

# An Early Historic Period Fishweir on the Fergus Estuary, Co. Clare

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*Archaeological intertidal surveys on the Fergus estuary, Co. Clare, have led to the recording of a range of Prehistoric and Early Historic material. The site to be discussed here is a wooden post-and-wattle fence found on the mudflats and dated to between the fifth and seventh centuries A.D. It is argued that this structure is the remains of an early fishweir, the first such discovery in Irish archaeology. Early Irish historical sources are combined with archaeological evidence to present the evidence for the control, management and use of such fisheries.*

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Estuarine wetlands are one of the richest natural environments in Ireland. The daily ebb and flow of tides and the continuous influx of freshwater from rivers constantly renews nutrients on the intertidal mudflats and saltmarshes. This process creates a rich habitat for large numbers of breeding waterfowl, migratory fish populations of eel and salmonids, shellfish and a range of plants capable of surviving their hostile chemical ecosystems. The estuary of the River Fergus is one of the largest in the country, stretching for ten miles from Clarecastle to Rineanna, with a drainage catchment of 1,041 square kilometres. The Fergus Estuary is quite shallow throughout, with eighty per cent of its area exposed as mudflats at low tide<sup>1</sup>. It is of considerable ecological importance both nationally and internationally, with a highly varied saltmarsh and maritime flora. The mudflats are rich in invertebrates and support large numbers of wintering waders and duck<sup>2</sup>. There is increasing evidence that early communities in North Munster were aware of such estuarine resources and exploited them on a systematic basis. In particular, there is now archaeological evidence for the early use of fishweirs in the discovery of a wooden post-and-wattle fence on the mudflats in the Fergus Estuary, Co. Clare.

Behind the mudflats and saltmarshes of the Clare coastline of the Shannon and Fergus Estuaries, there are up to 14,680 acres (5,941 ha) of reclaimed estuarine alluvium<sup>3</sup>. This land lies below spring high tide levels and has been reclaimed by a series of artificially constructed sea-walls. Formerly tidal marsh, it is now drained by a rectilinear fieldsystem of intersecting ditches which are lined by hedgerows of ash, willow and black poplar. This drainage system feeds water out through sluices in the sea-wall. It is probable that the reclamation of these estuarine levels or sloblands was carried out over a wide time-span. Indeed, there is much potential for researching the historical geography and archaeology of this reclamation. Briefly stated, along the upper Fergus Estuary it is possible to distinguish between different types of field-division. Narrower, linear strip-based fields are found further inland possibly associated with medieval settlements and larger, broader fields are found out

\*'Discovery Programme', 13-15 Lower Hatch St., Dublin 2.

<sup>1</sup>O.J. Merne, *The Infauna of the Shannon and Fergus Estuarine Mudflats as a Flood Resource for Shorebirds*, Unpublished M.Sc. thesis, Trinity College, Dublin 1985.

<sup>2</sup>R. Sheppard, *Ireland's Wetland Wealth*, Irish Wildbird Conservancy, Dublin 1993.

<sup>3</sup>T.F. Finch, *Soils of County Clare*, Soil Survey Bulletin No. 23, An Foras Talúntais, Dublin 1971, pp. 40-41.



towards the estuary. The likelihood is that the narrower, more linear fields belong to an earlier, possibly medieval phase of reclamation. Field-walking in the levels has also revealed the existence of the remnants of earlier sea-walls, rendered obsolete by later reclamation projects. In addition, there is a wide range of archaeological evidence for Early Historic and Anglo-Norman settlement on the dryland slopes that overlook the reclaimed marshes<sup>4</sup>.

Recently the author has been carrying out intertidal archaeological surveys on the mudflats for the North Munster Project. These surveys were intended to investigate later prehistoric activities in these wetlands, but have benefited by the discovery of archaeology widely ranging in date. The intertidal surveys were carried out by a team of three archaeologists systematically walking the mudflats exposed during low tides, recording by photography and measured drawings the exposed structures and extracting samples for dating purposes. A range of archaeological material has been uncovered to date, including Neolithic submerged forests, finds and spreads of red deer bone, Bronze Age wooden structures, dug-out boats, Anglo-Norman fishweirs and numerous Late-medieval post alignments and post-and-wattle fences<sup>5</sup>.

