

## MEDIEVAL AND LATER FISH WEIRS AT MAGOR PILL, GWENT LEVELS: COASTAL CHANGE AND TECHNOLOGICAL DEVELOPMENT

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*A selection of fishing structures exposed on the foreshore to the east of Magor Pill were recorded and subjected to dendrochronological and radiocarbon dating in order to provide complementary evidence for coastal retreat, and to date developments in fish weir and trap forms. The earliest traps found, dating to the 12th century, comprised arms of closely-spaced, native hardwood stakes with sub-rectangular concentrations of split oak posts at the apices of the arms indicating the former position of basket traps. Later medieval, linear fish weirs, again constructed from native hardwood species, exhibited V-shaped concentrations of stakes along their lengths. These medieval structures were located between 430 m and 620 m from the present sea wall. An 18th century or later date is suggested for post-medieval weirs containing non-native softwoods found between 320 m and 420 m from the seawall. A putt weir constructed from Douglas Fir and situated, in part, on the exposed peat shelf fell into disuse in the 1930s and demonstrates the extent of peat erosion in the latter half of the 20th century.*

### Introduction

A number of archaeological studies in the intertidal zone of the Gwent Levels, in the vicinity of Magor Pill, have noted the presence of extensive remains of fishing structures, particularly to the east of the major palaeochannel complex from which the medieval Magor Pill wreck was excavated in 1994 (Allen and Rippon 1995, 1997; Nayling 1997, 1998). These structures, subject to damage through both coastal erosion and human activity (bait digging), provide evidence for the nature of fishing through the use of fixed traps and weirs from the medieval period onwards. Some of these structures contain timbers suitable for tree-ring dating offering the potential for high resolution dating. In addition to allowing precise dating of the evolution of trap form over time, this may permit mapping of changes in coastal morphology where trap location far from the present sea wall may reflect past set-back of sea defences, complementing previous documentary, cartographic and particle-size studies (eg Allen and Rippon 1997).

This study targeted structures located in an area of foreshore east of the Magor Pill palaeochannel,

and west of Collister Pill where the foreshore is presently covered by deep deposits of mobile sediment. Structures were selected which contained oak timbers that might prove datable through dendrochronology and which were located at a variety of distances from the present shore (Figure 1). Once selected for study, each structure was recorded in plan, oak timbers assessed for their suitability for tree-ring dating, and samples taken for both dendrochronology and wood identification. During post-excavation, an overall plan of the study area was produced using pre-existing map bases for the area, and individual structure plans digitised using AutoCAD R12™ were annotated with tree-ring and radiocarbon dates and the results of wood identifications.

The fishing structures recorded and analysed during this study can be categorised by consideration of a number of variables including their location (relative to the present shoreline), form, date and the range of wood species employed in their construction (Figure 1 and Table 1). Comparisons are made with two forms of fish weir known to have operated in the Severn Estuary in relatively recent times. Putt weirs comprised rows of large, composite traps consisting of three interlocked baskets - the kipe, butt and forewheel (Godbold and Turner 1992, figs 30-1; Jenkins 1974, 45). Putter weirs comprised rows of more open, smaller, single baskets designed specifically to catch salmon (Green 1992, fig 35). Both types continued in use until relatively recent times, and a putcher rank remains in use today at Goldcliff. Parallels are also drawn with fishing structures recorded during survey and excavation in the Sudbrook/Caldicot Pill area in advance of construction of the Second Severn Crossing (Godbold and Turner 1993, 1994), and less extensive programmes of fieldwork elsewhere in the estuary.

### Recorded fishing structures

Description of the eighteen structures recorded during 1997 plus two structures recorded in 1996 follows a standardised format similar to that

employed by Godbold and Turner (1994), with any illustration reference followed by the centre-point National Grid Reference, any dating (either tree-ring or radiocarbon), descriptive and interpretative text. The original structure numbers assigned during fieldwork have been retained but the structures have been grouped in categories based on location, form and date, with each category followed by a section on interpretation.

### Large V-Shaped Traps

Fish traps comprising arms of roundwood stakes, with the mouth facing into the ebb tide and concentrations of split stakes at the apex of the arms, were found at two locations in the survey area - a group of traps, designated 'group 1' (Figure 2), at the eastern extent of the survey area, and a single trap, Structure 3, further to the south-west (Figure 3). Hazel and alder are apparently preferentially employed for the less substantial uprights in the arms of the traps, whilst oak was favoured for the sub-rectangular concentrations of posts at the apices of the arms. The uprights in the arms of the traps presumably represent the uprights (or sails) of wattle panels, of which the horizontal elements (or rods) rarely survive (eg Structure 3). No direct evidence for the presence of baskets was recorded but it does seem likely that the more substantial posts at the

apices of these fish traps were designed to secure woven baskets. These all appear to date to the 12th century. Markedly similar structures have been recorded on the southern shore of the estuary at Kingston Seymour, Somerset (Hildich 1998), and also upstream at Woolaston, Gloucestershire (Townley 1999, fig 2a).

