

## BEYOND THE CAVES: THE PALAEOLITHIC RIVERS OF SOUTH-WEST BRITAIN

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This paper introduces a new English Heritage (Aggregates Levy Sustainability Fund) project *The Palaeolithic Rivers of South-West Britain* (project no. 3847), and summarises the results of a first phase resource assessment. The goal of this ongoing project is to develop a new synthesis of the Lower and Middle Palaeolithic occupation of the south-west region, focusing upon river terrace-based archaeology and its implications for hominin landscape use. The resource assessment has reached two preliminary conclusions. Firstly that the region's earliest Palaeolithic archaeological record is significantly richer than previously believed, and secondly that although find locations have been added in several areas which previously had very few or no finds (e.g. West Cornwall) the overall bias of finds to the south coast is maintained. The project has also revealed that the river terrace resource of South-West England offers potential for geochronological dating, landscape reconstruction, and improved contextualisation of the archaeological material. Some outreach components of the project are also summarised.

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### INTRODUCTION

This paper summarizes the preliminary results of a new programme of research funded by English Heritage through the Aggregates Levy Sustainability Fund. *The Palaeolithic Rivers of South-West Britain* project is focusing upon the Lower and Middle Palaeolithic archaeology (c. 500,000–40,000 BP) of the south-west region, with particular attention to the findspots and artefacts associated with the region's river terrace landforms and deposits. The overall academic goals of the project are the development of a new synthesis of the Lower and Middle Palaeolithic occupation of the south-west, with an emphasis upon: (i) the apparent decline in the richness of the archaeological record to the west of the Axe valley and the well known site at Broom (Green, 1988), and to the south of the Bristol Avon (Roe, 1974; Wymer, 1999); (ii) the relationship between the river terrace archaeology and the cave deposit archaeology of the region, and the evidence for hominin landscape preferences; and lastly (iii) the different possible routes by which hominins reached the south-west region. The first phase of the project (for which preliminary results are reported here) undertook a resource assessment, documenting the Lower and Middle Palaeolithic archaeology and the Pleistocene river terraces of the region. These assessments have indicated both a richer archaeological resource than previously indicated in national syntheses (e.g. Roe, 1968; Wessex Archaeology, 1993; Wymer, 1999) and a river terrace resource with potential for geochronological dating, palaeo-environmental reconstruction, and the contextualisation of findspots and artefact assemblages.

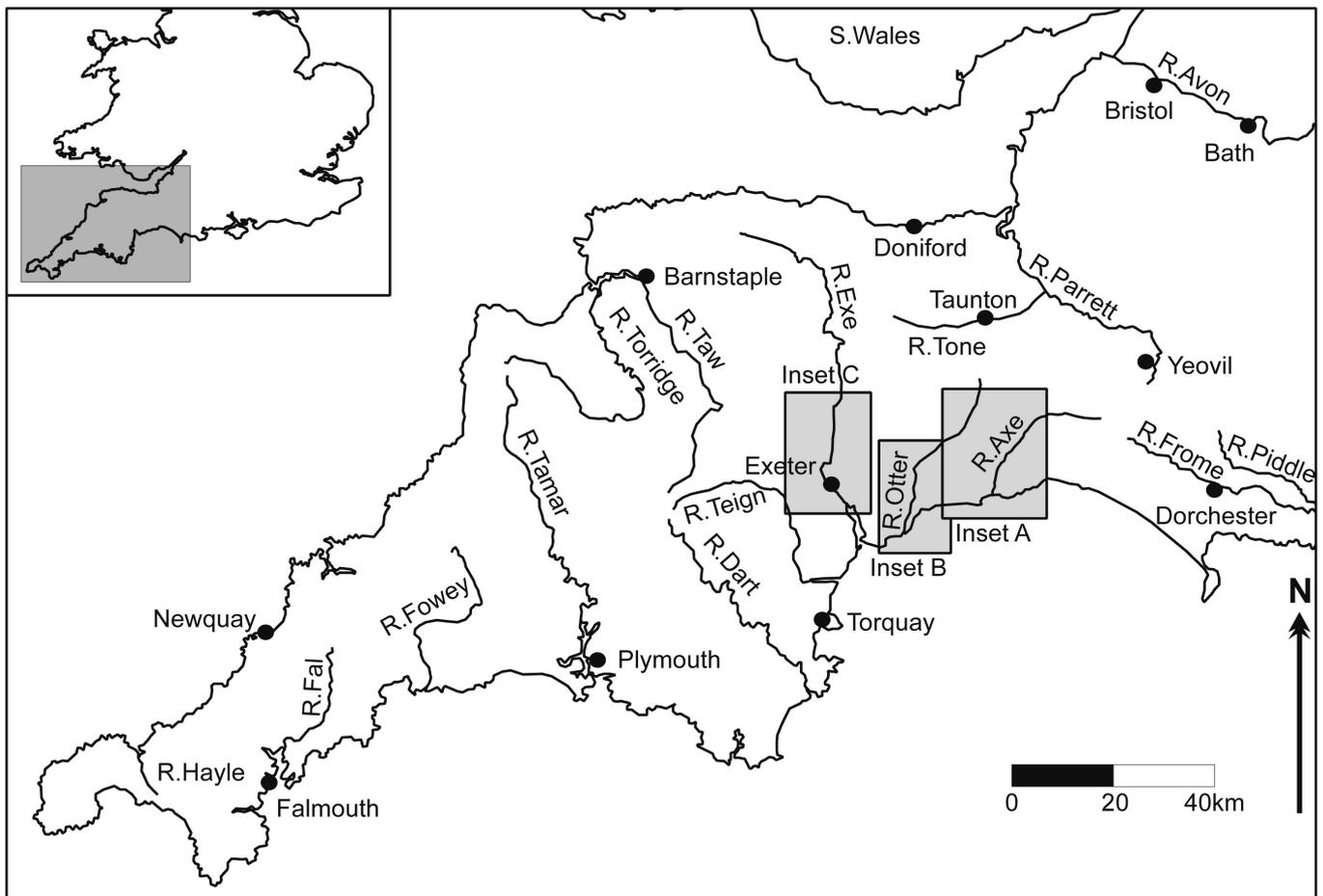
### BACKGROUND

For the purposes of the project, the south-west region was defined as the area to the west of the western headwaters (the Frome and Piddle rivers, Dorset) of the now-extinct Solent River (Allen and Gibbard, 1993), and to the south of the Bristol Avon (Bates, 2003; Figure 1).

