Leicester | Baxter 2004 | | **Surrey** | |
| 16 | Empingham West, Rutland | Morrison 2000 | 43 | Site G Mitcham | Cowie and Blackmore 2008 |
| | **Lincolnshire** | | 43 | Site L Ham | Cowie and Blackmore 2008 |
| 17 | Nettleton Top, Nettleton | Berg 1993 | 43 | South Lane, Kingston | Cowie and Blackmore 2008 |
| 18 | Quarrington | Rackham 2003 | | **Sussex** | |
| | **London** | | 37 | Bishopstone | Jones 1977 |
| 43 | Winchester Palace | Locker n.d. | 38 | Botolphs | Stevens 1990 |
| | **Middlesex** | | | **Wiltshire** | |
| 43 | Site D Clerkenwell | Cowie and Blackmore 2008 | 39 | Market Lavington | Bourdillon 2006 |
| 43 | Site H Hammersmith | Cowie and Blackmore 2008 | | **Worcestershire** | |
| 43 | Prospect Park, Hamondsworth | Cowie and Blackmore 2008 | 40 | Upwich, Droitwich | Meddens 1997 |
| 43 | Manor Farm, Hamondsworth | Cowie and Blackmore 2008 | | **Yorkshire** | |
| | **Norfolk** | | 41 | Easington | Johnstone et al. 1998 |
| 19 | Caister-on-Sea Norfolk | Harman 1985 | 42 | Kilham | Archer 2003 |

*Table 3.1 Names of early Anglo-Saxon sites and literature references concerning their faunal assemblages. Numbers correspond to those in Figure 3.1.*

The number of early Anglo-Saxon period sites with faunal assemblages is comparatively small, but fish remains were identified at almost half of them (Figure 3.2). The number of sites that were sieved or screened for small bone fragments was similar to the number of sites at which all material was hand-collected (Figure 3.3). The sieving and sampling strategies applied are, however, rarely known, as often reports do not state the proportion of faunal remains that came from sieved samples.

While botanical and environmental sampling was undertaken at many sites, most specialist reports fail to mention fish remains. This is the case, for example, for all sites in Oxfordshire, with the exception of Barton Court Farm (Wheeler 1986). Botanical sampling from Oxfordshire sites appears to have been targeted at the fills of Sunken Feature Buildings (SFB). Table 3.2 shows the number of sites where fish remains were recovered from SFBs and other types of features. However, published and even original archive reports rarely specify which features the faunal remains came from. Bones are found in several types of features, with particular features such as cess pits containing only particular types of bones. Due to the variety of features revealing faunal remains, several sites will be noted down more than once, while due to the lack of information in reports, others will not be mentioned. Though values presented in Table 3.2 should therefore be interpreted with caution, certain pieces of information can be drawn, such as the scarcity of fish remains in buildings.

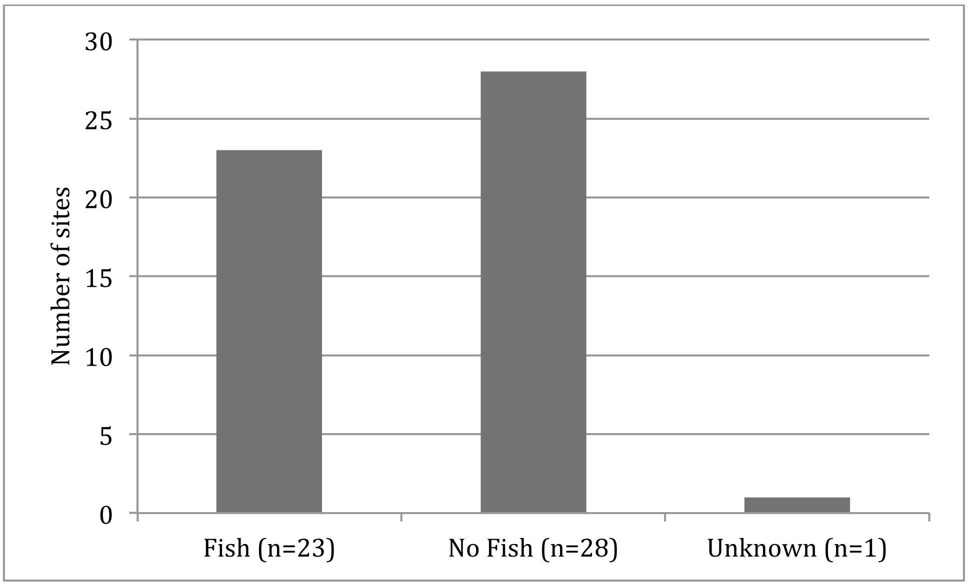



*Figure 3.2 Number of early Anglo-Saxon sites where fish remains were recovered, where no fish remains were recovered, and for which no information is available in this respect.*

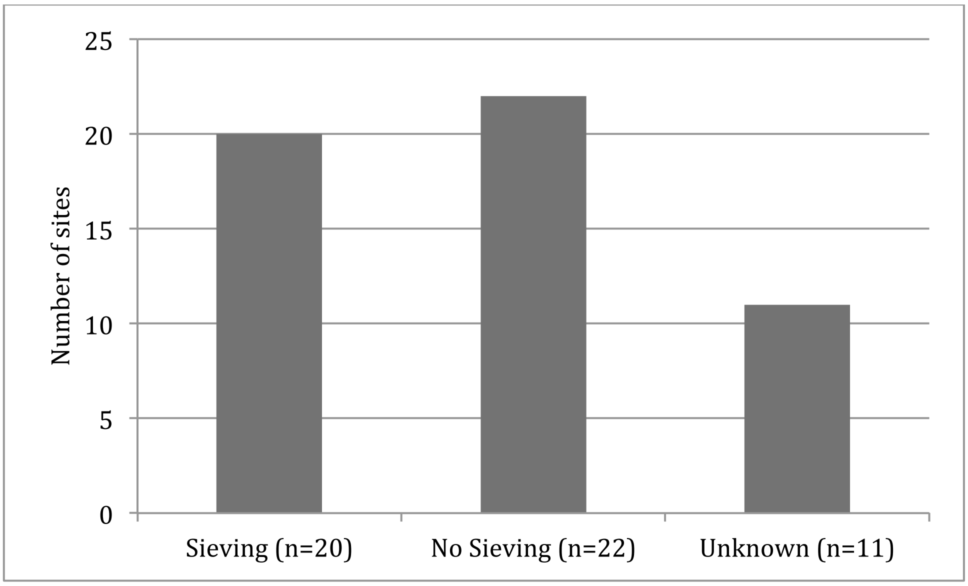


*Figure 3.3 Number of early Anglo-Saxon sites where sieving was performed, not performed or for which no information is available in this respect.*

| | Fish | No Fish |
|---|---|---|
| Building, structure fills, SFB | 9 | 20 |
| Pit, ditch | 9 | 10 |
| Gully, enclosure | 1 | 2 |
| Spread, occupation | 1 | 0 |
| Post-hole | 4 | 4 |

*Table 3.2 Types of features from the early Anglo-Saxon period with and without fish remains.*

About 50% of sites with fish remains contained eel, though never in great numbers (Appendix 6). Within the presence/diversity indices chart, the comparing of a "fish sites" column and an "all sites" column illustrates that overall fish are not very common throughout the early Anglo-Saxon period but, on the few occasions where fish remains have been recovered generally a wide variety of species are present (Figure 3.4). For example at Bloodmoor Hill marine species such as smelt *(Osmerus eperlanus)*, halibut *(Hippoglossus hippoglossus*) and herring dominated, though no species exhibited number of identified specimens (NISP) in greater numbers than 12. In addition, six fish hooks were revealed from that site (Lucy *et al.* 2009: 316).

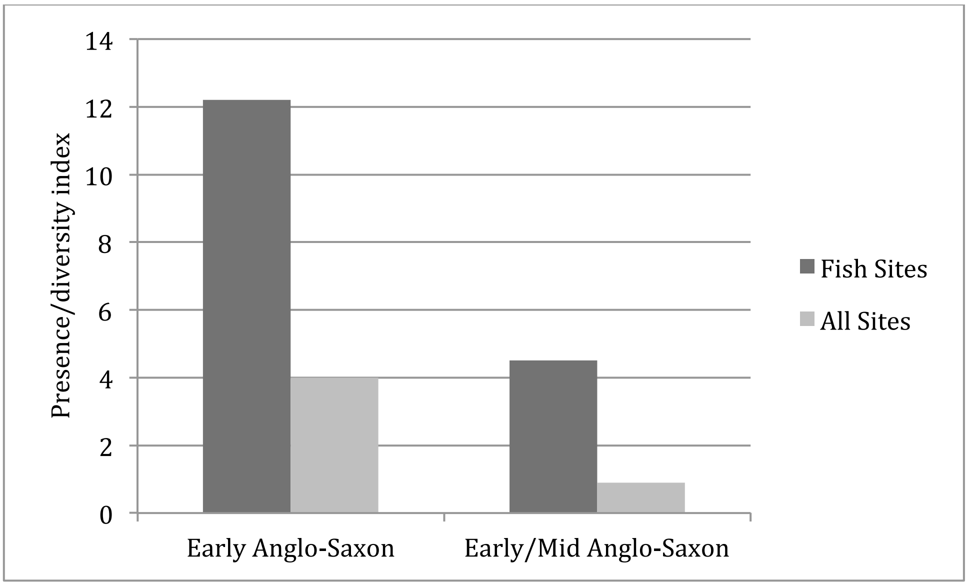


*Figure 3.4 Presence/absence index for early and early/mid Anglo-Saxon period sites.*

Marine species were found on some sites, though rarely in great numbers. Six bones were found at Bonners Lane, Leicester (Baxter 2004). Three and one bones were found at Clerkenwell and Hammersmith, respectively, both sites being situated close to the River Thames (Cowie and Blackmore 2008). A different situation is exhibited by the early phase of the occupation at Redcastle Furze, Thetford, where 24 bones of herring, 17 bones of eel, and potential single bone finds of pike *(Esox lucius)* and perch *(Perca fluviatilis)* were recovered (Nicholson 1995). Plaice/flounder were only found at four sites: Kings Meadow Lane, Northamptonshire; Hammersmith; Bloodmoor Hill; and across the excavations in Marlowe, Canterbury (Locker n.d.). Finds of the gadid family are extremely rare, but include two bones from the dark earth levels at Winchester Palace (Locker 1994), two cod bones from Bloodmoor Hill and one whiting bone from Bishopstone (Jones 1977). These were found amongst various types of marine molluscs that seem to have arrived at the settlement with seaweed, which was probably used as fertiliser

(Bell 1977). Data from Winchester Palace are taken from an unpublished report that lacks detailed information on excavation or phasing and should therefore be interpreted with caution.

Most of the sites that contained marine species were located near the coast or tidal rivers such as the Thames, indicating that inhabitants exploited fish species that were available. There are, however, three exceptions to this rule, which are located much further from the coast: Redcastle Furze, Thetford; Bonners Lane, Leicestershire; and Kings Meadow Lane, Northamptonshire. Only single fish finds were made at Bonners Lane and Kings Meadow Lane, which are thus likely to represent intrusive or residual material from earlier or later phases. However, the high number of fish remains from Redcastle Furze suggests that fish were caught by other communities and transported to that site. This in turn suggests a certain degree of demand for fish and the ability to satisfy this demand.

A few other sites revealed fish remains, but these either consisted of unidentifiable fragments or the actual species and abundance were not provided in the report. Grant (1976) stated that fish remains were recovered from the early Anglo-Saxon and later phases of Porchester Castle in much greater numbers than from the Roman phases, but fails to provide information on species or abundances. Bantham, Devon, is the only site with an assemblage that is entirely dominated by marine fish. Coy (1981) stated that some of the excavated layers contained predominantly fish and marine molluscs. However, no NISP values are given, rendering this site difficult to analyse and interpret. Given the coastal location of Bantham, this site may have been used for catching or landing fish alongside other traded goods. Other archaeological evidence from this site points towards seasonal occupation and extensive links with the western coast of France. One unusual site is Market Lavington, where 83 dogfish remains were found (Bourdillon 2006). "Dogfish" usually refers to a species from the shark family. Archaeological finds of shark vertebra are rare, though their spines may sometimes be found. No detailed information on the recovered elements is given in the Market Lavington report, and it seems doubtful that this would be the only site from the Anglo-Saxon period with shark remains.

In conclusion, fish remains were found at early Anglo-Saxon sites and reflect low-level exploitation of nearby aquatic environments. Sites close to the coast produced remains of a small number of marine species, while those inland tend to contain freshwater fish. Overall, however, fish did probably not comprise a significant proportion of the diet. Unfortunately, several excavation factors hinder more concrete conclusions. Sieving and sampling methodologies of many Anglo-Saxon excavations were not particularly rigorous and, without explicit descriptions of the respective methods in the reports, it is hard to account for any biases this may have caused. The features excavated may also not lend themselves to finding fish remains. Contents of SFBs are regularly interpreted as deposited rubbish containing midden material and surface rubbish, but recent studies highlighted that potential causes of deposits are numerous and may be related to rituals or special meanings (Hamerow 2006; Morris and Jervis 2011; Tipper 2004). Regardless, midden material is likely to have been trampled and gnawed on, reducing the chances of the survival of fish remains and especially small ones.

### 3.3 Early/Mid Anglo-Saxon

Early/mid Anglo-Saxon sites comprise those sites, at which phases overlap between the early and the mid Anglo-Saxon period. Fish remains were recovered at only two sites (Figure 3.6), i.e. Hillside Meadow, Cambridgeshire, and Abbots Worthy, Hertfordshire, which limited any further analysis of the evidence. This is despite the fact that sieving was carried out at over 50% of these sites (Figure 3.7). Unfortunately, feature data for Abbots Worthy was unavailable, but fish from Hillside Meadow came from pits (Baxter, n. d.). Eel were the only fish recovered from Abbots Worthy, and one pike bone was found at Hillside Meadow.

| No | Early/Mid Anglo-Saxon Sites | References | No. | Early/Mid Anglo-Saxon | Reference |
|---|---|---|---|---|---|
| | **Buckinghamshire** | | | **Hampshire** | |
| 1 | Pennyland | Holmes 1993 | 7 | Abbots Worthy | Coy 1991 |
| 2 | Wolverton Mill | Deighton *(pers. comm.)* | | **Lincolnshire** | |
| 2 | Wolverton Turn | Sykes 2007b | 8 | Quarrington | Rackham 2003 |
| | **Cambridgeshire** | | 9 | Riby Cross Roads | Scott 1994 |
| 3 | Eynesbury | Sykes 2004 | | **Northamptonshire** | |
| 4 | Hillside Meadow, Fordham | Baxter n. d. | 10 | Black Lion Hill, Northampton | Harman 1985b |
| | **Essex** | | 11 | Burystead | Davies 2009 |
| 5 | Mucking | Done 1993 | 10 | Marefair, Northampton | Jones 1979a |
| | **Gloucestershire** | | 12 | Northampton Road, Brixworth | Rilley 1995 |
| 6 | Sherbourne House, Lechlade | Maltby 2003 | | | |

*Table 3.3 Names of early/mid Anglo-Saxon sites and literature references concerning their faunal assemblages. Numbers correspond to those in Figure 3.5.*


*Figure 3.5 Map of England showing all early/mid Anglo-Saxon sites with faunal remains. Red numbers indicate sites with recovered fish remains. For detailed information on the names of sites and literature references see Table 3.3.*

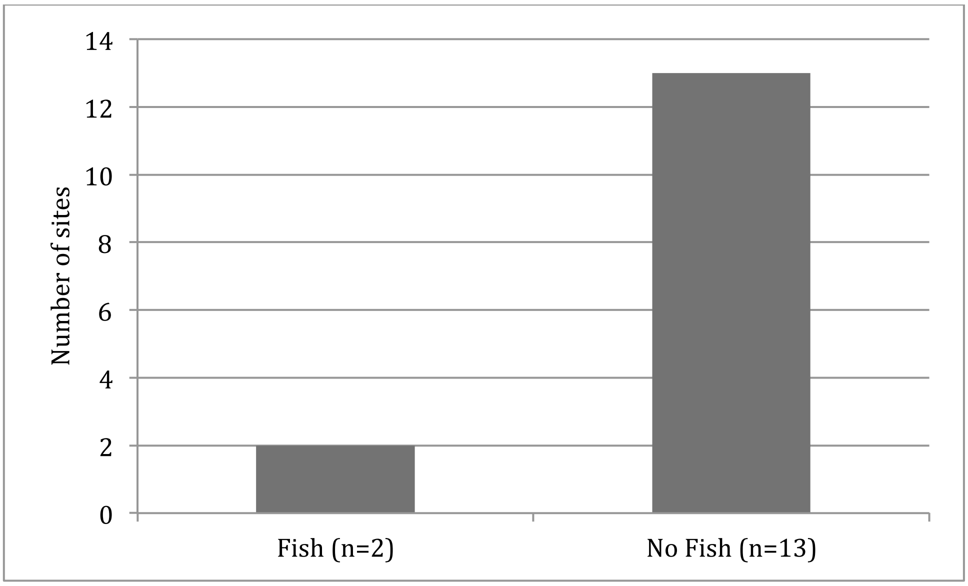



*Figure 3.6 Number of early/mid Anglo-Saxon sites where fish remains were recovered and where no fish remains were recovered.*

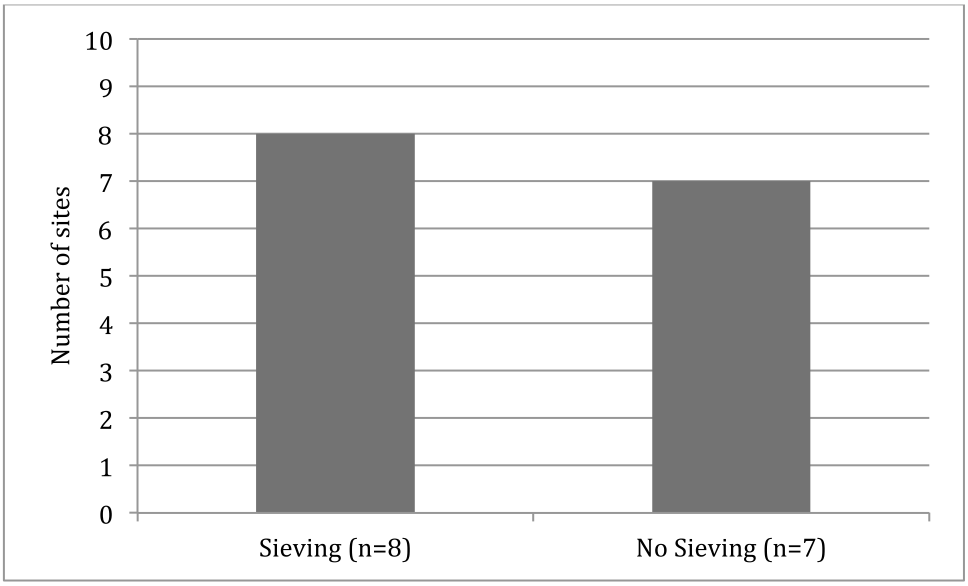



*Figure 3.7 Number of early/mid Anglo-Saxon sites where sieving was performed and where sieving was not performed.*

**3.4 Mid Anglo-Saxon**

In the mid Anglo-Saxon period, the number and proportion of sites with fish increases to just over half of all sites (Figure 3.8). This period exhibits a stronger emphasis on coastal and estuarine locations, with Anglo-Saxon sites in general being concentrated along the eastern seaboard (Figure 3.9, Table 3.4). The number of sieved sites also increased compared to earlier periods, which resulted in a greater number of fish remains recovered (Figure 3.10). As mentioned above (Section 3.2.), fish are unlikely to be found in structural deposits or occupation layers but instead are more common in pits or ditches. The vast majority of recovered fish remains from the mid Anglo-Saxon period originate from pits (Figure 3.11). One reason for this pattern may be the status of many of these settlements. The mid Anglo-Saxon period saw the development of proto-urban settlements or *emporia.* At these sites, rubbish appears to have been deposited in large pits, which were probably rapidly filled, thus increasing the survival of fish bones. Other sites, such as those of high status, also contained a large number of pits and even cess material. Appearance of these new site types in this period additionally changed the focus of excavations, which further improved recovery rates of fish bones.

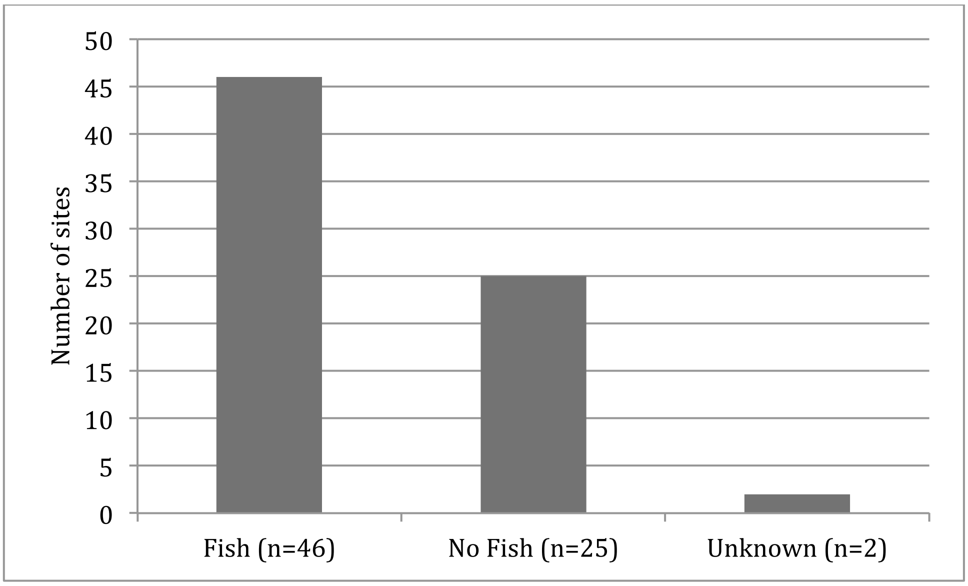



*Figure 3.8 Number of mid Anglo-Saxon sites where fish remains were recovered, where no fish remains were recovered, and for which no information is available in this respect.*


*Figure 3.9 Map showing all mid Anglo-Saxon sites with faunal remains. Red numbers indicate sites with recovered fish remains. For detailed information on the names of sites and literature references see Table 3.4.*

| No | Mid Anglo-Saxon Sites | References | No | Mid Anglo-Saxon Sites | References |
|---|---|---|---|---|---|
| | **Bedfordshire** | | 21 | James Street | Armitage 2004 |
| 1 | Puddlehill, Dunstable | Matthews and Hawkes 1985 | 21 | Bedford Street | Armitage, n. d. |
| 2 | Chicheley | Jones 1980 | 21 | Whitehall | Armitage, n. d.; Cowie and Blackmore 2008 |
| 3 | Lake End Road, Dorney | Powell 2002 | | **Norfolk** | |
| 3 | Lot's Hole, Dorney | Powell 2002 | 22 | Brandon Road, Thetford | Baxter, n.d. |
| | **Buckinghamshire** | | 23 | Caister-on-Sea | Harman 1985 |
| 4 | Walton, Aylesbury | Sadler 1989 | 24 | Downham Market | Curl, 2008 |
| | **Cambridgeshire** | | 25 | Hay Green, Terrington St Clement | Baker 2002, 2005 |
| 5 | Ashwell Site, West Fen Road, Ely | Piper 2005 | 26 | North Elmham | Bramwell 1980; Noddle 1980 |
| 6 | Station Road, Gamlingay | Roberts 2005 | 27 | Rose Hall Farm, Walpole St Andrew | Baker 2002, 2005 |
| | **Cleveland** | | 28 | Gosberton 22 | Baker 2002, 2005 |
| 7 | Hartlepool | Huntley and Rackham 2007; Locker 1988 | 28 | Gosberton 37 | Baker 2002, 2005 |
| | **Cumbria** | | 29 | Sedgeford | Personally collected |
| 8 | Blackfriars Street, Carlisle | Rackham 1990 | | **Northamptonshire** | |
| | **Hampshire** | | 30 | Higham Ferrers | Evans, Ingrem 2007 |
| 9 | Portchester Castle | Grant 1975; Easton *pers. comm.* | 30 | Kings Meadow Lane, Higham Ferrers | Albarella and Johnstone 2000 |
| 10 | Riverdene, Basingstoke | Hamilton-Dyer 2003 | 31 | Maxey | Seddon 1964 |
| 11 | Shavards Farm, Meonstoke | Bourdillon, n.d. | | **Oxfordshire** | |
| 12 | Cook Street, Southampton | Bourdillon 1993 | 32 | 79-80 St Aldates, Oxford | Marples 1977 |
| 12 | Melbourne Street, Southampton | Bourdillon and Coy 1980 | 33 | Cresswell Field, Yarnton | Mulville and Ayers 2004 |
| 12 | Six Dials, Southampton | Colley 1984 | 34 | Eynsham | Ayers *et al.* 2003 |
| 12 | SOU15, Southampton | Bourdillon, n. d. | 33 | Worton, Yarnton | Mulville and Ayres 2004 |
| 12 | St. Mary's Stadium | Hamilton-Dyer 2005 | | **Suffolk** | |
| 12 | Site SAR VIII, F1 and F27, Southampton | Coy 1977 | 35 | Brandon | Crabtree 1996 |
| | **Hertfordshire** | | 36 | Ipswich | Locker 1985 |
| 13 | St Albans Abbey | Crabtree (1983) | 37 | Wicken Bonhunt | Crabtree 1996 |
| | **Kent** | | | **Surrey** | |
| 14 | Sandtun | Hamilton-Dyer 2001 | 21 | Battersea | Cowie and Blackmore 2008 |
| 15 | Lyminge, Kent | Personally collected | | **Sussex** | |
| | **Lincolnshire** | | 38 | Bishopstone | Personally collected |
| 16 | Belton | Jaques and Dobney 2000 | 39 | Friars Oak, Hassocks | Stevens 2000 |
| 17 | Fishtoft | Locker 2012 | 40 | Old Erringham, Shoreham | Westley 1976 |
| 18 | Flixborough | Dobney *et al.* 2007 | | **Tyne and Wear** | |
| 19 | Quarrington | Rackham 2003 | 41 | Jarrow | Jones and Hutchinson 2006; Noddle 2006 |
| 20 | Riby Cross Roads | Scott 1994 | 42 | Weramouth | Noddle 2006 |
| | **London** | | | **Wiltshire** | |
| 21 | 21-22 Maiden Lane | Locker 1988a | 43 | Cadley Road, Collingbourne Ducis | Hamilton-Dyer 2001 |
| 21 | 21-24 Maiden Lane | Hamilton-Dyer 2004 | 44 | Market Lavington | Bourdillon 2006 |
| 21 | 28-31 James Street | Armitage 2004 | 45 | Ramsbury | Coy 1980 |
| 21 | Church Court/Hare Court | Bendrey 2005; Armitage, n. d. | | **Worcestershire** | |
| 21 | Jubilee Hall | Locker 1988a | 46 | Upwich, Droitwich | Meddens 1997 |
| 21 | Lyceum Theatre | Locker, n.d. | | **Yorkshire** | |
| 21 | National Gallery Basement | Locker 1989 | 47 | Blue Bridge Lane, York | Harland *pers. comm.* |
| 21 | National Portrait Gallery | Armitage 2004 | 47 | 46-54 Fishergate, York | O'Connor 1991 |
| 21 | Peabody site | Locker 1989 | 48 | South Manor Area, Wharram | Pinter-Bellows 2000 |

*Table 3.4 Names of mid Anglo-Saxon sites and literature references concerning their faunal assemblages. Numbers correspond to those in Figure 3.9.*

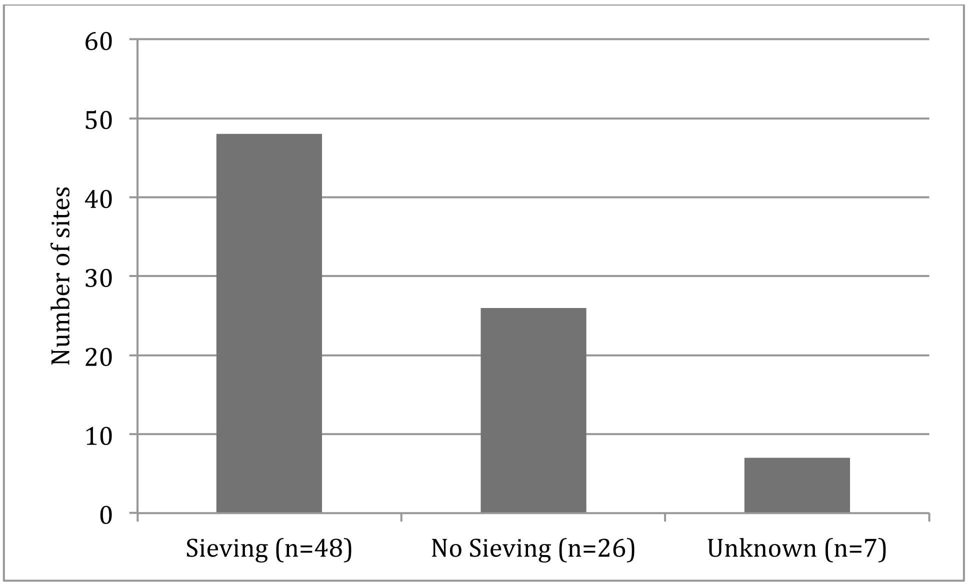



*Figure 3.10 Number of mid Anglo-Saxon sites where sieving was performed, not performed or for which no information is available in this respect.*

| | Fish | No Fish |
|---|---|---|
| Building, structure fills, SFB | 3 | 9 |
| Pit, ditch | 29 | 8 |
| Gully, enclosure | 1 | 2 |
| Spread, occupation | 1 | 3 |
| Post-hole | 1 | 0 |
| Cess | 1 | 0 |

*Table 3.5 Types of features from the mid Anglo-Saxon period with and without fish remains.*

The quantity and range of fish species found at mid Anglo-Saxon sites are much higher than those found at the previous period, and this pattern is reflected in presence/diversity index values (Figure 3.11). Many of the *emporia* revealed large assemblages of fish bones, undoubtedly facilitated by their estuarine location. This evidence is supplemented by the presence of large weirs, e.g. on the River Thames, and finds of fish hooks among other fishing paraphernalia (Chapter 4). The range of species recovered varies both between as well as within *emporia* sites. Eel were found in relatively high numbers in Southampton, London, Ipswich and York, but numbers of cyprinids and herring vary greatly between those sites. Herring was found in abundance at the Lyceum excavations in London (i.e. 1096 bones; Locker

2003), but was far less abundant at other London sites. Other common species include plaice/flounder and twaite shad. Despite being located further inland, the sites of Fishergate and Blue Bridge Lane in York also revealed large quantities of herring, which represents the only marine fish found in these deposits. Unsurprisingly, the rest of these assemblages is heavily dominated by eel and various members of the cyprinid family. Despite being located on the Solent, sites excavated in Southampton were not particularly rich in herring, but generally contained large numbers of plaice/flounder (e.g. at Melbourne Street; Bourdillon and Coy 1980). At Ipswich, a varied assemblage was revealed, which was dominated by eel and herring, but also included small amounts of other marine species such as cod, haddock and whiting (Locker and Jones 1985). Variation in fish assemblages between sites of a given settlement may be caused by differences in recovery methodology and/or site characteristics.

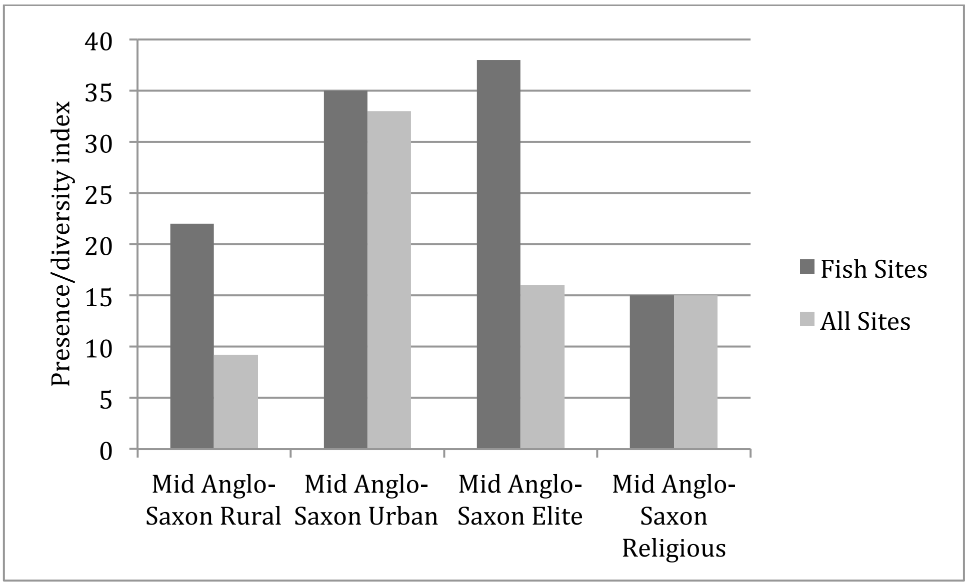



*Figure 3.11 Presence/diversity index for all site types from the mid Anglo-Saxon period.*

Eel is still found on all sites and usually in large amounts (Figure 3.12), though their numbers vary considerably. Compared to the early Anglo-

Saxon period, a much greater variety of species is recovered on a greater number of sites.

Figure 3.12 shows the proportion of sites containing eel, cod, cyprinid, herring, plaice/flounder and whiting. To provide a more complete understanding of fish remains, this analysis included sites that were not sieved. However, the potential bias caused by this approach needs to be considered when interpreting the results. Although Figure 3.12 illustrates the presence of cod at most sites, this is only part of the picture. Only one cod bone was recovered from the earliest phase of Eynsham Abbey (Ayers *et al*. 2003), and five cod bones and ten gadid bones were recovered from Jarrow and Wearmouth, respectively (Jones and Hutchinson 2006). Sieving was done at Eynsham but it is not known to what extent. No sieving was undertaken at Jarrow and Wearmouth, so it is difficult to ascertain the number of smaller fish and additional cod remains that were missed. Alternatively, these fragments may actually represent intrusions from later phases. Although cod also begin to appear at other sites of this period, these never reach high numbers. Using the number of identified specimens from all sites, cod are much lower in number than eel, herring and freshwater species. Exceptions to this rule are the sites of *Sandtun* (Hamilton-Dyer 2001a) and Lyminge, both in Kent, where cod was the dominant fish species. Several cod elements from Lyminge were measurable, and calculation of regression sizes demonstrated that cod at that site were large, with most individuals measuring around 100 cm in length (for further discussion about this see section 6.3). Textual evidence links *Sandtun* to Lyminge, potentially as an outlet to the sea (Kelly 2006). The site of Bishopstone, Sussex, spans the mid to late Anglo-Saxon period, and also exhibited cod in significant abundance. Calculated sizes of cod at this site are a bit smaller than those of Lyminge, but as unfortunately phasing was not very specific, it is difficult to fully assess the extent of cod fishing in the mid Anglo-Saxon period.

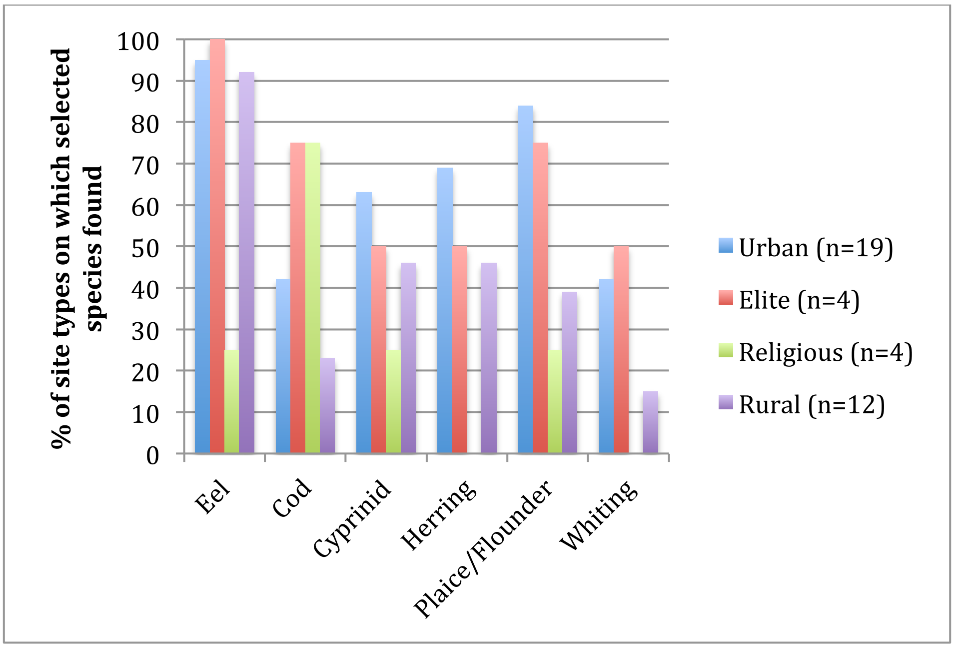


*Figure 3.12 Percentage of site types where selected species are present of mid Anglo-Saxon date.*

Other smaller gadids such as whiting appear predominantly at urban and elite settlements, as they were probably caught in inshore waters. Whiting were only found at two of the four elite sites of that period with fish, and the numbers at Sedgeford were small. Plaice and flounder were found at the majority of urban and elite sites. Most of the phases at Flixborough (Dobney *et al*. 2007) were dominated by plaice/flounder, which explains the high occurrence of this fish at elite sites. Cyprinids were present at most urban, rural and elite sites. All phases of the settlement of Flixborough contained freshwater fish in very high numbers. Urban centres and rural sites also revealed a high number of cyprinids, once again reflecting local availability.

The presence of fish at rural sites during this period is rather interesting. Generally, fish are not a common find, as many rural sites are located inland. However, large assemblages of marine fish were revealed at two coastal sites: *Sandtun*, West Hythe in Kent (Hamilton-Dyer 2001a) and Fishtoft in Lincolnshire (Locker 2012). Both of these sites exhibit evidence for extensive involvement in cross-Channel trade and other coastal and maritime activities including salt-making. For example, briquetage was found at Fishtoft (Cope-Faulkner 2012). Fish assemblages at both sites are rich in marine species. At Fishtoft, plaice/flounder were the most abundant marine fish, suggesting targeted fishing of these species. Surprisingly, garfish and horse mackerel were also common. Although eel were the most abundant species overall, the considerable abundance of marine fish is significant. At *Sandtun*, whiting, cod and plaice/flounder were the most abundant species, but many other marine species were also identified, such as garfish, mackerel, gurnards and rays. However, since that site consisted of sand dunes, phasing is uncertain and fish remains may not all be attributed to the mid Anglo-Saxon period. Both Fishtoft and *Sandtun* may have been connected to nearby estate centres (Loveluck 2013). *Sandtun* possibly belonged to the monastery of Lyminge or Lympne (Kelly 2006).

Marine fish become more apparent at sites of the mid Anglo-Saxon period but are generally low in numbers. This is with the exception of the coastal settlements of *Sandtun* and Fishtoft, and the religious and secular elite sites of Lyminge and Sedgeford (Reynolds, 2009)(Appendices 5 and 6). At other elite estate centres such as Higham Ferrers, Northamptonshire (Albarella and

Johnstone 2000; Ingrem 2007); and Yarnton, Oxfordshire (Mulville and Ayers 2004), only a very small number of fish bones – mostly from freshwater species – were revealed despite sieving efforts. One herring bone was found at Higham Ferrers, and at Yarnton, one eel bone was found, which may, however, represent a non-anthropogenic find, as eels cross over land to reach another river (Mulville and Ayres 2004). Unfortunately, information on sieving and recovered fish bones is not available for the estate centres of Wicken Bonhunt, Brandon and North Elmham. Sedgeford in Norfolk showed a few cod remains from individuals of varying sizes, with a small number of the measurable elements coming from individuals of 100 cm length. The rest of the assemblage is dominated by eel, herring, cyprinids and plaice/flounder. Excavations at this site are ongoing and unfortunately, the previous 16 years of excavation have not yet been published. As phasing is therefore not yet available for all contexts, I refrain from further interpretation of fish remains. Fish remains were also recovered from other elite settlements, such as Porchester Castle, but only in very small numbers due to the lack of sieving. These include plaice/flounder, single finds of cyprinid, perch, pike and ray, and two dermal scutes from a sturgeon (Easton *pers. comm.*). At Flixborough, cod remains were found in very small numbers, but other species, such as flatfish, eel and cyprinids were abundant. The faunal assemblage at that site also included the remains of porpoises and bottle-nose dolphins (Dobney *et al.* 2007).

The mid Anglo-Saxon period also sees the appearance of ecclesiastical sites. Types of ecclesiastical sites found range from monasteries to settlements belonging to monasteries and the lay settlements beyond a monastery.

Determination of a signature monastic diet for this early period is therefore not straightforward. As mentioned above, three of these ecclesiastical settlements, i.e. the monasteries of Eynsham, Jarrow and Wearmouth, exhibited very few fish remains. The settlement at Lyminge, which was home to a monastery from the 8th to the 9th century, revealed a number of fish remains that were entirely dominated by marine fish such as cod. The settlement of Flixborough was noted to have an ecclesiastical character from the late 8th to 9th century (Dobney *et al*. 2007; Loveluck 2007). While the faunal signature changes in this period, which is accompanied by different material culture, numbers of fish remains and species do not change greatly. All periods at Flixborough are dominated by freshwater and migratory species, with flatfish being the only marine species. Barrett compared fish assemblages from the medieval and late medieval periods and established that assemblages dominated by flatfish tend to be of ecclesiastical origin (Dobney *et al*. 2007: 231-233). The scarcity of ecclesiastical assemblages of the mid Anglo-Saxon period make it hard to establish whether all settlements that exhibit ecclesiastical characteristics also exhibit a distinct fish signature. Alternatively, the high abundance of fish at this site may be due to its proximity to an estuary.

The archaeological signatures of elite and ecclesiastical settlements are quite similar, which can cause confusion when trying to differentiate and assign status (Loveluck 2007, 2011, 2013). It is also possible that one or more ecclesiastical settlements were originally elite settlements or that the status and character of settlements changed over time. Evidence for such a change of status character is provided at Sedgeford (Davies *pers. comm.*) and

Flixborough. The exact status character of Lyminge still remains to be fully determined. Although a monastery was located at this site, the area may also have hosted a *villa regalis* or aristocratic household (Thomas 2005). Fish remains were found at all these sites, though they vary in quantity and species composition.

The situation in the mid Anglo-Saxon period is a lot more diverse and complex than in earlier periods. Additional site types and more sites with fish appear. Various excavations in urban centres demonstrate that although fish were fairly common in this period, they did probably not represent a substantial part of the diet but were used as a seasonal or regular addition to the diet. Eel were the most common species, but herring were also present at some sites. With exception to Flixborough, elite and ecclesiastical sites show an increasing reliance on marine fish. Cod also begin to appear at some elite sites, as well as coastal rural sites that may be linked to elite centres.

**3.5 Late Anglo-Saxon Period**

The number of sites with fish increases again from the mid Anglo-Saxon period (Figure 3.13 and Table 3.6. This is also true for the overall number of sites, though these are spread out across southern and central England to a greater degree. The other interesting point is that fish were recovered from several inland sites and are therefore no longer restricted to coastal areas. A bias towards Southern and Eastern England prevails. Fish were recorded from 73% and sieving was undertaken at 62% of the sites (Figures 3.14 and 3.15). Pits were the features that contained the most fish, but interestingly, a number of occupation layers and surface spreads also exhibited fish (Tables 3.7). All other types of features also revealed fish, but to a much smaller degree. During this period, the number of urban and elite sites increased throughout England. In addition, the number of sites with fish as well as the range of fish species recovered from sites increased (Appendix 6), which is also reflected in presence/diversity index analysis (Figure 3.16).


*Figure 3.13 Map of England showing all late Anglo-Saxon sites with faunal remains.Red numbers indicate sites with recovered fish remains. For detailed information on the names of sites and literature references see Table 3.6.*

| No | Late Anglo-Saxon Sites | References | No | Late Anglo-Saxon Sites | References |
|---|---|---|---|---|---|
| | **Bedfordshire** | | 29 | Mill Lane, Thetford | Locker 2004 |
| 1 | Bedford | Wilkinson 1986 | 29 | Redcastle Furze, Therford | Nicholson 1995 |
| | **Berkshire** | | 29 | Sites 1-5 and 1092, Thetford | Jones 1984 |
| 2 | Bartholemew Street, Newbury, Berkshire | Coy 1997 | 30 | Gosberton 22 | Baker 2005 |
| 3 | Wraysbury | Coy 1989 | 31 | Lower Bridge Street, Fordham | Baxter n. d. |
| | **Buckinghamshire** | | 32 | Fuller's Hill Great Yarmouth | Wheeler 1976 |
| 4 | Walton, Aylesbury | Bramwell 1976; Noddle 1976 | | **Northamptonshire** | |
| 5 | Wolverton Mill | Deighton (*pers. comm.*) | 33 | Black Lion Hill, Northampton | Harman 1985 |
| | **Cambridgeshire** | | 33 | Marefair, Northampton | Jones 1979a |
| 6 | Ashwell Site, West Fen Road, Ely | Locker 2005 | 33 | St. James Square, Northampton | Locker 1983 |
| 7 | Hillside Meadow, Fordham | Baxter n. d. | 33 | St. Peters Street | Jones 1979b |
| | **County Durham** | | 33 | The Green, Northampton | Harman 1996 |
| 8 | Saddler Street, Durham | Wheeler 1979a | 33 | Woolmonger Street, Northampton | Locker 1999 |
| | **Gloucestershire** | | 33 | Northampton Palaces | Locker 1985 |
| 9 | 1 Westgate Street, Gloucester | Maltby 1979b | 34 | Burystead | Davies 2009 |
| 10 | North Street, Winchcombe | Levitan 1985 | 35 | Higham Ferrers | Evans, Ingrem 2007 |
| | **Hampshire** | | 35 | Kings Meadow Lane, Higham Ferrers | Albarella and Johnstone 2000 |
| 11 | Alma Road, Romsey | Grimm forthcoming | 36 | West Cotton | Albarella and Davies 1994 |
| 12 | Faccombe Netherton | Sadler 1990 | | **Oxfordshire** | |
| 13 | Portchester Castle | Grant 1975 | 37 | Eynsham | Ayres *et al.* 2003 |
| 14 | Cook Street, Southampton | Bourdillon 1993 | 38 | Manor Farm, Drayton | Charles 2001 |
| 14 | Lower High Street, Southampton | Hamilton-Dyer 1997 | 39 | 113-119 High Street, Oxford | Hamilton-Dyer 2000 |
| 14 | Telecom House, Southampton | Hamilton-Dyer n.d. | 39 | 7-8 Queen Street, Oxford | Wilson and Locker 2003 |
| 15 | Winchester Northern/Eastern Suburbs | Bourdillon 2010 | 39 | 79-80 St Aldates, Oxford | Marples 1977 |
| 15 | Winchester Staple Gardens | Personally collected | 39 | All Saints Church, Oxford | Wilson 2003a |
| 15 | Winchester Western Suburbs | Coy 2009 | 39 | Hinxey Hall, Oxford | Wilson *et al.* 1983 |
| | **Herefordshire** | | 39 | Lincoln College, Oxford | Ingrem 2002 |
| 16 | Berrington Street, Hereford | Noddle 1985; Bramwell 1985 | 39 | St. Aldate's, Oxford | Amour-Chelu 2003 |
| 16 | Wall Street, Hereford | Hamilton-Dyer 2002 | 39 | St. Ebbe's, Oxford | Wilson 1989 |
| 16 | Deen Court, Hereford | Hamilton-Dyer 2002 | 39 | Trill Mill Stream, Oxford | Wilson 2003 |
| | **Hertfordshire** | | | **Somerset** | |
| 17 | St Albans Abbey | Crabtree 1983 | 40 | Cheddar Palaces | Higgs and Greenwood 1979 |
| | **Kent** | | | **Suffolk** | |
| 18 | Saltwood Tunnel | Nicholson n. d. | 41 | Ipswich | Locker 1985 |
| 19 | Marlowe, Canterbury | Locker n.d. | | **Sussex** | |
| 20 | Zion Chapel, Dover | Locker 1984 | 42 | Bishopstone | Personally collected |
| | **Lincolnshire** | | 43 | Botolphs | Stevens 1990 |
| 21 | Flixborough | Dobney *et al.* 2007 | 44 | Lewes Priory | Stevens 1997 |
| 22 | Goltho | Jones and Reuben 1987 | 45 | Steyning | Kirk 1997; O'Shea 1993 |
| 23 | Flaxengate, Lincoln | O'Connor 1982 | | **Tyne and Wear** | |
| 23 | Lincoln City | Dobney *et al.* 1996 | 46 | Jarrow | Noddle and Stallibrass 2006 |
| | **London** | | | **Warwickshire** | |
| 24 | Pudding Lane | Serjeanston and Woolgar 2006 | 47 | Hatton Rock | Noddle 1973 |
| 24 | Westminster Abbey | Locker 1997 | | **Wiltshire** | |
| 24 | Winchester Palace | Locker n.d. | 48 | Malmesbury | Sykes 2006a |
| | **Norfolk** | | 49 | Market Lavington | Bourdillion 2006 |
| 25 | Burnham Market | Baker *pers. comm.* | 50 | Trowbridge | Bourdillion 1993 |
| 26 | North Elmham | Bramwell 1980; Noddle 1980 | | **Worcestershire** | |
| 27 | Alms Lane, Norfolk | Jones and Scott 1985 | 51 | Deansway, Worcester | Nicholson and Scott 2004 |
| 27 | Castle Mall, Norwich | Albarella *et al.* 2010 | 52 | Droitwich | Locker 1992 |
| 27 | Norwich Cathedral Refectory | Curl 2006 | | **Yorkshire** | |
| 27 | Dragon Hall, Norwich | Nicholson 2005 | 53 | Cottam | Dobney *et al.* 1999 |
| 27 | Greyfriars, Norwich | Nicholson 2007 | 54 | Lurk Lane, Beverley | Scott 1991 |
| 27 | Fishergate, Norwich | Locker 1994 | 55 | South Manor Area, Wharram | Pinter-Bellows 2000 |
| 27 | St. Martin-at-Palace Plain, Norwich | Locker 1987 | 56 | Former Female Prison, York | Carrott *et al.* 1998a |
| 27 | Whitefriars Street Car Park, Noriwch | Jones 1983 | 56 | St. Saviourgate, York | Carrott *et al.* 1998b |
| 28 | Sedgeford | Personally collected | 56 | 16-22 Coppergate, York | O'Connor 1989 |
| 29 | Brandon Road, Thetford | Jones 1993a, 1993b; Baxter n. d. | 56 | 46-54 Fishergate, York | Harland *pers. comm.* |
| 29 | Bury Road, Thetford | Grimm *forthcoming* | | | |

*Table 3.6 Names of ate Anglo-Saxon sites and literature references concerning their faunal assemblages. Numbers correspond to those in Figure 3.13.*

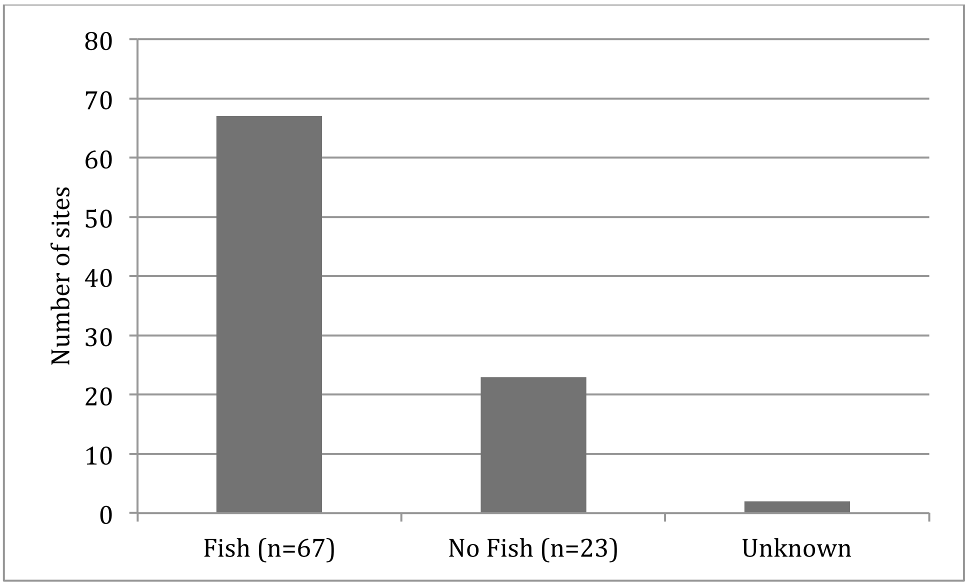



*Figure 3.14 Number of late Anglo-Saxon sites where fish remains were recovered, where no fish remains were recovered, and for which no information is available in this respect.*

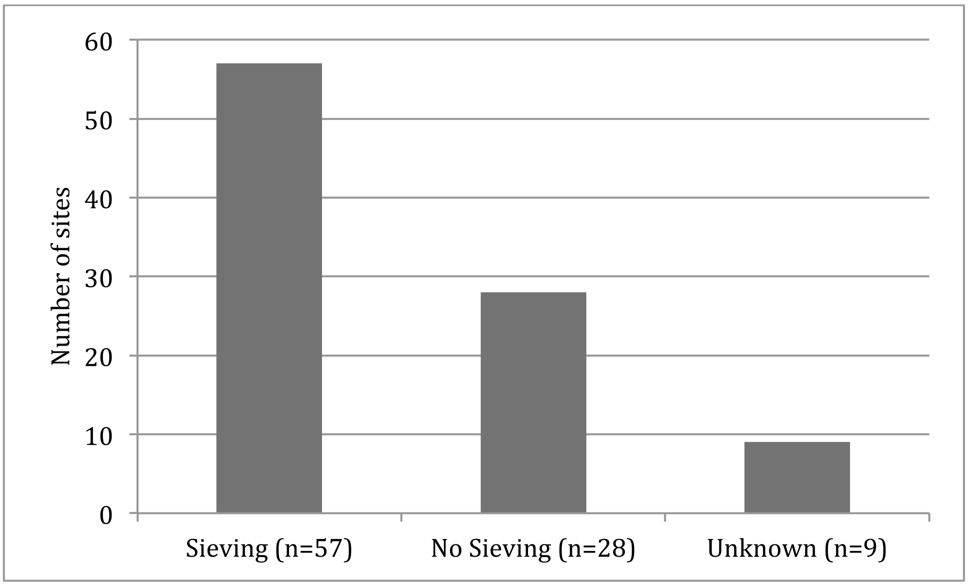



*Figure 3.15 Number of late Anglo-Saxon sites where sieving was performed, not performed or for which no information is available in this respect.*

| | Fish | No Fish |
|---|---|---|
| Building, structure fills, SFB | 1 | 0 |
| Pit, ditch | 19 | 8 |
| Gully, enclosure | 2 | 0 |
| Spread, occupation | 7 | 1 |
| Post-hole | 1 | 1 |
| Cess | 2 | 1 |
| Cellar infill | 1 | 1 |
| Well | 1 | 0 |

*Table 3.7 Types of features from the late Anglo-Saxon period with and without fish remains.*

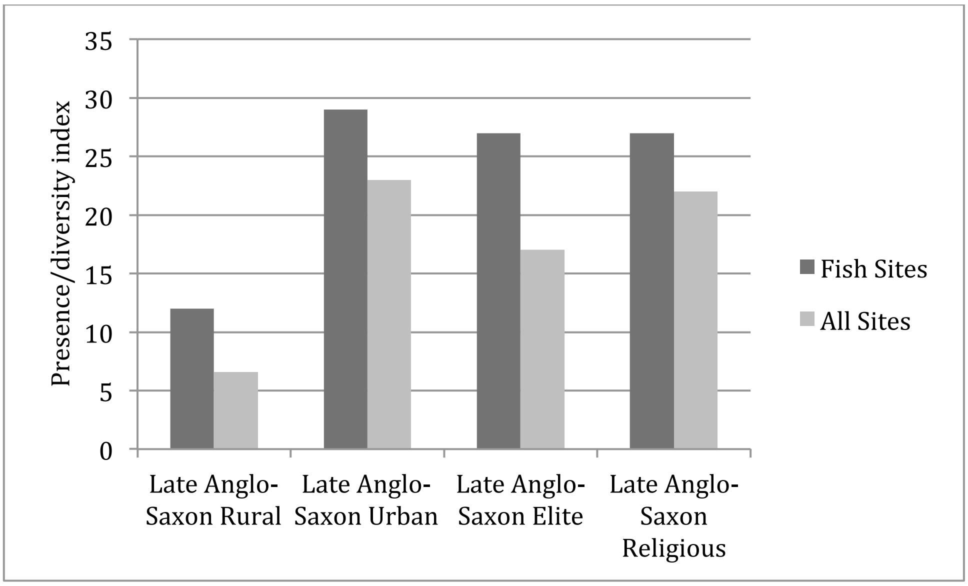



*Figure 3.16 Presence/diversity index for different site types from the late Anglo-Saxon period.*

While in the mid Anglo-Saxon period, cod were present only at a few sites and generally in small numbers, their numbers increased in the late Anglo-Saxon period, and especially at urban sites (Figure 3.17). Cod is still not the dominant species but tends to be more abundant in assemblages where other species are well represented. Other marine species, e.g. herring, increase in importance in terms of NISP and are also found on inland rural sites such as Wraysbury, Berkshire (Coy 1989). Marine fish were found on most inland sites of this period. Excavations at Oxford generally failed to reveal fish in large numbers, despite sieving being performed at several sites. The exception to this rule is Lincoln College, where herring predominates (Ingrem 2002). Excavations in Hereford revealed a similar situation (Hamilton-Dyer 2002).

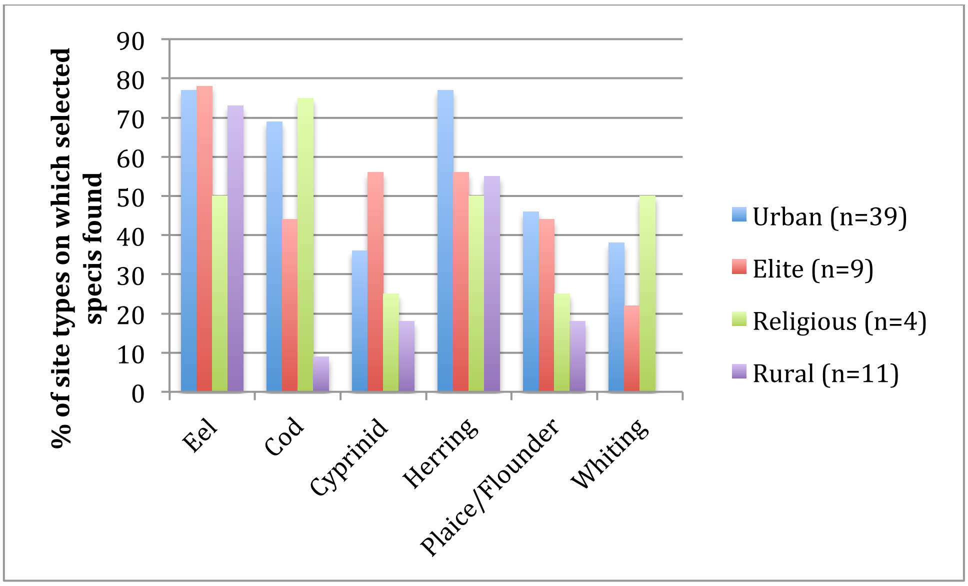



*Figure 3.17 Percentage of site types where selected species are present of late Anglo-Saxon date.*

The number of elite sites dating from the late Anglo-Saxon period is greater compared to other Anglo-Saxon periods. Presence/diversity indices from "fish" and "all" sites from this period are quite similar (Figure 3.16). This is due to the fact that many of the elite settlements from this period were not subject to extensive sieving (i.e. Goltho (Jones and Reuben 1987), Cheddar Palaces (Higgs and Greenwood 1979), Trowbridge (Bourdillion 1993) and Northampton Palaces (Locker 1985)). At Bishopstone and Flixborough, on the other hand, significant amounts of fish remains were revealed. The assemblage at Flixborough was very rich in cyprinids and other freshwater fish, while other elite settlements contained very few cyprinids. While marine fish were not very abundant at Flixborough, the remains of marine cetaceans were found in the elite phases of the settlement from the late Anglo-Saxon period. It is thought that these cetaceans may have been brought up the estuary and then killed (Dobney *et al.* 2007). Remains of cetaceans and other marine mammals have been found at other elite sites such as Bishopstone, but never in great numbers. In addition, these remains tend to be worked and include, for example, a polished mandible fragment that was possibly used as a linen smoother (Poole 2010: 67). Documentary evidence suggests that marine mammals were the property of elites (Gardiner 1997), and it is possible that certain other marine species, such as cod, were also considered to be special property. These big animals from the sea may have functioned as showpieces; a way of demonstrating power.

When taken at face value, Figures 3.16 and 3.17 suggest that religious settlements from the late Anglo-Saxon period were inhabited by prolific consumers of fish. In particular, presence/diversity indices show very little difference between "fish" and "all" sites. Unfortunately, however, this pattern is an artefact, as similar to mid Anglo-Saxon period sites, most religious sites were not exposed to sieving (Locker 1997). This is with the exception of Westminster Abbey, where a very large fish assemblage was revealed, comprising 36 species, 2923 specimens of herring, 1221 specimens of plaice/flounder, 1614 specimens of smelt, very high numbers of eel, whiting, cyprinids, rays and other marine fish, as well as migratory species such as salmon.