### Site Description

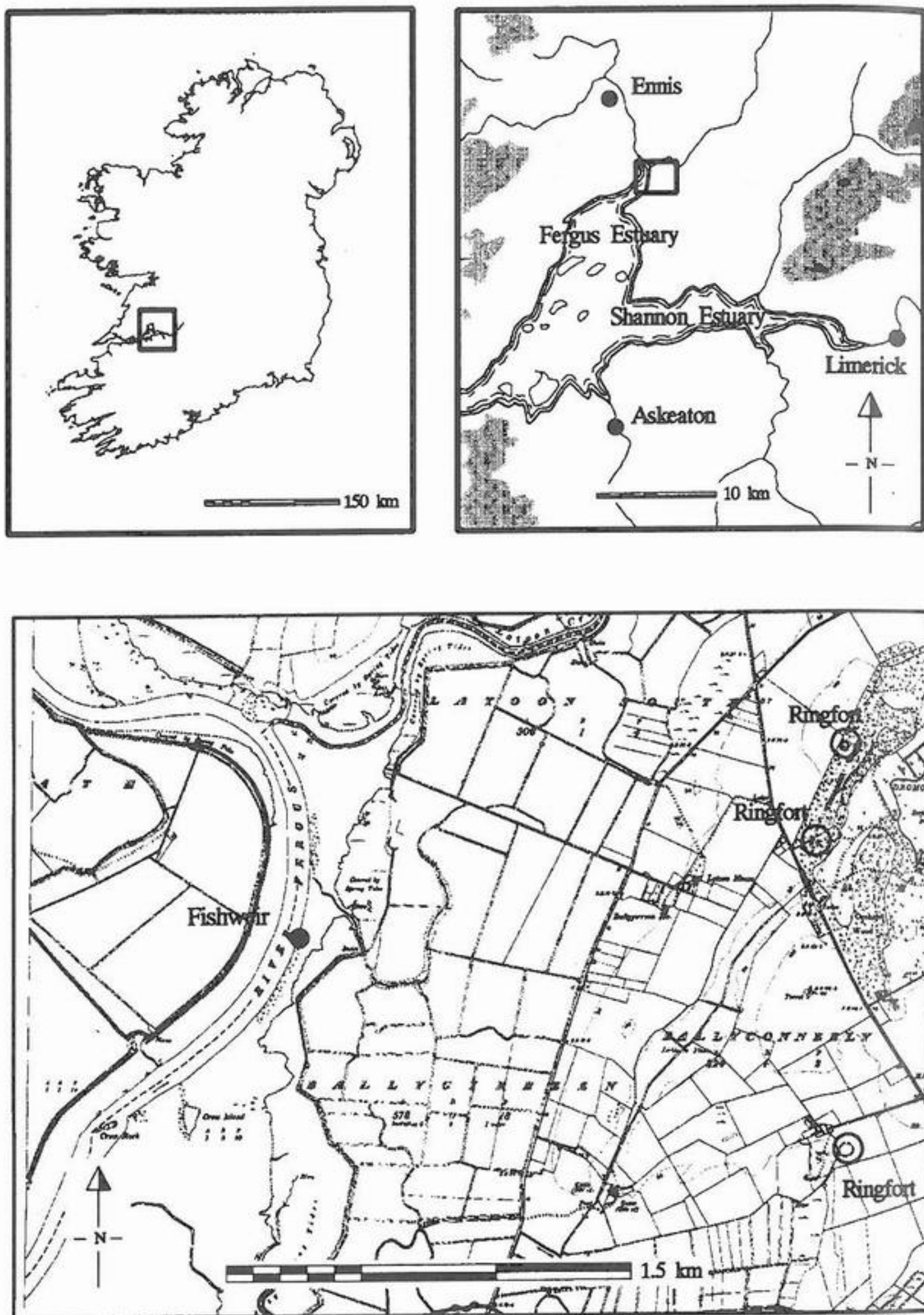
The site to be discussed in this paper is located on the east bank of the upper part of the Fergus Estuary, adjacent to the townland of Ballygirreen, barony of Bunratty Lower, parish Kilnasoolagh, Co. Clare (Illus. 1). It was discovered and recorded during the surveys in July 1992. As townland boundaries halt at the high water mark, the site has been designated in the survey records as Fergus Estuary East 2 (FEE2). It is located on the Ordnance Survey 6-inch Sheet 42, N.G.R. 13625 17033. The Fergus Estuary channel is relatively narrow in this area, flowing through a gently curving meander which is presently causing erosion on the east side. The foreshore is narrow (c.50m) and gently sloping down to the west from reed beds and saltmarshes. The foreshore is entirely composed of fine, estuarine clays and silts. At the lowest part of this foreshore, along the Mean Low Water mark, the channel is eroding a low shelf in the blue-grey clays c. 10–15cm high and gently revealing there in plan and section an unusual wooden structure (Illus. 2).

The stratigraphy of the clays along this shelf are as follows. The clays to the depth of at least a metre beneath the structure are fine-grained blue-grey clays with occasional shell inclusions. These clays and some of the wooden structure are then covered by a thin (c. 5cm) lens of reddish-grey clays which are rich in shell remains (possibly suggesting a slightly different water-regime at the time they were laid down). These are then succeeded by further grey clays and otherwise the upper foreshore is covered in modern, mobile sediments. It seems likely that the fence was erected on the upper tidal foreshore of a narrow estuary channel.

The structure comprises at least twenty-five roundwood posts driven vertically to a depth of at least c.70cm into blue-grey estuarine clays and arranged in a straight line. These vertical posts are spaced at intervals of 25–35cm, measure 2–3cm diameter and are sharpened to simple points at their lower ends. Between these vertical uprights are at least three bands of horizontal interwoven rods. The rods are slightly narrower measuring 1.7–1.9cm in diameter. The structure thus forms a light post-and-wattle fence oriented in an ENE/WSW direction, measuring at least 8.2 metres in length (c.5.6m is exposed on the clays, a further 2.6m can be traced underwater).

