

FISHING STRUCTURES ON THE SUDBROOK FORESHORE, MONMOUTHSHIRE, SEVERN ESTUARY

By Alex Brown¹, Richard Morgan, Rick Turner and Charlotte Pearson

¹Corresponding author: Department of Archaeology, School of Human and Environmental Sciences, University of Reading, Whiteknights, PO Box 227, Reading, Berkshire, RG6 6AB, UK
email: a.d.brown@reading.ac.uk

This paper presents the results of archaeological survey and post-excavation analysis of a remarkable number of wooden fish baskets, hurdling and stakes exposed on the foreshore of the Severn Estuary at Sudbrook. The foreshore to the south and southwest of Sudbrook Camp had been the subject of an intensive study in 1990, in advance of construction of the Second Severn Crossing, that found a number and variety of medieval fish traps. The present structures were recorded to the immediate north and south of the Second Severn Crossing, and around the scour of bridge caisson 12, following storms during December 2006 and January 2007 that had swept the foreshore at Sudbrook clear of soft sediment and gravel. All visible fishing structures were sketch-planned, photographed, and selected samples taken for wood identification and radiocarbon dating. They are largely of 11th to 14th century date, and include several fish baskets of a globular form, constructed of finely woven willow and hazel, that have not previously been recorded from Sudbrook, or indeed, elsewhere within the Severn Estuary. The evidence from Sudbrook further supports the importance of fishing within the estuary, but also expands upon the inventory of known fishing structures.

INTRODUCTION (AB and RT)

The Severn Estuary contains some of the best-preserved archaeological evidence for fishing from the British Isles, extending from the Mesolithic to the 20th century. Early evidence for fishing is restricted to assemblages of fish bones in late Mesolithic contexts at Goldcliff East, though the use of baskets is implied by the presence of many smaller species of fish (Bell 2007, 237). Thus far, however, the earliest remains of probable fishing structures date to the

Bronze Age, including those recorded preserved in palaeochannel deposits along the Welsh foreshore at Peterstone Great Wharf (Bell *et al* 2000; Bell and Brown 2005, 2007), Redwick (Allen and Bell 1999), Caldicot (Nayling and Caseldine 1997) and Cold Harbour Pill (Bell *et al* 2000).

The majority of recorded fishing structures are medieval or later in date, and are widely distributed along both the English and Welsh shores of the estuary, often in relation to exposed bedrock platforms or palaeochannels (eg Allen and Fulford 1992; Godbold and Turner 1994; Allen and Rippon 1997; Hilditch 1997; Townley 1998; Nayling 1999a; Allen and Bell 1999; Allen 2004; Brown *et al* 2005; Allen and Haslett 2006). Within the Severn Estuary, fish traps are constructed of wood and appear in a number of forms, including V-shaped post settings, linear post alignments, lengths of hurdling and baskets of a variety of forms (Jenkins 1991; Godbold and Turner 1994). Fish traps constructed of both stone and wood are to be found further west, along the shores of the Bristol Channel and west Wales (eg Aston and Dennison 1988; McDonnell 1994; Nayling 1999b; James and James 2003). The archaeological evidence is often fragmentary and difficult to interpret, but is aided by several important accounts of 19th and 20th century fishing practices in the Severn Estuary (Waters 1947; Jenkins 1991; Green 2005). These accounts also serve to highlight the antiquity of particular methods of catching fish, and emphasise the important social and economic role fishing played in the lives of many communities along the shores of the estuary.

Important concentrations of medieval and later fishing structures have been recorded along

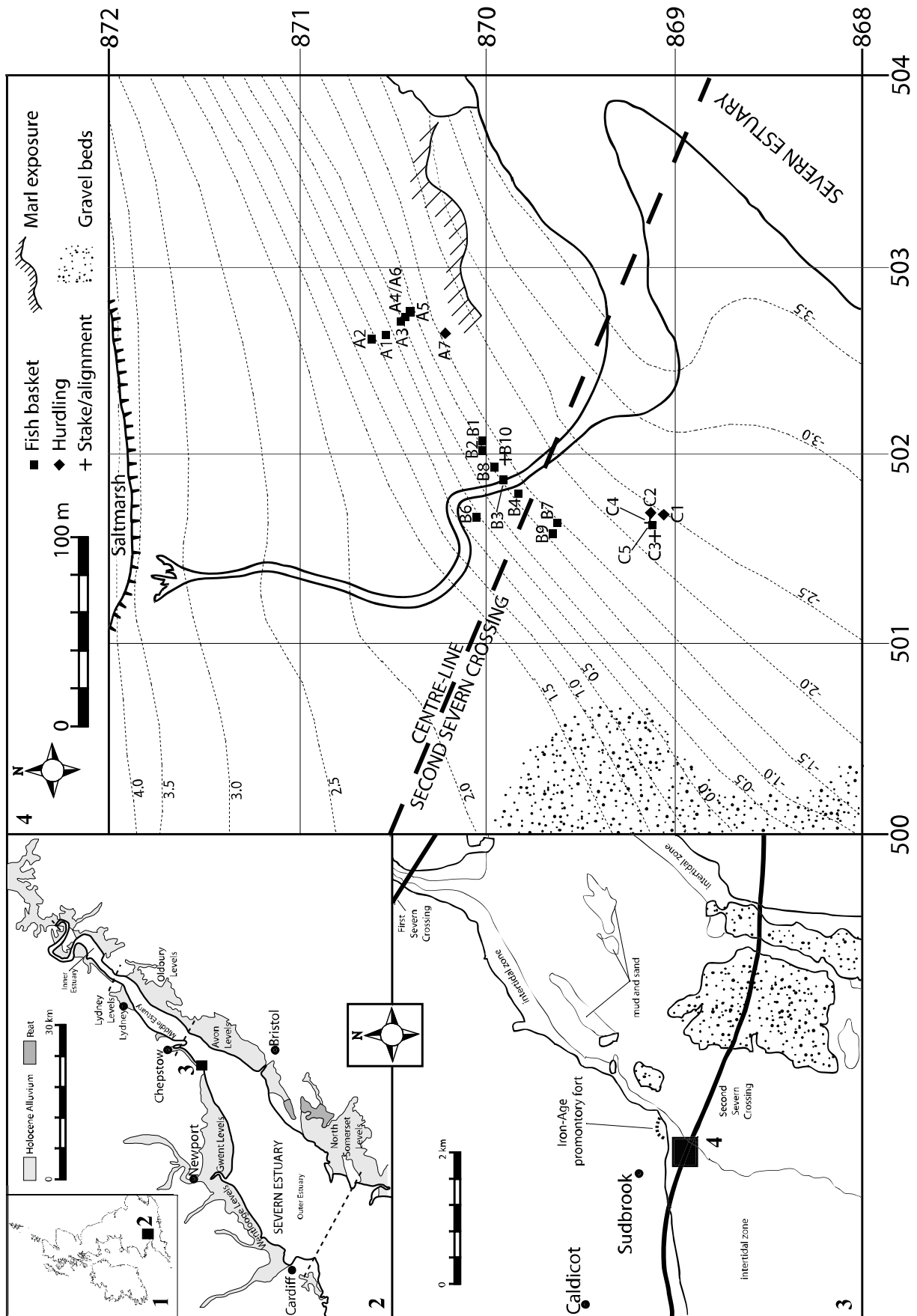


Figure 1 (left). Location of fishing structures recorded on the Sudbrook foreshore January-February 2007. 2, Base map drawn by M. Mathews, modified by A. Brown.

the east bank of the middle Severn Estuary and inner Bristol Channel between Hills Flats and Aust Rock (Allen 2004), and in Porlock Bay, Blue Anchor Bay and Minehead (Aston and Dennison 1988; McDonnell 1994), the latter recorded more recently as part of the English-Heritage-funded Severn Estuary Rapid Coastal Zone Assessment (www.english-heritage.org.uk/server/show/nav.1158). Along the Welsh foreshore, significant concentrations of fishing structures have been recorded at Magor Pill (Nayling 1999a), and, in particular, at Sudbrook Point. The area of foreshore to the south and southwest of Sudbrook Camp had been the subject of an intensive study in 1990 in advance of construction of the Second Severn Crossing. This survey found a number and variety of fish traps, included V-shaped post-settings, baskets and hurdling, in the first archaeological study of this type of site in Britain (Godbold and Turner 1994).