Despite Wymer's (1999) observation that '*...the great majority of the evidence for the Palaeolithic occupation of Britain comes from river deposits*' little attention has been paid to the terrace deposits and sequences of the south-west. This is in marked contrast to the river terrace sequences of south-east Britain such as the Thames, which have been well studied and formed the basis of the development of widely accepted models of climate- and uplift-driven cycles of terrace formation (e.g. Bridgland, 2000; Maddy *et al.*, 2001). The lack of attention to the south-west region at least in part reflects the relatively minor exposure of terrace deposits through aggregates (gravels and sands) extraction during the nineteenth and twentieth centuries. This has reduced opportunities for Quaternary research, and reinforced the view that the river terrace deposits of the south-west are insignificant, particularly in terms of their Middle Pleistocene archaeological content.

One of the aims of the first phase of this project was therefore to assess the scope and distribution of the terrace landforms and deposits of the south-west. This relates to the larger question of whether the apparent geographical differences in the national distribution of Lower and Middle Palaeolithic finds reflect regional histories of aggregates extraction, or genuine regional differences in the pattern of hominin occupation of Britain during the Middle Pleistocene (or, most likely, a combination of both of these factors).

Regarding the archaeological resource of the south-west region, clear evidence for a Lower and Middle Palaeolithic hominin presence comes from a number of well documented cave sites (e.g. Kent's Cavern, Torquay; Windmill Cave, Brixham; and the Hyena Den and Rhino Hole, Wookey, Somerset) (Campbell and Sampson, 1971; Tratman *et al.*, 1971; Straw, 1995, 1996; Figure 2b). However, preliminary analysis of the evidence for the region (e.g. Wessex Archaeology, 1993; Wymer, 1999) indicates that these sites only represent a fraction of the evidence for earlier Palaeolithic occupations in the region (both in terms of the overall number of sites/findspots and the total quantities of Palaeolithic artefacts). The principal focus of the project is therefore to develop a regional-scale



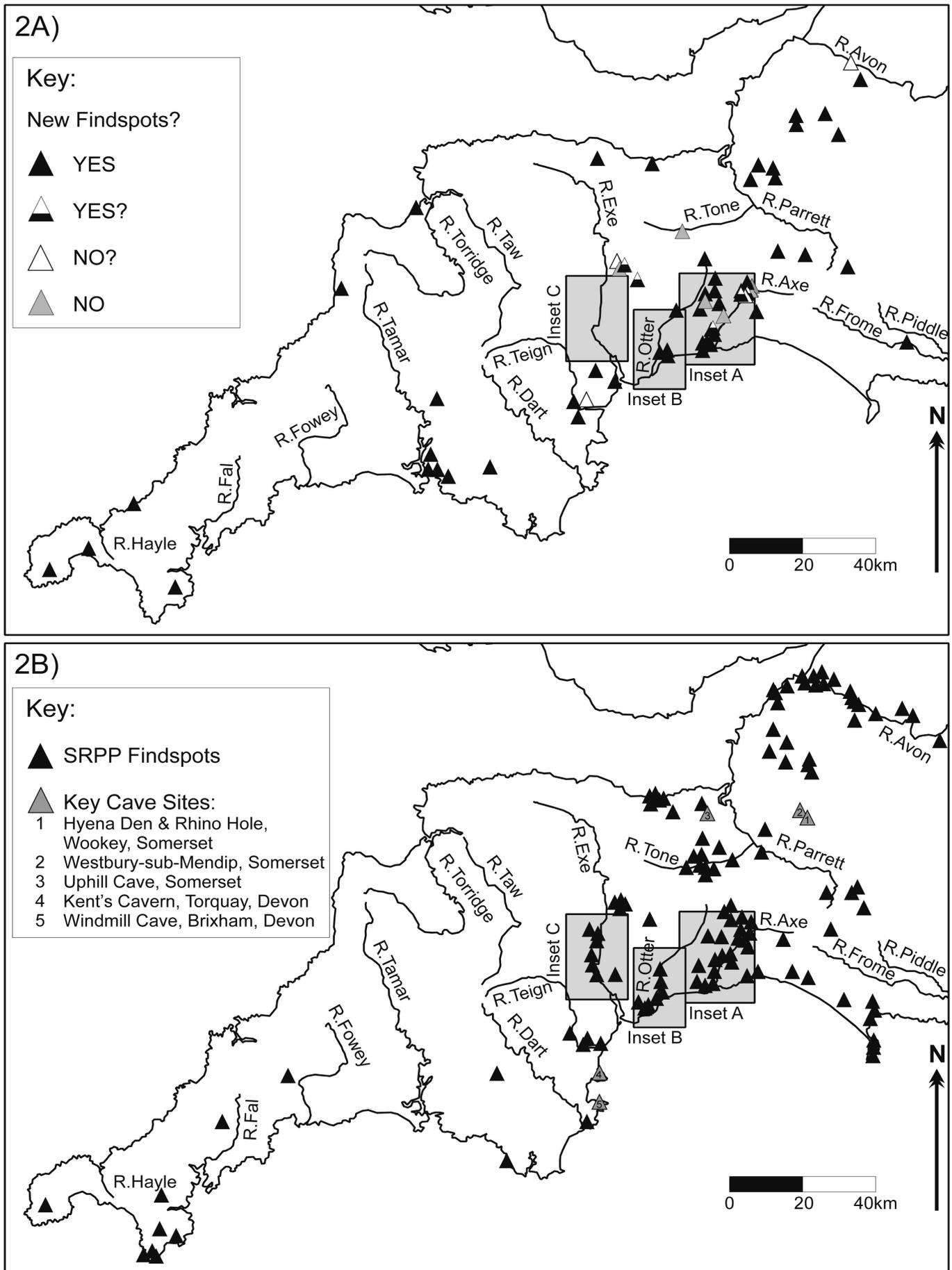
**Figure 1.** The south-west region as defined for *The Palaeolithic Rivers of South-West Britain* project. Inset A: Axe valley study region (phase two); Inset B: Otter valley study region (phase two); Inset C: Exe valley study region (phase two).

