CASTING THE NET WIDER: FURTHER DATING AND DISCUSSION OF FISH TRAPS RECORDED BY THE SEVERN ESTUARY RAPID COASTAL ZONE ASSESSMENT SURVEY

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A summary of the fishing structures recorded by the Severn Estuary Rapid Coastal Zone Assessment Survey (RCZAS) was published in the previous volume of this journal (Chadwick and Catchpole 2011). This follow-on paper presents the results of a second round of radiocarbon dating of timber samples from Gloucestershire and Somerset fisheries and includes a discussion of the evidence for wood use recorded during the entire RCZAS project. It concludes with suggestions for future research arising from the project.

INTRODUCTION

The background to the English Heritage funded Severn Estuary Rapid Coastal Zone Assessment Survey (RCZAS), see Figure 1, and a summary of the results, primarily a description and discussion of the types of fishing structures recorded, has previously been published in this journal (Chadwick and Catchpole 2011). Information contained in that paper will not be repeated here. The purpose of this follow-on article is to publish further radiocarbon dates produced since 2011, to expand the discussion of the results to include a comparison between our evidence for wood use

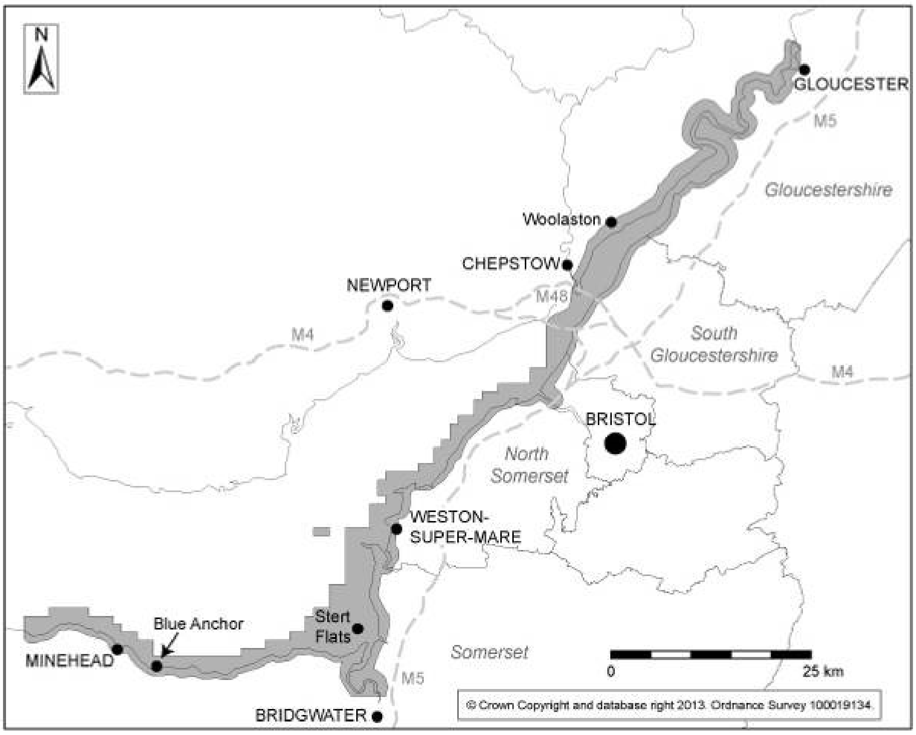

Figure 1: The RCZAS project area, larger towns (capitalised) and location of Round 2 dated samples.

and other medieval fish weir sites in the UK, and finally to summarise further research recommendations that arose from the entire RCZAS project.

No additional fieldwork has been undertaken by the project team since 2011. The three volumes of the final typescript project report have been completed (Chadwick and Catchpole 2013). They were submitted to English Heritage in February 2013 and are now available for download from the English Heritage website (http://www.english-heritage.org.uk/publications/severn-estuary-rczas-phase2/). They include a far fuller description of all the types of features recorded in the estuary than is possible here. All project reports and relevant digital survey records have been sent to the Historic Environment Records for Gloucestershire, South Gloucestershire, Bristol, North Somerset, Somerset and Exmoor. The full digital archive from the project will be submitted to the Archaeological Data Service (ADS).

As a result of the first round of radiocarbon dating and the published descriptions, it was recognised that the RCZAS had identified a nationally rare collection of fishing structures spanning from early medieval to post-medieval in date. English Heritage accordingly provided funding for a further round of radiocarbon dating, the identification to species of all timber samples, and the production of this report. The English Heritage Scientific Dating team organised the second round of radiocarbon dating and also assessed the suitability of an oar-like timber recovered from the foreshore at Beachley, Gloucestershire, for dendrochronological dating. Due to it comprising a single ash sample with no comparators, the object was found to be unsuitable for dating, and no further research has been undertaken into it. Three further samples, from timber fish traps located on Stert Flats, are to be dendrochronologically dated by Nigel Nayling, for English Heritage, outside of the RCZAS project. The results are due to be reported in a revised version of the Centre for Archaeology report 43/2004 (Groves *et al* 2004).

In early 2012 a prioritised list of structures, which merited being assessed for the further dating programme, was agreed between the authors and Peter Marshall of the English Heritage Scientific Dating team. Unfortunately, one of the three boxes of timber samples was lost en route to English Heritage at Fort Cumberland. The samples which remained from the selected structures were then assessed for suitable short-lived material and a limited number of samples were put forward to be dated. The oak timbers had previously been identified by Richard Brunning and the dated samples were identified to species by English Heritage. All remaining samples were identified at the York Archaeological Trust.

DATED FEATURES

Woolaston

An alder and oak woven fish basket from Grange Pill, Woolaston, Glos (Fig 2), which was located within the group (line 10326) of individual fish baskets reported upon in 2011 (Chadwick and Catchpole 2011, 61), has been dated. Seven roundwood stakes were taken from the fish basket at sample point 89 (SO 5918 9799) and two of these have been dated. Radiocarbon measurements on these timbers (89B; 1056±25 BP; OxA-26228, and 89G; 1095±30 BP; SUERC-40144) are statistically consistent (T'=1.0; (T'(5%)=3.8; v=1; Ward and Wilson 1978) and could be of the same age. The best estimate for the construction of the fish basket is *cal AD 945–1025* (88*% probability;*

Figure 2: The area of foreshore containing fish baskets at Grange Pill, Woolaston (Line No. 10326)

build_Woolaston: Fig 6).

Stert Flats

None of the features sampled by the RCZAS at Stert Flats were included in the first round of radiocarbon dating, as previous work had suggested the area was in use during the eighth to thirteenth centuries and again in the later post-medieval period (Brunning 2008, 70 and 72). Due to the evidence for both tidal scouring and the burial of features encountered by the RCZAS field team and the difficulty of gaining access to the area, however, it was decided to assess the samples from Stert Flats for the second round of dating. Only two structures provided samples that survived both the loss and the assessment of suitability.

Structure 10271 (Fig 3) was one of the westernmost and best preserved of the larger V-shaped wooden fish traps at Stert Flats. The apex was formed by larger split oak stakes that presumably had once supported a woven catch basket. The surviving elements of the arms or leaders were constructed using single lines of small, roundwood stakes. The northern arm of this structure survived better than the southern. The apex was located on the edge of a short length of broadly north-south orientated shingle ridge (at ST 2712 4884), so may have been deliberately sited to take advantage of this position during the ebb tide (although of course the shingle may have shifted since it was in use). Radiocarbon measurements on two oak timbers from the fish trap (10271A; 931±26 BP; OxA-26226, and 10271B; 905±30 BP; SUERC-40143) are statistically consistent (T'=0.4; (T'(5%)=3.8; ν=1; Ward and Wilson 1978) and could be of the same age. The best estimate for the construction of the fish trap is Cal AD 1045–1190 (95% probability; build_stert_flats: see Fig 6).