The present structures at Sudbrook, which were not exposed during the 1990 survey, comprise 16 fish baskets, three areas of hurdling, two stakes, two peg alignments and a withy tie. They were discovered by Richard and Martin Morgan, of the Blackrock Lave Net Fishermen's Association, to the immediate north and south of the Second Severn Crossing, and around the scour of bridge caisson 12 (Figure 1). These structures were exposed as a consequence of storms during December 2006 and January 2007 that swept the foreshore at Sudbrook Point clear of soft sediment and gravel.

The Lave Net Fishermen have seen evidence of old fish traps, baskets and lines of stakes over the years whilst fishing their traditional grounds on the north side of the Estuary between Black Rock and Sudbrook Point. These are exposed, especially after storms have washed the mud away, revealing the remains for a few days, during which time they can be recorded. Since the construction of the Second Severn Crossing, the fishermen have noticed that the mud on the Sudbrook side has slowly washed away to expose the Triassic red marl. The paper mill at

Sudbrook has recently closed, so its effluent no longer discharges down the Ship Brook, as the former palaeochannel of the River Nedern was called by past fishermen. Before the paper mill opened this was considered a good place to fish, which encouraged Richard Morgan to try the lave net here and so discover the baskets.

He made a comprehensive record of what, at the time, must have been recent exposures, including some withy ties and wooden stoppers found in association with fish baskets. These find spots were the subject of three days' survey (18th, 20th January and 16th February 2007), during which time additional fish baskets and stake alignments were recorded. A comprehensive photographic record of the various finds is presented here, along with the results of wood identification and radiocarbon dating of selected fish traps and hurdling. The location of all recorded fish baskets, hurdling and stakes are plotted on Figure 1 in relation to the original 1990 survey. A recent inspection by Richard Morgan on 7th December 2007, showed that a thick layer of mud had covered all the remains on the lower foreshore. Higher up, two baskets in Group A (see below) were still visible but badly damaged and two new baskets had emerged higher up the muddy beach. The significance of these finds lies not just in the number of structures recorded, but in their variety, including the remains of several finely-woven globular baskets, a type not previously recorded from the Severn Estuary. These finds, when considered in the context of other finds of fishing structures from Britain and Ireland (eg Strachan 1998; O'Sullivan 2001, 2003; McErlean *et al* 2002) further highlight the importance of intertidal estuarine fishing as a long-standing tradition around parts of the coast of the British Isles.

GROUP A (AB and CP)

This group of six fish baskets, one hurdle and one stake alignment were visible across an area of foreshore 75-100 m northeast of caisson 12 of the Second Severn Crossing (Figure 1).

Basket 1 (A1) (Figure 2): ST 50264 87053

Remains of a finely woven basket partially buried in blue-grey estuarine silts. The basket is globular in form, similar to baskets 2 and 3 (see below) but

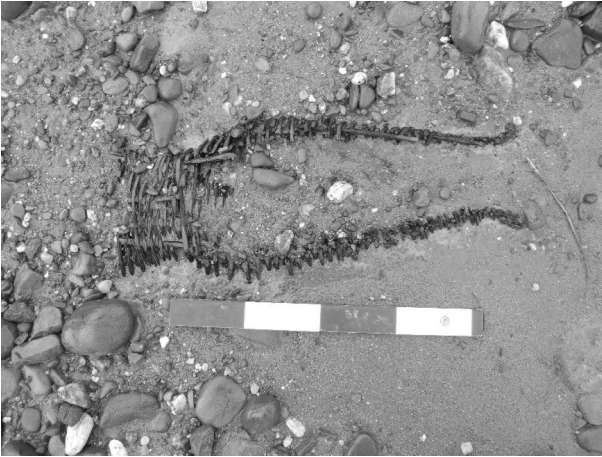


Figure 2. Group A, fish basket 1 (A1).
Orientation: north-south (left-right).
Scale 10 cm divisions.

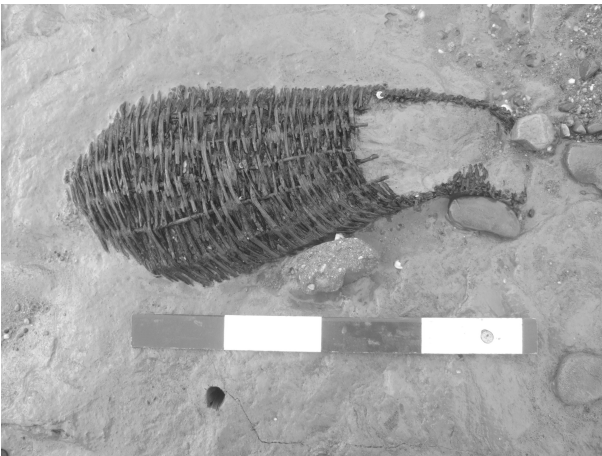


Figure 3. Group A, fish basket 2 (A2).
Orientation: north-south (left-right).
Scale 10 cm divisions.



Figure 4. Group A, fish basket 3 (A3).
Orientation: north-south (right-left).
Scale 10 cm divisions.

less well-preserved, with a maximum diameter of 22 cm and length of 55 cm. The basket is best preserved around the non-return throat, comprising longitudinal roundwood rods spaced 3 cm apart with a maximum diameter of 11 mm. Around these were slightly thinner closely-woven roundwoods measuring 8-10 mm thick. Samples of longitudinal roundwood and weave were taken for wood identification. The weave was found to be willow shoot-wood representing one years growth and was cut towards the end of the growth season. The roundwood was two year-old hazel cut at a similar time.

Basket 2 (A2) (Figure 3):
ST 50261 87061

Remains of a well-preserved finely-woven basket partially buried in blue-grey estuarine silts. The basket is similar in form to baskets 1 and 3, but with the non-return throat end clearly buried in estuarine silts. The basket is globular in form with a maximum diameter of 22 cm and length of 49 cm. The basket comprises longitudinal roundwood rods 6-8 mm thick, spaced a maximum of 40 mm apart. Around these were closely woven roundwoods of similar thickness surviving over the top 30 cm of the basket, largely eroded away at the base. Samples of the longitudinal roundwood and weave were taken for wood identification, and found to be one year-old willow shoot wood cut towards the end of the growth season.