understanding of the Lower and Middle Palaeolithic of the south-west through a focus upon the majority of the archaeological record, i.e. the 'open landscape' findspots associated with river terrace landforms and deposits. A subsidiary goal is to integrate the cave and river terrace archaeology and deposits in terms of their geochronology, palaeo-environmental and palaeo-landscape reconstructions, and hominin landscape preferences. These were key goals of the project from the earliest planning stages and were motivated by the observations of regional curatorial archaeologists that there is a significant 'invisible' Palaeolithic resource in the south-west.

## METHODOLOGY

The phase one resource assessment undertaken in Spring and Summer 2005 consisted of a number of different approaches. (1) Collation of the regional Historic Environment Records (HERs) pertaining to 'open landscape' Lower and Middle Palaeolithic archaeological findspots and their geological contexts (specifically their relationships to river terrace gravels and sands and/or surface deposits). The historic environment records were cross-compared to existing national-scale syntheses (Wessex Archaeology, 1993; Wymer, 1999) in order to identify: (i) 'new' findspots which are documented in the historic environment records but not in the national syntheses; (ii) findspots which are present in both the historic environment records and the national syntheses; and (iii) findspots which are present in the national syntheses but not in the historic environment records. This collation phase of the assessment also incorporated consultations with staff from the regional historic environment record offices (Cornwall, Devon, Dorset,

Plymouth, Somerset, Torbay and Bath) and with the archaeological curators from the main regional museums (the Royal Cornwall Museum; the Royal Albert Memorial Museum, Exeter; Devises Museum; Dorset County Museum, Dorchester; Somerset County Museum, Taunton; Plymouth Museum; Torquay Museum; Bristol City Museum; and Cambridge Archaeology and Anthropology Museum). The purpose of these latter meetings was to identify any 'invisible' resources (findspots or artefacts) present in the museum records and collections. (2) An artefact-sampling programme of the Palaeolithic and possible Palaeolithic material held in the regional museums. This programme also generated morphological, typo-technological and physical condition data for each artefact. The artefact recording procedures followed the methodologies established by Roe (1968) for artefact dimensions, and Wymer (1968) for artefact abrasion and typo-technology. The data recorded at this stage of the project was relatively limited in scope, reflecting the nature of the resource assessment. (3) Analysis of British Geological Survey (BGS) map sheets and memoirs in order to ascertain the extent and location of the terrace deposits, determine when specific areas were mapped (or re-mapped) by the BGS, and document all data relating to the landforms and deposits. (4) Analysis of BGS bore-hole records, with specific reference to the superficial (drift) deposit records. (5) Development of a Geographic Information System (GIS) spatial database to explore the relationships between zones of past and present aggregates extraction, fluvial terrace landforms and deposits, present fluvial landscapes, and Lower and Middle Palaeolithic findspots. The phase one GIS models will be delivered to the regional historic environment records during the initial stages of the project's second phase.



**Figure 2.** Distribution in the south-west region of 'new' Lower and Middle Palaeolithic findspots documented by The Palaeolithic Rivers of South-West Britain project. **A.** Lower and Middle Palaeolithic findspots documented in the Southern Rivers Palaeolithic Project (Wessex Archaeology, 1993). **B.** Key Lower and Middle Palaeolithic cave sites (after Wymer, 1999, figure 67).

## ASSESSMENT RESULTS

The phase one evaluation of the Lower and Middle Palaeolithic fluvial landscape archaeology of south-west Britain indicated a significant number of findspots that had been omitted from the previous national syntheses (Wessex Archaeology, 1993; Wymer, 1999). 72 new findspots (48% of the pre-project total, as calculated from The Southern Rivers Palaeolithic Project (Wessex Archaeology, 1993)) were provisionally documented through consultations with the regional historic environment records, local and regional museums, and private collectors. Detailed analysis of the historic environment records and comparison with the Southern Rivers Palaeolithic Project (SRPP) records suggested, however, that seven of these findspots had been previously documented in the Southern Rivers Palaeolithic Project ('NO' in Table 1 and Figure 2a), four findspots had probably been previously documented ('NO?' in Table 1 and Figure 2a), five findspots were identified as probable 'new' findspots ('YES?' in Table 1 and Figure 2a), and 56 findspots were positively identified as 'new' findspots ('YES' in Table 1 and Figure 2a). All 72 findspots are listed in Table 1 with their status as 'new' findspots, probable 'new' findspots, probable existing findspots, and existing findspots indicated (including their SRPP code where appropriate). The uncertainty surrounding 16 of the findspots reflects the nature of the HER records (and indeed the value of this type of assessment). Classification of the findspots was based on location, co-ordinate, context, artefact type, and additional descriptive data.