Wraysbury in Berkshire is the only rural site of this period that revealed a large fish assemblage including herring, which will have required transportation from the coast. The higher frequency of finds of herring and other marine species at inland sites such as York, Norwich and Lincoln College, Oxford, during this period point towards a greater demand for marine fish and a system for satisfying the same. This is likely to be due to a variety of factors including a more developed economy and environmental pressures that encouraged more extensive marine fishing (see sections 6.1 and 6.2). In contrast to the mid Anglo-Saxon period, there is no evidence for coastal rural settlements acting as fishing settlements. *Sandtun* was probably used until the 11th century, but it is not possible to confirm this by means of fish assemblages. Although it is more than likely that such settlements existed along much of the English coast, these sites are archaeologically largely invisible, which is due to their potential seasonal nature, and the policing and controlling efforts of elites at the time (Loveluck and Tys 2006; Loveluck 2013). What does become visible in the late 11th century, both archaeologically and textually, is the emergence of coastal urban settlements with a strong focus on fishing, such as at Sandwich and Old Winchelsea (see section 6.2).

As almost all urban sites from the late Anglo-Saxon period contained fish remains, no significant differences in presence/diversity indices were observed (Figure 3.16). However, since no sieving was performed at many of these sites, numbers of fish species and remains are quite small. Nevertheless, new settlements such as Norwich emerge, which revealed numerous large assemblages, including Fishergate, St. Martin-at-Palace Plain, Dragon Hall, Alms Lane and Greyfriars. As for any urban centre with multiple excavations, inter-site variation of fish remains is great. However, herring are always the most abundant species and sometimes, such as at Greyfriars and Alms Lane, the only species found in any great quantity. At Fishergate and St Martin-at-Palace Plain, gadids, cod, whiting, haddock and plaice/flounder were recovered in small numbers. Similarly, assemblages from Coppergate and Fishergate, York, dating from the 10th to 11th and 10th to 12th century, respectively, are dominated by herring, eel and cyprinids. Although the range of species at York is fairly small, thus reflecting continuing local exploitation, it is supplemented by herring in large numbers. Fish hooks, stone and lead sinkers were found at the same levels and provide further evidence for local exploitation by York's inhabitants.

While it is evident that a greater number of sites and proportion of sieved sites will result in more fish being recovered, it is evident that the presence of marine fish in particular is much more significant in the late Anglo-Saxon period. In particular, this is indicated by the presence of marine fish at inland urban sites, where it was previously lacking.

**3.6 Summary**

This chapter presented and discussed the evidence for fish remains across the Anglo-Saxon period. The analysis of fish remains is hampered by problems with regard to recovery and taphonomy, as well as inconsistencies in analysis, presentation and publication of finds; contexts and sizes of recovered fish bones are rarely mentioned. Despite these restrictions, it is possible to gain a much more complete understanding of the dynamics of fishing in Anglo-Saxon England by considering all finds of fish remains regardless of their recovery but taking into consideration any biasing factors. For a long time, it has been thought that fish were not consumed to any great extent during the early Anglo-Saxon period (Barrett *et al.* 2004a; Sykes 2007a). When and where fish were eaten, which occurred mainly after the mid Anglo-Saxon period, these were primarily freshwater fish, with the exception of certain coastal landing sites and urban centres, where also marine fish were consumed. Only during the late Anglo-Saxon period, fish were perceived as available food and consumed by different levels of society. The above analysis has shown that fish remains, including marine ones, become more frequent at settlements of the late Anglo-Saxon period. It additionally revealed that even in the earlier periods, fish were consumed at a higher level than previously believed. For instance, though during the early Anglo-Saxon period, fish remains are few and tend to represent freshwater species, some marine species were also found. Fish remains reflect local exploitation of the nearest water sources and in some instances, such as at Bloodmoor Hill, may be related to the beginning of social differentiation. The situation changes in mid Anglo-Saxon period sites, where larger fish assemblages were recovered, though this may to an extent be an artefact due to the better sieving strategies employed. Fish assemblages vary across the social spectrum, with urban centres primarily containing freshwater and estuarine fish, and the few elite sites exhibiting marine or larger freshwater and estuarine fish. These and other differences between sites appear to be a result of a conscious decision to eat particular types or species of fish. Differences in the levels of exploitation between sites is also visualised by the presence/diversity index (Figure 3.18).

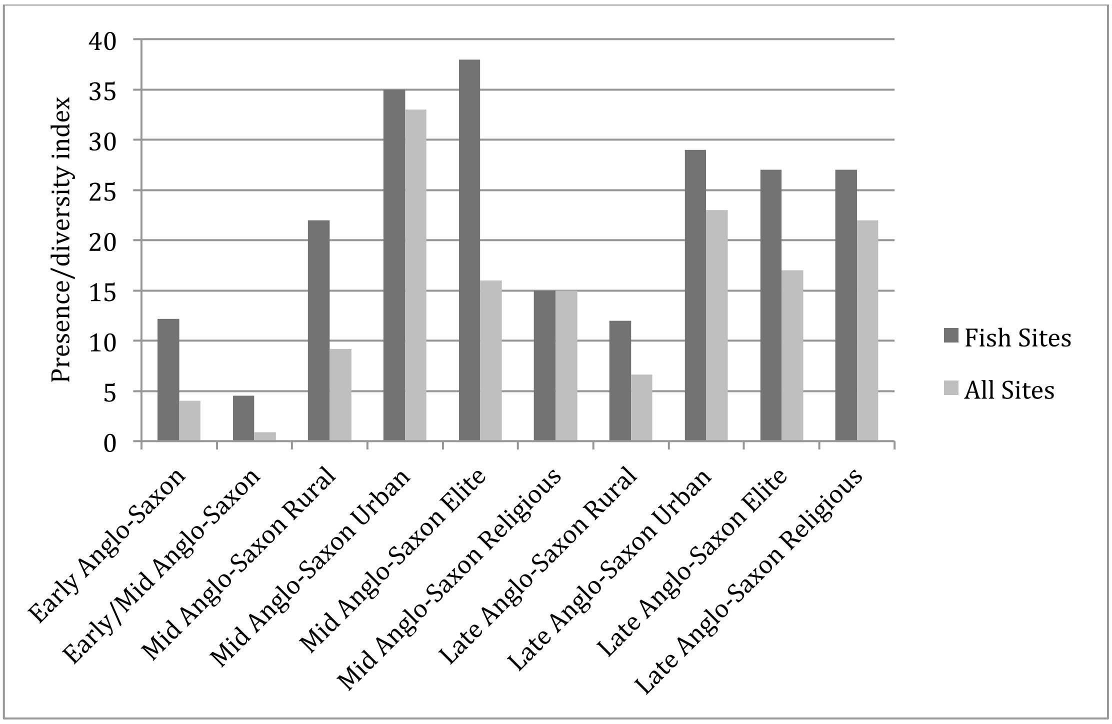



*Figure 3.18 Presence/diversity index for all site types across all Anglo-Saxon periods.*

The diversity of consumed fish is particularly high at mid Anglo-Saxon elite and urban "fish sites" (Figure 3.18). The large difference in presence/diversity index of "fish" and "all" mid Anglo-Saxon elite sites is due to the small number of sieved sites, which contained a large number of fish remains. Future excavations of elite settlements will hopefully shed more light on the role of elites in fish consumption. By the late Anglo-Saxon period, presence/diversity index values decrease slightly, though this is most likely caused by taphonomic and recovery factors, as a large number of sites dated to this period were not sieved. Previous studies argued that the greatest change in fish consumption occurred in the late Anglo-Saxon period. While patterns in the presence/diversity index suggest that variation in assemblages of fish species between site types was lower during that period, section 3.5 revealed that elites may still have preferred certain fish over others. The similarity of fish assemblages in the late Anglo-Saxon period is most likely due to a greater demand for fish and a better developed market that enabled fish to be transported further inland. Nevertheless, a degree of differentiation between site types prevails, with certain elites still targeting large fish species. It seems that elites may have played a role in instigating a taste for fish and providing fish for the urban centres in the mid Anglo-Saxon period, after which fish became more widely available.

Differences in fish assemblages within sites and between periods can be analysed using a variety methods (section 1.3.2), all with their limitations and problems. In this chapter, the presence/diversity index and relative percentages were used to assess changes in fishing throughout the Anglo-Saxon period. Fish remains from non-sieved sites were included in both analyses. This was done to provide a more complete picture of all fish recovered. Unfortunately, this approach can sometimes result in misleading results and observations.

With regard to the presence/diversity index, Figure 3.11 suggests that fish remains were recovered from several rural mid Anglo-Saxon sites, when in fact it was only two sites with very large and species-diverse assemblages. The lack of fish remains at the other sites may be due to a lack of sieving rather than a lack of demand for fish. The same may be true for several late Anglo-Saxon sites. While we may never fully understand the reasons for the lack of fish remains at particular sites, a method that can deliver a proxy for assessing patterns in fish abundance and diversity is important. Based on this, outliers and curious pattern can be explored by in-depth analyses of individual sites.

As no comparative method is perfect, this work adopted an all-inclusive approach including non-sieved sites. Other sources of evidence such as those for catching fish must also be considered and will be discussed in the next chapter.

## Chapter 4: How many ways are there to catch a fish?

Having assessed patterns in the composition of fish remains over the Anglo-Saxon period in the previous chapter, the present chapter will show which methods were used to catch different fish at different archaeological periods and how this may have impacted on the surrounding landscape and peoples worldviews. St. Wilfrid, Bishop of York and Abbot of Ripon travelled to the kingdom of the South Saxons (Sussex) to convert the population to Christianity. Bede recounts that on arrival he found the population starving, as a drought had been prevalent for the past three years. As the South Saxons knew how to catch eel but no other fish, Wilfrid's men showed them how eel nets could be cast in the sea to catch fish (Colgrave and Mynors 1969: 374-375), an act that convinced the population to convert to Christianity (Frantzen 2007: 124).

The story of St. Wilfrid suggests that some people in England during the 7th century did not know how to fish off shore. The zooarchaeological data presented in the previous chapter indicates that the evidence for the consumption of fish during the early Anglo-Saxon period is limited, though a small number of fish remains have been recovered. This chapter will look at the various ways fish can be caught, through passive means such as permanent structures like weirs or active methods using nets and hooks.

### 4.1 Weirs

Throughout the ages, fish weirs have been used to catch fish, whether along the coast, on a tidal estuary or on an inland river. Shape, form and construction material of weirs is determined by their location and the type of fish they were built to catch. Much of the available information on ancient fish weirs comes from ethnographic studies on fish catching methods (Jenkins 1974a, 1974b; Brinkhuizen 1986; Gabriel *et al.* 2004). Weirs with wicker baskets were used to catch salmon on the River Severn up to the mid 20th century (Godbold and Turner 1994). Archaeological finds of weirs have long fascinated people, and discoveries of weirs in Ireland by Went, for example, fuelled numerous studies of his (1946, 1955). Archaeological fish weirs have been discovered all over the world (see Bernick 1998). In Europe, ancient weirs are known from Denmark (Pedersen 1995), the Netherlands (Rijn 1993); Ireland (Evans 1951; McErlean and O'Sullivan 2002; O'Sullivan 1993, 1994, 1995, 1997, 2001, 2004, 2005; Went 1946, 1955), Wales (Bannerman and Jones 1999; Godbold and Turner 1994; Jones 1983; Turner 2002) and England (Bird 1999; Clark 1950; Clay 1990; Cowie and Blackmore 2008; Cohen 2011; Hall and Clark 2000; Losco-Bradley and Salisbury 1988; Salisbury 1988, 1995; Strachan 1998; Westmore *et al.* 2002; Williams and Brown 1999). Many of these finds were a result of intensive coastal surveys, such as in the Shannon estuary (O'Sullivan 2001) and Stangford Lough (McErlean and O'Sullivan 2002). In England, by the 13th century, weirs were so common on rivers that they caused obstructions for boats and even got them a mention in the Magna Carta "All kydells for the future shall be removed from Thames and Medway and trough out England, except upon the sea-shore" (Losco-Bradley and Salisbury 1988:344). In 1378, a royal commission was appointed to specifically investigate the “many weirs, mill dams, pales and kiddles fixed or raised in the waters of the Trent, impeding the passage of ships” (Losco-Bradley and Salisbury 1988: 344).

Research has shown that the various types of weirs discovered across the world are quite similar. This indicates that weirs are vital for catching fish. As well as serving as a medium for catching fish, due to their size, and the materials and labour required for their construction, use and upkeep, weirs probably played a significant part in society and in the landscape. Anglo-Saxon and medieval weirs have been recorded from various parts of England. Some authors studied the position and place of weirs in the landscape and peoples’ memory (O’Sullivan 2004), but their importance in Anglo-Saxon society and their role in the development of marine fish consumption across different levels of society has not yet been investigated. This study will describe the weirs dated to the Anglo-Saxon period found across England. The weirs found along the Severn and coast of Wales will be briefly discussed, as these could often not be dated and thus, may originate from earlier or later periods. Studies of weirs in Ireland, i.e. of Strangford Lough and the Shannon estuary, will also be discussed, as these often included the position of weirs in the surrounding landscape and will thus help interpretation of weirs in Anglo-Saxon England.

#### *4.1.2. Anglo-Saxon Weirs from England*

Within England, weirs have been found on the estuaries of some of the major rivers such as the Thames, Blackwater, along the Wootton-Quarr coast on the Isle of Wight (Westmore *et al.* 2002; Tomalin *et al.* 2012) and at Holme Beach in north-west Norfolk (Robertson and Ames 2010) (Figure 4.1). Further inland, weirs have been found on the River Trent at Colwick and Hemington Fields (Clay and Salisbury 1990; Losco-Bradley and Salisbury 1988; Salisbury 1988, 1995), at Raunds (Chapman 2010) and at Wareham (Clark 1950) (Figure 4.1). Radiocarbon dating is available for many of the aforementioned weirs (Table 4.). Barriers to trap fish, dated to the 2nd and 10th centuries, have been found on the River Witham in Lincolnshire (Gilmore 1982). In the following, weirs will be presented and discussed as by region rather than date in order to avoid confusion caused by overlapping radiocarbon dates.


*Figure 4.1 Locations of Anglo-Saxon weirs discussed in this chapter.*

| | Lab. No | BP date | Calibrated Date | Reference |
|---|---|---|---|---|
| **Blackwater Estuary** | | | | |
| The Nass | UB 4177 | 1268 ± 39 | AD 664-862 | Hall and Clarke 2000 |
| The Nass | UB 4178 | 1227 ± 24 | AD 690-882 | Hall and Clarke 2000 |
| Collins Creek | UB 4139 | 1300 ± 45 | AD 650-810 | Hall and Clarke 2000 |
| Collins Creek | UB 4140 | 1286 ± 45 | AD 650-880 | Hall and Clarke 2000 |
| Collins Creek | UB 4141 | 1262 ± 45 | AD 660-890 | Hall and Clarke 2000 |
| Collins Creek | UB 3485 | 1364 ± 48 | AD 600-700 | Hall and Clarke 2000 |
| Collins Creek | UB 3486 | 1140 ± 33 | AD 780-990 | Hall and Clarke 2000 |
| Sales Point | UB 4113 | 1144 ± 16 | AD 873-957 | Hall and Clarke 2000 |
| Sales Point | UB 4114 | 1214 ± 16 | AD 772-881 | Hall and Clarke 2000 |
| Sales Point | UB 4115 | 1251 ± 21 | AD 682-800 | Hall and Clarke 2000 |
| Sales Point | UB 4116 | 1277 ± 43 | AD 659-860 | Hall and Clarke 2000 |
| | | | | |
| **Norfolk** | | | | |
| Holme-next-the-Sea fish trap I HER38042 | GU 5800 | 1250 ± 50 | AD 660-900 | Robertson and Ames 2010 |
| Holme-next-the-Sea fish trap I HER38042 | GU 5801 | 1510 ± 50 | AD 420-650 | Robertson and Ames 2010 |
| Holme-next-the-Sea fish trap I HER38042 | GU 6012 | 1210 ± 50 | AD 670-970 | Robertson and Ames 2010 |
| Holme-next-the-Sea fish trap I HER38042 | GU 6013 | 1260 ± 50 | AD 650-890 | Robertson and Ames 2010 |
| Holme-next-the-Sea fish trap II HER38043 | GU 5802 | 1650 ± 50 | AD 250-540 | Robertson and Ames 2010 |
| Holme-next-the-Sea fish trap II HER38043 | GU 5803 | 1280 ± 50 | AD 650-890 | Robertson and Ames 2010 |
| Holme-next-the-Sea fish trap III HER39586 | GU 6028 | 1310 ± 50 | AD 640-810 | Robertson and Ames 2010 |
| Holme-next-the-Sea fish trap III HER39586 | GU 6029 | 1310 ± 50 | AD 640-810 | Robertson and Ames 2010 |
| Holme-next-the-Sea fish trap IV HER37613 | GU 6030 | 1480 ± 50 | AD 430-660 | Robertson and Ames 2010 |
| Holme-next-the-Sea fish trap IV HER37613 | GU 6031 | 1450 ± 50 | AD 530-670 | Robertson and Ames 2010 |
| Holme-next-the-Sea fish trap V HER38222 | GU 6034 | 1090 ± 50 | AD 820-1030 | Robertson and Ames 2010 |
| Holme-next-the-Sea fish trap V HER38222 | GU 6035 | 1170 ± 50 | AD 690-990 | Robertson and Ames 2010 |
| | | | | |
| **Sufolk** | | | | |
| Holbrook Bay | UB 5224 | 1135 ±17 | AD 880-975 | Everett 2007 |
| Holbrook Bay | UB 5225 | 1029 ± 17 | AD 985-1025 | Everett 2007 |
| Holbrook Bay | UB 5227 | 1312 ± 16 | AD 660-795 | Everett 2007 |
| Holbrook Bay | UB 5228 | 1260 ± 20 | AD 675-805 | Everett 2007 |
| Holbrook Bay | UB 5229 | 1269 ± 16 | AD 675-780 | Everett 2007 |
| Holbrook Bay | UB 5230 | 1287 ± 20 | AD 665-775 | Everett 2007 |
| Holbrook Bay | UB 5231 | 1323 ± 16 | AD 655-765 | Everett 2007 |
| Barber's Point, Alde Estuary | GrN 30512 | 1455 ± 25 | AD 550-650 | Everett 2007 |
| Barber's Point, Alde Estuary | GrN 30513 | 1370 ± 25 | AD 640-680 | Everett 2007 |
| Barber's Point, Alde Estuary | GrN 30514 | 1310 ± 40 | AD 650-780 | Everett 2007 |
| Barber's Point, Alde Estuary | GrN 30515 | 1360 ± 35 | AD 630-760 | Everett 2007 |
| Barber's Point, Alde Estuary | GrN 30516 | 1435 ± 30 | AD 560-660 | Everett 2007 |
| Barber's Point, Alde Estuary | GrN 30517 | 1350 ± 20 | AD 645-685 | Everett 2007 |
| | | | | |
| **Isle of Wight** | | | | |
| Wootton Quarr coast Q137 | GU 5597 | 1380±50 | AD 590-710 | Tomalin *et al*. 2012 |
| Wootton Quarr coast Q14 | GU 5256 | 1420±50 | AD 540-680 | Tomalin *et al*. 2012 |
| Wootton Quarr coast Q15 | GU 5254 | 1350±50 | AD 600-780 | Tomalin *et al*. 2012 |
| Wootton Quarr coast K16 | GU 5255 | 1350±50 | AD 600-770 | Tomalin *et al*. 2012 |
| Wootton Quarr coast K16 | GU 5591 | 1370±50 | AD 600-770 | Tomalin *et al*. 2012 |
| Wootton Quarr coast B17 | GU 5400 | 1390±50 | AD 560-690 | Tomalin *et al*. 2012 |
| Wootton Quarr P103 | GU 5592 | 1320±50 | AD 630-790 | Tomalin *et al*. 2012 |
| Wootton Quarr P103 | GU 5411 | 1450±50 | AD 540-670 | Tomalin *et al*. 2012 |
| Wootton Quarr B48/110 | GU 5399 | 1040±50 | AD 890-1040 | Tomalin *et al*. 2012 |
| Wootton Quarr B48/110 | GU 5398 | 1100±50 | AD 810-1020 | Tomalin *et al*. 2012 |
| Wootton Quarr Q44 | GU 5402 | 1010±50 | AD 890-1160 | Tomalin *et al*. 2012 |
| sea pond | GU 5053 | 1140±70 | AD 680-1020 | Tomalin *et al*. 2012 |
| | | | | |
| **Trent** | | | | |
| Colwick | Q 2030 | 1260±65 | AD 650-900 | Salisbury 1988 (Dendrochronology) |
| Colwick | UB 2351 | 1130±30 | AD 810-990 | Salisbury 1988 (Dendrochronology) |
| Colwick | HAR 552 | 1130±70 | AD 1099-1256 | Salisbury 1988 |

| | | | | |
|---|---|---|---|---|
| Colwick | HAR 846 | 1090±60 | AD 1070-1200 | Salisbury 1988 |
| Hemington Fields | HAR 8224 | 910±70 | AD 990-1270 | Bayliss *et al.* 2012 |
| Hemington Fields | HAR 8507 | 1280±70 | AD 640-900 | Bayliss *et al.* 2012 |
| Hemington Fields | HAR 8509 | 1150±70 | AD 680-1030 | Bayliss *et al.* 2012 |
| Hemington Fields | GU 5065 | 1230±50 | AD 660-940 | Bayliss *et al.* 2013 |
| Hemington Fields | GU 5066 | 1180±100 | AD 650-1030 | Bayliss *et al.* 2013 |
| Hemington Fields | GU 5067 | 1160±100 | AD 650-1040 | Bayliss et al. 2013 |
| Hemington Fields | GU 5068 | 1240±70 | AD 650-980 | Bayliss et al. 2013 |
| Hemington Fields | GU 5069 | 1090±110 | AD 670-1180 | Bayliss et al. 2013 |
| Hemington Fields | GU 5070 | 1070±60 | AD 820-1120 | Bayliss et al. 2013 |
| Hemington Fields | OxA 2288 | 1175±80 | AD 660-1020 | Bayliss et al. 2013 |
| Hemington Fields | OxA 3028 | 1240±90 | AD 640-990 | Bayliss et al. 2013 |
| | | | | |
| **Thames** | | | | |
| Putney | GU 5719 | 1540±50 | AD 410-620 | Cowie and Blackmore 2008 |
| Putney | GU 5720 | 1520±50 | AD 420-640 | Cowie and Blackmore 2008 |
| Barn Elms 1 | GU 5631 | 1470±60 | AD 430-670 | Cowie and Blackmore 2008 |
| Barn Elms 1 | GU 5630 | 1350±60 | AD 560-810 | Cowie and Blackmore 2008 |
| Chelsea 2 | Beta 196756 | 1290±60 | AD 640-880 | Cowie and Blackmore 2008 |
| Isleworth | GU 5721 | 1270±50 | AD 660-880 | Cowie and Blackmore 2008 |
| Isleworth | GU 5722 | 1250±50 | AD 660-890 | Cowie and Blackmore 2008 |
| Chelsea 1 | GU 5685 | 1250±50 | AD 660-890 | Cowie and Blackmore 2008 |
| Chelsea 1 | GU 5687 | 1250±50 | AD 660-890 | Cowie and Blackmore 2008 |
| Barn Elms 2 | GU 5689 | 1240±50 | AD 660-890 | Cowie and Blackmore 2008 |
| Barn Elms 2 | GU 5688 | 1220±50 | AD 670-900 | Cowie and Blackmore 2008 |
| Shepperton | Birm 420 | 1520±120 | AD 430 | Shotton *et al.* 1974 |

*Table 4.1 Radiocarbon dates from Anglo-Saxon weirs in England*

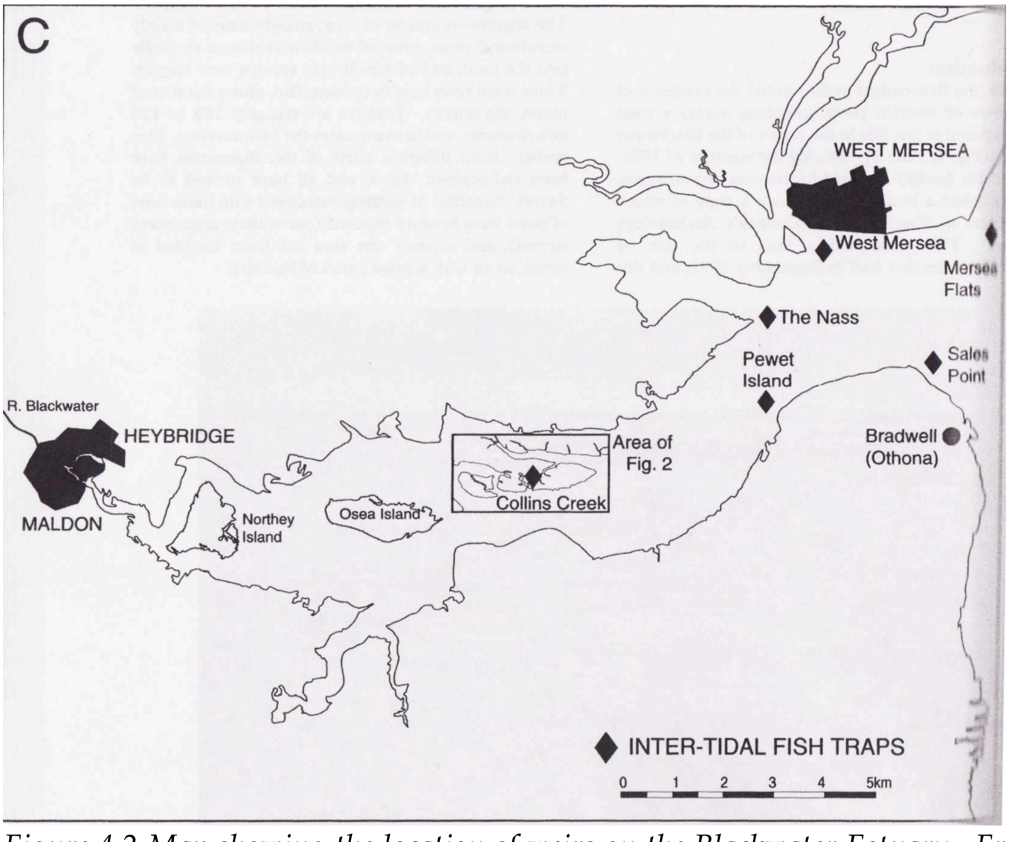



*Figure 4.2 Map showing the location of weirs on the Blackwater Estuary. From Hall and Clark 2000: Fig. 1.*

A total of seven weirs have been revealed in the Blackwater estuary (Figure 4.2). The discovery of timber posts at low tide prompted further investigations at this estuary. This involved aerial observations of the estuary's mud-flats and resulted in the discovery of more structures, of which the structure at Collins Creek was the biggest and most complex (Hall and Clarke 2000; Strachan 1998)(Figure 4.3). Various timber alignments were discovered, which are presumed to form a complex of different weirs and have been built over a period of time (Strachan 1998). The complex consists of one alignment running from east to west along the southern part of the mud-flat, another more fragmented alignment to the north of the first alignment, and a third row, which is aligned in a north-west/south-east direction. Further rows of timber are scattered around. Within the three main alignments, various structural patterns can be seen, ranging from simple single rows to single rows with raking struts that are set at slight angles. Posts are set in double rows or clear V-shaped forms. All posts are made from roundwood, which is often eroded, though bark is still visible in some specimens. They are set deep into the mud, and while it is impossible to reconstruct their original height at which they stood, they now lie just below the surface or stand at 25 centimetres. Post width varies from 10 to 15 centimetres.

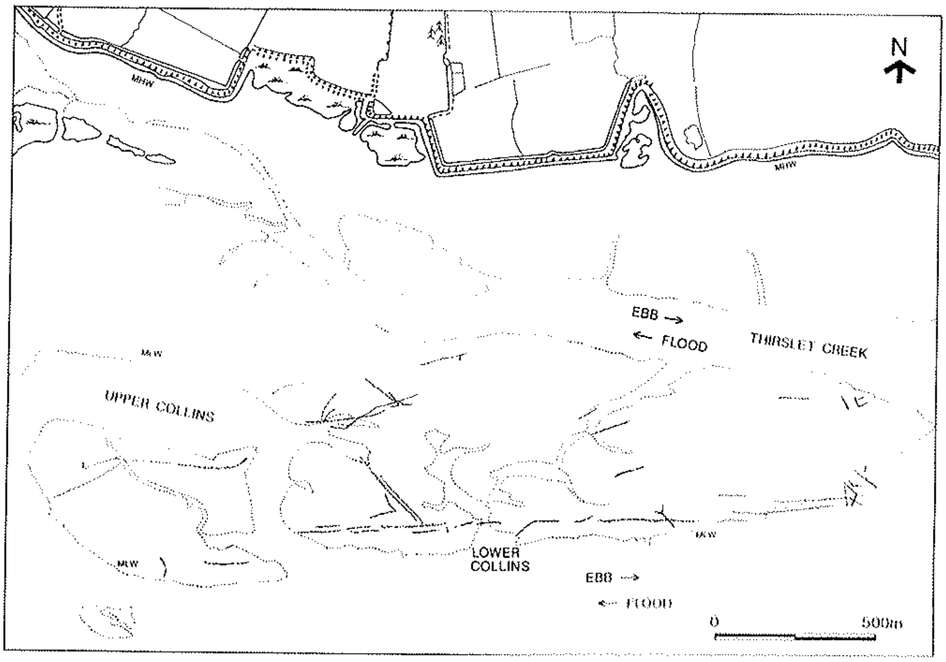


*Figure 4.3 Plan of the timber alignments of Collins Creek. From Strachan 1998: Fig. 12.*

Areas of wattling were found lying flat alongside posts and seem to have been held in position by other timber posts. These have been interpreted as parts of walkways that allowed access to the site. A small piece of basketry, thought to be part of a fish-basket, was also found (Hall and Clarke 2000: 125).

Five timber samples were collected for radiocarbon dating and dated to the Anglo-Saxon period between AD 600 and AD 990 (Hall and Clarke 2000: 134). Given this range in dates and the big size of the complex (i.e. about 3 x 0.7 km), it seems that this complex of timber posts was constructed and used during several different phases. The V-shaped structures, oriented with the apex pointing to the sea so as to catch fish during ebb tide, seem to be associated with wattle walkways.

The Nass is a single V-shaped weir south-east of Old Hall Marshes, Tollesbury (Figure 4.4). The arms of the weir measure 120 metres (north-east to south-west) and 130 metres (north-south). The north-south arm is made up of three parallel rows of posts, indicating several episodes of reconstruction. The "eye" of the weir contains an elongated "pound" trap where the fish would have been trapped before being collected at low tide. Two radiocarbon dates, i.e. 664-862 AD and 690-882 AD, are available for this weir, placing it in the mid Anglo-Saxon period (Strachan 1998: 276).

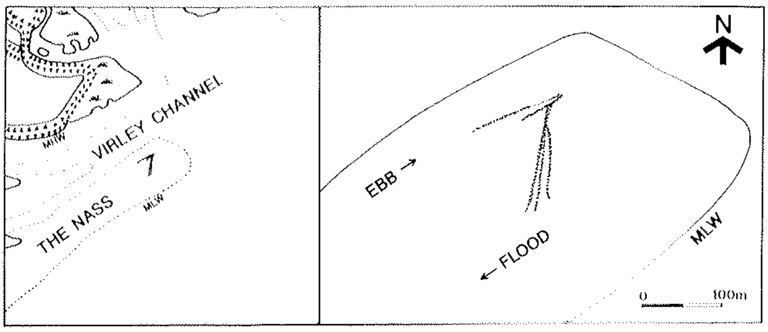



*Figure 4.4 Plan of the weir found at the Nass. From Strachan 1998: Fig.13.*

The weir at Sales Point, Bradwell-on-Sea, is very different from the other weirs found along the Essex coast (Figure 4.5). Rather than being V-shaped, it is formed of three walls in a rectangular position, which suggests its use for catching fish at both flood and ebb tides. The three walls measure 340 metres (west-north-west), 290 metres (west-north-west) and 180 metres (north-north-east), respectively. The eastern wall exhibits at least four stages of rebuilding. The rectangular form would have allowed for fish to be trapped in three areas of the weir: two at the west end of the weir, i.e. one catching fish at each flood and ebb tide, respectively, and the main trapping-area in the north-east corner of the weir catching fish at ebb tide. Just south of this main trapping-area, a single deposit of fish bones was found. These bones have not been analysed yet, but probably stem from a large fish such as cod and/or sea bass, which could easily have been caught in the estuary. Further analysis of this deposit could elucidate whether this weir also acted as a processing site, which may help explain its big size and unusual shape. On the other hand, the deposit may simply be the result of natural build up after the weir had gone out of use. Large panels of hurdling running parallel to the timber posts may represent a walkway that enabled use and repair of the weir. Fragments of basketry, probably stemming from the baskets used to catch fish, were also found. Four sets of radiocarbon dates place the construction of the weir between AD 659 and AD 957 (Strachan 1998: 279-280).

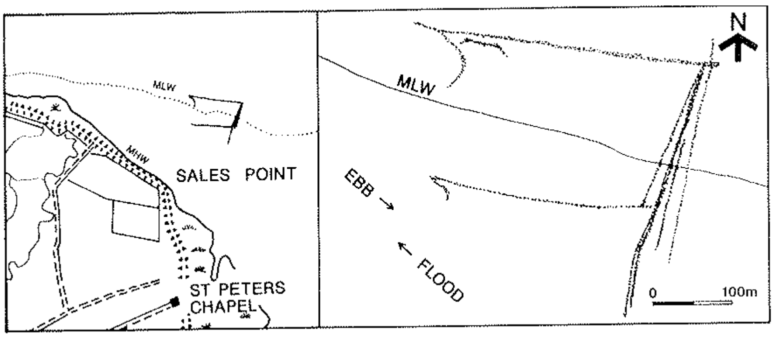



*Figure 4.5 Plan of the weir found at Sales Point. From Strachan 1998: Fig. 14.*

Three other discovered weirs have not yet been radiocarbon dated. Two small weirs, one lying inside the other, were found at West Mersea. Their walls measure between c.85 and c.100 metres, with some smaller alignments around the weirs (Figure 4.6). On the Mersea flats at East Mersea stands a very large V-shaped weir with walls measuring c.270-c.290 metres (Figure 4.7). The area behind the "eye" of this weir is very large and elongated, and the weir appears to have been reconstructed at least twice (Strachan 1998: 276). At Pewet Island, Bradwell-on-Sea, two V-shaped weirs, one built inside the other, were recorded (Figure 4.8). One of the walls of each weir is elongated and runs parallel to the current. The walls of this weir measure c.190-c.390 metres (Strachan 1998: 277). These weirs have yet to be dated, their context and associated textual evidence support an Anglo-Saxon origin. One weir and other related timber structures were recorded close to the River Stour in Suffolk at Holbrook Bay (Figure 4.9). Numerous samples were taken and have revealed dates in the later part of the 7th century with some falling later in the 9th century that suggest repairs (Everett 2007).

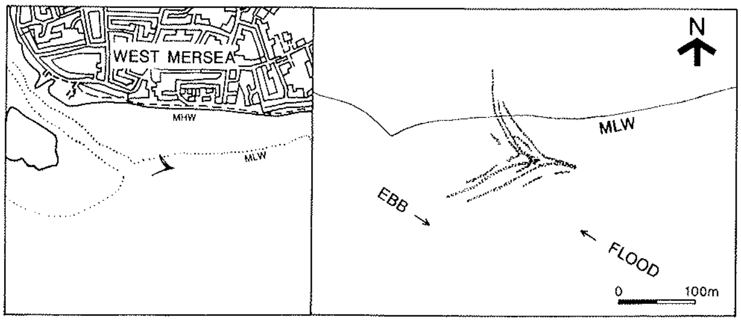



*Figure 4.6 Plan of the weir found at West Mersea. From Strachan 1998: Fig. 13.*

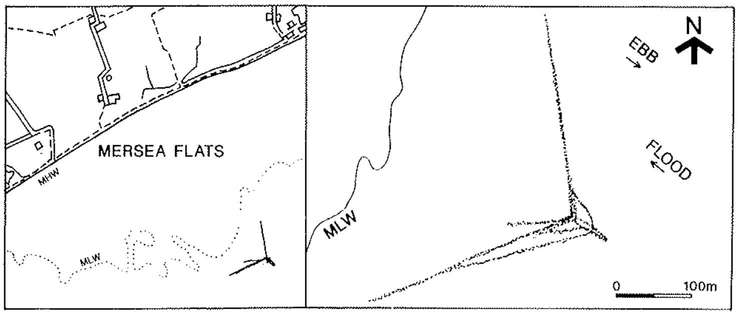



*Figure 4.7 Plan of the weir at East Mersea. From Strachan 1998: Fig. 13.*

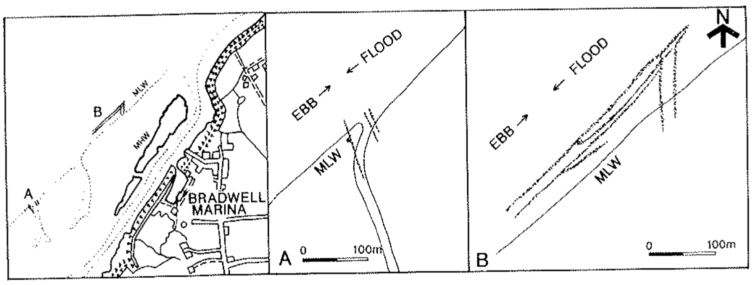



*Figure 4.8 Plan of the weir found at Pewet Island. From Strachan 1998: Fig. 14.*

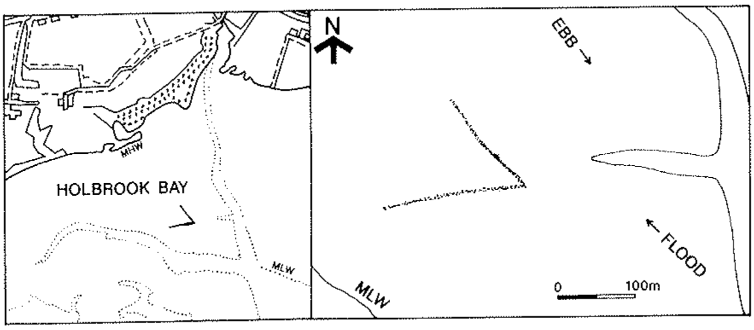


*Figure 4.9 Plan of the weir found at Holbrook Bay. From Strachan 1998: Fig. 14.*

The area of the River Thames that now lies within the modern city of London contained a very high number of fish traps and/or jetties from the Bronze Age to post-medieval period, which were probably associated with fishing (Figure 4.10). Eleven of these structures are located within the region of London; another weir is located further upstream at Shepperton (Bird 1999). Many other structures that probably represent fish traps have been found at other locations in London but remain undated (see Cohen 2011 for locations of undated weirs). Although the Thames is still tidal in this area, in contrast to the weirs discussed above, these weirs are of a riverine rather than estuarine function. As the weirs of the Blackwater estuary, many of these 11 River Thames-weirs were discovered during especially low tides. Four of these weirs were dated to the early Anglo-Saxon period, five to the mid Anglo-Saxon period, and two to the late Anglo-Saxon/early Norman period.

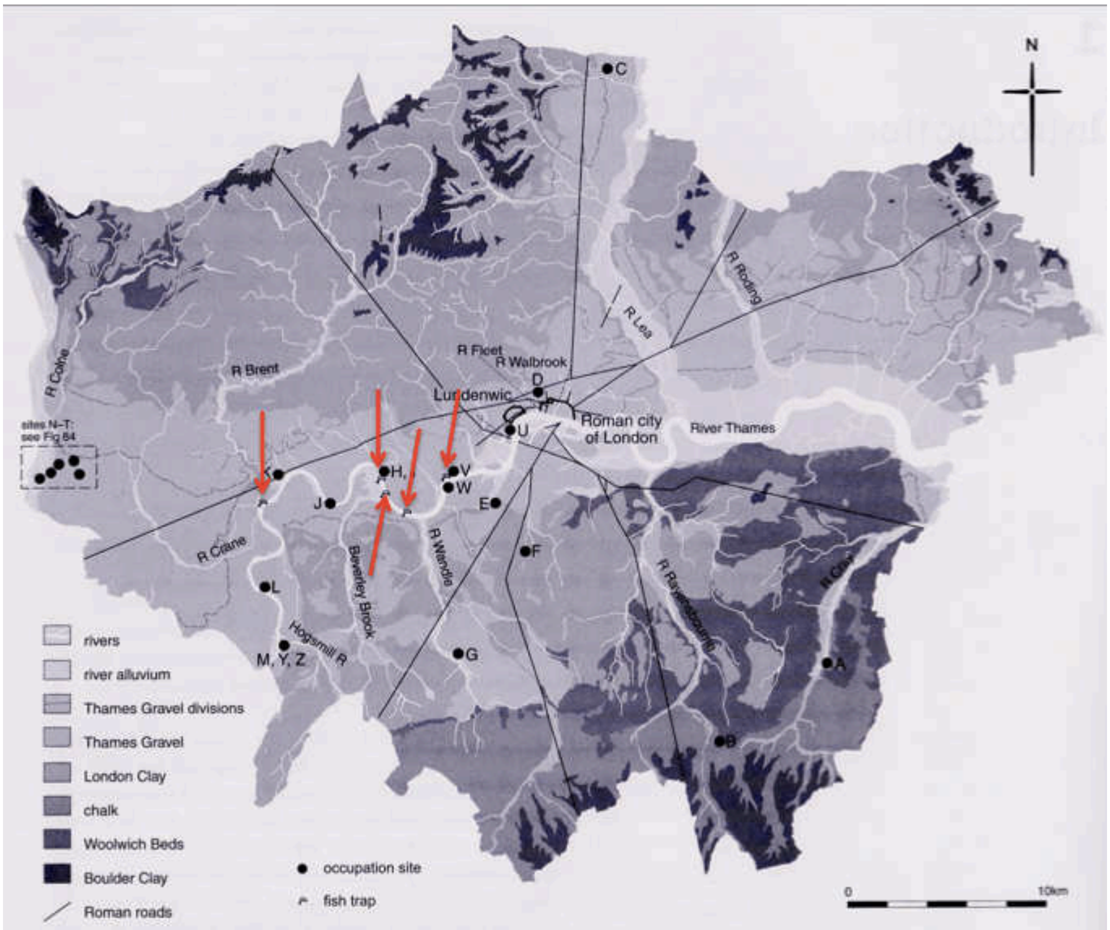



*Figure 4.10 Location of some of the weirs in the greater London area. From Cowie and Blackmore (2008).*

The oldest weirs probably date from the late Roman and early Anglo-Saxon periods. The remains of what appears to be a weir were discovered during gravel quarrying at Ferry Lane, Shepperton (Bird 1999). The identification of timber alignments during quarrying prompted rescue archaeological investigations. These revealed palaeo-channels of the River Thames and further alignments of posts. Two rows of posts were identified, measuring 21.5 and 19.5 metres in length, respectively. During excavation it was noted that the two rows of posts curved towards each other to form a V-shape and joined with a third row pointing towards them. A number of panels of wattle fencing were also found, which would have formed part of the weir walls. Associated with the timber alignments, weights that were rough and grooved, and weights with drilled holes were found. These weights were interpreted as sinkers for nets or for holding eel baskets in place at the eye of the weir (Bird 1999: 113). Radiocarbon dating is only available from one piece of wattle, which has been dated to AD 250-690 (Bird 1999: 116; Shotton *et al.* 1974:299).

The structure at Putney seems to represent one arm of a V-shaped weir (Figure 4.11). A second line of sporadic posts runs parallel to the main alignment (Cowie and Blackmore 2008: 116-118). A number of panels of wattle were also found. Additional posts were found 20-30 metres downstream and are believed to be part of the same weir. The first row of posts is 32 metres long and is made up of 45 roundwood posts. Two samples from this weir were dated to AD 410-620 and AD 420-640, respectively. A second weir is located opposite the Barn Elms sports centre (Figure 4.12). This weir differs from many other weirs discussed here, as it appears to have acted as a barrier that may have extended to an eyot. It consists of 21 roundwood posts aligned at an angle of 45° to the shore. Radiocarbon dates from two samples of this weir date to AD 560-810 and AD 430-670, respectively (Cowie and Blackmore 2008: 118).

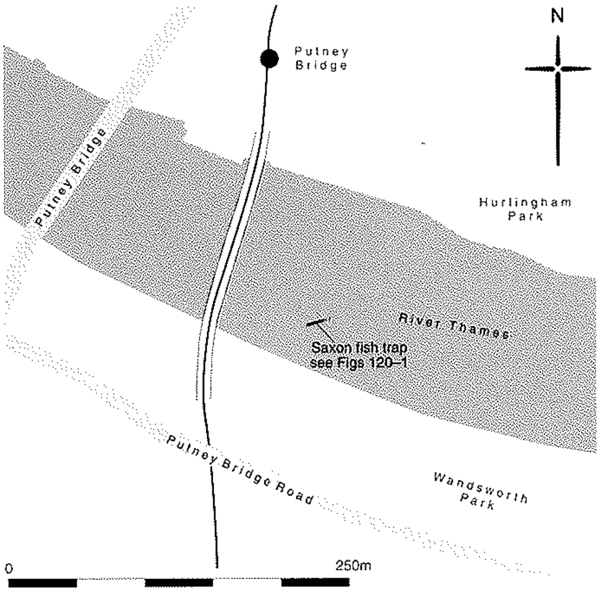



*Figure 4.11 Location of the weir at Putney. From Cowie and Blackmore 2008: Fig. 119.*

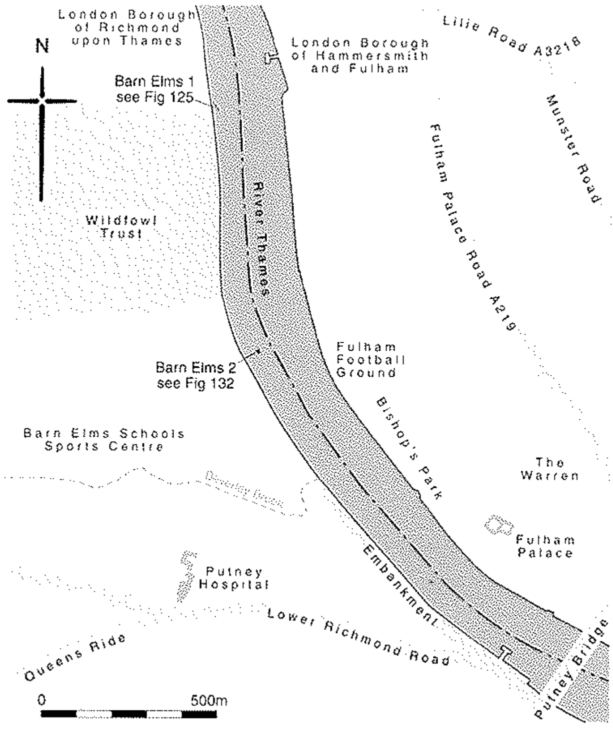



*Figure 4.12 Location of the weirs at Barn Elms 1 (early Anglo-Saxon) and Barn Elms 2 (mid Anglo-Saxon). From Cowie and Blackmore 2008: Fig. 124.*

An alignment of roundwood posts measuring 40 metres in length and dated to AD 420-592 was found at Thames Wharf in Hammersmith (Cohen 2011).

At Nine Elms, an alignment of paired posts dated to AD 500-670 was discovered (Cohen 2011: 135).

Two weirs from the mid Anglo-Saxon have been identified at Chelsea. One of these is V-shaped and has been dated to AD 660-890 (Figure 4.13), while the other one has been dated to AD 640-880 and appears to consist of a single line of posts similar to the weir at Barn Elms (Cowie and Blackmore 2008: 119-122). A second weir at Barn Elms dates to the mid Anglo-Saxon period, with radiocarbon dates of AD 660-890 and AD 670-950 (Figure 4.12). Very little remains from this weir apart from eight roundwood posts forming a V-shape. The two arms of the weir measure c.8 metres, and there is a gap at the eye where a basket would have been placed (Cowie and Blackmore 2008: 122). One weir at Isleworth is also V-shaped but includes a long line of posts extending westwards to the shore and possibly representing a walkway (Figure 4.14). Another group of posts have been identified to the south of the weir and may represent part of another walkway or a separate weir. Such as the first weir at Chelsea, this weir is made of roundwood posts though these have bases of boxed heartwood. The weir at Isleworth has been radiocarbon dated to AD 660-880 and AD 660-890 (Cowie and Blackmore, 2008: 123-124).

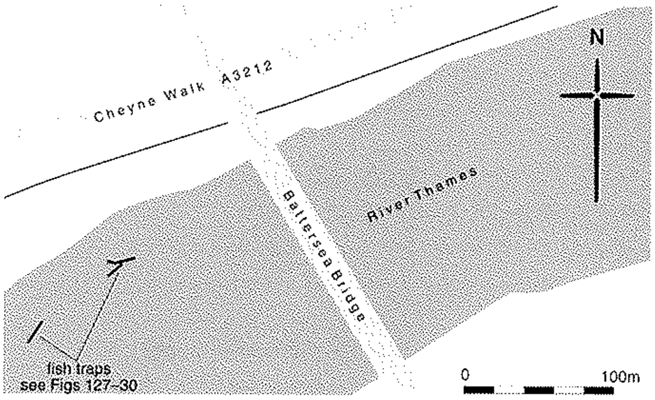



*Figure 4.3 Locations of the two weirs at Chelsea. From Cowie and Blackmore 2008: Fig. 126.*

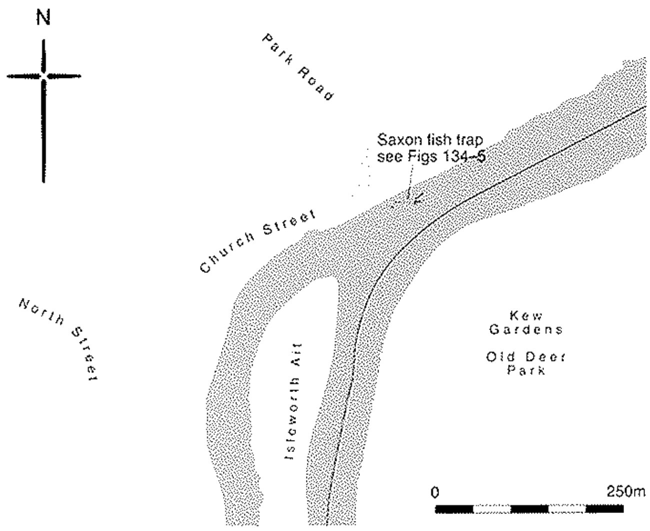



*Figure 4.14 Location of the weir at Isleworth. From Cowie and Blackmore 2008: Fig. 133.*

A survey of the Wootton-Quarr coast revealed a rich history of human activity (Westmore *et al.* 2002; Tomalin *et al.* 2012). During the Neolithic, the inhabitants of the coast most likely caught fish using large conical baskets, and corresponding remains of trackways dating from the Bronze Age have been found. The coastline, especially Fishbourne Beach, saw intense Roman trade and activity. Salt drying kilns from the Late Iron Age/Early Roman period have been found at Fishbourne and Quarr.

A number of alignments dating to the Anglo-Saxon period have been uncovered. One of these is over 1 kilometre long and stems from the middle Anglo-Saxon period (alignment Q137, Q14, Q15, K16, B17). This alignment consists of 384 stakes of various diameters spaced one metre apart (Tomalin *et al.* 2012: 210).

Only 700 metres east of this long alignment is another alignment of contemporary date, which is made of 32 posts spaced two metres apart from each other (P103). Extending from this structure is a smaller group of stakes (P184), which may form part of P103. Within the vicinity of both alignments, no evidence for hurdling or any other methods for catching fish was found. The woodworking techniques of alignment Q137-B17 suggests that it was built quickly and may have functioned as a defensive or territorial boundary (Tomalin *et al.* 2012: 211, 216). Alternatively, nets and lines, which would not have survived archaeologically, may have been set between the stakes to catch fish.

A V-shaped structure dating to the late Anglo-Saxon period was discovered on the Binstead palaeochannel (B48/110). The eastern and western arms measure 66 and 128 metres in length, respectively. Each of the arms consist of a double row of stakes, with the eastern arm additionally featuring Quarr rubble limestone blocks that run seaward (Tomalin *et al.* 2012: 219). A fragment of hurdle was found south of the weir. Within the arm of the weir, a platform-type structure of timbers and stakes was found. While this structure has not been dated, a contemporary origin is possible.

Another weir on Quarr Beach was dated to the Saxo-Norman period and comprised 30 stakes (Q44). On Fishbourne Beach, an area of black gravel extends along the shore in a crescent shape, joining with a natural limestone outcrop. This structure, featuring hurdling from AD 680-1020, which may have acted as revetment, may represent an intertidal "sea pond". The structure at Fishbourne Beach may represent the precursor of a sea pond on Wootton Creek, which in AD 1304, was owned by the medieval abbey of Quarr (Tomalin *et al.* 2012: 221). Activity along this coast and at Wootton Creek continued throughout the medieval period.

The archaeological richness of Holme Beach became apparent when an early Bronze Age timber circle was excavated in 1999 (Robertson and Ames 2010). Surveys undertaken at the same time revealed several other timber structures that have now been dated to the Anglo-Saxon period (Figure 4.15). These structures consist of a complex of V-shaped weirs and two timber fences. The first of these V-shaped weirs (HER37613) is made up of 38 roundwood posts, with arms of north-east/south-west and north-north-east/south-south-west orientation, and 35 and 16 meters in length, respectively. Available radiocarbon dates for this structure are AD 430-660 and AD 530-670. Just upstream of this weir sit three further V-shaped weirs that appear to be linked with each other. The north-eastern of these weirs (HER 38042) exhibits an eastern arm of 38.5 meters length and aligned north-north-east/south-south-west, and a western arm of 33 meters length and aligned north-east/south-west (Robertson and Ames 2010: 336). This weir was dated to AD 660-900, AD 670-970, AD 650-890 and AD 420-650. To the south-west of the western arm of HER38042 lies weir HER39586, with western and eastern arms of north-east/south-east and north/south orientation, and measuring 62 and 22 meters, respectively. The western arm still retained three panels of wattle and was dated to AD 640-810. Weir HER38222 is attached to the south-west end of the eastern arm of HER38042. This is the smallest of the three weirs with the western arm – of north/south orientation - measuring only 13.5 meters in length, and the eastern arm – of north-north-east/south-south-west orientation - measuring 14.5 meters in length. Samples of weir HER38042 were radiocarbon dated to AD 820-1030 and AD 690-990 (Robertson and Ames 2010: 336).

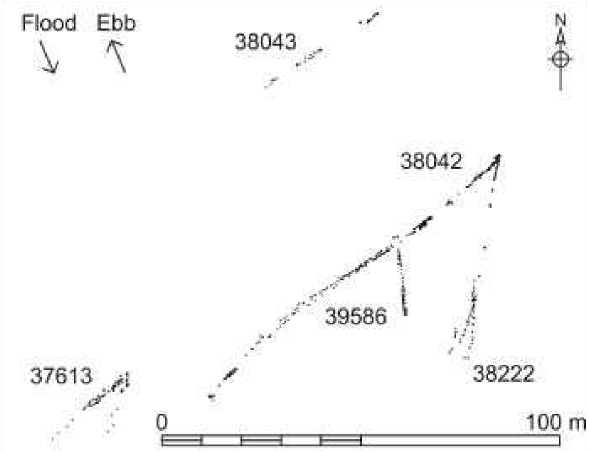



*Figure 4.15 Plan of the weirs at Holme Beach, Norfolk. The alignment of posts HER38209, 382210, 41645 is not shown on the plan. It is situated directly west of this group of weirs. (from Robertson and Ames 2010: Fig. 14)*

A row of posts of 33.6 meters length aligned in a north-east/south-west orientation are believed to represent a fish weir (HER38043). The alignment is broken up into three segments and was dated to AD 250-540 and AD 650-890. Another alignment (HER38209, 382210, 41645) is also split into three segments, measures 110 meters in length and is orientated to the north-north-east/south-south-west. While posts of this row were not suitable for radiocarbon dating, the similarity of several elements of this and Anglo-Saxon weirs HER37613 and HER38222 suggests an Anglo-Saxon origin of this weir (Robertson and Ames 2010: 337).

Several other weirs have been recorded at locations further inland such as at Wareham, Dorset (Clark 1950), incidentally a weir-related place-name (see section 4.2.2), Colwick, Nottinghamshire, and Hemington Fields, Leicestershire (Clay and Salisbury 1990; Losco-Bradley and Salisbury 1988; Salisbury 1988, 1995). The weirs at Colwick actually form a complex that includes a mill and a V-shaped weir of Norman and medieval date. Samples from post and wattling revealed dates covering most of the Anglo-Saxon period (see table 4.1). The wattle hurdle is likely to have had to be replaced on a regular basis, and the two radiocarbon dates suggest that the weir was in use from the 8th to the 9th centuries. This alignment of posts may form an arm of a V-shaped weir or have acted as a barrier, though no form of associated trapping mechanism was found (Salisbury 1988). At Hemington Fields, Leicestershire, ten miles from Colwick, a total of 40 weirs spanning the Anglo-Saxon and late Medieval periods were recorded, which enabled dating of the changing course of the River Trent (Salisbury 1995). Radiocarbon dating placed nine timber structures to the 8th and 9th centuries, and four timber structures to the 10th century (see table 4.1 and radiocarbon dates from Bayliss *et al.* 2012, 2013). One of these weirs was sufficiently complete to be identified as a V-shaped, downwards-pointing structure with arms measuring 16 and 32 metres, respectively. No visible eye was found but stone anchors in the vicinity, which may have held a basket or net in place. The direction of the weir suggests that it was used to catch eels and perhaps other freshwater fish travelling downstream. Hemington Fields also exhibited an 11th century bridge and a 12th century mill dam. Both Colwick and Hemington Fields provide evidence for the continuous use and exploitation of the River Trent for its resources whether it be fish or the power it provided.

During the excavations at West Cotton, Raunds, a complex of palaeochannels and man-made channels that feed into a series of timber water mills were uncovered (Chapman 2010). To the west of West Cotton, a number of smaller palaeochannels were discovered, three of which contained man-made timber structures that have been interpreted as V-shaped weirs. Although the age of these channels is unknown, the main channel is believed to have been redundant by the 12th century, and a similar date is assumed for these smaller side channels, which would thus be contemporary to the watermills (Chapman 2010: 150).

The best preserved structure was 5.5 metres long, C-shaped, made of stakes, horizontal planking and withes, and backed by limestone. To the North and South of this structure was a line of stakes, which likely supported a revetment. One of the other structures was set at an angle to the channel and comprised of a platform (Chapman 2010:150).

#### *4.1.3. Weirs from the Severn Estuary and the Coast of Wales*

Numerous weirs have been discovered along the Severn. Though most of the documentary evidence focuses on weirs on the English side, numerous weirs have also been found along the coast of Wales (Bannerman and Jones 1999; Godbold and Turner 1994; Jones 1983; Nayling 1999; Turner 2002). The weirs in the Severn Estuary were discovered during a survey of a small area immediately west of Sudbrook Point, which is characterised by banks and river gravels. Only one of the structures dated from the 10th– 11th century (i.e. radiocarbon dated to AD 960-1230 and AD 890-1170) (Godbold and Turner 1994: 29, 36). This structure consists of a large group of 230-250 posts in a sub-oval alignment, two sections of timber hurdling and a piece of basketry, which likely served as the actual fish trap. The alignment of posts is located in a shallower area on the seaward fringe. Considering that the structure is not orientated to catch fish either on the flood or ebb tide, the local topography probably aided in catching fish (Godbold and Turner 1994: 29). A series of V-shaped weirs that were all joined together and date from the 13th and 14th centuries were found. Analysis of the basketry remains have shown that their shape and form is very similar to those until recently used in the River Severn. Several documentary sources from as early as the 7th century indicate that the estuary was used as a food source (Godbold and Turner 1994: 44). A grant from the estate of Henbury and Aust mentions a fishery at St Peter's Church in Worcester in c. 690 (Finberg 1961: 32). A similar grant from the estate at Ombersly includes two weirs at the Abbey at Evesham dated to 706 (Godbold and Turner 1994: 44). A charter from the estate at Tiddenham, Gloucestershire, from the 10th century mentions the ownership of 64 *cytweras* (basket-weirs) and states that several of the fish, especially the marine ones, and any porpoises belonged to the lord (Robertson 1956: 207). In Domesday Book, the presence of several fisheries along the Severn, primarily salmon and eel fisheries, are mentioned (Tsurushima 2007).

A coastal survey in Wales revealed 71 weirs from several centuries and constructed from different materials (Turner 2002). Some of these, such as those in the Menai Strait (Jones 1983), form complexes, while others are singular structures. Unlike in England, stone fish traps were found at several sites in northern Wales. The most impressive of these are located in the Menai Strait (Jones 1983). The Menai Strait hosts an unusual tidal pattern, with the sea coming in from Caernafon Bay to the south-west, and the tide coming from the north a quarter of an hour earlier. This situation results in an average tidal range of six to seven metres, in turn resulting in a broad intertidal zone at low water, which is perfect for weirs (Turner 2002). These stone structures formed barriers that would trap the fish on the ebb tide. The weirs along the Severn Estuary tend to be constructed of roundwood stakes. Their shape and form is very similar to those found in England, with fences placed at the eye to direct fish into a basket or to support ranks of basket traps. In a few instances, these stakes fence off a natural pool (Turner 2002).