Basket 3 (A3) (Figure 4): ST 50272 87045,
580±70 BP (Beta-228125)

Remains of a finely-woven basket partially buried in blue-grey estuarine silts. The basket is globular in form, with a maximum diameter of 26 cm and length of 73 cm. The basket is best preserved at the non-return throat end, comprising longitudinal roundwood rods spaced 25 mm apart with a maximum thickness of 16 mm. Around these were closely spaced woven roundwoods 6-8 mm thick. At the north end of the basket are two roundwood stakes 20 mm thick, projecting into estuarine silts at 45° to the longitudinal rods. These may have functioned to fix the basket in place. Samples of the longitudinal rods, weave and stakes were taken for wood identification. Of the stakes, one was found to be seven year-old

beech wood cut in the middle of the growth season (S07-3/1), the other (S07-3/5) was nine year-old hazel cut towards the end of the season. The shaped longitudinal rods were found to be two and four year-old hazel cut towards the end of the growth season. The weave was a mixture of one and two year-old hazel and willow shoots, again cut towards the end of the growth season. The different species and cutting time of sample S07-3/1 may suggest this stake was added to the trap at a later stage, or perhaps even washed in naturally.

Basket 4 (A4) (Figure 5):
ST 50274 87042

Half a metre to the north of basket 4 are the remains of a basket buried in blue-grey estuarine silts, now largely eroded away. The basket comprises longitudinal roundwood rods spaced 4 cm apart and 10 mm thick. Around these are the remnants of closely spaced woven roundwoods 8-9 mm thick. It appears that only the top of the basket remains, the body having been completely eroded away. This basket was not sampled for wood identification.

Basket 5 (A5):
ST 50277 87040

One metre to the north of basket 4 are the very fragmentary remains of a probable fishing basket buried in blue-grey estuarine silt, now largely eroded away. It comprises a single longitudinal roundwood rod 15 cm long, around which are a few closely spaced roundwoods a maximum of 5 cm in length and 8 mm thick. Samples of the rod and roundwood weave were taken for wood identification. The rod was two year-old hazel and the weave a one year-old hazel shoot, both cut towards the end of the growth season.

Basket 6 (A6) (Figure 6): ST 50274 87042,
860±80 BP (Beta-228126)

Remains of a finely-woven basket partially buried in blue-grey estuarine silts. The basket is conical in shape, with a maximum diameter of 35 cm and length of 64 cm. The basket is best preserved at the south end. It comprises a series of longitudinal roundwood rods spaced *c* 20 mm with a maximum diameter of 8 mm. Around these



Figure 5. Group A, fish basket 4 (A4). Orientation: north-south (top-bottom). Scale 10 cm divisions.

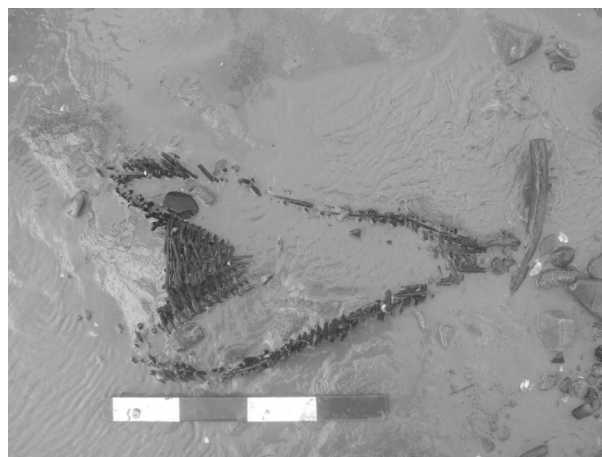


Figure 6. Group A, fish basket 6 (A6). Orientation: north-south (right-left). Scale 10 cm divisions.



Figure 7. Group A, best preserved westerly section of Hurdling 1 (A7). Orientation: west-east (bottom to top).



Figure 8. Group A, stake alignment 1 (A8), comprising roundwood stakes 3-7. Scale, 10 cm divisions.



Figure 9. Group A, wood alignment, argued to represent root penetration within Pleistocene ice-wedge casts.



Figure 10. Group B, fish basket 8 (B2). Scale 30 cm.

are closely spaced woven roundwoods of similar thickness. The body of the basket is preserved only around the margins but takes the same form. At the base of the basket is a stake projecting at a right angle into the estuarine silt. It is 40 cm long and 19 mm thick and may have functioned to hold the basket in place. Samples of longitudinal roundwood, weave and the stake were sampled for wood identification. The longitudinal roundwood and weave were both identified as one year-old willow shoot-wood; the stake was found to be hazel of six years growth. All the samples were cut towards the end of the growth season.

Hurdling 1 (A7): (Figure 7)

The remains of a very fragmentary hurdle structure were recorded over a *c* 5 m² area of foreshore. This structure was not sampled for wood identification.

*Stake alignment 1 (A8) (Figure 8):
ST 50222 87062 to ST 50213 87057*

An alignment of seven roundwood stakes was recorded *c* 70 m north-northeast of caisson 12 and 40 m west of fish basket A1 at *c* 1 m OD. They are partly exposed in blue-grey estuarine silts that form a roughly northwest to southeast oriented channel eroded into the underlying marl. They vary in diameter from a maximum of 45 mm (stake 2) to 25 mm (stakes 3-7). A further roundwood stake of 30 mm diameter was recorded *c* 15 m to the southeast of this alignment at ST 50223 87051.

*Wood features (Figure 9):
ST 50299 87078 to ST 50266 87066*

A series of enigmatic alignments of wood were recorded *c* 20 m to the north of baskets 1-6, over approximately 40 m of foreshore between 1 to 1.5 m OD in elevation. They comprise compact, closely arranged upright timbers partly exposed above gravely marl. It is most probable that these wood features are the same as site 11 recorded during the 1990 survey, then interpreted as the remains of alder trees, whose roots had penetrated the softer, sandy-infill, of late Pleistocene ice-wedges (Godbold and Turner 1993, 20). Ice-wedge casts are recorded at numerous locations on exposed bedrock platforms within the middle

Severn Estuary, including at Sudbrook (Allen 1984, 1987). A characteristic feature of these periglacial structures is the triple junction between ice-wedge casts that form the typical pattern of polygonal wedges recorded from other localities (Allen 1984, fig. 1; 1987, fig. 3). It is uncertain whether these features preserve similar triple junctions, but Godbold and Turner (1993) note that the gravel surrounding these features was in an upright stance characteristic of periglacial frost-heaved features.

GROUP B (RT and CP)

This group of nine fish baskets, one hurdling and one stake alignment were visible immediately to the north and west of caisson 12 of the Second Severn Crossing (Figure 1).

*Basket 7 (B1): ST 50206 87001,
580±70 BP (Beta-228127)*

This was a large basket resembling, but substantially smaller, than a putt. It was buried in blue-grey estuarine silts with a thin seam of red clay marl washed over the basket. It was exposed *c* 5 m from the northwest corner of the caisson and it was close to the edge of the deep scour around the structure. The opening faced north towards the former channel of the River Troggy. Its maximum length was 1.3 m and width of 0.9 m and was made of roundwood woven around similar rods. Alongside the basket were heavier axed stakes which may have held it in position. Two samples of the roundwood were found to be hazel of eleven and five years age respectively, cut towards the end of the growth season. The form of basket was similar to context 238 of the 1990 survey.