Sample 30021 (ST 2717 4867) was taken from a far more fragmentary line of roundwood stakes (line 20120), thought to represent a fish trap arm (Fig 4). Radiocarbon measurements on two stakes (30021H; 932±26 BP; OxA-26225, and 30021G; 1035±30 BP; SUERC-40142) are not statistically consistent (T'=6.7; (T'(5%)=3.8; ν=1; Ward and Wilson 1978). One of these results could be a statistical outlier, or the later result (OxA-26225) may represent later activity associated with the use of the structure, or the earlier result (SUERC-40142) re-use of a stake.

Blue Anchor

Unfortunately it has only proved possible to date timbers associated with one Somerset stone weir as part of the RCZAS. There is a pressing need for further research before even a basic outline of the chronology and development of this form of trap can be presented. It is usually difficult to discern whether stakes were integral to the construction of the remaining stone weirs, or if they related to earlier structures. In many cases, however, the timbers were located at the apex or 'guts' or along the outer side of the arm of the stone structures, where they must at the very least represent the use of the same site over time.

A series of oak stakes were recovered from underneath the dispersed leader arm of a stone fish weir at Blue Anchor Bay (Fig 5; Line 20039, centred at ST 0193 4403). The stakes were

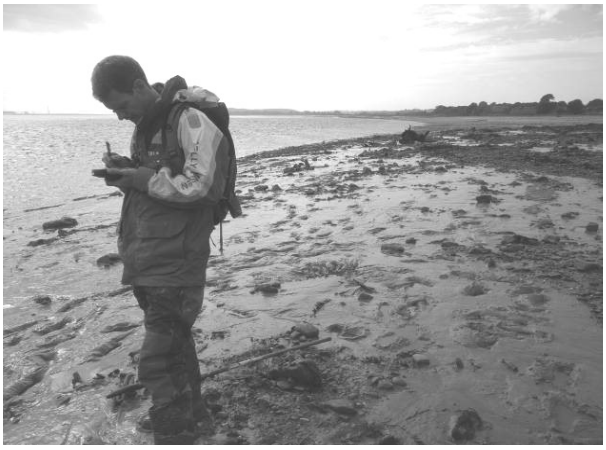

Figure 3: Split oak states at the apex of a V-shaped fish trap (Line No. 10271) at Stert Flats.

Figure 4: Richard Brunning sampling round-wood stakes from a fish trap leader arm at Stert Flats (line 20120)

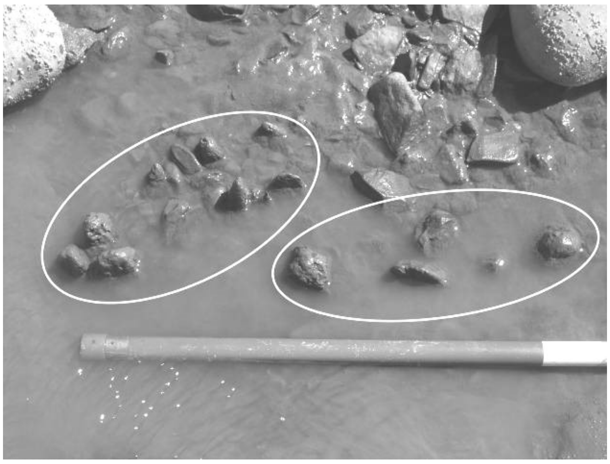

Figure 5: Wooden stakes (circled) underneath the eroding leader arm of a stone fish weir in Blue Anchor Bay, Somerset. (Line No. 20039).

densely packed, forming a near continuous line with no gaps. The short length of the extracted stakes suggests that others could have been lost to erosion in the recent past. Some of the timbers displayed axe cuts made by iron (or steel) blades. Radiocarbon measurements on two stakes from below the stone fish weir (30008-4; 974±25 BP; OxA-26227, and 30008-6; 1010±30 BP; SUERC-40148) are statistically consistent (T'=0.9; (T'(5%)=3.8; *v*=1; Ward and Wilson 1978) and could be of the same age. The best estimate for the construction of the stone fish weir is Cal AD 1010 –1060 (57% probability; build_blue_anchor: see Fig 6) or Cal AD 1075–1155 (38% probability).

DETAILS OF RADIOCARBON DATING PROGRAMME

The information in this section was provided by Alex Bayliss, Head of Scientific Dating at English Heritage. Full results of the second round of dating are presented in Table 1. The samples were dated by Accelerator Mass Spectrometry (AMS) at the Scottish Universities Environmental Research Centre in East Kilbride (SUERC-) and the Oxford Radiocarbon Accelerator Unit (OxA-) respectively. The samples dated at SUERC were pre-treated using methods outlined in Hoper *et al* (1998), combusted following Vandeputte *et al* (1996), graphitized as described by Slota *et al* (1987), and measured by AMS (Xu *et al* 2004). The samples processed at OxA were pre-treated using a standard acid/base/acid method followed by an additional bleaching step (Brock *et al* 2010), combusted, converted to graphite, and dated as described by Bronk Ramsey *et al* (2004). Internal quality assurance procedures and international intercomparisons (Scott 2003; Scott *et al* 2010) indicate no laboratory offsets, and validate the measurement precision quoted.

The results reported in Table 1 are conventional radiocarbon ages (Stuiver and Polach 1977). The calibrated date ranges have been calculated by the maximum intercept method (Stuiver and Reimer 1986), using the program OxCal v4.1 (Bronk Ramsey 1995; 1998; 2001; 2009) and the IntCal09 data set (Reimer *et al*

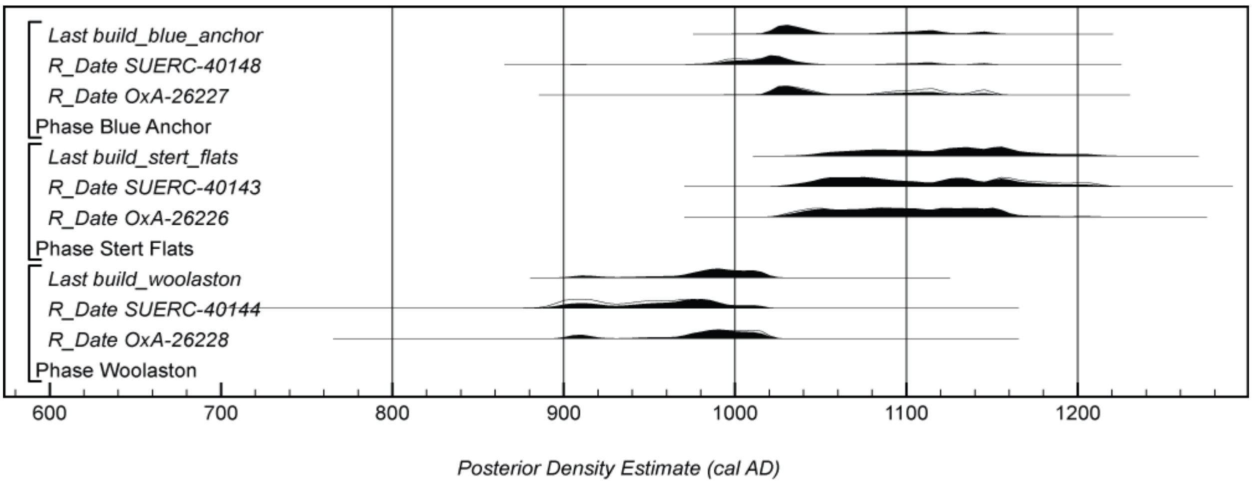

Figure 6: Probability distributions of dates from Woolaston, Stert Flats, and Blue Anchor: each distribution represents the relative probability that an event occurs at a particular time. For each of the radiocarbon dates two distributions have been plotted, one in outline, which is the result of simple calibration, and a solid one, which is based on the chronological model used (Figure courtesy of Peter Marshall).