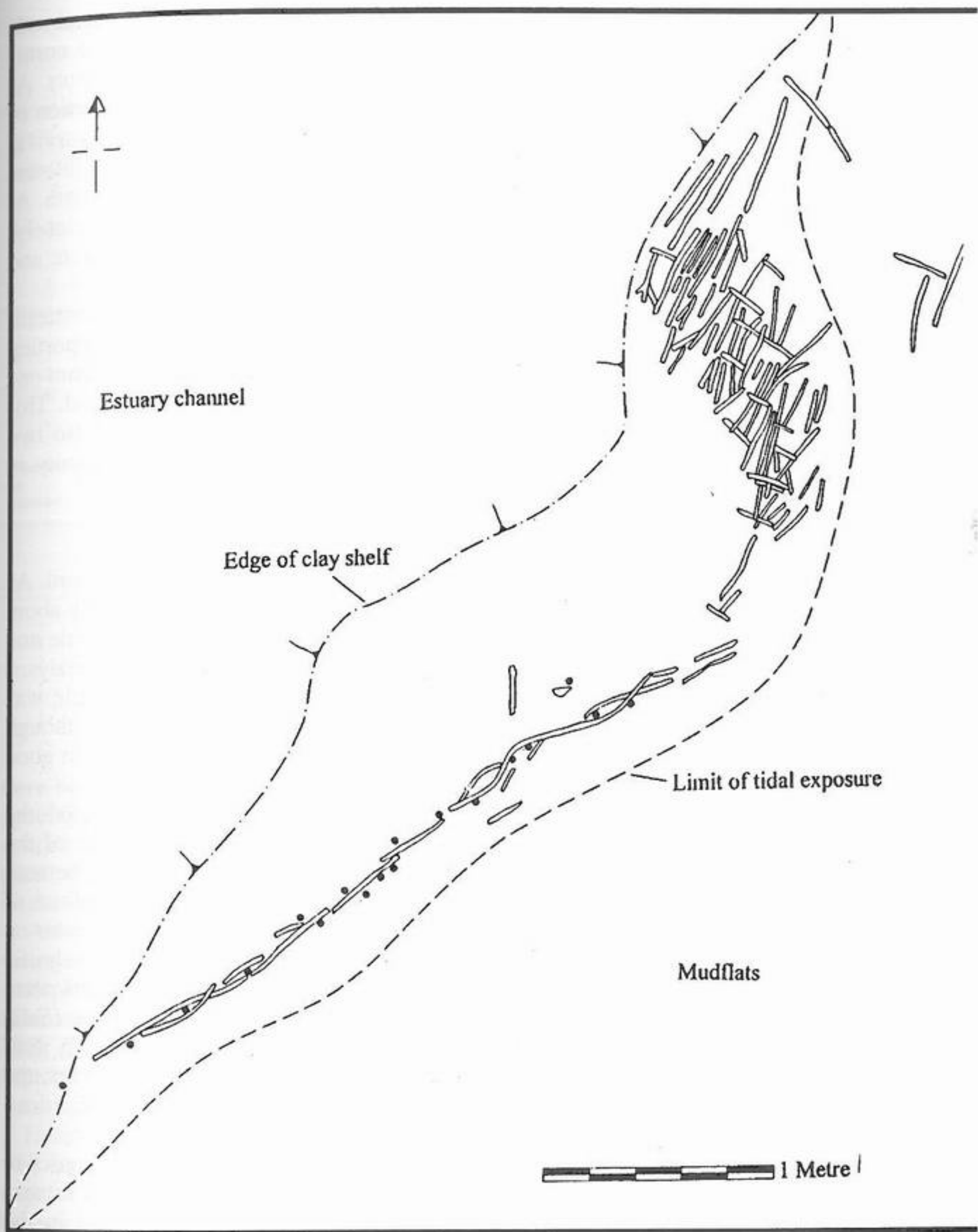
<sup>4</sup>S. Kirwan, *Sites and Monuments Record for County Clare*, OPW/UCC, Cork 1992.

<sup>5</sup>A. O'Sullivan, 'Intertidal Survey on the Fergus Estuary and the Shannon Estuary', *Discovery Programme Reports*, 1 (1993), 61–68.



Illus. 1. Location map of fishweir, Fergus Estuary, Co. Clare.





Illus. 2. Plan of wooden structure, fishweir, in Fergus Estuary.

It is clear that what survives is the actual base of this fence, as the rows of horizontal rods are not found deeper in the clays. However the fence can also be seen in plan at the north-east end, where a portion of it fell in antiquity before being covered by clay sediments. At this point the clays are also being slowly washed away, gently exposing an intact portion of the panel of posts and rods which is now oriented NNE/SSW. This panel is a useful survival as it suggests that the original fence stood to a height of c.1.5m. The fence disappears into the sloping clays of the foreshore to the NNE and may well have been of much greater length. At a distance of 6.5m further to the south-west, downstream of the fence, were two closely-spaced small roundwood posts driven vertically into the clays, of likely similar date and possibly related function.

The post-and-wattle fence is now oriented diagonally to the river and pointing downstream (although the present course of the channel may have altered since). As part of a supporting programme of radiocarbon dating for the intertidal surveys, a sample was submitted from one of the upright hazel posts to Dr. Jan Lanting of Rijksuniversiteit Groningen, Holland. This sample provided a date of  $1495 \pm 35$  BP (GrN-20139) which has been calibrated (to two sigma) to AD 447-637. The structure therefore dates to earliest period of Christianity in Ireland.

### Wood Species and Woodworking

Wooden structures in the inter-tidal zone tend to be both fragile and difficult to record. As the structure described here was situated at extreme low water, it was visible for only about an hour at very low tide. However, it was possible to draw a detailed plan at 1:20 scale and carry out a detailed sampling strategy for wood species identifications and tree-ring analysis. Forty-seven wood samples, each a piece c.4cm in length, were taken. Each sample was placed in a sealable plastic bag, numbered and its location noted on the drawn plan. Although occasionally weathered on the surface, the wooden posts and rods were found to be in good condition.