*Basket 8 (B2) (Figure 10): ST 50201 87001,
320±60 BP (Beta-228128)*

Remains of a finely-woven basket, similar in form to baskets 9 and 10, located *c* 6 m west of basket 7 and close to the scour around the caisson. A length of 30 cm was exposed in grey clay mixed with fibrous roots, though it is not clear whether these are roots are detrital or roots of plants that had grown post-depositionally in the clay. The basket is a maximum diameter was 20 cm. A sample of the weave and rods were taken. These



*Figure 11. Group B, fish basket 9 (B3).
Orientation: north-south (top-bottom).
Scale 30 cm.*



*Figure 12. Group B, fish basket 10 (B4).
Orientation: north-south (left-right).
Scale 30 cm.*

were identified as willow shoot-wood of only one years growth, cut towards the end of the growth season.

*Basket 9 (B3) (Figure 11):
ST 50186 86990*

Remains of a finely-woven basket. The outer part is globular and measured *c* 30 cm by 30 cm, facing south. The weaving produced sharp points and was turned inwards to create an inner basket, or non-return throat. The tip of this was buried. It was set in blue-grey estuarine silts and has some pebble infill, most probably washed in as a result of storm action. No evidence of staking was visible. Though similar in size and weave to baskets 10 and 14, the use of an integral weave

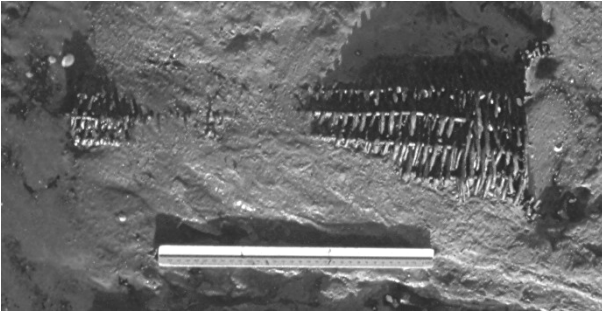


Figure 13. Group B, fish basket 11 (B5).
Orientation: north-northwest-south-southeast
(left-right). Scale 30 cm.

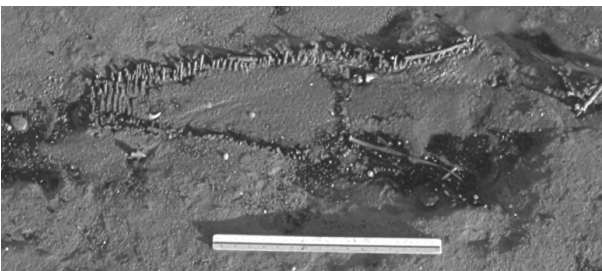


Figure 14. Group B, fish basket 12 (B6).
Orientation: north-northwest-south-southeast
(left-right). Scale 30 cm.

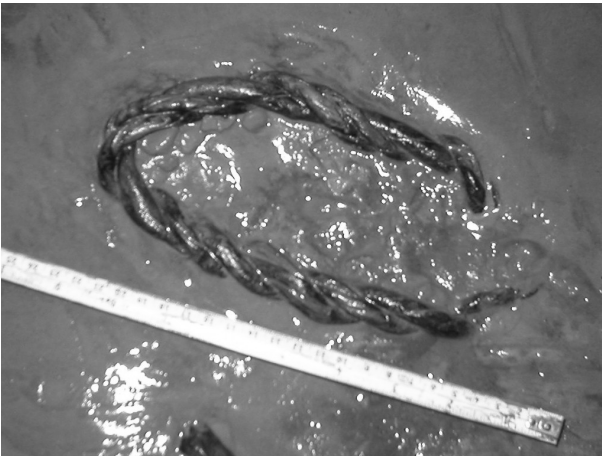


Figure 15. Group B, withy tie found in close
association with fish basket 12. Scale 25 cm.

rather than a separate basket to create the non-return throat is unique. A sample of roundwood weave was taken. This was identified as willow shoot-wood cut towards the end of the growth season.

*Basket 10 (B4) (Figure 12): ST 50180 86983,
620±40 BP (Beta-228129)*

Remains of a finely-woven basket partly buried in

blue-grey estuarine silts *c* 15 m from the west centre of caisson 12. The basket is globular, measuring *c* 30 cm long and 25 cm in diameter. Into the southern end was inserted the remains of a second basket. This was made of a fine roundwood weave around split and sharpened rods, making a non-return throat. This second basket was V-shaped and an area of roundwood and heavier stakes lay 60 cm on the line of the V to the southwest suggesting either that this was the former extent of the fish basket or that a third stage forewheel was used. If the latter is the case, this would make basket 10 part of a putt. A sample of the weave and split rods of the second basket were taken. These were identified to be hazel of two years growth, cut towards the end of the growth season.

*Basket 11 (B5) (Figure 13):
not accurately located*

This basket was conical rather than globular in shape. It was made of finely-woven roundwood around fine roundwood rods. It measured 50 cm long with a maximum diameter of 15 cm at its south-southeast end. For the last 12 cm towards that end the basket had a double rather than single weave. The opposite end looked finished and may have been closed by a bung but no tethering stake or withy tie was seen in association. This basket, which was not sampled, may represent the forewheel of a putt.

*Basket 12 (B6) (Figure 14):
ST 50166 87005*

This is the truncated remains of a conical basket. Only the bottom part lying on blue-grey estuarine silt survived on the 20th January 2007. Richard Morgan had photographed a finely woven withy handle or tie alongside this basket on 30th December 2006 (Figure 15). Only an imprint of that tie showed on the 20th January 2007. This basket was not sampled.

*Basket 13 (B7) (Figure 16):
ST 50163 86962*

This basket was exposed in blue-grey estuarine silts with a little red marl overwash. The cross-section of the basket would suggest that it is preserved almost upright. It was finely woven and

globular in shape and associated with roundwood suggesting it was *in-situ*. This basket lay 12 m southwest of the corner of caisson 12. It was not sampled.

Basket 14 (B8):
ST 50194 86994

Remains of a very fragmentary woven basket, partly exposed in blue-grey estuarine silts. It is situated on the edge of the eroded scour of sediment on the west side of caisson 12. Three roundwood rods are closely associated with basket 14, located 0.75 m to the south and 1 and 2 m to the northeast. They measure 45, 25 and 20 mm in diameter respectively. This basket was not sampled.

Basket 15 (B9) (Figure 17):
ST 50158 86965

Remains of a finely-woven basket partly exposed in blue-grey estuarine silts. Only the edges of the basket are exposed, but it appears to be globular in form, *c* 60 cm in length and *c* 20 cm in width. There are indications of a non-return throat at the north end. Closely associated with basket 15 is a series of larger roundwoods varying in length from *c* 10-50 cm and *c* 30 mm in diameter, perhaps forming part of a larger fishing structure, such as a hurdle or leader, used to channel fish into the basket.

Stake alignment 2 (B11) (Figure 18):
ST 50206 86985 to ST 50197 86990

A series of eight roundwood stakes 20-40 mm in diameter were recorded from the edge of the sediment scour on the immediate west side of caisson 12. They are partly exposed in what appear to be blue-grey laminated estuarine silts, roughly 1.5 m below the level of nearby baskets 7-10 and 14.

GROUP C (RT and CP)

This group of structures lay about 40 m south and south-southeast of caisson 12, centred on ST 50164 86911. It consisted of two areas of collapsed hurdling, two very long stakes with circular holes bored at their former upper ends and one fish basket made in two parts.