2009). They are quoted in the form recommended by Mook (1986), rounded outwards to five years. The probability distributions of the calibrated dates, shown in Figure 7, have been calculated using the probability method (Stuiver and Reimer 1993), and the same data.

WOOD USE

The analysis of the surviving samples from the fieldwork has identified some significant patterns of woodland exploitation, in regard to species selection and seasonality. These limited results suggest that further random sampling of a range of wooden weirs of differing dates would enable a robust characterisation of the woodland resources selected for their construction, and how this changed over one and a half millennia.

SEASONALITY

In terms of the season of felling of the material used in the structures there is a remarkable consistency across all the structures from the early Anglo-Saxon to the post-medieval periods. All the material was felled in winter (71 samples), early spring (13) or spring (37) with no evidence of summer or autumn cutting. There are several probable reasons why those seasons were chosen. Woodland is easier to work over winter and in early spring, before the undergrowth becomes too thick. The trees are easier to cut and are less prone to subsequent decay before the sap rises. It is also the time in the farming calendar when there is more time available for this sort of task. The frequency and intensity of winter storms may also help to clear away deep sediment and thus make construction easier in the inter-tidal zone. Damage from such storms may also mean that repairs and rebuilding are more commonly required in winter and spring. There may also be a need to build or repair fishing structures in order to exploit seasonal fish migrations in late spring and early summer.

Table 1: Radiocarbon dates and stable isotope measurements from the second set of samples from the Severn Rapid Coastal Zone Assessment Survey

Lab. number	Sample	^{14}C age (BP)	δ^{13}C (‰)	Cal date (68%)	Cal date (95%)
Grange Pill, Woolaston (Point 89)					
OxA-26228	Line No. 10326, Point 89B, *Alnus* roundwood outer rings from a partly-exposed woven basket/wattling fishing structure.	1056±25	-26.09	Cal AD 980–1020	Cal AD 900–1025
SUERC-40144	Line 10326, Point 89G, *Quercus* sapwood outer rings from a partly-exposed woven basket/wattling fishing structure.	1095±30	-28.6	Cal AD 895–990	Cal AD 885–1020
Stert Flats (Sample 10271)					
OxA-26226	Sample 10271A, Line 10271, *Quercus* sapwood outer *c*. 5 rings from the apex of a stake built fish trap.	931±26	-25.47	Cal AD 1030–1160	Cal AD 1020–1170
SUERC-40143	Sample 10271B, Line 10271, *Quercus* fast-grown roundwood (outer *c*. 5 rings) from the apex of a stake built fish trap.	905±30	-26.9	Cal AD 1045–1170	Cal AD 1030–1215
Stert Flats (Line 20120, Sample 30021)					
OxA-26225	Sample 30021H, Line 20120, *Corylus*/*Alnus* outer *c*. 5 rings of roundwood stake from the fragmentary arm of a fish weir.	932±26	-25.84	Cal AD 1030–1160	Cal AD 1020–1170
SUERC-40142	Sample 30021G, Line 20120, *Corylus*/ *Alnus* outer 5 rings of roundwood stake forming the fragmentary arm of a fish weir.	1035±30	-27.1	Cal AD 985–1030	Cal AD 900–1030
Blue Anchor (Line 20039)					
OxA-26227	Point 30008–4, Line 20039, *Quercus* sapwood outer rings from a stake from line associated with a stone walled fish weir.	974±25	-27.21	Cal AD 1020–1120	Cal AD 1015–1155
SUERC-40148	Point 30008–6, Line 20039, *Quercus* sapwood outer rings from stake from line associated with a stone walled fish weir.	1010±30	-29.4	Cal AD 995–1030	Cal AD 985–1120

Table 3, attached to the end of this article,

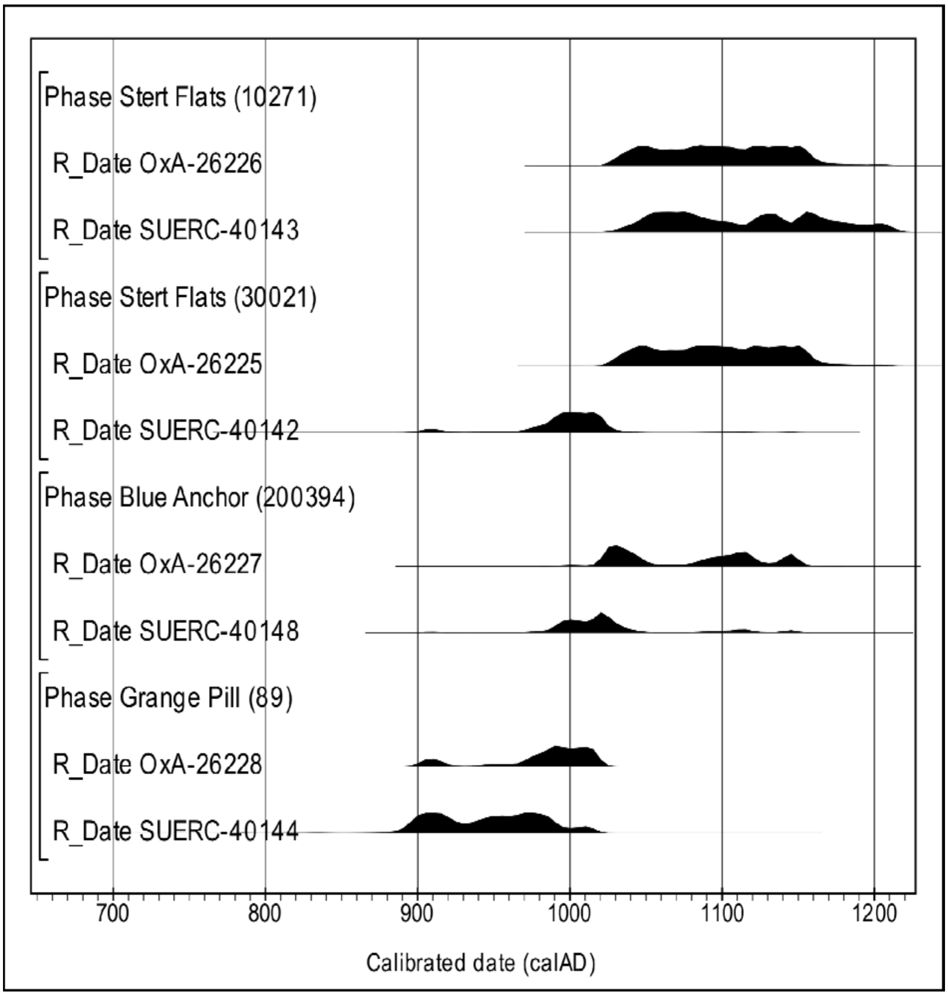

Figure 7: Calibration of radiocarbon results from the second set of samples from the Severn Rapid Coastal Zone Assessment Survey by the probability method (Stuiver and Reimer 1993)

details all the timber samples which were identified to species, ordered by place name from south to north on the shoreline of the Forest of Dean and then southwards along the coast from Gloucester to Porlock.