### Group 1 (Figure 2)

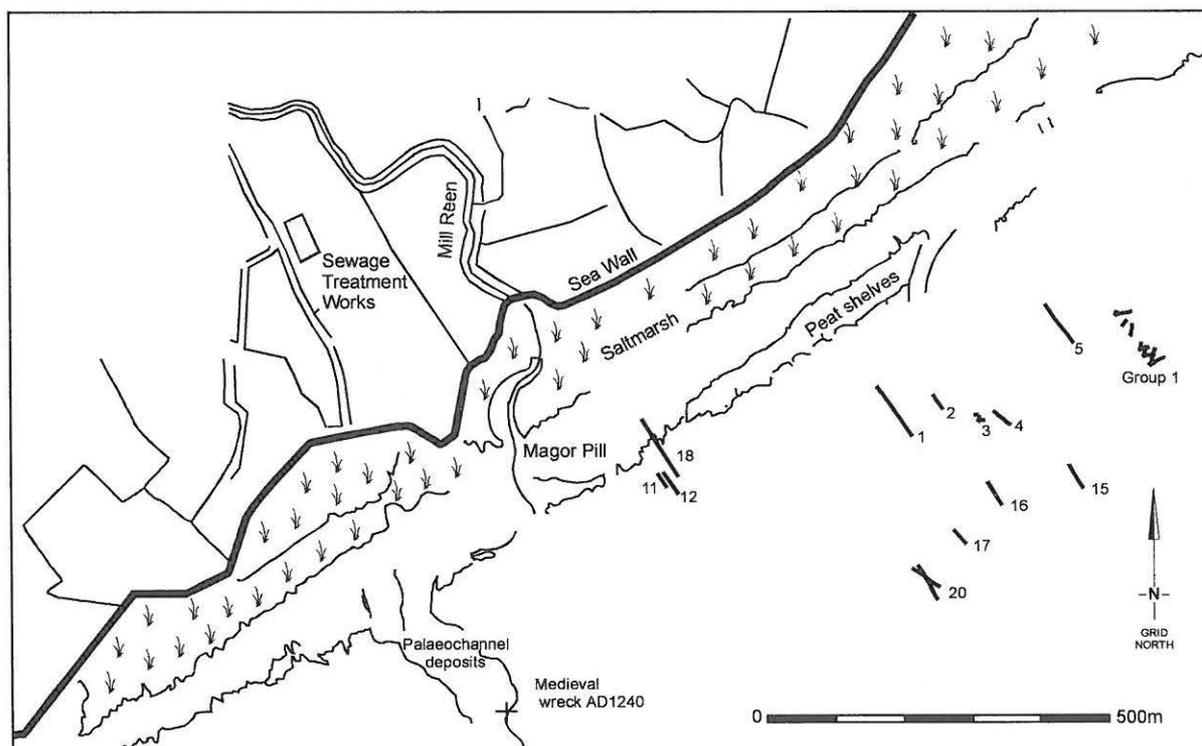
The structures that make up this group are all on the same alignment and of similar construction (Figure 2). On spatial grounds alone, these structures could not all be contemporary as in a number of cases they overlap. Unlike Structure 3, where it would appear that at least two basket traps secured by oak posts worked together with their respective leaders running together at the mouths of the traps, this group may consist of individually built traps rather than a weir of interconnecting leaders. The individual structures are described below, starting with the northernmost and working seaward towards the south-east.

#### Structure 6 ST 44735 84864

*Tree ring dates: AD 1115/1122*

The structure comprised two lines of closely spaced roundwood uprights forming a V shape with a rectangular group of split posts at the apex.

Figure 1: Magor Pill, its environs, and recorded fishing structures. Saltmarsh, prehistoric peat shelf edges and palaeochannel deposits on the lower foreshore are indicated along with the location of recorded fishing structures with their structure or group numbers.



The southern arm of the structure, which could be traced for 24 m, was made up of predominantly roundwood uprights generally spaced 0.1-0.3 m apart. A random sample of 30 uprights from this southern arm had a diameter ranging from 30 to 65 mm with a mean of 45.8 mm. These uprights were predominantly hazel with lesser quantities of alder, beech, ash and oak. The northern arm could only be traced for a distance of 6.2 m, running at an angle of 66° from the southern arm. At the apex of the two arms, a rectangular group of split-oak uprights, approximately 2 m long and 1.2 m wide, survived.

The fragmentary remains of a further arm of roundwood uprights, running parallel but to the east of the northern arm and surviving for a similar distance, could not have operated at the same time as the rest of this structure, and could be part of an earlier or later trap.

*Structure 9 ST 44735 84864*

*Tree ring date AD 1190*

An irregular group of six split-oak posts, five of which formed a rectangle approximately 2 m by 1 m. Only one post retained any sapwood suggesting the felling date given above. This group was located to the east of the apex of Structure 6 and presumably replaced this structure although no remnants of associated arms were observed.

*Structure 8 ST 44748 84848*

*Tree ring date: AD 1127*

An irregular, sub-rectangular group of radially-split oak posts and non-oak roundwood uprights measuring 6.25 m by 1.9 m, located to the south of Structure 6 and north of Structure 7. The few roundwood uprights identified were hazel ranging in diameter from 45 mm to 70 mm. As with Structure 9, this probably represented the more substantial posts used to secure a basket at the apex of two leading arms which had either not survived or were not visible during the survey.

*Structure 7 ST 44753 84838*

*Tree ring date: AD 1119/1146*

Located between Structures 8 and 14, this comprised a 16.3 m long row of predominantly roundwood uprights, running from north to south, and a sub-rectangular group of predominantly split-oak posts measuring approximately 3.4 m long and 1.3-1.6 m

wide

The row consisted of approximately 50 roundwood uprights, predominantly of hazel with lesser quantities of holly, ash and alder, and 14 split-oak posts spaced approximately 0.3 m apart. The roundwood uprights exhibited a diameter range of 20-75 mm with a mean of 45 mm. The oak uprights were generally radially-split, of medium-growth rate and 50-100 mm wide. A single dendrochronology sample from this arm gave a felling date of AD 1119. The frequency of split-oak uprights within the arm is unusual compared with similar features in other structures of this group.

Three samples of split-oak uprights from the sub-rectangular group gave felling dates or ranges of AD 1143-82, AD 1122-54 and AD 1146. The unusual number of split oak uprights in the surviving arm, with one giving a felling date substantially earlier than those indicated for the 'box' could indicate construction in AD 1146 with timbers from a dismantled structure being reused to build the surviving arm. Alternatively, the structure could have been constructed in AD 1119 and the 'box' rebuilt with new wood in AD 1146.

*Structure 14 ST 44768 84814*

*Tree ring date AD 1118-51*

This well-defined example comprised two arms, the northernmost running for 10.46 m whilst the other arm ran, at an angle of approximately 70° to the former, for 13.6 m. At the apex of the two arms, a sub-rectangular concentration of posts measured 3.32 m by 1.42 m at its 'mouth' tapering to 0.47 m at the rear. The northern arm of Structure 13 overlapped with southern arm of this structure suggesting that the two are not contemporary.

A random sample of 19 uprights had a diameter range of 20-70 mm with a mean of 40 mm. These uprights were predominantly hazel with lesser quantities of oak, holly, ash and alder.