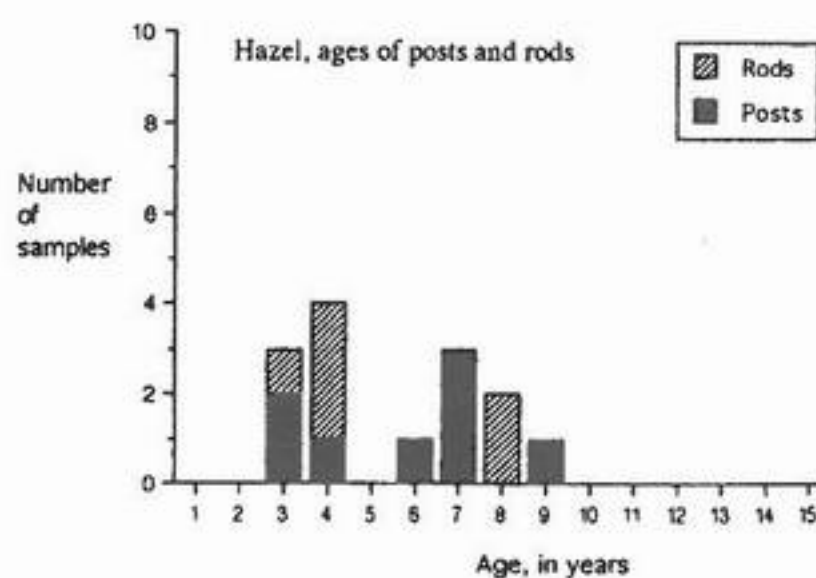
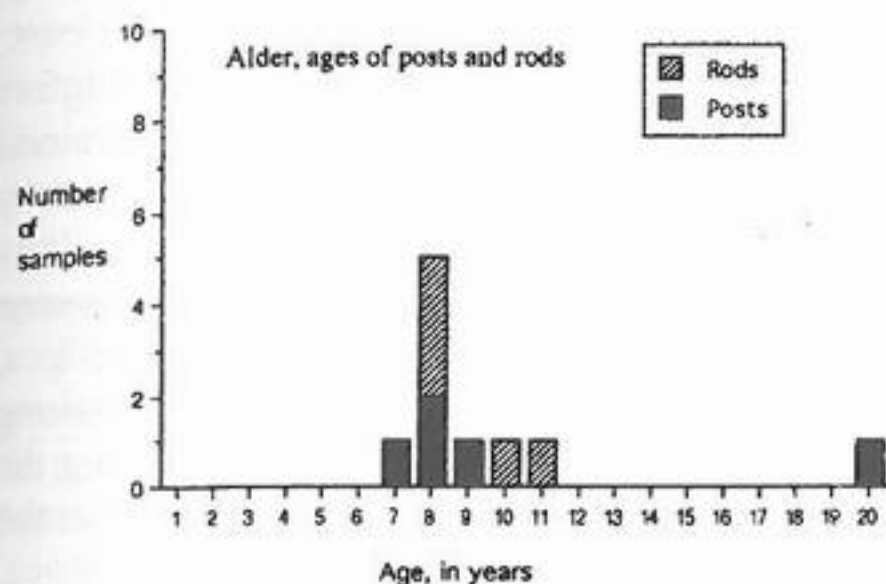
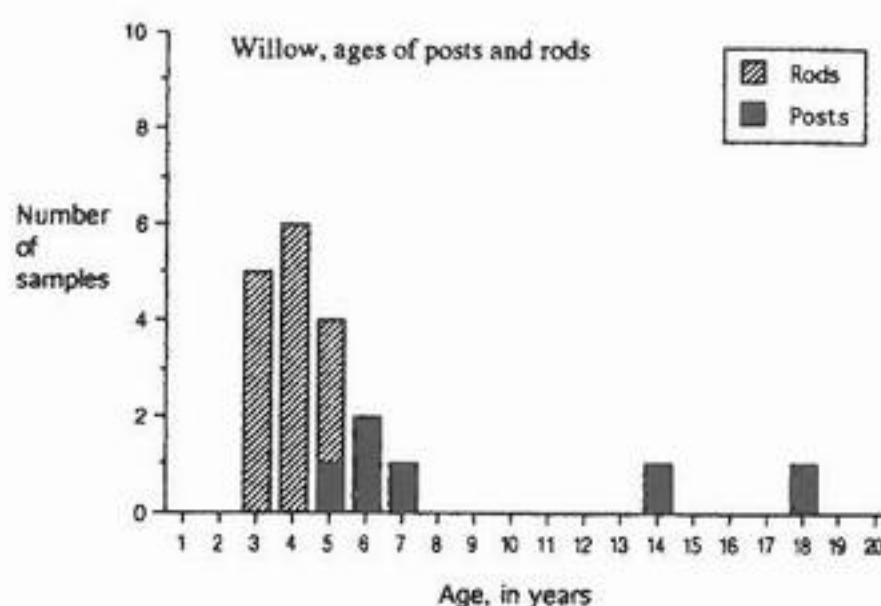
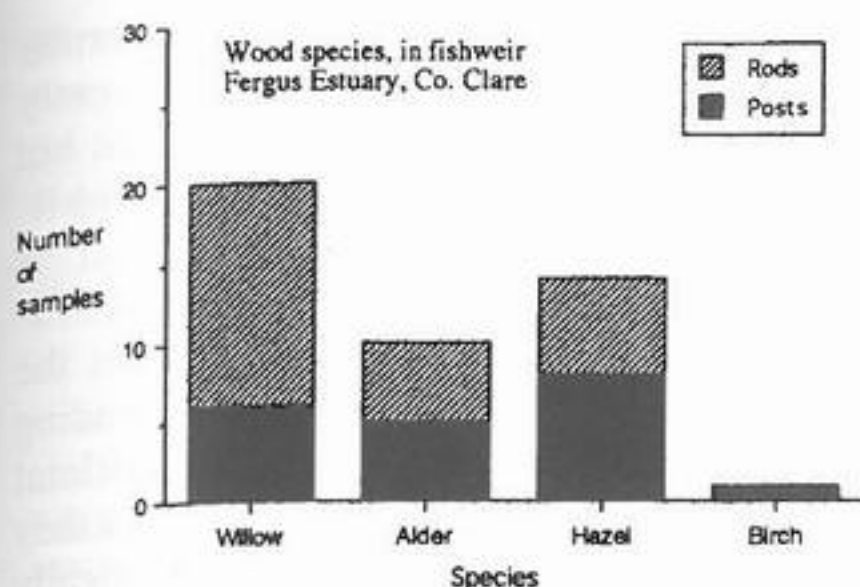
In terms of woodworking, the posts and rods had been left as unmodified roundwood, the bark was still attached. The posts were sharpened by simply chopping on one side of the branch with a flat bladed iron axe or billhook. A number of worked ends could also be seen on the rods, evidence of their having been cut to required lengths. Species identifications of the wood were made by cutting thin-sections with a razor blade, mounting these sections on glass slides and comparing their cellular structure under 10x, 40x and 100x magnifications with the established scientific identification key<sup>6</sup>. Accurate tree-ring counts were simultaneously made under the microscope. Twenty samples were identified as willow (*Salix* spp.), ten were alder (*Alnus glutinosa*), fifteen were hazel (*Corylus avellana*) and two were birch (*Betula* spp.). The willow rods were typically aged between three and six years, the alder was rather older, aged between seven and eleven years. The hazel displayed no particular tree-ring pattern, ranging from three to nine years of age (Illus. 3).