Stone traps are difficult to date. It is believed that they were built and used in the early medieval period (Nayling 1999). Some wooden fish traps, e.g. from the Loughor Estuary, are post-medieval in date, while the wooden traps at Magor Pill are of later medieval date. Some V-shaped weirs in the River Severn were dated to the 9$^{th}$ and 10$^{th}$ centuries (Turner 2002: 103). While weirs were found in a large number of places along the Welsh coastline, they are conspicuously absent from Pembrokeshire (Turner 2002). It is thus likely that in this area, fishing was largely done by boat. Nayling (1999) suggested that the use of weirs to catch fish was secondary to other methods.

#### *4.1.4. Weirs from Strangford Lough and the Shannon Estuary*

Groups of weirs spanning several centuries were found on the Shannon Estuary and Strangford Lough, and further individual weirs were found elsewhere in Ireland. The majority of these were made from timber posts, exhibit wattle fencing and a V-shape. However, a number of stone weirs have also been found. The weirs on the Shannon Estuary and at Strangford Lough have been the subject of in depth studies, which will be briefly discussed in the following.

The coast, inter-tidal areas and overall cultural maritime landscape of Strangford Lough in Northern Ireland have been intensively studied. Findings of these surveys included landing sites, boats, tidal mills and a great number of fish weirs. All these finds were integrated into other aspects of the archaeology and history of the area, including monasteries, Viking burials and late medieval tower houses (McErlean *et al.* 2002). The survey identified 20 fish traps, 13 of which were made of stone and seven were made of wood. A further three objects may be weirs (McErlean and O'Sullivan 2002: 146). Of the seven wooden traps, six were V-shaped and three exhibited a box-like structure in the eye of the weir for trapping fish. The walls of these weirs vary from 27 metres to 200 metres in length (McErlean and O'Sullivan 2002:151). Two weirs were radiocarbon dated to the 7th and 10th centuries, and four others date from the 11th and 13th centuries.

Considering that stone is a much more durable material than wood, the greater number of stone compared to wooden weirs is understandable. It is possible therefore that the number of stone weirs recorded is more representative than the number of wooden ones. Stone weirs are rather similar to wooded weirs in terms of size, but show a greater variety of shapes, ranging from V-shaped to crescent-shaped (McErlean and O'Sullivan 2002: 165). The V-shaped weirs can vary in style. For example, one wall may be significantly shorter than the other one (e.g. at Greyabbey), which can best be described as a "tick mark". The crescent-shaped weirs also vary in size and angle. The mechanism by which the fish were trapped in the eye of the weir is hard to establish without further excavations. The stone weir at Chapel Island West revealed a line of 20 post stumps across the eye, which suggests the presence of a wattle barrier to close the trap. Other traps have gaps at the eye of the weir. However, it is not known if this is part of the original design for holding wicker baskets to trap the fish, or due to erosion at the eye, which is often situated on top of tidal currents or streams (McErlean and O'Sullivan 2002: 169).

The difficulty of dating stone weirs has already been raised when discussing the stone weirs on the Menai Straits of Wales. Nevertheless, McErlean and O'Sullivan (2002: 178) believe that the stone weirs at Strangford Lough post-date the wooden ones. The authors argue this, because wooden weirs are known to underlie the stone weirs at Ogilby Island, Chapel Island West, Chapel Island East and South Island. It is therefore assumed that stone weirs were built to replace wooden ones at these and possibly other locations. Considering radiocarbon dates of the wooden traps as mentioned above, stone weirs may have come to replace wooden ones in the late 12th or early 13th century. Possibly, this was triggered by new ideas brought to the area by the Anglo-Normans at this period (McErlean and O'Sullivan 2002: 179).

The Shannon Estuary and its surrounding estuaries, e.g. the Deel and Fergus, have also been the subject of intensive survey, which revealed a variety of types of evidence spanning several millennia. While the earliest evidence of occupation dates to the Bronze Age, all fish weirs date to the early, late and post-medieval periods. The earliest structure, a post-and-wattle fence, was found on the Fergus Estuary and dated to AD 442-644 (O'Sullivan 2001). It seems that this represents the base of the fence comprising 25 roundwood posts, with the alignment measuring 8.2 metres. The fence seems to represent the arm of a weir that would have caught fish on the ebb tide. The surrounding area provided evidence of extensive early medieval settlement. These include various types of ringforts that were most likely the farmsteads of tenant farmers. These ringforts provide good views over the estuary. The Ballyconneelly ringfort is located right at the edge of the estuary, providing further evidence that inhabitants were actively exploiting resources such as fish from the estuary (O'Sullivan 2001: 143).

The Deel estuary revealed three weirs of medieval date, i.e. AD 1041-1208, AD 1262-92 and AD 1297-1392 (O'Sullivan 2001: 146-148). The first weir is V-shaped, with the arm closest to the shore being significantly longer than the other. There is a concentration of posts at the eye and a few rods running across the alignment after the eye, which suggests that this would have been part of the trap mechanism. The entire length of the weir, including the posts buried under the clay, may measure up to 26 metres. The two other structures are significantly smaller and only single alignments were recorded. However, it is clear that these form part of the arms of a V-shaped weir. A series of weirs were recorded on the mudflats of the Shannon Estuary near the town of Bunratty West, County Clare. Three of these are single post-and-wattle fences that may have been arms of V-shaped weirs or single fences on which baskets were hung. At Bunratty 3, two accompanying baskets were also found (O'Sullivan 2001: 157). Bunratty 4 is a multiphase complex with evidence of V- and U-shaped weirs made of post-and-wattle fences. This weir was dated to AD 1018-1159 and shows several phases of repair and reconstruction (O'Sullivan 2001: 159). It is thought that it underwent four separate phases of construction. The first phase put in place a V-shaped weir, which was later transformed to a distinct rectangular space as defined by posts at the apex, where a basket or net would have been placed. Finally, Bunratty 6 consisted of a post-and-wattle fence with a basket. A stake from the basket was dated to AD 1164-1279 (O'Sullivan 2001: 165). The fence measured at least 22 metres in length, and recovered panels of post-and-wattle would likely have been slotted in between the roundwood posts.

The basket was extremely well preserved, almost intact. It measured 4.1 metres in length and 70 centimetres in maximum width at the mouth. It is narrow in shape, and the parallel sides become narrower from the mouth at a very slight degree (O'Sullivan 2001: 170). Eight roundwood posts in a trapezoidal shape probably served as a platform on which the basket was placed or hung.

The Bunratty fish weirs probably formed part of a complex of settlements centred around the estuary. This area was an important Anglo-Norman borough, though earlier settlement is probable when considering that the Bunratty 4 fish weir was dated to the eleventh century. The settlement could thus represent either a native Irish dwelling or an outlying settlement linked to Hiberno-Norse Limerick (O'Sullivan 2001: 176). The wood of the Bunratty fish weirs were extensively analysed, which revealed that several types of wood were used for their construction. The age of the wood suggests that the wood used for the weirs came from managed woodlands from both wetland and dryland.

### 4.5 Discussion

The fish weirs from England, Wales and Ireland were described in some detail focusing on their shape and size, with interesting similarities exhibited between them. The weirs found in Ireland have been studied in great detail, which included their placement in the wider context of the surrounding landscape.

Across the British Isles and Ireland, the greatest activity in weir construction and use occurred in the early medieval period around AD 600 to AD 800. In England and along the River Severn, there was further activity in the late Anglo-Saxon and early Anglo-Norman periods. Activity continued in Wales and at Strangford Lough and the Shannon Estuary in Ireland into the late medieval and post-medieval periods. This survey of weirs in England did not go beyond the chronological bounds of the thesis. While there is considerable documentary evidence detailing the problem weirs caused to ships, other documentary evidence suggests that in some areas such as Foulness Island, Essex, weirs continued to be used and played an important role in local economies (Cramp and Wallis 1992).

With some exceptions, the majority of weirs recorded in Britain and Ireland demonstrate great similarity in shape and style. The most common is the V-shaped weir made of roundwood posts with wattle fencing to make the wall “fish tight” (Figure 4.16). The wattle fencing was sometimes interwoven between the roundwood posts probably at the site of the weir. Alternatively, the wattle was made as panels that could then be slotted in between parallel rows of roundwood posts (McErlean and O’Sullivan 2002:153). Parallel alignments of roundwood posts were found at Strangford Lough and the early Anglo-Saxon weir at Putney and Nine Elms, London. The length of weirs, and possibly also size and spacing of roundposts, were probably determined based on the size of the river or estuary and the strength of the water. Most of these weirs are ebb weirs, and riverine weirs tend to be orientated in a way that downstream travelling fish are caught.

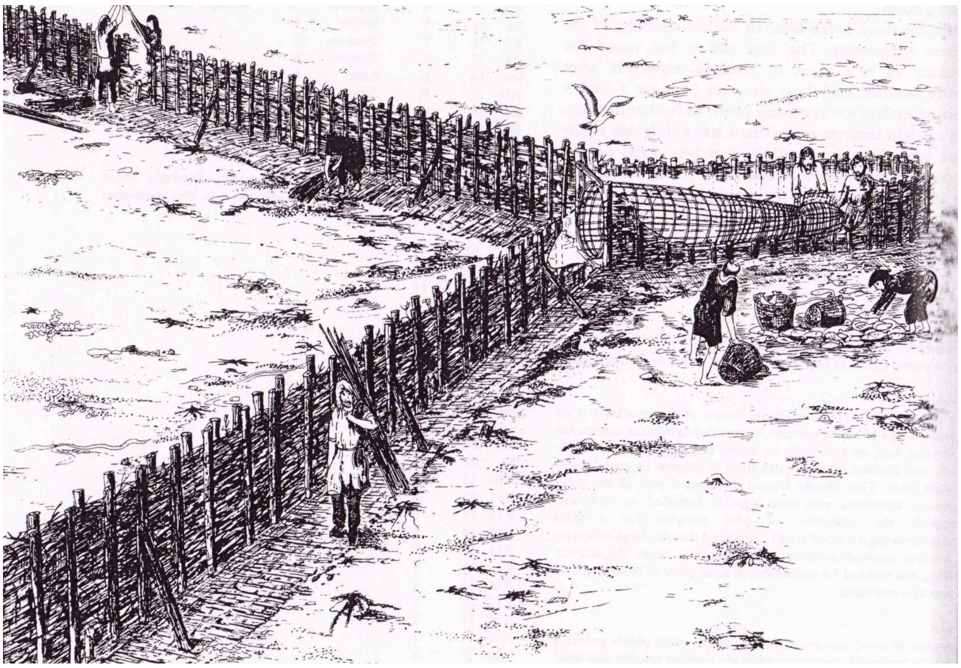


*Figure 4.16 Artist's impression of a tidal weir from Essex. From Hall and Clarke 2000: Fig. 8.*

The mechanism by which the weirs would have caught fish is unresolved due to the general lack of evidence and clues. The most common type of weir is a series of roundwood posts extending beyond the eye that could have supported a series of baskets or nets to catch the fish. In some cases, such as at Bunratty 6, a significant proportion of the basket remains. Traditional fishing methods using weirs were used until recently in salmon fishing on the River Severn. This method includes large conical baskets that are placed at the eye of the weir (Figure 4.17). The inside of these baskets were narrow and prevented the fish from escaping (Godbold and Turner 1994). The majority of the traps in England, with the exception of the rectangular shaped weir at Sales Point, Essex, probably used a large conical basket that was placed at the eye of the weir. This theory is supported by the presence of roundwood posts that extend beyond the apex. Remains of baskets were also found at Shepperton along with grooved stones that may have acted as sinkers to hold the basket in place. However, other trapping mechanisms may have been used but may need further excavations to be revealed.

*Figure 4.17 Wicker-woven fish traps known as "putts" used on the River Severn. From O'Sullivan 2003: Plate 1.*

The biggest difference between English and Welsh/Irish weirs lies in the material of construction. While timber weirs are found everywhere, later weirs appear to be made from stone. This development to stone weirs is most evident at Strangford Lough, where several timber weirs appear to be superseded by stone weirs (McErlean and O'Sullivan 2002: 178-179). In Wales, stone weirs were common throughout the north-west coast and most prominent along the Menai Strait (Jones 1983). It has been suggested that stone weirs would have been more resilient to storms and the battering of the waves, rendering repairs easier and less frequent. Stone weirs would also have had the added benefit of eventually becoming self-baiting, as molluscs and algae would attach to the rocks, thus attracting more fish (McErlean and O'Sullivan 2002: 178-179). The only stone weir from England was found at Wareham and was dated to the 12th century (Clark 1950). The scarcity of stone weirs in England seems odd when considering the advantages of building weirs out of stone. The wood of the majority of weirs from England and Ireland were studied, which showed that the timber used for the weirs came predominantly from managed woodland. Wood types that are more resistant to water such as elm and oak were thereby preferred (Hall and Clarke 2000; Strachan 1998). There is evidence for early woodland management (Rackham 2000) in the Anglo-Saxon period. This was followed by law codes such as the one of the laws of Ine, which prohibited the cutting of trees without adequate reasons. It is thus likely that the forests were under some amount of pressure (Whitelock 1955: 404). The size of some of these weirs, with arms often measuring up to several hundred metres, would have required considerable amounts of timber for both construction and repair work. Why then do we not see a progression to building weirs out of stone? Jones suggested that the stone weirs or "goredau" in Wales may be of Roman or Scottish origin (1983: 35). If the construction of stone weirs is due to Roman influence, these should also be found in England. Alternatively, the lack of stone weirs in England may be due to the fact that stones were not abundant enough in these estuaries, or that these estuaries were not suited to stone weirs. The pressure on woodland may also not have been great enough to prevent the construction of timber weirs.

The large number of weirs within the Blackwater Estuary would have necessitated large amounts of timber for their construction and maintenance. Radiocarbon dates and observations on these weirs suggest that not all weirs were contemporary. Some weirs were used over a longer period of time with continuous repairs, while others were abandoned and replaced by new ones. This would have required a large amount of labour, management and materials. Against this background, it has been suggested that these weirs would have belonged to high status, secular or ecclesiastical settlements. At Strangford Lough, the wooden weir at Chapel Island East is likely to have been contemporary with the chapel on the island, which was probably used as a hermitage attached to one of the large monasteries of the lough (McErlean and O'Sullivan 2002: 183). The later medieval weirs on the lough were also part of a Cistercian fishery (McErlean and O'Sullivan 2002: 184-185).

Domesday Book mentions a number of "fisheries" in Essex. The term "fishery" is slightly ambiguous, as it may refer to a large complex of permanent structures (e.g. at Collins Creek) or a lighter structure known as a *kiddle* in Essex. This is a V-shaped structure that uses nets to catch the fish. As this structure is relatively light, it is unfortunately less likely to survive into the archaeological record (Hall and Clarke 2000: 138-139). Domesday Book mentions three fisheries at Mersea Island, two at Bradwell, one at Osea Island and one at Tollesbury (Rumble 1983). Domesday Book records the situation in the 11th century. Many of the weirs recorded have revealed radiocarbon dates placing them in the mid Anglo-Saxon period, thus it is possible then that the weirs recorded at Mersea, Sales Point, Collins Creek and the Nass may be the predecessors of those recorded in Domesday Book. Settlements within the Chelmer-Blackwater river valley show a continuation of occupation since the late Roman period and a return to open pasture farming, which coincides with the dates of construction of the weirs (Tyler 2011).

Domesday Book also provides further information on ownership. The Domesday Book record for West Mersea mentions it belonged to St. Ouen before 1066 and among several holdings was one fishery. Bradwell Quay is listed in the lands of the Bishop of Bayeux and holds one fishery among others (Rumble 1983: 17, 18, 23). The weir recorded at Sales Point is located c. 1200 metres south of the Chapel of St. Peter on the Wall, which is built on the west gate of the Saxon shore fort of Orthona. In addition, Bede recorded that St. Cedd established a Christian mission at *Ythancester*, which is generally accepted as the Bradwell site in c. AD 650 (Strachan 1998: 280). Domesday Book mentions several eel, herring and salmon fisheries across England. This may imply the use of weirs, although herring would have been caught using boats at sea.

Robertson and Ames (2010) suggest that if a large estate built the weirs at Holme beach, this estate would have been the precursor to the hundred of Smithdon. Within the Smithdon parishes, excavations have revealed several sites that are comparable in date to the weirs. This includes the settlement at

Sedgeford, where fish bones including estuarine species like flatfish were found (Appendix 3). Two early or middle Anglo-Saxon coins were found at Holme, and a further seven in the parish, four of which originate from continental Europe (Robertson and Ames 2010: 342-343). These coin finds may indicate the presence of a commercial centre, such as a trading settlement or possibly a "production site". Several of such commercial centres, including Sedgeford, have been identified in north-west Norfolk (Davies 2010). The weirs, which are located on the foreshore as a result of the movement of the dunes, were originally located in an estuarine channel accessed by the river Hun (Robertson and Ames 2010: 341). This would have enabled easy access from slightly further inland *via* the waterways, possibly to catch or purchase the freshly caught fish.

The Nottinghamshire Domesday Book mentions 22 *piscariae*, one of which was specifically recorded at Colwick (Lasco-Bradley and Salisbury 1988: 345-346). These are noted to specifically catch eels. As these weirs are riverine, eels would be one of the most common and easiest fish to catch. An arm of a V-shaped weir dated to the late Anglo-Saxon period was discovered at Colwick A far greater number of weirs were recorded at Hemington Fields, with ten dated to the 8th and 9th century, and four dated to the 10th century (Salisbury 1995). As on the Blackwater Estuary, it is possible that some of the weirs recorded may be the predecessors to those mentioned in Domesday.

Further mentions of weirs come from Anglo-Saxon charters. The charter from the manor at Tidenham, dated to c.1050, mentions its ownership of 101 *cytweras* or basket weirs, probably specifically designed for catching salmon.

In addition, the charter mentions that "every rare fish which is of value – sturgeon or porpoise, herring or other sea fish belonged to the lord" (Robertson 1956: 207).

In his discussion of the weir found at Wareham, Dorset, Clark mentions that Wareham is first mentioned in the Anglo-Saxon Chronicle with other literary references such as William of Malmesbury, writing that Aldhelm visited the area in about AD 698. Domesday states that Wareham belonged to the Crown (1950: 100). From this, the author concluded that a weir was present in the area by the late 7th century. Several of the other weirs in England date from the 7th century. The place-name "Wareham" contains the element *wer*, which is Anglo-Saxon for weir (see section 4.2 for further discussion on place-names).

The weirs from the River Thames are significantly older: the weir at Shepperton Lane is dated to the late Roman or early Anglo-Saxon period; a structure from Borough High Street at Southwark identified as a weir on an eyeot and surrounded by three channels is also thought to be Roman in date (Cohen 2011: 135). Within one of the channels, a double fish hook and an oyster shell deposit were found. Four more weirs are of early Anglo-Saxon and mid Anglo-Saxon date. The early fish traps may be interpreted as continuing Roman activity. Several finds were made around the weir at Putney, suggesting this place remained an important crossing point (Cohen 2011: 136). The only settlement found in the area was at Winslow Road near the Barn Elm and Hammersmith weirs. Cowie and Blackmore (2008) interpreted the weirs as a vital and significant part of the environment and landscape, and most importantly as a food source.

The surrounding landscape did not exhibit any elite settlements that could have owned the weirs, though it is possible that the owning settlement was some considerable distance away. Alternatively, the weirs may have been built and managed by people that lived locally. O'Sullivan (2004) suggested that the bigger weirs, e.g. those of Strangford Lough and the Blackwater Estuary, were under the ownership of elites who were in the position to provide the vast amounts of timber required. Smaller weirs, e.g. those on the Shannon and Fergus Estuaries, on the other hand, were built by the people living along the estuary to provide fish for the local settlements and markets.

A similar theory may perhaps be applied to the weirs from the Thames. However, some of these weirs are not much smaller than those from the Blackwater Estuary. This may demonstrate a changing situation, the development of secular estates and subsequently, ecclesiastical estates. The second weir at Barn Elms was first mentioned in a charter dated to AD 704 where land here and a weir was granted to Wealdhere, Bishop of London. Further downstream at Chelsea, further mid Anglo-Saxon fish weirs can be found, and this area was also home to several ecclesiastical councils (Cohen 2011: 137).

An alternative explanation lies in the fact that during the mid Anglo-Saxon period, an urban settlement flourished in the area of London. Studies of faunal remains from the mid Anglo-Saxon urban centres have shown that they were provided with certain foods from the surrounding area (Bourdillon 1994; O'Connor 2001). Faunal deposits from mid Anglo-Saxon London have revealed plenty of fish remains, the most common species being eel, flatfish, herring and cod-like species (see Chapter 3). Eel and flatfish were probably the fish most commonly caught in these weirs. Within the urban centres, several elites were possibly present. The surrounding area may also have been host to further elite settlements, they just await discovery. Alternatively, the weirs could have been built by the inhabitants of the local rural settlements, who in turn may have sold the fish in *Lundenwic*. Studies of the find spots on the Isle of White have identified the existence of a "productive site" (Ulmschneider 2003) that is likely to have been linked to the *emporia* of *Hamwic.* The post alignment at Quarr-Binstead and the "sea pond" at Wootton Creek may be related to maritime and trade activities that took place elsewhere on the island.

Regardless of whether the weirs were owned by distant elite settlements or local ones, the people who built them, maintained them, and collected the fish from them twice a day lived along these estuaries. People living along estuaries and in wetlands were considered mysterious and were probably excluded from the rest of society. However, people began to change their perceptions in this respect (van de Noort and O'Sullivan 2006). The people who gathered the fish twice a day from the weirs would have had to adapt their life to the tides, which come and go, sometimes at "unsociable" hours, as the catch must be gathered before it was stolen. The gathering sometime had to be done in the dark, and in cold and wet conditions. O'Sullivan (2003) denies that people working on weirs would have considered themselves to have a separate identity. In fact, they were likely to also work as farmers, with the gathering of fish representing an additional source of food and possibly income.

The size of weirs is often quite considerable, so that they would have been visible even at high tide. At low tide, weirs would have been even more impressive, which can be seen even today in some of the Thames weirs, which are still visible at low tide (Plate 4.1).

*Plate 4.1 Mid Anglo-Saxon weir at Chelsea. Image courtesy of Nathalie Cohen.*

Many of the weirs discussed exhibit several phases of construction and repairs, which suggests that they would have been in use for many years. As such, they would have become an important part of peoples' lives and memories (O'Sullivan 2004). Place-names named after the presence of weirs are likely to reflect their importance in the landscape and memories of the people living around them. Numerous weir-related place-names have been identified in England (section 4.2.2). Wareham has already been discussed, as a weir has been recorded there. No other locations with weir-related place-names have yet revealed the presence of weirs, but some of these sites are situated close to recorded weirs. For instance, Edgware in London is just north of the Thames, where the London weirs were recorded. In Essex, Greater and Little Weare lie just beyond the Blackwater Estuary.

The increase of weirs in Ireland coincides with an increase in population size (McErlean and O'Sullivan 2002: 145). This growing population required more food, and fish weirs were a method of catching large amounts of fish whilst still being able to produce food by farming. In Strangford Lough, several tide mills were discovered, to which weirs were found in close proximity (McErlean *et al.* 2002). Classical Roman writers such as Pliny (*Nat. hist.* IX 78,167-82, 173) and Varro (*Re rust.* III 3,10) mentioned that *piscinae* and *vivaria* (fish-ponds) or *piscationes* and *piscatoria* (fishing-places) were constructed with a water mill. At Colwick, a Norman water mill was found as part of a complex that included a fish weir. Other water mills of Anglo-Saxon date were found at Old Windsor (Wilson 1958: 183-185; Holt 1988: 5) and West Cotton (Gaimster *et al.* 1989, 204). Not all weirs exhibit an associated water mill, such as not all water mills exhibit an associated weir, yet it is possible that the construction of weirs is related to a need to provide another source of food. In a recent study of the past exploitation of coastlines, Murphy (2010) suggested that the appearance of tidal weirs coincides with the appearance of settlements in the Fenlands (Crowson *et al.* 2000) where cereals and other grain were exploited. This indicates a general need to produce more food. Small numbers of fish bones were recovered from some of these sites such as Terrington St Clement, Walpole St Andrew and Gosberton (Baker 2005), all in north west Norfolk. This also indicates some degree of exploitation of coastal and estuarine fish resources.

The presence of weirs further provides evidence for the presence of people, who constructed weirs and thus, had a very good understanding of the rivers, estuaries and the power of the water. Irish law codes from the early medieval period state that a weir should not go all way across a river so as to allow some fish to escape (O'Sullivan 2001). In 19th century Wales, there were laws prohibiting the catching of fish in weirs that were located in proximity to the mill unless the weir was under a certain size (Jenkins 1974a). Throughout the life spans of these weirs, the people who built and repaired them understood their value, but also the need to maintain a balance with the landscape to ensure their durability.

#### *4.1.6 Summary*

A great number of estuarine and riverine weirs have been identified in England, and it is possible that a greater number await to be discovered along the coasts. All these weirs show similarities in their shape and materials of construction, indicating that the knowledge of weirs was not localised or specific to certain areas. There are differences in size, which may be related to ownership and location. Later textual evidence indicates that several weirs were owned by ecclesiastical and religious elites, but some of the small weirs may have been built and owned by local communities. The large weirs were still worked and managed by people who lived along the estuaries. Maintenance of weirs was probably an additional daily activity that could also have been seasonal. During the mid Anglo-Saxon period, small urban centres appear, and some of the weirs such as those on the Thames may have supplied these markets with fish. This would have been the case again in the late Anglo-Saxon and Anglo-Norman periods, when urban centres flourished to a greater extent.

The sizes of some of these weirs would have made them favourable markers in the landscape. It is also possible that places known for good fishing would have been known and this knowledge shared with others. The evidence for fish and weir- related place-names will now be discussed.

## 4.2 Place-names

English place-names can be divided into two types: (1) Topographical place-names are defined by the physical surroundings of the settlement. (2) The main component of habitative place-names is the type of settlement (Gelling and Cole 2000). The two may obviously overlap. In both cases, place-names will also be formed of different elements, such as personal or animal names. Identifying the linguistic origins of the different elements is complex and this is just a preliminary study to explore the potential that fish-related place-names may provide to the study of fishing on society.

### *4.2.1 Fish Place-Names*

All fish- and weir-related place-names and their locations are listed and shown in Table 4.2 and Figure 4.18. Place-names with *hærringa* elements have also been included, though the meaning of this element is debated. Parsons

(2003) proposed that the place-name Herringby, Norfolk, may not originate in the Old Norse personal name but represent a hybrid formation with the Old English (OE) *hæring*. Herring fisheries are indeed numerous in Domesday Book, and East Anglia was known for its herring fisheries in the late medieval period. With regard to fish species-related place-names, eel place-names are the most common followed by generic fish place-names. Names related to eel contain the OE word *æl or ēl.* Only two other species are mentioned, trout and eelpout or burbot *(Lota lota)*.


*Figure 4.18 Locations of English fish-related (black) and weir-related (orange) place-names.*

| | Fish place-names | 18 | Herrington, East. Sundld. |
|---|---|---|---|
| 1 | Alford, Lincs. | 19 | Troutbeck, Cumbria near Ambleside. |
| 2 | Almer, Dorset | 20 | Troutbeck, Cumbria, near Penruddock |
| 3 | Alresford, Essex* | 21 | Trouts Dale, N. Yorks.+ |
| 4 | Elford, Northum+ | 22 | Whaplode, Lincs. |
| 5 | Elham, Kent | 23 | Fangfoss, E. R. Yorks. |
| 6 | Ellingham, Norfolk+ | 24 | West Fingel, Devon.+ |
| 7 | Ellingstring, N. Yorks | 25 | Fishbourne, Isle of Wight. |
| 8 | Ellington, Cambs | 26 | Fishbourne, W. Sussex. |
| 9 | Ellington, Northum | 27 | Fishburn, Durham |
| 10 | Ellington, High and Ellington, Low, N. Yorks | 28 | Fishlake, Donc. |
| 11 | Elton, Ches. | 29 | Fishtoft, Lincs. |
| 12 | Elton, Derbys | 30 | Fiskerton, Lincs. |
| 13 | Elton, Stock. on T. | 31 | Fiskerton, Notts. |
| 14 | Ely, Cambs. | 32 | Fleet, Hants. |
| 15 | Herringby, Norfolk | 33 | Fleet, Lincs. |
| 16 | *Heryngloṅd*, Worth, Kent | 34 | Stalham, Norfolk. |
| 17 | Herringsfleet, Suffolk | 35 | Stallingborough, NE Lincs. |

*Table 4.2 Fish-related place-names. *Place names with an alternative meaning not related to fish. +Place names listed in Watt (2011) but not in Mills (2003).*

Terms that denote settlements, e.g. homesteads and farmsteads, are the most common, followed by those that are linked to rivers, channels and streams. Fords and pools are mentioned in a few place-names only. One place-name is defined as a district: Ely, Cambridgeshire. Bede describes Ely as an island surrounded by eels. The occurrence of eelpout as an element of a place-name at Whaplode, Lincolnshire, is interesting. Eelpouts resemble eel in appearance, but are purely marine bottom-dwellers. No zooarchaeological remains of eelpout have been found in any Anglo-Saxon assemblage. The name Whaplode thus probably refers to burbot rather than eel. Burbot was quite common in the past, especially in the Fens (Worthington *et al.* 2010: 375), and is also mentioned in the list of fish caught by the fictional fisherman of Aelfric's *Colloquy* (Swanton 1975). However their zooarchaeological presence is scant, only a few numbers have been found at Flixborough (Dobney *et al.* 2007). Two of the three place-names with a trout element originate from *post*-1086 and are separated by Lake Windermere.

The number of generic fish place-names is smaller than species-specific ones. In this case, environments denoting rivers, channels and streams are most common. The majority of these place-names describe places where fish may have been obtained. Only two of the respective places represent settlements, both of which are named Fiskerton (one in Nottinghamshire and one in Lincolnshire). A number of *tūn* settlements could be labelled as "functional *tūns*", where the settlement had a further asset or, in addition to normal farming activities, the inhabitants had to perform an obligation (Cole 2011: 52). These include the *ēa-tūns*, which seem to have been concerned with keeping river channels navigable (Cole 2007: 78-82). The exact function of these *tūn* settlements is not always clear. Both Fiskertons may denote settlements of regularly active fishermen or other activities related to the river. Fiskerton manor, belonging to Peterborough Abbey, was probably responsible for the causeway and ferry at Washingborough-Fiskerton (Stocker and Everson 2003: 279) from the 12th century on. An alternative explanation is that these were settlements of farmers as well as fishermen, but that fishing may not have taken place here. Fox (2001a) explained that because fishing was a largely seasonal activity, those who fished would have come from settlements further inland. The settlements occupied during the fishing season would have been small and possibly unnamed, but the settlement from which they came would be named. Excavations at Fishtoft, Lincolnshire, revealed Anglo-Saxon phases of occupation with evidence of salt making and fish remains, suggesting that fishing concentrated on flatfish during the 8th and 9th centuries (Cope-Faulkner 2012; Locker 2012). However, the "fish" element of the place-name is not present in the Domesday Book record and was thus likely added at a later time.

The *flēot* and *stall* place-names are less obviously related to fish. However, Watts *et al.* (2011) explained that *flēot* place-names refer to estuaries, inlets, creeks and/or stretches of river, thus implying fishing rights. Indeed, a fishery is recorded in Domesday Book at Fleet, Lincolnshire, which used to lie at the head of an arm to the sea. The word *stall* can mean a cattle stall as well as a fishing pool. Stalham, Norfolk, is near the Stalham Broad and could thus refer to a fishing pool. The proximity of Stallingborough, Humberside, to the Humber would support the meaning of a fishing pool. However, the origins of the elements make the meaning of this name unclear.

Most of these major place-names are only first recorded in AD 1086. However, a few have been recorded earlier. The origins of these records and their links to other settlements may be worth exploring, especially in light of Fox's (2001) suggestion on the developments of fishing villages.

Fish- related place-names are particularly common in eastern England (Figure 4.18). While several of these are located on or near the coast, a fair number are situated further inland. Eel are migratory fish, which spend their adult life in freshwater, which is why place-names with eel elements are not restricted to the coast. Fish-related place-names can indicate streams for fishing or the settlement of fishermen. These place-names do not specify the type of fish, and their distance from the coast is thus not important. There is a cluster of fish- related place-names in the northern part of the Fens, extending into parts of Lincolnshire and the Midlands. Excavations at Fishtoft in Lincolnshire have revealed a large deposit of fish remains dated to the mid Anglo-Saxon period. Smaller rural settlements located on the Fen edge also revealed small numbers of fish bones (Baker 2005). There is another cluster north of the Humber in Yorkshire and near Hartlepool. Excavations at Flixborough (Dobney *et al.* 2007) along the Humber estuary, in the city of York (Harland *pers. comm.;* O'Connor 1989, 1991) and at Hartlepool monastery (Locker 1988b) revealed vast quantities of fish remains.

Many other freshwater and marine fish were known in the Anglo-Saxon period, as attested by the species mentioned by the fictional fisherman in *Aelfric's Colloquy*. The zooarchaeological record, especially from the mid to late Anglo-Saxon period, indicates a variety of freshwater and marine fish of varying relative abundances. Eel tend to be found on the vast majority of sites in large abundance and are a very common fresh-water species, which explains the high number of place-names relating to eels. Eels are a very distinct fish due to their shape and were consumed on a great number of sites. The rivers in England are also very rich in other freshwater fish, especially cyprinids, which are found on several sites throughout the Anglo-Saxon periods. While the Anglo-Saxons differentiated between many of these species as shown by their vocabulary (Roberts and Kay 2000: 87-88), it is interesting that apart from eel, none of the commonly found species are found in place-names. Marine fish begin to appear on sites, particularly elite sites, in the mid Anglo-Saxon period. As these species would have been caught out at sea, they may not have been perceived as natural to the landscape, which may explain the lack of place-names with marine fish elements. This is despite the fact that several marine species were also named (Roberts and Kay 2000: 88). Anglo-Saxon perceptions of the sea, coastlines and fish need to be looked into in more detail, to better understand the apparent ambiguity between presence of marine fish at archaeological sites and their lack of their mentioning in place-names.

### *4.2.2 Weir Place-Names*

Table 4.3 lists all weir-related place-names in England. Several of these sites are located on estuaries, which implies that fishermen took advantage of the tides to catch fish. At locations further inland, fishing is more likely to have been performed using simple traps. In Yarpole, Herefordshire, and Yarwell, Northamptonshire, weir forms the second element of the name. In these instances, the place-names denote a pool or spring with a weir or dam for catching fish. Some even specifically denote a weir, such as Crow, Hampshire, or Ware, Hertfordshire. Weirs would have been fairly noticeable, especially at low tide, and would have served as good marking points. Rumble (2011: 40, 46) suggested a sub-category of "man-made landscape features" within the study of place-names in the landscape, in which weirs would be classified as "machinery and other structures". A settlement (e.g. Wareham) may be attached to these places. However, these may be seasonal or specifically related to the task undertaken here. As such, the habitation settlement is not the main characteristic of the place. At certain times of year, for instance in autumn when eels migrate downstream, estuarine weirs will have been visited twice a day to collect the catch after the tide had gone out.

| | Weir Place-names |
|---|---|
| 1 | Crow, Hampshire |
| 2 | Edgware, Greater London |
| 3 | Ware, Hertfordshire |
| 4 | Wareham, Dorset |
| 5 | Warfield, Berkshire |
| 6 | Wargrave, Wokingham |
| 7 | Warham, Norfolk |
| 8 | Warley, Great and Warley, Little, Essex |
| 9 | Warwick, Warwickshire |
| 10 | Weare, Somerset |
| 11 | Weare Giffard, Devon |
| 12 | Wylam, Northumbria |
| 13 | Yarpole, Herefordshire |
| 14 | Yarwell, Northamptonshire |

*Table 4.3 Weir-related place-names*

The use of weirs for catching fish during the early and mid Anglo-Saxon period has always been obvious to archaeologists (Cowie and Blackmore 2008). However, archaeological remains of weirs are rare, which is a result of the organic nature of the construction materials. Nevertheless, numerous weirs spanning the whole of the Anglo-Saxon period were found across England (see section 4.1.1). The finds of fish bones on early Anglo-Saxon sites are rare, and only a small number of weirs that fall within this early period were radiocarbon dated. However, the frequency of fish bone remains increases for the mid Anglo-Saxon period, and several large complexes of weirs are dated to this period, suggesting a change in landscape use and interaction.

Sites with weir-related place-names are more evenly distributed across England than those with fish-related place-names, though they are particularly abundant in southern and eastern England. There is a small concentration present along the eastern Thames, which is a highly tidal river. Weirs and fish traps would have been used to catch a number of different types of freshwater fish including eels and some marine fish (e.g. flounder) that swim up tidal estuaries as the tide comes in. A number of fish weirs have been located along the Blackwater Estuary (Hall and Clarke 2000; Strachan 1998) and the River Thames in the area around London (Bird 1999; Cowie and Blackmore 2008), an area very similar to the concentration of weir- related place-name evidence.

#### *4.2.3 Discussion*

Place-names have helped elucidate perceptions of landscape and belief in the early Anglo-Saxon periods (Lund 2010; Semple 2010). Fish- and weir- related place-names revealed that places were recognised as good fishing locations. Some of the first recorded dates of place-names come from Domesday Book, though they may have been used beforehand. Interestingly, not all of the fish and weir- related place-names entries in Domesday Book actually list a weir or fishery. The entries that do list a weir or fishery are: Eaton, which is held by Earl Edwin, and includes one fishery with 1000 salmon and 6 fishermen; Fleet, which belongs to Earl Ælfgar and has one fishery with 16d and two salt-pans with 2s; Fiskerton, Lincolnshire, which belonged to Peterborough Abbey but featured a manor who held three and a half fisheries worth 21d; Wargrave, which had a mill worth 9s2d and three fisheries containing 3000 eels; Weare Giiffard, with half a fishery worth 40d; the Borough of Ely, with fisheries containing 3750 eels, gifts of fish amounting to 2s3d; and finally, the Abbot, which held lots of other land with fisheries such as Wisbech with three fisherman and 3000 eels. Some ambiguity surrounds the use of the word "fishery" in Domesday Book. The word could refer to a fixed trap such as a weir (Lennard 1959: 248), but numerous herring fisheries are listed in Domesday Book, predominantly from the southeast of England (Tsurushima

2007). As such, Lennard rightly pointed out that fishing by any other means may have gone unrecorded (1959: 249). This may perhaps also explain the near complete lack of references to fishermen, as by definition and according to Ælfric's *Colloquy*, fisherman used various methods to catch fish, none of which were fixed or permanent (Swanton 1975: 171-172).

Many entries mention a mill as part of the holding. In some cases, e.g. at Wargrave and Snettisham, a fishery is mentioned alongside a mill. In other instances, only a mill is listed despite being a fish- or weir-related place-name (e.g. Elford, Staffordshire, and Fishbourne, West Sussex). In Ireland, several of the weirs found in Strangford Lough were found in mill-streams (McErlean *et al.* 2002), and many Classical writers suggest the close association of these two for practical reasons. Two mills of Anglo-Saxon date were discovered at Old Windsor (Wilson 1958: 183-185; Holt 1988: 5) and West Cotton (Chapman, 2010; Gaimster *et al.* 1989, 204). The mill at West Cotton seems to also have a contemporary weir. It is possible that smaller mechanisms for trapping fish in mill-streams were in place but not recorded or recognised by the surveyors for the Domesday Book. Alternatively, these settlements may have changed function. They may have been home to a weir or renowned for fishing previously, but due to any number of reasons, perhaps even the building of a mill, fishing stopped. As such, the fish or weir element may relate to a previous activity at the settlement. It is thus possible that several of these fish- and weir-related place-names originate from earlier dates but were only used orally.

From the place-names looked at, fish and in particular eel and weirs were common place-name elements. As evidenced by fish bones, river fishing, in particular for eels, was an important part of life and the landscape. Watery landscapes such as pools, wells and springs, seem to have been feared, as several place-names express an association with monsters and demons (Semple 2010). Metalwork deposits in rivers are common in Iron Age contexts. While this practice all but disappears in the Anglo-Saxon period, deposits continue to be placed in the River Witham, indicating that this area retained a "sacred" meaning (Stocker and Everson 2003). Metalwork deposits were found in the area around Fiskerton, Lincolnshire. While these are of Iron Age date (Field and Parker Pearson 2003), the fish related place-name may signify that this place was recognised as retaining a special meaning.

Bridges, fords and crossings were seen as important locations, possibly as assembly places. Their locations would have been vital in communication routes (Semple 2010: 31). The increase in building of weirs in the mid Anglo-Saxon period, and naming of places with fish- and weir-related names throughout the Anglo-Saxon period, may show a continued respect for watery environments. The Christianisation of the Anglo-Saxons saw the appropriation of pagan rituals and locations. In addition, it possibly removed the fear that was associated with some of these places, instead revealing the wealth of aquatic flora and fauna. The story of St Wilfrid and the South Saxons as recounted by Bede is believed to represent how in contrast to Christianity, paganism did not allow for correct and full exploitation of the landscape (Frantzen 2007: 124). Wet places may still have been shrouded in mystery due to their liminal quality. Attempts to further understand the perceptions of the sea and estuaries is required. Similarly, more information may be revealed by better understanding the links between these place-names and their surrounding landscapes. A lot of documentation suggests that weirs were built and maintained by elites, and the same may be true for early fishing villages such as Fiskerton. The relationship between fish- and weir-related place-names and elite centres may be worth further investigation.

#### *4.2.4 Summary*

Place-names are very useful for elucidating how people in the past interacted and viewed their landscape. In this section, fish and weir elements in place-names were surveyed. Eel are the most common species reflected in place-names and also found in the majority of zooarchaeological assemblages throughout the Anglo-Saxon period. Many other fish- and weir-related place-names are also recorded from across England. While the majority of these are first recorded only in Domesday Book, some of these names were already recorded in the mid Anglo-Saxon period. This probably reflects a change in the perception of landscapes and important aquatic environments, which were previously feared and perceived as mysterious. This change in perception during the mid Anglo-Saxon period witnesses an increase in fish exploitation, which is supported by zooarchaeological evidence. The presence of weirs is also reflected by place-names. What may have caused this change is very hard to discern. Elites may have played a part in increasing the demand for fish, and further investigation of the relationship of elite centres and fish- and weir-related place-names through boundary charters may be useful. While this study focused on major place-names, further study into minor place-names from the volumes of the English Place-Name society may reveal further fish-related place-names, which may help understand their meaning and importance. Nevertheless, this work revealed that fish and fishing were important activities in the Anglo-Saxon landscape.

Whilst weirs were efficient mechanisms for trapping eels and flatfish, other species such as cod would have required different methods and equipment for catching them. Available evidence for these types of fishing aids will now be discussed.

**4.3 Fishing material culture**

One of the simplest and oldest methods of catching a fish is by using bait and usually a line to pull the fish back. The bait can be placed on a sharp implement such as a hook or gorge, which gets stuck in the fish's mouth or throat. Gorges and hooks represent some of the oldest methods for catching fish, as they can easily be made from materials such as wood, bone, antler and stone (Brinkhuizen 1983; Clarke 1948). Unfortunately, wood and bone will not always survive, which makes it very difficult to understand past fishing practices. In many instances, the zooarchaeological evidence is the only source available for reconstructing how fish were caught. However, a variety of tools associated with fishing have been identified across the Anglo-Saxon periods, ranging from easily identified items such as iron fish hooks to more debatable and less understood objects such as bone net sinkers (Riddler 2006). A catalogue of objects related to fishing is provided in Appendix 1.

***4.3.1 Hook and Line Fishing***

Around 73 iron fish hooks were recovered from Anglo-Saxon sites in England. A further five fish hooks were recovered from unstratified contexts at Flixborough (Ottaway 2009), eight from Alms Lane, Norwich, without any available details or dates (Atkin *et al.* 1985), and 11 from *Sandtun*, West Hythe, probably Post-Conquest in date (Riddler 2001). Fish hooks are very uncommon finds on earlier period sites (Table 4.4). One fish hook was found during excavations at Ramsgate along with some other fishing-related objects (Riddler 2000). Five iron fish hooks and one made from copper alloy came from the early Anglo-Saxon settlement at Bloodmoor Hill (Lucy *et al.* 2009).

After the 9th century, numbers of fish hooks begin to steadily increase, with one of the biggest assemblages with a total of 12 fish hooks coming from Flixborough. Regional and chronological differences are evident. The fish hooks from Flixborough date to the 9th to 10th century, and the fish hooks from Fishergate and Coppergate, York are from the 8th, 9th and 10th centuries (Ottaway 1992; Rogers 1993). Three fish hooks were recovered from Bishopstone, East Sussex (Thomas 2010), and assigned to the late Anglo-Saxon period. In the 11th and 12th centuries, the number of occurrences of fish hooks increased, with several finds in Norwich, London and York (Williams 1987, 1994a, 1994b; Pritchard 1991; Rogers 1993; Vince 1994: 114). In the South-East of England, fishing with fish hooks among other items seems to progress. This progression continues during the medieval period, as demonstrated by fish hook finds from *Sandtun*, New Romney and Dover (Riddler 2001; Draper and Meddens 2009; Parfitt *et al.* 2006).

| | 0-30mm | 30-60mm | 60-90mm | over 90mm |
|---|---|---|---|---|
| 400-600 AD | 6 | | | |
| 600-800 AD | 13 | 1 | | |
| 800-1100 AD | 3 | 4 | 6 | 4 |

*Table 4.4 Numbers and size of fish hooks found across the different Anglo-Saxon periods.*

Almost all hooks are made of iron, either from a square or round section of metal, though a small number of hooks are made of wire. The hooks are either barbed or not; no multi-barbed hooks were found. None of the fish hooks from Flixborough were barbed. While there is no apparent chronological development from barbed to barbless fish hooks, this is hard to confirm, as the overall number of fish hooks increases in the late Anglo-Saxon period. The heads of hooks - when present - are either looped, flattened or not different from the shank. The line could have passed through the eye of the loop or just been wound and fastened around the head (Figure 4.19). A range of different sizes are exhibited by these fish hooks (Table 4.4). Fsh hooks under 30mm are the most common, with all but one Flixborough-fish hook falling into this category. Fish hooks over 90mm tend to be Post-Conquest in date, with the exception of one of the hooks from Bishopstone. Thus, a progression from small, early fish hooks to bigger, later ones is evident. Though larger fish hooks are likely to have been used for catching larger fish such as pike and cod, a large hook is not always a pre-requisite for catching large fish. Fish such as cod became more common in later Anglo-Saxon England and after the Conquest, and the numbers of fish hook assemblages also increases at the same time. All larger fish hooks are barbed. The smaller, earlier hooks are not always barbed. However, no clear chronological relationship is evident with regard to presence/absence of barbs, as some of the earlier hooks such as those from Fishergate, York, are barbed (Rogers 1993).

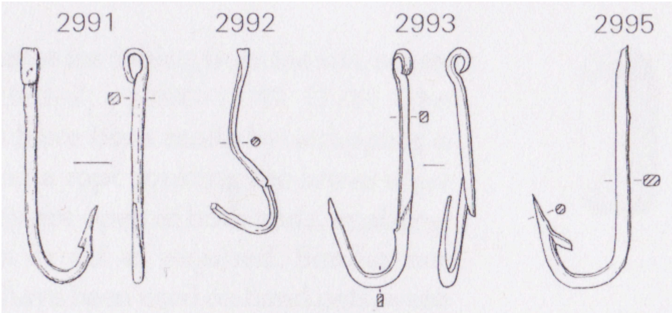



*Figure 4.19 Fish hooks from Fishergate demonstrating the looped eye and barb. From Rogers 1998.*

The range of hooks recovered suggests that fishing with a sinking line, rod and line were practised both in rivers and the sea. Those hooks found in Anglo-Scandinavian contexts in York were most likely used to catch fish in the River Ouse and the River Foss, while the two larger fish hooks from late Anglo-Saxon Bishopstone were used to catch marine fish like large cod. The hooks from the early Anglo-Saxon settlement of Bloodmore Hill were likely used to catch both freshwater and marine fish as evidenced by the associated fish species assemblage (section 3.1). Hooks made of iron may not have been the only ones used, though other materials would not have been so durable nor resistant to taphonomic processes.

Gorges - like fish hooks - would have been attached to a line, the difference being that when it enters the mouth of the fish, the gorge can pivot and get lodged, which prevents the fish from escaping after eating the bait (Figure 4.20). Gorges are more common on prehistoric sites and thought to be the oldest method of catching fish (Riddler 2006). Only three gorges were found from the periods under consideration. Two of these have a central groove, which would have helped to secure the line. The gorge from Trowbridge differs from those from Pennyland and Fishergate, as it is made of antler as opposed to bone. The Fishergate and Trowbridge gorges are similar in length, i.e. 36.5mm and 36mm, respectively. Riddler (2006) stated that gorges and pin-beaters are very similar looking objects, which may lead to misinterpretation or reflect multiple use of the same object. While pin-beaters tend to be much bigger than the gorges found in England, some gorges from Europe are similar in size to the smallest English pin-beaters. Pin-beaters tend to exhibit a smooth polished finish, which is also present in some gorges.

*Figure 4.20 Bone gorges from Pennyland (A) and Fishergate (B). From Riddler 2006: Fig. 1.*

#### *4.3.2 Weights and Nets*

Lead weights are an essential component of fishing material culture and can be used in various different fishing methods. Weights can be placed on lines to make them sink to the bottom, and they can be placed on nets to hold them in fast moving waters or to help one end of the net sink to the bottom such as in *kiddles*. Due to their organic nature, nets are rarely found archaeologically, but the charred remains of a rolled up net were found in the remains of an SFB on Palace Street, Norwich. This seems to be part of a group of craft buildings located on the riverbank, which are in turn part of the early settlement (Ayers 2009: 49-50). In contrast, lead weights are a common find on Anglo-Saxon sites from all periods. Lead weights that were used for fishing tend to be oblong or conical in form. This is as a result of how they are made: a sheet of lead is rolled, probably around a piece of cord, to form the central perforation, thereby allowing the weight to be slid on and off the cord (Figure 4.21). Many of the weights taper at the points and exhibit associated finger pinch marks. Length of these objects varies from 18mm (i.e. from Coppergate) to 61mm (i.e. from Fishergate), with most of the weights being 20-40mm long. Weight ranged from 2.4g to 59g. Some of the weights from Flixborough were loop-shaped and smaller, and thus weighed significantly less.

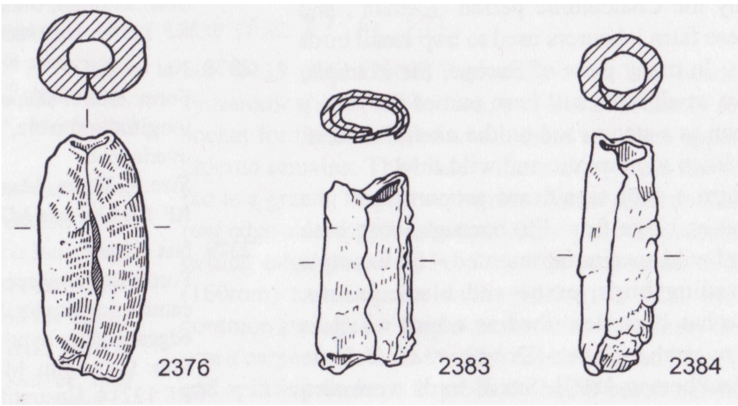



*Figure 4.21 Examples of lead weights from Flixborough. From Wastling 2009.*

Flixborough recovered the largest assemblage of lead weights with a total of 29 weights, including 16 from unstratified contexts (Wastling 2009). A variety of shapes and sizes were found. Although a number of looped and conical shapes were found, most represent variations of the common oblong cylindrical shape. The different forms may relate to different activities, and nets with attached weights may have been used for catching birds (Wastling 2009). Cowie and Blackmore (2008) noted that a large number of lead weights were found at the early settlement at Hammersmith. While it is probable that these served as loom weights, the authors note that they could have been used for a variety of other activities including fishing. Lead fishing weights may thus actually be more common than currently believed, but may have also served several additional purposes.

A small number of line and net weights made of stone or clay were also found. Four stone weights came from Fishergate, York (Rogers 1993), one from Coppergate, York (Mainman and Rogers 2000), and one from Bishopstone (Thomas 2010). Three of the stone weights from Fishergate are made of flint nodules and are naturally perforated. The other weight is made from chalk and is cylindrical in shape. The shape of this object is very similar to that of the weight from Bishopstone, which is also made of chalk but considerably heavier (i.e. 2.175kg *vs*. 479g). A chalk disc weighing 1.31kg with an incised ship was found at Cottam, Yorkshire (Richards 1994). A similarly-sized weight without incision was also found at Cottam. The incised weight has been interpreted as a net weight for fishing, while the other could be a thatch weight, though it does show signs of immersion in water. Weights with incised crosses were found at Hartlepool and interpreted as thatch or net weights (Daniels and Loveluck 2007). These may represent loom weights, but the heavy weight of some of these stone objects would have been prohibitive (Richards 1994). Two clay discs were recovered from Ramsgate, Kent (Figure 4.22). These have been shaped by hand and fired. On the inside of the perforation of one of the discs, a barnacle is attached. While based on its weight, the smaller of the two objects could be interpreted as a loom weight, this is unlikely as no contemporary parallels have been found (Riddler 2000).

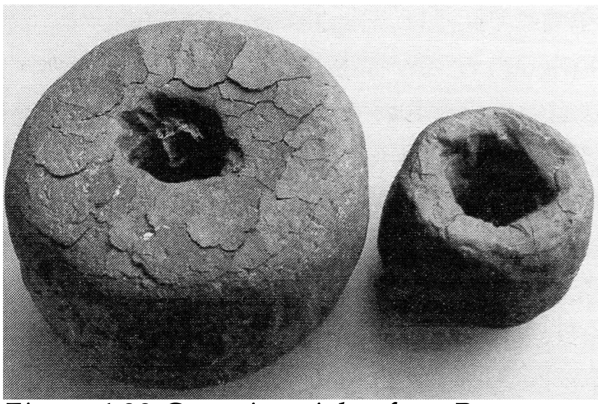


*Figure 4.22 Ceramic weights from Ramsgate. From Riddler 2000: 65.*

Another type of net sinker has been identified by Riddler (2006). These are made of axially perforated ovicaprid metapodia (Figure 4.23). The greatest assemblage of such objects comes from various excavations in Southampton, though others have been found in Ely, London and York. These objects all originate from 8th to 9th century contexts. Similar objects were found in Ribe, which Ambosiani likened to bone net sinkers used in Iceland (1981: 136).


*Figure 4.23 Net sinker. Image courtesy of Ian Riddler.*

As well as dragging a net to the bottom of the sea floor, it is important to ensure that some parts of the net remain at the surface. This is being achieved using floaters. Only one artefact identified as a floater has been discovered from the Anglo-Saxon period. Found during excavations in Ipswich, this circular disc is made of whalebone and exhibits a central perforation (Riddler 2006). Whalebone is known for its particularly buoyant properties. Floaters could also have been made of wood, which is another very buoyant material but unfortunately, does not survive very well.

Herring and other surface swimming, shoaling fish are best caught with nets. The date of introduction for the drift net has generally been placed in the 12th century (van Neer and Ervynck 2003). However, finds of herring bones from a number of earlier sites in coastal and estuarine locations suggests that fishing with a net of some sort was widely practiced. The Domesday Book also mentions numerous herring fisheries along the South-Eastern coasts of England (Tsurushima 2007). Herring begin to appear in larger numbers during the mid Anglo-Saxon period at a number of urban sites such as Ipswich, London and Hamwic (Coy 1977; Colley 1984; Locker 1985, 1988a, 1989, n.d.; Bourdillon 1993). Some of the excavations within Hamwic (e.g. Cook Street) (Bourdillon 1993) were dominated by herring bones. Against this background, the large number of axially perforated metapodia, which are used as net sinkers, is likely to be more than just a coincidence.

When fishing with nets, repairs on a regular basis are to be expected. Netting needles are most likely to have been made of wood, bone or antler; materials that do not favour preservation. An antler tine from mid Anglo-Saxon Ipswich, which is perforated at the broad end and splayed at the other, is thought to be a cordage implement used for repairing nets (Riddler 2006: 173). Three bone and antler objects from Skerne, Lincolnshire, were identified as netting needles (Dent *et al.* 2000: 233-234). This site in the Hull valley revealed a causeway onto a palaeochannel alongside numerous carpentry tools. Though no fish were found in the faunal assemblage, most likely as a result of recovery and site formation processes, the location of the finds suggests that perhaps boat building and fishing with nets took place here. Needles made from pig fibula are common finds from the Anglo-Saxon period and their uses seem to have been multi-functional and may have included netting. The interpretation of these objects may have to take into account the proximity of the site to the sea and any possible remains of fish bones.

#### *4.3.3 Discussion*

The discussion of fishing methods in Anglo-Saxon England is a troublesome subject. While several fish weirs have been identified from riverine and estuarine environments, they have very rarely been discussed in conjunction with nearby settlements with recovered fish remains. Similarly, with the exception of a few reports, the finds of fish hooks or lead weights are rarely put into the wider context of the settlement's environment. This makes it very difficult to paint a picture of Anglo-Saxon fishing. The catalogue of fishing artefacts in appendix 1 revealed that a fair number and variety of objects associated with fishing has been found in Anglo-Saxon England and can be added to the zooarchaeological data.

Data of fish remains from the early Anglo-Saxon period have shown that fishing was not a major activity. Recovered fish bone assemblages tend to be very small in numbers and consist predominantly of riverine or estuarine fish (e.g. at West Stow; (Crabtree *pers. comm.*)). Some of these fish could have been caught with a hook and line, and hooks may be made of materials much less durable than iron. In addition, other methods of catching riverine fish such as catching with bare hands or by stunning the fish, may have been used but left no archaeological trace (Brinkhuizen 1986; Gabriel *et al.* 2004). Several riverine and estuarine fish could be caught with weirs or barriers going across a stretch of river. These would have been made of timber and therefore not have always survived. Several such structures were identified from the mid Anglo-Saxon period and a smaller number to the later part of the early Anglo-Saxon period (e.g. weirs at Ferry Lane, Shepperton, and Putney and Barn Elms, London) (Bird 1999; Cowie and Blackmore 2008).

In the middle Anglo-Saxon period, the zooarchaeological record and fishing material culture begins to change. Fish bones appear on several sites, small urban centres and elite settlements. In addition, the species of fish represented across these sites changes, which may be associated with a change in the methods used for catching fish. Flixborough contained the biggest assemblage of fish bones from the mid to late Anglo-Saxon periods and the biggest assemblage of artefacts relating to fishing. The assemblage largely consisted of freshwater and estuarine fish, particularly flatfish, but also contained remains of marine mammals, porpoise and bottle nose dolphins. None of the fish hooks were particularly large, but they would have been big enough to catch freshwater fish and some estuarine fish. Lines with baited hooks may have been drawn across river sections, attracting estuarine fish moving up with the tide. The weights could have been used in conjunction with the lines and nets that could have been temporary barriers in the estuary. The porpoise and dolphin are thought to have been herded up the estuary and killed close to the settlement. Herding and killing was probably done with the aid of river crafts using nets and spears, a method known to have been used for hunting large and small marine mammals

(Szabo 2008), as well as big fish. Spearing of big and small fish is popular in several parts of the world and considered as a sport in some parts (Gabriel *et al.* 2004). It requires a spear, which can also be used to kill land mammals, illustrating that fishing-related objects can be used in various aspects of daily life. The similarity of objects used in fishing and other aspects of daily life will be discussed further below.

Other elite sites from the mid Anglo-Saxon period, such as Lyminge and the earlier periods of occupation at Bishopstone, have revealed assemblages dominated by marine fish, particularly cod and herring. The cod found at both sites were large and were probably caught using a hook and line. The possibility of cod-fishing as a sport or form of hunting at sea for certain elites is discussed in chapter 7. In both assemblages, herring, mackerel and horse mackerel are present to some degree. These three species are shoaling surface swimmers and were probably caught in nets. Neither of these sites revealed large numbers of weights. Tsurushima (2007) suggests that herring were caught by a large group of people, which either came from the same community or were drawn from several communities but worked under the command of a lord or person of wealth. It is possible that the remains of fishing equipment (e.g. weights and netting) may be deposited at outlying communities rather than the settlements where the fish were consumed.

The fish assemblages found at urban settlements from the mid Anglo-Saxon period are largely made up of freshwater species, with some estuarine and sometimes a small number of marine fish. Most of these species could have been caught in a variety of ways. Tidal and estuarine weirs would have helped to catch many species including eel, flatfish and even small cod. Perforated stones were found at two excavated weirs, i.e. Ferry Lane (Bird 1999) and Hemington Fields (Salisbury 1995). No fish bones were found in the vicinity of these weirs, but the various excavations from mid Anglo-Saxon London revealed freshwater, estuarine and marine fish, most of which could easily have been caught in weirs. Bone net sinkers were also found at these settlements (Riddler 2006), and some of these assemblages such as Ipswich (Locker and Jones 1985) and Lyceum (Locker 2003) did reveal many herring bones. It is possible that within these urban contexts, fishing with a net was a communal activity, possibly also commanded by a person of wealth.

In the late Anglo-Saxon period, the number of sites with fish remains increases, which are no longer limited to coastal and estuarine sites (section 3.5). The proportion of marine fish in assemblages as well as the number of sites with fishing artefacts also increases, although the number of fishing artefacts per site is not always high. Isotopic studies on cod from various urban centres in England has shown that these fish were coming from local waters. Long distance trade in preserved cod did thus not take over the English market until around the 13th-14th century (Barrett *et al.* 2011; Orton *et al.* 2014). The fish hooks from the excavations in Norwich and from Saxo-Norman London are supplemented by large fish hook assemblages from Kings Lynn (Rackham *pers. comm.*), Great Yarmouth (Rogerson 1976), *Sandtun* (Riddler 2001) and Dover (Parfitt *et al.* 2006). These finds are likely associated with expeditions into local waters to catch bigger marine fish. Cod sizes from these 11th and 12th century urban centres are unfortunately unknown as sizes of the fish recovered are hardly ever mentioned in reports. The number of weights used in line and/or net-fishing may also have been high but this is not directly visible from the archaeological record.