The 61 'new' and probable 'new' Lower and Middle Palaeolithic findspots were distributed throughout the south-west region study area (Figure 2a). Two general patterns were evident: (i) the majority (n=46, 75%) of findspots are located in areas of the south-west with an already well documented Palaeolithic heritage (e.g. the 'hotspots' of the Axe Valley and Broom, the Exe, and the Teign; Figure 2b); while (ii) a minority (n=15, 25%) of the findspots are located in areas with little or no previously documented Lower and Middle Palaeolithic archaeology (e.g. south-west Cornwall and the Plymouth region). The former category of findspots principally confirms the importance of relatively rich Palaeolithic landscapes within the south-west. By contrast the latter category of findspots has highlighted new areas for archaeological study and interpretation, and developed understanding of hominin landscape use across the wider south-west region. Of particular interest are the small numbers of 'new' findspots distributed along the north coast of the south-west peninsula, which highlight the potential importance of the Bristol Channel as a 'route' into the region (and the more widespread importance of the peninsula's northern coastal zone to Pleistocene hominins). The quality of the findspot data derived from the historic environment records was variable, reflecting inevitable differences in the quality of the documented information.

The artefact collections of the south-west region's public museums which could be confidently assigned to the Lower and Middle Palaeolithic were dominated by handaxes, reflecting the secondary context origins of the findspots, the higher level visibility of those artefacts, and their status as a diagnostic chronological marker. There were also significant collections of non-diagnostic lithic artefacts (e.g. débitage flakes), although in the majority of cases these artefacts were poorly provenanced and effectively un-dated.

Overall the phase one evaluation indicated that the Lower and Middle Palaeolithic record of the south-west region is of greater significance than traditionally considered. It is likely that its previous low profile reflects both its relative size in comparison to the Palaeolithic archaeology of other regions (e.g. the Thames Valley (Bridgland, 1994) and/or the Solent River (Wenban-Smith and Hosfield 2001)), and the absence of large scale aggregates extraction from post-Tertiary sands and gravels in the counties of Cornwall, Devon and Somerset (Brown, 2004): in other words, absence of evidence (due to a paucity of aggregates extraction) rather than evidence of absence (Roebroeks, 1996) is argued to be at least partially

responsible for the extant patterns in fluvial landscape Palaeolithic archaeology in the south-west region.

The phase one resource assessment of Pleistocene fluvial landforms and deposits of south-west Britain also indicated that the resource was of greater scope and potential value than previously known (Table 2). This was particularly true for the Devon rivers (e.g. the Exe and the Otter), although potential was also identified in Cornwall and Somerset. Examination of the BGS mapping for the south-west region indicated variability in mapping quality across the region, with those regions that have recently been re-mapped (e.g. the Exeter sheet) providing the greatest detail and most up-to-date interpretations of the fluvial deposits. For example, the 1975 1:50,000 Solid and Drift Sidmouth sheet showed only 'undifferentiated valley gravels'. This sheet has been recently re-mapped and published in 2005 by the British Geological Survey. Deposits previously classified as 'undifferentiated valley gravels' are now sub-divided into a series of river terrace and 'head' deposits. In the case of the river Otter, ten terrace deposits are differentiated and on the sheet as a whole 'head' types are mapped separately. A contrast is drawn between soliflucted deposits restricted to valleys ('valley head and colluvium'), and 'other' head deposits. The assessment therefore suggested that mapping variability is one factor behind the traditional perception of a limited river terrace resource in the south-west region. In general, while terraces are present across the full extent of the south-west region, the largest exposures are located in Devon, where there is also the greatest degree of differentiation between the individual terrace landforms.

As with the BGS mapping, the bore-hole data was similarly variable. Where superficial deposits such as river terrace gravels were described in the logs, the available information ranged considerably from general (e.g. 'terrace deposit') to specific (e.g. 'medium dense red/brown, sandy, well-graded gravel'). Where detailed records were available (e.g. providing descriptions for individual strata) it was possible to assess extant interpretations of deposits as remnant terrace sediments rather than as for example head. It was also possible to assess whether deposits contain sediments suitable for dating (e.g. the presence of sand lenses appropriate for optically stimulated luminescence (OSL) dating).

Differential GPS (Global Positioning System) mapping of the Exe and Culm terraces indicated that the terrace sequences of the south-west are different to those of the south-east (e.g. Bridgland, 1994), but that the terraces can be defined as separate, altitudinally-differentiated entities, in-keeping with Bridgland's (e.g. 2000, 2001) models of terrace formation. OSL dating on the Exe (terrace three) and the Culm (terrace three) also indicated the potential antiquity (pre-Devensian, marine isotope stages 5d-2) of the higher terraces of these river systems, which is in-keeping with the archaeological (Acheulean handaxe) associations with terrace five in the main valley of the Exe.

It had previously been assumed that because most of the south-west region was not glaciated the Exe catchment would have persisted throughout the Pleistocene. However, the assessment indicated that the shape (planform) of the Exe basin, the existence of high-level terraces on internal interfluvies, and the mis-match between terrace distribution and present river size all suggest that at some point in the Pleistocene the Exe catchment has changed, probably by capturing northerly drainages and by losing easterly drainage areas. Such information is clearly central to developing a fuller understanding of the palaeo-environments that formed the backdrop to the Lower and Middle Palaeolithic occupation of the south-west region, and is also relevant to attempts to reconstruct the 'routeways' into/out of/and within the region that may have been utilised by Middle Pleistocene hominins.