There is abundant historical evidence that woodland was a important economic resource in Early Historic Ireland<sup>7</sup>. The species, size and age of the wood used in the Fergus estuary structure is useful evidence for local woodland character and its exploitation in the period. The predominance of willow and alder in the structure suggests, unsurprisingly, a surrounding marshland landscape. Willow was used as posts, but narrow willow rods seem to

<sup>6</sup>F.H. Schweingruber, *Microscopic Wood Anatomy*, Swiss Federal Institute for Forest, Snow and Landscape Research, Birmensdorf 1990.

<sup>7</sup>A. O'Sullivan, 'The Use of Trees and Woodland in Early Medieval Ireland', *Irish Forestry*, 51 (1994), 80-94.





Illus. 3. Graphs indicating species and ages of wood used in fishweir, Fergus Estuary.

have been especially preferred for the interwoven rods. There are a range of types of willow species native to Ireland, most prefer wetland soils but all are tolerant of a range of conditions. The main native willows, sally (*Salix cinera*), goat willow (*Salix caprea*) and eared willow (*Salix aurita*), are all commonly found on marsh-edges, river banks, field-ditches and damp scrub woodland.

Alder was used equally for posts and rods. Alder usually grows on constantly or seasonally waterlogged soils, providing the water is not stagnant. It can often be found growing in amorphous soils of an organic ooze in which there is a permanently high watertable. Wet alder woodland ('carr') often contains smaller amounts of other species such as hazel, downy birch (*Betula pubescens*) and grey willow (*Salix cinera*). It can grow on estuarine alluvium, kept wet by freshwater springs and drainage at low tide and inundated by brackish estuary water at high tide<sup>8</sup>.

Hazel was used for both posts and rods. Hazel can be found in wetlands, but it prefers well-lit, open conditions and was most probably found on the drier, transitional zone at the edge of the nearby dryland slopes<sup>9</sup>. Hazel-ash woodland is especially common on the thin, lime-rich soils found in this part of south-east Clare. A few birch posts were also found in the structure. Birch prefers moist, peaty soils but probably was growing in mixed association with the other species described above. The posts and branches for the structure were

<sup>8</sup>G.L. Peterken, *Woodland Conservation and Management*, London and New York, Second edition, 1993, pp. 148–156; P. Coleburn, *Hampshire's Countryside Heritage: Ancient Woodland*, Hampshire County Council, 1983, p. 45.

<sup>9</sup>O. Rackham, *Ancient Woodland: its history, vegetation and uses in England*, London 1980, pp. 203–219.

typically taken from immature branches. The tree-ring evidence suggests the selective cutting of rods and posts for their appropriate size. The alder and willow rods are fairly tightly clustered in age, possibly indicating their origins in deliberately coppiced woodlands, but there may well have been a plentiful supply of underwood in the wetlands.