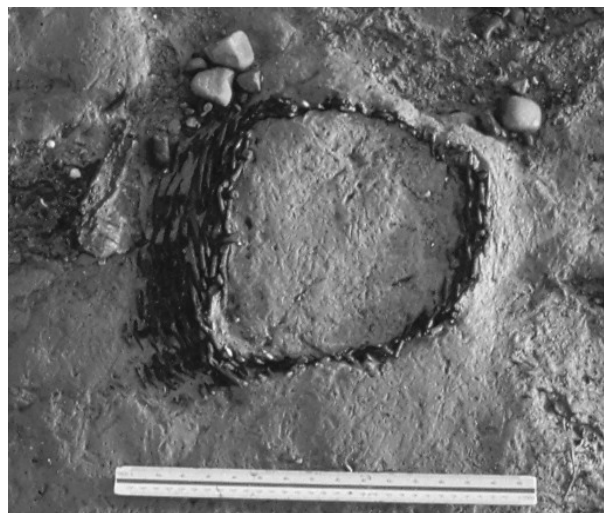


Figure 16. Group B, fish basket 13 (B7). The cross-section of the basket would suggest it is preserved almost upright. Scale 30 cm.

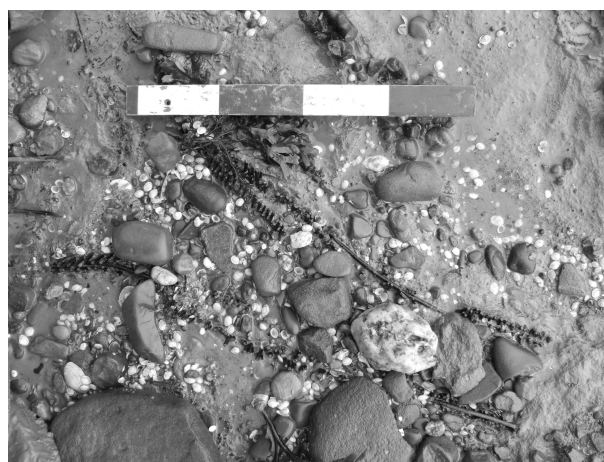


Figure 17. Group B, fish basket 15 (B9). Orientation: north-northwest-south-southeast (right-left). Scale, 10 cm divisions.

Hurdling 2 (C1) (Figure 19):
ST 50167 86905

An irregular length of hazel roundwood hurdling woven around one nearly-complete and pointed stake and a broken example suggesting centrings of *c* 30 cm between stakes. There were 32 rods surviving giving a height of *c* 85 cm with the pointed end of the stake protruding another 34 cm. The hurdling had fallen to the northeast in the direction of the flooding tide and lay in a mixture of blue-grey estuarine silt and pebbles. Samples of the rods were taken for wood identification and confirmed as hazel from four to six years in age, cut towards the end of the growth season. The



Figure 18. Group B, Stake alignment 2 (B11), running northeast for c 5 m along edge of scour of caisson 12.



Figure 19. Group C, Hurdling 2 (C1). Orientation: northeast, in the direction of the flooding tide.

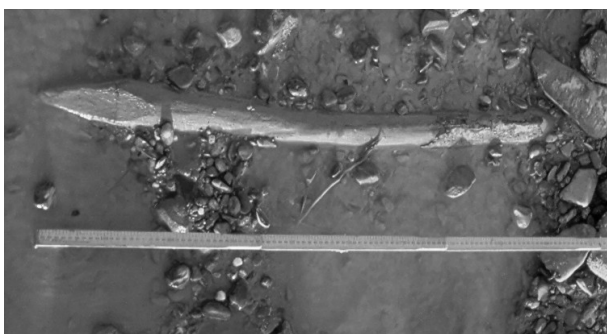


Figure 20. Group C, stake 1 (C3). Orientation: approximately west-east.

hurdling is similar to contexts 230 and 261 found in 1990 and very close to their location.

*Hurdling 3 (C2): ST 50168 86914,
780±60 BP (Beta-228130)*

Area of hazel roundwood rods only 8 courses high and 1.2 m long. No evidence for staking. Approximately 6 m northwest of hurdling 1.

*Stake 1 (C3) (Figure 20):
ST 50157 86910*

Very long wooden stake partly buried but with both ends visible. The whole stake measured 3.69 m long and lay roughly west to east and was roundwood with an average diameter of 8 cm. The western 18 cm had been sharpened to point with flat facets showing no clear axe marks. The eastern end was rounded and 18 cm from the end was a neatly-bored hole 15 mm in diameter.

*Stake 2 (C4):
ST 50165 86913*

Apparently similar to stake 1, but only 37 cm was exposed, with the stake lying east to west. It was roundwood of c 7 cm diameter with a neatly-bored hole 20 mm diameter, 22 cm from its rounded western end.

*Basket 16 (C5):
ST 50162 86916*

At the northwest corner of this group, and not necessarily associated, was a well-preserved, two-part basket facing east. The western end was a globular basket measuring 50 cm long with a maximum diameter of 22 cm and a minimum of 11 cm. The bung end seems intact. Inserted into the eastern end is part of a V-shaped second basket measuring 20 cm long and 22 cm across its damaged end. All were made with finely woven willow roundwood. It was similar in construction to basket 10 above. Richard Morgan has made a replica based on these two examples (see below).

WOOD IDENTIFICATION (CP)

Samples taken were frozen and transverse, tangential and radial surfaces prepared with a stainless steel razorblade. Wood identification

Table 1. Results of wood identification.

Sample details		Sample type	Group	Age (years)	Species	Cut
S07-1/4	S07-1	weave	A	1	Willow	Towards end of growth season
S07-1/3	S07-1	weave	A	1	Willow	Towards end of growth season
S07-1/2	S07-1	weave	A	2	Hazel	Towards end of growth season
S07-1/6	S07-1	longitudinal	A	2	Hazel	Towards end of growth season
S07-1/5	S07-1	weave	A	2	Willow	Towards end of growth season
S07-2	S07-2	weave	A	1	Willow	Towards end of growth season
S07-3/1	S07-3	stake	A	7	Beech	Mid growth season
S07-3/2	S07-3	shaped, round-wood from the none return throat	A	4	Hazel	Towards end of growth season
S07-3/3	S07-3	shaped, round-wood from the none return throat	A	2	Hazel	Towards end of growth season
S07-3/4	S07-3	longitudinal	A	7	Hazel	Towards end of growth season
S07-3/5	S07-3	stake	A	9	Hazel	Towards end of growth season
S07-3/6	S07-3	weave	A	1	Willow	Towards end of growth season
S07-6/2	S07-5	weave	A	1	Willow	Towards end of growth season
S07-5	S07-5	weave	A	1 & 2	Hazel	Towards end of growth season
S07-6/1	S07-6	stake	A	6	Hazel	Towards end of growth season
S07-7	S07-7	stake	B	11 & 5	Hazel	Towards end of growth season
S07-8	S07-8	weave	B	1	Willow	Towards end of growth season
S07-9	S07-9	weave	B	1	Willow	Towards end of growth season
S07-10	S07-10	split rod	A	2	Hazel	Towards end of growth season
Hurdling 2		hurdling	C	4 & 6	Hazel	Towards end of growth season

was carried out under high magnification using Schoch *et al* (2004) and reference slides. Nineteen distinct pieces of wood, and several duplicates from the same contexts, were sampled from eleven features (Table 1). The dominant species present were hazel and willow, with hazel chiefly being used for the more structural elements of the traps and willow for the weave. Insufficient representative material was collected to draw any real conclusions as to the source of the material. The various age ranges present do not point towards a managed source, but rather to the deliberate selection of shoots of appropriate

diameter for the purpose. The fact that all the samples with the exception of the beech wood appear to have been cut at a similar time of year suggests that there was a tradition of making these baskets in the late autumn or early winter after the seasonal runs of migratory fish had ended.