The assessment also identified paired terraces (i.e. where terrace deposits that correspond in terms of altitude above the floodplain are found on either side of the current river) on many of the rivers in the south-west region (e.g. the River Axe). These are especially important because they indicate that the

Co-ordinates	County	Location	Context	Artefact type	Comments (verbatim from HER records)	New?
ST 660657	Avon	Burnett, Compton Dando	/	Handaxe	Localised concentration of flints. Very patinated retouched flake may be axe resharping flake.	YES
ST 600500	Avon	Clutton	Found besides stream	Miscellaneous finds	Found by H. Strachey 1928.	YES
ST 563560	Avon	East Harptree	/	Handaxe	Widespread flint scatter. Possible prolonged use of site.	YES
ST 635704	Avon	Keynsham, Bath & Northeast Somerset	Found on surface of ploughed field	Handaxe	Artefacts destroyed in war.	NO? (SEV-4/5)
SS 214057	Cornwall	16 Hawthorn Ave, Bude	Found in garden	Handaxe	Found in 1975.	YES
SW 751198	Cornwall	Field in Kerrier, St Keverne	Surface find in field	Retouched flake	Found by Mr P. Steele 1988 while field walking.	YES
SW 513308	Cornwall	Marazion Beach, Penwith	Surface find	Handaxe	Found by Mr J. Matthews 1997, identified by C. Thorpe of CAU. Stone not native to Cornwall. Handaxe (?) possibly brought in ships ballast. Possible derived from Palaeolithic forest deposits.	YES
SW 403253	Cornwall	Pendrea, St Buryan	Surface find	Core	Found in ploughed field by Mr P. Pearman 1988.	YES
SW 636439	Cornwall	Raskajeage Downs, Illogan	Surface finds	Miscellaneous finds	Found by Mr H.J. Berryman over 15 year period. Only 3 artefacts from Upper Palaeolithic with no listing as to what types.	YES
SY 241903	Devon	18 Seaton Down Rd. Seaton	Found in garden	Handaxe	/	YES
SX 874686	Devon	Aller Brook, Teignbridge, Kerswells	Found in sandy gravels 1.22m thick overlying ball clay	Miscellaneous finds	Clactonian, found opposite zigzag quarry near 50 ft contour.	YES
ST 265015	Devon	Beekford Bridge, River Yarty, Stockland	Found in waterway	Handaxe	/	YES
SY 226879	Devon	Beer Head	/	Handaxe	Miscellaneous collection of tools including Neolithic.	YES
SY 216995	Devon	Beer Head plateau, Beer	Surface & excavated finds	Handaxe	Excavations took place in 1920's, thousands of artefacts found, span period from Palaeolithic, Mesolithic & Neolithic.	YES
SY 235898	Devon	Beer to Seaton road, Seaton	<i>In situ</i>	Handaxe	Layer may be correlated with upper boulder clay glaciation of East Anglia & upper tumbled gravel at Broome Pit. Mousterian or Clactonian.	YES
SX 460570	Devon	Brickfields Devonport, Plymouth	Slope of fields	Handaxe	Deposits of widely separated ages. Scatter.	YES
SX 458546	Devon	Brickfields, Devonport, Plymouth	/	Handaxe	Found in 1933 (possible duplicate of NSA-4/9)	YES
SX 86-73-	Devon	Broadway, Kingsteignton	/	Handaxe	Retained by Mr Gill of Ashburton.	YES
SX 629541	Devon	Clenmeads, Ermington	/	Handaxe	Handaxe of vesicular spilitite.	YES
SY 244939	Devon	Colyton	/	Handaxe	Found during evaluation at stonewalls representing residual material incorporated into deposits of a later date. Felt to date to around 35 kya.	YES
ST 23-03-	Devon	Corry Brook or Millstream, near Millhayes, Stockland.	Found in waterways	Handaxe	/	NO (AX-1/10)
SX 98-79-	Devon	Dawlish Warren, Teignbridge	/	Handaxe	Flint implements.	YES
SX 506521	Devon	Field at Higher Hooe near Plymouth (not precisely located)	/	Handaxe	Quartzite axe.	YES
SX 470560	Devon	Ford Park, Stoke Damerel, Plymouth	/	Handaxe	Worked flints found during building operations. Scatter.	YES
SY 275980	Devon	Gammon's Hill Quarry, Kilmington	/	Handaxe	/	NO (AX-2/6)
SX 464572	Devon	Greenslade Park, Beacon Park, Plymouth	Garden	Flake, core	/	YES
SS 998120	Devon	Halberton	/	Handaxe	Organised fieldwalk, miscellaneous artefacts from all periods including Palaeolithic. Scatter.	YES?
SX 921820	Devon	Haldon, Teignbridge, Kenton	Found on disturbed surface	Flake	Clactonian, near ruined barrow.	YES
SY 119869	Devon	Jacobs Ladder, Sidmouth	Found in cliff fall	Chopper/core	Rough possible chopper on Broom flint.	YES
ST 04-08-	Devon	Kentisbeare	/	Handaxe	Also Mesolithic axe from same area.	YES?
SY 24-91-	Devon	Manor Pit, Seaton	Gravel pit found on 50 foot terrace	Handaxe	/	YES
SX 899739	Devon	Market garden near Wolfs Grove, Bishopsteignton	Surface	Handaxe	Found by Mr Rogers. Includes Neolithic finds. NGR not particularly near Wolfs Grove.	NO? (EX-2/2)
ST 257052	Devon	Membury	Surface finds	Handaxe	Collected from field by N. Pearce. Scatter.	YES
SY 246940	Devon	Near Colyton.	/	Handaxe	May have come from ballast gravels at Broom.	YES?
SY 12-88-	Devon	New cemetery, Sidmouth	Surface find	Miscellaneous finds	Found by Mr H. Ede 1878.	YES
SY 254927	Devon	North of Colyford station, Colyton	/	Handaxe	Worked flints similar to those found on Beer Head plateau (NSA-6/3)	YES
SX 465581	Devon	Penycross, Plymouth	Found in soil heap	Handaxe	Raised by bulldozer making new road to serve Burringdon industrial estate.	YES