### Early Historic Settlement on the Fergus Estuary

A post-and-wattle fence situated at low water in estuarine clays, running down the foreshore diagonally to the river current, can best be interpreted as the remains of the leading fence of a small fishweir designed to trap fish on an ebbing tide. Fishweirs are artificial barriers of stone or wood built in rivers or estuaries to deflect fish into traps. In estuaries they typically take the form of converging lines of fences of interwoven wattle, driven vertically into the clays, which lead to a trap of netting or basketry. The nearest identifiable settlements of Early Historic date to the structure are three ringforts on the dryland ridge to the east. There is a pair of earthen ringforts 2km to the ENE in Dromoland and a substantial ringfort 2.1km to the ESE at Ballyconneely. These ringforts are sited on south-facing, well-drained slopes with good views to the south and west over the Fergus Estuary. It is likely that they represent the settlement enclosures of contemporary single-family farming groups. It is interesting that the Ballyconneely ringfort in particular is located at the edge of the estuarine levels, possibly indicating the exploitation of the former wetlands for raw materials (sedges, reeds, willow and alder) cattle-grazing, some fowling and possibly the use of fishweirs along the estuary foreshore. It is also worth pointing out that the siting of these ringforts along the dryland ridge may be influenced by its use as a north-south routeway along the estuary in the Early Historic Period.

### DISCUSSION

There is a range of European archaeological evidence for the construction and use of fishweirs and fishtraps. Individual woven fishtraps are known to have been used in the Mesolithic in Denmark, the Netherlands and France. The additional use of post-and-wattle fences in Neolithic eeltraps has been revealed by recent excavations at Oleslyst, Denmark where a well-preserved series of post-and-wattle panels running down the shore have been dated to c.3250 BC<sup>10</sup>. Similar types of trap continued in use into historic periods. Woven fishtraps for catching eels are known from a Roman settlement site at Valkenburg, The Netherlands<sup>11</sup>. In recent years, there has been an explosion of interest in England in the archaeology of fishweirs, where a range of Anglo-Saxon, Norman and Medieval fishweirs and fishbaskets have been excavated. These include a fifth-century row of stakes and wattle found in a gravel pit along the River Thames and post-and-wattle fences found in riverine gravels on the River Witham, at Lincoln, dated to between the second and the tenth century AD<sup>12</sup>. A series of excavations in river gravels beside the River Trent, Nottinghamshire have produced wooden fishweirs dated to both the Anglo-Saxon and the Medieval Periods<sup>13</sup>.

<sup>10</sup>L. Petersen, 'Alegard', *Skalk*, 6 (1992) 3-7.

<sup>11</sup>P. van Rijn, 'Wooden artefacts', in *The Valkenburg Excavations, 1985-1988* (eds.) R.M. van Dierendonck, D.P. Hallewas and K.E. Waugh, ROB, Amersfoort (1993).

<sup>12</sup>C.R. Salisbury, 'Primitive British Fishweirs', in *Waterfront Archaeology* (eds) G.L. Good, R.H. Jones and M.W. Ponsford, CBA Research Report, 74 (1991), 76-87.

<sup>13</sup>C.R. Salisbury, 'An Anglo-Saxon Fish-weir at Colwick, Nottinghamshire', *Trans. Thoroton Soc.*, 84 (1981), 27-35; C.R. Salisbury 'A Mediaeval Fish Weir at Colwick, Nottinghamshire' *Trans. Thoroton Soc.*, 83 (1979), 15-22; P.M. Losco Bradley and C.R. Salisbury, 'A Saxon and a Norman Fish Weir at Colwick, Nottinghamshire', in *Medieval fish, fisheries and fishponds in England* (ed.) M. Aston, *British Archaeological Reports British Series*, 182 (1988) 329-351.



Coastal fishweirs constructed of stone walls on the sands of Caernarfon Bay, Wales have been dated to the Medieval Period<sup>14</sup>. More recently, intertidal survey and excavation at Sudbrook on the Severn estuary has produced a range of Anglo-Saxon and Medieval wooden fishtraps, baskets and post-and-wattle fences<sup>15</sup>.

In contrast, until this discovery there was no archaeological evidence for early fisheries in Ireland. There is however some historical evidence for Early Historic Irish fishweirs, much of it dating to the centuries immediately after the construction of the Fergus Estuary structure. Early Irish annals, law-tracts and hagiographies all mention the construction, use and ownership of the cora éisc (cora denoting fence or wall, éisc denoting fish). The early Irish laws are particularly tantalising. One seventh-century law-tract dealing with the valuation of types of land, *cis lir fodla tire* ('how many types of land there are'), states that proximity to an estuary could increase the value of land by ten sét<sup>16</sup>. The obvious benefit of such a location would be the access to water, salt and to fish stocks. There is also an implication in *Coibnes Uisci Thairidne* ('kinship of conducted water') that a fishweir could be erected in water adjacent to a neighbour's land<sup>17</sup>. There might well have been more detailed legal guidelines on the ownership and use of estuarine waters outlined in the *Cáin Inbir* ('the law of the estuary'), which was part of a now lost law-tract *Muirbretha* ('sea-judgements')<sup>18</sup>.