Brinkhuizen (1986) and Gabriel *et al.* (2004) assessed the various methods and tools required for catching different fish. It is evident that numerous methods of catching fish would not have left any archaeological trace and that there is no one way of catching particular species of fish. From the archaeological record it is possible to identify objects that could presumably only have been used for catching fish or be related to fishing (e.g. needles for repairing fish nets). However, some of the more recent finds such as the clay discs or perforated metapodia, their interpretation as fishing implements is not entirely clear. Archaeological recognition of fishing equipment is probably fairly new with the exception of obvious fish hooks. This means that it was difficult to reconstruct the full complexity of the methods and materials used for fishing in Anglo-Saxon England. Riddler (2006) also highlighted the fact that some objects have different interpretations in different countries. Very common bone needles, such as probably many other objects, could have served various uses. Gabriel *et al.* argue that one way of catching flatfish is by disturbing the sandy bottom they hide in using an object that looks very much like a rake (Gabriel *et al.,* 2004: Fig. 7.13), a common agricultural tool. Eels are often caught with a spear that may also have been used to spear other animals (Gabriel *et al.,* 2004: Fig. 6.4 and 6.6). The pin-beaters found in England generally tend to be bigger than the few finds of gorges, but an used or broken pin-beater could be re-formed into a gorge. The trajectory or "biography" of an object has shown that an object may serve many different purposes before being discarded (Kopytoff 1986; Gosden and Marshall 1999).

Against this background, it is easy to see that many different tools could be used to catch fish as well as in other aspects of daily life. The spears used to kill the dolphins at Flixborough may also have been used to hunt deer, another animal whose bones were found at the settlement (Dobney *et al.*, 2007). The lead weights likely attached to nets to catch fish may also have been used to catch wild birds, especially those found in wetland environments. Multiple uses of fishing materials thus hamper their identification. One possible approach of identifying fishing-related artefacts may be an investigation of settlements in their wider context and environment. If a settlement is close to a watercourse or the coast, and fish remains are present in the zooarchaeological assemblage, chances are that some fishing-related artefacts will be present among the finds.

Both weirs and line and hook-fishing may have required the use of boats or small water craft. These will now be briefly reviewed.

**4.4 Boats and Water Craft**

The fish caught in weirs may have been collected on foot at low tide or from the riverbank by way of a jetty, which were, for example, found at Holme Beach, Isleworth and Skerne. Similarly, hook and line fishing for cyprinids or small inshore marine species could have taken place from land. However, the size of several of the species found throughout the Anglo-Saxon period indicate that boats were used to collect fish from weirs and for line-and-net catching at sea. Boats will have been used for a variety of activities including raiding, piracy, migration and trade. Numerous written works tell about the voyages of saints such as that of St Wilfred going to Gaul (Haywood 2006:

107). Evidence also comes in the form of coinage, artefacts and ideologies. This evidence suggests that contact and communication across Europe did not disappear entirely after the withdrawal of the Romans and that transport will have required boats (McCormick 2001). Unfortunately, evidence for boats in Anglo-Saxon England is limited.

Much of the evidence for boats comes from burials. Three boats from the 5th-7th centuries were recovered from Snape, i.e. one clinker-built and two logboats. Two clinker-built boats from Sutton Hoo along with several fragments of boats found in three other burials were dated to the early half of the 7th century (van de Noort 2012: 207-208). Two of the boats from Snape and those from Mound 1 and 2 from Sutton Hoo only exist as imprints in the sand. A late Anglo-Saxon clinker-built boat was discovered in Graveney, Kent (Evans and Fenwick 1971).

Woodworking tools associated with the construction of clinker boats and clench nails have been found at Flixborough (Loveluck: 2007: 104). The hull of these boats is made of overlapping planks that are fastened together with large nails and strakes that are lashed to the frame (van de Noort 2012: 169). The boats were steered using a single-side rudder, and a sail and keel was added by the 9th century (van de Noort 2012: 170). The use and development of the sail is the subject of much debate. Some boats, such as those from Sutton Hoo, are thought to have been powered by rowing, though a scaled down replica has shown that the structure of the hull is sturdy enough to hold a sail (Gifford and Gifford 1995). A large number of pictorial representations of boats are found on coins minted at Dorestad (Lebecq 1983: 167) and

Hedeby (Haywood 2006: 76). The Dorestad coins depict a rounded boat with a central single mast, a side rudder at the stern and objects that could be interpreted as oars. However, these latter objects are sometimes astern of the steering oar, so it is possible that these markings actually represent waves (Haywood 2006: 177). Some of the coins from Hedeby depict a Viking longship, while others show a flat-bottomed boat with steep straight sterns and a single mast with a square sail, probably representing a trading cog (Haywood 2006: 177)(Figure 4.24).

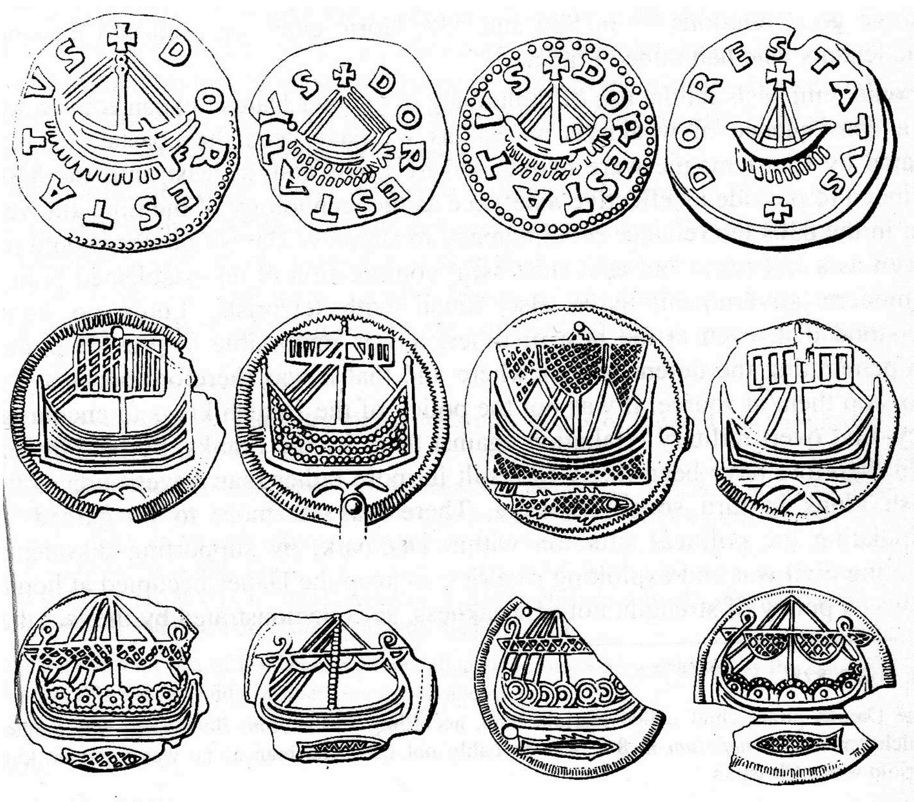


*Figure 4.24 Early 9th century coins from Dorestad (top) and Hedeby (middle and lower). From Haywood 2006: Fig. 16.*

It is, however, very unlikely that any of these boats would have been used for fishing. Haywood believed that the Sutton Hoo boat from Mound 1, as well as the boat from Nydam, Denmark, were prestige ships (2006:96). The boats depicted on the Dorestad and Hedeby coins likely represent mercantile ships, which could carry heavy loads and required more manpower than required for coastal fishing. Individual or pairs of fishermen such as the one described in Ælfric's *Colloquy*, probably used small boats that could be powered by rowing or paddling. These could have been built with wooden planks or from hide. Several Classical authors described that the natives of Britain used hide and skin boats (van de Noort 2012: 152). Such boats are also assumed to have been the preferred method of transport for early medieval Irish monks. Tales often described the perils of sea travel, including sea monsters that almost pierce the hide (van de Noort 2012: 152).

England has a long history of log boats, dating from the Bronze Age to the later medieval period (McGrail 1978). Some of the logboats that have been dated to the Anglo-Saxon period (Table 4.5) were discovered at the beginning of the 20th century, were not scientifically dated and unfortunately, were subsequently lost to the scientific community (e.g. logboats from Newcastle and Horsey).

| **Boat Name** | **Date** |
|---|---|
| Amberley 3, Sussex* | 1310 ± 70 BP c. 640 AD |
| Warrington 11, Lancashire* | 950 ± 90 BP c. 1000 AD |
| Walton-on-Thames, Surrey | 405-530 AD |
| Langstone Harbour, Hampshire | 400-620 AD |
| Snape, Suffolk+ | late 6th/early 7th |
| Walthamstow, London ++++ | 750 AD |
| Clapton, London ++ | 950 AD |
| Waltham Abbey, Essex | 960 AD |
| Hamble, Hampshire +++ | 668-704 AD |
| Sandwich, Kent | AD 970-1160 |
| Everton, Nottinghamshire | AD 460 ± 80 |
| Reading | Roman/early Saxon |
| Barton logboat, Trafford | 920 ± 65 AD and 985-1240 AD |
| Normanton, Yorkshire | 990 ± 70 AD |
| Newcastle | Probably Anglo-Saxon |
| Horsey | Probably Anglo-Saxon |

*Table 4.5 Known Anglo-Saxon logboats and their dates of origin. *From McGrail 1978. +From Filmer-Sankey 1990. ++From Marsden 1989. +++From Whitewright 2010. ++++From Switsur 1989. All others from www.pastscape.co.uk (accessed 01/11/2014)*

Herring-fishing is thought to have involved several boats acting together, often under the auspices of a wealthier person who owned the boats (Tsurushima 2007). These small fleets would have helped minimise risk and facilitated the catch of herring using nets. As such, whether fishing alone or as part of a group, small, easily maneuverable boats would have been essential.

**4.5 Summary**

This chapter has reviewed the various methods by which fish was caught throughout the Anglo-Saxon period. Fixed structures such as estuarine weirs were common features on the River Thames and Blackwater estuaries. More active methods of catching fish, such as by hook and line, were also used. Overall, there is a lack of evidence of materials used for catching fish in the early Anglo-Saxon period. Some weirs, e.g. from Shepperton Lane, are believed to represent the transition from the late Roman to the early Anglo-Saxon period. Other structures, e.g. at Putney, Barn Elms, Nine Elms and Hammersmith, were dated from the early Anglo-Saxon period and, in some instances, later periods. This situation can be interpreted as two scenarios. Firstly, the weir was built in the early Anglo-Saxon period and continuously repaired in the mid and late Anglo-Saxon periods. Or secondly, the weir was built in a later period using wood that was felled during a much earlier period. Some fish hooks were found from the 7$^{th}$ century. Although no "fishing" boats were found from that period, the primary boat evidence also comes from the 7$^{th}$ century. The end of the 7$^{th}$ century sees the emergence of *emporia*, i.e. estuarine settlements specialising in various crafts, recipients of imported goods and assemblages rich in fish remains. The beginning of the 7$^{th}$ century also marked the beginning of the slow conversion of people to

Christianity in the south of the country by the Augustinians. The boat burials at Sutton Hoo may represent kin ties with Scandinavia and the Baltic, and demonstrate common ritual practices (Carver 2005: 501). However, these burials must also be seen in the context of a time when Christianity was spreading, cosmology and belief systems changed, and maritime outlook increased. Latter is evidenced by the increase in cross-channel trade, as shown by numerous imports at coastal rural and elite settlements (Loveluck 2013; Loveluck and Tys 2006).

The mid Anglo-Saxon period witnessed a dramatic increase in the number of coastal and estuarine weirs. This trend continued during the late Anglo-Saxon period, when many of the earlier weirs were still being used and repaired. An increase in the number of weirs in Ireland at a similar period is linked to a growing population and the construction of water mills. However, as yet, there is not much evidence in England linking water mills with weirs. Nevertheless, it is evident that ecclesiastical and secular elites sought to own pre-existing weirs or construct their own; a trend that continues into the late Anglo-Saxon period. Fish hooks and evidence for other fishing materials appear in large numbers at Flixborough as well as some of the *emporia*. Fish hooks increase dramatically in numbers in the urban centres of late Anglo-Saxon England, especially from contexts of the 11th century. The role of elites in driving marine activities is difficult to establish. Van de Noort argued that as the sea was perceived as a liminal, marginal and socially inhospitable space, the engagement with the North Sea was not led by the terrestrial elite (2012: 174). However, imported goods are often found on elite sites, as are marine fish bones such as cod and herring (e.g. at Lyminge, Bishopstone and

Sedgeford), as well as cetacean bones (i.e. at Flixborough). Textual sources (discussed further in section 6.3) indicate that elites tried to control marine resources such as fish. Tsurushima (2007) argued that herring was fished at the request of elites and probably done using several boats. The use of landing sites for fish, the presence of fish traps and locations known for fishing are likely to have made a lasting impression in people's minds and in the landscape and may therefore explain the existence of fish- and weir-related place-names. Looking at weirs, place-names and fishing material culture has shown us that fishing is likely to have had an impact on many people, both elite and secular. How this may have defined their identities will be discussed in the next chapter.

# Chapter 5: Fishing for Identities

## 5.1 Introduction

Previous chapters have shown inter-period and inter-site variation in the representation of fish and the various methods by which different species of fish were caught in the waters surrounding England. It is clear – particularly from the bones recovered from cesspits that show crushing and acid-etching, indicative of digestion – that humans were eating fish; however we do not know if fish consumption was universal or limited to a small percentage of settlement inhabitants. Fish consumption may have been determined by a variety of factors such as sex, age, and social standing. Alternatively, no such factors may have existed. Anglo-Saxon society was made up of a variety of different groups: men, women, young, old, monastic men and women, people of higher and lower status, and Vikings and other ethnicities. All of these identities will have been negotiated and defined through different daily actions such as interacting with the landscape and food consumption.

Establishing gender and age roles in the production-consumption cycle is very important as it can also help to understand how certain food types were viewed within the natural environment, which in turn reflects who may or may not consume them. Domestic activities have traditionally been interpreted as being the domain of women. This is largely due to the fact that women have often been seen as invisible in the archaeological record unless distinct sexual differences are visible – such as skeletal differences in a grave (Gilchrist 1997; 1999). Much of our views on the interactions of men and women and their respective roles in Anglo-Saxon England come from ideologies entrenched in the ideals and perceptions of the 19th and early 20th centuries, where a woman's place was seen as in the home (Lucy 1997). Such ways of looking at gender are common throughout archaeological interpretations (Gilchrist 1999). Accompanying grave goods, common during the early Anglo-Saxon period, have often influenced the interpretation of the sex of the individual; closer examination of the burials and artefacts showed that the accepted belief that weapons and tools were associated with men and jewellery with women was not always correct, and it offered a too simplistic view of gender (Knüsel and Ripley 2000; Lucy 1997). Attention has recently been drawn to the limitations and possible inaccuracies of such ways of thinking, and attention is shifting to identifying the different roles of women in the past (Gero and Conkey 1991; Moore and Scott 1997). For instance, knives have often been found in female graves of the early Anglo-Saxon period (Härke 1989), but only large knives are found in male graves. These larger knives become more common in the 7th and 8th centuries and Sykes (2010a) has pointed out that this increase coincides with the increase in deer exploitation as well.

Similarly, rules and beliefs surrounding the consumption of certain food types will also relate to their production and distribution. Within the later medieval period, humoural balance was central to everyday life (Scully 2005; Arikha 2007; Jones 2013), and while it is primarily viewed as dictating the foods to be eaten by different age groups and sexes, more attention has turned towards trying to identify how humoural theory affected other aspects of daily life – such as architecture and farming practices (Gardiner 2011; Jones 2013). Sykes (2014) strongly argues that since the origins of humoural theory lie in Greek and Roman philosophy and were so entrenched in later medieval life – as they are also most likely in most modern non-Western societies – it is likely that they were the norm. Evidence of such should thus be expected in more archaeological periods. Hence it is worth investigating the possibility of this existing earlier – a possibility that has been largely ignored by archaeologists up to now. Fish were a crucial part of the late medieval diet, the origins of this are believed to lie in economic developments of the late Anglo-Saxon period (Barrett *et al.* 2004a); but it is possible that other reasons may have contributed to this taste in fish and it is not impossible for humoural principles to have existed in the Anglo-Saxon worldview. Establishing this may help enhance our understanding of how fish were perceived.

Understanding how fish are exploited and where and by whom they are consumed is necessary; but elucidating who is catching and distributing the fish is equally important, although not always easy or exact. This ethos is vital and has been brought to the fore by Hamilakis (1999), who rightly stresses that eating is not just an act of survival but also one that is thoroughly entrenched in culture. Eating serves to emphasise and strengthen social positions and therefore the foods eaten by different people will have different meanings. As such, the meaning of food and consumption is acquired through the whole process of production, distribution, consumption and disposal.

For this reason, each aspect of this cycle – production, distribution, consumption and disposal – will be explored in this chapter, with the main aim being to discover who was involved at each stage and to what extent their personal identities were created and negotiated via their involvement. This will also further enhance our understanding of how fish were perceived, and will hopefully help us to understand the levels of fish consumption and how they changed throughout the Anglo-Saxon period.

### 5.2 Production

The evidence available for the Anglo-Saxon period concerning the role and tasks of women is very limited. Most of the information suggests that women were primarily involved in cloth making. This is supported by textual as well as archaeological evidence, such as when pin-beaters, combs and needle boxes are found in what are thought to be female graves (Fell 1984: 39-40).

However, many of these same sources suggest that some women held large amounts of power and responsibility. Many laws existed to protect the interests and belongings of women, and abbesses were given huge responsibilities in early monastic houses (Fell 1984). Evidence for daily life and tasks is more difficult to come by as most textual sources focus on the elite. Similarly, the range of activities performed and their social position will have depended on factors such as region, period of time, wealth, and whether it is a rural or urban context. Advice from Charlemagne on how women living on his estates should earn their keep suggested that they restrict themselves to cloth making as they did not how to brew, nor to make/repair nets for fowling or fishing. It was recommended that these tasks be left to men who were apparently more knowledgeable about such matters (Bitel 2002: 216). It is very difficult to establish to what extent this was adhered to; the likelihood is that on large estates, lower status women performed similar agriculturally related tasks as men due to time pressures and the changing of seasons (Fell 1984: 48). There are no direct descriptions for the responsibilities of food preparation or for the gathering of certain foodstuffs. Several references are made to the serving of food and drink at feasts, but very little to the preparation beforehand (Fell 1984: 46-47).

The only direct description of someone fishing in the Anglo-Saxon period comes from Ælfric's *Colloquoy*, and in this instance, reference is only made to a fisherman. In modern maritime anthropological and ethnographical studies it is well established that men are fishers, especially when it comes to deep-sea fishing; this seems to be the case in most cultures all over the world (Acheson 1981; van Glinken 2007; Malm 2009). However, there is just as much evidence suggesting an equally large role which is played by women in inshore fishing today (Malm 2009; Jones 2009), and in gathering foodstuffs often from the shore, for example with the Chipwyan and Cree peoples (cited in Gilchrist 1999: 40) and other groups in the past (Classen 1991; Chapman 1997: 137).

Another potential way of elucidating who was responsible for fishing is in the interpretation of iconographic representations of fish found in male graves dating to the early Anglo-Saxon period. Aquatic creatures have been found as metal fittings for shields, and on several occasions these have been identified by their heads, tails and body-shapes. They may be real or imaginary. Two different styles of depicting fish have been identified by Dickinson (2005). The first type shows smaller fish in profile. The pair from Spong Hill 31 is the most realistic and seems to represent a pike, due to the elongated lower jaw with a forked tail and rectilinear dorsal fin. Two other fittings, one from Eriswell site 046, 284 (re-used as a brooch) and the other from Mildenhall, depict similar creatures with the addition of a stylized fish scale pattern (Figure 5.1).

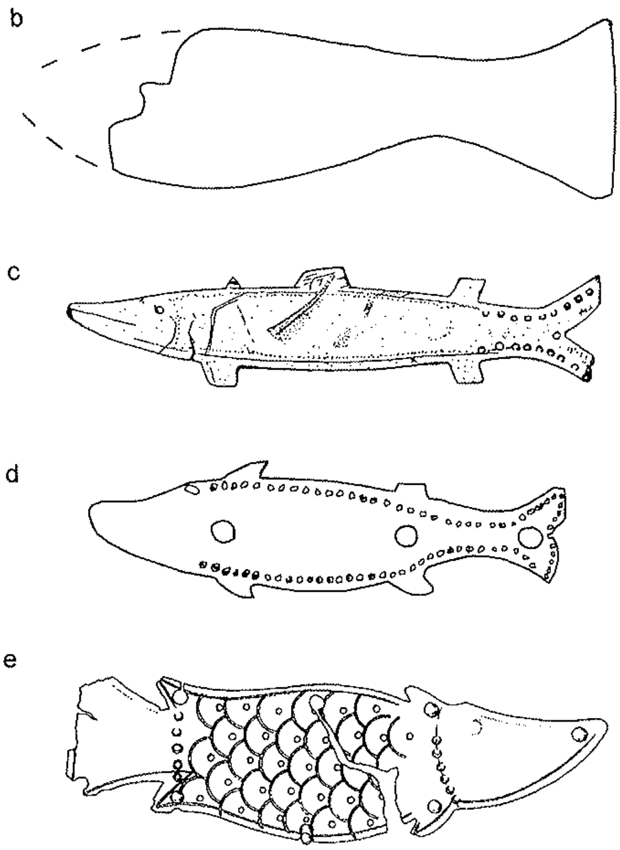



*Figure 5.1 Drawings of first type of aquatic shield mounts. B: Cleatham 25; c: Spong Hill 31; d: Eriswell 046, 284; e: Mildenhall. (Dickinson 2005: fig. 9)*

The second type (Figure 5.2 and 5.3) is not as realistic in its depiction of a fish. The fins, if they are present, tend to be arranged symmetrically on one or two triangular hooked pairs giving the impression that the fish is being viewed from above (Dickinson 2005: 130). These fins, which almost look like legs, give this fish a very unrealistic quality – but may in fact be a depiction of an unknown monster. Other fittings have been found at Warren Hill, Suffolk (Kennet 1974), Buttsole, Kent (Baldwin Brown 1903-1937) and Mucking, Essex (Jones and Jones 1975). The fitting from Warren Hill is distinctly pike-like in appearance with its elongated jaw and some indication of scales, and it most likely fits Dickinson's first type. The example from Buttsole is less realistic, with a pair of symmetrical fins like those in Dickinson's second style. The example from Mucking is not definitive as it has a very round head and body with fins that are leg-like (Hicks 1993: 30). Dickinson suggests that these mythical underwater monsters were familiarised by the makers, hence the resemblances with pike, a voracious fish common in English freshwaters (Dickinson 2005: 156-157). The presence of these aquatic monsters alongside birds identified as raptors and the creatures identified as 'dragons' from Sutton Hoo suggest aggressive power: perhaps as symbols of the warriors these shields were buried with, in addition to the depicted creatures' symbolic role of protecting the buried warriors (Dickinson 2005; Hicks 1993).

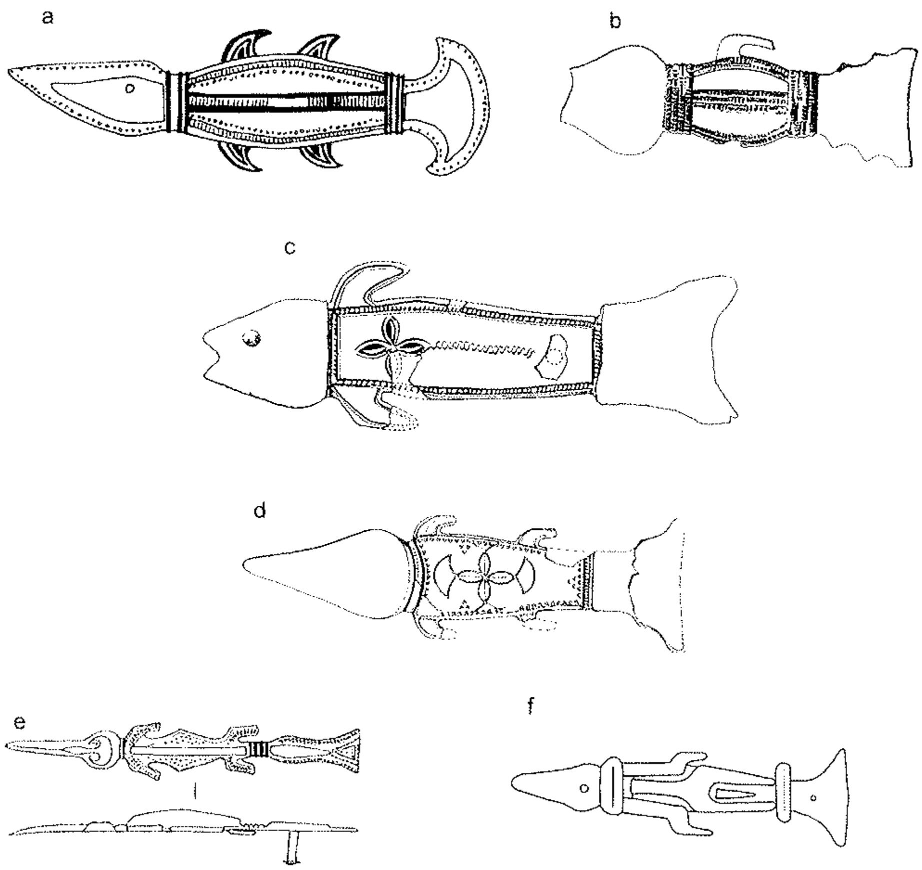


*Figure 5.2 Drawings of the second type of aquatic shield mounts. A: Sheffield's Hill 115; b: Worlaby; c: Kenninghall; d: Barnes; e: Sutton Hoo 018, 868; f: Eriswell 104, 232 cone mount. (Dickinson 2005: fig. 10)*

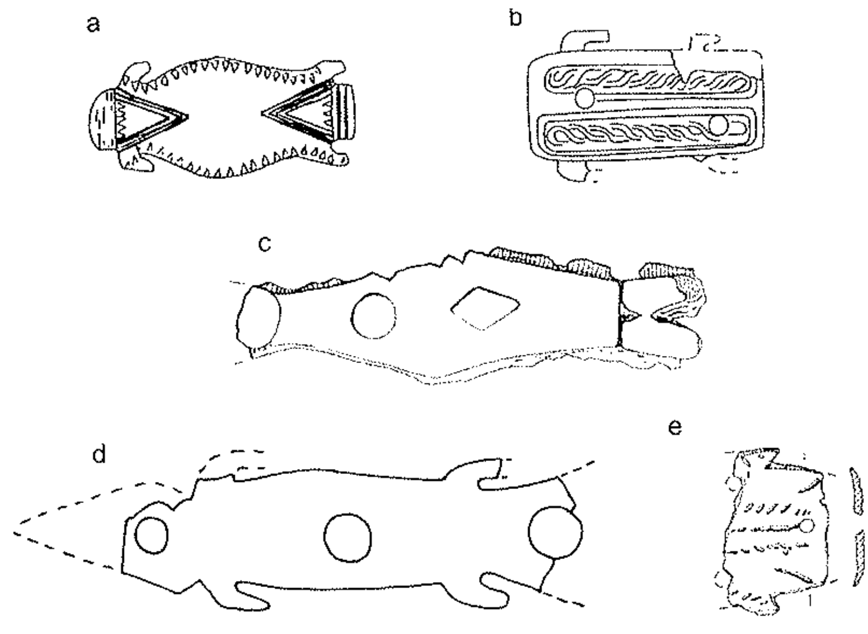


*Figure 5.3 Drawings of shield mounts similar to second type. A: Barton Court Farm, Abingdon, 807; b: Boxford; c: Buckland 93; d: Kempstone 52; e: Canterbury. (Dickinson 2005: fig. 11)*

Dickinson mentions that fish also appear on buckles and strap ends, and there is an example of fish depicted on the catch-plates of two great square-headed brooches and on a florid cruciform brooch from Westbere (2005: 155). A brooch with what appears to be a fish was found at Tuddenham, Suffolk (West 1998) and buckles have been found at Eastry I (Baldwin Brown 1903-1937), Crundale and Eccles, Kent (Detsicas and Chadwick-Hawkes 1973; Speake, 1980: pls. 8g and 9e) and Foxton, Cambridgeshire. (Malim and Hines 1998: 323-324). These objects are all dated to the 6th and 7th centuries. Some of these look very much like the fish in Dickinson's second style of aquatic creatures, such as the one at Eastry which is shown to have symmetrically paired fins – hence giving the creature the appearance of having four legs. The body of this fish is decorated with an unrealistic fish scale pattern. The example found at Tuddenham (Figure 5.4) is very round in body with no indication of fins, and apart from the long snout the head is not very fish-like in appearance.

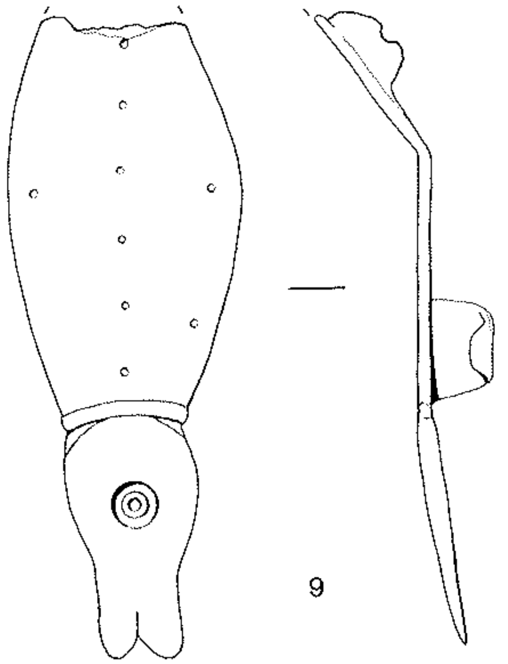



*Figure 5.4 Drawing of the brooch from Tuddenham, Suffolk. From West 1998: fig. 129.*

Many of these fish shield fittings are found alongside other fittings depicting other animals, which has led to the belief that they are protective emblems – perhaps for battle or for after death (Dickinson 2005). The presence of anatomic elements and furs of wild animals in graves is known in many animistic societies and is believed to help the deceased take on the attributes of these animals (Ingold 1998; Viveiros de Castro 1998). Perhaps it is possible to extend this to also include iconographic representations of animals. Apart from the vertebrae of fish, they do not offer many body parts to adorn themselves, and very few vertebrae have been found. When they are found, they are usually interpreted as being the remains of consumption (see section 5.4).

Due to the dangers associated with fishing and activities undertaken in aquatic environments reflected in these symbols, it may be possible to suggest that fishing was a male activity. It demonstrated bravery and courage, the same meanings as the hunting of wild animals (Sykes 2007a). In several societies women were not allowed to come into contact with boats or the construction of boats. Likewise, women were to be avoided before any fishing trips as they might bring bad luck (Acheson 1981: 288; van Glinken 2007: 108). As a result of spending much time at sea, fishermen often develop a 'macho complex' (Acheson 1981: 297). The reasons for this are numerous, but this overt display of masculinity has strong parallels with the involvement of men in hunting.

The iconographic evidence available only relates to the early Anglo-Saxon period. From the late Anglo-Saxon period we have the literary description of a fisherman in Ælfric's *Colloquoy.* This fisherman is male and uses a boat along with nets and lines to catch fish in rivers and the sea. While the text is late Anglo-Saxon in date, it is very likely that it describes fishing habits that are much older. The presence of larger fish and marine creatures on elite sites helps support the suggestion that fishing, at least for certain species, was a male-dominated activity (see section 6.4). On Orkney, isotopic studies of human burials have indicated that men consumed fish instead of women (Barrett *et al.* 2001); this is matched in the zooarchaeological record where prior to the Viking colonisation of the area marine foodstuffs were not consumed. The change did not just involve consuming a new foodstuff, but also catching it – and this seems to have been done by men.

Fish could also be gathered from the shore and from weirs. The size of many of the mid to late Anglo-Saxon fish traps would have required several people to build and maintain them as well as to gather the fish caught within them. During certain times of year it may be that women, and perhaps more likely older women, played a more important role in this, as many more people would have been needed in the fields. It is quite likely that in rural communities a degree of pragmatism would have been applied to a certain number of daily tasks. The overall impression is one of rural labour being gendered but not inflexible or uniform (Smith 2005: 122).

The bones of three eels were found in a copper-alloy bowl in the grave of a 25-year-old woman at the King's Garden Hostel cemetery, Cambridgeshire (Dodwell *et al.* 2004). This bowl is likely to have been an import from Frankia. The grave included other finds such as an iron knife placed slightly above the left hip, a worked stone spindle whorl, and a white bead pendant surrounded by a silver band. Copper-alloy hanging bowls have been found in other locations and have been found to contain fruit such as crab apples among other food items. Unopened oysters were found in a grave at Sarre, Kent (Smith 1908: 357-361), unfortunately of unknown sex, and this example offers the only parallel for the presence of an aquatic foodstuff found in a grave.

Being the only example of fish bones found in a female grave, this makes the remains from King's Garden Hostel all the more difficult to interpret. The symbolic meaning of an object or foodstuff can acquire a different meaning when placed in a funerary context, so remains of food and drink may not merely be provisions for the afterlife (Halsall 1998). They could represent a gift of food for the dead in which case they are to be consumed by the deceased in the next world, or by someone else in the afterlife. Similarly, this deposit may be a reflection of the woman's status: perhaps she gathered fish from a weir on a regular basis or was a member of a group who helped to build and then subsequently owned a fish weir.

The gendered roles surrounding fishing in Anglo-Saxon England are unclear, but it seems likely that the gathering of fish from fixed structures, such as from weirs and baskets, could have been undertaken by women as well as by men. The catching of fish from moving waters where a boat was required seems to have been done by men – whether they were small fish such as herring, or larger ones like cod. This situation is paralleled today in many fishing societies around the world (van Glinken 2007; Jones 2009).

**5.3 Distribution**

In Fiji, after the women have landed the fish they have caught in the inshore waters, they gut the fish on the beach before distributing them among the families of the village (Jones 2009). Some women own businesses and will sell the remaining fish to those families that have not participated in fishing on that day, but these women are few. In Anglo-Saxon England, fish are found on a variety of different site types and locations – some are coastal while others are inland. The fish found on coastal sites will not have had to be transported very far, but the marine fish such as herring and cod that are found on inland rural and urban sites in the late Anglo-Saxon period will have arrived there as a result of an intricate transport and distribution network.

The market economy of the late Anglo-Saxon period is believed to have been much more developed than that of the mid Anglo-Saxon period, thus allowing for the transport of fish much further inland (Barrett *el al*. 2004a). Items from across the English Channel will also have been bought and sold in these urban centres, and given that both fish and imported items will have arrived by boat, it may be fair to say that the direct role of women in primary distribution (once landed) may have been small. It is also very important to consider the logistics of transporting and distributing fish: certain species of fish can be transported live in buckets of water, whereas if they are preserved, or even just fresh but dead, they would be moved in barrels. Both methods require the movement of heavy containers which, although done with the aid of carts, would still require substantial shifting by human strength – thus potentially prohibiting the work of women in this area.

However, the role of women in the distribution of fish much closer to the location of consumption may have been different. The large number of girdle hangers found in women's graves from the early Anglo-Saxon period are thought to represent their role in controlling food stores (Meaney 1981: 247). While the evidence for this in the Anglo-Saxon period is not great, many ethnographic studies have highlighted the role of women in domestic food distribution (Hastorf 1991: 134; Holtzman 2002; Jones 2009). The distribution and consumption of foodstuffs are closely linked, but the gender roles are not always clear-cut; and in many instances, women were involved in the production and serving of food but were not allowed to consume it (Fell 1984: 144; Hastorf 1991).

### 5.4 Consumption

The presence of fish on archaeological sites is usually a good indicator that they were consumed especially if found in large numbers. However, it is very difficult to establish who may have consumed the fish – given that a multitude of people of different sex, age and even status lived together on one settlement. This fact of course has a great impact on disposal as well (section 5.5). Certain species, if found on high-status settlements, may be said to have been consumed by the higher-status inhabitants – we see this with the large number of cod found on a few elite settlements. This is because the fishing of large sea creatures may have been an act perceived to be similar to that of hunting (see section 5.2). But it is not really possible from the fish remains alone to tell whether or not the creatures were only consumed by men.

Aside from reflecting social status (van der Veen 2003), food consumption can help us to understand beliefs, medicine and taboos. Textual sources help us to understand the rules and beliefs that may have surrounded the consumption of foods such as fish, but they do not necessarily reflect the degree to which these rules were followed. Consumption does not only happen through the eating of food. During the medieval period it was believed to happen through all the senses (Woolgar 2006). Consumption therefore involved seeing, touching, smelling and perhaps also hearing the food in addition to eating it. Zooarchaeology can help us understand whether or not animals were consumed by their presence or absence, as well as by butchery marks. More concrete methods of establishing the degree to which different types of protein were consumed can be elucidated through the analysis of carbon and nitrogen stable isotopes. To understand the reasons for consuming or abstaining from fish it is necessary to explore the possibility of humoural principles; the influence of these principles in Roman and later medieval life means that they cannot be entirely excluded from Anglo-Saxon belief systems.

### *5.4.1 Humoural Theory*

Food was a central component of women's lives and spirituality during the later medieval period (Bynum 1987). Controlled food intake was believed to limit lust, which was believed to be particularly virulent in women (Brown 1988: 220-224; Bynum 1987: 33-41). For both men and women, their manner of eating and choice of foods were guided by religious rules, such as the Rule of St. Benedict and medical treatises and beliefs centred around maintaining humoural balance (Arikha 2007). In the later medieval period, the importance of maintaining humoural balance was to play a very significant part in the diets of people, including those of ecclesiastics. Imbalances in the four humours that make up the human body – blood, phlegm, yellow and black bile – would result in illness and, as all plants and animals were living things, their individual properties could serve to rectify or maintain a healthy humoural balance. The seasons and the four elements that were believed to make up the world (earth, air, fire and water), alongside the characteristics of these elements (hot, cold, dry and moist), all played a part. Age was also believed to play a part; and thus since one's humoural balance changed with age and with the seasons, so must one's diet (Figure 5.5). The origins of humoural belief lie in the writings of Hippocrates and Galen (*De Alimentorum Facultatibus*; Nutton 2004; Arikha 2007) and were kept alive in the early medieval period by court physicians trained in Greek and Galenic medicine, such as Anthimus, who was an ambassador to King Theodoric. Galen wrote extensively on food and how things should be eaten in his *On the Properties of Foodstuffs*, which includes an entire book devoted to fish, and it is through his writings that humoural theory continued on into the Renaissance (Arikha 2007: 18 and 33). Evidence of Anthimus' training and beliefs is seen in a letter to King Theodoric advising on the correct foods to eat. Much is taken from Galen, but it also incorporates foods that would be local to the king such as salmon, trout, eel and pike, as well as foods specific to Frankish culture such as eggs and butter (Grant 1996).

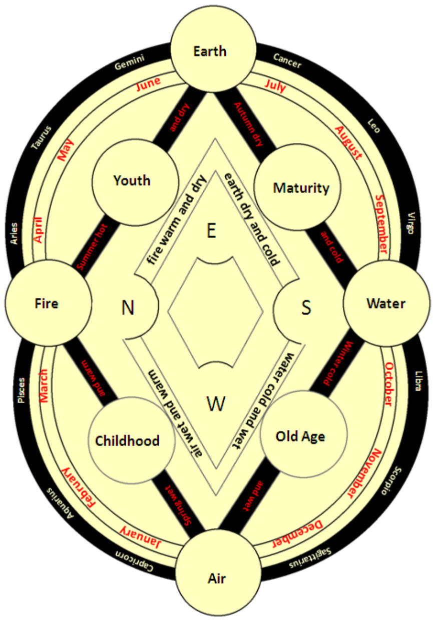



*Figure 5.4 The medieval worldview highlighting the elements, seasons, age and humours. From Sykes (2014).*

The writings of some Anglo-Saxon ecclesiastics suggest that they had some knowledge of the humours. Byrhtferth of Ramsey drew upon the writings of many scholars for his studies of numbers, seasons and agriculture, and it is very likely that writings on the humours would have been included in this because of the relationship of humoural balance to the seasons (Baker and Lapidge 1995). Bald's *Leechbook* discusses the best practice of bloodletting, certain days being better than others. This is inherently related to the principles of humours (Cameron 1993). Liuzza notes that several Anglo-Saxon texts on prognostics contain reference to the humours (2011). It is indisputable that the Anglo-Saxons knew about the humours; what is less clear is how much their knowledge extended into its role in diet (Chardonnens 2007: 33).

Aside from fish, Galen advises on the consumption of pigs and young animals as well as wild animals since they are leaner. He also advocates the consumption of cheese and milk. These aspects do seem to be reflected in some assemblages that have been recovered from ecclesiastical sites, such as Hartlepool where the cattle kill-off patterns suggest an emphasis on dairying (Rackham and Huntley 2007: 122). It is however not possible to suggest conclusively that humoural belief was responsible for the make-up of zooarchaeological assemblages from monastic sites.

In terms of humoural balance, women were believed to be cold and moist while men were hot and dry; as such, fish were prescribed to men but not to women. Interestingly, though, only one stable isotope study has indicated women had lower δ15N values compared to men (Reitsema *et al.* 2010). All the other studies from later medieval Europe show equal levels of marine protein consumption between the sexes (Polet and Katzenberg 2003; Reitsema and Vercellotti 2012; Salamon *et al.* 2008; Szostek *et al.* 2009; Yoder 2010). Reitsema's study comes from an 11th to 12th century inland cemetery in Poland. The diet was largely terrestrial based, but three male individuals suggested a higher level of marine protein consumption. There are several explanations for this. It could be down to humoural beliefs suggesting women abstain from fish and other rich protein sources, or it could be related to the stresses of pregnancy and lactating which have shown to give depleted levels of δ15N in hair that could also be reflected in bone (Fuller *et al.* 2005; 2006). In Viking Orkney, Barrett (Barrett *et al.* 2001; Barrett and Richards 2004) noticed that there did exist a difference in the levels of marine protein consumption between men and women. Whether this was because of humoural beliefs and worldviews, or simply because it was the men that fished, and therefore ate the catch, is currently impossible to establish.

A further way of investigating the situation may be to try and understand what types of food were considered appropriate. Many of the characteristics of food types were related to their texture and appearance, as well as to the habitat the animal had lived in. This is perfectly exemplified by fish: these were considered wet and cold since they live in watery environments and their flesh is cold and moist. Thus, according to humoural principles, women should not consume fish because they themselves are believed to be wet and cold. One of the most common fish consumed throughout the medieval period would have been stockfish, or air-dried cod. By the very nature of its preservation method the majority of the moisture contained within its flesh is removed. To render it edible once again it is usually degorged in water or milk before being eaten. As such, stockfish may have been perceived as a 'dry' food, thus enabling women to eat fish. This would have formed part of the foods consumed on the numerous fasting days and allowed for the following of the Rule of St Benedict; although whether the knowledge of this rule was widespread in Anglo-Saxon England is still inconclusive (see section

6.5). Stockfish were widely traded across Europe and formed a significant part of the diet of the English population (Locker 2001).

The humours permeated all aspects of life in the later medieval period, and the habitats of animals were central to human's perception of them and the beliefs about who could consume them. The Lullingstone Bowl found in Kent, likely 7th or early 8th century, is decorated with zoomorphic appliqués depicting fish, birds and stags (Figure 5.6). The bird is placed above the fish as if it was gripping it in its talons: this would reflect a wildlife scene depicting these animals in their natural habitats, although at the same time these three animals can be seen to depict the three elements of earth, air and water (Hicks 1993: 28). The presence of fish among these other wild animals can serve to reinforce the view that fish were wild animals, viewed alongside other creatures that were the preserve of elite men (see section 6.3 and 6.4).

*Figure 5.6 Bowl from Lullingstone, Kent depicting the fish appliqué among other zoomorphic appliqués (Bruce-Mitford and Raven 2005: fig. 168).*

### *5.4.2.i Regional Variations in Diet from Stable Isotopes*

Stable isotopic values may indicate those individuals whose diet comprised a higher marine component and – where the skeletons can be sexed or were accompanied by trappings – can give an indication of dietary difference between the sexes and individuals of different social status. Many of the isotope studies conducted dating from the Anglo-Saxon period have been at site level, but two recent surveys (Hull and O'Connell 2010; Mays and Beavan 2012) have been undertaken, bringing to the surface new data, although in both instances the sites have been primarily from the early and mid Anglo-Saxon periods. Unlike the Iron Age where the diet seems to have been quite uniform across large geographic areas (see section 3.1.2), the two surveys demonstrate that there are differences in diet across different areas. The data presented in the surveys have not been published, so the context of the samples is not known; and in the case of Hull and O'Connell's (2011), the raw data from each site are not published and so could not be included in the following discussion. There is also a strong bias for material coming from southern England, with Hull and O'Connell primarily focussing on East Anglia and Hampshire. The isotopic values from those studies available are shown in figure 5.7.

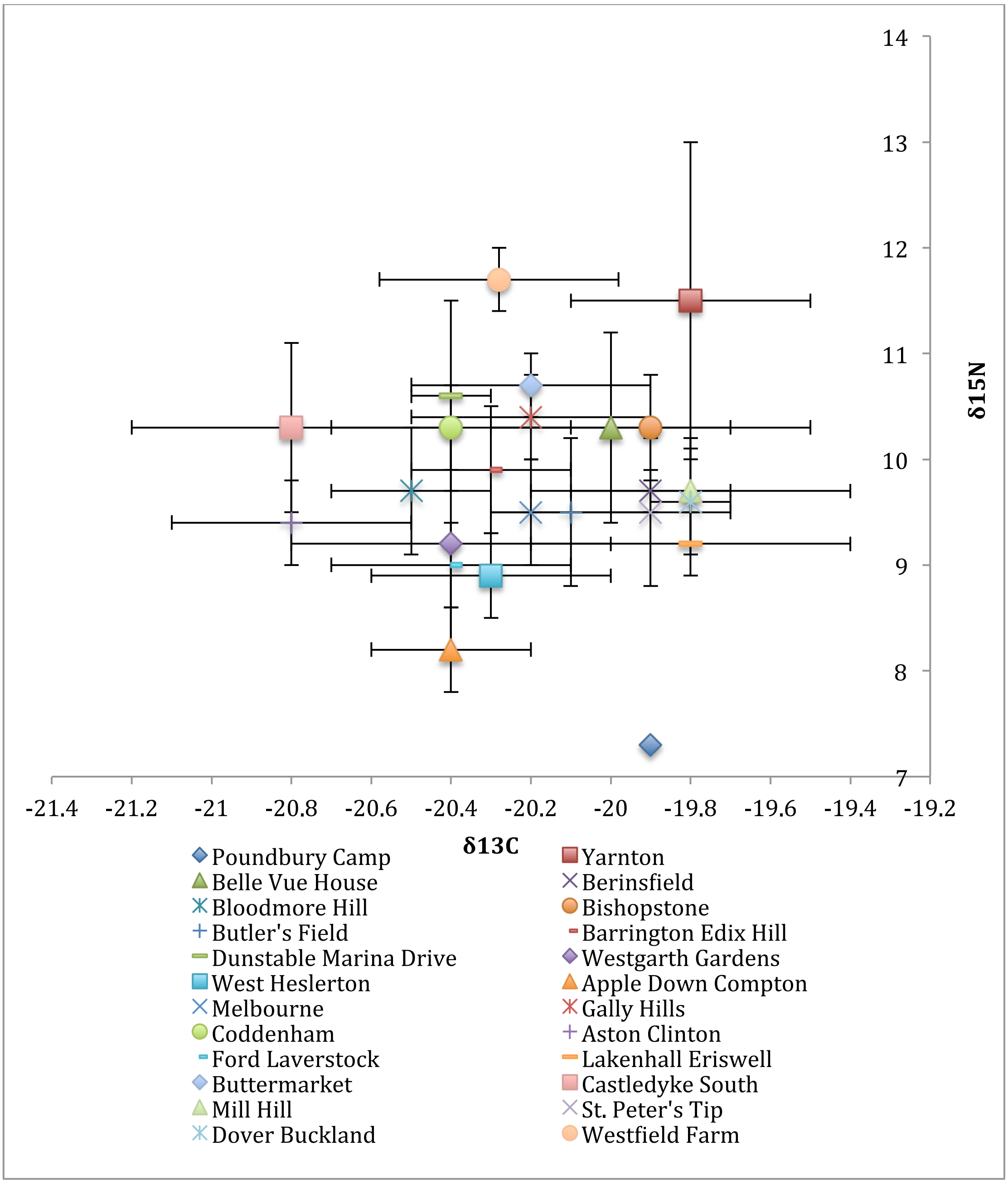



*Figure 5.7 Carbon and nitrogen isotope values from Anglo-Saxon sites in England. Poundbury Camp (Richards et al. 1998), Yarnton (Lightfoot et al. 2009), Belle Vue House (Müldner and Richards 2007a), Berinsfield (Privat et al. 2002), Bloodmoor Hill (O'Connell and Lawler 2009), Bishopstone (Thomas 2010), Butler's Field (O'Connell and Wilson 2011), Barrington Edix Hill, Dunstable Marina Drive, Westgarth Gardens, West Heslerton, Apple Down Compton, Melbourne, Gally Hills, Coddenham, Aston Clinton (Mays and Beavan 2012), Westfield Farm (Dekker 2008).*

There are, however, some problems with the Anglo-Saxon material available. First, the majority of the studies are from the early Anglo-Saxon period, with only a few from later periods, making it difficult to see any chronological developments (Table 5.1). Similarly, there is currently very little isotopic data for the late Anglo-Saxon period; and since the beginning of the 11th century is seen by Barrett *et al.* (2004a) as signalling a change in the levels of fish consumption, an investigation of human stable isotopes from this period would be interesting.

| Site | Sample Size | Date |
|---|---|---|
| Poundbury | 1 | 5th-7th Century AD |
| Belle Vue House | 33 | Late 7th/early 8th Century AD |
| Bloodmore Hill | 17 | 6th to early 8th Century AD |
| Butler's Field | 9 | 5th-7th Century AD |
| Dunstable Marina Drive | 2 | 5th-7th Century AD |
| West Heslerton | 1 | 5th-7th Century AD |
| Melbourne | 9 | 5th-7th Century AD |
| Coddenham | 1 | 5th-7th Century AD |
| Ford Laverstock | 1 | 5th-7th Century AD |
| Buttermarket | 1 | 5th-7th Century AD |
| Mill Hill | 8 | 5th-7th Century AD |
| Dover Buckland | 6 | 5th-7th Century AD |
| Yarnton | 9 | Saxon |
| Berinsfield | 93 | 5th-7th Century AD |
| Bishopstone | 7 | 8th-9th Century AD |
| Barrington Edix Hill | 8 | 5th-7th Century AD |
| Westgrath Gardens | 2 | 5th-7th Century AD |
| Apple Down Compton | 3 | 5th-7th Century AD |
| Gally Hills | 1 | 5th-7th Century AD |
| Aston Clinton | 1 | 5th-7th Century AD |
| Lakenhall Eriswell | 1 | 5th-7th Century AD |
| Castledyke South | 7 | 5th-7th Century AD |
| St. Peter's Tip | 12 | 5th-7th Century AD |
| Westfield Farm | 15 | Late 7th Century AD |

*Table 5.7 List of cemeteries from which human isotope data has been retrieved with sample size and date.*

At Poundbury, only one individual dated to the post-Roman phase gave isotopic results, and these suggest a terrestrial diet with no marine or freshwater protein (δ13C = -19.9‰, δ15N =7.3‰). Compared to the values from individuals from the Romano-British period, this shows a very different diet (see section 2.2.2) – largely terrestrial in this instance. At Yarnton, where nine individuals from the Anglo-Saxon period were sampled, the average δ13C value is -19.8‰ and the average δ15N value is 11.5‰. This slightly elevated nitrogen value is most likely due to higher environmental nitrogen values as it is reflected in the nitrogen values of the archaeological herbivore samples as well. No fish bones were found despite sieving having been undertaken (Lightfoot *et al.* 2009).

The cemetery at Berinsfield, Oxfordshire provided one of the biggest samples from the early Anglo-Saxon period with 93 individuals studied. The isotopic values again suggest a terrestrial based diet, but the range of nitrogen values suggest that most individuals consumed high levels of animal protein – some more than others. A similar picture seems to be the case at the cemetery of Bloodmoor Hill, Suffolk, where the average δ13C value was -20.5‰ and the average δ15N value was 9.7‰. The excavations at Bloodmoor Hill also revealed a small number of fish remains. Only 44 were identifiable, but a wide range of species were represented from both freshwater and marine environments (Parks and Barrett 2009). It could be that the population buried at Bloodmoor Hill consumed some very small amounts of fish to add variety to their diet.

Mays and Beavan (2012) concentrated on sites of the early Anglo-Saxon period that exhibited high status grave goods. Their sites fell into three geographical categories: coastal, riverine and inland. To help identify what the diets of the different populations consisted of, their analysis also made use of IsoSource – a technique that seeks to determine where the sources of protein are coming from (pork, beef, marine vs. freshwater fish). There was no statistically significant difference between the δ13C and δ15N from all sites, so the two were analysed separately; and thus differences were noticed between the δ13C values from the coastal area compared to the values from the other two areas. The δ15N values also showed differences between the riverine populations compared to the other two. The more elevated δ13C values at the coastal sites are thought to be due to slightly higher levels of marine fish or as a result of terrestrial mammals grazing on seaweed. The fact that the δ15N levels are not also elevated is believed to be due to the fact that δ15N in bone collagen is influenced by a multitude of factors that are not completely understood (Mays and Beavan, 2012: 872). The δ13C also suggests that sites further inland may also have consumed marine fish, but on a much smaller basis, and isotope studies unfortunately do not give any indications of whether or not fish or shellfish were consumed – or the frequency, if so. The δ15N values are higher at riverine locations, and this is likely due to a greater consumption of eel and freshwater fish that are elevated in δ15N. This was also supported by the IsoSource calculations.

The data from Westfield Farm, Ely (Dekker 2008) comes from one of the smallest samples of the period, comprising only 15 individuals. Despite being one of the smallest, it presented some very interesting results. The average δ15N values were some of the highest for the period at 11.7‰. The elevated δ15N levels are unlikely to be down to environmental factors and thus reflect a dietary habit which involved the consumption of freshwater fish, waterfowl, and pigs (Dekker 2008: 41). Two burials seem to be of wealthy individuals; one of them, an adult, seems to have had a diet much richer in terrestrial protein, a pattern similar to that observed at Berinsfield (Privat *et al.* 2002). The other 'wealthy' individual exhibited different values between rib and femur isotopes, making it difficult to establish a dietary influence. Also, a small increase in δ15N values of male individuals was noticed compared to females (Dekker 2008: 31). Again, a similar trend was noticed at Berinsfield in individuals older than 35 (Privat *et al.* 2002).

One of the largest samples from the mid Anglo-Saxon period came from York where Müldner and Richards (2007a) studied 33 samples from the Mid-Anglian (late 7th/early 8th) cemetery at Belle Vue House, York. The authors state that this sample produced the most negative values of all the periods studied from York. The average δ13C was -20.0‰ and the average δ15N value was 10.3‰. It is thought that, if they were consuming fish, whether marine or freshwater, it was such a negligible amount it did not leave an isotopic signature.

The settlement at Bishopstone covered the mid and late Anglo-Saxon periods and revealed a significant assemblage of marine and estuarine fish bones. The average isotopic values for the human remains from the excavations suggest a largely terrestrial diet with a small marine component. Isotope values from the faunal assemblage showed that chickens were omnivorous and one cat may have consumed significant amounts of marine fish (Thomas 2010). The fish bone assemblage was largely made up of marine fish, but eel were also very important; this fish species has elevated δ15N values but δ13C values that appear more terrestrial, which can result in blurs in the resultant human isotope values. Being near the coast it would seem obvious that marine resources would be taken advantage of.

The isotopic values of the late Romano-British period are similar to those from the mid Anglo-Saxon period in that they reflect a diet that is mainly terrestrial but with some marine protein that increases from the mid Anglo-Saxon period onwards (Hull and O'Connell 2010: 682). The zooarchaeological evidence for the mid Anglo-Saxon period shows fish on several archaeological sites. Some elite sites have revealed very large numbers of marine fish remains, and the estuarine *emporia* also have revealed considerable amounts of fish bone, largely dominated by eel; but some numbers of marine fish are also present. Weirs and a small number of hooks (see Chapter 4) support fishing activities in the late early Anglo-Saxon period, and more importantly in the mid Anglo-Saxon periods. Several of these findings show links with elites.

The biggest difference in isotope values relating to marine fish consumption is seen in samples from the late medieval and post-medieval periods (Figure 5.8). Most of these studies have concentrated on northern England, with the exception of Lakin's (2008) study which focussed on London – although individual sample data are unfortunately not available.

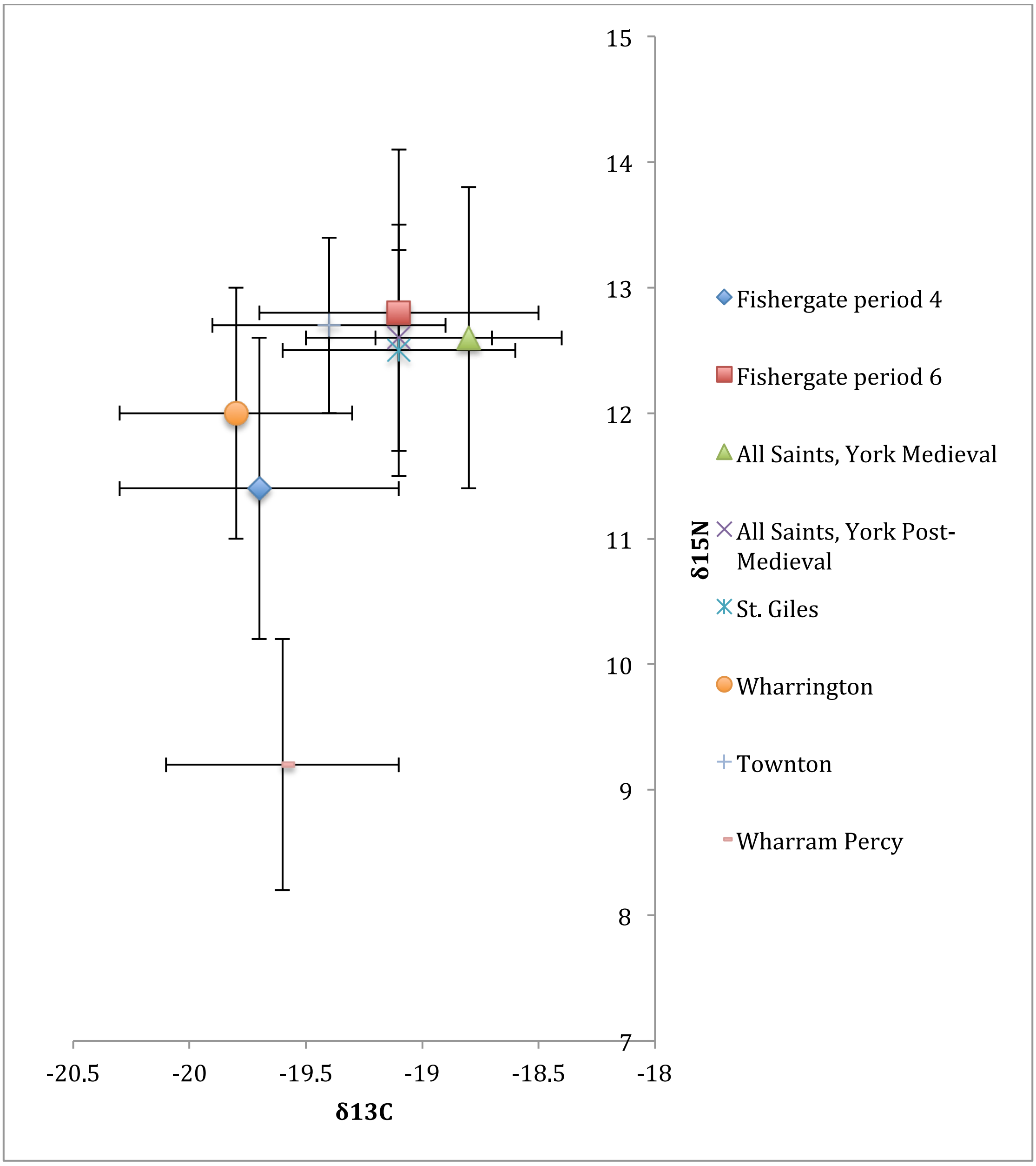



*Figure 5.8 Carbon and nitrogen isotope values from late medieval and post-medieval sites in England. Fishergate period 4, Fishergate period 6, All Saints medieval, All Saints post-medieval (Müldner and Richards 2007a); St. Giles, Wharrington, Towton (Müldner and Richards 2007b); Wharram Percy (Richards et al. 2002).*

The isotopic values in figure 5.8 show two clusters: the bigger cluster makes up of the majority of sites, and they all have nitrogen values of 12.5‰ or higher. The nitrogen values from Fishergate period 4 are the lowest, and the carbon values are also fairly low in comparison to the other sites. Müldner and Richards (2007b) see this site as evidence of a transition period. The majority of the individuals had a diet that was largely terrestrial based, but a few were consuming large amounts of marine protein – which would become the norm in later periods. This transition period coincides with the 'fish event horizon' in Barrett *et al.'s* (2004a) which is thought to have occurred in the early 11th century.