SPECIES SELECTION, SIZE AND CHARACTER

The available data on the size of wood used for dated weirs, baskets, and hurdles is presented in Table 2. Length is not included as that dimension is largely determined by erosion rather than the original size. The lengths were recorded and are available in the site archive. The species variation is distorted by the fact that oak is more resistant to decay and erosion than some of the other species, and is therefore more likely to survive to be sampled. In most of the structures the number of samples is too small to be meaningful though the range of oak, willow and alder from structure 10326 at Woolaston suggest that significant differences between the basket and the stakes would be apparent if more samples could be obtained in the future. Only six structures had a meaningful number of identifications, a late Anglo-Saxon/early Norman stone and wood weir at Blue Anchor Bay (20039), a post-medieval double stake alignment at Burnham-on-Sea (10264/5), and four stake alignments at Berrow that are probably all of post-medieval date.

The Blue Anchor stakes from the stone weir (20039) comprised 18 pieces of oak and one of alder and was composed of an unusual mixture of split timbers and roundwood. These had a wide age distribution of 5 to 55+ years, with an average of 18 years. The nine pieces of roundwood were 33–47+ mm in diameter (average 38 mm) with ages of 6–18+ years (average 10). The other ten timbers were all radially split oak, some of which had then been sub-divided tangentially. As there was hardly any sapwood present on the split timbers it is difficult to estimate the age of the trees being used. This pattern suggests that the builders were careful to use the species they

Site **H=hurdle W=weir** **B=basket**	**Split wood (mm)**		**Roundwood**				
			Age		**Diameter (mm)**		
	Width	**Thick**	**Range**	**Average**	**Range**	**Average**	**Sample No**
Early medieval (7th –10th centuries)							
Beachley 10343W					15–69	41	8
Aust/Oldbury Flats 10339 W					29–42	36	2
Aust/Oldbury Flats 10021 W					28–80	49	4
Woolaston 10326/89 W					25–67	37	7
Woolaston 10326/88 W					13–38	28	10
Woolaston 10326/87 H					22–48	39	4
Woolaston 10326/86 B					17–61	33	4
Woolaston 10326/90 B					11–25	16	13
Stert Flats 20120 W					30+–50+	40+	8
Stert Flats 10269 W					40–68	52	8
Stert Flats 10267 W	120–127	51–58	110+–145+	128			
Saxo-Norman (11th – early 13th centuries)							
Aust/Oldbury Flats 10332 W	54	31			16–53	32	7
Blue Anchor 20039 W	29–60	16–47	6–18+	10	33–47+	38	9
Stert Flats 10271 W	135	65	11–37	24	75	75	1
Stert Flats 20117 W					47–59	54	3
Post-medieval (17^{th}– 20th centuries)							
Aust/Oldbury Flats 10015 W					17–65	34	5
Berrow 10257 W			4–12	6.3	6–42	24	24
Berrow 10251 W			4–8	4.8	22–45	32	14
Berrow 10252 W			3–9	5	16–42	28	24
Berrow 10260 W			4–7	5.5	21–40	29	15
Burnham-on-Sea 10265 W					13–44	23	13
Burnham-on-Sea 10264 W			2–4	3.5	6–42	19	22
Burnham-on-Sea point 77			4	4	23–33	28	3
Stert Flats 10274 W			4–9	7	31+–56+	43+	11

Table 2: Sizes of dated wood samples

preferred but were not concerned about uniformity of size or shape, and were not exploiting a woodland resource managed by coppicing or pollarding of oak trees. It is possible that the split timbers were derived from the main trunk of mature oaks and the roundwood from the branches. The stakes from structure 20039 had been cut at shallow angles of 2–12 degrees leaving flat facets. The split timbers had mainly been cut along their narrow sides to produce a point while the roundwood was cut on all sides to leave a pencil shaped point.

The Burnham-on-Sea stake alignment (10264) was also dominated by one species — willow — which provided all 22 identifications. This material was cut from a young stand of uniform age, ranging from 2–4 years of age (average 3.5). The size of these stems ranged from 6–42 mm in diameter (average 19 mm). The large variation in size but uniformity in age may imply that the stand used may have been managed by coppicing or pollarding. The other lines of stakes (10265), that formed part of the same structure, used similar sized roundwood of 13–44 mm diameter (average 23 mm) while the stakes between the two lines were slightly larger (23–33 mm, average 28 mm).

The four, densely-packed lines of stakes on Berrow Beach (Brean Parish) have a similar character and are probably all post-medieval in date, although only 10257 has been dated. The species composition shows significant variation from the medieval structures by the complete absence of oak. Two of the structures (10252 and 10251) are largely composed of willow roundwood with the former also using a small number of alder and a single *Viburnum* stem. The other two lines (10257 and 10260) are dominated by alder, with the former structure being the most diverse, also containing willow, ash, hazel and pine. The absence of any larch, spruce or other species of recent introduction in the Burnham and Brean structures supports the impression gained from the condition of the stakes that they were probably constructed during the earlier part of their dated range.

The age of the material in the lines at Berrow is fairly consistent between the rows ranging from three to twelve years with averages of 4.8–6.3 years. The range of diameters was also similar at 16–45 mm, except in the most species diverse line (10257) where diameters as low as 6 mm were recorded. The average diameters were 29–32 mm and 24 mm at 10257. The two identifications of Douglas fir in structure 10226 at Minehead support the field observation that those stakes appeared relatively recent and are probably of nineteenth century or later date. The species is not native to the British Isles and was only introduced from North America in 1827 (Forestry Commission 2014). The presence of two elm posts in a probable putcher rank (10274) at Stert Flats suggests that this feature may also date from the last few centuries. This would accord with the observed condition of the wood. Further analysis of species and age may be able to establish significant differences in wood use amongst the post-medieval fishing structures.

The early medieval V-shaped weirs often use a combination of split oak timbers at their apex and roundwood in the leading arms. The size of the roundwood varies slightly in different structures but remains fairly consistent along the length of the estuary, although the largest material is used at Stert Flats where the structures may be more exposed to storm damage than sites further up the estuary. The average diameters of roundwood posts in the weirs were 41 mm at Beachley, 32–49 mm at Oldbury Flats, 28–37 mm at Woolaston and 47–75 mm at Stert Flats.

Unfortunately the lack of species identifications from the early medieval weirs precludes any significant characterisation of wood use from these structures. Obtaining significant numbers of samples from these early structures must be a key research priority for the future. The limited evidence from previous work at Stert Flats suggests the use of a wide range of species including alder, hazel, birch, ash and willow (Brunning 2008). This contrasts with the oak dominated composition at Blue Anchor (20039).

COMPARISONS WITH OTHER SITES

There is no comparable data on felling seasons from other weirs in the UK, so it is not known if this is a typical pattern. The data for species composition and size of wooden materials used in fish weirs in England remains very poor. In comparison far more detailed work has been undertaken in Ireland (O'Sullivan 2001) and France (Bernard *et al* 2012), with the examination and species identification of over a thousand samples from one Bronze Age fishing structure alone in Mont-Saint-Michel Bay, Normandy.

The evidence from early medieval V-shaped weirs in Ireland shows that roundwood posts varied significantly in their diameter

(O'Sullivan 2001). The fifth to seventh century AD weir (site 2) on the Fergus estuary used posts of 20–30 mm, while eleventh to twelfth century AD examples from the Deel estuary utilised larger material of 20–100 mm diameter. At Bunratty on the Shannon estuary, five weirs of eleventh to thirteenth century AD dates varied greatly in their use of roundwood, even in different building phases on the same weir, with diameters ranging from 20–30 mm to 40–100 mm. At Strangford Lough, the V- and L-shaped weirs of eighth to thirteenth century AD date were slightly bigger, 50–100 mm and mostly 70–90 mm in diameter (McErlean *et al* 2002), which is larger than the examples in the Severn and most of the other Irish estuaries. The fifth to eleventh century weirs at Holme Beach, Norfolk used posts of 20–200 mm in diameter although they were mostly less than 100 mm (Robertson and Ames 2010). The large late-seventh to eleventh century weir at Holbrook Bay, Suffolk, used posts of 90–110 mm diameter (Everett 2007).