*Structure 13 ST 44775 84805*

This structure was located with its northern arm of driven posts running for some 14.3 m partially overlapping the southern arm of Structure 14, and its southern arm, running for 15.75 m, partially overlapping the northern arm of Structure 19. The two arms had an internal angle of *c* 65°, with the mouth of the structure facing into the ebb tide. A

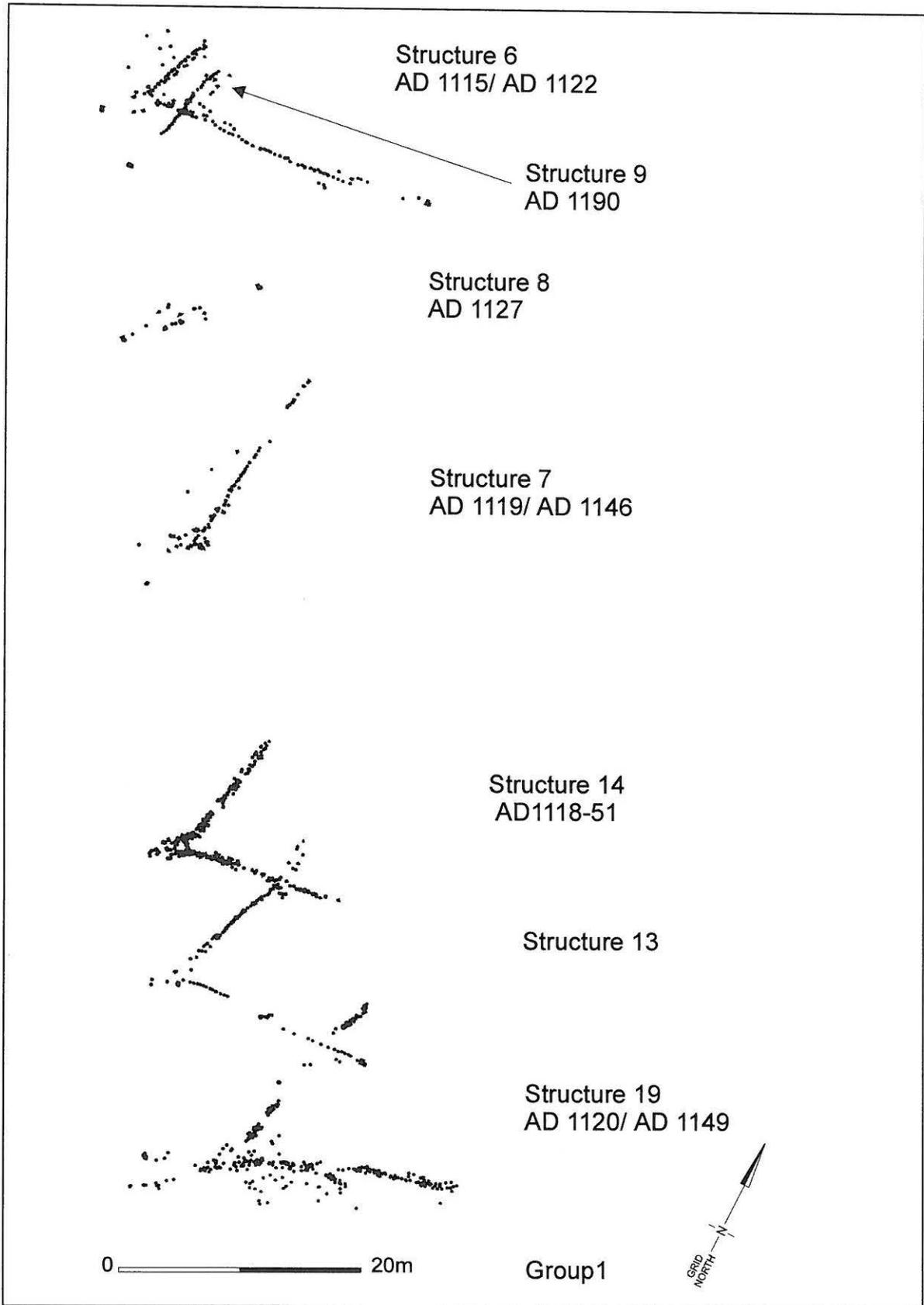


Figure 2: Magor Pill, Fishtrap structures forming 'group 1'. Tree-ring dates for individual structures are given.

sub-rectangular group of predominantly split oak uprights was located at the apex of the arms, some 2.15 m long, 1.1 m wide at mouth tapering to 0.47 m wide at back. A random sample of 30 uprights had a diameter ranging from 17 to 76 mm with a mean of 34 mm. These uprights were predominantly hazel with lesser quantities of ash, oak, beech and alder.

*Structure 19 ST 44789 84797*

*Tree-ring date AD 1120/1149*

The southernmost structure of this group again faced into the ebb tide with the two arms forming a mouth some 18 m wide. The posts were predominantly non-oak roundwood but lesser numbers of split oak stakes were also observed. At the apex of the arms, a sub-rectangular arrangement of posts was predominantly split oak. Tree-ring dates indicate initial construction in or soon after AD 1120 with later dating to AD 1149 implying subsequent repairs.

*Structure 3 (Figure 3) ST 44530 84707*

*Tree-ring date: after AD 1123*

This structure was located some 450 m south-east of the present sea wall. Overall it measured 16.2 m by 10.2 m, and faced into the ebb tide, comprising a zig-zag of three lines of closely-spaced roundwood uprights with remains of more substantial posts arranged in a sub-rectangular pattern at the surviving, downstream apex. It is best described by considering the main structural elements in turn.

The southernmost two lines of roundwood uprights, both 8 m long, together formed a V-shape, with an open mouth 11 m wide facing up-river, narrowing to an apex. Occasional horizontal lengths of roundwood suggested the former presence of wattling. Roundwood uprights spaced 0.15-0.2 m apart were predominantly alder and hazel with occasional occurrences of beech, oak and ash. Sampled alder stems were 25-55 mm in diameter with a mean of 44 mm compared with a diameter range of 19-30 mm and a mean of 24 mm for those of hazel. Analysis of the individually numbered samples from the southernmost arm suggest that originally most uprights were alder with ash or beech stems placed at approximately 2 m intervals. The oak and thin hazel uprights occurred only in the central portion of the arm's length, and possibly represent a repair. At the apex, a sub-rectangular

arrangement of substantial roundwood and split-oak uprights, along with hazel, alder and ash uprights, measured 3.8 m long and 1.2 m wide at its mouth, narrowing to 0.6 m at the rear. No basketry, indicative of the former presence of a fish basket, was observed here.

A third line of roundwood uprights ran for 7.6 m from the northern end of the mouth of the more complete V-shape to the south. At its west end, a single split oak post survived.