Mays (1997) conducted a study on assemblages from Fishergate, York, Wharram Percy, Scarborough, Hartlepool and Newcastle to establish the extent to which people had access to marine foods in the later medieval and post-medieval periods, but used only the stable carbon isotope. The assemblages varied depending upon location and status: coastal or inland, monastic or lay. The results show that the monastic community from the Gilbertine priory at Fishergate, York had a more significant marine component in their diet. Interestingly, the lay burials in the same cemetery did not show the same signature, and in fact resemble the values from the samples from Wharram Percy, an inland medieval village. The sample from Scarborough also shows a marine signature and this is understandable given its coastal location and its history as a major port.

*5.4.2.ii Gender and Elite Differences in Diet from Stable Isotopes*

In the studies discussed, very little dietary difference between males and females was noticed. Mays and Beavan (2012) noticed a small elevation in ð15N levels in men over 30 years of age from riverine areas; however, the reasons for this are numerous and it is not possible to say if this difference is due to a higher proportion of riverine or marine protein (2012: 873). In their survey of isotopic evidence from Anglo-Saxon England, Hull and O'Connell tried to establish if there were any geographical, financial, or sex-based differences. Overall men have higher δ15N values in Hampshire, but the opposite is noted in Suffolk. In terms of burials accompanied by weapons, the males from the cemeteries of Portway, Shavard's Farm, Winnall 2 and Swaffham have higher nitrogen values, but at the cemeteries of Alton, Droxford, Worthy Park, Bergh Apton, Morningthorpe, Westgarth Gardens and Berinsfield it is the male burials without weapons that exhibited the higher nitrogen levels (Hull and O'Connell 2011: 675). Similarly, it is not always the 'wealthy' burials that exhibited the higher nitrogen values, as one would expect, given the belief that higher levels of meat consumption are a sign of higher status. Higher nitrogen levels may be due to freshwater fish consumption but also to the consumption of omnivorous animals such as pigs.

Hull and O'Connell (2011) – based on data from early and mid Anglo-Saxon cemeteries – suggest that a change in diet occurred in East Anglia during the mid Anglo-Saxon period, and this change consisted of increased levels of fish consumption. Many of these samples came from monasteries, so it is possible that they consumed more fish for religious reasons compared to the rest of the population; however it is not possible to say if this was by male or female religious communities. The results of Mays and Beavan's investigation suggest that elites, particularly on coastal sites, did consume some small amounts of marine protein. Elites further inland may also have consumed some fish, though in much smaller quantities.

Evidence for dietary gender differences from studies of later periods in England is also absent. Even when the majority of male burials were likely to be from brethren and the women layfolk, as at Scarborough, the coastal location of the settlement meant both communities consumed high levels of marine fish (Mays 1997:565).

At present, isotopic evidence for differences in fish consumption between men and women and between those of high and low status is patchy, but does have the potential with continued research to show some interesting results. There is some evidence to suggest that those of higher status were consuming a small amount of fish even when they were far from the coast. Some cemeteries in Hampshire and Oxfordshire indicate that some men may also have been consuming fish, either freshwater or marine, but this does not seem to be the case in other parts of England. The differences in the levels of fish consumption, when they are present, may perhaps be explained by humoural theory among other factors.

**5.5 Disposal**

The disposal of food items can say much about how these animals were viewed before being consumed. They can also say much about a person when they are included in graves, instead of being found in rubbish pits. Fish bones have only been found in three graves of Anglo-Saxon date; and two burials from Spong Hill, Norfolk contained cremated single vertebrae that were unfortunately unidentifiable. One of these was associated with an older infant of unknown sex and the context of the other is unfortunately unknown (Worley 2008: 341-342). Whether these finds represent last meals or had any other symbolic function is impossible to know due to the lack of contextual information. The eel skeletons from King's Garden Hostel in Cambridge may reflect the deceased woman's role in fishing (see section 5.2). Alternatively they could have been for consumption in the afterlife. Similarly, the incorporation of whole fish into a burial gives them a particular status in the contemporary worldview. Perhaps these creatures that lived in watery environments were no longer so feared – or at least not in certain regions – by the late 6th century as the perception of fish was beginning to change. This change is reflected in other areas such as in the bone evidence (Chapter 3), in the presence of fish weirs (Chapter 4), and perhaps even in some isotopic studies (see section 5.4.2.i.).

More discrete trends in patterns of disposal are unfortunately harder to discern as many zooarchaeological reports do not pay much attention to the combination of species found within deposits. At Bishopstone, a total of 92 fish bones were recovered from graves. The species identified were eel, herring, horse mackerel, mackerel, elasmobranch, whiting, gadid, cod, flatfish and conger eel. The most common species were herring and whiting. It is possible to swallow herring bones, but whiting bones, though not a particularly large fish, would have been unpleasant to swallow. Most of the bones were vertebrae, but some cranial elements such as dentaries were also present. Unfortunately the locations of where the samples came from within the graves is not known, and while some of the herring and eel vertebrae did show signs of crushing, it is not possible to establish whether these bones form part of the stomach contents or were deliberately placed. It seems most likely that these bones formed part of the backfill of the graves and that midden and cess material were used to backfill the graves (Reynolds 2008; Thomas 2010).

At both Bishopstone and Lyminge, deposits which were rich in the bones of larger fish such as cod, were poor in the number of bird bones – particularly domestic fowl. Instead, these deposits were rich in the remains of mammals (Reynolds 2008; 2009). A similar situation was observed at Flixborough (Dobney *et al.* 2007: 74-75), though it is possible that the difference here is down to the preferred features for depositing rubbish varying over time. Nevertheless, this separation is odd given that both species can be served either on or off the bone, and thus the bones can be classified as kitchen or table waste as opposed to solely butchery waste. Alternatively, these separations may reflect different eating events; but this seems to contradict humoural eating habits: fish (being wet) would make a good compliment to birds (being dry). However, the humour of a bird did vary with age and its habitat, so some birds were considered wet (Galen, *De Alimentorum Facultatibus*). Wildfowl were consumed at Bishopstone and therefore the separation of these from fish may have been deliberate. Alternatively, these different deposits may reflect the meals of different people; perhaps the deposits rich in domestic fowl were from the meals of women and young children who are deemed 'wetter,' while the fish and other terrestrial mammals were from those of men who were drier – and who also needed to demonstrate their virility through the consumption of meat. Alternatively this difference may be due to seasonal eating habits.

Double monastic-houses were known to have existed in Anglo-Saxon England, for example at Hartlepool, Wearmouth, Jarrow and Lyminge but waste does not seem to have been separated out – thus masking any potential dietary differences. The same can be said of other settlements, whether rural or urban: disposal of rubbish was not separated by gender, so dietary differences are not visible.

In the context of the late medieval period, rosaries comprised of fish bones have been found buried in churches and graves (Hamilton-Dyer *pers. comm.;* Stallibrass 2005) and individual and articulated bones have been found in single graves – for example at the Priory of St. Augustine at Taunton, Somerset (Hamilton-Dyer 2009). The meaning of these finds still remains unclear, and their scarcity hinders comparative interpretations. They may refer to the symbol of Christ being the fisher of men. Alternatively these objects could symbolise the dichotomy between land and sea. Westerdahl (2005) suggests that the elements from a number of terrestrial and sea creatures are used in rituals to safeguard and protect fishermen or sea-crossings. It could be that these rosaries made from fish and shark bones deposited in churches represent the coming together of the opposing spaces of land and sea, Christian and non-Christian beliefs and rituals so common with fishermen (Acheson 1981; van Glinken 2007; Westerdahl 2005) into mainstream Christian belief systems. They protect the fishermen who are out at sea catching the fish that will then be distributed, consumed and deposited, taking us back to the beginning.

**5.6 Summary**

This chapter has tried to understand the dynamics of production, distribution, consumption and disposal surrounding fish to gain a better understanding of the people involved in the catching and consuming of fish. This in turn enhances our understanding of the dynamics surrounding fishing and fish consumption. Much of the evidence presented in this chapter can be interpreted in a number of ways, and thus no firm conclusions have been reached. This is because it is not always clear what the meaning of a shield appliqué of a fish or deposits of fish bones in a grave are. As Gilhus (2006: 6) explains, 'A picture of a lion is not a lion, but a picture of a lion may help us to recognize a lion when we see one. The challenge is to understand when and to what extent representations of animals make comments on animals, and what they say about them'. Therefore the fish found on shield appliqués may simply be the representation of fantastical creatures that reflect the belief system of the period; or they may also be an explanation of the worldview and how men fitted into it. It is men who explored these liminal environments, - the land beyond the terrestrial that was familiar - and maybe brought back evidence of their adventures. Both interpretations are valid and useful.

Fish are found on many objects of metal – primarily as shield appliqués, but also on brooches and buckles. All of these have come from graves attributed to males, with the exception of those from hoards and individual spot finds which are thus un-gendered. Most of these are believed to be from pagan contexts, but precise dating of these graves is not always possible (Dickinson 2005). The buckles have been interpreted as representing the beginnings of ideological change: Christian symbols are appearing in objects of personal adornment but are not always worn as overt display – for example, the fish on the buckle from Eccles, Kent is hidden on the underside of the buckle (Dickinson 2005:156).

Examples of fish bones from grave contexts are very rare, though it is not likely that this is due to a deliberate choice of not including these at the time of burial. Instead this is most likely due to recovery techniques both during excavation and from the pyre site at the time of cremation (Worley 2008). The most complete example of fish from a burial comes from that of a female where the skeletons of at least three eels were found within a hanging bowl. It is possible that this rare example indicated direct consumption of fish and was a gift of food for the afterlife, or it could represent this individual's position and role in constructing or maintaining a local fish weir. This is in direct contrast to the pictorial representations of fish of the early Anglo-Saxon period, which are restricted to men. Perhaps in the early period, fish or aquatic creatures were not fully understood; their habitats were shrouded in mystery and therefore were deemed only appropriate for men who often protected themselves with depictions of other mystical creatures as well. Certain types of fishing, especially marine fishing that takes place far away from land, is seen as the duty of men in traditional societies, such as on Tonga and Fiji (Jones 2009; Malm 2009: 6-7).

The perception of fish seems to change around the 7th century. Fish bones are found on more sites and in greater abundance at this time (see section 3.2). Methods of catching fish, such as from weirs, become common features of the landscape (see section 4.1) and it is also very possible that these weirs and fish were increasingly being recognised and placed within the landscape in the form of place-names (see section 4.2). As a result of this, it is possible that women were now part of the activities surrounding fishing and may also have been consuming them.

The isotopic evidence from England from the Iron Age to the late medieval period indicates that some dietary changes occurred. The greatest evidence for fish consumption comes from the late medieval period and this change seems to have occurred around the 11th and 12th centuries. This evidence comes from Orkney and York (Barrett *et al.* 2001; Müldner and Richards 2005; 2007a; 2007b) and is supported by increased amounts of fish bone evidence across England (Barrett *et al.* 2004a); although there is some small amount of evidence, both isotopically and zooarchaeologically, that suggests that a dietary change may have occurred earlier in some regions of southern England. The analysis of stable sulphur isotopes may help in the identification of freshwater fish consumption, which may have been important during the Anglo-Saxon period. Similarly, new methods of identifying the sources of protein such as ISoSource proposed by Mays and Beavan (2012) will equally be of use. Much of the isotopic evidence for Anglo-Saxon England is divided: for those cemeteries of earlier date, they are largely from southern and eastern England, while those from the later period and extending into the later medieval period are from northern England. Given the cultural differences that span these different regions and time periods, these gaps in the data make it very difficult to assess the picture of fish consumption as a whole for England. Analysis of late Anglo-Saxon burials from across England would be of great use to add to the picture of zooarchaeological data and material data relating to fishing.

Some isotopic studies have shown that women and men consumed different diets, and this is most often evidenced by different degrees of protein – terrestrial or marine – consumption (Barrett *et al.* 2001; Reitsema *et al.* 2010; Schutkowski 1995). This is also supported by literary evidence: humoural theory suggested women should not eat fish; yet at the same time, the Rule of St Benedict forbade the consumption of quadrupeds on fast days, thus making fish a common alternative foodstuff. Unfortunately, there are an equal number of studies that have shown that no difference existed between the diets of men and women; and in later medieval England, regardless of the proximity to the coast, marine fish were readily available for consumption (Mays 1997). As such, evidence for adherence to the Rule of St Benedict or humoural theory is still inconclusive for the Anglo-Saxon period but is still worth investigating with further research.

# Chapter 6: The Dynamics of Fishing and Fish Consumption in Anglo-Saxon England

The previous chapters have characterised fishing and fish consumption throughout the Anglo-Saxon periods using a variety of sources of evidence: zooarchaeological data, artefactual and pictorial representations of fish, material evidence associated with fishing, structural evidence such as weirs, place-names and isotopic data. In each chapter, available data were discussed within a chronological framework. However, to better comprehend the dynamics of procurement, distribution and consumption of fish, all the evidence will now be discussed within the context of the Anglo-Saxon period.

**6.1 Environment and Landscape**

Changes in marine exploitation and habitation along coasts are often thought to be related to climate and sea level (Barrett *et al.* 2004a). It is believed that at the beginning of the 5th century, the climate became wetter and colder until the beginning of the 10th century, marking the beginning of the "Medieval Warm Period" (Dark 2000 :27). In addition to the change in climate, sea levels rose (the Dunkirk II transgression) (Behre 2007), rendering many low lying areas such as the Fenlands inhospitable for most of the year. Certain activities took place, but primarily on a seasonal basis (Rippon 2000: Chapter 7). By the mid Anglo-Saxon period, there appears to be a greater number of sites in wetland areas such as the Fens (Crowson *et al.* 2005; Murphy 2010). Religious establishments may have been drawn to these areas because of their isolation and "wilderness", thus allowing the church to tame and control this environment (Pluskowski 2006: 58). Much of this activity is seen in land charters, where land was granted to monasteries, which probably encouraged land drainage and reclamation in the 10th century (Hooke 1998: 172-173). Continued surveying in the Fens has shown that settlements in these areas are not as rare as previously thought. Along the coast of the Wash in Norfolk and south Lincolnshire, a series of small, probably permanent settlements indicate that activities that are more favourable to the area (e.g. growing of barley, herding of sheep and horses) were carried out (Crowson *et al.* 2005). The material assemblages from these settlements often contain imported artefacts, which indicates that if these settlements were part of estates, this did not limit material gain from exploiting maritime connexions (Loveluck 2013: 149). Further south, the Chelmer-Lower Blackwater valley shows continued levels of activity in the 5th century. In the 6th to 7th centuries, the centre of activity moved to the bottom of the valley, where mixed arable and pastoral farming was practised and supplemented by fishing through the construction of fish traps (Tyler 2011; see section 4.1.1 for the description and discussion of the Blackwater estuary weirs). On the opposite side of the sea, i.e. in Flanders, the coastal plain was fairly stable and not severely inundated during the early medieval period (Baeteman *et al.* 2002; Ervynck *et al.* 1999). In this area, a series of settlements that are part of a complex settlement hierarchy were discovered (Loveluck 2013; Loveluck and Tys 2006: 156).

The great increase in fish at late Anglo-Saxon sites across England may in part also be a result of environmental factors and temperature (Barrett *et al.* 2004a: 628-629). The increasing numbers of marine relative to freshwater fish (except eel) at these sites may indicate decreasing freshwater fish populations caused by rising industrial pollution levels in urban centres (Hoffmann 1996: 638).

Alternatively, the relatively low levels of cod and herring could be a reflection of a lack in availability in nearby waters, as both these species' productivity and spatial distributions are affected by climate (Alheit and Hagen 1997). In relatively southern waters such as the North and Baltic Seas, an increase in temperature will lead to a decrease in production while the opposite is true in northern waters (Brander 2000). Interestingly, the late 10th and early 11th centuries are considered a period of higher temperatures, thus dubbed the Medieval Warm Period (Dark 2000: 27; Fagan 2000: 7-9), which witnessed agricultural intensification (Dyer 2002 : 26). However, the higher temperatures will not have favoured inshore fish stocks in this instance, and the apparent abundance of fish remains is more likely to relate to other factors then temperature.

### 6.2 Economy and Urbanism

The environment and the economy are closely linked, as the right climatic conditions are fundamental for economic expansion. The end of the Roman Empire in Britain resulted in a slow breakdown of communication and transport links. At the same time, the level of activity in urban centres decreased, and a resurgence in economic activity and settlement was not witnessed until the later half of the 7th century. In many cases, such as in London, the new settlements were located outside the boundaries of the Roman predecessor (Vince 1990). A small number of marine fish were found inland at early Anglo-Saxon sites - plaice at Kings Meadow Lane, Higham Ferrers (Ingrem 2007) and herring at Bonners Lane, Leicester (Baxter 2004). This suggests continued links between inland and coastal settlements. It must be remembered that these finds are few and far between.

The emergence of new settlements called *emporia* or *wic* resulted in more complex patterns of production and distribution of food. The coastal *emporia* were gateways to the English Channel, the continent as well as the hinterland of England. These settlements were the centres of specialisation and production of objects such as bone artefacts and pottery (see for instance Hill and Cowie 2001). Several authors suggested that the urban settlements of the mid Anglo-Saxon period were supplied by surplus food redistributed from estate centres located in the immediate hinterland (Bourdillon 1994; O'Connor 2001; Rackham 1994). According to O'Connor (2001), these settlements are characterised by a low number of species, very small numbers of typical "backyard" animals (pigs and domestic fowl), most of which are elderly animals. However, any of these settlements may have supplied or procured their food differently from the others. Mammal bones recovered from excavations at the National Gallery Basement and the National Portrait Gallery suggest on site animal husbandry (Rackham 2004: 149). Considering that both of these sites are located on the western edge of the settlement focus, it seems likely that these animals were brought into the core of the settlement for consumption. A similar situation is evident at Dorestad in the Netherlands, where farms were located behind the settlement (Prummel 1983). During recent excavations in Southampton, richly furnished, 7th century burials were found on the north-eastern edge of the urban settlement (Birbeck *et al.* 2005). These burials are most likely associated with a royal estate, as is indicated by a charter dated to AD 840 (Morton 1999: 56). Other research has shown that pigs and domestic fowl are not as scarce as previously thought (Sykes 2006b). The lack of diversity in the species recovered is probably the result of an underdeveloped market (Hinton 2000: 220; Sykes 2006: 64).

The fish species recovered from these *emporia* are largely freshwater and estuarine with occasional presence of marine ones (see section 3.4). As in the early Anglo-Saxon period, these fish originate from the waters surrounding respective settlements. They may have been caught by specialised fishermen or individual inhabitants of the settlement, who fished to add variety to their diet. However, evidence suggests that not all fish were caught by the inhabitants of these centres. For example, herring from Fishergate and Blue Bridge Lane, York (Harland *pers. comm.*), were probably transported upstream from a fishery on the Humber Estuary. This example importantly reveals the demand for fish as well as the availability of transport links to supply marine fish. Significantly more evidence for methods of catching fish is available for the mid and late Anglo-Saxon periods compared to the early Anglo-Saxon period. Many of the freshwater fish from York could have been caught with small hooks and lines as evidenced by the finds of fishing tackle at Fishergate (see section 4.3, Appendix 3; Rogers 1993). Axially perforated ovicaprid metapodia have been recovered in large numbers from Southampton, along with sporadic finds in London (Riddler 2006). These metapodia were probably used to sink particular areas of nets while catching herring from boats (see section 4.3.2). It is known that herring shoals used to travel up the River Thames (Wheeler 1979b: 70), which was possibly also the case in the Solent. Tsurushima (2007) explained that before the 11th century, herring were fished in groups with several boats, of which many belonged to elites.

Whether the herring from Southampton were caught with some assistance from elites or just by a community of part-time fishermen remains unknown.

*Emporia* were not the only places involved in regional and international trade. A number of rural inland sites, which were predominantly surveyed by metal detection, are believed to have been part of the growing economy in mid Anglo-Saxon England (Ulmschneider and Pestell 2003: 1). Similarly, several coastal settlements such as *Sandtun*, West Hythe, Kent were also part of this network as a coastal landing site (Gardiner *et al.* 2001). However, the actual excavated evidence in this respect is small for England when compared to the other side of the North Sea (Loveluck and Tys 2006). It is very likely that these landing sites will have dealt with objects for trade as well as fish. This is demonstrated by the large fish assemblage from *Sandtun*, which is accompanied by numerous fish hooks (though these are likely to be post-11th century in date (Riddler 2001)). The seasonal nature of occupation and fishing at this site may indicate the emergence of early fishing outposts, as many fishing villages of the later medieval period began as such (Fox 2001a).

The site of Fishtoft, Lincolnshire, demonstrated evidence for specialisation in both salt production and fishing, predominantly for flatfish (Locker 2012). The site was also a landing site for continental imports (Cope-Faulkner 2012). While the name "Fishtoft" indicates that this fishing activity was recognised in the name of the settlement, the fish element in the name was probably added at a much later stage (see section 4.2.1). Fish are not very apparent in phases dating from before and the early part of the 8th century, but their numbers increase during the 8th and 9th centuries. Interestingly, the range of species is quite small in these assemblages, with eel and plaice/flounder representing the most abundant species, followed by horse mackerel and garfish. Such as in *Sandtun*, both these sites were engaged in marine activities, which may explain the presence of fish. This is in contrast to other rural sites, which focused on agriculture.

Fish are also more common on rural sites in the mid and late Anglo-Saxon periods compared to the earlier period. Those sites that are closest to the coast generally exhibit more fish bones. There also remains the problem that many rural sites have not been sieved to high degrees. For instance, at Ramsbury, Wiltshire (Coy 1980), no fish bones were recovered, and it is unclear whether any sieving took place. The small numbers of fish remains recovered at Quarington (Rackham 2003) and Riby Cross Roads (Scott 1994) were probably caused by the selective environmental strategies at both sites, though bad preservation will also have played a part. Even when samples were sieved, the numbers of fish remains are often very small, such is the case at Rose Hall Farm and Gosberton (Baker 2005), both in Norfolk. It is possible that these sites were predominantly occupied in other activities, with fishing representing only a minor activity. Evidence for specialisation and production can be found at several rural sites throughout the period, including Rose Hall Farm and Gosberton (Baker 2005). At these sites, agriculture was focused on cattle and barley, which reflects both the environmental limitations as well as the potential of the Fenlands, which are very suitable for certain types of farming (Rippon 2000). Although sieving was undertaken on several of these sites, the numbers of fish are rather low. This is interesting, as a cluster of fish-related place-names is apparent in the area comprising the north of the Fens and south Lincolnshire (section 4.2.1). The lack of fish bones at these sites may be a deliberate choice by the inhabitants not to catch and consume fish. In these cases, fish place-names may simply indicate an acknowledgement of fish in these environments.

Starting with the increased numbers of fish found on the *emporia* of the mid Anglo-Saxon period and continuing with the great increase in the presence of fish found across late Anglo-Saxon England (Figure 3.14, section 3.5), the "fish event horizon" at the turn of the first millennium is largely put down to the demand for food resources by these urban centres (Barrett *et al.* 2004). Indeed, fish, and in particular, marine fish, are found at many more late Anglo-Saxon period sites than those from the preceding two periods (see section 3.5, Figures 3.15 and 3.18). This period is further characterised by a greater number of urban assemblages than earlier periods. Isotopic evidence on the provenance of cod from late Anglo-Saxon, Saxo-Norman and later medieval urban centres indicated that up until the 13th century, cod all originated from local waters (Barrett *et al.* 2011; Orton *et al.* 2014). This implies the emergence and growth of large specialised fisheries after this date. Many of these late Anglo-Saxon urban assemblages also revealed much higher numbers of fish hooks than those from the mid Anglo-Saxon period, suggesting a greater degree of fishing by the local population. The fictional fishermen in Ælfric's *Colloquy* describes how he fishes with his net and hook, and that he cannot catch enough fish to sell at the market, suggesting a very high demand in fish. Fish hooks, weights and other materials were found at Alms Lane (Atkin *et al.* 1985), Fishergate (Williams 1994), St. Martin-at-Palace Plain (Williams 1987), Redcastle Furze (Andrews 1995) and Thetford (Goodall and Ottaway 1993), London and York. A great number of weirs also date to this period (see section 4). The high number of eel and herring fisheries along the southern and eastern coasts of England listed in Domesday Book indicate that fishing was a very important activity in these parts. The herring fisheries along the Norfolk and Suffolk coast are likely the beginnings of the important herring industry that was to dominate the economy in these areas (Campbell 2002; Kowaleski 2010). The high number of weirs in the Blackwater estuary were linked to the late medieval Foulness fishing industry (Cramp and Wallis 1992).

Marine fish are much more significant in the late Anglo-Saxon period. However, considerable variation in marine fish abundance across sites suggests the marine fish market was not yet a completely controlled industry as it was to become in the late medieval period. A multitude of sites were excavated in Norwich. As these span the whole of the late Anglo-Saxon period, - often including the post-Conquest period, the range of species recovered is fairly wide. Herring, cod and mackerel are found on almost all sites, whiting and flatfish species are fairly common, and cyprinids comparatively rare (Curl 2006; Jones 1983; Jones and Scott 1985; Locker 1987a, 1987b, 1994, 2010; Nicholson 2005, 2007). At Fuller's Hill, Great Yarmouth, large Saxo-Norman deposits were revealed, which were entirely dominated by marine fish such as cod, herring, plaice and whiting (Wheeler and Jones 1976). This assemblage was also accompanied by a large number of iron fish hooks. Though slightly later in date, this site reflects the growing importance of the marine fish industry.

The excavations at Coppergate and elsewhere in York also revealed high numbers of herring and cod. However, smelt, cyprinids and pike are also common here, reflecting the inland position of these settlements (Harland *pers. comm.;* O'Connor 1989). Unfortunately, sieving was not as commonly or thoroughly carried out in Oxford - another inland urban settlement. Nevertheless, herring, eel and a few cod bones were found (Hamilton-Dyer 2000; Ingrem 2002). Further south, excavations in Southampton and Winchester revealed very similar fish assemblages with large numbers of herring, mackerel, cod, whiting and flatfish (Bourdillon 1993, 2010; Coy 2010; Hamilton-Dyer 1997, n.d.). The situation for both Southampton and Winchester sites is very similar to that of 7th to 9th century London sites in that the fish remains come from various excavations that were all subject to different degrees of sieving. Other excavations in urban contexts revealed smaller numbers of fish. Even without sieving, very small numbers of cod and herring may be found, and such was the case at Sadler Street, Durham (Wheeler 1979a), Wall Street and Dean Street in Hereford (Hamilton-Dyer 2002). Fish still appear in small numbers on rural sites of the late Anglo-Saxon period. For example, Wraysbury, Berkshire (Coy 1989), where some samples were sieved, herring represented the second most abundant species, amongst finds of cyprinids, perch, trout and pike. This indicates the presence of extensive trade networks with the coast and importantly, the demand inland for marine fish.

During the mid Anglo-Saxon period, settlements such as *Sandtun* and Fishtoft played a part in procuring fish for urban and rural centres. Unfortunately, there is very little evidence for these in the late Anglo-Saxon period.

However, coastal urban centres that become major fishing ports in the later medieval period, such as Sandwich and Old Winchelsea, emerge at this time. The bulk of this information comes from textual sources. Sandwich is referred to in several sources as a place of safety. For example, Bishop Wilfrid, who arrived after an encounter with the pagan south Saxons, referred to Sandwich as a port "*in portum Sandwicae salutis*" (Clarke *et al.* 2010: 15). King Æthelstan of Kent defeated a Danish Viking fleet at sea at *Sandwic* in 851, and Æthelred II assembled warships in the Haven in 1001 (Clarke *et al.* 2010: 16). Edward the Confessor also assembled ships to look out for the rebellious Earl Godwin (Clarke *et al.* 2010: 25). The fact that there is little archaeological evidence for the location of a settlement, let alone an urban one, has led archaeologists to believe that the early medieval centre lay outside of the later medieval walls. The site four kilometres to the south-west of the royal estate of Eastry could be one possibility, though archaeological evidence for this is not very convincing (Clarke *et al.* 2010: 19). As such, it is possible that Sandwich consisted of separate foci of ecclesiastical, royal and trading centres. Domesday Book states that Sandwich was obliged to provide Christ Church Priory in Canterbury with 40,000 herrings each year (Clarke *et al.* 2010: 23). This points to the presence of an important fishery, though these herrings may have been caught with other fishermen from the south-east coastlines during annual fishing expeditions (Clarke *et al.* 2010: 23). Fishing trips, during which fishermen of the later Cinque Ports were allowed to attend the fishery and fair at Great Yarmouth, date to the 11th century (Sylvester 2004: 15). Tolls were taken on boats from Hastings at *Safluet* in Lincolnshire. A king's peace or truce existed in Dover between Michelmas and St. Andrew's day, which implies that a certain number of boats were absent on fishing expeditions, most likely on the east coast fisheries (Gardiner 1996: 18).

Old Winchelsea, like Sandwich, came to be one of the major Cinque Ports of the later medieval period. Archaeological evidence is also lacking due to the fact that this site has been submerged since the late 13th century. Winchelsea, now New Winchelsea, has been relocated to a further inland location, which was still close enough to the coast to allow it to be a port of significance (Eddison 2004: 2-3). The fisheries around Winchelsea and the manor of *Rameslie* were granted to the Abbey of Fécamp in Normandy in 1017 by King Cnut (Eddison 2004: 2). This agreement demanded that each Rye vessel conferred a percentage of its catch to the abbey based on the size of the vessel (Sylvester 2004: 15).

Several other settlements along the south coast became important ports. Many of these, e.g. New Romney (Draper and Meddens 2009) and Dover (Parfitt *et al.* 2006), were part of the confederation of Cinque Ports. To many of the Cinque Ports, smaller settlements, i.e. small towns or villages, were attached as limbs. These include Lydd and Dungeness, which is first mentioned in 1052 in relation to Earl Godwin, who amassed ships probably on the shingle on which Dungeness is located (Gardiner 1996: 18). Concrete archaeological evidence is also lacking here, but it is not impossible for Dungeness and other smaller fishing settlements of the late Anglo-Saxon period to have existed as seasonal fishing establishments. The hierarchy and definitions of coastal settlements, particularly those involved in fishing, is far from clear (Fox 2001b; Gardiner 2001).

Other settlements that are known to have been involved in fishing from at least the medieval period but have some origins in the late Anglo-Saxon period include Great Yarmouth and King's Lynn, both in Norfolk. Great Yarmouth is mentioned in Domesday Book as one of the burgesses listed under the manor of Gorleston. The burgesses also include fishermen, which suggests that Great Yarmouth was a temporary fishing settlement. Further development in the 10th and 11th centuries, most likely at Fuller's Hill, was fuelled by the growing importance of Norwich (Rogerson 1976: 133). Early layers of occupation were identified during excavation, but the stratigraphy is complicated by the presence of large amounts of blown sand. Nevertheless, large amounts of marine fish bones and iron fish hooks clearly show that fishing was an important activity from the 11th to the 13th centuries (Rogerson 1976: 157-161).

King's Lynn in north-west Norfolk probably emerged from various foci. These originate from the estate structure of the late Anglo-Saxon period, and were consolidated and formally established with the foundation of St Margaret's Priory by Bishop Losinga in AD 1090 (Hutcheson 2006). King's Lynn's main industries were fishing and wool production, which became a base of the Hanseatic League in the later medieval period (Brown and Hardy 2011: 4). However, no archaeological evidence of the early settlement exists, and much of the fishing evidence (in the form of fish bones and fish hooks) has not been published to date (Rackham *pers. comm.*).

It is perplexing why fish became so much more significant in urban and inland areas during the late Anglo-Saxon period, thus paving the path for the major fishing ports of the later medieval period. Although there is no doubt that the development of urban centres including their markets (Barrett *et al.* 2004a; O'Connor 1994: 145) played an important role in this respect, fish remains are not only found in urban centres. Economic development leads to a change in settlement, which in turn creates social diversification and social hierarchy. Food undoubtedly plays a part in this development.

**6.3 Social Hierarchy**

Changes in taste for certain foods will be determined by a variety of factors. Different types of evidence point to an absence or at least a very low level of fish consumption in the early Anglo-Saxon period. To an extent, this may be a result of how the environment and the wild were perceived, as well as the prevalent belief systems (see section 6.4 and 6.5). Alternatively, it may be associated with real environmental factors (see section 6.2). Acceptance of new foods was often started by elites. As the new foodstuff is accepted by and becomes available to more people, elites must find a different foodstuff to differentiate themselves and so remain exclusive (Bourdieu 1984 ; Lupton 1996).

Settlement evidence indicates that the early Anglo-Saxon period is characterised by a lack of social differentiation. Zooarchaeological assemblages of the period include all mortalities for cattle, sheep and pig (Poole 2010: 93-94). This pattern is very similar to the situation exhibited in Iron Age England (Hamerow 2002: 148). However, in terms of the make-up of the zooarchaeological assemblages, the proportions of domesticates are more similar to those of the Roman period than the Iron Age, with cattle being more dominant than sheep (Poole 2010: 95). It is likely that cattle were an important symbol of status in some places such as Yeavering, where a large deposit of skulls was found and thought to represent ceremonial feasting (Hope-Taylor 1977).

Sieving has rarely been undertaken on early Anglo-Saxon sites (section 3.2), which is partly why fish remains are not very common. Fish were found at a few sites, and interestingly, seem to be found in higher numbers at sites where other wild animals are also present. Examples include West Stow and Bloodmoor Hill, Suffolk, where a fish assemblage dominated by estuarine fish was found alongside six fish hooks (Lucy *et al.* 2009: 316; Parks and Barrett 2009). This assemblage also contained several other wild animals. The settlement and associated cemetery, which contained several wealthy burials, is interpreted as a gift of land by an elite (Scull 2009; 2010: 851). Lyminge in Kent revealed wealthy cemeteries dated to the 5th and 6th centuries (Chadwick Hawkes 1982; Detsicas and Chadwick Hawkes 1973). It is postulated that the site may have been host to a *villa regalis.* A substantial post-built structure (Thomas and Knox 2012) and an area of settlement characterised by SFBs dating to the 5th and 7th centuries have recently been discovered. Several of these SFBs contained small numbers of fish bones. The most common species were herring and flatfish. The filling of SFBs with rubbish is likely to have taken place after the abandonment of the building, so it is possible that these fish remains are mid Anglo-Saxon in date. Lyminge was also the site of a mid Anglo-Saxon monastery (Thomas 2010), and ongoing excavations have revealed deposits rich in fish dating to the 8th and 9th centuries (Reynolds 2009; Appendix 5 ; Knapp *pers. comm.*). The fish remains from the SFBs may represent the beginning of fishing and fish consumption at this site, in turn reflecting the emergence of an elite hierarchy. The assemblages from Bloodmoor Hill and Lyminge may mark a turning point in the levels of fish consumption; a slight increase to what is usually seen at early Anglo-Saxon sites. This increase in fish consumption may be related to the emergence of social hierarchies.

The increasing levels of fish remains in 7th century sites are accompanied by the first appearance of weirs after the late Roman/early Anglo-Saxon weir at Shepperton Lane and the 6th-century weirs on the Thames in London (Bird 1999; Cohen 2011; section 4.1). The construction of these weirs would have required a substantial amount of timber and time, especially with regard to the upkeep and the collection of fish twice a day. Because of this, the construction and ownership of weirs has often been thought to be related to elites (Strachan 1998: 281). However, it is equally possible that the construction of weirs - as many other activities - was community-driven (O'Sullivan 2004), and only later was controlled by elites (Faith 1997; Fleming 2010). Many weirs are mentioned in charters, indicating their importance as a source of both food and income. These charters were issued in the king's name and represented a new form of royal power (Smith 2005: 35). Many of the first settlements to benefit from these charters were minsters, as the gift of land ensured the donor's quest for eternal salvation (Howe 2008: 45). This was, for example, the case of a weir on the Thames being given to the Bishop of London in AD 704 (Sawyer 1968: 471, No. 1785). The interest in owning weirs continued into the late Anglo-Saxon period. Many fisheries are listed in Domesday Book as belonging to both religious and secular estates.

It is possible that some weirs may have been built by elites as an investment or to demonstrate power over the landscape (see section 6.4). Several of the weirs on the Thames show successive repairs and further construction. Though no fish weirs were found in the vicinity of Bloodmoor Hill or Lyminge, the fishing activity witnessed at these sites may represent a new way for emerging elites to distinguish themselves by interacting with an environment previously feared or misunderstood.

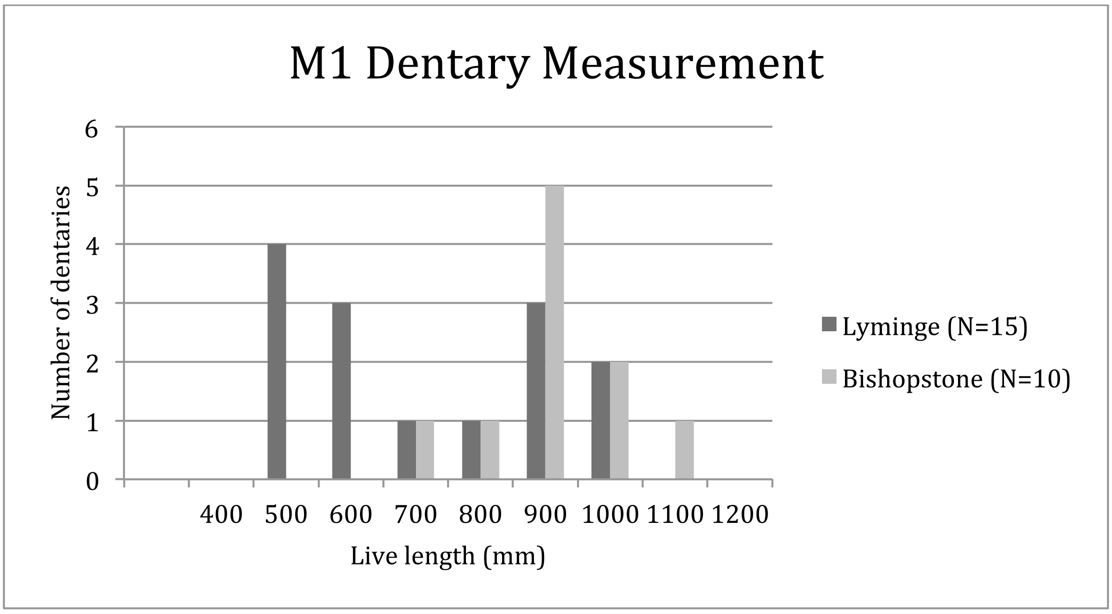
Many estate centres acted as food collecting and redistribution centres, while also producing foodstuffs from the *inland* of the estate (Faith 1997). Wool production became an important activity on many sites, as indicated by the finds of loom weights, wool combs and pin beaters. Several of these items were found at Lyminge, Bishopstone and Flixborough, among many other sites. Similarly, ageing data show that in general, a much greater number of animals were surviving beyond four years of age (Poole 2010: 107, Figures 3.10 and 3.11). These developments in specialisation and agricultural intensification are believed to have been driven by the elite (Wickham 2005: 428-434) in order to produce surplus for ecclesiastical and secular lords (Hamerow 2002: 123).

Wild mammals and birds also begin to appear in large numbers on elite secular and religious sites such as Bishopstone and Flixborough. Red and roe deer seem to have become the preferred wild species of the elites, which is also supported by an etymological development. The Old English word for wild animals, i.e. *deor*, now came to refer to deer in particular (Cartmill 1993: 67). High levels of roe deer were found on ecclesiastical settlements. Though hunting would seem to contradict the peaceful behaviour advocated by religious houses, Sykes (2007a: 68) suggested that the representation of roe deer as faithful and chaste creatures in later medieval literature may also have reflect the perception in the late Anglo-Saxon period. This would render roe deer ideal for monastic consumption. Hunting and hawking became one of the favourite past-times of the elite; so much so that some had specialised hunting settlements (Poole 2010: 277).

A few large fish assemblages from both secular and ecclesiastical elite settlements were recovered and often span mid and late Anglo-Saxon phases of occupation. However, unfortunately the sample size is rather small, as many of the other sites have not been sieved. Large numbers of fish bone from wet and dry sieving were recovered from Lyminge, Kent; Sedgeford, Norfolk; Bishopstone, East Sussex as well as Flixborough, Lincolnshire. Lyminge exhibited the greatest number of marine fish bone, with cod being the most abundant. Excavations and identification work are still ongoing. At Sedgeford, recovered fish species such as eel, herring, garfish, plaice/flounder, cyprinids and the odd very large cod, represent local exploitation. The River Heacham was tidal once, and thus likely provided very good fishing and access to the Wash. Similarly, the nearby complex of weirs at Holme Beach (Robertson 2010) is unlikely to have been the only one in the area. Weirs could have helped catch many of the fish. The presence/diversity index for secular elite settlements from late Anglo-Saxon England shows a slight drop from the previous period, while there is a slight rise on religious settlements (see section 3.6 and Figure 3.16). The drop seen on elite settlements is most likely a result of recovery factors rather than representing an actual change in fish tastes by this section of the population. The situation is complicated by the fact that the term elite is used to define a wide range of site types exhibiting certain trappings associated with elites. However, recent excavations showed that there are several types of elite (Loveluck 2011, 2013). The variances between secular elite settlements become more complex with the emergence of *thegns* who tried to emulate the aristocracy (Reynolds 1999; Senecal 2001). Of the 11 late Anglo-Saxon elite settlements (section 3.5), four were not sieved and thus revealed no or very small numbers of fish remains: for instance, no fish were found at Cheddar Palaces, though high numbers of oysters and mussels were present. At Goltho in Lincolnshire, just 17 cod bones were found (Jones and Reuben 1987). From the other estate centres at Northampton Palaces that were subject to some degree of sieving, only five and four bones were recovered from the phases dating to AD 820-875 and AD 875-1100, respectively. Some elite sites were subject to extensive sieving and revealed rich fish assemblages. These include Flixborough, Bishopstone and Winchester Palace. The number of marine fish species is far greater in all of these sites except Flixborough, where apart from flatfish and smelt, all other species are freshwater fish. The number of fish remains at Flixborough decreases in the $10^{th}$-$11^{th}$ century phases, but porpoises are found in large numbers alongside other wild animals (Dobney *et al.* 2007: 52). The increasing numbers of cetaceans may reflect an attempt to control big species from marine contexts. Showing that herring was particularly prized in the east, whereas salmon was in the west, Tsurushima (2007) argued that the species of fish favoured by the elites depended on the region they lived in. Gautier (2007) explained that herring was also the food of elites in modern day northern France, Belgium and the Netherlands before becoming more widely available during the medieval period.

Previously, I have tried to argue that at higher-status settlements, inhabitants were targeting and consuming particular species, whereas at the *emporia* and rural settlements the diversity of fish species found was as a result of occasional fishing activity (Reynolds 2009). However, considering new and different types of evidence this now does not seem entirely likely. Fish traps were built by elites and possibly also communities, and may have been part of gifts of land to kin as well as religious houses. In any of these situations, the traps were maintained by those living in the nearby countryside. In those cases where the trap belonged to a distant estate, the caught fish could have been part of food-rents, as in the case of the charter of the manor at Tidenham, Gloucestershire (Douglas and Greenaway 1953: 117-118). As such, the fish sent to these estates may have been sorted, and the species chosen beforehand. This may perhaps explain the general absence of certain species. It is also possible that fish were caught further out at sea, if the location and resources of the settlement allowed. A charter dating to 732 mentions a grant of land on the coast near *Sandtun* given to Lyminge (Kelly 2006: 109). This may be referring to a place where sea-going vessels departed and landed, or where traded goods and possibly fish were landed by merchants and fishermen, the dues being collected by Lyminge. Thomas (2008: 2-3) suggested that this place may represent the dune site of *Sandtun*, West Hythe, which revealed high quantities of fish bone as well as evidence of cross-Channel trade (Gardiner *et al.*. 2001). However, there is no clear zooarchaeological evidence linking the site to Lyminge (Reynolds 2009).

Landing sites may be much more common than we think and may have served a purpose in early marine fishing practiced further out at sea. Excavations at Lyminge have so far revealed a considerable number of cod bones, some of which originating from large individuals (>100 cm length). In comparison, cod found at Bishopstone were slightly smaller though still of significant sizes (80-90 cm length; Figure 6.1 and 6.2).



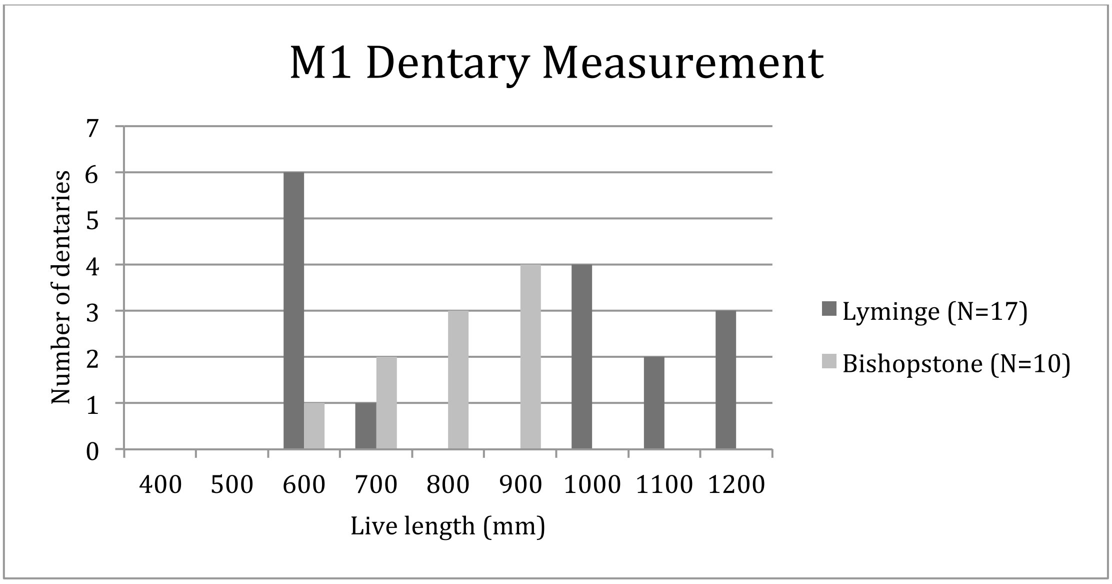
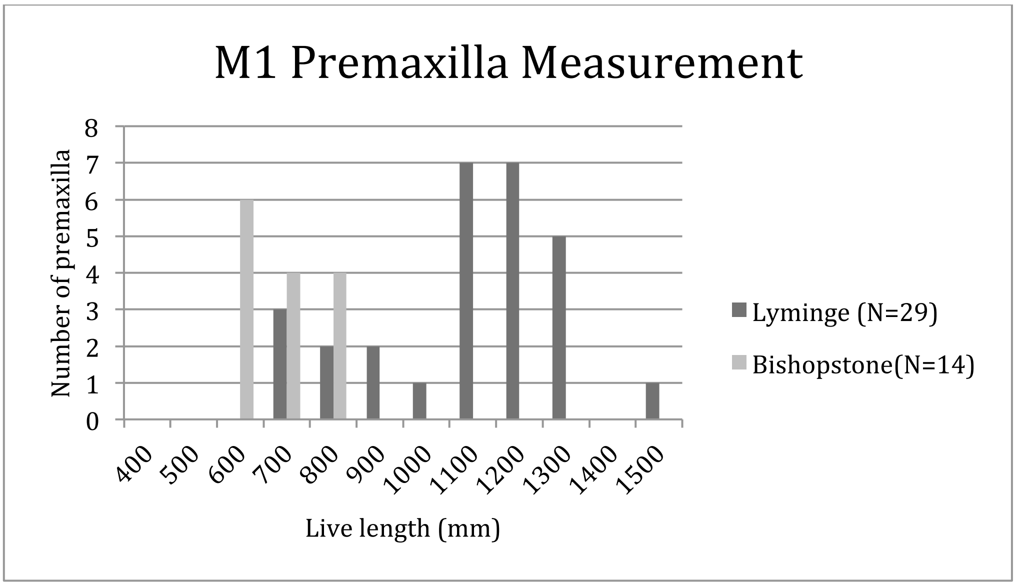




*Figure 6.1 Reconstructed live lengths of cod from Lyminge and Bishopstone using the regression formula from Jones (1991) and measurements (M1 and M2) taken on dentaries.*



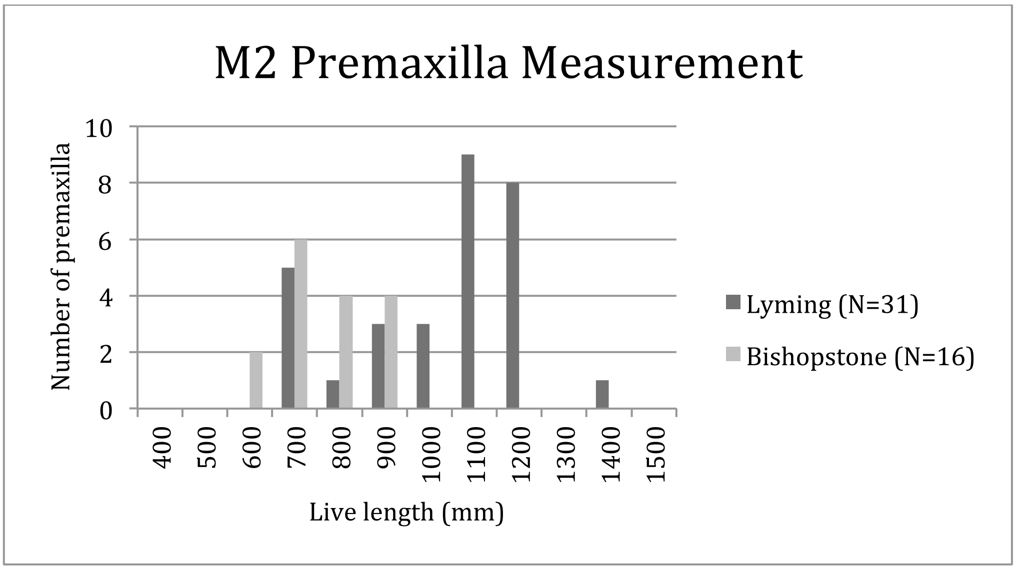




*Figure 6.2 Reconstructed live lengths of cod from Lyminge and Bishopstone using the regression formula from Jones (1991) and measurements (M1 and M2) taken on premaxillae.*

Although a bias in taphonomic survival and recovery due to the prevalence of larger bones is possible, on both sites, the state of preservation was very good and sieving was thorough. The sizes of cod at other sites are not noted in the specialist reports, but it is occasionally possible to speculate on this based on the method of recovery. At Goltho, the only fish recovered were cod bones through hand collection. For these to have been noticed by the naked eye, they had to be of fairly significant size. Unfortunately, numbers of cod at other sites are low, which are thus likely to represent occasional catches. Smaller cod can be found and caught in inshore waters in winter with a simple hook and line, which may explain their appearance in mid and late Anglo-Saxon London for instance.

The assemblage from Bishopstone was entirely dominated by marine fish with the exception of eel and a very small number of cyprinids. Cetaceans remains found at this site are worked and probably served a function, such that of a chopping board (Poole 2010: 67). The amount and size of cod found at Lyminge and Bishopstone may be related to the increased levels of wild mammal exploitation witnessed across other elite sites of the period (Sykes 2005a, 2007a, 2010a, 2014; Poole 2010). The cetaceans at Flixborough may also be part of the same trend, and were probably chased up the estuary and slaughtered. This rather brutal act required the use of spears; tools that are used in the hunting of mammals such as deer and wild boar, as well as a weapon for warfare. Sykes (2014) noted that much of the equipment used in hunting is identical to that used in war, which helps explain the symbolical links between the two: prowess at hunting was seen to imply success in war. The relatively small number of cod bones at Flixborough, i.e. only 12, may be due to the site's location on the River Trent near the Humber. Alternatively, the inhabitants of the site may have accessed and killed the cetaceans in lieu of other big "fish".

Whether the Anglo-Saxons knew that cetaceans were different to fish is very hard to establish. Poole showed that in the eyes of the Anglo-Saxons, species were linked by the way they move and their habitats (2010: 65). In Ælfric's

*Colloquy* (Swanton 1975: 171-172), whales are grouped alongside fish. When asked why he does not catch whales he replied "Because it is better for me to catch a fish that I can kill, than a fish which can drown or kill…". Categorisation of whales as fish is also seen in the contemporary writings of Isidore of Seville (Barney *et al.* 2006: 260). Fish are commonly grouped linguistically alongside other water mammals, such as cetaceans, beaver, otter and shellfish (Anderson 2003: 406, 410). From an etymological point, the Old English word for whale, *hwæl,* is derived from the Proto-Germanic **khwalaz* which is cognate with the Latin *squalus* meaning "a kind of large sea fish". Dolphins and porpoises were known as *mereswin*, which means "sea pig". The evolution of this word to porpoise is derived from Old French *porpais, porc* "pork" and *peis* "fish" (Harper 2001).

Two illustrations from the life of St Cuthbert depict a fish and a dolphin, respectively. In the first image, the animal is described as a dolphin and shown butchered into three sections, with the head and tail removed (Figure 6.3). This image matches the manner in which the dolphins and porpoises were butchered at Flixborough (Dobney *et al.* 2007: 199). The other image describes the animal as a fish that is being prepared for consumption (Figure 6.4). The head has been removed and the tail is about to be cut off, just like the dolphin in the previous image. Interestingly, the story recounts that the fish was caught by an eagle from a river. Once the head is removed, it is given to the eagle as a sign of gratitude (Marner 2000: 72).

*Figure 6.3 Image from Chapter 11 of the Life of St Cuthbert by Bede, illuminated in the 12th century. From Marner 2000: Plate 14.*

*Figure 6.4 Image from Chapter 12 of the Life of St Cuthbert by Bede, illuminated in the 12th Century.  From Marner 2000: Plate 15.*

Many literary sources of the late Anglo-Saxon period suggest that the elites pursued further control and ownership of cetaceans by claiming all stranded individuals to be the property of the king (Gardiner 1997). These sources include beached animals, which are described in a rather different terminology, as can be seen on the inscription on the Franks Casket (Figure 6.5): "The waters raised the fish onto the mountainous shore; the savage creature grew sad, where he swam onto the shingle. Whale's bone". As a living and swimming creature, it is referred to as a fish. However, when it leaves its natural environment and hence is no longer able to survive, it becomes a whale. The whale's identity is further enhanced by the fact that it is now useful – whale's bone (Sorrell 1994: 45).

*Figure 6.5 Left side of the Franks Casket depicting the story of Weland the blacksmith (www.britishmuseum.org)(19/05/13).*

Sayers (2002) suggested that there was no Old English word for cod and until recently, the noticeable lack of cod remains until the 10th century has supported this (Barrett *et al.* 2004a: 622-623). The appearance of cod and other gadids after the late 10th century was thought to be related to the expansion of Scandinavian influence over England, which brought the taste, knowledge and equipment to catch these fish (Sykes 2007a: 58). The word for cod thus may originate from Scandinavia. Lockwood (2006) argues that the Old

English *codd,* which means sack, refers to cod-fish, thus meaning "fish in a sack" and referring to the trade in dried cod from Scandinavia. The Old Norse word for cod is *þorskr*, which was then substituted by *fiskr* meaning "fish". However, the presence of cod in many of these zooarchaeological surveys has increased, albeit only from two new sites – Lyminge and Bishopstone. Nevertheless, cod were present in large numbers at these two sites, with body-part patterns indicating that whole fish were brought to the sites (Barrett 1997). Cod are found on several mid and late Anglo-Saxon sites, but since unfortunately, body-part patterns are rarely mentioned, it is difficult to establish if these fish arrived in a fresh or preserved state. Isotopic studies on cod bones from various English sites showed that up to the 13th century, cod in England came from local waters (Barrett *et al.* 2011; Orton *et al.* 2014). Those cod specimens found on inland sites of the late Anglo-Saxon period are likely to have been preserved. However, cod finds from estuarine sites may in some instances have been consumed fresh. The fact that mid and late Anglo-Saxon period sites are not completely void of cod shows that cod was not unknown. It appears that in some places such as Lyminge and Bishopstone, cod were actively sought for, though they may not have been named correctly or at all.

A discrepancy between naming a fish and finding it in zooarchaeological contexts may also exist with sturgeon. Sturgeon is part of Ælfric's fisherman's list of fish that he catches (Swanton 1975: 171). It is also one of the species that, if caught in one of the traps belonging to the manor at Tiddenham, must be given to the lord along with other marine fish (Douglas and Greenaway 1953: 117-118). Other such fish include herring, salmon and porpoises.

Intriguingly, zooarchaeological finds of sturgeon are rare; two of which have recently been revealed during excavations at Lyminge (Knapp *pers. comm.*). Six bones were found in the mid Anglo-Saxon period, three of which came from excavations at the Royal Opera House, James Street and Peabody (Armitage 2004; Locker 1989), all in London, two came from 9th century phases at Flixborough (Dobney *et al.* 2007), and one from Porchester Castle (Easton *pers. comm.*). Only 21 late Anglo-Saxon period bones of sturgeon were found, all at Westminster Abbey (Locker 1997). It seems rather odd that a fish that is supposed to have been highly prized and favoured by the elite appears so infrequently in the zooarchaeological record. On the other hand, this scarcity could be the reason for its desirability, i.e. sturgeon was under threat of becoming extinct (Locker 2010). In northern France, sturgeon were found on high-status sites of the 10th and 12th centuries, e.g. Boves and Andone (Racinet 2010: 265; Rodet-Belrabi 2009: 342; Clavel 2001), but also in small numbers on other elite sites of the 7th to 9th centuries, e.g. Serris and Hamage (Gentili and Valais 2007: 102; Clavel and Yvinec 2010: 80). Possibly, what is called sturgeon by the Anglo-Saxons may in fact relate to another species of fish. The name of these large fish, sought after by the elites, may in fact have related to any large white-fleshed fish or any marine fish. This may also have extended to include cetaceans, such as porpoises and bottle-nose dolphins.

Large fish have always been prized and considered show-pieces. Romans regularly caught large specimens from their ponds to display them in front of guests or send them as presents (see section 2.5). The very large bones of pike found in the late Anglo-Saxon phases at Eynsham are believed to suggest luxury fish consumption (Serjeantson and Woolgar: 2006: 124). It is thus perhaps not unreasonable to interpret finds of large cod and cetacean bones as evidence for luxury fish consumption as well. These large fish may have been prized for their size as well as for the bravery and skills required to catch them. Changes in the perception of and engagement in the environment seem to have been taken place in the mid Anglo-Saxon period. The late Anglo-Saxon elite continued to hunt, securing their control over the wilderness (Sykes 2007a).

The literature on angling from the late 17th century and later is vast (Locker *pers. comm.*). The earliest explicit text is *The Treatyse of Fysshynge wyth an Angle*, which appears as a full text in the *Boke of St Albans* printed in 1496. This text extols the virtues and benefits of fishing alongside hunting, hawking and fowling, for living a full and long life. It also provides practical information on the appropriate tackle and bait required. Hoffmann (1986, 1997) argued that certain phrases within the treatise suggest that this work was not the first of its kind and may be a compilation of previous ones. Hoffmann (1986, 1997) discussed that mentions of angling as a sport in France may date to as early as the late 12th century. In his letters and poems, Guido of Bazoches (d. 1203) regularly mentioned fishing as part of his "pleasures", alongside the chase and fowling (Hoffmann 1986: 887). Chrétien de Troyes' Fisher King in *Conte du Graal* or *Perceval* recounted the story of a king who is too injured to partake in the usual pursuits of a king, such as hunting or hawking, so instead goes fishing, which is comparable in amusement to the chase and falconry and appropriate for a noble (Hoffmann 1986: 888). In the *De vetula*, a pseudo-Ovidian probably dating from the mid 13th century (Hoffmann 1986: 890), fishing is described alongside fowling and hunting.

Several texts from 13th century Germany also deal with fishing as a sport practised by members of the elite (Hoffmann 1986). While there is only one relevant text in Spanish, it is particularly interesting. Dating to the 16th century, this text is a dialogue between an old fisherman and a young noble who is out fishing. The noble and the fisherman discuss the virtues of their pastime. The fisherman explains how hunters "threaten their salvation by damaging the properties of others, by ignoring the obligations of religion, and by indulging in pride and gluttony" (Hoffmann 1986: 897). Fishing, on the other hand, is superior as it is balanced and does not allow for any excess. It is suited to noblemen, as it allows performance of their social roles, and has also been done by apostles and saints. The nobleman admits defeat and then asks the fisherman for instruction, to which the remainder of the text is dedicated. Despite the fisherman disagreeing with hunting, both the nobleman and the fisherman describe their sports as recreation and beneficial to the soul (Hoffmann 1986: 898).

Many of the above texts give detailed descriptions of the tackle required and the methods used. In Guido's writings, nets are mentioned among the rods and lines, sinkers and floaters. The Emperor Maximilian is known to have occasionally fished with a net. This equipment is identical to what would have been used by professional fishermen whose catches were sold in markets, such as the one in Ælfric's *Colloquy*. Archaeological identification of when such equipment is being used by elites is problematic, unless it is found specifically on an elite site and there is no possibility that they would have been used by any other person living on or near this settlement. Hooks were found at both Bishopstone and Flixborough, and weights were also common at the latter settlement. The weights could have also been used for fowling, in which case the evidence for two noble pursuits would be present at this site.