On the Severn, two of the four thirteenth to fourteenth century weirs at Sudbrook (sites 2 and 5) had broad diameter ranges of 29–130 mm, while the other two used smaller material of 24–53 mm (site 4) and 35–75 mm (site 6) in range (Godbold and Turner 1994). The posts used in the twelfth-century weirs at Magor Pill were similar to those on the English side of the estuary, ranging from 17–76 mm in diameter (Nayling 2000). This evidence from across the British Isles shows considerable variation exists in the size of material used, but begins to suggest some possible patterning, with most of the Severn material sharing a similar range and being somewhat smaller than posts used in other areas such as Strangford, Norfolk and Suffolk. The absence of average diameter measurements, except at Magor Pill, precludes a more reliable examination of size distribution.

The species used in early medieval traps varies across the British Isles, as does the sample size. Alder, hazel, oak, ash, holly, beech, willow, field maple, Pomaceous fruitwood and birch were all utilised for posts with most structures showing at least three species even from small sample sizes. Hazel is dominant in the weirs at Magor Pill, several structures at Bunratty on the Shannon and at Chapel East Island on Strangford Lough. Alder is dominant at Chapel West Island and willow was mainly used for the posts of Site 2 in the Fergus estuary (Nayling 2000; O'Sullivan 2001 and McErlean *et al* 2002). In contrast, the five weirs at Sudbrook had a different composition dominated by oak and beech with significant quantities of elm, hazel and ash (Godbold and Turner 1994). The presence of posts and wattling of gorse/broom and elder from Baker's Point (FRS047) in Suffolk is a reminder that other surprising local variations are possible, although these structures may not be weirs (Everett 2007).

The presence of elm at Sudbrook is unusual in an early medieval structure as it usually appears in post-medieval weirs, as at structure 17 at Magor Pill (Cal AD 1470–1650; 320±40 BP, SWAN-279), the sixteenth to nineteenth century semi-circular structures at Holbrook Bay, Suffolk and the putcher rank (10274) at Stert Flats (Nayling 2000 and Everett 2007). The use of larch or spruce in weirs can also be useful for assigning eighteenth century or later dates to structures as in five double post rows at Magor Pill and one structure at Stert Flats (Nayling 2000 and Brunning 2008). The use of Douglas fir in structure 10226 at Minehead is paralleled in structure 18 at Magor Pill, suggesting that they both date from the nineteenth century or later (Nayling 2000).

The species use in the post-medieval structures at Berrow has a similarity with many of their medieval predecessors, except in the complete absence of oak. Further characterisation of the wood used in the structures in the Severn will undoubtedly be able to more firmly identify significant temporal and spatial patterns. For the post-medieval structures it may also provide a better and cheaper form of dating than radiocarbon. The fishing structures represent a rare opportunity to examine woodland utilisation and selection around the Severn over the last one and a half millennia.

FURTHER DISCUSSION OF THE FISH WEIRS OF THE SEVERN ESTUARY

The latest batch of dates obtained through the RCZAS project has added to a body of evidence that is unrivalled in the UK. A total of 42 weirs from the Severn now have dating evidence, 20 from radiocarbon dates, 12 from dendrochronology and ten from the species used in their construction. In addition radiocarbon dates are available for 11 baskets, four hurdle structures and one possible trackway.

The earliest form of weir is the individual V -shaped wooden weir, catching fish on the ebbing tide. These span the period from the seventh to the early thirteenth centuries, with the earliest examples occurring at Woolaston and Aust/ Oldbury Flats, and the tradition continuing longest at Stert Flats and Magor Pill. At their guts, they either had stakes to support catch baskets, or circles of stakes with woven wattling, the latter with narrow necks and inward pointing spikes to deter fish from leaving. Similar structures of the same broad date ranges, although of greatly varying overall size, are known from Norfolk, Suffolk, Essex, Strangford Lough, and the Fergus, Deel and Shannon Estuaries (Robertson and Ames 2010; Everett 2007; Strachan 1998; Heppell 2011; McErlean *et al* 2002 and O'Sullivan 2001). The development of these weirs may be related to changes in diet for religious reasons, coupled with an expanding population and the growing influence of monastic houses.

The dating from structure 20039 at Blue Anchor Bay shows that V-shaped composite weirs in stone and wood were being created by the eleventh century. Parallels can be seen in the eighth to tenth century Chapel Island West weir in Strangford Lough, which was stone-built but had wooden stakes in its eye (McErlean *et al* 2002); and from at least two V-shaped stone and post weirs from the Isle of Wight that date between the eleventh and thirteenth centuries (Loader 2008, and pers. comm.). Although the use of large wooden V-shaped weirs appears to be greatly reduced after the early thirteenth century on the Severn, the stone (and possible stone and wood composite structures) examples in West Somerset continue in use till the present day. The disappearance of the large wooden V-shaped weirs from the outer estuary is paralleled wherever they have been dated. This may be related to thirteenth century disputes over interference with navigation that famously led to article 33 in the Magna Carta that 'all fish weirs shall be removed from the Thames, the Medway, and throughout the whole of England, except on the sea coast' (British Library 2014).

Fishing structures did not disappear from the Severn from the thirteenth century, however. In the outer Severn Estuary the large wooden V-shaped weirs appear to have been replaced, at least in part, by long lines of continuous small V-shaped weirs. These are distinguished by having stake arrangements not just at their guts but also along their leader arms. They probably accommodated some form of basket, although none have been found in situ. Examples have been dated to Cal AD 1260–1420 (Site 2, 620±50 BP Beta-54823, Site 4, 620±60 BP Beta-54825 and Site 6, 640±60 BP Beta 54824) at Sudbrook, AD 1243–73, after 1172 and after 1189 (dendro dates for structures 4, 15 and 20) at Magor Pill; and the eleventh to seventeenth centuries (structures 20106/202 and 10282/054) at Stert Flats (Nayling 2000; Godbold and Turner 1994 and Brunning 2008). The double row of posts (structure 17) at Magor Pill is from the same date range as the Stert examples but may be slightly different in form.

These medieval and Tudor conjoined V-shaped structures can be distinguished from double rows of stakes that bear a close resemblance to the well-recorded structures used to hold putt baskets (Jenkins 1974a and b). At Stert Flats, putts appear to be a post-medieval introduction; they are thought to have been in use earlier in Gloucestershire but this remains to be tested through scientific dating. The lines containing larch and spruce at Magor Pill may have been used for the smaller putchers.

The long hedge weirs at Berrow and Brean may represent very large V- or U-shaped weirs, although this remains uncertain because of their poor exposure. It seems likely that they date from before the eighteenth century when larch/spruce and elm seem to become more common components in weirs. It had previously been assumed by the authors that the stone fish weirs of Somerset were of later origin than the wooden versions found further east and north in the Severn Estuary, and that they were predominantly a 'high medieval' or post-medieval tradition. Of course the need for constant repairs and the impossibility of dating the major construction components continues to make dating this class of monument difficult. If the major reason for the presence of stone rather than timber fish weirs is relative availability of building material (McDonnell 2001, 22), then there is really no reason to assume that stone weirs would necessarily have begun to be constructed later than wooden examples.