SY 099875	Devon	Pin Beacon area, Otterton	/	Retouched flake, scraper, blade	In Hutchinson collection, possibly Palaeolithic.	YES
SX 479537	Devon	Plymouth Hoe	/	Handaxe	Found during works on Marine biology lab, tools accompanied by teeth of Ox and Boar. Scatter.	YES
ST 257083	Devon	River Yarty, Yacombe	Found in waterway	Miscellaneous finds	Found by Mr C.T. Shaw in 1930's possibly Palaeolithic.	YES
SY 143996	Devon	Route of SWW pipeline, Gittisham	/	Handaxe	Handaxe of probable Palaeolithic date.	YES
SS 990114	Devon	Rowridge Farm, Halberton	/	Handaxe	Found by Mr M. Britton. Evidence of multi-period activity. Scatter.	NO (EX-4/5)
ST 230036	Devon	Stocklands little camp, Stockland	/	Handaxe	Mesolithic axe also found here unsure if there are two separate entries.	YES
SX 48-74-	Devon	Tavistock	/	Handaxe	Made on Broom chert.	YES
SS 983131	Devon	Tiverton	/	Handaxe	Fieldwalking. Miscellaneous finds including Mesolithic/Neolithic/early Bronze age. Handaxe found by Mr S. Bush. Scatter.	NO? (EX-4/6)
SS 42-29-	Devon	Westward Ho! Northam	Raised beach	Miscellaneous finds	Worked stone possibly Palaeolithic/Mesolithic.	YES
ST 342044	Dorset	Gravel pit Thorncombe	Dug up in gravel 14 ft down	Handaxe	Found by Mr G. Osborne 1955. Ovate handaxe.	YES?
ST 347048	Dorset	Hodge Ditch Thorncombe	1m below surface during ditch digging	Handaxe	Found by Mr. D. Waller in 1988.	YES
SY 37-99-	Dorset	Lamberts Castle (?) Marshwood	/	Handaxe	Unfinished roughout handaxe	YES
ST 623119	Dorset	Near Lillington Beacon, West Dorset	Found in field	Miscellaneous finds	Worked ochreous flint.	YES
ST 343045	Dorset	North side of present quarry, Thorncombe	/	Handaxe	Abraded, twisted ovate handaxe (flint) found by J. Wymer 1959.	NO (AX-1/2)
ST 339042	Dorset	Thorncombe gravel pit	/	Handaxe	Findspot. Palaeoliths found by G. Osbone 1-5m depth.	YES?
ST 340042	Dorset	Thorncombe gravel pit	/	Miscellaneous finds & handaxe	Implements including handaxe found by W.G Larcombe, north side of road opposite Bateman's Farm.	NO? (AX-1/1)
ST 344045	Dorset	Thorncombe quarry	Found below screening plant & spoil heap	Handaxe, flake	Found by J Wymer in 1974. Handaxe & flakes.	NO (AX-1/2)
ST 344049	Dorset	Thorncombe quarry	Found on surface	Handaxe	Found by C. Waller 1986.	NO (AX-1/2)
ST 339043	Dorset	Westford Farm Gravel pits, Thorncombe	Dug up in gravels	Miscellaneous finds & handaxe	Palaeoliths, including handaxes.	YES
SY 79----	Dorset	Woodsford, West Dorset	/	Handaxe	/	YES
ST 482554	Somerset	East of Piney Sleigh Farm, Cheddar	/	Handaxe	Flint scatter.	YES
ST 423373	Somerset	Greylake, Middlezoy	/	Handaxe	"Probable prehistoric date".	YES
ST 080413	Somerset	Long street, Williton	Dug up in garden	Handaxe	Ovate, similar to those in Broom gravels.	YES
ST 334047	Somerset	Lower Hurtham, South Chard, Tatworth	/	Handaxe	Found in spoil heap from shallow trench. Handaxe, tip broken.	YES
ST 352368	Somerset	Mount Close Batch, Chedzoy	/	Flake	Burnt flake found in molehill. No period given.	YES
ST 349367	Somerset	Mount Close Batch, Chedzoy	/	Retouched flake	Found after ploughing. No period given.	YES
ST 480527	Somerset	Northeast of Carscliff Farm, Cheddar	/	Flake, scraper	Found by V Russett 1983. No period given.	YES
ST 504153	Somerset	Odcombe	Dug up in garden of Odcombe rectory	Scraper	/	YES
ST 23-14-	Somerset	Otterford	Bed of Yarty Stream	Scraper, Levallois flake, core	Found by T. Leslie & St Gorge Gray family 1902 & 1915.	YES
ST 418402	Somerset	Skinner's Wood, Shapwick	/	Handaxe	Prehistoric finds.	YES
ST 376411	Somerset	South of Newclose Drove, Chilton Polden	/	Retouched flake, flake	Found in 1971. No period given.	YES
ST 43- 16-	Somerset	South Petherton	/	Handaxe	/	YES
ST 343072	Somerset	The Drift, east of Forton	/	Handaxe	Found on surface of tracks, probably imported to site as bricks etc... form surface here.	YES
ST 166219	Somerset	West of Hetherton Park, Bradford-on-Tone	Clay embankment of stream	Handaxe	Found by Mr A. Discombe. Taunton museum bout coupé Handaxe Accession No. 84-AA-11	NO (SEV-2/1)
SS 93-43-	Somerset	Wootton Courtenay	/	Scraper	Found by Mr L. Ketting 1966	YES