Few of the above texts explicitly mention the preferred fish. It is thus generally accepted that these texts refer to fishing as a sport on rivers and lakes. *The Treatyse of Fysshynge wyth an Angle* lists 18 different species of fish that are good to catch. The German documents all refer to river fishing. Other texts such as Chrétien de Troyes do not give any details. Basurto's dialogue is followed by a teaching on the best methods for fishing at sea and on rivers. Herring is among the freshwater fish listed by Guido de Bazoches. Hoffmann (1986) stressed that the English, French, German and Spanish texts were written independently of each other, and that it is therefore unlikely that any influences were shared. However, all these documents are similar with regard to the scarcity of mentioning of marine fishing. As the medieval period progresses, the marine fish drop in numbers with the exception of cod and herring and are replaced by freshwater species. This trend is accompanied by an increase in the number of fishponds associated with manor houses and ecclesiastical establishments (Aston 1988). Household documents, however, continue to mention marine fish, which seem to have been prized by the elite (Serjeantson and Woolgar 2006).

In recent times, sport fishing in marine waters has been and still is widely practised across the world, with marlin being a favoured fish for its power and speed. This sort of fishing is practised from a high-speed boat with very strong lines and rods, and is limited to those who can afford it (Chevenix

Trench 1974). However, many scholars believe that marine fishing is the oldest form of angling (Chevenix Trench 1974: 243)(Figure 6.6).

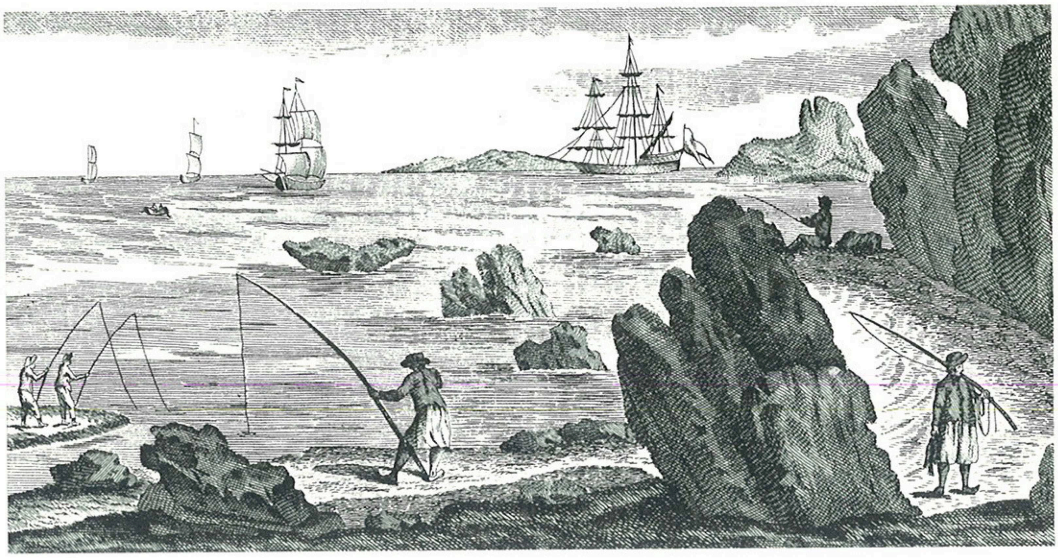


*Figure 6.6 18th century print of shore-side fishing. From Chevenix Trench 1974.*

The literary evidence from the 13th century onwards is very clear in classifying fishing as a noble sport. It is possible that the concept of fishing as a recreational activity is older than the earliest dates of the documents, but it is impossible to know when it began. The equipment used is made of organic materials, which rarely survive archaeologically and can also be used for other types of fishing. The only useful evidence in this respect are the species of fish found on archaeological sites. In modern game fishing, fish such as salmon and trout are targeted because of their speed, and the required skills and knowledge of the angler to successfully cast the line and land the fish. It is also an active sport, which requires walking up, down and across relatively fast moving waters. This is in contrast to coarse fishing, which is more relaxed and generally done from a boat or the banks of a river. It is difficult to know what sort of fish would have been favoured by the Anglo-Saxons, if indeed they were fishing for sport. Several documents from the late Anglo-

Saxon period demonstrate that elites sought to control aquatic resources through ownership of fisheries (Hoffmann 1996: 653; Hooke 2007: 44-47; Tsurushima 2007). The definition of these fisheries is unclear and probably varies from region to region. It may refer to a single weir, a group of weirs or perhaps even a stretch of river or coast. In terms of fish behaviour, species that may have made good "sport" include pike, grayling, haddock, cod, trout and salmon. These species can grow to large sizes; the bigger the fish, the greater skill and strength is required to land the fish. Grayling, haddock and cod provide the added challenge of living in open waters, where quick weather changes can make conditions more precarious. Haddock and grayling are rare on archaeological sites of the period, whereas pike have been found at Flixborough and Eynsham, as well as Coppergate, York. Cod are also found on a variety of other mid and late Anglo-Saxon settlements, though rarely in high numbers. The only sites where large specimens are known from are Bishopstone and Lyminge. Unlike hunting, sport fishing may have been a perfectly acceptable pastime for ecclesiastics. Later documents present fishing as an activity that is calming and relaxing for both body and soul. Its association with saints and apostles strengthens this view.

The changes in the amounts and species of fish found in this period are also reflected in other areas of zooarchaeology. Finds of hawking birds in urban contexts such as at Coppergate, York (O'Connor 1989), and St Aldate's, Oxford, may suggest that professional fowlers sold their catches in urban centres or that birds were kept by the elite when living in or visiting towns (Poole 2010: 275). Much textual evidence points to the importance of hawking by the elite. King Alfred is portrayed as an avid hunter in the *Vita Ælfred*

(Marvin 2006: 84-85), and the scene for October in the Cotton Tiberius Calendar shows goshawks being used to capture cranes (Dobney and Jacques 2002: 18). The number of deer remains on secular elite sites increases, which is part of a wider trend of elites seeking to distinguish themselves from others and to control nature and the environment (Sykes 2007a, 2010a, 2014). Hunting and the consumption of wild animals provided the perfect avenue for such an ambition. Whereas meat-bearing elements representing gifts are present on rural sites of the mid Anglo-Saxon period, this all but disappears as the meat is being consumed on the estate by the owners (Sykes 2010a, 2014). Although people of lower status would still have been involved in the hunt, the underlying ideology is one of increasing social boundaries (Sykes 2007a).

By the later medieval period, secular and religious settlements preferred to consume freshwater fish. When exactly this began is hard to date. It seems that many elite settlements of the late Anglo-Saxon period tried to control marine sources, while still profiting from them due to an increasing demand for fish. Perhaps at the same time, the elites seeked to differentiate themselves from other society levels, as they used to do through the display of material goods and the consumption of deer. This may have been done by singling out bigger fish where possible.

### 6.4 Engaging with the wild

The lack of wild animals in zooarchaeological assemblages of the early Anglo-Saxon period is likely to be a result of how these animals were perceived. Poole (2010: 230) demonstrated that there is ample evidence supporting a strong relationship, close contact and regular interactions between humans and domesticated animals throughout the Anglo-Saxon period. It may thus be assumed that contact with wild animals would have been much more limited and sporadic. Ingold (1994) stressed that the lack of close contact and familiarity with wild animals placed these animals in a social sphere that is symbolically remote from that of people. As such, it is likely that wild animals were seen as belonging to a type rather than individuals in their own right (Poole 2010: 230). In this case, fish would have been considered a part of wild animals as a whole, which may explain their scarcity in early Anglo-Saxon zooarchaeological assemblages.

Zooarchaeological (section 3.1) as well as isotopic evidence (section 5.4.2.i) has shown that the consumption of fish was uncommon during the early Anglo-Saxon period and to some extent the mid Anglo-Saxon period as well. A comparison of the available isotope data across various periods shows that $\delta13C$ and $\delta15N$ values are significantly lower for Anglo-Saxon period sites (which are mainly comprised of early Anglo-Saxon samples) than for the Roman and later medieval periods (Figure 6.7).

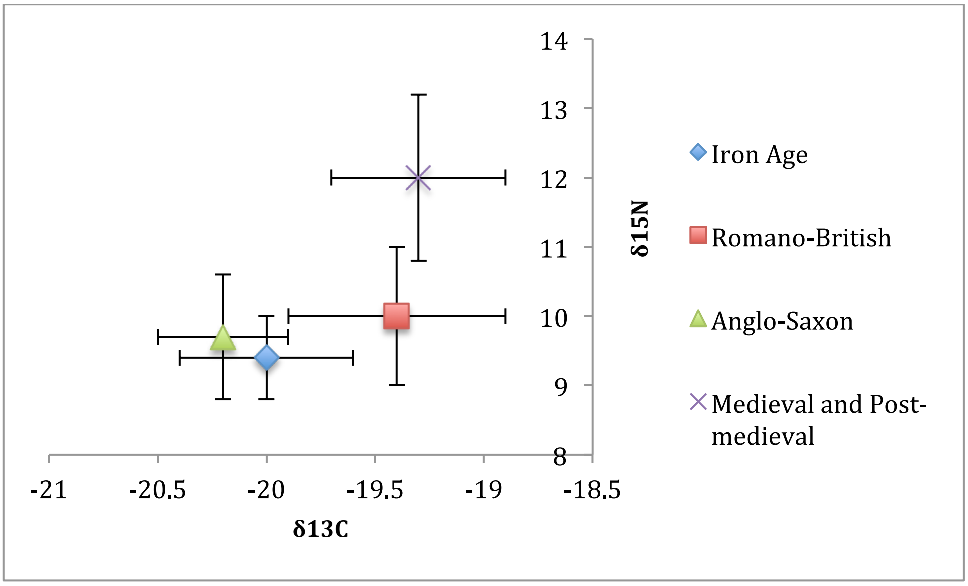



*Figure 6.7 Isotope values for Iron Age, Romano-British, Anglo-Saxon, and Medieval and Post-medieval sites*

The majority of the samples from the Anglo-Saxon period come from early contexts, which suggest that fish were not consumed in such amounts that would leave an isotopic signature (see section 5.4.2.i and Figure 5.7). The absence of a distinct isotopic signature may also be down to the fact that fish found in assemblages were generally not of marine origin. According to Mays and Beavan (2012), the ability to distinguish between the isotopic signatures of marine, estuarine and riverine fish may help unlock further clues. Indeed, richly accompanied burials located relatively far upstream revealed that marine protein was of only small significance (Mays and Beavan 2012: 872). These fish were transported up the river, probably either as a traded or exchanged commodity, or people further inland actively sought to exploit the sea sporadically. This is probably how fish arrived at sites such as Bonners Lane, Leicester, where amongst the few bones of freshwater fish were found six herring and two salmonid bones (Baxter 2004). The single bone from a plaice or flounder recovered from Kings Meadow Lane, Higham Ferrers (Evans and Strid 2007), is also likely to originate from a food item that was transported from the coast. These fish bone data show that, with a few exceptions, fish were acquired from the nearby surroundings of settlements. However, the exceptions highlighted above indicate that trade and transport of fish did take place to a certain degree.

Wild animals do not seem to have played a particularly large part in diets during the early Anglo-Saxon period. Many studies have shown that hunting was a secondary activity in farming societies, which was usually carried out only as part of a ritual involving expressions of masculinity (Cartmill 1993; Hamiliakis 2003; Ingold 1994).

As was discussed in section 5.2, depictions of aquatic creatures are rarely naturalistic, which may be a result of a lack of familiarity and understanding of fish and their habitats. These creatures are most often interpreted by archaeologists as representing pike due to the long nose and the placement of fins. Although pike bones are known from early Anglo-Saxon sites, they are very uncommon. In total, 27 bones were recovered, 19 of which at West Stow. Other pictorial depictions of fish do not place them in a recognisable habitat. On the Lullingstone bowl, all animals seem to be floating separately from each other, with a raptor being placed above the fish as if it was trying to clasp them in its talons. This imagery is very similar to the appliquée from the Staffordshire hoard (Figure 6.8). An example of birds fighting over fish was found on a buckle at Faversham (Speake, 1980: fig. 6n).


*Figure 6.8 Gold shield fitting from the Staffordshire Hoard (http://www.staffordshirehoard.org.uk/staritems/fish-and-eagles-zoomorphic-mount)*

The fact that fish were depicted alone or being caught by birds may indicate a lack of understanding of these creatures' various habitats. The fact that they are depicted as bird prey may indicate that fish were most commonly encountered in estuaries, possibly during wildfowling. Wildfowling seems to have been the most common form of wild animal exploitation at West Stow, where crane (*Grus grus*) is the most commonly represented species. Primarily freshwater fish, e.g. pike and cyprinids, were recovered, but some flatfish were also found. Though primarily estuarine, some flatfish will enter tidal rivers (Wheeler 1969: 535-536). In this instance, both wildfowl and fish will have been encountered in very similar environments, i.e. floodplain and tidal estuaries. It is thus possible that both fishing and wildfowling may have occurred simultaneously. Estuarine birds were often caught using nets. Ælfirc's fowler mentions nets among other methods (Swanton 1975: 172). The net may be attached to a wooden frame or strung up between a tress to catch birds in flight, or placed at the bottom of a river or lake to catch diving birds (Wastling 2009: 250). Similar nets may have been used to catch fish. This may have been done by throwing the net into the water and gathering it subsequently, or stretching it across a segment of river to catch fish as the tide retreats.

Actual instances of raptors catching fish from flowing waters may not have been sighted regularly, but wading birds catching fish in estuaries may have been a more common sight. The two events may have been combined artistically. Alternatively, the depiction of a fish resembling a pike may just simply represent a generic fish whose shape and form resembles that of a pike. The zooarchaeological evidence shows that fish were caught in the waters closest to the settlement. These included freshwater, estuarine or marine species, which are very diverse in their appearances. While fish from all sorts of environments were caught in small numbers and at a small number of sites, this may further support the argument that the interaction with fish and their habitats was limited and little understood. As discussed previously, place-name evidence suggests the existence of a real fear of dark watery environments at the time (Semple 2010; Lund 2010).

The exploitation of wild mammals and birds was minimal in the early Anglo-Saxon period. Poole (2010: 60) noted that wild mammals and birds only make up 0.2% and 0.07% of assemblages, respectively. This is despite the fact that the zooarchaeological evidence from excavations does not suggest that there were less wild animals present at the time compared to other times (Poole 2010; Sykes 2011). The most common species were red and roe deer followed by hare and smaller numbers of badger, fox, bear, otter, beaver and stoat. A number of postcranial elements suggest that some hunting did take place, but only very rarely. The presence of wild mammals and birds differs between sites. Some sites suggest a very different picture to the general trend. Amongst these is West Stow, which provided one of the largest zooarchaeological assemblages, as well as one of the largest assemblages of wild mammals and birds from the early Anglo-Saxon period. Nevertheless, even at West Stow, wild animals make up less than one percent of the assemblage (Crabtree 1989, 1996). It seems that during this period, fishing is closely related to the presence of other wild animals. This is confirmed by the fact that the settlement at Bloodmoor Hill also revealed higher numbers of wild mammals.

Fish are often depicted iconographically alongside birds (see examples above) as well as other wild animals. The Lullingstone Bowl shows fish accompanied by birds and stags (Figure 5.6). A hanging bowl from Sutton Hoo Mound 1 contains a fish on a pedestal inside the bowl (Figure 6.9). The fish is a salmonid, of round shape, depicted with fins and scales, and rotates on the pedestal. The body is spotted with small pits that are filled with an unidentified colour of enamel (Figure 6.10). Depicted around the fish are seals and otters, and under each hook escutcheon is a stylized boar's head making it appear as a genre scene (Bruce-Mitford and Raven 2005:263).

*Figure 6.9 Hanging-bowl from Sutton Hoo showing fish on pedestal. From Bruce-Mitford and Raven, 2005: Fig. 341.*

*Figure 6.10 Drawing of fish pedastal from Sutton Hoo. From Bruce-Mitford and Raven, 2005: plate 7)*

Besides fish, watery environments are represented by seals and otters, both of which were likely admired for their ability to live and move between two different environments. On the bowl described above and other objects within Mound 1, these creatures are depicted alongside boars, portray stags and other wild animals. It is thus likely that fish were also considered as wild creatures. This may explain their scarcity on early Anglo-Saxon sites but also support the possibility that fish consumption and fishing was an activity favoured by elites (see section 6.3).

The presence of fish may also be related to an expression of power. Catching these creatures, which live in a mysterious and sometimes dangerous environment, may have carried special meanings. Many cultures revere water as a bringer of life and assign it sacred connotations (Simoons 1994). As such, water and in particular the sea, could have been seen as something that sustains life but could also take lives away (Barber 2003; Cooney 2003: 325). Both Romans and Greeks feared but also revered the sea, as many sailors and fishermen disappeared during expeditions out to sea (Purcell 1995; Mylona 2008). For the Anglo-Saxons, the sea was associated with the danger of raids by pagan "northmen", as described in the writings of Alcuin (Loveluck 2013: 323; van de Noort 2012: 196). In many societies, both past and present, the catching of fish is part of belief systems and ritual practices (Jones O'Day 2004; Westerdahl 2005). Marine fish found on early and mid Anglo-Saxon sites are generally of coastal or estuarine origin. The coast, estuaries, as well as rivers and wetlands were perceived as liminal places with boundaries that had to be crossed (Bradley 2000: 27; Pollard 1996; Westerdahl 2000, 2005: 11-12; O'Sullivan and van der Noort 2006). To an extent, these areas were described as liminal places, as this was the opinion put forward by secular and religious elites, who viewed these landscapes from a landholding position and judged land on its agricultural potential (Loveluck 2013: 323). Catching fish and also wildfowl meant travelling across and through separate worlds, and taking creatures out of these worlds. This may have resulted in the view that fish was a food source that had to be respected. The concept of the sea in the Anglo-Saxon mind was complex. It was feared but also formed a core of the mentality and life style through sea-borne trade and travel (Rose

2007: 3). This may explain why we know so little about seafarers and fishermen.

The zooarchaeological and isotopic evidence of the Iron Age suggests a lack of fish consumption (see section 2.1). The isotope data for the Anglo-Saxon period shows that even less marine protein was consumed. However, in the later part of the early Anglo-Saxon period and the mid Anglo-Saxon period, zooarchaeological finds of fish become more frequent. It seems that fish were not a taboo but were bound up in a complex belief system along with other wild animals. If fish were avoided, we would expect even fewer fish bones in assemblages. Similarly, if there were no limiting beliefs, one would expect a greater number of fish on archaeological sites of the period. However, the discrete meanings of such a belief system are hard to untangle. The evidence for fish consumption for the early half of the early Anglo-Saxon period is rather scattered but not entirely limited to coastal areas. Herring bones have been found as far inland as Northamptonshire, indicating the existence of a trade and communication network that occasionally included fish. Unfortunately, those fish bones recovered from SFBs are very likely of a later date than their accompanying structure; their assignment to a period of activity or occupation can thus be problematic. The meanings attached to the appliqués on shields are hard to discern. Unlike raptors, whose power of flight and aggressive nature can be interpreted as desirable attributes, the attributes of fish in this respect are harder to distinguish. The most obvious characteristics would be the ability to swim fast, and the powerful jaws of pikes for defence and aggressive behaviour. However, on a more complex level, the presence of fish as shield appliqués may relate to bravery and courage. The owner of the shield may have conquered wet environments or crossed boundaries between land and water to catch fish or to travel. Such acts may sometimes be recounted on the shield. Two sites, i.e. Bloodmoor Hill, Suffolk, and Lyminge, Kent, revealed a slightly greater number of fish remains along with equipment associated with fishing. These sites may thus perhaps display the beginnings of social differentiation in the latter half of the 7th century (see section 6.3). A small number of discovered fish traps also dated to this period. Considering that the evidence is very limited, it would be presumptuous to suggest that a greater degree of fishing was undertaken by a small number of higher status individuals. However, it is evident that different people, i.e. communities as well as the emerging elites, engaged in fishing activities to a certain degree. Peoples' perceptions of the world were changing, as evidenced by the mid Anglo-Saxon period, and so were their attitudes to fish.

Through the recording of place-names, the establishment of literacy also allows us to gain a better understanding of how fish were perceived in the landscape. Various types of place-names relating to fish have been recorded (section 4.2). Some of these earliest recordings of fish-related place-names indicate establishment of settlements in previously avoided locations such as Ely, Cambridgeshire, in the Fens. In this case, the place-name denotes this place as one where eels were found in abundance. Ely was also the location of an early monastery, which is the context of its first record. Many early monastic houses were situated in isolated landscapes such as marshlands or islands, as the landscape and sense of isolation fitted with monastic ideals. Both demons and angels inhabited the wilderness, rendering these areas both a source of temptation and salvation (Pluskowski 2006: 58). Ely is the only place-name definitely recorded in the mid Anglo-Saxon period. Wareham in Dorset may appear in written records dated to AD 784 (Watts *et al.* 2011). A stone-built weir discovered at Wareham is likely to date to the 9th century (Clarke 1950). It is possible that many of the weirs dating to the mid Anglo-Saxon period were named or recognised verbally. As O'Sullivan (2004) points out, these weirs served as clear and important memory markers in the landscape both due to their size and because they demonstrated a change in landscape usage and attitude. While fish were sometimes caught and consumed in the early Anglo-Saxon period, the sudden increase in quantity seen in the mid Anglo-Saxon period can only be interpreted as a result of a significant change in how watery environments were perceived.

Increased levels of fish remains are coupled with a much greater degree of wild animal exploitation, seen most clearly on elite sites. Red and roe deer remains were found on far more elite than rural sites. Deer remains on rural sites most likely represent gifts from elites (Sykes 2007a, 2010). The increased level of activity in estuaries is also mirrored in wetlands and open spaces through wildfowl exploitation and hawking. Wild birds are present on all site types, but their numbers are significantly higher at secular high status sites than on rural and urban sites (Poole 2010: 255). Wildfowl could be caught in various ways but hawking was restricted to the elite (Sykes 2005). Other wild animals that are not consumable but were killed, for example, for their fur, were also present in much smaller numbers.

Overall, the Anglo-Saxon period is characterised by greater coastal exploitation and, in some instances, exploitation further afield in the sea. It is very problematic that phasing at many of these settlements is not very precise and most often broadly covers the 7th, 8th and 9th centuries. When there are phases, as at Flixborough and Fishtoft, the earliest phases contain almost no fish. Fish are present in late 7th century phases at Flixborough, with the numbers of eel, plaice/flounder and smelt remains increasing from the 7th to the 9th centuries. In the early 8th century phase at Fishtoft, fish remains were not overly abundant. Earlier phases at Lyminge revealed small numbers of fish bones. However, more precise dating of the appearance of larger amounts of fish and cod will have to await the post-excavation analysis. While this exploitation is not limited to particular levels of society, it does seem that different people had access to different species of fish or at least chose to eat different fish. The coastal exploitation was not limited to fish; shellfish exploitation also became much more significant, with large deposits of oysters and mussels found at Sedgeford and Lyminge, amongst many other sites. Although marine shellfish exploitation was not included in this study, the role of gathering food from the foreshore is important and demonstrates a change in the use of this landscape.

Finds of other wild animals, such as otter, polecat and bear found at Coppergate (O'Connor 1989) indicate that fur processing was a common craft practised in towns. As Poole notes (2010: 281), the fact that more people were now in much greater contact with wild animals means that their perceptions of the wild had greatly changed from the early and mid Anglo-Saxon periods. Similarly, the greater abundance of fish means that people were becoming more familiar with their appearance and, importantly, their smell and taste. The higher numbers of weirs and fisheries also indicates a change in perception. A large number of people would have been involved in the building of the weirs or as fishermen, but even more will have witnessed the increased activity along rivers and coasts.

This increased engagement with wet environments and the associated rise in fish consumption is likely to have had an impact on the elite's perceptions of the sea and its resources. The 10th century phases of occupation at Flixborough are characterised by a decrease in fish remains, but a return of cetacean remains alongside other evidence of elite lifestyle (Dobney *et al.* 2007; Loveluck 2007). There also seems to be a much reduced level of interest in coastal links. Loveluck (2007, 2013) noticed that while in the mid Anglo-Saxon period, many elite settlements demonstrated a clear maritime outlook, this disappears in the late Anglo-Saxon period, when imported items were brought directly to urban centres. This change in maritime view and interest may also be reflected in the consumption of marine resources at a wider social level. Fish became more common and available at urban sites. While elites still sought to control some of these, they tried to change their habits and differentiate themselves by consuming larger marine fish and marine mammals.

These changes are perhaps reflected in the landscape. Only a small number of fish-related place-names are known from mid Anglo-Saxon texts; most of the other fish-related place-names were written down for the first time only as part of the Domesday Book. However, it is highly probable that many of these names would have frequently been used orally before that. Eel remain the most commonly used species-specific name. Indeed, even though marine fish become more frequent on archaeological sites, eel are still found on the majority of fish-bearing sites. The more generic fish place-names generally denote areas where one can fish, such as a hole (e.g. Fangfoss in Yorkshire) or a broader body of water (e.g. Fishlake in Yorkshire). Other names denote settlements, such as Fiskerton, Nottinghamshire, and Fiskerton, Lincolnshire. Many of these place-names fall within the Danelaw. While fishing activities may have increased in these regions due to the Viking presence, it is likely that the language of the name was simply changed, and that the invaders adapted around the activities already taking place (Hadley 2002).

Perceptions of the wild will also have been very closely linked to the belief systems of the Anglo-Saxon period and the dramatic change of Christianisation.

**6.5 Religion**

Studies in the material culture of the early Anglo-Saxon period indicate that peoples' perceptions of the wilderness and animals were very different to those of today (Pluskowski 2010a, 2010b). It is likely that this also had an impact on people's attitudes towards fish as a food item and symbol. Finds of bear claws, eagle talons, and teeth of boar, wolf and beaver in burials suggest a belief in talismanic powers attributed to such items (Meaney 1981). Pagan beliefs are often "zoocentric", meaning that animals are seen as having powers equal to or in excess of humans (Pluskowski 2006, 2010a). Pictorial representations of aquatic creatures and birds on shield appliqués, brooches and other objects that were found in graves are believed to be linked to the belief of protection (Dickinson 2005) or taking on properties of the animal (i.e. through the wearing of different body-parts; Conneller 2004: 48-51; Ingold 1998). The aggressive nature and protective powers of these creatures depicted on artefacts was not their only admired attribute. The ability to transcend boundaries and live in different environments was equally important (Poole 2010: 242). The presence of otter and beaver fur in the Sutton Hoo burial is likely related to these species' ability to live both on land and in water. Much of this evidence suggests that the early Anglo-Saxon world was perceived as a sacred and scary place, where both wild and supernatural creatures lived (Sykes 2014).

Generally, the evidence for fishing during the early Anglo-Saxon period is limited, which to an extent, is very likely a result of recovery techniques and disposal patterns (see 3.1). While settlement evidence in coastal marshes and low land areas is not completely lacking, these areas were still perceived as liminal, particularly by those living in upland and drier areas. It is likely then that activities in these areas were not undertaken very frequently and were viewed with suspicion. The infrequency of these early forages into aquatic areas is reflected in the iconographic representations of fish, which are rarely realistic (see section 5.2).

The Christian Church was responsible for numerous changes in the lives and daily practices of people, in particular with regards to understanding their natural environments. It is believed that society and nature were closely entwined. The spiritual world was accessible through the natural world, and animals provided a link for this transformation (Glosecki 1989; Williams 2005). The depiction of these aggressive creatures has been interpreted as suggesting the struggle between deities and monsters linked to Woden. The similarities between the Anglo-Saxon Woden and Scandinavian Odin in artefacts of personal adornment are common (Pluskowski 2010a). Zoomorphic designs are common on objects from the same period across Europe, and particularly from Scandinavia, and similarities can be observed between them (Dickinson 2005; Pluskowski 2010a). During this period, the Church would have been responsible for teaching beliefs, while previously, beliefs would have been acquired through society (Urbáncyzk 2003: 16). Apart from a relative scarcity of fish at early Anglo-Saxon sites, very little is known of how fish and other aquatic creatures were viewed. Several shield appliqués depict fish, which have been interpreted as pike and are believed to be protective (Dickinson 2005). The representation of many of these appliqués is rather stylised, and very few of these fish are realistically depicted. This seems at odds with similar depiction of birds, particularly raptors, which are generally much more realistic. I believe that the lack of realism in these fish appliqués may reflect a lack of knowledge of fish. The lack of fish remains is perhaps a real avoidance, with the exception of a small number of sites such as West Stow, where both estuarine fish and birds were exploited (see section 6.5). These appliqués therefore reflect aquatic monsters or terrifying creatures that are also admired for their fierce teeth and quick movement. These appliqués are no longer found at mid Anglo-Saxon period sites, which is largely a result of Christian burial practice. However, fish remains at archaeological sites increase greatly in numbers, and there is a greater level of coastal and wetland exploitation. Perhaps part of the

Church's teachings was to dispel fears and uncertainties surrounding fish and their watery environments, such as Wilfrid teaching the south Saxons to fish (Colgrave and Mynors 1969: 374-375).

Certain iconographic representations of fish are thought to represent Christian symbols. However, given their aggressive and fantastical nature as shield fittings this seems very unlikely. The lack of any other Christian symbolism on these shields also makes this argument less plausible (Dickinson 2005). Some pieces such as the belt buckles from Eccles and Crundale are believed to be Christian symbols, as these appear to be reused shield fittings (Hicks 1993). The buckles from Eccles and Crundale show a fish mount on one side, while the other side is decorated with interlacing snake-like creatures typical of Salin's Style II. Hawkes suggested that as the fish is on the back plate of the buckle from Eccles, this may be the deliberate placement of a Christian symbol. The wearer would display the old symbols of protection, while wearing the new close to his body. This is in contrast to the almost contemporary buckle from Crundale, where the fish is on the front of the buckle and fully on display (Hawkes 1997: 323-324). Fish appear to be an important symbol in early and later Christian art, but there are very few unambiguous examples in the Anglo-Saxon period.

Monastic houses were run on a series of rules and guidelines that impacted on all aspects of daily life, none the more so than on diet. The Rule of St. Benedict, written in the 6th century AD, is best known for forbidding the consumption of quadruped flesh (Gasquet 1966). Diets rich in fish have thus often been linked to monastic houses. The Rule of St Benedict will have been known to several ecclesiastics such as Wilfrid and Benedict Biscop, and it is likely that they introduced some of these aspects into their own monasteries (Foot 2006: 54). The oldest known copy of the Rule in England dates to the 7th or 8th century (Gasquet 1966; Farmer 1997). However, it is difficult to evaluate the extent to which this rule was adhered to and its impact on secular members of society. Gem (1997:12) explains that the practising of the Rule was reinforced by religious reforms in the late 9th and early 10th centuries. Before, monasteries practised a *regula mixta*, where no single rule was dominant. The *regula mixta* was either the choice of the abbot or the founders and local rulers who wished to further exert their influence (Blair 2005: 80; Foot 2006: 6; Mayr-Harting 1976).

Many studies tried to identify the zooarchaeological markers of a monastic diet (see for example Dobney and Jaques 2002; Ervynck 1997), and while hawking and hunting were not viewed as appropriate for members of the clergy (Kylie 1911: 178), these land mammals are not absent from assemblages recovered from monastic settlements. Roe deer, for instance, is regularly found on ecclesiastical sites (Sykes 2007a: 68). Assemblages that are rich in sheep remains and are usually accompanied by the material remains of textile working such as pin beaters and loom weights, have also been taken to indicate monastic attributes. Examples include the late 8th and early 9th century phases at Flixborough (Dobney *et al.* 2007; Loveluck 2007:156-157). Ageing data for sheep from the mid Anglo-Saxon period shows an overall trend of increasing importance of wool production (Poole 2010: 107). A higher number of sheep remains does thus not always suffice as sole indicator for monastic presence.

As a result of the Benedictine Rule, assemblages rich in fish remains have often been thought to be indicative of a monastic diet. It is difficult to test the validity of this hypothesis for the Anglo-Saxon period, as only a few monastic sites have been extensively sieved. For instance, samples from the double monasteries of Wearmouth and Jarrow were not sieved, the early phases at Eynsham revealed no fish remains, and at Lewis Priory, only one well deposit was sieved (Stevens 1997). Westminster Abbey, dated to the late Anglo-Saxon period, revealed a very rich fish assemblage of 9000 fragments and therefore supports the hypothesis of a monastic fish-diet (Locker 1997). However, this site is an exception. The settlement at Flixborough seems to have changed character during the 9th century and was described as exhibiting a monastic character. James Barrett (Dobney *et al.* 2007: 231-233) applied correspondence analysis to the fish assemblage of Flixborough and noted the difficulties associated with the small dataset available for the Anglo-Saxon period. As a consequence, the analysis incorporated data from later medieval monastic sites as well. The results indicated that flatfish were a trait of monastic houses, though the NISP of flatfish does not vary greatly over the different phases at Flixborough. Incidentally, flatfish were also found at numerous other site types of the Anglo-Saxon period. At Fishtoft, Lincolnshire, flatfish were one of the most abundant fish species recovered, suggesting the presence of a fishery focussing on flatfish alongside eel. Other sites that have revealed significant numbers of flatfish are *Sandtun,* Sedgeford and Bishopstone. Flatfish have also been found in the pre-7th, 7th and 8th century phases from Lyminge. A mid Anglo-Saxon monastery is believed to exist at Lyminge (Thomas 2010), but at present it is hard to assign a distinct monastic signature to the assemblage (Reynolds 2009). Other studies showed that herring and cod were also an important element of monastic diets (Locker 2001). Herring was most likely preserved through drying, while cod was preserved by salting or brining. Fishponds were common features on estates and monasteries in the later medieval period (Aston 1988). Monasteries further inland may have relied on their ponds to a greater extent, while those closer to the sea will have benefited from a better access to both fresh and preserved marine fish.

Poole (2010) suggested that both Sedgeford and Bishopstone display attributes that are often associated with monasteries. At Sedgeford, Eynsham and St Alban's Abbey, large numbers of immature chicken bones, along with strong evidence for dairying were found. This was supplemented by the cemetery evidence from Sedgeford (Davies 2010). Like Sedgeford, Bishopstone also revealed high numbers of domestic fowl, but these settlements lack the other attributes associated with monasteries. Loveluck (2011) highlighted the similarities in the material culture between secular elite and monastic sites. It is thus crucial to examine all faunal evidence and material remains, rather than base interpretations on only a single zooarchaeological marker..

Several other factors would have contributed to the zooarchaeological assemblage of monasteries. Monasteries were probably responsible for providing medical care, though no hospitals are recorded in Northern Europe, and hospitality, a firmly ingrained practice in Anglo-Saxon England (Gautier 2009). Similarly, monastic establishments may have been required to pay food rents (Foot 2006: 124) or acted as redistribution centres (Blair 2005: 252).

It is very difficult to establish to what extent fish contributed to the diets of the various populations of the mid Anglo-Saxon period. Certain fish such as eel show a high number of bones in relation to their size, which can lead to archaeologically exaggerating their importance. In reality, fish may only be consumed on rare occasions and not necessarily by all persons living in the settlement. The isotopic evidence for the whole Anglo-Saxon period is problematic. Human isotope studies from cemeteries with nearby settlements that have also recovered fish bones are rare. In fact, only three examples exist, one for each of the three periods: Bloodmore Hill, Bishopstone and York (Belle Vue House cemetery with the fish bones recovered from Anglo-Scandinavian levels at Fishergate). Interestingly, the average isotopic signature from Belle Vue House, York, is very similar to that of Bishopstone. The cemetery of Belle Vue House may have served either a rural settlement close-by or the Anglian population of York (Müldner and Richards 2007a). Hull and O'Connell (2011) noticed a clear change in diet in the mid Anglo-Saxon period, particularly in East Anglia, towards greater levels of marine protein. Unfortunately, their survey does not include raw data, which is why it is not possible to ascertain the contexts of these burials or their exact date. However, the authors suggest that the change in diet is related to monastic houses, and that consequently, the increased marine fish consumption is related to religious rules (Hull and O'Connell 2011). Food rules such as the one of St Benedict suggesting a life of simplicity and stressing fish over the meat of quadrupeds, are likely to have had an impact on the diets of several monastic houses. However, it is very hard to establish when these rules were enforced. Many of the early monastic establishments of the mid Anglo-Saxon period would have been subject to the rules imposed by the house's benefactor, often a member of the aristocracy. The lack of mid Anglo-Saxon isotopic data from Hull and O'Connell's survey, and the information presented in section 5.3 of this thesis make it very difficult to assess the impact of marine fish consumption. The zooarchaeological data suggest a significant rise in fish on archaeological sites, with the numbers of marine fish also increasing on certain sites. However, the limited isotopic data suggest that this increase was still not significant enough to leave distinct signatures: fish are likely to have been consumed only occasionally in small quantities. Both sources of data are severely limited and therefore require caution. Isotopic data from the *emporia* may perhaps shed light on whether a more pronounced signature may be identified. Extensive sieving at monastic houses and further isotopic studies may provide a clearer picture.

### 6.6 Summary

Considering all the gathered evidence for fishing and fish consumption throughout the Anglo-Saxon period, it becomes clear that changes witnessed in this respect concur with wider changes and developments in the Anglo-Saxon period. Of course, a number of analytical problems remain, including the fact that conclusions are based on a very small amount of evidence. To some extent, the scarcity of fishing evidence from the early Anglo-Saxon period fits well with the view that wilderness was feared and considered to have magical properties (Sykes 2007a, 2010a, 2010b). The lack of accuracy in pictorial representations of fish suggests a lack of familiarity with these creatures. Their inclusion in mortuary contexts suggests a belief that these creatures may have provided protection. Similarly, the lack of settlement evidence, and lack of activity in wetlands and in proximity to large water bodies suggests that the focus of activities lied away from these areas, possibly for ideological reasons. However, fish bones are not entirely absent from sites. When they are recovered fish bones are present only in very small numbers, are most likely the evidence of very sporadic fishing excursions and probably date to the later part of the early Anglo-Saxon period. A clear understanding of their prevalence is hampered by the fact that many sites were not subject to sieving, and settlement morphology and disposal patterns of the early Anglo-Saxons do not favour the survival nor the recovery of fish remains.

At the time when the mid Anglo-Saxon period witnessed an increase in wild animal exploitation on elite sites, the numbers of fish also increased at all site types. To a large part, this pattern is down to more systematic and intensive sieving strategies implemented on the new *emporia* of the period. Unfortunately, many of the secular and ecclesiastical sites of the period did not benefit from these methods of excavation. However, when this was the case, such as at Flixborough, Lyminge, and to a smaller extent at Sedgeford, fish are seen to be exploited in large amounts. The increased levels of continental trade, together with the establishment of *emporia* on rivers and estuaries, will have increased awareness and knowledge of these environments and perhaps served to dispel fears and uncertainties surrounding them. This development was still restrained. As a result, the species of fish recovered are still primarily of freshwater and estuarine origin.

Herring are the most common marine fish found, which used to be found in the River Thames (Wheeler 1969). It is possible that elites went further afield to catch fish such as cod for display purposes or to demonstrate power and skill. This may have continued in the late Anglo-Saxon period and flourished in the late medieval period (Hoffmann 1986). A small number of coastal rural settlements revealed large marine and estuarine fish assemblages, and it is possible that these represent early fishing villages or their landing sites.

The late Anglo-Saxon period witnessed an explosion in all types of evidence relating to fishing and fish consumption: fish bones were found on a much greater number of sites, and even when only minimal sieving took place, fish bones were sometimes found. Fish hooks, and line or net weights were also found at many sites, such as the various excavations in Norwich. In terms of place-name evidence by Domesday Book, a large number of places were named after eels or were recognised as good places to fish. Herring in particular are found frequently even on sites further inland or away from rivers such as the Thames, where they could easily be caught. Cod remains were also found more frequently, not just on elite sites, though their numbers remain much higher on elite sites such as Bishopstone and Westminster Abbey.

Several textual and archaeological sources illustrate that the elites tried to maintain and increase control over the wilderness and wild animals. This is indicated by an increased number of ownership of fisheries as well as documents stating claims to marine fish and beached cetaceans.

With the increased number of fish found on archaeological sites, one would expect isotopic signatures of the late Anglo-Saxon period to reflect a distinct change in dietary habits that includes marine fish consumption. Unfortunately, hardly any isotopic data from the late Anglo-Saxon period are available. When comparing isotope values from the Anglo-Saxon and medieval period, it is evident that the populations in the medieval period were consuming enough marine protein for it to leave an isotopic trace (Figure 6.5). However, it is not possible to determine when this change happened or whether it was a gradual development that was accompanied by increasing amounts of marine fishbone on a wider number of sites.

Fishing and fish consumption in the Anglo-Saxon period is complex. This chapter discussed the different strands of evidence presented throughout the thesis. A multitude of social and economic factors seems to have played a part in this, including urban development and elite exploration of the sea.

# Chapter 7: Conclusion

Fishing and fish consumption came to play an important role in the daily lives of people in the later Middle Ages. At the same time, preserved fish became one of the key commodities that was traded throughout Europe. Our understanding of the chronology of these developments is evolving continuously with new zooarchaeological and isotopic studies (Perdikaris 1999; Barrett 1995, 1997; Harland 2006; Barrett *et al.* 1994a, 2011; Orton *et al*. 2014). It is clear that fishing habits changed significantly around the 11th century. From this point on, marine fish become more abundant at archaeological sites across much of Europe. The provenance of these marine fish, in particular cod, also changes. Isotopic data suggest that from the beginning of the 13th century, in England, cod was no longer caught in local waters but came from further afield instead (Orton *et al.* 2014). However, the reasons for this increase in marine fishing in the 11th century are still not understood; a question that has so far been tackled primarily from an economic standpoint (Barrett *et al.* 2004).

This thesis explored the dynamics of fishing and fish consumption in the Anglo-Saxon period in order to understand the role of fishing prior to the 11th century and to establish if fishing during this period was indeed as limited as suggested by previous authors (Barrett *et al.* 2004a; Sykes 2007a). To this end, six research questions were set out, and a variety of sources of evidence, including zooarchaeological, material, place-name and isotopic evidence, were investigated. The study showed that fishing and fish consumption in Anglo-Saxon England was highly complex and not controlled by one single factor. A number of different factors contributed to the growing demand for fish and its developing industry during this period.

**7.1 To Fish or not to Fish?**

The fact that fish consumption in Britain and in Europe changed throughout different periods has been noted by many authors (Barrett *et al.* 2004a; Dobney and Ervynck 2007; Locker 2007; Richards and Schulting 2006; Richards *et al.* 2003). The lack of evidence for fish consumption for certain periods including the Iron Age has led various scholars to believe that a taboo surrounding fish consumption may have existed during these periods (Dobney and Ervynck 2007). Data collected in the course of Barrett *et al.*'s (2004) extensive survey suggest a distinct lack of marine fish consumption during the Anglo-Saxon period before the 11th century, with the exception of the mid Anglo-Saxon urban centres. A similar study by Clavel (2001) on northern French sites suggested a similar situation. However, since publication of both of these two studies, new archaeological sites were surveyed and new reports were published, revealing fish remains from the early and mid Anglo-Saxon periods.

Chapter 3 of this thesis discussed all available zooarchaeological evidence from all three Anglo-Saxon periods. Differences in recovery techniques and disposal patterns will have had an impact on the quantity of fish bones recovered from particular periods and sites. Nevertheless, in general, fish do not seem to have been overly exploited in the early Anglo-Saxon period with a few exceptions such as Redcastle Furze, Bloodmoor Hill and Lyminge. Although dating at Bloodmoor Hill and Lyminge was not precise, fish at these sites appear to originate from late 6th or early 7th century deposits. These finds thus represent the precursors to the much greater Lyminge deposits from the 8th and 9th centuries.

Material and structural evidence from the early Anglo-Saxon period includes fish hooks from Bloodmoor Hill and a small number of weirs from the River Thames (Chapter 4). Iconographic representations of fish disappear with the onset of the mid Anglo-Saxon period. While this is largely due to Christian burial practises, the fear and misunderstanding surrounding aquatic creatures seems to have become less prevalent during this period (Chapter 6).

Both freshwater and marine fish are found not only in the new urban centres of the mid Anglo-Saxon period, but also at a small number of elite and coastal rural sites. These rural sites also show evidence of involvement in maritime trade. A great number of weirs were built in this period, which show evidence of continued use and repair into the late Anglo-Saxon period. The increased levels of fishing activity, particularly the construction of weirs, will have had a marked impact on the landscape (e.g. weirs as markers for travellers) and peoples' memories. Weirs and fish species appear in place-names (Chapter 4). Although many of these fishing-related names do not appear in writing until the Domesday Book, some are mid Anglo-Saxon in date, indicating that others may also originate from earlier periods.

The isotopic evidence for direct consumption of fish is complex. While the majority of samples come from early Anglo-Saxon cemeteries, this is the period from which we have the least evidence for fishing (Chapter 5). York is the only settlement from which multi-period samples were available. Anglo-Scandinavian levels showed the lowest isotopic signatures, which change only in 12th century samples that probably come from elite individuals. As such, it the authors concluded that the chronology of fish consumption, at least in York (Müldner and Richards 2007a; 2007b), matches the chronology of marine fishing proposed by Barrett *et al.* (2004a). However, evidence presented in this thesis showed that attitudes towards marine fishing started to change a lot earlier than the late Anglo-Saxon period. Some earlier samples such as those from Lechlade (O'Connell and Wilson 2011), as well as those surveyed in Mays and Beavan (2012) and Hull and O'Connell (2011), indicate small levels of marine fish consumption. However more attention needs to be given to samples from the late Anglo-Saxon period in order to gain a fuller understanding of fishing consumption.

### 7.2 The Reasons to Fish

Fish become more frequent on mid Anglo-Saxon sites. Finds come mainly from urban sites, and a small number of rural secular and religious elites. The increase in fish remains, particularly of marine fish, occurs at the same time as an increase in numbers of wild animals and birds. It is thus possible that marine fishing of certain species may have been an elite-sponsored activity. At both Lyminge and Bishopstone, large cod were found in high numbers. At Flixborough, marine fish are rare, but in the phases where conspicuous consumption is most evident, there is evidence for exploitation of bottle-nose dolphins and porpoises, which were most likely herded up the estuary and killed. Fishing in many parts of the world today is a highly ritualised activity similar to hunting (section 5.2 and 6.4), and elites have often been shown to start such trends (Bourdieu 1984). It is possible that marine fishing, particularly of bigger species, was to some extent an elite activity. This hypothesis is supported by textual sources, which suggest that elites were interested in controlling fishing and sought to own weirs and fisheries (Hoffmann 1996; Hooke 2007; Tsurushima 2007).

The Rule of St Benedict, which forbade the consumption of quadruped flesh, is believed to have resulted in a greater demand for fish (Locker 2001; Barrett *et al.* 2004). To what degree the Rule was accepted is open to debate. However, before the 11th century, it was probably not widely adhered to (section 5.4 and 6.5). As such, it is unlikely that religious beliefs were solely responsible for the increases in fish consumption.

Fish found at *emporia* from the mid Anglo-Saxon period indicate some inshore marine fishing as well as the exploitation of the immediate water sources. In this instance, some of the fish would likely have been caught by individual people as well as purchased. In other instances, fish may have symbolised elite consumption, a display of courage and adventure, as venturing out to sea to catch big fish was dangerous. Later on, religious food rules probably also contributed to the increasing demand for fish.

**7.3 Future Research**

This thesis has shown that several factors have contributed to the taste for fishing and fish consumption during the Anglo-Saxon period. Many questions still remain to be answered. Zooarchaeological and textual evidence revealed that both secular and religious elites played a significant role in this respect. Future in-depth investigation of fish- and weir-related place-names in relation to nearby elite centres may help further our understanding of the role of elites in controlling fishing settlements.

Similarly, the discovery and excavation of more religious and elite secular settlements will help further our understanding of the role elites played in fishing and fish consumption. The possibility that elites caught large marine fish needs to be explored further. However, this will require further excavations using adequate recovery methods.

Zooarchaeological remains are not the only indication that fishing took place. Fish hooks, lead weights and other implements for fish have been found at a variety of sites throughout the Anglo-Saxon period. The frequencies of these finds increase from the 11th century onwards, as does the size of the fish hooks, indicating increasingly more forages into deeper waters. It is possible that more fishing implements have already been excavated but have yet to be recognised. Such finds require greater attention by specialists.

Isotope evidence is crucial in understanding who is consuming fish and when, and can help to reveal how fishing may have been used in defining identities. Ironically, at present, extensive isotopic evidence is available for the early Anglo-Saxon period, while very little data exist for the late Anglo-Saxon period, when fishing became much more prevalent. More isotope data is needed to fully understand the importance of fishing.

The taste for fish and fishing was probably not restricted to England. Much attention has been directed to Scotland (Barrett 1995; Céron-Carrasco 2005; Harland 2006; Jones 1991), where greater levels of fishing were observed for the 11th century. The situation seems to be similar in mainland Europe (Clavel 2001; Bødker Enghoff 2000; Ervynck and van Neer 1994; Ervynck 1997; van Neer and Ervynck 1994, 1996; Pigière 2009; Prummel 1983). Many of the excavations in northern France and Belgium did not involve extensive sieving. However, those that did, revealed fish bones even in earlier phases (Clavel *pers. comm.*). Application of better sieving strategies and perhaps a multidisciplinary approach such as applied in the present work, may be beneficial to archaeological research on both sides of the Channel.

Fish studies in archaeology are fascinating and vital to our understanding of past diets, environment, landscape perception and exploitation. This thesis has significantly advanced our understanding of fishing in the early medieval period, highlighted the benefits of a multidisciplinary study, and will hopefully encourage more studies on this topic.

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# Appendix 1

## Catalogue of Anglo-Saxon Fishing Paraphernalia

### Fish hooks

1. Ramsgate, Kent. Iron fish hook. SFB fill. Early Anglo-Saxon. (Riddler 2000)
2. Redcastle Furze, Norfolk. Iron fish hook. Barbed with looped head. No length given. Period IV2 (early to mid 11th century). (Fig. 72, catalogue number 50. S.f. 724) (Andrews 1995:97)
3. Bloodmoor Hill, Carlton Colville, Suffolk. Iron fish hook. Simple hook with round cross-section, no barb nor loop. L.14mm. 5th-7th century. (Catalogue number 424)(ref)
4. Bloodmoor Hill, Carlton Colville, Suffolk. Iron fish hook. Simple hook with round cross-section, no barb nor loop. L.18mm. 5th-7th century. (Catalogue number 425)(ref)
5. Bloodmoor Hill, Carlton Colville, Suffolk. Iron fish hook. Simple hook with square cross-section, no barb nor loop. L.20mm. 5th-7th century. (Catalogue number 426)(ref)
6. Bloodmoor Hill, Carlton Colville, Suffolk. Iron fish hook. Simple hook with round cross-section, no barb nor loop. L.24mm. 5th-7th century. (Catalogue number 427)(ref)
7. Bloodmoor Hill, Carlton Colville, Suffolk. Iron fish hook. Simple hook with round cross-section, no barb nor loop. L.25mm. 5th-7th century. (Catalogue number 428)(ref)
8. Bloodmoor Hill, Carlton Colville, Suffolk. Copper alloy fish hook. Simple hook with round cross-section, no barb nor loop. L.14mm. 5th-7th century. (Catalogue number 429)(ref)
9. Flixborough, Lincolnshire. Iron fish hook. Point tipped tang with step between hook and tang which has wood remains on it. No barb nor loop on head. L. 16mm. Phase 6iii (10th century). (catalogue number 2405) (Ottaway 2009: 252)
10. Flixborough, Lincolnshire. Point tipped tang. No barb nor loop on head. L. 21mm. Phase 4ii (early to mid 9th century). (catalogue number 2406) (Ottaway 2009: 252)
11. Flixborough, Lincolnshire. Point tipped tang. No barb nor loop on head. L. 21mm. Phase 6i (10th century). (catalogue number 2407) (Ottaway 2009: 252)
12. Flixborough, Lincolnshire. Point tipped tang. No barb nor loop on head. L. 16mm. Phase 6iii (10th century). (catalogue number 2408) (Ottaway 2009: 252)
13. Flixborough, Lincolnshire. Point tipped tang. No barb nor loop on head. L. 16mm. Phase 5b (mid to late 9th to early 10th). (catalogue number 2409) (Ottaway 2009: 252)
14. Flixborough, Lincolnshire. Point tipped tang. No barb nor loop on head. L. 19mm. Phase 6iii-7 (10th century). (catalogue number 2410) (Ottaway 2009: 252)
15. Flixborough, Lincolnshire. Point tipped tang. No barb nor loop on head. L. 30mm. Phase 4ii (early to mid 9th century). (catalogue number 2411) (Ottaway 2009: 252)

16. Flixborough, Lincolnshire. Point tipped tang. No barb nor loop on head. L. 18mm. Unstratified. (catalogue number 2412) (Ottaway 2009: 252)
17. Flixborough, Lincolnshire. Wedge-shaped tang. No barb nor loop on head. L. 21mm. Phase 6iii (10th century). (catalogue number 2413) (Ottaway 2009: 252)
18. Flixborough, Lincolnshire. Wedge-shaped tang. No barb nor loop on head. L. 23mm. Phase 6iii-7 (10th century). (catalogue number 2414) (Ottaway 2009: 252)
19. Flixborough, Lincolnshire. Wedge-shaped tang. No barb nor loop on head. L. 33mm. Unstratified. (catalogue number 2415) (Ottaway 2009: 252)
20. Flixborough, Lincolnshire. Wedge-shaped tang. No barb nor loop on head. L. 23mm. Unstratified. (catalogue number 2416) (Ottaway 2009: 252)
21. Flixborough, Lincolnshire. Tang missing. No barb nor loop on head. L. 18mm. Phase 2i-4ii (7th to mid 8th - early to mid 9th centuries). (catalogue number 2417) (Ottaway 2009: 252)
22. Flixborough, Lincolnshire. Tang missing. No barb nor loop on head. L. 17mm. Phase 6ii-6iii (10th century). (catalogue number 2418) (Ottaway 2009: 252)
23. Flixborough, Lincolnshire. Tang missing. No barb nor loop on head. L. 19mm. Phase 6iii (10th century). (catalogue number 2419) (Ottaway 2009: 252)
24. Flixborough, Lincolnshire. Tang missing. No barb nor loop on head. L. 15mm. Phase 6iii (10th century). (catalogue number 2420) (Ottaway 2009: 252)
25. Flixborough, Lincolnshire. Tang missing. No barb nor loop on head. L. 17mm. Unstratified. (catalogue number 2421) (Ottaway 2009: 252)
26. Flixborough, Lincolnshire. Tang missing. No barb nor loop on head. L. 28mm. Unstratified. (catalogue number 2422) (Ottaway 2009: 252)
27. National Portrait Gallery. Barbless and head is continuation of shaft. Middle Anglo-Saxon in date. No length given. (Riddler, 2004)
28. Jarrow, Tyne and Wear. Looped head with no barb. L. 29mm. Saxon. (Fig. 31.6.5 catalogue number Fe125) (Cramp 2006: 287-288)
29. 46-54 Fishergate, York. Barbed, head is missing. L. 49.2mm. Period 3b (8th to 9th century). (Fig. 637 catalogue number 5038) (Rogers 1993: 1317-1319)
30. 46-54 Fishergate, York. Barbed with flattened head. L. 25.1mm. Period 3z (8th to 9th century). (Fig. 637 catalogue number 5039) (Rogers 1993: 1317-1319)
31. 46-54 Fishergate, York. Head and point missing. L15.1mm. Period 4z (late 10th-12th century). (catalogue number 5041)( Rogers 1993: 1317-1319)
32. 46-54 Fishergate, York. Fragment of fish hook. L24.2mm. Period 4z (late 10th-12th century). (catalogue number 5040)( Rogers 1993: 1317-1319)
33. Wharram, South Manor Area, Yorkshire. Iron wire, most likely part of a fish hook. No length given. Phase 4 (Late Saxon). (catalogue number 30)(Goodall and Clark 2000: 133)

34. Wharram, South Manor Area, Yorkshire. Iron wire, most likely part of a fish hook. No length given. Phase 4 (Late Saxon). (catalogue number 31) (Goodall and Clark 2000: 133)
35. Thames waterfront, London. Barbed with looped head. L. 175mm. Late 11th century. (Fig. 3.17 catalogue number 33) (Pritchard 1991: 251)
36. Thames waterfront, London. Barbed with flattened head. Tip of head broken off. L. 60mm. 1055 to c.1080 AD. (Fig. 3.17 catalogue number 34) (Pritchard 1991: 251)
37. Thames waterfront, London. Fragment of fish hook shank. 1055 to c.1080 AD. (catalogue number 35) (Pritchard 1991: 251)
38. Thames waterfront, London. Barbed with flattened head. Tip of head broken off. 1055 to c.1080 AD. (catalogue number 36) (Pritchard 1991: 251)
39. Thames waterfront, London. Barbed with flattened head. L. 90mm. 1055 to c.1080 AD. (catalogue number 37) (Pritchard 1991: 251)
40. Thames waterfront, London. Fragment of fish hook shank. 1055 to c.1080 AD. (catalogue number 38) (Pritchard 1991: 251)
41. Thames waterfront, London. Fragment of fish hook shank. 1055 to c.1080 AD. (catalogue number 39) (Pritchard 1991: 251)
42. Thames waterfront, London. Fragment of fish hook shank. 1055 to c.1080 AD. (catalogue number 40) (Pritchard 1991: 251)
43. Thames waterfront, London. Fragment of fish hook shank. 1080 to early 12th century AD. (catalogue number 41) (Pritchard 1991: 251)
44. Thames waterfront, London. Fragment of fish hook shank. c.1080 AD. (catalogue number 42) (Pritchard 1991: 251)
45. Thames waterfront, London. Barbed with flattened head. L. 82mm. c.1080 AD. (catalogue number 43) (Pritchard 1991: 251)
46. Thames waterfront, London. Barbed. Seems to have been made from wire. L. 90mm. 1055 to c.1080 AD. (catalogue number 34) (Pritchard 1991: 251)
47. Alms Lane, Norwich. Hook with no barb and flattened head broken off. A total of 8 hooks found across the site but no details given in report.Catalogue number 38)(Atkin *et al.* 1985: 211)
48. Fishergate, Norwich. A total of 10 fish hooks recovered but no details given in report apart from the majority of them being barbed with flattened heads. Two phases given, Period III2 (11th century) and Period IV (12th century) (Williams 1994: 14)
49. St. Martin-at-Palace Plain, Norwich. Barbless with looped head. No Length given. Phase 13 (late 11th-12th century). (Fig. 29 catalogue number 29)(Williams 1987: 71)
50. St. Martin-at-Palace Plain, Norwich. Barbless with flat head. No length given. Phase 13 (late 11th-12th century). (Fig. 29 catalogue number 30) (Williams 1987: 71)
51. Brandon Road, Thetford. Barbless with looped head. Very narrow gap. L. 63mm. Late period (11th-12th century).
52. Bishopstone, East Sussex. Fish hook. No description of hook given. L. 60mm. Late Anglo-Saxon. (catalogue number 82, S. F. 49)(Ottaway, Barber and Thomas 2010: 132-133)
53. Bishopstone, East Sussex. Barbed with flattened head. L. 115mm. Late Anglo-Saxon. (catalogue number 83. S. F. 111)(Ottaway, Barber and Thomas 2010: 132-133)

54. Bishopstone, East Sussex. Barbed with missing head. L. 30mm. Late Anglo-Saxon. (catalogue number 84. S.F. 11)(Ottaway, Barber and Thomas 2010: 132-133)
55. 16-22 Coppergate, York. Barbed with looped head. L55mm. Period 4a (late 9th/early 10th – c.930/5). (catalogue number 2991)(Ottoway 1992: 600-601)
56. 16-22 Coppergate, York. Barbed with flattened head. L16mm. Period 5B (c.975-early/mid 11th). (catalogue number 2995)(Ottoway 1992: 600-601)
57. 16-22 Coppergate, York. Barbed with looped head. L78mm. Period 5B (c.975-early/mid 11th). (catalogue number 2996)(Ottoway 1992: 600-601)
58. 16-22 Coppergate, York. Barbed with looped head. Shank has rounded cross-section. L69mm. Period 5B (c.975-early/mid 11th). (catalogue number 2997)( Ottoway 1992: 600-601)
59. 16-22 Coppergate, York. Barbless with looped head. L42mm. Period 4B (c.930/5-975). (catalogue number 2993)( Ottoway 1992: 600-601)
60. 16-22 Coppergate, York. Barbless with flattened head. Shank is slightly distorted and has round cross-section. L42mm. Period 4A ((late 9th/early 10th – c.930/5). (catalogue number 2992)( Ottoway 1992: 600-601)
61. 16-22 Coppergate, York. Barbless with flattened head. L44mm. Period 5A (c.975) (catalogue number 2994)( Ottoway 1992: 600-601)
62. *Sandtun*, New Romney, Kent. Incomplete hook with barbed tip, rounded and flattened head. L. 107mm. Likely Post-Conquest in date. (catalogue number 91) (Riddler, 2001)
63. *Sandtun*, New Romney, Kent. Incomplete hook with barbed tip, rounded and flattened head. L. 100mm. Likely Post-Conquest in date. (catalogue number 92) (Riddler, 2001)
64. *Sandtun*, New Romney, Kent. Incomplete hook with barbed tip, rounded and flattened head. L. 70mm. Likely Post-Conquest in date. (catalogue number 93) (Riddler, 2001)
65. *Sandtun*, New Romney, Kent. Fragment of hook with no barb and missing head. L. over 125mm. Likely Post-Conquest in date. (catalogue number 94) (Riddler, 2001)
66. *Sandtun*, New Romney, Kent. Fragment of hook with no barb and missing head. L. 117mm. Likely Post-Conquest in date. (catalogue number 95) (Riddler, 2001)
67. *Sandtun*, New Romney, Kent. Incomplete hook with no barb, rounded and flattened head. L. 70mm. Likely Post-Conquest in date. (catalogue number 96) (Riddler, 2001)
68. *Sandtun*, New Romney, Kent. Incomplete hook with barbed tip, rounded and flattened head. L. 65mm. Likely Post-Conquest in date. (catalogue number 97) (Riddler, 2001)
69. *Sandtun*, New Romney, Kent. Fragment of hook, tip missing with rounded and flattened head. L. 45mm. Likely Post-Conquest in date. (catalogue number 98) (Riddler, 2001)
70. *Sandtun*, New Romney, Kent. Fragment of hook shank. Likely Post-Conquest in date. (catalogue number 99) (Riddler, 2001)
71. *Sandtun*, New Romney, Kent. Fragment of hook shank. Likely Post-Conquest in date. (catalogue number 100) (Riddler, 2001)