Fish would have been an economic resource and there seems to have been an awareness that fish-stocks needed to be protected in Early Historic Ireland. The need for such protection is accentuated by the fact that the species of freshwater fish native to this country is actually quite limited. This protection seems to be defined in a fragment of eighth-century law-text preserved in O'Davoren's Glossary. This states '*Ní téchta ní bes (mo) no trian inn uisce do aire .i. do ime*', which translates as 'It is not proper to (build) a weir, i.e. a fence, more than one third of the water'<sup>19</sup>. This seems to indicate the legal enforcement of a gap in the fishweir, allowing at least a certain percentage of the fish-stocks to move unimpeded upriver. Certainly, in more recent times, legislation demanded such an opening.

Fish seem to have been an important element in the diet of Early Historic coastal communities, while literary sources point at the high-status of salmon and trout, at least for the upper classes of society. The seventh-century wisdom-text *Audacht Morainn* states that among the attributes of a just king must be the abundance of fish swimming in his streams<sup>20</sup>. There has unfortunately been little research on the occurrence of fishbones from archaeological sites, mostly because laborious on-site retrieval techniques are required. Nevertheless, fishbones from eel, cod, haddock, plaice and salmon/sea trout have all been found in an Early Historic coastal shell midden at Oughtymore, Co. Derry<sup>21</sup>. An Early Historic coastal promontory fort at Larrybane, Co. Antrim, has produced cod, saithe, pollack,

<sup>14</sup>G. Momber, 'Gorad Beuno: investigation of an ancient fish-trap in Caernarfon Bay, N. Wales', *The International Journal of Nautical Archaeology*, 20:2 (1991), 95–109.

<sup>15</sup>S. Godbold and R.C. Turner *Second Severn Crossing: archaeological response, phase 1-the intertidal zone in Wales*, Brentwood 1993.

<sup>16</sup>G. MacNiocaill, 'Tir Cumaile', *Eriu*, 22 (1971) 81–86.

<sup>17</sup>D.A. Binchy, 'Coibnes Uisci Thairidne', *Eriu*, 17 (1955) 4–6.

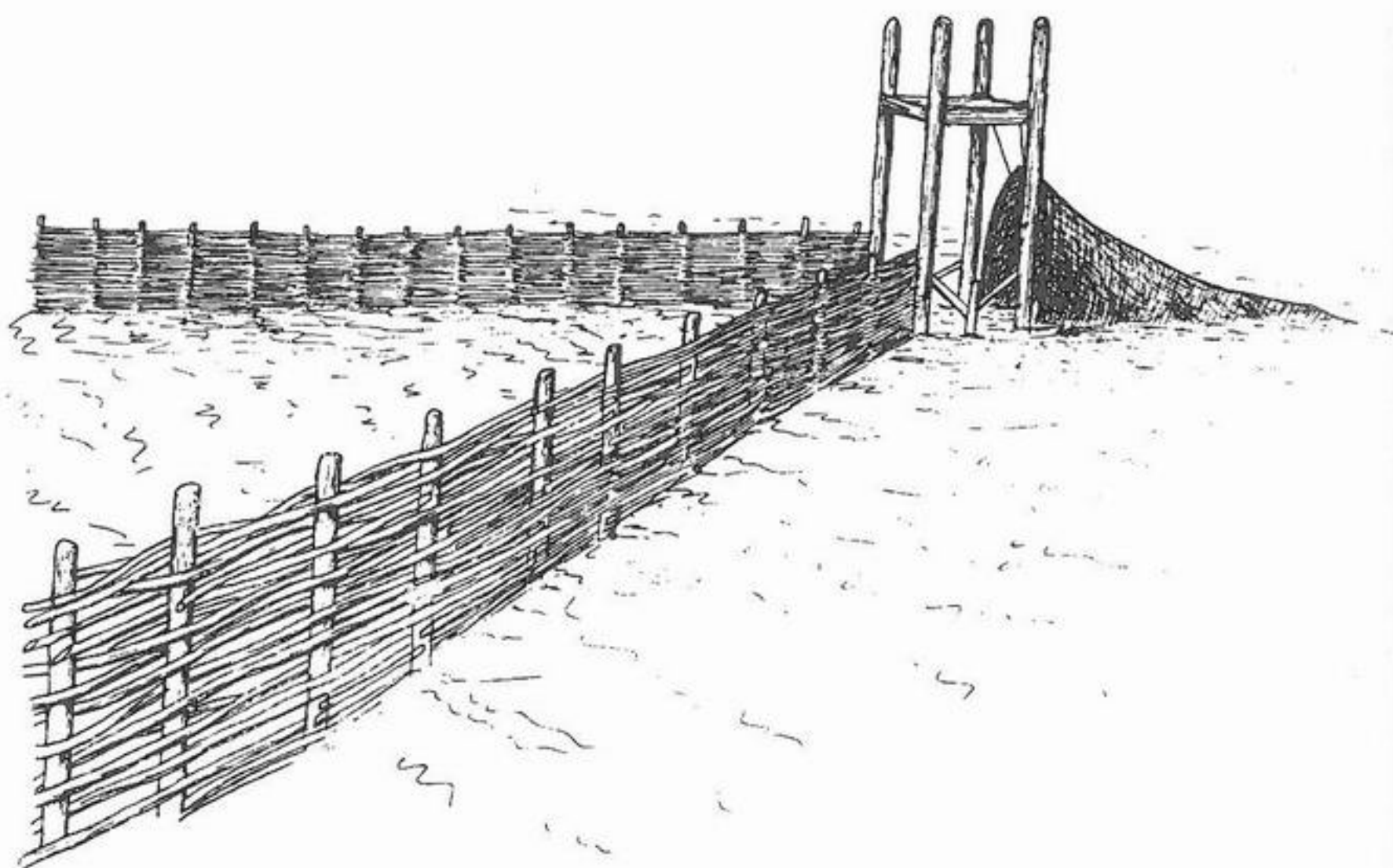
<sup>18</sup>F. Kelly *A Guide to Early Irish Law*, Institute for Advanced Studies, Dublin 1988, pp. 276–77.