*Interpretation*

The spatial relationships of the structures making up the group of V-shaped traps at the eastern edge of the survey area, in conjunction with the tree-ring dating, raises a number of issues. The manner in which the northern arm of Structure 13 overlaps with the southern arm of Structure 14, and its southern arm overlaps with Structure 19, make it highly improbable that all three traps could have operated at the same time. Unfortunately no tree-ring dates were forthcoming for Structure 13. Similarly, it seems unlikely that Structure 8 could have operated efficiently while Structures 6 and 7 were in good order. Caution is required in interpretation of the tree-ring dates, as reuse of oak posts in the repair of existing traps or the construction of new ones seems probable given the lack of readily available timber in the immediate vicinity. On balance, however, the evidence points to the construction of a rough line of traps, perhaps consisting of Structures 6, 7, 14 and 19 during the period AD 1115-1120, and the later repair of at least Structures 7 and 19 around AD 1150. The dating of a sub-rectangular group of posts (Structure 9) to AD 1190 suggests it then replaced Structure 6, while, at some stage, Structure 13 replaced Structures 14 and 19.

The distinctive form of Structure 3, along with detailed species identification and tree-ring dating (albeit only a *terminus post quem*) allows fairly confident reconstruction of at least parts of this fishing structure. The evidence suggests the former presence of at least two apparently contemporary traps. These faced into the ebb tide and so were designed to catch fish only on the falling tide. The evidence for horizontal wattling was limited to occasional, poorly-preserved fragments, and it is debatable whether the arms were constructed by pushing closely-spaced roundwood alder stems into the contemporary foreshore in lines and then weaving horizontals between them, or pre-built

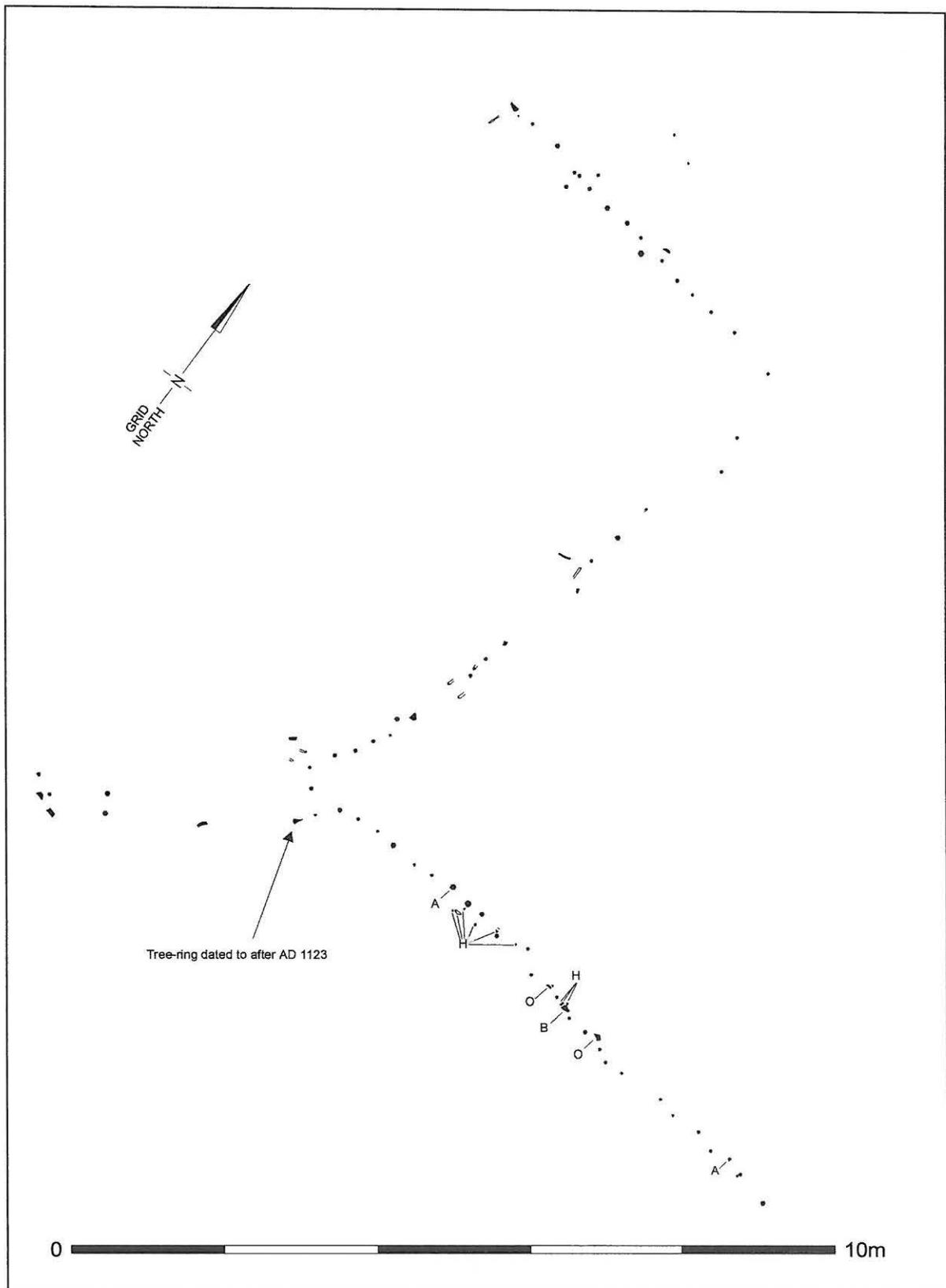


Figure 3: Magor Pill, fishtrap Structure 3. Wood identifications of the individually sampled uprights of the southernmost arm are indicated by 'O' = Oak, 'A' = Ash, 'B' = Beech, 'H' = Hazel. Unlabelled uprights from this arm were identified as alder.

hurdle panels were transported to the construction site. Given the erosion of the former foreshore surface, indicated by the very shallow depth of some of the uprights recorded, the paucity of evidence for wattling is perhaps unsurprising and its former presence should not be discounted. Individual sampling of the southernmost arm of this structure (Figure 2), suggests the use of more substantial uprights of ash, beech or oak at approximately 2 m intervals and the possible repair of the middle part of this arm with hazel wattling.

Consideration of taphonomic processes is also necessary when interpreting the concentration of posts located at the apex of two of the surviving arms. The presence of more substantial, often converted, wooden posts encourage the view that these held either a woven basket or a tapering net, which has not survived.

### Linear Structures with V-shaped Features

Five linear structures located as far, or further, from the sea wall than the V-shaped traps described above exhibited a number of common characteristics including the use of native hardwood species, and regular, V-shaped concentrations of posts along their lengths.