Table 1. Lower and Middle Palaeolithic findspots documented during the project's phase one resource assessment.

particular section of the river has not significantly shifted laterally since the terraces were formed (as otherwise the landforms and deposits on one, or both, banks of the river would have been eroded away). These areas effectively represent fluvial landscape remnants, potentially of great antiquity. They provide evidence of the size of the river and its floodplain, past drainage patterns, and the potential for recovering Palaeolithic artefacts from minimally-disturbed secondary contexts. This potential will be tested during the evaluation fieldwork scheduled for the second phase of the project (November 2005–July 2006).

County	River	No. of Terraces/ Gravels Defined	Date of most recent BGS mapping
Cornwall	Camel	Undifferentiated	1994
	Fal	Undifferentiated	2000
	Fowey	Undifferentiated	1982
	Neet	Undifferentiated & 1	1974
	Tamar	Undifferentiated & 1–8	1998
Devon	Axe	Undifferentiated & 1	2005
	Dart	Undifferentiated	2004
	Erme	Undifferentiated	1974
	Exe	Undifferentiated & 1–8	1995
	Otter	Undifferentiated & 1–10	2005
	Petrockstowe	1–4	1980
	Sid	Undifferentiated	2005
	Taw	1–10	1982
	Teign	Undifferentiated & 1	1995
	Torridge	Undifferentiated & 1–9	1980
Dorset	Axe	Undifferentiated & 1	2005
Somerset & Bristol	Bristol Avon	Undifferentiated & 1–3	2004
	Parrett	Undifferentiated	1984
	Tone	Undifferentiated	1984

**Table 2.** Number of terraces/gravel deposits differentiated for the major drainages of the south-west region according to BGS 1:50,000 mapping (analysis restricted to the principal river channels for each drainage system).

## PHASE ONE OUTCOMES

The resource assessment of the Lower and Middle Palaeolithic archaeological record has highlighted a number of factors relevant to the issue of how genuine the potential Axe valley western boundary phenomenon is. Overall it can be seen that while the majority of the ‘new’ findspots recorded in this project lie in areas of well documented Palaeolithic activity to the east of the ‘western’ frontier, several of the ‘new’ findspots lie further west and south of this area, strengthening the evidence for a significant presence beyond this boundary and indicating potential access routes into the south-west peninsula (e.g. via the Bristol Channel and the north coast). Such findspots include the recent discovery of a handaxe at Marazion Beach, Penwith in Cornwall in 1997 and the Levallois flake from Otterford, Somerset.

The data provided through this resource assessment therefore has implications for the archaeological interpretation of the south-west region (and the south of England as a whole) during the Middle and Late Pleistocene. This concerns both the extent to which the south-west region was occupied, and how this is represented in the current interpretation of the region’s Palaeolithic archaeological record. However, the assessment of the archaeological resource also highlighted the geochronological and contextual limitations of the material, and the resolution of these issues forms a central aspect of phases two and three of the project.

Analysis of the recent re-mapping by the BGS has indicated that considerable swathes of terrace deposits exist in the south-west region, particularly in association with the rivers Exe, Otter, Taw, Torridge, Tamar, and Bristol Avon, and at Doniford (Somerset) in association with the palaeo-river Washford (Figure 1). The phase one resource assessment has also

identified a series of key rivers which will be targeted for evaluation fieldwork in the second phase of the project. These are: (1) The River Axe (Figure 1, inset A). The River Axe is of particular archaeological and geoarchaeological significance in the south-west region because of: (i) the archaeological richness of the terrace gravels at Broom (Shakesby and Stephens, 1984; Green, 1988; Marshall, 2001; Hosfield, and Chambers, 2004); (ii) the distinctive geomorphology in comparison to the surrounding drainage systems (in particular the apparent presence of a single terrace landform (the surface is c. 15 m above the modern floodplain), recently dated to MIS-9 (marine isotope stage 9) and MIS-8 (Toms *et al.*, 2005); (iii) the potential for further OSL dating applications (after Toms *et al.*, 2005), both at Broom and other terrace gravel exposures through the valley, such as Kilmington and Chard Junction; and (iv) the current lack of understanding of its terrace and palaeolandscape evolution. (2) The River Otter (Figure 1, inset B): the significance of the Otter lies in: (i) its number of distinct terrace landforms (thus offering the opportunity to develop robust geochronological frameworks for one of the south-west region’s better preserved fluvial landscapes); (ii) the association of Palaeolithic findspots with individual terraces; (iii) the correlation of its terraces with those of the Exe (thus permitting the development of regional frameworks linking different valley systems); and (iv) the presence of terrace deposit exposures suitable for dating. (3) The River Exe (Figure 1, inset C): the significance of the Exe is in: (i) the number of distinct terrace landforms (thus offering, as with the Otter, the opportunity to develop robust geochronological frameworks); (ii) the association of Palaeolithic findspots with its high terraces, which are of potential Middle Pleistocene age; (iii) the potential for expanded dating programmes and clarification of the terrace sequence; and (iv) the importance of the Exe for understanding palaeo-landscape and palaeo-drainage evolution in the central zone of the south-west region.

The proposed fieldwork in these three key systems will therefore provide new data to develop understanding and interpretation of fluvial landforms and deposits, and promote new models of Pleistocene landscape evolution in the south-west region.