It is unclear whether the availability of suitable stone contributed to the continuation of the use of V-shaped weirs in west Somerset, after they had been replaced by putt and then putcher ranks further north, or if the type of structure chosen was dictated more by the tidal regimes and species of fish available or being sought. The fact that the stone weirs of Somerset continued in widespread use until fairly recently, and the wealth of written and oral records regarding their use, may have led researchers to assume that they represented a 500-year-old tradition when it seems now to be double that. The one dated example at

Blue Anchor clearly predates the earliest documentary source for west Somerset fish weirs, which relates to the gift of a Dunster fishery to the Priory by William de Mohen in the late twelfth century (Siraut 2009). The coastline from the Devon border as far as Watchet was claimed by Dunster Castle. Much of the written history of the coast centres on disputes over rights to fishing and wrecks between the Luttrell family, who owned the castle from the late-fourteenth century, and local lords (M. Siraut pers. comm.). This class of structure could clearly benefit from further integrated historical and archaeological research. The fishing rights held by major landowners, either on the coast or along the major rivers, were much prized. Even though fish traps and stations were often leased to others, their value will have contributed to the on-going use of these structures, which required major resources of materials and manual labour (Turner 2011, 81–2).

FUTURE RESEARCH SUGGESTIONS

One valuable outcome of the Severn Estuary RCZAS is that it has highlighted areas where future research-based fieldwork undertaken by university-based researchers and/or local archaeological societies would be extremely productive, assuming sufficient note is taken of the hazards of the intertidal environment.

Given current rates of erosion and their vulnerability, it is considered a matter of some urgency that more archaeological surveying work takes place on the complexes of stake-built fish traps and woven structures at Beachley, Waldings Pill, Woolaston/Grange Pill and Aust/Oldbury Flats. This needs to take the form of detailed scale planning and/or scanning or photogrammetric recording. This will not only constitute a form of preservation by record, as some of these structures are now rapidly eroding, but might also draw out further details of the construction and phasing of these features. Some limited 'cleaning' of the intertidal surface would undoubtedly be necessary in order to resolve details of these structures. Additional samples of wooden stakes could be taken as part of this work, provided that adequate funding for a programme of dating and analysis has been secured in advance. Further investigation of the size and species composition of the wooden components of the weirs throughout the estuary is required to identify and characterise significant spatial and temporal changes in the utilisation of local woodland. This is especially important for the medieval structures. As stated above, there still remains an urgent need to further investigate the origins and developmental sequence of stone built weirs.

Although peat and submerged forest deposits at Woolaston/Grange Pill, Hills Flats and Oldbury Flats have been the focus of previous work (eg Allen 1998a; Brown 2007a, 2007b; Brown and Allen 2007; Brown *et al*. 2006), some of these areas would benefit from additional future research investigations, especially the palaeochannel deposits at Grange Pill and Hill Pill. Future erosion might expose prehistoric structures associated with these palaeochannels. A palaeochannel identified by the Severn RCZAS Phase 2 fieldwork at Brean Beach/Berrow Flats (Line No. 20105) has the potential to preserve important palaeoenvironmental, faunal and artefactual remains.

The peat deposits recorded at Woodspring Bay have had no known previous investigation, and dating and characterising them is therefore an important goal. The peat and submerged forest deposits at Blue Anchor Bay and Minehead Bay are rapidly disappearing due to erosion. The Blue Anchor Bay deposits have had little work undertaken on them, and although the deposits at Minehead have been previously investigated, the next 5–10 years probably offer the last window of opportunity for researchers to carry out any further analyses at both of these locales.

In the absence of any local authority or English Heritage funding (and any low cost methods), for the preservation *in situ* of archaeological deposits eroding out of exposed stratigraphy, or their preservation by record, then it might be possible for research-led archaeological projects to investigate such locales instead. Geophysical survey and targeted excavation could be used to characterise and date these deposits, and might also establish the extent and nature of the Romano-British sites. If some of these remains are derived from small estuarine ports (Allen 1998b, 2009; Allen and Fulford 1992), then such work would provide extremely important additional evidence for trade and communications along the Severn. Any surviving remains of Roman period harbours and quays would have great national significance, as there have been few excavated outside London (Walsh *et al* 2010, 175). Within the Severn RCZAS study area for example, efforts to locate the Roman and early medieval waterfronts at Gloucester have to date proved negative (Hurst 1999, 123), and it is likely that there were waterfronts in the vicinity of Woolaston, Lydney, Oldbury and Combwich at least. Alternatively, beaching and unloading/ loading craft directly onto shores may also have been commonplace (Walsh *et al* 2010, 175), and there is thus the potential for finds of lost cargoes and artefacts. Several Roman-period iron billets were recently found at Oldbury Flats (Kurt Adams pers. comm.).

Finally, there is also considerable scope for a research project focusing on the post-medieval and early-modern fishing practices and lifeways along the Severn. This could combine the results of the Severn Estuary RCZAS with archive document and photographic research, the Environment Agency records of Certificates of Privilege and oral history testimonies, in order to document ways of life which are now almost outside living memory. Some smaller-scale historical studies have been published (eg Jenkins 1974a, 1974b, 2009; Taylor 1974), but these have not been linked to the archaeological evidence.

ACKNOWLEDGEMENTS

In addition to repeating thanks to all those mentioned in 2011 the authors would like to acknowledge the assistance and/or information provided by Becky Loader, Steve Ford and Ian Panter at York Archaeological Trust, Helen Keeley and Jan Wills. Thanks also go to the English Heritage Scientific Dating Team, particularly Peter Marshall and Alex Bayliss, for their further assistance.

Table 3: Selected list of RCZAS samples showing all timbers dated or identified to species.

Botanical name:	**Common English name:**
Acer *campestre* L.	Field maple
Alnus spp.	Alders, exact species not determinable
Corylus avellana L.	Hazel
Fraxinus excelsior L.	Ash
Pinus sylvestris L.	Scots pine
Pomoideae spp.	Apples, pears, hawthorns, exact species not determinable
Pseudotsuga menziesii	Douglas fir
Quercus spp.	Oaks, exact species not determinable
Salix spp.	Willows, exact species not determinable
Ulmus spp.	Elms, exact species not determinable
Viburnum opulus L. /*V. lantana* L.	Guelder rose/wayfaring tree

Place	**Line no.**	**Point/ Sam-ple**	**Feature type**	**Wood identification**	**Ann. rings**	**Felled/ cut**	**Calibrated date (95% conf)/other**
Beachley	10004	104	fish trap	*Quercus* spp.			
Beachley	10004	11/3	fish trap	*Quercus* (immature)	11	winter	
Beachley	10006	105		*Ulmus* spp.			
Beachley	10343	106A	Fish trap	*Quercus* spp.	14		
Beachley	10343	106D	Fish trap	*Quercus* (immature)	11	spring	
Beachley	10343	106E	Fish trap	*Quercus* spp.	12	spring	Cal AD 775–970
Beachley	10343	106G	Fish trap	*Quercus* spp.	12	spring	Cal AD 770–970
Beachley		Find no. 1	Oar	*Fraxinus excelsior* L			Unsuitable
Woolaston	10326	86A	Fish basket?	*Salix* spp.	*c*.12	uncertain	Cal AD 880–995
Woolaston	10326	86B	Fish basket?				Cal AD 895–1025
Woolaston	10326	88A	Fish basket?	*Salix* spp.	5	spring	Cal AD 900–1025
Woolaston	10326	88D	Fish basket?	*Salix* spp.	5	spring	Cal AD 890–1025
Woolaston	10326	89A	Fish basket?	*Alnus* spp.	6	winter	
Woolaston	10326	89B	Fish basket?	*Alnus* spp.			Cal AD 900–1025
Woolaston	10326	89E	Fish basket?	*Quercus* spp.	15		
Woolaston	10326	89F	Fish basket?	*Quercus* spp.	16		
Woolaston	10326	89G	Fish basket?	*Quercus* spp.	7		Cal AD 885–1020
Woolaston	10328	87A	Revetment/ fish trap	*Quercus* spp.	30		Cal AD 685–885
Woolaston	10328	87D	Revetment/ fish trap	*Quercus* spp.	14		Cal AD 830–990
Woolaston	10326/7	90B	Fish basket?	*Corylus avellana* L.	5	spring	Cal AD 895–1025
Woolaston	10326/7	90M	Fish basket?	*Corylus avellana* L.	5	spring	Cal AD 775–980
Aust	10015	92A	Fish trap	*Quercus* spp.			Cal AD 1665–1990
Aust	10015	92C	Fish trap	Pomoideae spp.	10	winter	Cal AD 1660–1955
Aust	10021	93A	Fish trap	*Quercus* spp.			Cal AD 660–775
Aust	10021	93B	Fish trap	*Corylus avellana* L.	9	winter	Cal AD 650–775
Aust	10032	100A	Fish trap	Pomoideae spp.	12	winter	Cal AD 1040–1215