#### *Structure 4 ST 44563 84739*

##### *Tree-ring date range AD 1242-73*

Located some 14 m east of Structure 3, this structure survived as at least 55 uprights concentrated along a single line running for 35.7 m. These uprights were generally 2-2.5 m apart with less frequent, often smaller uprights located to the west. Substantial uprights located along the main line were predominantly radially split oak 60-100 mm wide, although some split beech uprights were encountered. Smaller roundwood uprights, either of alder or hazel were encountered to the west of this main line.

#### *Structure 15 (Figure 4) ST 44670 84622*

##### *Tree-ring date: after AD 1172*

This structure had at least eleven, V-shaped groups of posts along its 41 m length, giving a maximum depth of 3.2 m. These concentrations of posts were especially clear to the north where the V-shapes were

generally c1.5 m wide at the 'mouth' and 2.25-2.5 m deep with centre-to-centre distance between V's of c2.75 m. Remains of baskets were observed at two locations. One was reminiscent of the portable eel traps noted by Jenkins (1974, 278) whilst the other could have been the remains of a basket associated with this structure. Posts were either split oak or roundwood (predominantly willow, oak and ash with lesser quantities of alder, beech, hazel, and holly). The maximum width/diameter of sampled posts ranged between 20 and 90 mm with a mean of 53 mm.

#### *Structure 16 (Figure 4) ST 44551 84597*

This structure ran from the north-east seaward to the south-west for an overall distance of 37.7 m, with a maximum depth 3.75 m. At least nine V-shaped groups of stakes, with their mouths facing into the ebb tide were observed. The post settings were less well defined than those observed elsewhere, in part due to the presence of overlying semi-mobile sediment. The clusters of posts tended to be 2-2.5 m deep with the centre-to-centre distance between V-shaped groups being 3.0-3.5 m. Posts were split oak or roundwood willow, beech, oak or alder with diameters between 30 mm and 95 mm.

#### *Structure 17 ST 44501 84532*

##### *Radiocarbon date 320±40 BP (SWAN-279)*

Located at a similar distance from the present coastline to Structures 15, 16 and 20, this structure stretched from north-west to south-east for some 26 m with a maximum width of 4.1 m. Better-preserved sections comprised an irregular double row of uprights including split oak posts generally 1-1.4 m wide with V-shaped groups of generally slighter roundwood uprights 'behind' these with their apices to the south-west. The distance between these apices can be as little as 0.8 m. The roundwood ranged in diameter 25-80 mm with a mean of 40 mm, consisting predominantly of oak with frequent hazel and elm and occasional ash, holly and willow.

The distribution of the surviving V-shaped groups of posts along the length of this linear structure may be the product of renovation or repair in addition to initial construction and subsequent erosion. The density of the groups at the south-west end seems too great to permit contemporary use of as many basket traps as the surviving posts suggest.

Nonetheless the overall form of the trap is highly suggestive of the former presence of regularly-spaced basket traps grouped as a linear weir facing into the ebb tide. Towards its northern end, where preservation is poorest, only the double row of forward posts survives encouraging caution when interpreting other structures where erosion or poor visibility could have prevented observation of more fragile supports for the butt end of baskets.

*Structure 20 ST 44062 84668*

*Tree-ring date: after AD 1189*

Some 450 m from the present sea wall, two linear concentrations of posts were recorded in 1996. Although no attempt was made to clean the area, and only clearly visible posts were recorded, it was evident that the 60 m long, east-north-east facing line of posts consisted of at least nine V-shaped groups. Their size and spacing suggest that they formed a line of large basket traps similar to the three part baskets known locally as putts (see above) Their orientation indicates that they were designed to take fish on the falling tide. Samples from two of the V-shaped groups gave dendrochronological dates of AD 1176++ and AD 1179++ implying construction probably in the 13th century. A second irregular line of less well defined posts, some 50 m long and north-east facing, remains undated but probably represents a separate phase, implying continuity of use.

*Interpretation*

Two of the structures located furthest from the present shoreline, Structures 15 and 20, have been dated by dendrochronology to the late 12th century or later. A radiocarbon sample from Structure 17 gave a d13-corrected age determination of 320±40 BP (SWAN-279) which, when calibrated to two standard deviations, gave a date range of 1470-1650 cal AD (Bronk Ramsey 1994, Stuiver and Kra 1986). This suggests construction after that of the majority of the V-shaped traps described above. Whilst some could have acted in conjunction with groups of V-shaped traps slightly further inland, their form shows that they were not simply leaders designed to funnel fish inshore. The regular clusters of uprights along the length of these linear structures in V-pattern configurations suggest the presence of basket traps. Split oak posts form the most substantial elements while a wide range of other, native species including both beech and holly is employed (Table 1).

Structure 16, although undated, would seem to fall into the same category with clusters of post in V-patterns along its length and the use of a similar range of wood species. The identification of elm in Structure 17 is perhaps surprising as this species is more usually encountered in post-medieval contexts, although it has been identified in medieval fishing structures from the Sudbrook area (Johnson 1993, 33). Structure 4, dated to the mid to late-13th century, although located further inland than Structures 15-17 and 20, is similar in form, being a linear structure with limited evidence for the presence of baskets. Together these weirs could be seen as a development in trap form from the large V-shaped traps (Structure 3 and group1) dated to the 12th century. As a whole, this category exhibit a number of similarities to sites 2, 4, 5 and 6 recorded at Sudbrook/Caldicot Pill (Godbold and Turner 1993, 1994) which have been dated by dendrochronology (site 5) to the beginning of the 13th century, and by radiocarbon to the 13th to 15th centuries. This category of weir may be of the form constructed by one John Bridde of Magor in AD 1411-12 at 'Erlisgout', near the Cistercian grange at Lower Moor (Williams 1976, 135) located just inland of Magor Pill. This rare example of detailed documentary evidence for the medieval construction of a fish weir at an identifiable location highlights the role of monastic orders in the development of fisheries in the estuary.