RADIOCARBON DATING (AB)

Six samples were sent for radiocarbon dating to Beta Analytic, and the results are listed in Table 2 and as a multi-plot in Figure 21. Samples of identified weave and roundwood were taken from

Table 2. Radiocarbon dates from fish baskets and hurdling.

Sample	Structure/ Group	Type of material	δ^{13} value	^{14}C years BP	Lab code	Calibrated BC	
						68.2% prob.	95.4% prob.
Group A							
S07-3	Basket 3 A3	Wood	-27.4	580±70	Beta- 228125	1300-1370 (45.5%) 1380-1420 (22.7%)	1280-1440
S07-6	Basket 6 A6	Wood	-27.9	860±80	Beta- 228126	1040-1090 (14.3%) 1120-1140 (5.0%) 1150-1260 (48.9%)	1020-1280
Group B							
S07-7	Basket 7 B1	Wood	-29.1	580±70	Beta- 228127	1300-1370 (45.5%) 1380-1420 (22.7%)	1280-1440
S07-8	Basket 8 B2	Wood	-28.0	320±60	Beta- 228128	1490-1650	1440-1670 (94.3%) 1780-1800 (1.1%)
S07-10	Basket 10 B4	Wood	-28.0	620±40	Beta- 228129	1295-1325 (26%) 1340-1390 (42.2%)	1280-1410
Group C							
S07-H2	Hurdling 3 C2	Wood	-29.1	780±60	Beta- 228130	1190-1200 (1.6%) 1205-1285 (66.6%) 1360-1390 (1.7%)	1050-1090 (3%) 1150-1310 (90.7%) 1360-1390 (1.7%)

Atmospheric data from Reimer et al (2004);OxCal v3.10 Bronk Ramsey (2005); cubr:5 sd:12 prob:usp[chron]

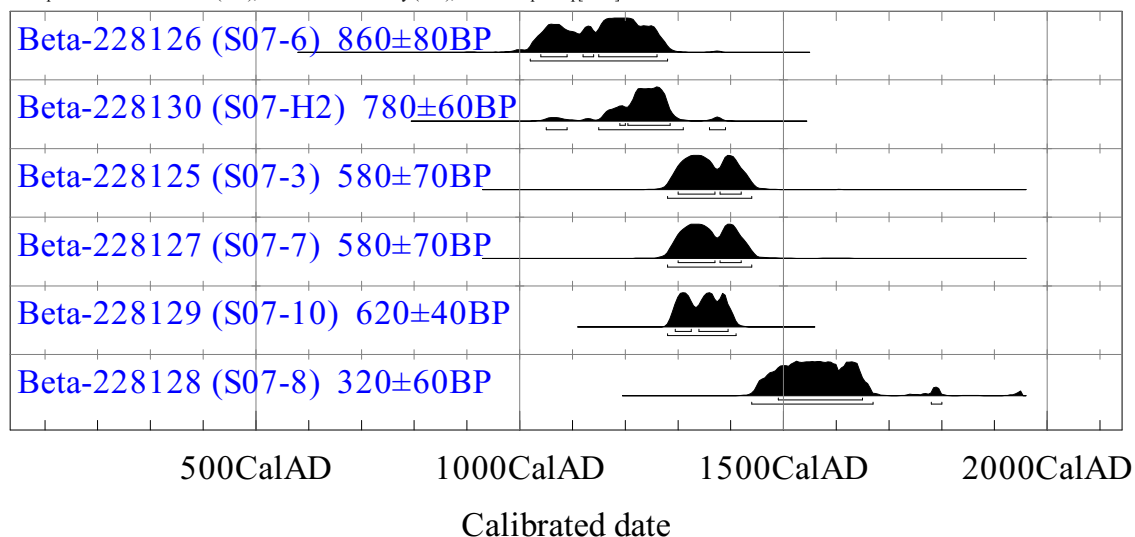


Figure 21. Plot of calibrated radiocarbon dates for fish traps: Beta 228126 (fish basket 6), Beta 228130 (Hurdling 3), Beta 228125 (fish basket 3), Beta 228127 (fish basket 7), Beta 228129 (fish basket 10), Beta 228128 (fish basket 8).

fish baskets 3 and 6 (Group A), fish baskets 7, 8 and 10 (Group B) and hurdling 3 (Group C). All radiocarbon dates are quoted in radiocarbon years

BP, followed by the laboratory code and the calibrated BC range at the 68% and 95% confidence level. The calibration curve used is



Figure 22. Replica of baskets 10 and 16, held by Martin Morgan.

that of Reimer *et al* (2004), using the OxCal version 3.9 computer programme (Bronk-Ramsey 2003).

REPLICATING THE GLOBULAR FISH BASKET (RM)

The remains of Baskets 10 and 16 were used as a model for constructing a replica (Figure 22). This was undertaken before the results of the wood analysis were available. When it came to replicate the globular type basket, having been shown how to make the traditional putcher baskets by an old fisherman, the same method was followed but on a smaller scale. One-year-old willow was cut for weaving, when the leaves had fallen in the winter, and hazel rods were cut the same as for the putcher. A smaller version of a putcher bench was made. This is a square board with short legs, in which a circle of holes is drilled to hold the rods whilst the basket is woven (Jenkins 1974, 56-7). The ends of the rods within the basket were sharpened to make the mouth and the non-return

throat. The completed structure was placed mouth down, then willow rods were inserted into the sides and finer willow woven around the rods, bending them to form the globular shape. The end of the basket would have been closed with a round wooden stopper.

DISCUSSION AND CONCLUSIONS (AB, RT and CP)

A total of sixteen fish baskets, three hurdling, two alignments of roundwood pegs, two stakes and a withy tie was recorded during the course of this survey. This is the most remarkable collection of such structures found to date in the Severn Estuary. None of these find-spots appear to have been recorded during the 1990 survey (Figure 1). These various structures add to the list of previous finds recorded from the Sudbrook foreshore (Godbold and Turner 1993, 1994). This suggests that the former mouth of the River Nodern/Troggy was particularly favourable for fishing in medieval times.

The fishing structures were exposed in three groups upon the foreshore around caisson 12 of the Second Severn Crossing. The relict channel of the Nedern/Troggy can still be seen running through Group B of the survey. This river was canalised in the 18th century and its outfall was moved further west; the size of the medieval pill is unknown.

Sudbrook Point protrudes into the estuary, and migratory fish heading for the Rivers Wye and Severn would have swum close to shore. The present low sandstone cliff of the point will have been eroding for centuries. Some idea of its former size can be made by projecting around the defences of the Iron Age hillfort (Figure 1), suggesting perhaps as much as *c* 100 m of the headland has been lost to erosion. At the time these fishing structures were in use, the line of the foreshore would have been further to the southeast, and the estuarine pill would have been more prominent. This may have provided different opportunities for catching fish, requiring different types of traps.