72. *Sandtun*, New Romney, Kent. Fragment of hook with rounded and flattened head. Likely Post-Conquest in date. (catalogue number 101) (Riddler, 2001)
73. *Sandtun*, New Romney, Kent. Fragment of hook with rounded and flattened head. Likely Post-Conquest in date. (catalogue number 102) (Riddler, 2001)

**Lead Weights**

1. Flixborough, Lincolnshire. Barrel-shaped with central perforation and tapering towards the ends. Made from lead sheet which is rolled and overlaps on one edge. Slightly splayed or broken at one end and encrusted. L. 44mm, D. 14.5mm, W.24.2g. Phase 2-4ii (late 7th- mid 8th to early to mid 9th centuries) (Fig. 6.3 catalogue number 2374)(Watling 2009: 249-252)
2. Flixborough, Lincolnshire. Squat barrel-shaped with central perforation. Made from sheet that was rolled and pressed into form with overlapping edge at the centre. L. 18.5mm, D. 10.5mm, W. 7.8g. Phase 6ii-6iii (10th century) (Fig. 6.3 catalogue number 2375) (Watling 2009: 249-252)
3. Flixborough, Lincolnshire. Barrel-shaped with central perforation. Made from sheet that was rolled and pressed into form with overlapping edge at the centre. L. 31mm, D. 13.5mm, W. 22.8g. Phase 6iii (10th century) (Fig. 6.3 catalogue number 2376) (Watling 2009: 249-252)
4. Flixborough, Lincolnshire. Barrel-shaped with central perforation. Made from rolled sheet with one overlapped and slightly flattened. L. 35.5mm, D. 11mm, W. 13.7g. Unstratified (Fig. 6.3 catalogue number 2377) (Watling 2009: 249-252)
5. Flixborough, Lincolnshire. Barrel-shaped with tapering at each end and longitudinal perforation. Made from rolled sheet with slightly overlapping edges. L.32mm, D.11.5mm, W.15.9g. Unstratified (catalogue number 2378) (Watling 2009: 249-252)
6. Flixborough, Lincolnshire. Barrel-shaped with slight tapering at each end and longitudinal perforation. Made from rolled sheet with slightly overlapping edges. L.49.5mm, D.8.5mm, W.16.5g. Unstratified (catalogue number 2379) (Watling 2009: 249-252)
7. Flixborough, Lincolnshire. Barrel-shaped with slight tapering at each end and longitudinal perforation. Made from rolled sheet with slightly overlapping edges. L.33mm, D.10mm, W.13g. Unstratified (catalogue number 2380) (Watling 2009: 249-252)
8. Flixborough, Lincolnshire. Barrel-shaped with tapering at each end and longitudinal perforation. Made from rolled sheet wrapped around twice with slightly overlapping edges. L.32.5mm, D.14mm, W.23.9g. Unstratified (catalogue number 2381) (Watling 2009: 249-252)
9. Flixborough, Lincolnshire. Squat barrel-shaped with longitudinal perforation. Made from rolled sheet with one overlapped edge. L.19.5mm, D.9.5mm, W.6.9g. Unstratified (catalogue number 2382) (Watling 2009: 249-252)
10. Flixborough, Lincolnshire. Cylindrical-shaped with longitudinal perforation. Made from rolled sheet consisting of two thin layers with

one edge overlapping. Possibly pinched at the edges. Flattened. L.24.5mm, W.12mm, W.7.8g. Phase 2-4ii (late 7th- mid 8th to early to mid 9th centuries) (Fig 6.3. catalogue 2383) (Watling 2009: 249-252)

11. Flixborough, Lincolnshire. Cylindrical-shaped with longitudinal perforation and slightly tapering ends. Made from rolled sheet with overlapping edges. Flattened. L.31.5mm, W.11mm, W.15.6g. Phase 2-4ii (late 7th- mid 8th to early to mid 9th centuries) (Fig 6.3. catalogue 2384) (Watling 2009: 249-252)
12. Flixborough, Lincolnshire. Cylindrical-shaped with longitudinal perforation. Made from rolled lead and weight has been slightly flattened. L.13mm, Width 12mm, W.4g. Phase 2-4ii (late 7th- mid 8th to early to mid 9th centuries) (catalogue number 2385) (Watling 2009: 249-252)
13. Flixborough, Lincolnshire Cylindrical-shaped with longitudinal perforation. One end is slightly pinched and the other splayed or broken. Made from rolled sheet with one edge overlapping. L.27.5mm, D.11mm, W.10.5g. Phase 4ii (early to mid 9th centuries) (Fig. 6.3 catalogue number 2386) (Watling 2009: 249-252)
14. Flixborough, Lincolnshire. Cylindrical-shaped with longitudinal perforation. Made from a very thin sheet of lead rolled and pressed into shape with one overlapping edge. Pinched at one end and possibly cut at the other. L.22.5mm, D.10mm, W.7.6g. Phase 6ii-6iii (10th century) (catalogue number 2387) (Watling 2009: 249-252)
15. Flixborough, Lincolnshire. Cylindrical-shaped with longitudinal perforation. Made from a very thin sheet of lead rolled and pressed into shape with edges possibly overlapped. Now flattened. L.25.5mm, Width 14.5mm, W.8.2g. Phase 6ii-6iii (10th century) (catalogue number 2388) (Watling 2009: 249-252)
16. Flixborough, Lincolnshire. Cylindrical-shaped with longitudinal perforation. Made from sheet of lead rolled, one end overlapped having been wrapped twice. Flattened at one end. L.25mm, D.12mm, W.15.9g. Unstratified (catalogue number 2389) (Watling 2009: 249-252)
17. Flixborough, Lincolnshire. Cylindrical-shape. Made from thin double layer of lead rolled. Flattened. L.22.5mm, D.10mm, W.7.6g. Phase 6ii-6iii (10th century) (catalogue number 2390) (Watling 2009: 249-252)
18. Flixborough, Lincolnshire. Cylindrical-shape. Made from rolled sheet and pinched at the ends. Flattened. L.28mm, Width10.5mm, W.8g. Unstratified (catalogue number 2391) (Watling 2009: 249-252)
19. Flixborough, Lincolnshire. Cylindrical-shape with longitudinal perforation. Made from rolled sheet. Ends formerly butted but now up to 2mm apart, possibly opened up for line removal. Flattened on one side.. L.36.5mm, D.10.5mm, W.16g. Unstratified (catalogue number 2392) (Watling 2009: 249-252)
20. Flixborough, Lincolnshire. Cylindrical-shape with longitudinal perforation. Made from triangular sheet and rolled into tubular form and has overlapped edges. L.24mm, Width 20mm, W.3.4g. Unstratified (catalogue number 2393) (Watling 2009: 249-252)
21. Flixborough, Lincolnshire. Loop-shaped. Cast strip forming a sub-triangular loop with overlapping ends. L.24mm, Width 20mm, W.11.5g. Phase 4ii (early to mid 9th centuries) (Fig. 6.3 catalogue number 2394) (Watling 2009: 249-252)

22. Flixborough, Lincolnshire. Loop-shaped. Cast rod bent to form a sub-triangular loop with overlapping ends. L.23mm, Width 22mm, W.21.6g. Phase 5a-5b (mid to late 9th to early 10th)(Fig. 6.3 catalogue number 2395) (Watling 2009: 249-252)
23. Flixborough, Lincolnshire. Loop-shaped. Cast strip rolled twice to form a sub-triangular loop with overlapping ends. L.21mm, Width 15.5mm, W.17.5g. Phase 6iii-7 (10th century) (catalogue number 2396) (Watling 2009: 249-252)
24. Flixborough, Lincolnshire. Loop-shaped. Sub-rectangular strip bent to form a loop with butted ends. Diameter 12.5mm, W.2.4g. Unstratified (catalogue number 2397) (Watling 2009: 249-252)
25. Flixborough, Lincolnshire. Loop-shaped. Rod of rectangular section bent to form an irregular loop with butted ends. L.21.5mm, Width 16mm, W.5.8g. Unstratified (catalogue number 2398) (Watling 2009: 249-252)
26. Flixborough, Lincolnshire. A line-sinker or net weight of irregular shape made of lead sheet with perforations at either end. L.23.5mm, Width 10mm, W. 5.1g. Unstratified (Fig. 6.3 catalogue number 2399) (Watling 2009: 249-252)
27. Flixborough, Lincolnshire. Cone-shaped cast weight with integral suspension loop. Diameter 14.5mm, W.15.8g. Unstratified (Fig.6.3 catalogue number 2400) (Watling 2009: 249-252)
28. Flixborough, Lincolnshire. Conical flat-based casting with iron suspension loop at apex. W. 38.2g. Unstratified (catalogue number 2401) (Watling 2009: 249-252)
29. Flixborough, Lincolnshire. Barrel-shaped solid flattened oval in section. Appears broken at one end. May have been used as a fishing weight or plum-bob if the broken end bore a suspension loop or perforation. L.38.5mm, W.19.6g. Unstratified (catalogue number 2402) (Watling 2009: 249-252)
30. 28-31 James Street, London. Conical-shaped with two lateral perforations across the upper rim. W.267g with infill. Mid Anglo-Saxon. (Riddler 2004: 25)
31. Jarrow, Tyne and Wear. Cylindrical-shaped with longitudinal perforation and tapered ends. Made from rolled lead sheet. L.38mm, W.22.06g. Anglo-Saxon. (Fig. 31.8.1 catalogue number Pb12)(Cramp, 2006: 302-305)
32. 46-54 Fishergate, York. Cylindrical-shaped with longitudinal perforation. Made from lead alloy sheet. L.27.4mm. Period 3b (8th-9th century). (catalogue number 5477)(Rogers 1993: 1320)
33. 46-54 Fishergate, York. Cylindrical-shaped with longitudinal perforation. Made from lead alloy sheet. L.30.1mm. Period 3b (8th-9th century). (catalogue number 5478)(Rogers 1993: 1320)
34. 46-54 Fishergate, York. Cylindrical-shaped with longitudinal perforation. Made from lead alloy sheet. L46.5mm. Period 3z (8th-9th century). (catalogue number 5479)(Rogers 1993: 1320)
35. 46-54 Fishergate, York. Cylindrical-shaped with longitudinal perforation. Made from lead alloy sheet. L.21mm, W.4.3g. Period 4z (late 10th-12th century). (Fig. 637 catalogue number 5480)(Rogers 1993: 1320)

36. 46-54 Fishergate, York. Cylindrical-shaped with longitudinal perforation. Made from lead alloy sheet. L26.2mm. Period 4z (late $10^{th}$-$12^{th}$ century). (catalogue number 5481)(Rogers 1993: 1320)
37. 46-54 Fishergate, York. Cylindrical-shaped, perforation does not go all the way through weight. Made from lead alloy sheet. L.61.9mm, W.38.6g. Period 4z (late $10^{th}$-$12^{th}$ century). (Fig. 637 catalogue number 5482)(Rogers 1993: 1320)
38. 46-54 Fishergate, York. Cylindrical-shaped with longitudinal perforation. Made from lead alloy sheet. L39.2mm. Period 4z (late $10^{th}$-$12^{th}$ century). (catalogue number 5483)(Rogers 1993: 1320)
39. Fishergate, Norwich. Cylindrical-shaped with longitudinal perforation. Made from rolled lead sheet. Pinch marks at ends likely made when securing weight to line. W.40g. Period III1. (catalogue number 4)(Williams 1994: 14)
40. Fishergate, Norwich. Cylindrical-shaped with longitudinal perforation. Made from rolled lead sheet. W.35g. Period III2. (catalogue number 5)(Williams 1994: 14)
41. Fishergate, Norwich. Cylindrical-shaped with longitudinal perforation. Made from rolled lead sheet though only partially rolled. L.40mm, W.38g. Period III2. (catalogue number 5a)(Williams 1994: 14)
42. Fishergate, Norwich. Cylindrical-shaped with longitudinal perforation. Made from rolled lead sheet. Pinch marks at ends likely made when securing weight to line. W.30g. Period III2. (catalogue number 6)(Williams 1994: 14)
43. Fishergate, Norwich. Cylindrical-shaped with longitudinal perforation. Made from loosely rolled and folded lead sheet. Pinch marks at ends likely made when securing weight to line. L.23, W.59g. Period III2. (catalogue number 7a)(Williams 1994: 14)
44. Fishergate, Norwich. Cylindrical-shaped with longitudinal perforation. Made from rolled lead sheet. Pinch marks at ends likely made when securing weight to line. L.34mm, W.43g. Unstratified. (catalogue number 8a)(Williams 1994: 14)
45. Fishergate, Norwich. Cylindrical-shaped with longitudinal sub-rectangular perforation. Made from loosely rolled lead sheet. Pinch marks at ends likely made when securing weight to line. L.30mm, W.42g. Unstratified. (catalogue number 8b)(Williams 1994: 14)
46. Fishergate, Norwich. Cylindrical-shaped with longitudinal perforation. Made from partly rolled lead sheet. Pinch marks at ends likely made when securing weight to line. L.22mm, W.38g. Unstratified. (catalogue number 8c)(Williams 1994: 14)
47. Fishergate, Norwich. Cylindrical-shaped with longitudinal perforation. Made from tightly rolled lead sheet. Pinch marks at ends likely made when securing weight to line. L.27mm, W.27g. Unstratified. (catalogue number 8d)(Williams 1994: 14)
48. Bishopstone, East Sussex. Conical-shaped with longitudinal perforation. Likely cast. L.26mm. No weight given. Late Anglo-Saxon. (Fig. 6.27 catalogue number 86 S.F.17)(Thomas and Barber 2010: 133)
49. 16-22 Coppergate, York. Cylindrical-shaped with longitudinal perforation. Made from rolled lead sheet. L. 18mm, no weight given. Period 4B (c.930/5-975) (Fig. 1237 catalogue number 10553 S.F.11306)(Mainman and Rogers 2000: 2535)

50. 16-22 Coppergate, York. Cylindrical-shaped with longitudinal perforation. Made from rolled lead sheet. L. 31.1mm, no weight given. Period 5B (c.975-early/mid 11th) (Fig. 1237 catalogue number 10554 S.F.5645)( Mainman and Rogers 2000: 2535)
51. *Sandtun*, West Hythe, Kent. Conical-shaped with longitudinal perforation. Very squat. No length or weight given. (Fig. 50 catalogue number 103)(Riddler 2001)
52. West Fen Road, Ely. Conical lead weight. L.12mm, W.18g. Unstratified. (Catalogue number 128)(Mortimer *et al.* 2005: 72)
53. West Fen Road, Ely. Conical lead weight made from rolled thick lead sheet. W.35g. Phase 9 (12th century)(Catalogue number 129)(Mortimer *et al.* 2005: 72)

**Ceramic Weights**

1. Ramsgate, Kent. Fired clay cylindrical weight. Dark brown in colour with finger marks on surface. Central longitudinal perforation with barnacle attached to inner surface. W.1.4kg. Early Anglo-Saxon. (Riddler 2000: 64)
2. Ramsgate, Kent. Fired clay cylindrical weight. Dark brown in colour with finger marks on surface. Very large central longitudinal perforation. W.285g. Early Anglo-Saxon. (Riddler 2000: 64)
3. Foundation Street, Ipswich. Cylindrical ceramic weight. 11th or 12th century (Riddler *pers. comm.*)

**Stone Weights**

1. Bishopstone, East Sussex. Large chalk disk with central longitudinal perforation, maximum diameter of perforation 35mm. Both surfaces of disc have scratch marks. Depth 210-230mm, W.2.175kg. (Fig. 6.27 catalogue number 85)(Thomas and Barber 2010: 133)
2. Cottam, East Yorkshire. Chalk disk with natural perforation likely caused by marine mollusk. Evidence of marine infestation and very rounded so likely it is a beach pebble. Profile of ship incised on one side, with hull incised as a single line with curving prow and stern. W.1.31kg. 8th-9th century. (Richards 1994: 167-169)
3. Cottam, East Yorkshire. Chalk weight with man-made perforation of similar weight to other weight from Cottam but no incision. Likely that it was immersed in water at some stage. (Richards 1994: 167-169)
4. 46-54 Fishergate, York. Incomplete subovoid stone net sinker with naturally formed central perforation. Broken across perforation. Made from nodular flint. Pale brownish grey. L57.5mm. Period 3c (8th-9th century). (Fig. 637 catalogue number 4459)(Rogers 1993: 1319-1320)
5. 46-54 Fishergate, York. Incomplete subovoid stone net sinker with naturally formed central perforation. Broken at one side and across perforation. Made from nodular flint. White. L60mm. Period 4b (late 10th-12th century). (catalogue number 4460)( Rogers 1993: 1319-1320)
6. 46-54 Fishergate, York. Ovoid stone net sinker with oblique formed central perforation. Made from sandstone. Pale greyish brown.

Period 4z ($10^{th}$-$12^{th}$ century). (Fig. 637 catalogue number 4461)( Rogers 1993: 1319-1320)

7. Clifford Street, York. Stone net sinker, perforated at both ends. Incised with an interlace on one face and the beginning of one on the other side. Black stone. (fig 23.14)(Waterman 1959: 59-106)
8. 46-54 Fishergate, York. Subcylindrical chalk weight with central longitudinal perforation, one squared off the other rounded. White. L82mm, W479g. Period 3a ($8^{th}$-$9^{th}$ century). (Fig. 638 catalogue number 4462)(Rogers 1993: 1321)
9. 16-22 Coppergate, York. Small Norwegian Ragstone pebble with central longitudinal perforation. No period given. (Fig. 1237 catalogue number 9816 S.F.6240 6789)(Mainman and Rogers 2000: 2534-2535)
10. Church Close, Hartlepool, Tyne and Wear. Stone weight. Incised with cross on all four sides. No visible perforation. (Fig. 7.6.1) (Daniels and Loveluck 2007: 130-133)
11. Church Close, Hartlepool, Tyne and Wear. Stone weight. Incised with cross on both broad sides. Perforated at top. (Fig. 7.6.2) (Daniels and Loveluck 2007: 130-133)
12. Hartlepool Foreshore. Perforated stone. (Fig. 7.6.3) (Daniels and Loveluck 2007: 130-133)
13. Hartlepool. Stone weight, possibly thatch or net weight or even loomweight. (Daniels and Loveluck 2007: 130-133)
14. Hartlepool. Stone weight, possibly thatch or net weight or even loomweight. (Daniels and Loveluck 2007: 130-133)
15. Ferry Lane, Shepperton. Stone net weight made from rough lump of chalk with central indentation likely from the friction of the rope attached to it (Bird 1999: 119)
16. Ferry Lane, Shepperton. Stone net weight made from rough lump of chalk with central indentation likely from the friction of the rope attached to it (Bird, 1999: 119)
17. Ferry Lane, Shepperton. Stone disc with central perforation with diameter of 120mm. Only photographic record exists (Bird 1999: 119)
18. Ferry Lane, Shepperton. Stone disc with central perforation with diameter of 260mm. Very carefully shaped so thought more likely to be an anchor for a basket (Bird 1999: Fig. 15 199)
19. Hemington Fields, Leicestershire. A total of 127 stone weights, all made from rubble from the local stone. All have a central groove for holding the rope. One weight retained remains of a twisted band of split withy rods with a radiocarbon date of AD 1175-1419. All others are undated (Salisbury 1988: 83)

**Gorges**

1. Pennyland. Bone gorge with central groove and sharply pointed tips. L26mm. From an SFB. Early/Mid Anglo-Saxon. (Riddler and Waller, 1993: 117)
2. 46-54 Fishergate, York. Crudely shaped bone object identified as a gorge. Both ends taper, one to a sharp point, the other has broken off. Shaped by longitudinal knife cuts. L36.5mm. Period 3c ($8^{th}$-$9^{th}$ century). (Fig. 637 catalogue number 5529)(Rogers 1993: 1319)

3. Trowbridge, Wiltshire. Worked antler object identified as a fish gorge. Whittled to a tapering point at both ends. Opposed knife-cut notches in an off-centre position which likely served as an anchor point for drawline. L36mm. 9th/10th century (Small finds number 83)(Mills 1993: 119)

**Netting Implements**

1. Gosbertone Third Drove, Lincolnshire. Needle made from a pig fibula. Most likely multi-functional and uses could have included netting needle. Early Anglo-Saxon (Small finds number 12, Fig. 10)(Fryer 2005: 32)
2. Skerne, Lincolnshire. Netting needle made from an antler tine and round in section. The butt is pierced and has a circular indentation likely from an attempt to pierce the object. The point curves gently. L155mm. Mid Anglo-Saxon to Anglo-Scandinavian. (Fig. 11.10 catalogue number S74)(Loveluck 2000: 233-234)
3. Skerne, Lincolnshire. Netting needle made from either bone or antler. Straight and sub-rectangular in section with perforation at the butt. L140mm. Mid Anglo-Saxon to Anglo-Scandinavian. (Fig. 11.10 catalogue number S84)(Loveluck 2000: 233-234)
4. Skerne, Lincolnshire. Netting needle made from antler. Square section with rounded corners and tapers to a point. The point is also curved. L110mm. Mid Anglo-Saxon to Anglo-Scandinavian. (Fig. 11.10 catalogue number S264)(Loveluck 2000: 233-234)
5. St. Nicholas Street, Ipswich, Suffolk. Antler tine. Perforated at broad end and splayed hole at other end. Smoothed. Possibly a cordage implement for repairing nets (Riddler 2006: 173)

**Floaters**

1. Arcade Street, Ipswich, Suffolk. Floater made from whalebone with a centrally cut perforation. 9th or 10th century (Riddler 2006: 173)

**Bone Net Sinkers**

1. Ely, Cambridgeshire. Axially perforated ovicaprid metapodia. Interpreted as a net sinker. 8th – 9th century (Riddler, 2006)
2. Royal Opera House, London. Half ovicaprid metacarpal with hole drilled through proximal end. Period 5 (c. AD 730-770). (Catalogue number <B75>) (Blackmore 2003: 302-315)
3. Royal Opera House, London. Complete ovicaprid metacarpal with hole drilled through proximal end and through convex face of distal end. Period 6 (c. AD 770-850). (Catalogue number <B243>) (Blackmore 2003: 302-315)
4. Royal Opera House, London. Half ovicaprid metacarpal with hole drilled through proximal and distal ends. Period 6 (c. AD 770-850). (Catalogue number <B253>) (Blackmore 2003: 302-315)

5. Clifford Street (SOU32), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
6. Clifford Street (SOU32), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
7. Clifford Street (SOU32), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
8. Clifford Street (SOU32), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
9. Clifford Street (SOU32), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
10. Clifford Street (SOU32), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
11. Clifford Street (SOU32), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
12. Clifford Street (SOU32), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
13. Clifford Street (SOU32), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
14. Clifford Street (SOU32), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
15. Clifford Street (SOU32), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
16. Clifford Street (SOU32), Southampton. Axially perforated ovicaprid tibia. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
17. Downham Barker (SOU177), Southampton. Axially perforated ovicaprid tibia. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
18. Six Dials (SOU 23), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
19. Six Dials (SOU 23), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
20. Six Dials (SOU 23), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
21. Six Dials (SOU 24), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
22. Six Dials (SOU 24), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
23. Six Dials (SOU 24), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
24. Six Dials (SOU 24), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
25. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
26. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
27. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
28. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
29. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)

30. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
31. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
32. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
33. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
34. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
35. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metacarpal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
36. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
37. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
38. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
39. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
40. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
41. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
42. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
43. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
44. Six Dials (SOU 26), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
45. Six Dials (SOU 7), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)
46. Six Dials (SOU 7), Southampton. Axially perforated ovicaprid metatarsal. Interpreted as a net sinker. 8th – 9th century (Riddler 2006)

# Appendix 2

## Lyminge Fish Report

The village of Lyminge, Kent, was home to a mid-Anglo-Saxon double monastery founded by Æthelburga of Kent (Thomas 2010b). Excavations exploring the origins, preceding occupants and activities of this monastery began in 2008 and are due to continue till 2014. So far, excavations have revealed extensive occupation sequences rich in faunal remains, ferrous metalworking, window glass fragments and important agricultural tools such as an iron coulter of mid Anglo-Saxon date. In 2012, an impressive post-built structure of early Anglo-Saxon date was excavated in the village.

The fish assemblage from the first season of excavation was studied by the author for her MSc dissertation alongside the respective mammal and bird assemblage. This was done using the methods described in Chapter 1 but without noting measurements or sizes. Sizes and measurements were taken in the course of the present doctoral study.

In addition, the fish assemblage from the 2010 excavation season, which has been dated to the early Anglo-Saxon period, was also studied for this doctoral thesis. This material came only from sieved samples from the four SFBs excavated.

## Results

The fish assemblages of the early and mid-Anglo-Saxon phases of occupation (Tables 1 and 2) must be discussed separately, as the levels and attitudes towards fish consumption changed greatly between the two periods. As has been shown in this doctoral work, only a small number of fish remains were recovered from the early Anglo-Saxon phases. Interestingly, the assemblage is not dominated by eel, cyprinids or other freshwater species but by herring followed by plaice/flounder. A very small number of eel, cyprinids and horse mackerel were also present. The majority of the bones were vertebra, but several cranial elements of both herring and plaice/flounder were also present.

| **Species** | **Sieved** |
|---|---|
| Eel | 8 |
| Cyprinid | 2 |
| Herring | 118 |
| Plaice/Flounder | 27 |
| Horse mackerel | 1 |
| Unknown fish | 66 |
| **Total** | **222** |

*Table 1. Fish species from the early Anglo-Saxon occupation sequence excavated in 2010.*

| Species | Sieved | Dry-sieved/hand-collected | Total |
|---|---|---|---|
| Eel | 1512 | 3 | 1515 |
| Cyprinid | 10 | 0 | 10 |
| Herring | 244 | 9 | 153 |
| Herring? | 1 | 0 | 1 |
| Herring family | 6 | 0 | 6 |
| Conger eel | 0 | 4 | 4 |
| Cod | 63 | 562 | 625 |
| Cod family | 24 | 85 | 109 |
| Cod family? | 2 | 0 | 2 |
| Haddock | 2 | 11 | 13 |
| Haddock? | 0 | 1 | 1 |
| Whiting | 114 | 55 | 169 |
| Plaice/Flounder | 143 | 116 | 259 |
| Plaice/Flounder? | 1 | 1 | 2 |
| Flatfish | 0 | 11 | 11 |
| Brill/Turbot | 0 | 2 | 2 |
| Ray family | 81 | 3 | 84 |
| Red sea bream | 34 | 34 | 68 |
| Sea bream family | 0 | 1 | 1 |
| Sea bream family? | 0 | 9 | 9 |
| Sea bass? | 2 | 0 | 2 |
| Perch family | 0 | 72 | 72 |
| Atlantic mackerel | 110 | 43 | 153 |
| Horse mackerel | 319 | 74 | 393 |
| Gurnard family | 15 | 12 | 27 |
| Salmonid | 10 | 0 | 10 |
| Tuna? | 0 | 2 | 2 |
| Unidentified fish | 2189 | 2232 | 4421 |
| **Total** | **4882** | **3342** | **8124** |

*Table 2. Fish species from the mid Anglo-Saxon occupation sequence excavated in 2008.*

The range of species and quantities from the mid Anglo-Saxon period are very different to that from the earlier period. The most common species is eel, followed by cod, horse mackerel, plaice/flounder, whiting, herring and mackerel. Most surprising in this assemblage is the dominance of cod. Other marine species such as sea bream, gurnards and conger eel were also found alongside a small number of salmonids, perch and other cyprinids.

Complete skeletons of all fish species seem to have been present on site. The author noted in her master's study that the bones of larger fish, irrespective of whether they were cranial or vertebral, were generally found in large pit deposits amongst the remains of mammals. Interestingly, similarly to Bishopstone and Flixborough, avian remains were rarely found in fish-rich deposits. The bones of smaller fish such as eel, herring and cyprinids, were confined to cess-deposits.

**Preservation**

Texture and completeness scores were recorded for all cranial elements. Overall, the level of preservation was fairly good. However, Lyminge's inhabitants seem to have favoured larger fish such as cod, as indicated by the small number of cranial eel and herring elements. Due to the low number of cranial elements recovered for these species, no graphs were generated in this respect.

Figures 1-5 illustrate texture scores for the main species at Lyminge. The overall levels of preservation were fairly good. This is indicated, for example, by the large number of mackerel elements classed as "good". However, a not insignificant number of elements were classed as "poor" or "fair".

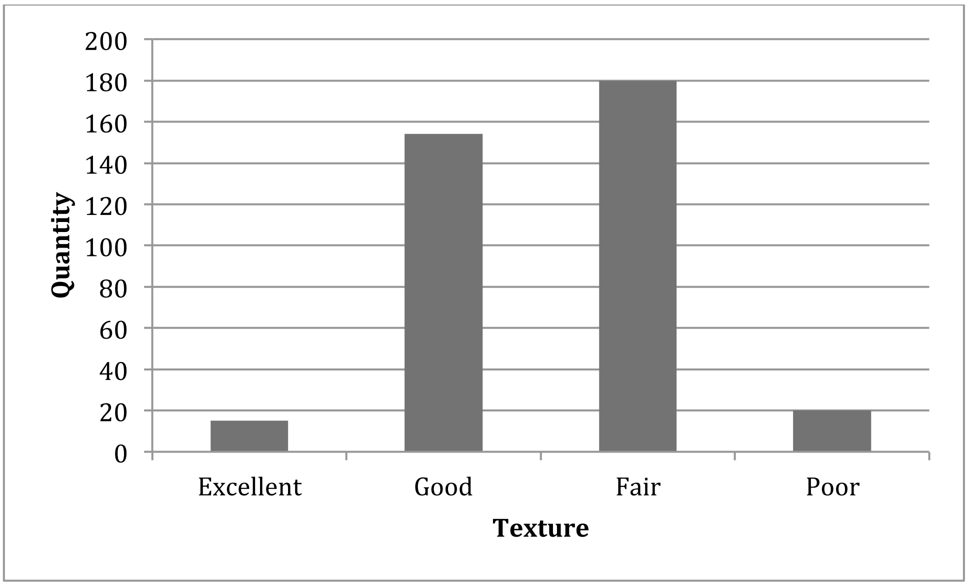

*Figure 1. Texture scores for cranial cod elements at Lyminge*

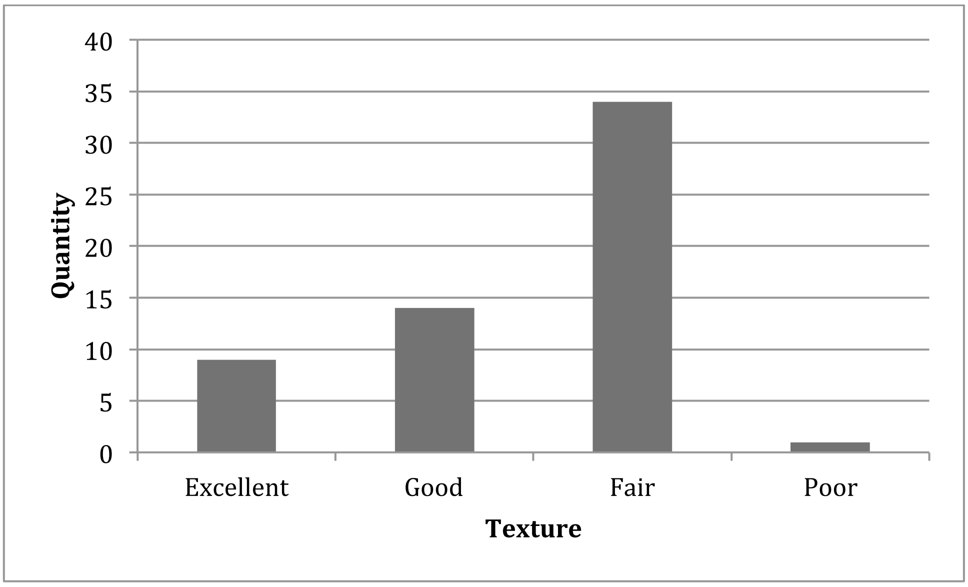

*Figure 2. Texture scores for cranial whiting elements at Lyminge*


*Figure 3. Texture scores for cranial plaice/flounder elements at Lyminge*

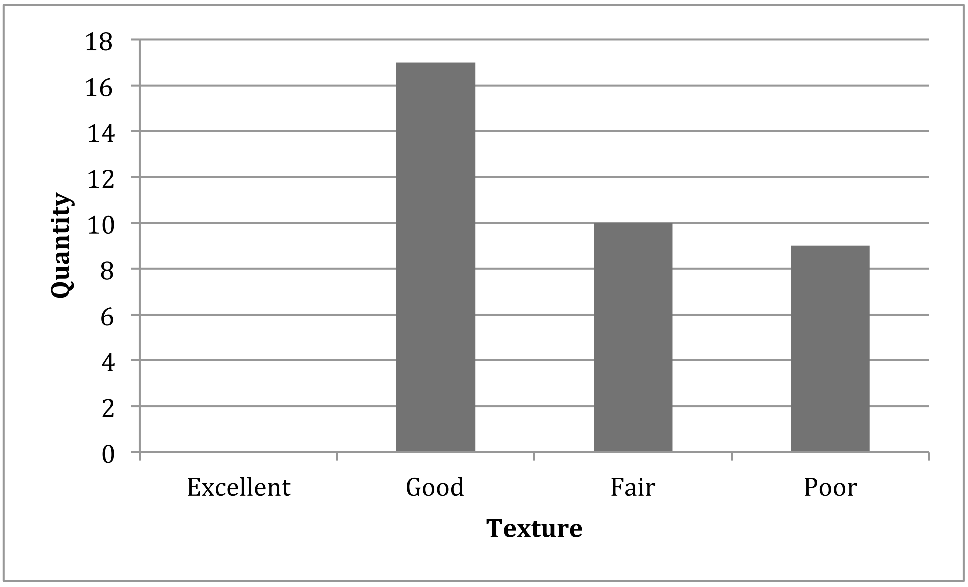


*Figure 4. Texture scores for cranial mackerel elements at Lyminge*

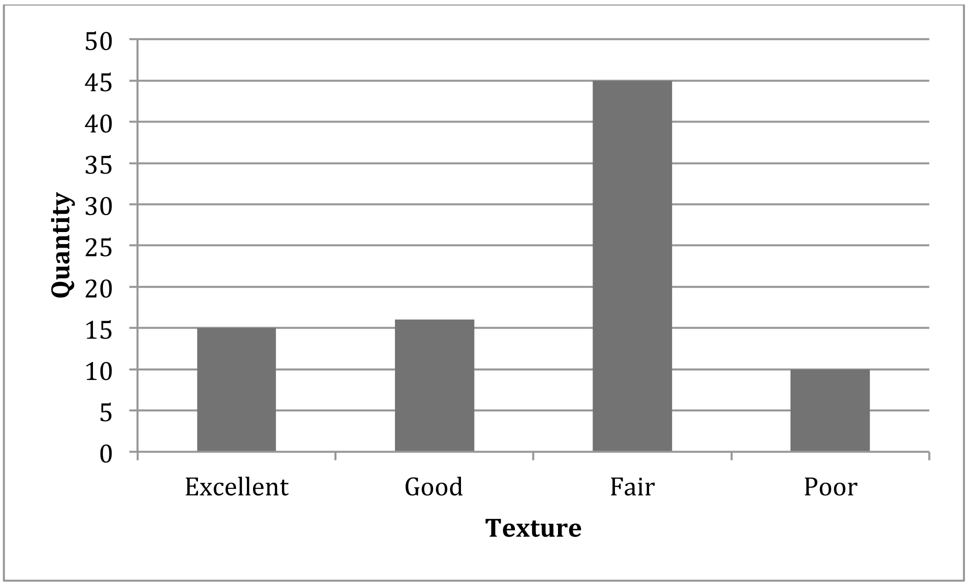

*Figure 5. Texture scores for cranial horse mackerel elements at Lyminge*

Figures 6-11 illustrate completeness scores for five of the main species. Due to the low number of cranial elements, no graphs were generated for eel and herring in this respect.

Many cranial elements of whiting, mackerel and horse mackerel were almost 100% complete, despite relatively low texture scores for mackerel and horse mackerel (Figures 6-11). Many cod and, to a lesser extent, plaice/flounder elements were highly fragmented compared to the elements of other species. This may reflect differences in deposition habits between species. One single deposit contained almost all red sea bream fragments recovered from this site, all of which showed very good texture with very little fragmentation. This suggests that the fish bones had been thrown away and the deposit sealed soon after. It would seem that many of the elements of fish were deposited in a similar manner: they were not left on the ground surface to be trampled on or re-deposited. In contrast, cod remains seem to have been subjected to trampling or re-deposition, leading to a greater degree of fragmentation.

The lack of cranial eel and herring elements may be due to the fact that mostly came from cess deposits. Heads of small fish can be swallowed which would decrease the survival rates of these bones, which tend to be less dense and more fragile than vertebra. Alternatively, the heads may have been removed before consumption and discarded elsewhere. If they were left on ground surface and trampled, the chances of survival are very small.

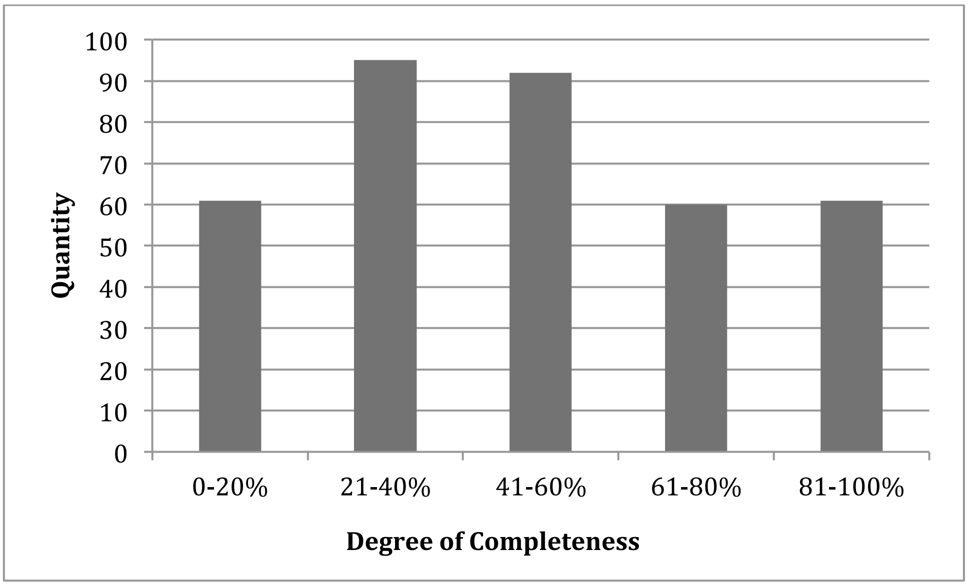


*Figure 6. Completeness scores for cranial cod elements at Lyminge*

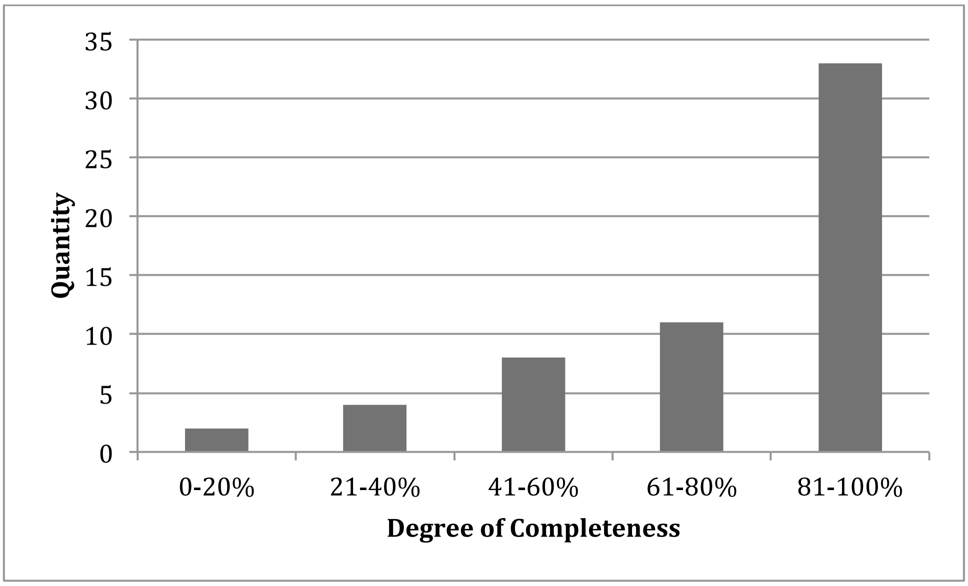


*Figure 7. Completeness scores for cranial whiting elements at Lyminge*

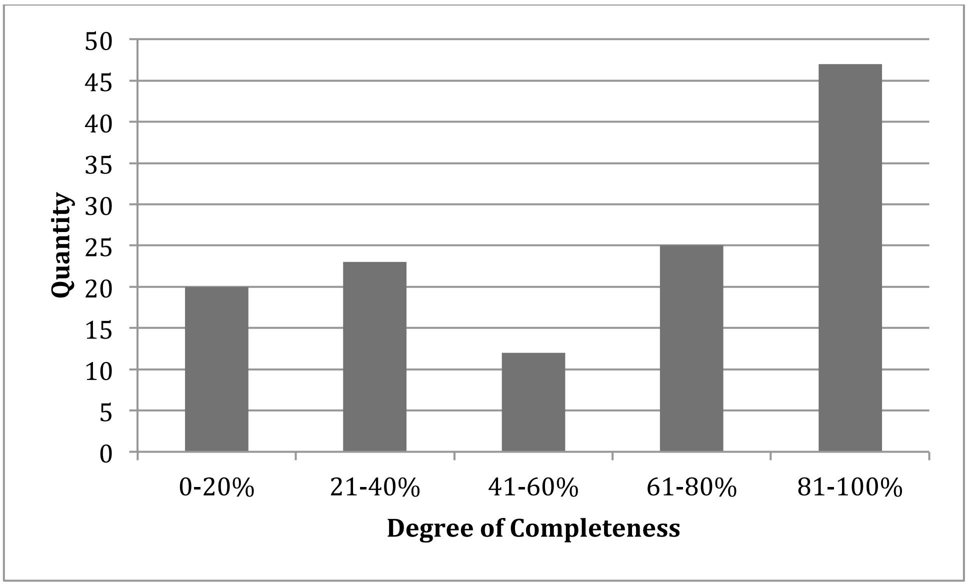


*Figure 8. Completeness scores for cranial plaice/flounder elements at Lyminge*

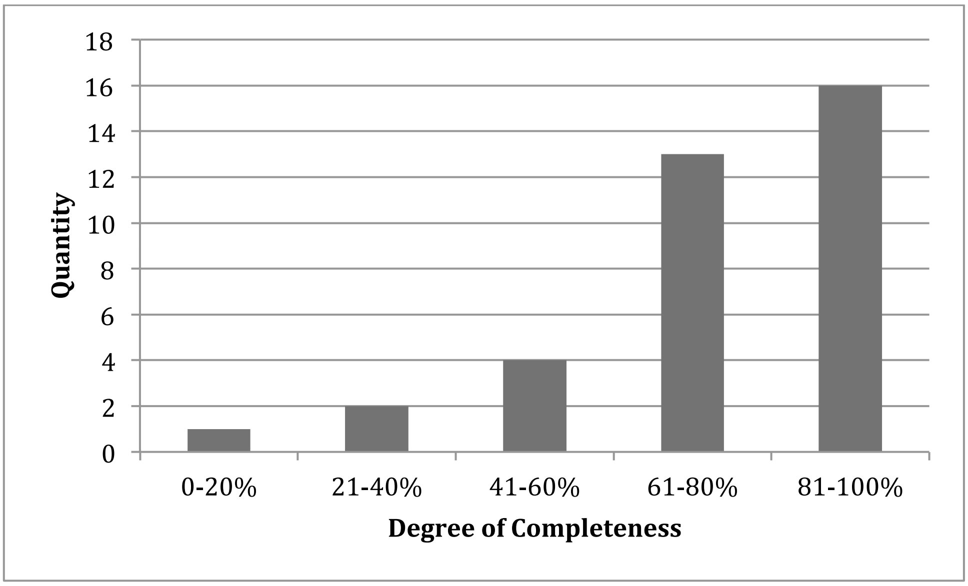


*Figure 9. Completeness scores for cranial mackerel elements at Lyminge*

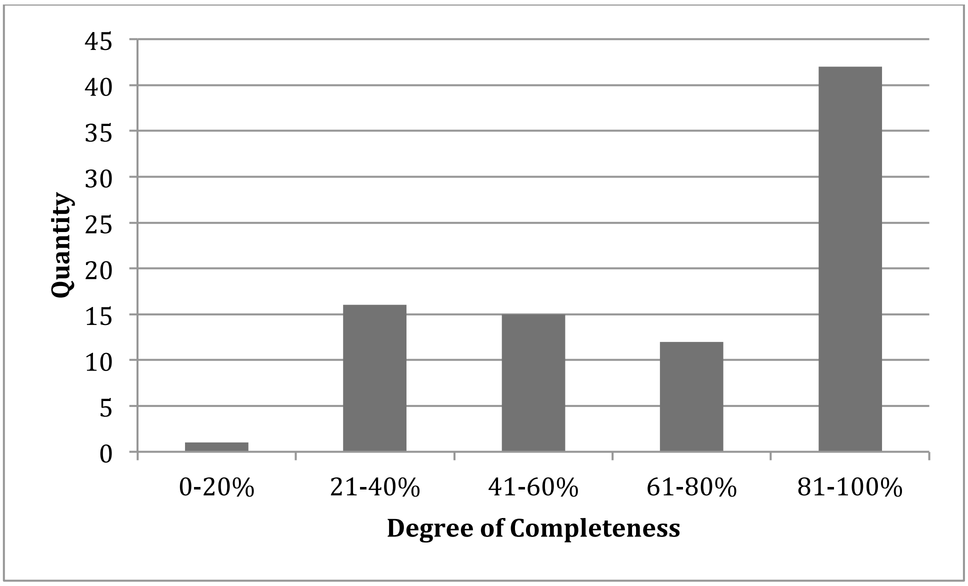


*Figure 10. Completeness scores for cranial horse mackerel elements at Lyminge*

**Other taphonomic alterations**

A total of 18 eel, 37 herring, one small whiting, two mackerel, two plaice/flounder, and 23 unidentifiable vertebra showed signs of crushing. A further seven vertebra showed signs of acid etching. Several elements were burnt, including one eel, three herring, two cod, three whiting and 9 unidentifiable vertebra. Of these, one of the cod vertebra was calcinated.

**Butchery**

One cod articular exhibits what appears to be knife marks on its lateral side. The exact cause of this is unknown, though it may relate to the removing of flesh from the head, particularly the cheeks.


*Plate 1. Cod articular with knife marks on lateral side*

**Sizes**

The live lengths and ordinal sizes of cod are presented and discussed in Chapter 8. Figures 11-15 present the ordinal size categories for five of the other main fish species.

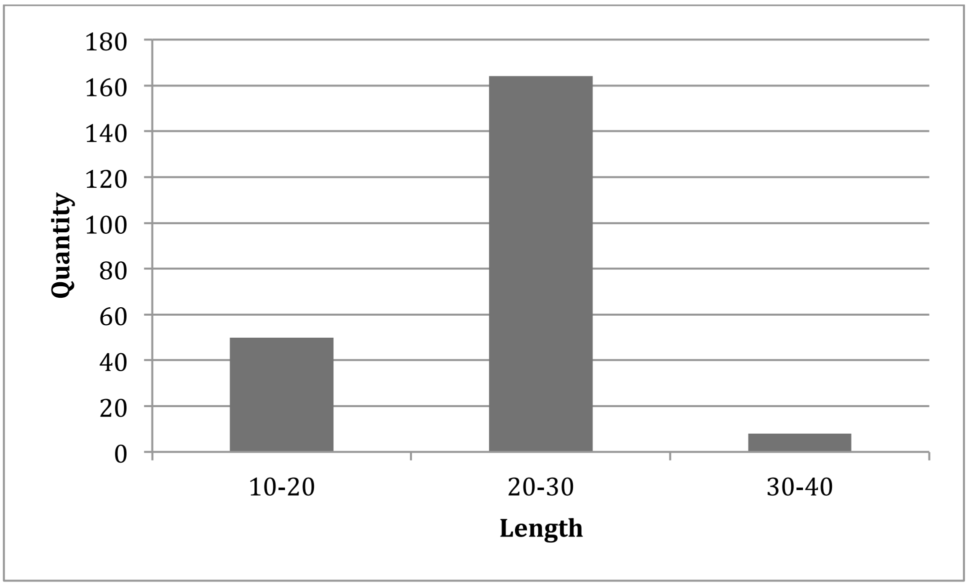


*Figure 11. Relative abundance of herring elements (N=222) of different lengths (centimetres) at Lyminge*

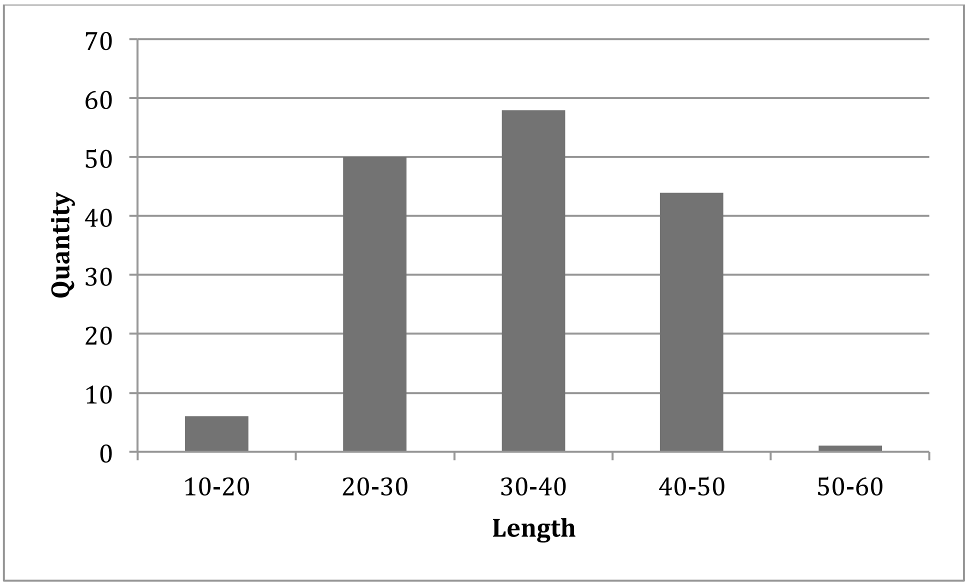


*Figure 12. Relative abundance of whiting elements (N=159) of different lengths (centimetres) at Lyminge*

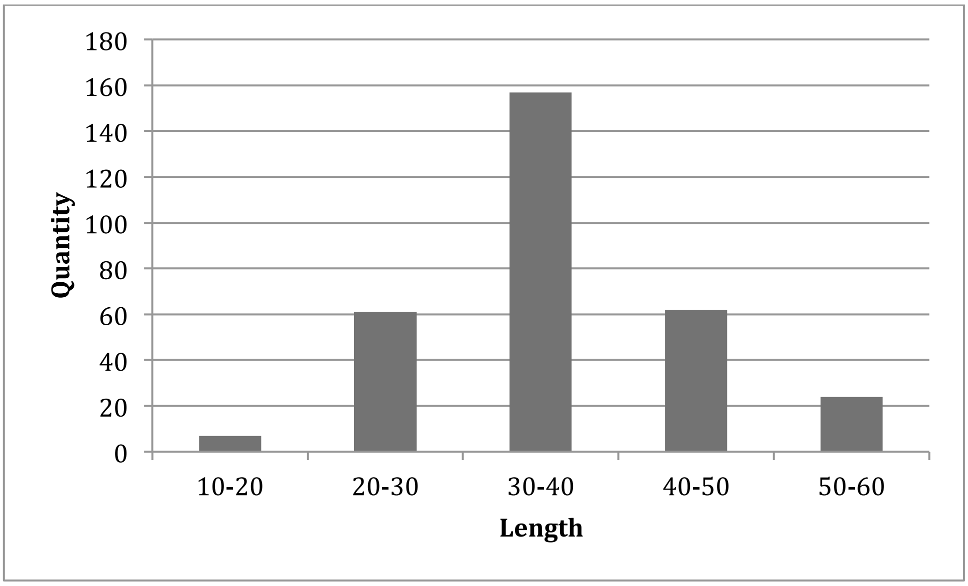


*Figure 13. Relative abundance of plaice/flounder elements (N=311) of different lengths (centimetres) at Lyminge*

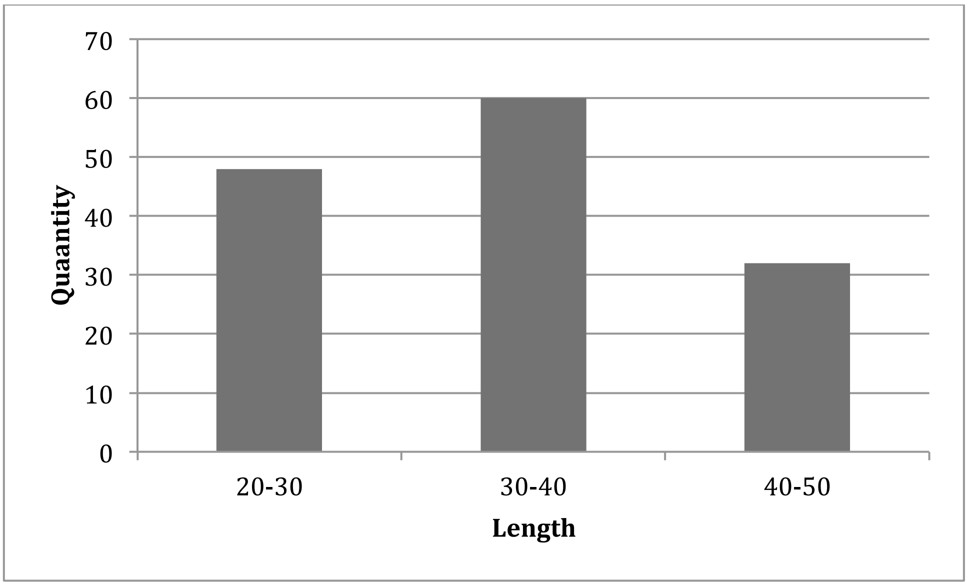


*Figure 14. Relative abundance of mackerel elements (N=140) of different lengths (centimetres) at Lyminge*

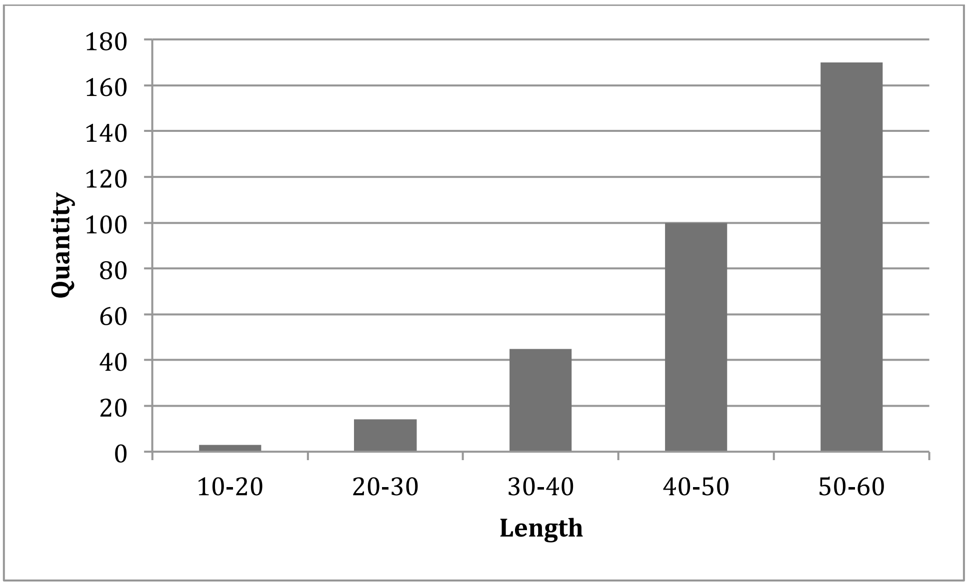


*Figure 15. Relative abundance of horse mackerel elements (N=322) of different lengths (centimetres) at Lyminge*

The ordinal size ranges for all species indicates very little variation in the sizes of individuals caught on site. With the exception of plaice/flounder and horse mackerel, the majority of specimens were fairly large. While some smaller individuals were also present, the patterns seem to exhibit a similar situation to Bishopstone, where the largest of individuals were kept on site. However, whether these large individuals were sorted on site or prior to arriving is difficult to tell. Most of the cod from Lyminge came from very large specimens, though calculated live lengths showed that a small number of cod were present as well. It is thus possible that all fish were brought to the site and were sorted, with the largest specimens remaining at the settlement.

**Summary**

Though excavations are still ongoing, Lyminge is providing an excellent opportunity to study the changing levels of fish consumption over the Anglo-Saxon period. The evidence for fish consumption in the early Anglo-Saxon period is small. Remains from this period additionally often come from the fills of SFBs and could thus represent activities and deposits of later date. Nevertheless, fish remains seem to signal the beginning of a shift to greater marine exploitation, which commences in the 8th century and is dominated by large cod. Though eel is still the most abundant fish in terms of NISP, the quantity of large cod elements is very significant. An assessment of the faunal material recovered in 2009 showed that marine fish, especially cod, continue to dominate the fish assemblage. Lyminge is thus poised to contribute a great deal to our understanding of early medieval fishing.

# Appendix 3

### Sedgeford Fish Remains

Excavations conducted in the village of Sedgeford over the past 17 years revealed occupation levels from the Bronze Age through to the late Anglo-Saxon period. From the Anglo-Saxon period, agricultural features, a burial ground and several pits were found. The present doctoral study analysed fish remains that were recovered at this site from 1996 to 2010.

### Results

Unfortunately, the sampling strategy at Sedgeford has been very inconsistent. While in some years, samples were floated on site, with usually no more than one 10 litre sample per context, in other years, all contexts were subjected to dry-sieving. In some occasions, no sieving took place. Bags containing fish remains generally offered very little information regarding their method of recovery. As neither context information nor dating is available for the site, the remains are considered to date from the mid Anglo-Saxon period.

Almost every year of excavation, some fish bones were recovered, albeit in very small amounts. It is thus very likely that if sampling and sieving had been more consistent, the number of fish remains recovered would have been considerably larger. Nevertheless, a reasonably wide range of species were found, with herring being the most abundant followed by eel and plaice/flounder (Table 1). Smaller numbers of cod, whiting, cyprinid and garfish were also present. The fish assemblage indicates exploitation of species found in the nearby Wash, as well as the Heacham and Hun rivers, which were most likely tidal in the Anglo-Saxon period. A complex of weirs were discovered at Holme Beach near Hunstanton (Robertson 2010), which is some distance from Sedgeford. It is possible for other complexes of weirs to have existed closer to the settlement of Sedgeford. The settlement at Fishtoft, Lincolnshire, revealed a far greater fish assemblage, which included high numbers of garfish and horse mackerel (Locker 2012). Considering that very few other Anglo-Saxon sites contained garfish in high numbers, this may reflect a specialised regional exploitation around the Wash.

| Species | Sieved | Dry-sieved/hand-collected | Total |
|---|---|---|---|
| Eel | 264 | 143 | 407 |
| Herring | 537 | 172 | 709 |
| Herring? | 1 | 0 | 1 |
| Twaite shad | 0 | 2 | 2 |
| Herring family | 1 | 1 | 2 |
| Cyprinid | 4 | 18 | 22 |
| Bream | 0 | 1 | 1 |
| Roach | 1 | 0 | 1 |
| Tench | 1 | 0 | 1 |
| Pike | 0 | 3 | 3 |
| Sea bass | 1 | 0 | 1 |
| Gadid | 5 | 3 | 8 |
| Cod | 17 | 19 | 36 |
| Haddock | 1 | 0 | 1 |
| Whiting | 8 | 20 | 28 |
| Garfish | 1 | 18 | 19 |
| Garfish? | 0 | 1 | 1 |
| Plaice/flounder | 152 | 88 | 240 |
| Brill/turbot | 1 | 0 | 1 |
| Flatfish | 0 | 2 | 2 |
| Ray family | 10 | 0 | 10 |
| Salmonid | 3 | 3 | 6 |
| Gurnard family | 10 | 3 | 13 |
| Mackerel | 0 | 3 | 3 |
| Horse mackerel | 30 | 13 | 43 |
| Unidentified fish | 406 | 455 | 861 |
| **Total** | **1454** | **968** | **2422** |

*Table 1. Fish species assemblage at Sedgeford*

## Preservation

Assessing the levels of preservation at Sedgeford is very difficult, as this requires cranial elements, which were rarely found at this site. In addition, the excavations at Sedgeford encompassed a wide area. While soil conditions and individual depositional processes are therefore likely to vary between trenches, the number of fish remains from each trench was often too small to gain sufficient information in this respect. The few cranial elements recovered indicated “excellent” to “poor” texture scores. Species with denser bones were not different from other species in this respect. Completeness scores were also widely variable across all species.