Place	**Line no.**	**Point/ Sample**	**Feature type**	**Wood identification**	**Ann. rings**	**Felled/ cut**	**Calibrated date (95% conf)/other**
Aust	10032	100E	Fish trap	*Salix* spp.	20	winter	Cal AD 1045–1225
Aust	10032	99A	Fish trap	*Quercus* spp.	31		Cal AD 1025–1205
Aust	10032	99B	Fish trap	*Ulmus* spp.	11	spring	Cal AD 1180–1280
Aust	10339	94A	Fish trap	*Fraxinus excelsior* L.	5	winter	Cal AD 660–775
Aust	10339	94B	Fish trap	*Acer campestre* L.	15	winter	Cal AD 660–780
Aust	10041/ 10342	102A	Fish trap	*Quercus* spp.	20		
Brean	10251	68A	Fish trap?	*Salix* spp.	4	winter	
Brean	10251	68B	Fish trap?	*Salix* spp.	6	winter	
Brean	10251	68C	Fish trap?	*Salix* spp.	6	winter	
Brean	10251	68D	Fish trap?	*Salix* spp.	4	winter	
Brean	10251	68E	Fish trap?	*Salix* spp.	5	winter	
Brean	10251	68F	Fish trap?	*Salix* spp.	4	winter	
Brean	10251	68G	Fish trap?	*Salix* spp.	5	winter	
Brean	10251	68H	Fish trap?	*Salix* spp.	4	winter	
Brean	10251	68I	Fish trap?	*Salix* spp.	5	winter	
Brean	10251	68J	Fish trap?	*Salix* spp.	8	winter	
Brean	10251	68K	Fish trap?	*Salix* spp.	4	winter	
Brean	10251	68L	Fish trap?	*Salix* spp.	4	spring	
Brean	10251	68M	Fish trap?	*Salix* spp.	4	winter	
Brean	10251	68N	Fish trap?	*Salix* spp.	4	spring	
Brean	10252	69A	Fish trap?	*Alnus* spp.	6	winter	
Brean	10252	69B	Fish trap?	*Salix* spp.	5	winter	
Brean	10252	69C	Fish trap?	*Salix* spp.	5	winter	
Brean	10252	69D	Fish trap?	*Salix* spp.	8	winter	
Brean	10252	69E	Fish trap?	*Salix* spp.	7	winter	
Brean	10252	69F	Fish trap?	*Salix* spp.	4	early spring	
Brean	10252	69G	Fish trap?	*Salix* spp.	5	winter	
Brean	10252	69H	Fish trap?	*Salix* spp.	4	winter	
Brean	10252	69I	Fish trap?	*Salix* spp.	4	spring	
Brean	10252	69J	Fish trap?	*Salix* spp.	3	spring	
Brean	10252	69K	Fish trap?	*Salix* spp.	5	spring	
Brean	10252	69L	Fish trap?	*Alnus* spp.	4	winter	
Brean	10252	69M	Fish trap?	*Alnus* spp.	4	spring	
Brean	10252	69N	Fish trap?	*Salix* spp.	4	winter	
Brean	10252	69O	Fish trap?	*Alnus* spp.	5	early spring	
Brean	10252	69P	Fish trap?	*Salix* spp.	3	spring	
Brean	10252	69Q	Fish trap?	*Salix* spp.	4	early spring	

Place	**Line no.**	**Point/ Sample**	**Feature type**	**Wood identification**	**Ann. rings**	**Felled/ cut**	**Calibrated date (95% conf)/other**
Brean	10252	69R	Fish trap?	*Salix* spp.	4	winter	
Brean	10252	69S	Fish trap?	*Salix* spp.	3	spring	
Brean	10252	69T	Fish trap?	*Salix* spp.	7	winter	
Brean	10252	69U	Fish trap?	*Viburnum opulus* L./ *V. Lantana* L.	9	early spring	
Brean	10252	69V	Fish trap?	*Salix* spp.	4	spring	
Brean	10252	69W	Fish trap?	*Alnus* spp.	8	winter	
Brean	10252	69X	Fish trap?	*Salix* spp.	5	spring	
Brean	10257	70A	Fish trap?	*Salix* spp.	5	early spring	
Brean	10257	70B	Fish trap?	*Alnus* spp.	7	spring	Cal AD 1665–1950
Brean	10257	70C	Fish trap?	*Salix* spp.	5	early spring	
Brean	10257	70D	Fish trap?	*Alnus* spp.	4	spring	
Brean	10257	70E	Fish trap?	*Alnus* spp.	7	spring	
Brean	10257	70F	Fish trap?	*Corylus avellana* L.	8	spring	
Brean	10257	70G	Fish trap?	*Corylus avellana* L.	5	winter	
Brean	10257	70H	Fish trap?	*Alnus* spp.	8	winter	
Brean	10257	70I	Fish trap?	*Alnus* spp.	5	winter	
Brean	10257	70J	Fish trap?	Alnus spp.	6	spring	
Brean	10257	70K	Fish trap?	*Alnus* spp.	5	winter	
Brean	10257	70L	Fish trap?	*Alnus* spp.	5	winter	
Brean	10257	70M	Fish trap?	*Corylus avellana* L.	6	winter	
Brean	10257	70N	Fish trap?	*Fraxinus excelsior* L.	7	winter	
Brean	10257	70O	Fish trap?	*Corylus avellana* L.	7	winter	
Brean	10257	70P	Fish trap?	*Alnus* spp.	6	spring	
Brean	10257	70Q	Fish trap?	*Alnus* spp.	8	winter	
Brean	10257	70R	Fish trap?	*Alnus* spp.	9	winter	
Brean	10257	70S	Fish trap?	*Pinus sylvestris* L.			tangentially faced axe chipping
Brean	10257	70T	Fish trap?	*Corylus avellana* L.	4	winter	
Brean	10257	70U	Fish trap?	*Corylus avellana* L.	12	spring	Cal AD 1650–1955
Brean	10257	70V	Fish trap?	*Salix* spp.	7	winter	
Brean	10257	70W	Fish trap?	*Salix* spp.	6	winter	
Brean	10257	70X	Fish trap?	*Alnus* spp.	4	early spring	
Brean	10260	71A	Fish trap?	*Salix* spp.	4	winter	
Brean	10260	71B	Fish trap?	*Alnus* spp.	6	winter	
Brean	10260	71C	Fish trap?	*Alnus* spp.	6	spring	