Jenkins (1974, 44-66) and Godbold and Turner (1994, 45-8) have reviewed the different types of basket traps used in the Severn Estuary. It is possible to divide the finds from the present survey into three types. The first corresponds to the putt, a form of trap in use in the middle of the 20th century. This is a basket trap made of three components, the kipe, the butt and the forewheel. These were tethered to a framework of stakes driven into the foreshore. Basket 7 seems to be a kipe, and Baskets 6, 11, 12 and probably 4 resemble forewheels, whose rear end could be closed by a bung. Richard Morgan recorded wooden plugs in some of the fish baskets when they were initially exposed during December 2006 (eg Basket 3). None were recorded during subsequent field survey, no doubt removed during storms prior to 18th January 2007.

Putts can be arranged in ranks or be placed at the apex of a broad V formed by hurdle fences. Evidence for both types of grouping were found in the 1990 survey (Godbold and Turner 1994, 48). The three lengths of hurdling and the two stake alignments are also likely to derive from this sort of trap. The withy tie, closely associated with basket 12 (Figures 14 and 15), may have functioned to connect the kipe with the butt

section of the putt, as is documented in historical accounts (Waters 1947, 149). These describe the use of a withy, or 'rod', bound to a stake, or 'pin', perhaps similar to stakes C1 and C2. However, Waters (1947, 149) indicates that the stake was attached through a tight noose in the withy without the need of a tie. If one were to interpret stakes C1 and C2 as elements of a 'rod and pin', used to connect separate sections of a putt, then the bored holes recorded in both stakes may have functioned as an alternative means of attaching a withy. Neither stake were dated or sampled, but appear to have been driven in as upright stakes, and could, alternatively, have supported a net, tethered to the holes drilled in the top.

Archaeological evidence for putts has been found in different places on the northern foreshore of the Severn Estuary at sites such as Magor Pill (Nayling 1999a) and Woolaston (Townley 1998; Brown *et al* 2005). The radiocarbon dates for Baskets 6 and 7 and Hurdling 3 lie within the calibrated range AD 1020-1440, and are contemporary with those found in the 1990 survey (Godbold and Turner 1994), and at Magor Pill (Nayling 1999a). Putts continued in use into the 20th century, demonstrating, convincingly, that this specific tradition of fixed-engine fishing extends back as much as 1000 years. Putts appear also to represent a mechanism of fishing unique to the Severn Estuary. They have not been recorded in similar large-scale surveys of either the Shannon Estuary, Republic of Ireland (O'Sullivan 2001, 2003), Strangford Lough, Northern Ireland (McErlean *et al* 2002), or Blackwater Estuary, Essex (Gilman 1996; Strachan 1998), where medieval and later fishing structures are known to be widespread.

In these areas, fish traps are often V-shaped, the open ends facing the ebb-tide, with leaders of post-and-wattle fencing converging on a single-piece basket. They vary in size, with those in the Blackwater Estuary ranging between 100-300 m in length (Gilman 1996), 200-400 m in Strangford Lough (McErlean *et al* 2002), but much smaller in the Shannon Estuary (O'Sullivan 2001). Post-and-wattle V-shaped fish traps, including baskets, have also been recorded in the Severn Estuary, including at Magor Pill (Nayling 1999a) and Sudbrook (Godbold and Turner 1994) where they date between the 12th and 14th

centuries AD. Baskets associated with V-shaped post-and-wattle structures range in size from *c* 1.2 to over 4 m in length, and are much larger than the baskets recorded as part of this survey.

Much more unusual was the survival of nine finely woven globular baskets, with evidence for the insertion of a second basket with a non-return throat (Baskets 1, 2, 3, 8, 10, 13, 15 and 16), or in the case of basket 9, having an integrally woven throat. They do not exceed a maximum of *c* 75 cm in length, and so are much smaller than those baskets considered to form sections of putts, or baskets associated with V-shaped fish traps. The Lave Net Fishermen have never seen this type of basket except at this location. The baskets show evidence of having been staked down in the estuarine mud and it is remarkable how these delicate baskets have survived for 700 years. Similar baskets including one of more throats were in use in modern times to catch eels in particular. Jenkins (1974, 277-83) describes and illustrates a number of examples from the Severn and the Fens. Most were designed for use in freshwater and were often associated with mill weirs. In the Upper Severn, the throat was called the 'inchin', whilst in the Lower Severn it was referred to as the 'chale'. However, at Oldbury-on-Severn, out in the middle of the estuary, two types of basket were described: the wheel, measuring 60 cm long, and the putcheon, measuring 135 cm long. Here wheels were used to catch lampreys, which were much sought after in medieval times (Turner 2006).

A small basket of conical, rather than globular form, with evidence of a non-return throat, was recorded at Magor Pill (Nayling 1999a). However, there are no other documented instances of globular baskets from archaeological contexts in the Severn Estuary, or, indeed, in other intertidal and wetland contexts from Britain or Ireland (eg O'Sullivan 1994, 1997, 2001, 2003; Gilman 1996; Strachan 1998; McErlean *et al* 2002; Turner 2002; James and James 2003). This would suggest, at present, that the globular baskets were a local variant of basket, like the wheel, used to catch eel or lamprey. The radiocarbon dates for globular baskets 3 (AD 1280-1440), 8 (AD 1440-1670) and 10 (AD 1280-1410) are similar in date to medieval fishing structures elsewhere within the Severn Estuary and inner Bristol Channel, that concentrate from

the 12th-14th/15th centuries (eg Nayling 1999a).

Earlier fish traps of Anglo-Saxon date have been recorded within the Severn Estuary, for example, at Redwick (Allen and Bell 1999), but also more widely within the Blackwater Estuary (Strachan 1998), Thames Estuary (Milne *et al* 1997), Shannon Estuary (O'Sullivan 1997, 2001) and Strangford Lough (McErlean *et al* 2002). However, in all these locations, the majority of medieval fish traps are of 12th-14th century date. This most-likely relates to the growth of urban centres within the later medieval period and the wealth and power associated with fishing, many fisheries being owned by monasteries and the nobility, and the importance of fish within the medieval diet (O'Sullivan 2001; Turner 2002).

Analysis of the wood samples from the baskets show a considerable standardisation in the selection of the timber. The fine weave was achieved with largely one-year old willow shoots, with one example, two-year old, and one using hazel. Stakes and rods were made from more mature hazel rods. All this timber was felled at the end of the growing season. This confirms the modern tradition that the baskets were made by the fishermen during the close season (Jenkins 1974, 57).

This project has shown that the discovery of the remains of fish traps is often fortuitous, following bad weather, when wave-action and more than usually vigorous tidal currents scour away loose sediment. Under these circumstances, a rapid reaction is needed to recover what is often very fragile evidence. The sheer number of fish traps recorded from Sudbrook, and the Severn Estuary, demonstrate the important role fishing played in the lives of local communities, and continue to confirm the longevity of a wide range of fishing methods whose last use is just within living memory.

ACKNOWLEDGEMENTS

The writers gratefully acknowledge Richard and Martin Morgan of the Blackrock Lave Net Fishermen's Association for bringing the finds reported here to the attention of Rick Turner (Cadw), and for helping make a comprehensive record of these finds. Martin Morgan is thanked for guiding the fieldwork team along the

foreshore, at times in very difficult weather conditions. The fieldwork team on the 18th January 2007 and 16th February 2007 comprised Alex Brown, Anne-Marie Bonwick and Jodi Davidson. The fieldwork and post-excavation analysis was funded by Cadw, which also granted this publication.