**Other taphonomic alterations**

A wide variety of other taphonomic alterations were identified at Sedgeford (Table 2).

| | Crushed | Burnt | Calcinated |
|---|---|---|---|
| **Eel** | 3 | 1 | 8 |
| **Herring** | 15 | 11 | 23 |
| **Cod** | 0 | 1 | 5 |
| **Plaice/flounder** | 6 | 2 | 6 |
| **Garfish** | 0 | 2 | 1 |
| **Unidentified fish** | 2 | 16 | 3 |

*Table 2. Other taphonomic alterations*

Often those vertebra that were either burnt or calcinated came from the same context indicating they may represent one burning event. The crushed vertebra of eel and herring were found across many different contexts, as the other finds from these contexts are not known it is not possible to say whether these are cess deposits or cess material being re-deposited elsewhere.

**Sizes**

With the exception of a few cod bones and the eel, the remains of four other fish species found at Sedgeford came from small to medium individuals (Figures 1-6). This is especially evident with regard to herring vertebra, which were mostly between 10 and 20 centimetres long. This may reflect the fishing of a local herring population from the Wash. The relatively small size of remains of all other species may be due to the same reason. The few larger cod elements may represent odd catches of big fish that had either wandered into the Wash or had been caught by fishermen that ventured into more open waters. Larger-sized eel indicate the catching of adults at the time of travelling downstream.

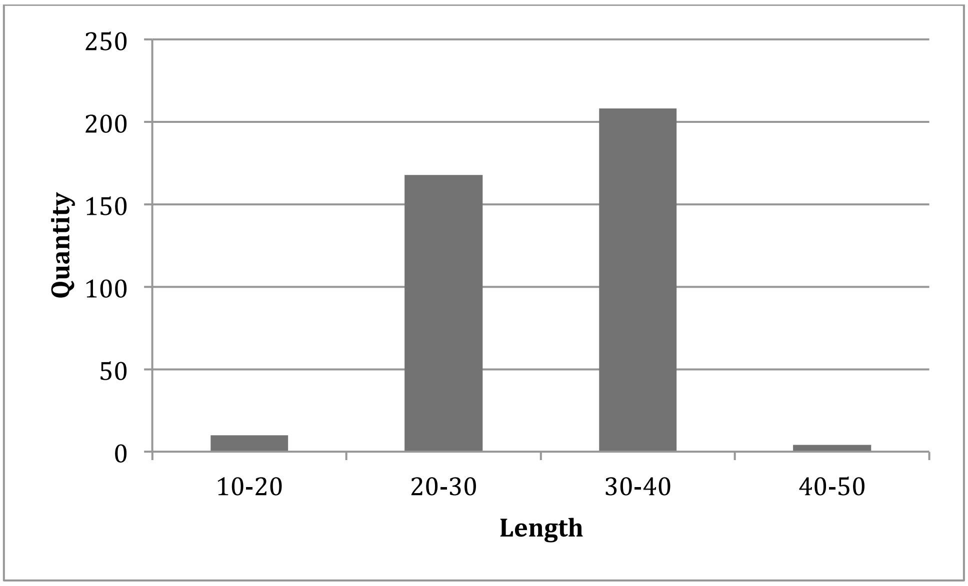


*Figure 1. Relative abundance of eel elements (N=390) of different lengths (centimetres) at Sedgeford*

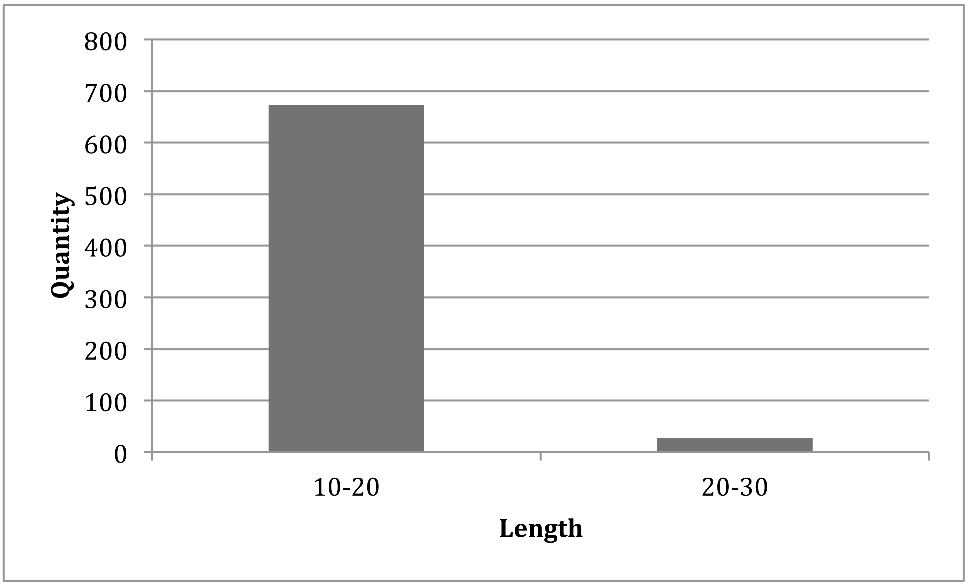


*Figure 2. Relative abundance of herring elements (N=701) of different lengths (centimetres)*

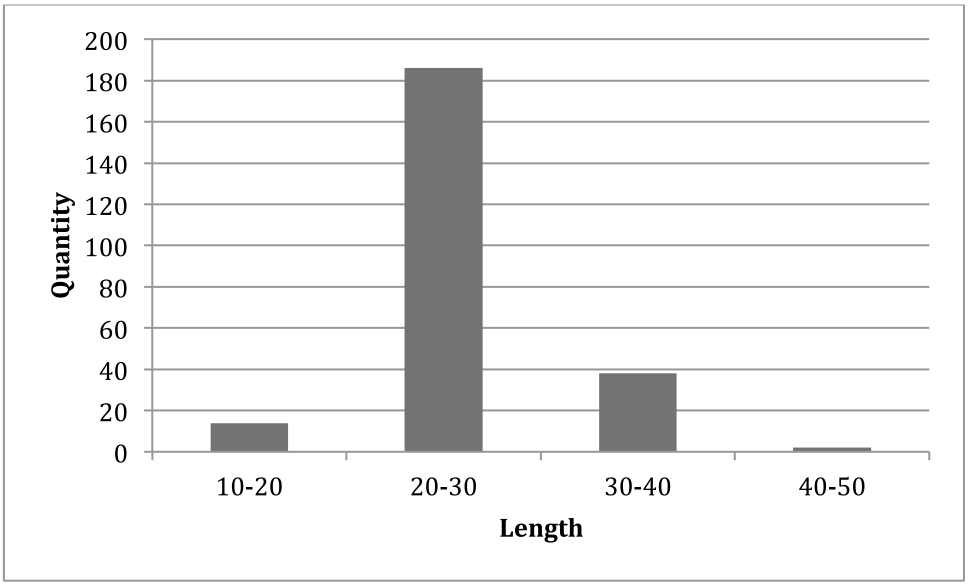


*Figure 3. Relative abundance of plaice/flounder elements (N=240) of different lengths (centimetres) at Sedgeford*

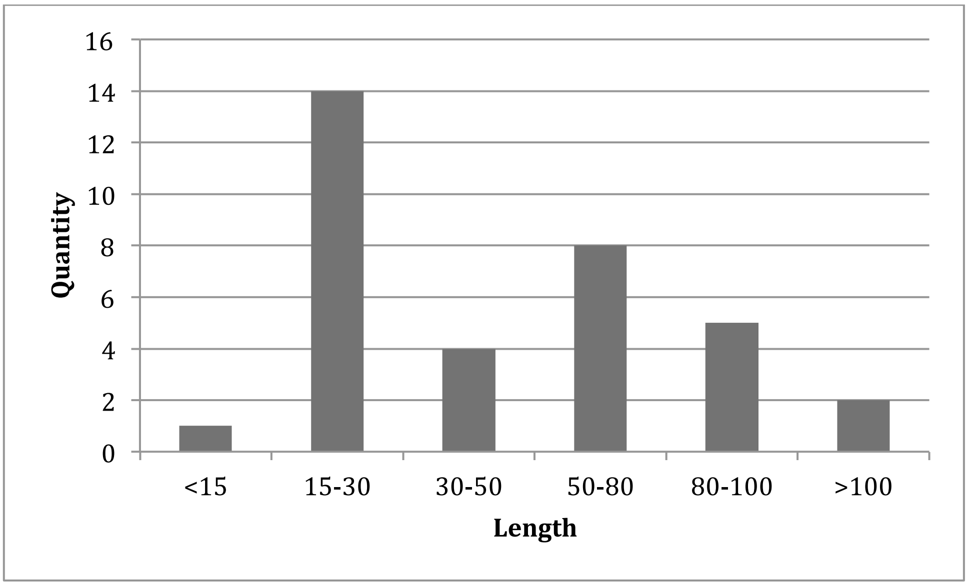


*Figure 4. Relative abundance of cod elements (N=34) of different lengths (centimetres) at Sedgeford*

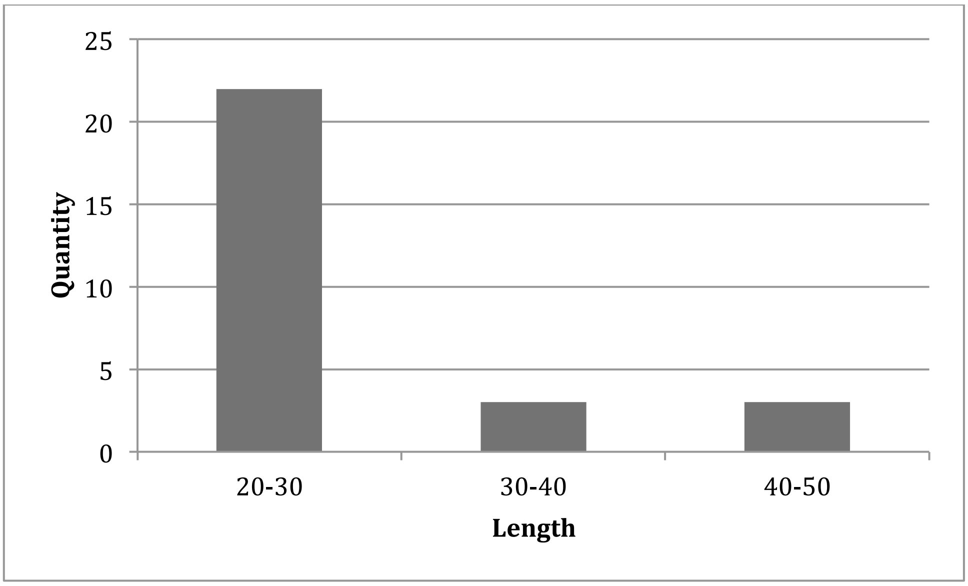


*Figure 5. Relative abundance of whiting elements (N=28) of different lengths (centimetres) at Sedgeford*

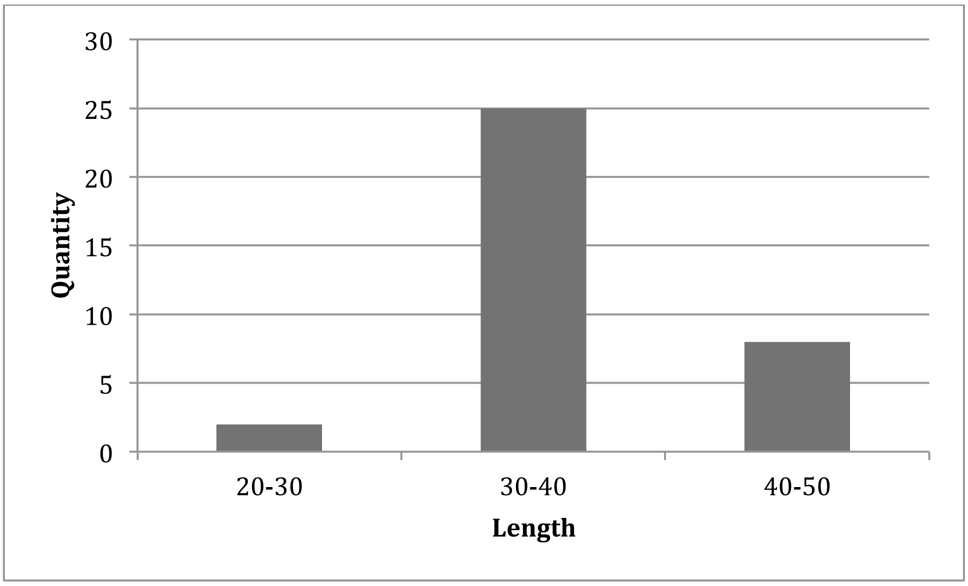


*Figure 6. Relative abundance of horse mackerel elements (N=35) of different lengths (centimetres) at Sedgeford*

**Summary**

The fish bones found at Sedgeford are difficult to interpret due to the inconsistency in recovery methods. Though all fish species found were locally present, it is possible that fishing from further afield has taken place to some degree. Analysis of mammal and bird bones suggested that Sedgeford was an elite site that may have experienced a shift in status character to a religious settlement (Poole 2010). This is supported by some of the material remains (Davies 2011). Unfortunately, it is not possible to suggest that the fish remains support this change. However, if more effective sieving strategies are used in future excavations, Sedgeford may very well reveal a rich fish assemblage.

# Appendix 4

### Bishopstone Fish Remains

Excavations at Bishopstone, East Sussex, were conducted over three years from 2003 to 2005. The excavations revealed a late Anglo-Saxon settlement, probably home to an early thegnly residence, as well as large mammal, avian and fish assemblages (Thomas 2010a). As the fish bone assemblage of this site had already been studied by myself for my undergraduate dissertation, only four elements (i.e. pre-maxilla, dentary, cleithrum and vertebrae) were routinely identified to family or species level (Reynolds 2008). These four elements were selected under the guidance of Dr James Barrett (McDonald Institute, University of Cambridge), and because they are easily identified and represent three distinct sections of a fish's skeleton: pre-maxilla and dentary from the cranium, cleithrum from the appendicular section, and vertebrae from the abdominal and caudal parts of the skeleton. Based on Barrett's preserved cod models (1995; 1997), presence of all four elements would thus imply the presence of whole fish on the settlement.

The undergraduate dissertation formed the basis of the final report, which is part of the excavation monograph (Reynolds 2010). For the present thesis, the author re-analysed these fish remains, including all routinely identified elements, and additionally focused on effectively recording preservation and sizes. The remains were identified according to the methods presented in Chapter 1.

**Results**

The new analysis of the assemblage almost doubled the number of specimens but did not significantly increase the number of species identified. It served to re-emphasise the importance of the major species that were identified in the first study, namely herring, plaice/flounder, whiting and cod. Other pelagic species such as Atlantic mackerel and horse mackerel also seem to have been fished regularly. Eel is the most abundant freshwater species, which is in line with the trends seen at other Anglo-Saxon fish assemblages.

| **Species** | **Hand-collected/ dry sieved** | **Wet sieved** | **Total** |
|---|---|---|---|
| Eel | 0 | 571 | 571 |
| Garfish | 0 | 1 | 1 |
| Herring | 0 | 706 | 706 |
| Conger eel | 16 | 10 | 26 |
| Cyprinid family | 0 | 5 | 5 |
| Cyprinid Family? | 0 | 10 | 10 |
| Sea bass | 1 | 0 | 1 |
| Sea bass? | 0 | 4 | 4 |
| Sea bass/European perch | 7 | 3 | 10 |
| Gadid | 1 | 80 | 81 |
| Cod | 180 | 48 | 228 |
| Haddock | 1 | 1 | 2 |
| Haddock? | 1 | 1 | 2 |
| Whiting | 25 | 198 | 223 |
| European perch | 0 | 2 | 2 |
| Flounder | 0 | 2 | 2 |
| Flounder/Plaice | 88 | 143 | 231 |
| Ray family | 9 | 112 | 121 |
| Salmonid | 1 | 0 | 1 |
| Atlantic Mackerel | 32 | 145 | 177 |
| Atlantic Mackerel? | 2 | 0 | 2 |
| Tuna? | 1 | 0 | 1 |
| Horse mackerel | 24 | 14 | 38 |
| Gurnard family | 0 | 2 | 2 |
| Bib | 0 | 1 | 1 |
| **Total** | **389** | **2059** | **2448** |

*Table 1. Fish species at Bishopstone identified during undergraduate study.*

| Species | Sieved | Dry-sieved/hand-collected | Total |
|---|---|---|---|
| Eel | 594 | 0 | 594 |
| Herring | 749 | 0 | 749 |
| Herring? | 2 | 0 | 2 |
| Herring family | 1 | 0 | 1 |
| Conger eel | 19 | 17 | 36 |
| Cyprinid | 8 | 0 | 8 |
| Sea bass | 83 | 26 | 109 |
| Sea bass? | 2 | 1 | 3 |
| Cod | 80 | 344 | 424 |
| Cod? | 1 | 1 | 2 |
| Gadid | 53 | 26 | 79 |
| Haddock | 0 | 3 | 3 |
| Haddock? | 1 | 0 | 1 |
| Whiting | 359 | 55 | 414 |
| Ling | 0 | 1 | 1 |
| Ling? | 1 | 0 | 1 |
| Bib | 4 | 1 | 5 |
| Plaice/Flounder | 324 | 120 | 444 |
| Plaice/Flounder | 1 | 0 | 1 |
| Flounder | 0 | 1 | 1 |
| Plaice | 1 | 0 | 1 |
| Brill/Turbot | 0 | 2 | 2 |
| Flatfish | 4 | 1 | 5 |
| Ray family | 176 | 10 | 186 |
| Atlantic mackerel | 165 | 48 | 213 |
| Horse mackerel | 39 | 34 | 73 |
| Horse mackerel? | 2 | 0 | 2 |
| Gurnard family | 10 | 2 | 12 |
| Gurnard family? | 3 | 0 | 3 |
| Sea bream family | 4 | 0 | 4 |
| Salmonid | 0 | 1 | 1 |
| Sandsmelt? | 0 | 1 | 1 |
| Perch | 2 | 0 | 2 |
| Mullet family? | 2 | 0 | 2 |
| Garfish | 3 | 0 | 3 |
| Garfish? | 3 | 0 | 3 |
| Tuna? | 0 | 1 | 1 |
| Unidentified fish | 3890 | 525 | 4415 |
| **Total** | **6586** | **1221** | **7807** |

*Table 2. Fish species at Bishopstone re-identified in the present study*

## Preservation

Overall, the state of preservation for all species was fairly good. Many elements exhibited reasonably good texture and only a few bones were broken into too small fragments.

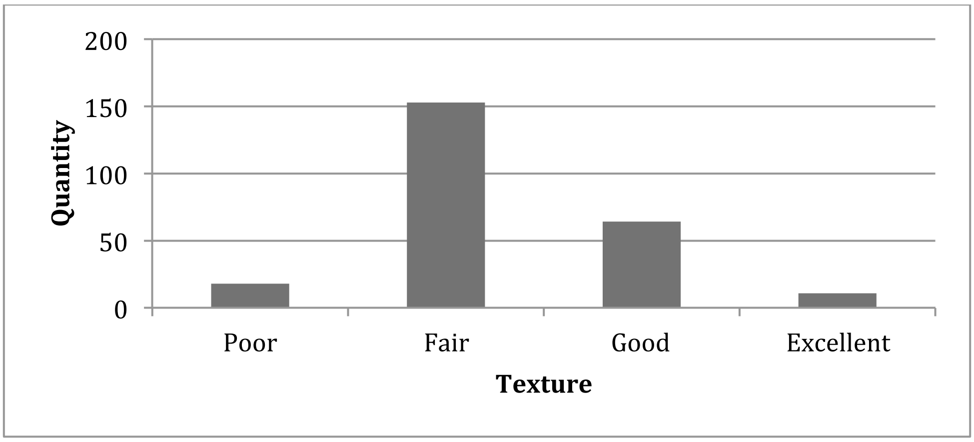


*Figure 1. Texture scores for cranial cod elements at Bishopstone*

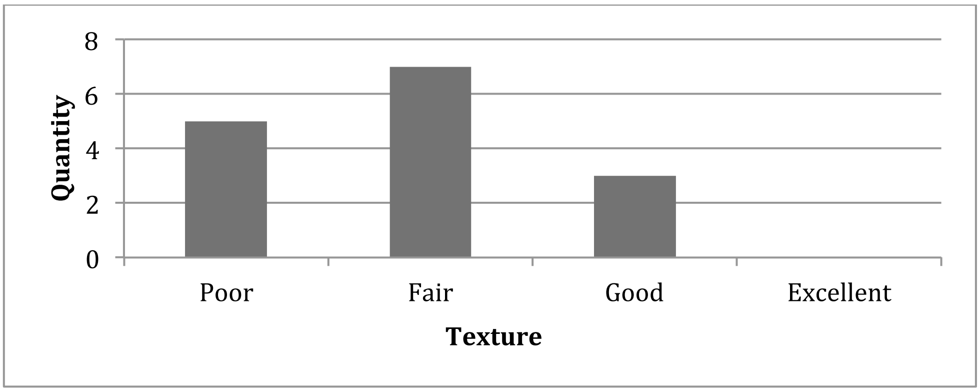


*Figure 2. Texture scores for cranial herring elements at Bishopstone*

A much greater number of cranial cod elements than cranial herring elements were recovered (Figures 1 and 2). Even though cranial cod elements are much more robust compared to those of herring, the majority of both species' cranial elements were of fair texture (Figures 1 and 2). Herring cranial bones are very thin and fragile, which explains why several of them have been recorded as poor. Nevertheless, both of these species have thin, fragile bones, and oily flesh and bones, which may affect their preservation in a similar way as in salmon (Lubinski 1996).

The elements of more robust species such as cod showed a lower degree of fragmentation (Figure 3) compared to that of herring (Figure 4).

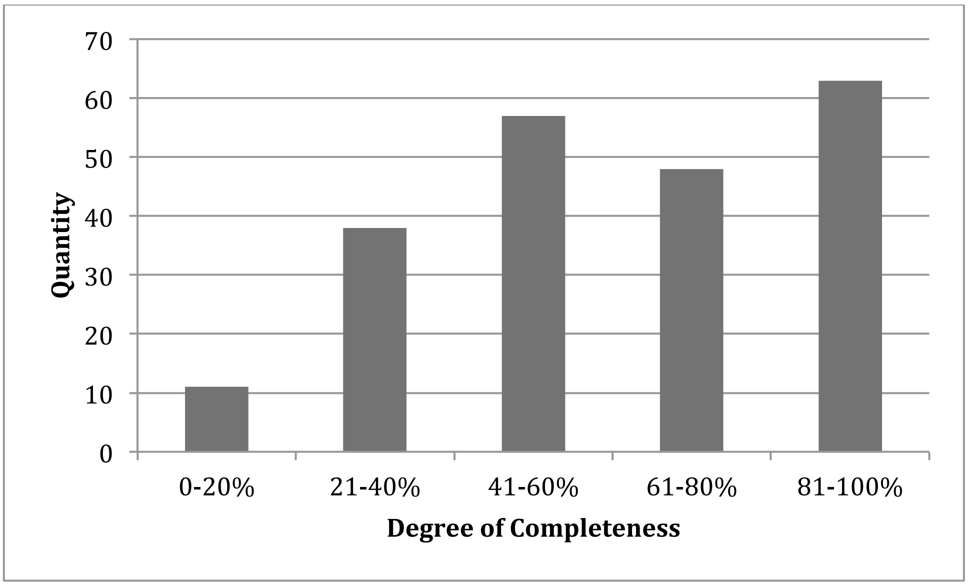

*Figure 3. Completeness scores for cranial cod elements at Bishopstone*

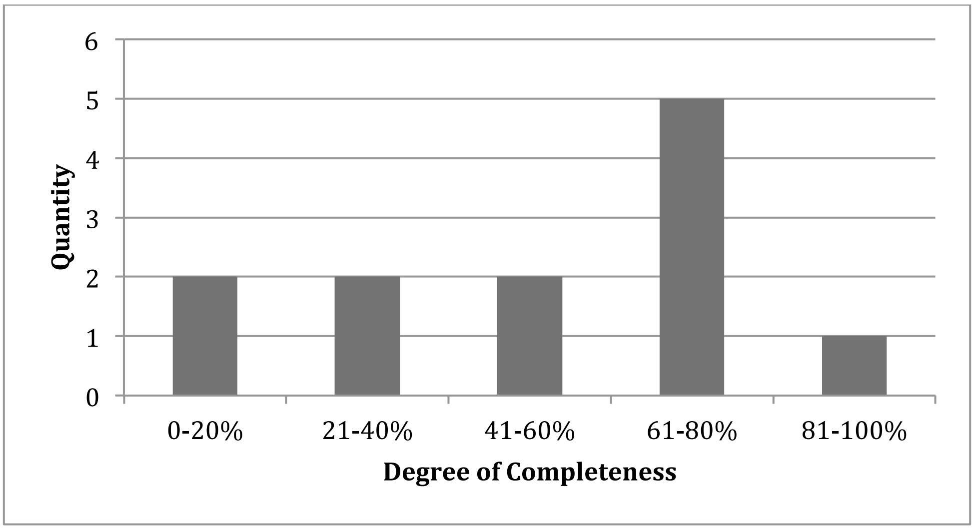

*Figure 4. Completeness scores for cranial herring elements at Bishopstone*

Even though cranial cod elements are very robust, the fairly good preservation levels resulted in a rather large number of herring elements that are not too fractured. Trends in texture and completeness scores of the other main species are similar to those seen in cod and herring (Figures 5-12). Only very few cranial eel and horse mackerel elements were recovered, which were generally the most robust ones. To an extent, the low variability in texture and completeness in these species' cranial elements is probably caused by the low number of elements recovered.

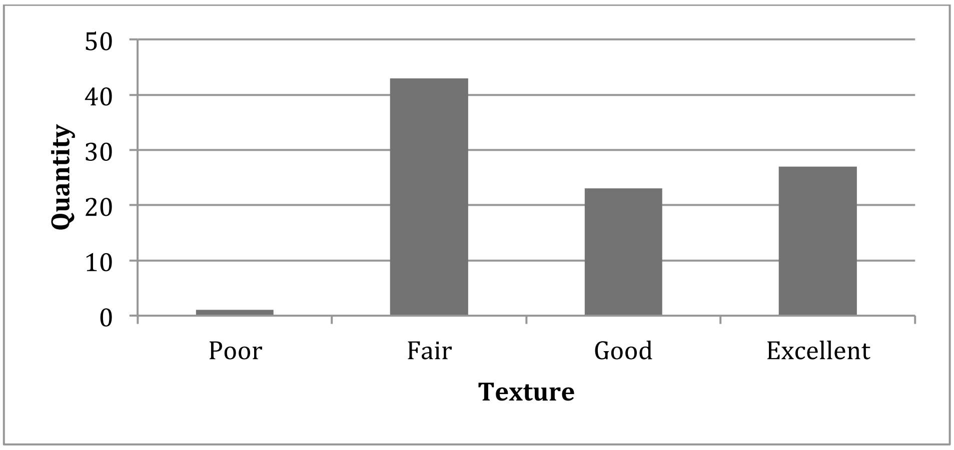


*Figure 5. Texture score for cranial sea bass elements at Bishopstone*


*Figure 6. Texture score for cranial whiting elements at Bishopstone*

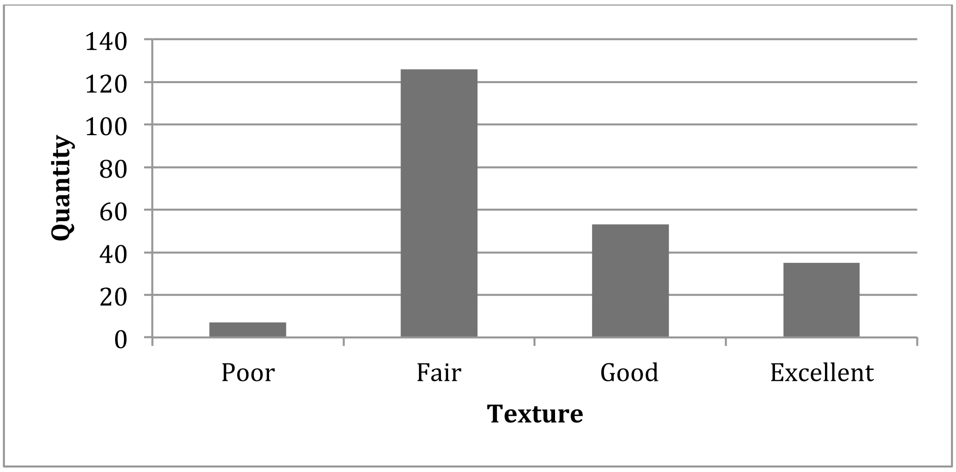


*Figure 7. Texture scores for cranial plaice/flounder elements at Bishopstone*

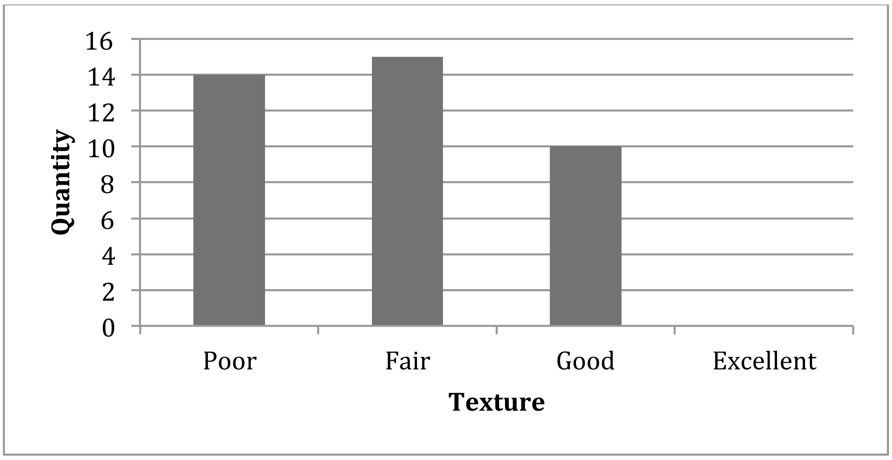


*Figure 8. Texture scores for cranial mackerel elements at Bishopstone*

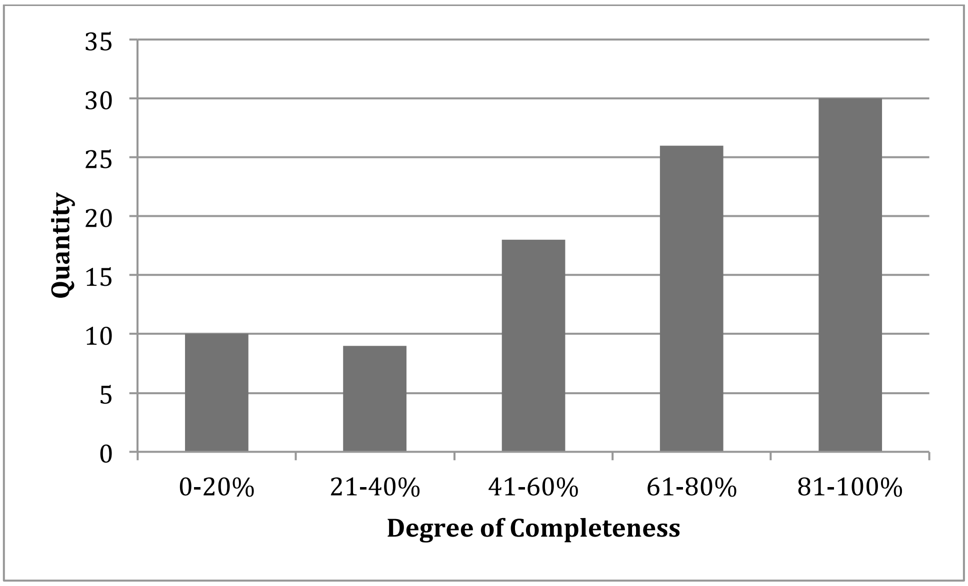


*Figure 9. Completeness scores for cranial sea bass elements at Bishopstone*

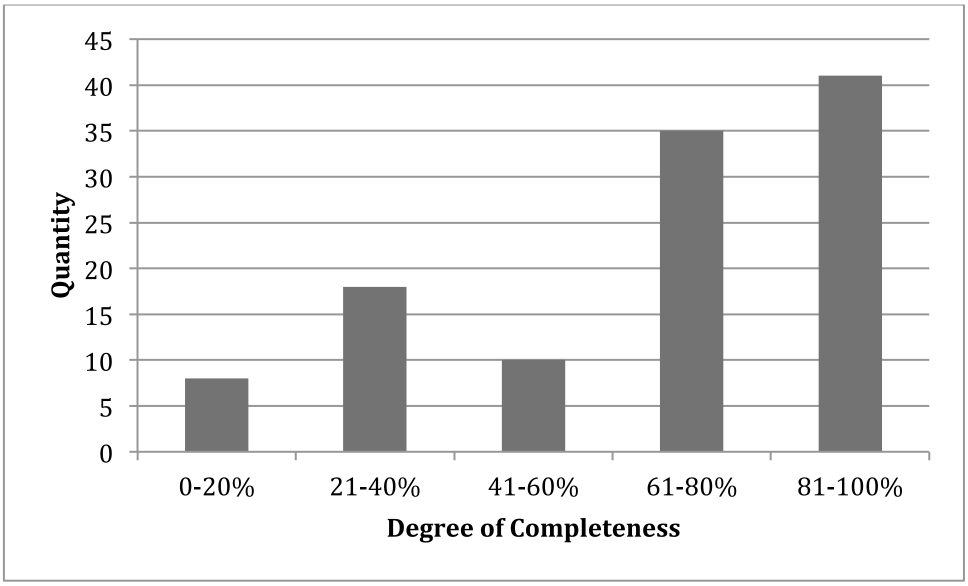


*Figure 10. Completeness scores for cranial whiting elements at Bishopstone*

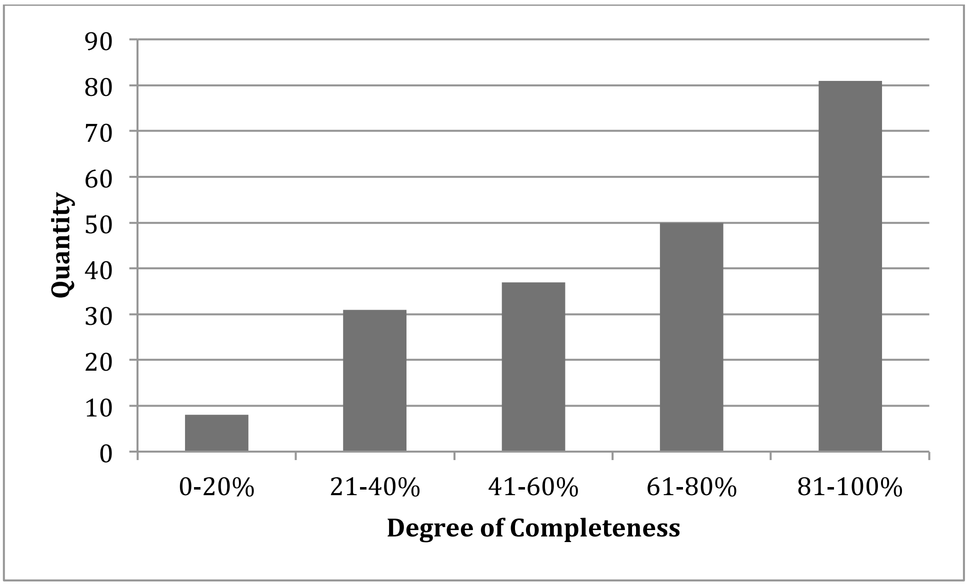


*Figure 11. Completeness scores for cranial plaice/flounder elements at Bishopstone*

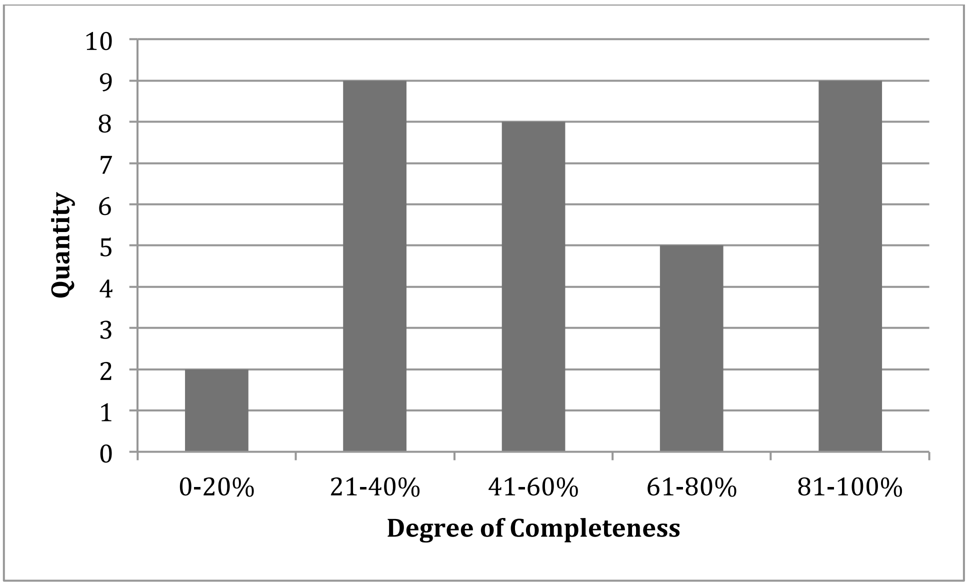

*Figure 12. Completeness scores for cranial mackerel elements at Bishopstone*

**Other taphonomic alterations**

Many eel and herring vertebrae were either crushed or showed signs of acid etching, as the vertebra of both species can easily be swallowed. In total, 16 eel and 63 herring vertebra were crushed. Some vertebrae of other species were also found to be crushed, i.e. two horse mackerel, 23 mackerel, six plaice/flounder, two whiting and two sea bass. In addition, 24 unidentified vertebrae were crushed.

Several vertebrae from different species showed evidence of burning. However, as most of these came from separate contexts, it is not possible to establish if they represent a specific activity.

**Pathology**

One large pharyngeal identified as a large gadid – most likely cod – showed distinct hyperstosis. However, the cause for this is unfortunately unknown.


*Plate 1. Frontal view of cod pharyngeal from Bishopstone showing hyperstosis.*


*Plate 2. Dorsal view of cod pharyngeal from Bishopstone showing hyperstosis.*

**Sizes**

As discussed in Chapter 1, the reconstruction of live fish sizes can reveal information on environmental and climatic conditions as well as fishing techniques. How useful reconstructed live lengths are in this respect will depend on the species of fish and the size of the sample. Reconstructing live lengths is only useful when a large enough sample is present. In the case of Bishopstone, live lengths were only calculated for cod, as cod size changes with age and habitat. As discussed in section 6.3, fishing of big fish may have been an elitist activity similar to hunting. All vertebra and cranial elements were placed into ordinal size groups where possible (see Figures 13-18 for the most abundant fish species at Bishopstone).

Most fish species present at Bishopstone would have been caught seasonally. Adult eel will have been caught in autumn, when travelling downstream, or in spring, when elvers are travelling upstream. Pelagic fish such as herring and mackerel will also have been caught seasonally, when shoals contain the most mature fish and are close to the shore.

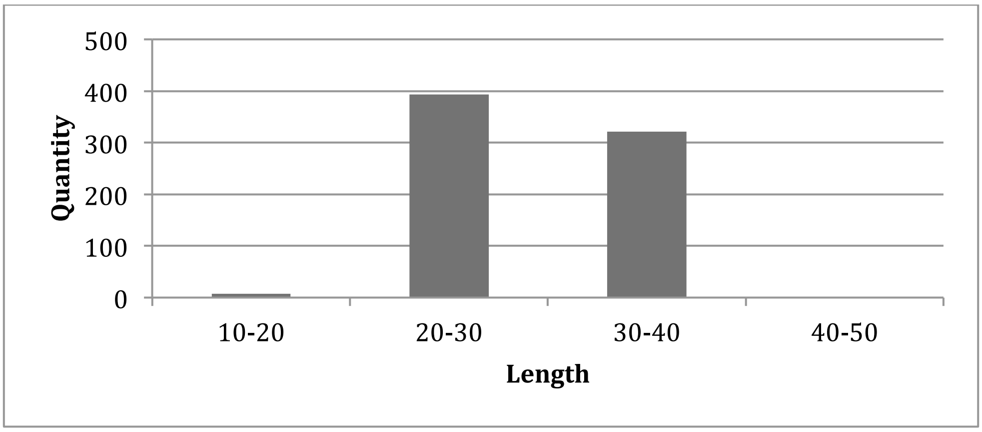


*Figure 13. Relative abundance of herring elements (N=725) of different lengths (centimetres) at Bishopstone*

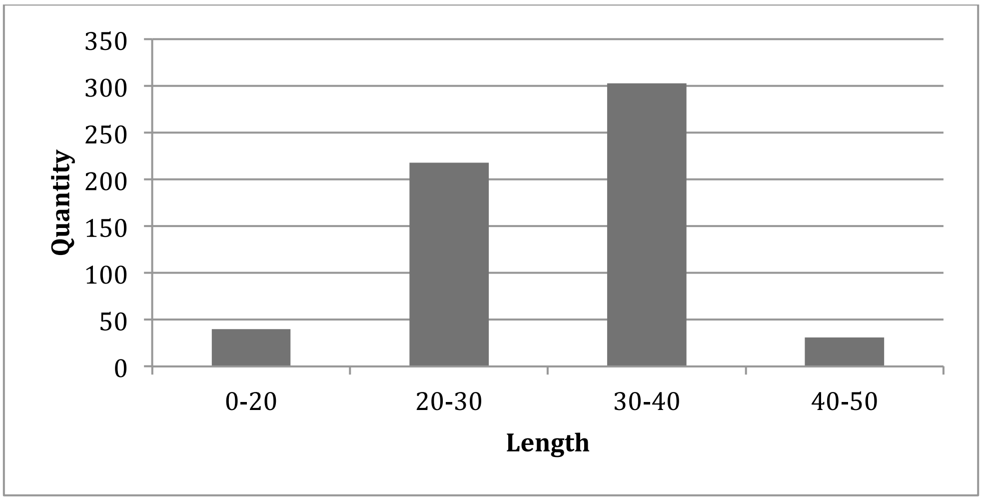


*Figure 14. Relative abundance of eel elements (N=592) of different lengths (centimetres) at Bishopstone*

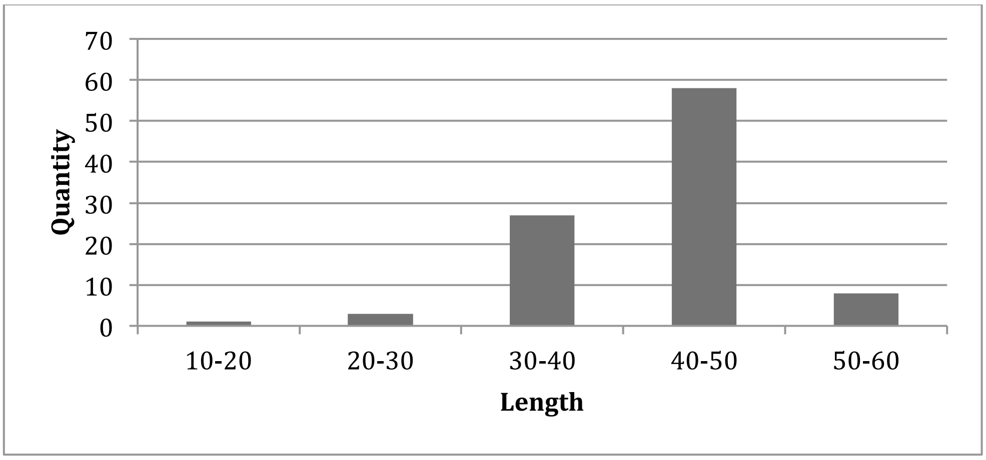


*Figure 15. Relative abundance of sea bass elements (N=97) of different lengths (centimetres) at Bishopstone*

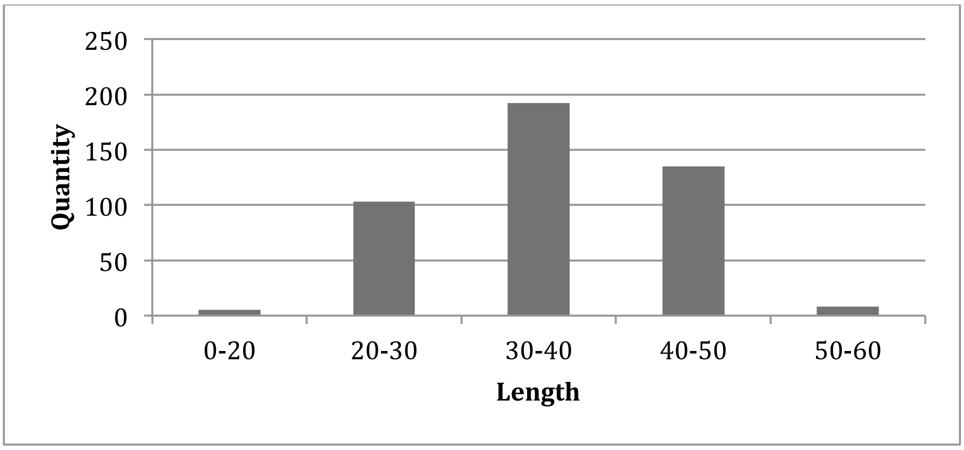


*Figure 16. Relative abundance of plaice/flounder elements (N=443) of different lengths (centimetres) at Bishopstone*

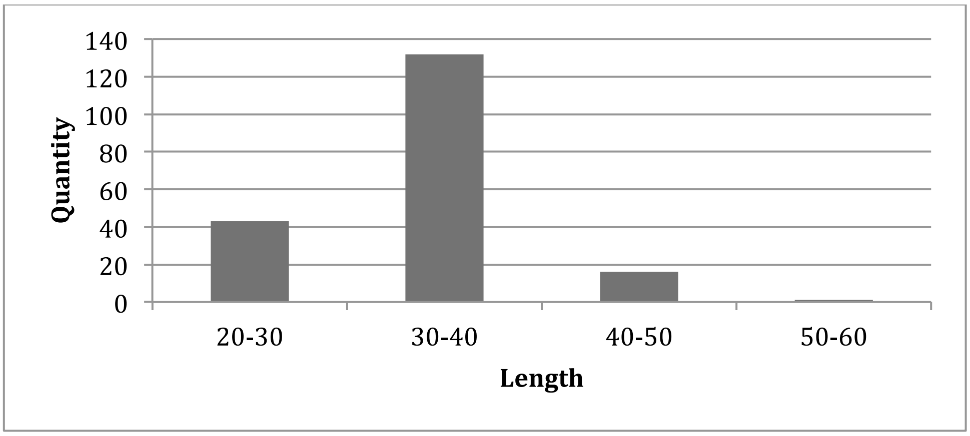


*Figure 17. Relative abundance of mackerel elements (N=192) of different lengths (centimetres) at Bishopstone*

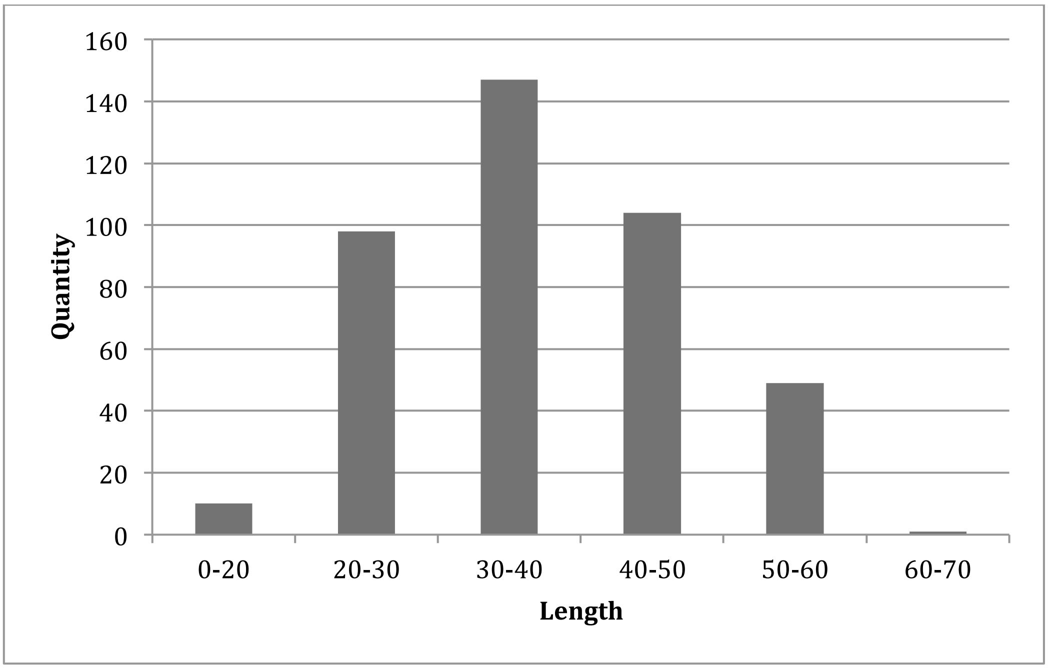


*Figure 18. Relative abundance of whiting elements (N=409) of different lengths (centimetres) at Bishopstone*

For all fish species analysed, the greatest number of elements are of intermediate size (i.e. represented by the two middle columns in Figures 13-18). This is most likely due to the fact that elements were assorted in size categories of 10 centimetre-increments. As it is impossible to accurately determine the exact location of a vertebra within the vertebral column, it is very likely that vertebra from different size categories belong to single individuals. However, it is clear that most of the fish from each species tend to come from similar sized individuals, often from the larger end of the scale. It is impossible to know whether the inhabitants of Bishopstone fished these larger individuals for consumption on site or requested them from fishermen further afield. The presence of larger individuals of other species than cod is interesting given the potential symbolism associated with large fish, but also in terms of food distribution strategies and the trend of late Anglo-Saxon elites increasing their control over fisheries.

# Appendix 5

## Staple Gardens, Winchester Fish Remains

The fish assemblage from Staple Gardens, Winchester, was studied for this doctoral study using the methods described in Chapter 1. Unfortunately, apart from some phasing and contextual information, very little is known about these excavations. While some fish remains were recovered from environmental samples, all other fish remains were hand-collected.

| **Species** | **Sieved** | **Dry-sieved/hand-collected** | **Total** |
|---|---|---|---|
| Eel | 54 | 0 | 54 |
| Conger eel | 1 | 15 | 16 |
| Herring | 173 | 0 | 173 |
| Herring family? | 1 | 0 | 1 |
| Sea bass | 0 | 1 | 1 |
| Garfish? | 3 | 0 | 3 |
| Cod | 1 | 12 | 13 |
| Gadid | 0 | 4 | 4 |
| Whiting | 18 | 1 | 19 |
| Plaice/Flounder | 8 | 9 | 17 |
| Atlantic mackerel | 2 | 2 | 4 |
| Unidentified fish | 269 | 441 | 710 |
| **Total** | **530** | **485** | **1015** |

*Table 1. Fish species identified at Staple Gardens*

Unsurprisingly for a site of late Anglo-Saxon and late Anglo-Norman date, herring is the most abundant species (Table 1). Eel were found in much lower numbers, as were other marine species including whiting, plaice/flounder, conger eel and cod.

**Preservation**

Assessing the levels of preservation at Staple Gardens is difficult, as this requires cranial elements, which were rarely found at this site. The few cranial elements recovered indicated "good" or "excellent" texture levels for species with denser bones such as conger eel, cod, plaice/flounder and whiting, while herring and eel cranial elements were classed as "fair". Despite the comparatively poor texture of eel and herring elements, most of these were not too fragmented. In fact, several of these were almost 100% complete. Cranial cod elements showed various degrees of fragmentation.

**Other taphonomic alterations**

No bones showing signs of crushing, acid etching or burning were identified.

**Sizes**

A rather large proportion of cod elements originated from very large individuals (Fig. 3). This may indicate occasional large catches. As all other species were fairly small in size (Figures 1,2,4 and 5), it is very likely that all these fish had been caught in the nearby Solent. Other excavations in Winchester revealed an assemblage dominated by herring and eel, with no other species being present in any great numbers. Holmes (2011) studied the mammal and avian remains from Staple Gardens, and noted that a high number of birds and wild mammals were found at this site. Given the small size of the fish assemblage, it is very difficult to assess whether any of the fish remains can be used as status indicators.

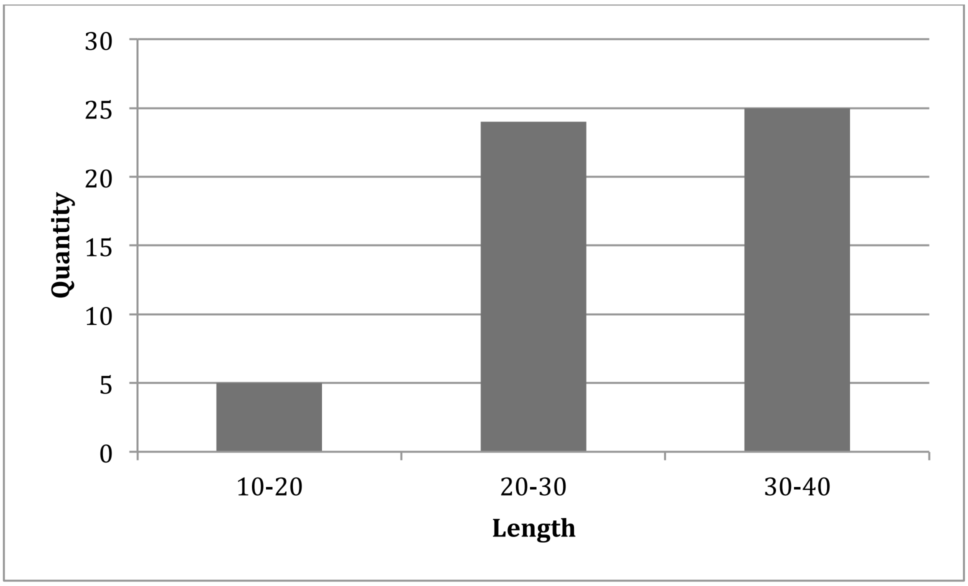


*Figure 1. Relative abundance of eel elements of different lengths (centimetres) at Staple Gardens*

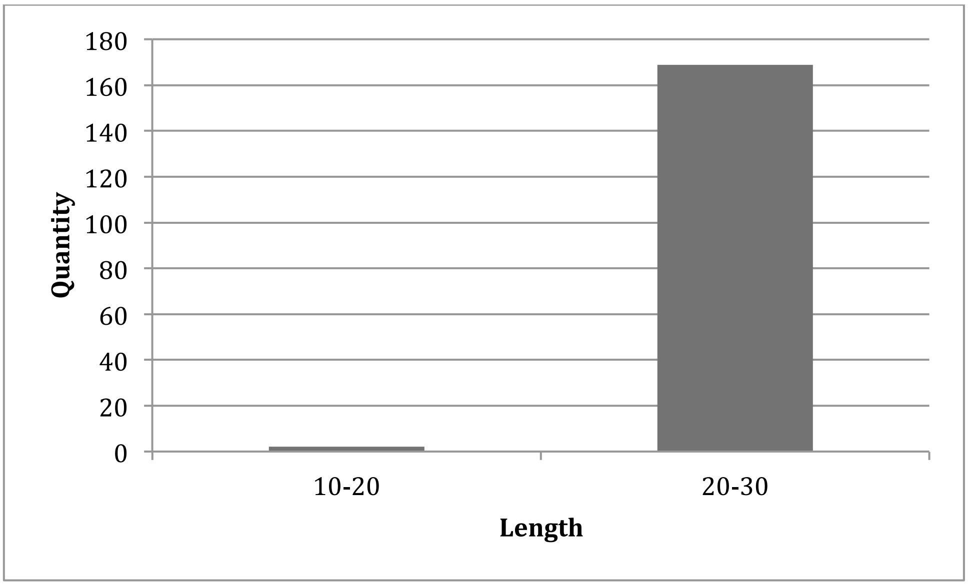


*Figure 2. Relative abundance of herring elements of different lengths (centimetres) at Staple Gardens*

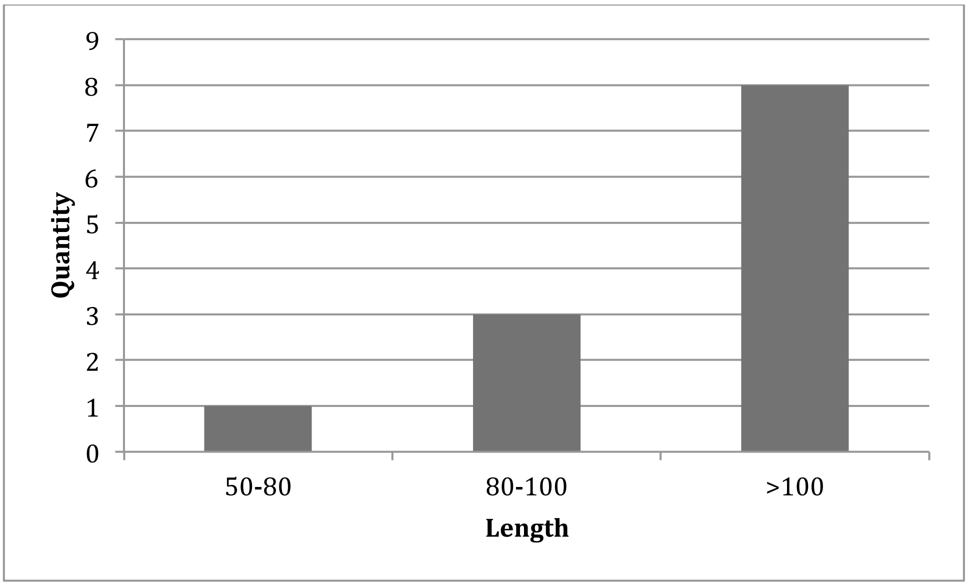


*Figure 3. Relative abundance of cod elements of different lengths (centimetres) at Staple Gardens*

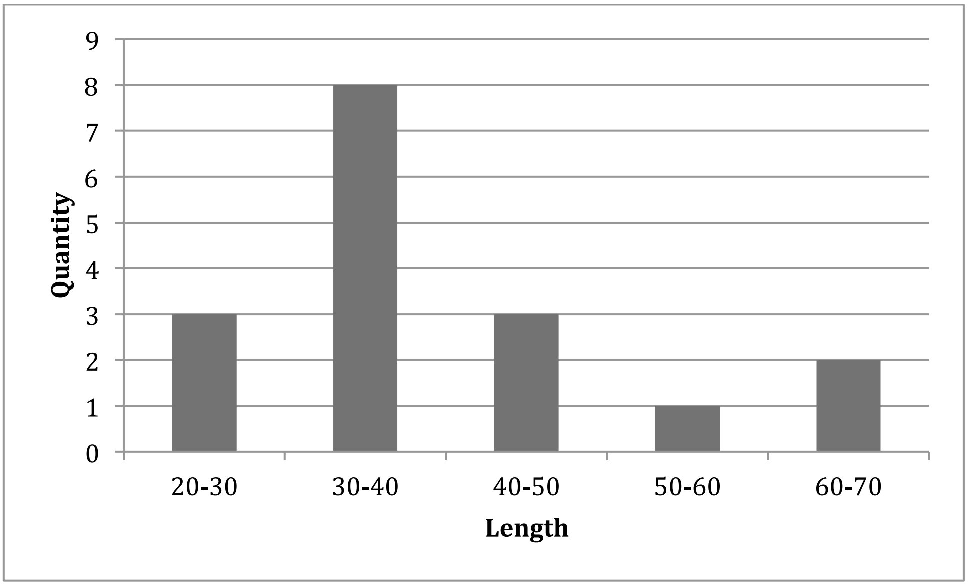


*Figure 4. Relative abundance of plaice/flounder elements of different lengths (centimetres) at Staple Gardens*

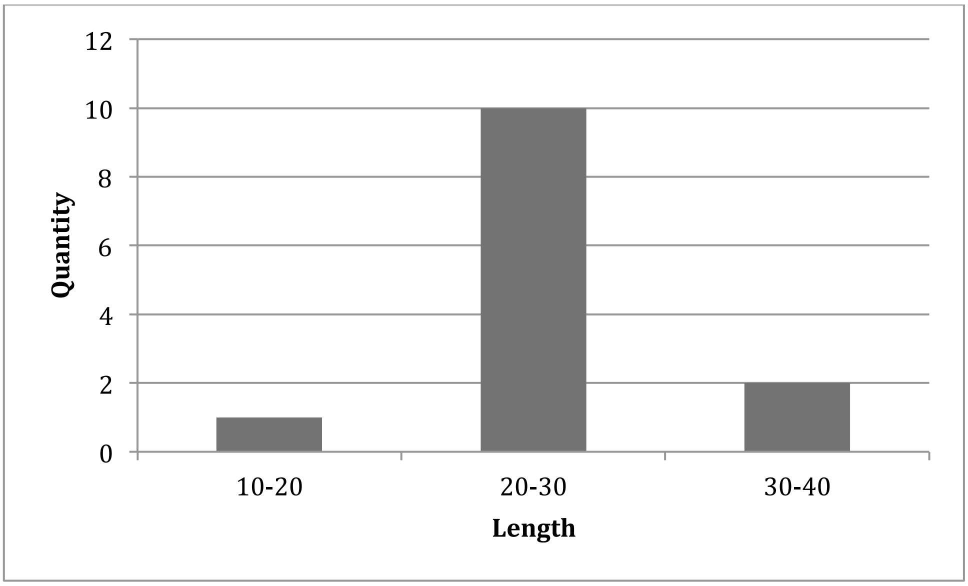


*Figure 5. Relative abundance of whiting elements of different lengths (centimetres) at Staple Gardens*

## Appendix 6

## Appendix 7