<sup>19</sup>Personal communication from Fergus Kelly, see D.A. Binchy, *Corpus Iuris Hibernici*, 4 (1978), 1468.9, for untranslated text and also *Corpus Iuris Hibernici* 2, (1978), 395–18–21 for a later, possibly twelfth-century, commentary on the legal restriction of the length of fishweir fences.

<sup>20</sup>F. Kelly, *Audacht Morainn*, Institute of Advanced Studies, Dublin 1976, p. 7.

<sup>21</sup>J.P. Mallory and P.C. Woodman 'Oughtymore: an Early Christian Shell Midden', *Ulster Journal of Archaeology*, 47 (1984), 51–62.





Illus. 4. Reconstruction drawing of Irish tidal headweir.

whiting and wrasse, most probably caught with nets<sup>22</sup>. Fishbones found at Beginish Island, Co. Kerry, included wrasse, which judging by the net and line sinkers were probably caught by angling and netting techniques<sup>23</sup>. Iron, multi-pronged eel and salmon spears have been found on Early Historic crannóg sites at Strokestown and Lagore<sup>24</sup>. The combined evidence certainly suggests the varied use of traps, nets and implements for catching fish.

In the absence of a second fence or a trapping mechanism from the Fergus Estuary site (these could well be present, but would be permanently submerged underwater) it is necessary to refer to historical practices to enable a reconstruction of an early Irish fishweir (Illus. 4). In recent times, the most common type of fishweir in Irish estuarine waters was known as a headweir. This was constructed of two long post and wattle fences or 'wings' which converge to a point in a V-shape. The widest opening of these fences most commonly faced upstream or towards the shore, to funnel fish coming down on the ebbing tide into the 'eye' of the weir. At the 'eye' of the weir, fish were trapped in a 'coghill' net which was suspended from a raised platform. These nets were conical in shape being long composite mesh bags kept open by means of attachments to the uprights of the wooden platform<sup>25</sup>. Although such nets were used in modern times, earlier traps may have been of woven basketry.

There are a range of post-medieval historical references for tidal fishweirs in north Munster. For example, by the time of the Civil Survey of Limerick (1655), there were at least

<sup>22</sup>N. Edwards, *The Archaeology of Early Medieval Ireland*, London 1990, p. 66.

<sup>23</sup>M.J. O'Kelly, 'An Island Settlement at Beginish, Co. Kerry', *Proc. Roy. Irish Acad.*, 57c, 1956, pp. 159-164.

<sup>24</sup>A.E.J. Went, 'Irish Fishing Spears', *J. Roy. Soc. Antiqs. Ireland*, 82 (1952), 109-134, pl. XX.

<sup>25</sup>e.g. A.E.J. Went, 'Irish Fishing Weirs I: notes on some ancient examples fished in tidal waters', *J. Roy. Soc. Antiqs. Ireland*, 76 (1946), 176-194; A.E.J. Went 'The Ancient 'Sprat' fishing weirs in the south of Ireland', *Industrial Archaeology*, 6 (1969) 254-260.

eight fishweirs in operation or only recently abandoned on the Shannon Estuary<sup>26</sup>. However the tradition of (legal) fishweirs seems largely to have died away on the Fergus estuary. The Ordnance Survey map editions for the 1840s and 1918 record few extant structures. There is historical evidence for a riverine fishweir on the River Fergus at Ennis, Co. Clare, in the mid-sixteenth century. A Dr. Nelande successfully petitioned Henry VIII in 1569 for a lease of "the site of the monastery of gray friars of Inch of Clonramata, a water mill, a salmon weir and eel weir upon the river Fergus"<sup>27</sup>. There are several other fishweirs of possible antiquity in north Munster, in particular the 'salmon walls' at Doonbeg Bay, Co. Clare<sup>28</sup>. These were formed of long, low stone walls constructed on the sand flats. They trapped fish moving out to sea on the ebbing tide, whereupon they were taken from the remaining pools by nets. Their apparent association with a range of tower-houses around the bay may indicate that the salmon walls are of medieval origin. The combined archaeological and historical evidence suggests the former existence of large numbers of fishweirs on both riverine and estuarine waters in medieval Ireland. However, their construction in such dynamic environments, with strong currents and erosion has meant that until now they have received little attention. Further fieldwork on the intertidal zone in North Munster will undoubtedly lead to other discoveries.

### Acknowledgements

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<sup>26</sup>A.E.J. Went, 'Historical notes on the fisheries of the estuary of the River Shannon', *J. Roy. Soc. Antiqs. Ireland*, 111 (1981) 107-118.

<sup>27</sup>A.E.J. Went, 'Historical Notes on the Fisheries of Some Tidal Tributaries of the River Shannon', *Nth. Munster Antiq. J.*, 8 (1960), 138-155.

<sup>28</sup>A.E.J. Went, 'The Pursuit of Salmon in Ireland', *Proc. Roy. Irish Acad.*, 63c (1962-64), 191-243.