**Linear structures containing non-native softwoods**

Structures 1, 2 and 5 are located at similar distances from the present foreshore, and are constructed primarily from larch/spruce and oak. The usage of introduced (or imported) softwoods implies a relatively late date for this group, probably no earlier than the 18th century. Structures 1 and 5 are markedly similar in form comprising double rows of posts approximately 1 m apart. This distance between the rows seems rather short if these are weirs designed to accommodate the putcher traps described by Jenkins (1974, 46) and Davis (1958, 47) as generally being five to six feet in length. The longitudinal spacing of the posts certainly precludes the use of putts, or the construction of putcher ranks where two or three rows of baskets, one on top of the other, were usually secured by vertical posts between every third or fourth basket. The use of fixed nets does not appear to have a long tradition in the estuary, and again the density of the posts is not

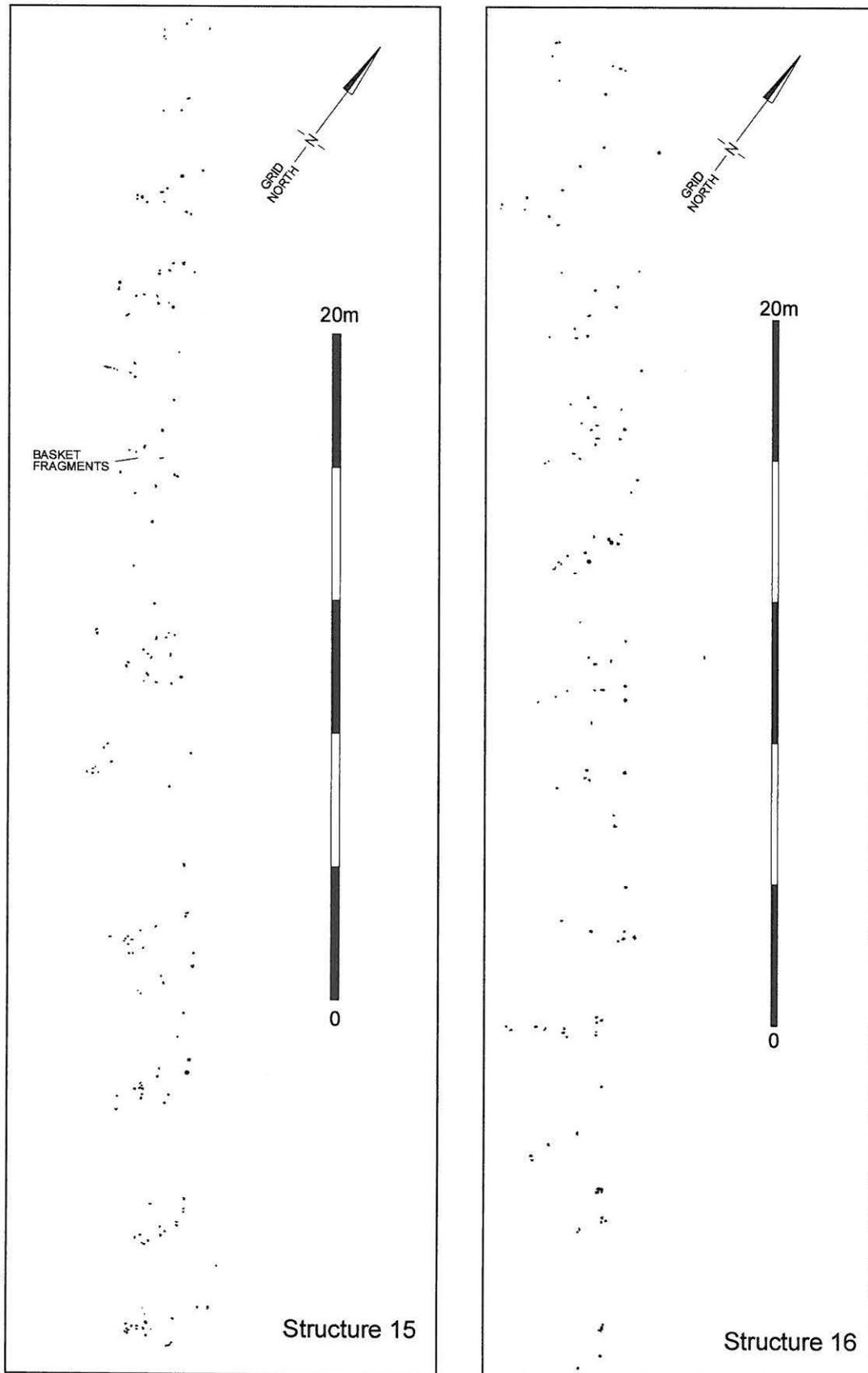


Figure 4: Magor Pill, linear fishtrap structures 15 and 16. Note the V-shaped concentrations of posts along the length of the weirs indicating the former position of basket traps.

characteristic of the post settings normally associated with stop nets. The function of these structures may be resolved by further documentary research. At present, their most probable interpretations are either as fish weirs securing putcher type traps in a manner not seen in the recent past, or as leaders, drawing fish towards traps further inland.

**Structure 1 (Figure 5) ST 44405 84721**

**Radiocarbon date 260±40 BP (SWAN-278)**

The northern end of this structure was located 325 m south-east of the present sea wall. A total of 125 posts were traced on a nearly north-west to south-east alignment over a distance of 86.75 m. A modern line of scaffold poles continued the line to the south-east.

The timbers formed an irregular double row of posts generally 0.9-1.0 m apart with no clear evidence for pairing. The posts within each row tended to be 1-2 m apart. Where there was less mobile sediment obscuring the foreshore, additional, usually smaller posts were noted further to the west of these lines. Field observations in conjunction with wood identifications indicate that the majority of the posts consisted of larch/spruce in the round (ie unconverted). Approximately 5% of the posts were oak with occasional occurrences of ash and beech, and less than 10% of the posts had been converted.

**Structure 2 ST 44469 84733**

This structure was located some 60 m north-east of Structure 1. At least 25 posts were observed running on a north-west to south-east alignment over a distance of 25 m. The remains were both poorly preserved and exposed. Frequently posts had collapsed and the distances between them were irregular. Although the structure largely comprised posts in a single line, often 2.0-2.5 m apart, rare occurrences of posts forward or behind this line were observed, giving a maximum observed width of 2.15 m. The timbers were generally in the round, 60-80 mm in diameter and either larch/spruce or oak with occasional occurrences of ash and beech.