Place	Line no.	Point/ Sample	Feature type	Wood identification	Ann. rings	Felled/ cut	Calibrated date (95% conf)/other
Brean	10260	71D	Fish trap?	*Alnus* spp.	5	winter	
Brean	10260	71E	Fish trap?	*Alnus* spp.	5	winter	
Brean	10260	71F	Fish trap?	*Alnus* spp.	6	spring	
Brean	10260	71G	Fish trap?	*Alnus* spp.	7	early spring	
Brean	10260	71H	Fish trap?	*Alnus* spp.	6	spring	
Brean	10260	71I	Fish trap?	*Alnus* spp.	5	winter	
Brean	10260	71J	Fish trap?	*Alnus* spp.	7	spring	
Brean	10260	71K	Fish trap?	*Alnus* spp.	4	spring	
Brean	10260	71L	Fish trap?	*Alnus* spp.	4	winter	
Brean	10260	71M	Fish trap?	*Alnus* spp.	5	winter	
Brean	10260	71N	Fish trap?	*Alnus* spp.	6	spring	
Brean	10260	71O	Fish trap?	*Alnus* spp.	7	winter	
Brean	N/A	50016/3	Stake	*Quercus* spp.			
Brean	N/A	50018/4	within peat	*Quercus* spp.			
Burnham	10264	76A	Trackway	*Salix* spp.	3	spring	
Burnham	10264	76B	Trackway	*Salix* spp.	3	early spring	
Burnham	10264	76C	Trackway	*Salix* spp.	4	winter	Cal AD 1650–1955
Burnham	10264	76D	Trackway	*Salix* spp.	3	spring	
Burnham	10264	76E	Trackway	*Salix* spp.	4	winter	
Burnham	10264	76F	Trackway	*Salix* spp.	4	early spring	
Burnham	10264	76G	Trackway	*Salix* spp.	4	winter	
Burnham	10264	76H	Trackway	*Salix* spp.	4	winter	
Burnham	10264	76I	Trackway	*Salix* spp.	4	winter	
Burnham	10264	76J	Trackway	*Salix* spp.	4	spring	
Burnham	10264	76K	Trackway	*Salix* spp.	5	winter	
Burnham	10264	76L	Trackway	*Salix* spp.	4	winter	
Burnham	10264	76M	Trackway	*Salix* spp.	4	winter	Cal AD 1640–1955
Burnham	10264	76N	Trackway	*Salix* spp.	3	early spring	
Burnham	10264	76O	Trackway	*Salix* spp.	2	early spring	

Place	**Line no.**	**Point/ Sample**	**Feature type**	**Wood identification**	**Ann. rings**	**Felled/ cut**	**Calibrated date (95% conf)/other**
Burnham	10264	76P	Trackway	*Salix* spp.	3	spring	
Burnham	10264	76Q	Trackway	*Salix* spp.	2	winter	
Burnham	10264	76R	Trackway	*Salix* spp.	2	early spring	
Burnham	10265	74J	Trackway	*Salix* spp.	4	spring	
Burnham	10264/5	77A	Trackway	*Salix* spp.	4	winter	
Burnham	10264/5	77B	Trackway	*Salix* spp.	4	winter	
Burnham	10264/5	77C	Trackway	*Salix* spp.	4	winter	
Stert Flats	10267	79A	Fish trap	*Quercus* spp.	*c*.100		Sent for dendro.
Stert Flats	10267	79B	Fish trap	*Quercus* spp.	*c*.145		Sent for dendro.
Stert Flats	10269	78A	Fish trap	*Quercus* spp.	18		
Stert Flats	10269	78B	Fish trap	*Salix* spp.	14	winter	
Stert Flats	10269	78C	Fish trap	*Quercus* spp.	16		
Stert Flats	10269	78D	Fish trap	*Quercus* spp.	13		
Stert Flats	10269	78E	Fish trap	*Salix* spp.	14	winter	
Stert Flats	10269	78F	Fish trap	*Quercus* spp.	9		
Stert Flats	10269	78G	Fish trap	*Quercus* spp.	14		
Stert Flats	10269	78H	Fish trap	*Salix* spp.	11	winter	
Stert Flats	10271	10271A	Fish trap	*Quercus* spp.	*c*.37		Cal AD 1020–1170
Stert Flats	10271	10271B	Fish trap	*Quercus* spp.	11		Cal AD 1030–1215
Stert Flats	10274	10274C	Putcher rank?	*Ulmus* spp.	4	spring	
Stert Flats	10274	10274H	Putcher rank?	*Ulmus* spp.	9	spring	
Stert Flats	10282	10282/3A	fish trap	*Quercus* spp.	*c*.45		Sent for dendro.
Stert Flats	10292	10292	Fish trap	*Quercus* spp.	*c*.47		
Stert Flats	20108	30016	Fish trap	*Quercus* spp.	*c*.36		
Stert Flats	20111	30017A	Fish trap	*Quercus* spp.	*c*.41		
Stert Flats	20111	30017B	Fish trap	*Corylus avellana* L.	34	winter	
Stert Flats	20117	30018A	Fish trap	*Alnus* spp.	7	early spring	
Stert Flats	20118	30019	Fish trap	*Quercus* spp.	*c*.20		
Stert Flats	N/A	81	Fish trap	*Quercus* spp.	7+		
Stert Flats	20120	30021G	Fish trap	*Corylus/Alnus*			Cal AD 900–1030
Stert Flats	20120	30021H	Fish trap	*Corylus/Alnus*			Cal AD 1020–1170
St Audries	10160	N/A	net hang	*Corylus avellana* L.	10	spring	

Place	**Line no.**	**Point/ Sample**	**Feature type**	**Wood identification**	**Ann. rings**	**Felled / cut**	**Calibrated date (95% conf)/other**
Blue Anchor	20039	30008-1	stone weir	*Quercus* spp.	*c*.46		
Blue Anchor	20039	30008-2	stone weir	*Quercus* spp.	*c*.46		
Blue Anchor	20039	30008-3	stone weir	*Quercus* spp.	*c*.55		
Blue Anchor	20039	30008-4	stone weir	*Quercus* spp.	*c*.9		Cal AD 1015–1155
Blue Anchor	20039	30008-5	stone weir	*Quercus* spp.	*c*.9		
Blue Anchor	20039	30008-6	stone weir	*Quercus* spp.	*c*.9		Cal AD 985–1120
Blue Anchor	20039	30008-7	stone weir	*Quercus* (immature)	5	winter	
Blue Anchor	20039	30008-8	stone weir	*Alnus* spp.	9	winter	
Blue Anchor	20039	30008-10	stone weir	Quercus spp.	*c*.18		
Blue Anchor	20039	30008-11	stone weir	*Quercus* (immature)	13	spring	
Blue Anchor	20039	30008-12	stone weir	*Quercus* (immature)	*c*.6		
Blue Anchor	20039	30008-13	stone weir	*Quercus* (immature)	*c*.13		
Blue Anchor	20039	30008-14	stone weir	*Quercus* (immature)	*c*.15		tangentially faced
Blue Anchor	20039	30008-15	stone weir	*Quercus* (immature)	*c*.8		tangentially faced
Blue Anchor	20039	30008-16	stone weir	*Quercus* (immature)	*c*.5		radially faced
Blue Anchor	20039	30008-17	stone weir	*Quercus* spp.	*c*.6		
Blue Anchor	20039	30008-18	stone weir	*Quercus* (immature)	*c*.5		tangentially faced
Blue Anchor	20039	30008-19	stone weir	*Quercus* spp.	*c*.30		
Blue Anchor	20039	30008-20	stone weir	*Quercus* spp.	*c*.36		
Minehead	10226	61A	stone weir	cf *Pseudotsuga menziesii*			
Minehead	10226	61B	stone weir	cf *Pseudotsuga menziesii*			

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