REFERENCES

- Allen, J.R.L. (1984) Truncated fossil thermal contraction polygons (?Devensian) in the Merica Mudstone Formation (Trias), Oldbury upon Severn, Gloucestershire. *Proceedings of the Geologists Association* 95, 263-273.
- Allen, J.R.L. (1987) Dimlington Stadial (Late Devensian) ice-wedge casts and involutions in the Severn Estuary, southwest Britain. *Geological Journal* 22, 109-118.
- Allen, J.R.L. (2004) Fishtraps in the middle Severn Estuary: air-photographic evidence from the mid-twentieth century. *Archaeology in the Severn Estuary* 15, 31-48.
- Allen, J.R.L. and Bell, M.G. (1999) A late Holocene tidal palaeochannel, Redwick, Gwent: late Roman activity and a possible early medieval fish trap. *Archaeology in the Severn Estuary* 10, 53-64.
- Allen, J.R.L. and Fulford, M.G. (1992) Romano-British and later geoarchaeology at Oldbury Flats: reclamation and settlement on the changeable coast of the Severn Estuary, south-west Britain. *Archaeological Journal* 149, 82-123.
- Allen, J.R.L. and Haslett, S.K. (2006) A wooden fishtrap in the Severn Estuary at Northwick Oaze, South Gloucestershire. *Archaeology in the Severn Estuary* 17, 169-173.
- Allen, J.R.L. and Rippon, S.J. (1997) Iron Age to early modern activity at Magor Pill and palaeochannels, Gwent: an exercise in lowland coastal-zone geoarchaeology. *Antiquaries Journal* 77, 327-370.
- Aston, M. and Dennison, E. (1988) Fishweirs at Minehead. In: Aston, M. (ed.) *Medieval fish, fisheries and fishponds in England*. British Archaeological Reports, British Series 181. Oxford: Archaeopress, 401-403.
- Bell, M. (2007) *Prehistoric coastal communities: the Mesolithic in Western Britain*. York: Council for British Archaeology Research Report 149.
- Bell, M. and Brown, A.D. (2005) Prehistoric activity in Peterstone Great Wharf palaeochannels: field survey 2005-6. *Archaeology in the Severn Estuary* 16, 85-97.
- Bell, M. and Brown, A.D. (2007) *Prehistoric activity in Peterstone Great Wharf palaeochannels: field survey 2007*. University of Reading, unpublished report.
- Bell, M., Caseldine, A. and Neumann, H. (2000) *Prehistoric intertidal archaeology in the Welsh Severn Estuary*. York: Council for British Archaeology Research Report 120.
- Brown, A.D., Bell, M., Timpany, S. and Nayling, N. (2005) Mesolithic to Neolithic and Medieval coastal environmental change: intertidal survey at Woolaston, Gloucestershire. *Archaeology in the Severn Estuary* 16, 67-83.
- Gilman, P.J. (1998) Essex fishtraps and fisheries: an integrated approach to survey, recording and management. In: Bernick, K. (ed.) *Hidden dimensions: the cultural significance of wetland archaeology*. Vancouver: UBC Press, 273-289.
- Godbold, S. and Turner, R.C. (1993) *Second Severn Crossing: archaeological response. Phase 1. The intertidal zone in Wales*. Cardiff: Cadw.
- Godbold, S. and Turner, R.C. (1994) Medieval fish traps in the Severn Estuary. *Medieval Archaeology* 38, 19-54.
- Green, C. (2005) Sabrina's disappearing art? Exploring craft fishing on the Severn and Bristol Channel. *Archive* No. 48 (December), 25-50.
- Hildich, M. (1997) Preliminary survey of coastal archaeology including the intertidal zone between Wains Hill (Clevedon) and Sand Point (Worle), North Somerset. *Archaeology in the Severn Estuary* 8, 99-102.
- James, H. and James, T. (2003) Fish weirs on the Taf, Towy and Gwendraeth estuaries,

- Carmarthenshire. *The Carmarthenshire Antiquary* 39, 22-48.
- Jenkins, J.G. (1974) *Nets and Coracles*. Newton Abbot.
- Jenkins, J.G. (1991) *The inshore fishermen of Wales*. Cardiff: University of Wales Press.
- McDonnell, R. (1994) Bridgwater Bay: a summary of its geomorphology, tidal characteristics and intertidal cultural resource. *Archaeology in the Severn Estuary* 5, 87-114.
- McErlean, T., McConkey, M. and Forsythe, M. (2002) *Strangford Lough, an archaeological survey of the maritime cultural landscape*. Belfast: Blackstaff Press and Environment and Heritage Service, Northern Ireland, Archaeological Monograph 6.
- Milne, G., Bates, M. and Webber, M.D. (1997) Problems, potential and partial solution: an archaeological study of the tidal Thames, England. *World Archaeology* 29, 130-146.
- Nayling, N. (1999a) Medieval and later fish weirs at Magor Pill, Gwent Levels: coastal change and technological development. *Archaeology in the Severn Estuary* 10, 93-113.
- Nayling, N. (1999b) A stone and wattle fish weir complex in Swansea Bay. *Archaeology in the Severn Estuary* 10, 115-124.
- Nayling, N. and Caseldine, A. (1997) *Excavations at Caldicot, Gwent: Bronze Age palaeochannels in the lower Nedern Valley*. York: Council for British Archaeology Research Report 108.
- O'Sullivan, A. (1994) An early historic period fishweir on the Fergus Estuary, Co. Clare. *North Munster Antiquarian Journal* 35, 52-61.
- O'Sullivan, A. (1997). Medieval fishtraps at Bunratty, Co. Clare. *The Other Clare* 21, 40-42.
- O'Sullivan, A. (2001) *Foragers, farmers and fishers in a coastal landscape, an intertidal archaeological survey of the Shannon Estuary*. Dublin: Royal Irish Academy, Discovery Programme Monograph 5.
- O'Sullivan, A. (2003) Place, memory and identity among estuarine fishing communities: interpreting the archaeology of early medieval fish weirs. *World Archaeology* 35, 449-460.
- Reimer, P.J., Baillie, M.G.L., Bard, E., Bayliss, A., Beck, J.W., Bertrand, C., Blackwell, P.G., Buck, C.E., Burr, G., Cutler, K.B., Damon, P.E., Edwards, R.L., Fairbanks, R.G., Friedrich, M., Guilderson, T.P., Hughen, K.A., Kromer, B., McCormac, F.G., Manning, S., Bronk Ramsey, C., Reimer, R.W., Remmele, S., Southon, J.R., Stuiver, M., Talamo, S., Taylor, F.W., van der Plicht, J. and Weyhenmeyer, C.E. (2004) IntCal04 terrestrial radiocarbon age calibration, 0-26 Cal kyr BP. *Radiocarbon* 46, 1029-58.
- Schoch, W., Heller, I, Schweingruber, F.H. and Kienast, F. (2004) Wood anatomy of central European species. www.woodanatomy.ch
- Strachan, D. (1998) Intertidal stationary fishing structures in Essex, some C14 dates. *Essex Archaeology and History* 29, 274-282.
- Townley, E. (1998) Fieldwork on the foreshore: Stroat to Woolaston, Gloucestershire. *Archaeology in the Severn Estuary* 9, 83-85.
- Turner, R.C. (2002) Fish weirs and fish traps. In: Davidson, A (ed.) *The coastal archaeology of Wales*. York: Council for British Archaeology Research Report 131, 95-107.
- Turner, R.C. (2006) A surfeit of lampreys. *Archaeology in the Severn Estuary* 17, 161-168.
- Waters, B. (1947) *Severn tide*. London: Dent.