**Structure 5 ST 44647 84848**

The north-west end of this structure, which ran for 71.5 m to the south-east, was located some 370 m south-east of the sea wall. It comprised an

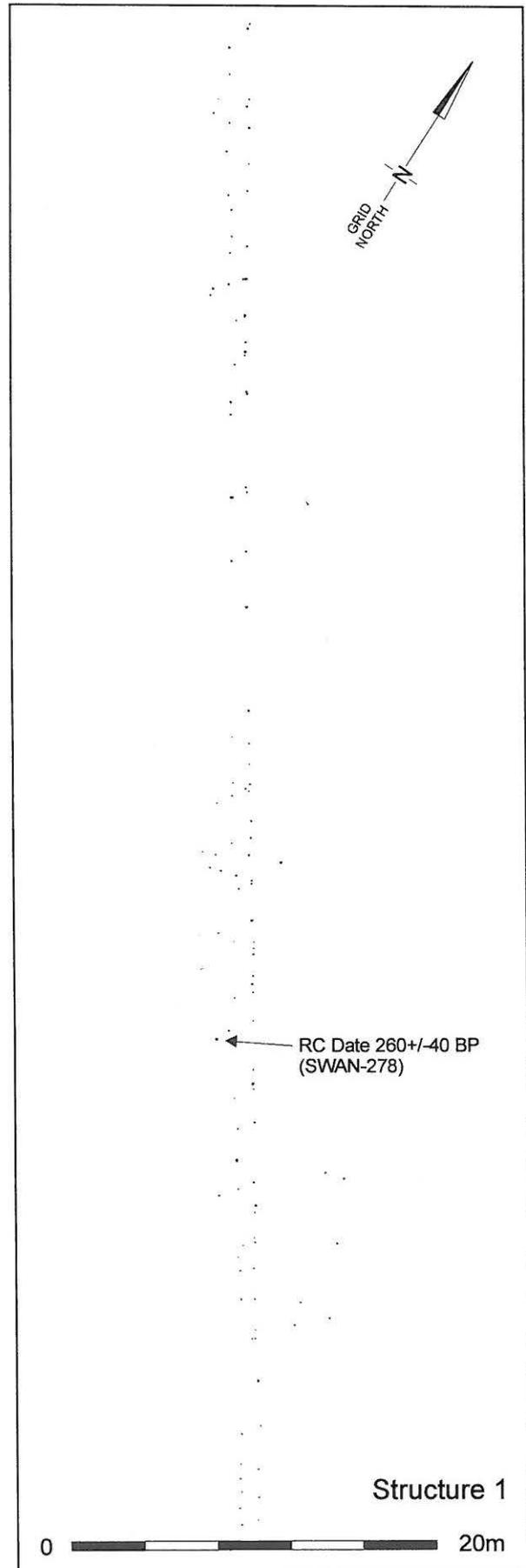


Figure 5: Magor Pill, structure 1.

intermittent double row of posts, 0.8-1 m apart with posts of the same row 1-2 m apart. The eastern line comprised predominantly oak posts, often split in half, at approximately 1 m intervals. The western line appeared more mixed comprising both split oak uprights and larch/spruce roundwood posts. The structure was not cleaned extensively, so a number of apparent gaps in the structure are likely to be a function of partial exposure or erosion.

### *Interpretation*

A radiocarbon sample from Structure 1 gave a  $\delta^{13}\text{C}$ -corrected age determination of  $260 \pm 40$  BP (SWAN-278) which, when calibrated to two standard deviations, gave date ranges of 1490-1680 cal AD and 1740-1800 cal AD (Bronk Ramsey 1994, Stuiver and Kra 1986). The dominance of larch/spruce in the wood composition points to a post-medieval date for construction. Hyde and Harrison (1977, 53) give AD 1743 as an early planting date for an extant common larch tree at Brecon and describe the cultivation of larch as widespread in Wales during the 18th century. Norway spruce was one of the earliest introductions to Britain and was extensively employed in re-forestation schemes during the 18th century (Hyde and Harrison 1977, 49). The later date range given by the radiocarbon calibration is consistent with the wood identification evidence suggesting construction in the second half of the 18th century. The identification of larch/spruce in the other two structures within this group also suggests a similar date. The absence of evidence for hurdles or other forms of wattling may simply be a function of the highly-eroded nature of the trap. Although the post configurations would not be inconsistent with the use of some form of stake/kettle nets (cf Davis 1958), the use of such net weirs is not a recognised part of the local tradition (Jenkins 1974).

### **Structures at the peat shelf edge**

Two structures were recorded just to seaward of the present edge of the peat shelf. Structure 12 is similar both in form and wood species usage to Structures 1, 2 and 5 and could have been a putcher weir. The function of Structure 11 is less clear. Again, larch and oak predominate, but its form is unusual with a maximum width of 5 m. It may be that this concentration of posts represents two or more fish weirs. Given the location of these weirs, it seems unlikely that they could have been contemporary as

Structure 12 would have run along the face of Structure 11, assuming that any traps faced into the ebb tide.

### *Structure 11 ST 4406 8494*

This structure was located just seaward of the prehistoric peat shelf and to the west of Structure 18, running for an overall length of 22.7 m and with a maximum width of 5 m. Its posts, predominantly split oak and roundwood larch/spruce with occasional birch, ash and elm, were distributed in a grid-like pattern.

### *Interpretation*

The gridded pattern of the uprights would be consistent with the remains of a relatively modern putcher weir. The width of the structure suggests it could consist of more than one phase of construction.

### *Structure 12 ST 44066 84615*

This structure survived as an intermittent double line of posts with an overall length of 44.5 m and a width of 0.8-1.75 m. The posts were predominantly roundwood larch/spruce with frequent occurrences of split oak and occasional pieces of alder roundwood. The maximum width/diameter of sampled posts ranged between 20-160 mm with a mean of 92 mm.

### *Interpretation*

Although this structure was located nearer to the present shoreline than Structures 1, 2 and 5, the use of larch/spruce, indicates a post-medieval date, while the similarity of form suggests a similar function.

### *Structure 18 (Figure 6b) ST 44062 84668*

This structure survived with an overall length of 120 m and a maximum depth of 8.75 m. From its north-west end, the structure runs for 51.8 m to seaward on the upper peat shelf where it comprises a double row of posts 1.2 m apart. These rows continue across the lower peat shelf for 17.5 m, where only occasional posts were visible. There has clearly been erosion of the seaward face of the lower peat shelf since this structure's abandonment since for a distance of some 7.2 m from the present edge of the lower peat shelf to a concentration of stone, no posts survive. Thenceforth, the structure continues

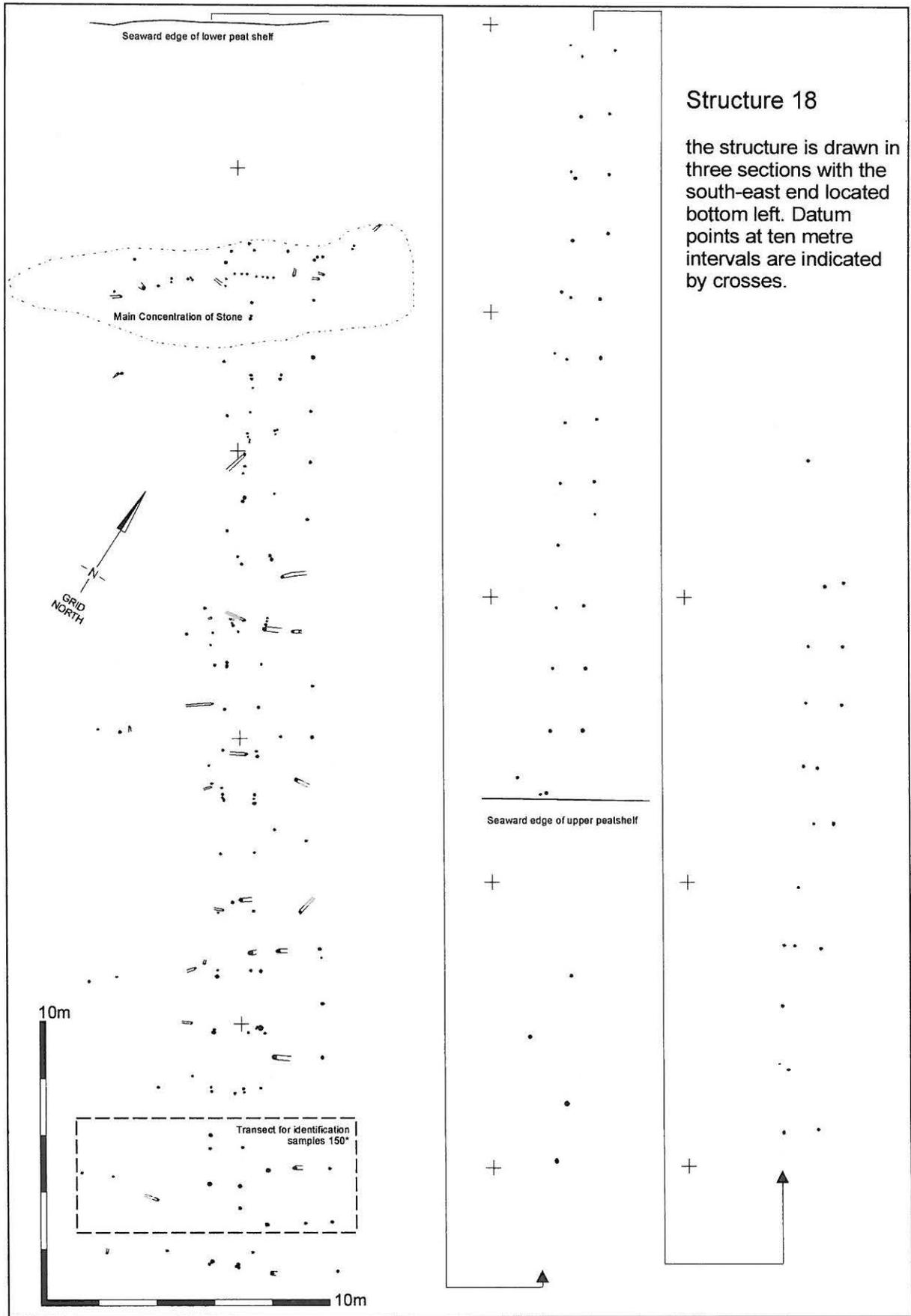


Figure 6: Magor Pill, structure 18.



no earlier than the 18th century, assuming construction from home-grown rather than imported timber. It has been suggested, on cartographic and sedimentary grounds (Allen and Rippon 1995), that the sea defences from at least the mid-18th century followed their present line. The distance from the landward end of these structures to the present seaward edge of the eroding peat shelves (80-130 m) may therefore reflect erosion of intertidal salt marsh rather than coastal erosion necessitating set-back of the sea wall itself. This process of erosion of the peat shelf is also seen in relation to the latest structure recorded which runs over both the peat surfaces and the lower foreshore. Despite the dumping of quantities of stone, it would appear that the peat shelf has been eroded back by some 7 m since abandonment of this putt weir in the 1930s. Hence, the mapping and dating of fishing structures can provide complementary evidence for historic coastal change.

A variety of trap forms were recorded by this survey. Structures comprising two arms of driven roundwood uprights some 20 m in length, facing into the ebb tide, with sub-rectangular concentrations of oak posts at their apices (presumably to secure basket traps) have been dated to the early to mid-12th century. These structures appear to have been built either in isolation or linear groups and to have required replacement or repair every 20-30 years. Linear structures, dated to the late-12th century, or later, with V-shaped groups of stakes along their length, reflecting the use of wattle panels, parallel medieval weirs recorded at Caldicot Pill/Sudbrook. These medieval traps and weirs may be seen as precursors of the putt and putcher weirs which survived in use into the modern period. As additional fishing structures are recorded around the British coast, it may be possible to identify a tradition of weir construction that has already become distinctive to the Severn Estuary by the medieval period.

Some comment on the techniques employed extensively in this project, notably hand-held GPS (Global Positioning System) and dendrochronology, are perhaps pertinent.

The intertidal zone can be a difficult environment within which to carry out archaeological fieldwork, in part due to the lack of nearby, previously mapped features to which archaeology under investigation can be related spatially. The hand-held GPS system employed proved useful in providing an approximate ( $\pm 20$ m) location for structures, which helped to relocate

features but lacked the accuracy possible with more bulky, and expensive, differential GPS hardware. It proved necessary to carry out a detailed EDM survey in order to locate the structures accurately in relation to the National Grid. Hand-held systems have been primarily of use as navigational aids but, as the American military have recently stopped degrading the signal from GPS satellites, their resolution should improve significantly.

Dendrochronology was successfully applied to the dating of ten of the fifteen structures sampled. Post-medieval structures tended to contain few, if any, oak posts and none were dated. The oak posts within the medieval structures were relatively insubstantial but with *in situ* assessment of their dating potential and careful sampling, it proved possible to generate well-replicated and datable tree-ring sequences. The results suggest that similar structures encountered elsewhere in the Estuary could be dated by this technique but that detailed assessment and sampling *in the field* is necessary if their full potential is to be realised.

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