## PROJECT OUTREACH

A key aspect of the project is the development of public and non-professional archaeological involvement with the project. In the first phase this was principally achieved through the project’s *Regional Palaeolithic Networks Meeting* (held at Exeter University on 16 June 2005). The meeting clearly demonstrated the interest of local government archaeologists, historic environment record officers, museum staff, local enthusiasts, and regional archaeological societies for the further development of Palaeolithic research in the south-west region. The importance of further training and education in lithic artefact and fluvial terrace identification was also highlighted, with regards to findspot identification and reporting, and lithic artefact classification within extant and new collections. Emphasis was also given to the role of non-flint raw materials in Palaeolithic artefact production in the south-west, and the need for training in non-flint/chert artefact identification. All of these themes will be developed during the second and third phases of the project.

## CONCLUSIONS

The resource assessment conducted during the first phase of *The Palaeolithic Rivers of South-West Britain* project has indicated that while fragmentary, the river terraces of the region are of considerable scope and have wide-ranging potential for developing archaeological and geoarchaeological knowledge. It is apparent that the south-west peninsula is by no means an area of Palaeolithic absence and that the ‘open landscape’ record is considerably more extensive than has previously been thought. This is especially true in light of the limited history of

exploitation of the region's Pleistocene sands and gravels by the aggregates industry. The new data generated by the first phase of the project will support both reconstructions of the Pleistocene fluvial landscape (as snap-shot views and models of change over time) and the contextualisation (especially in terms of geochronology) of the Lower and Middle Palaeolithic archaeology of the region.

This is a key development for Palaeolithic archaeological research in the south-west of Britain as it permits greater resolution in the identification of key areas for future archaeological and geoarchaeological research. The research reported here has also highlighted the potential for geochronological and palaeoenvironmental contextualisation of the 'open landscape' findspots and artefacts of the region, through their association with identifiable and dateable gravel deposits. Such research is central to a greater understanding of hominin land-use during the Middle and Late Pleistocene, a goal that is eminently achievable from the river terrace archaeological record of the south-west.

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## REFERENCES

ALLEN, L. and GIBBARD, P.L. 1993 Pleistocene evolution of the Solent River of southern England. *Quaternary Science Review*, **12**, 503–528.

BATES, M.R. 2003 A brief review of deposits containing palaeolithic artefacts in the Shirehampton area of Bristol and their regional context. Unpublished archive report for Avon Archaeological Unit, Bristol.

BRIDGLAND, D.R. 1994. *Quaternary of the Thames*. Geological Conservation Review Series 7. Chapman and Hall, London.

BRIDGLAND, D.R. 2000 River terrace systems in north-west Europe: an archive of environmental change, uplift and early human occupation. *Quaternary Science Reviews*, **19**, 1293–1303.

BRIDGLAND, D.R. 2001 The Pleistocene evolution and Palaeolithic occupation of the Solent River. In: WENBAN-SMITH, F.F. and HOSFIELD, R.T. (eds), *Palaeolithic Archaeology of the Solent River*. Lithic Studies Society Occasional Paper 7. Lithic Studies Society, London, 15–25.

BROWN, A.G. 2004. The achievements, status and future of aggregate extraction related archaeology in England (English Heritage ALSF Project Report (Project No. 3350). English Heritage Archive Report, London).

CAMPBELL, J.B. and SAMPSON, C.G. 1971. A new analysis of Kent's Cavern, Devonshire, England. *University of Oregon, Anthropology Papers*, **3**, 1–40.

GREEN, C.P. 1988. The Palaeolithic site at Broom, Dorset, 1932–41: from the record of C.E. Bean, Esq., F.S.A.. *Proceedings of the Geologists' Association*, **99**, 173–180.

HOSFIELD, R.T. and CHAMBERS, J.C. 2004. The archaeological potential of secondary contexts. (English Heritage ALSF Project Report (Project No. 3361). English Heritage Archive Report, London).

MADDY, D., BRIDGLAND, D.R. and WESTAWAY, R. 2001. Uplift-driven valley incision and climate controlled river terrace development in the Thames Valley, UK. *Quaternary International*, **79**, 23–36.

MARSHALL, G.D. 2001. The Broom pits: a review of research and a pilot study of two Acheulian biface assemblages. In: WENBAN-SMITH, F.F. and HOSFIELD, R.T. (eds), *Palaeolithic Archaeology of the Solent River*. Lithic Studies Society Occasional Paper 7. Lithic Studies Society, London, 77–84.

ROE, D.A. 1968. *Gazetteer for British Lower and Middle Palaeolithic Sites*. Council for British Archaeology, London.

ROE, D.A. 1974. Palaeolithic artefacts from the River Avon terraces near Bristol. *Proceedings of the University of Bristol Speleological Society*, **13**, 319–326.

ROEBROEKS, W. 1996. The English Palaeolithic Record: Absence of Evidence, Evidence of Absence and the First Occupation of Europe. In: GAMBLE, C.S. and LAWSON, A.J. (eds), *The English Palaeolithic Reviewed*. Wessex Archaeology Ltd., Salisbury, 57–62.

SHAKESBY, R.A. and STEPHENS, N. 1984. The Pleistocene gravels of the Axe Valley, Devon. *Report of the Transactions of the Devon Association for the Advancement of Science*, **116**, 77–88.

STRAW, A. 1995. Kent's Cavern — whence and whither. Pengelly Centenary Lecture III. *Transactions and Proceedings of the Torquay Natural History Society*, **21**, 129–211.

STRAW, A. 1996. The Quaternary Record of Kent's Cavern: a brief reminder and update. *Quaternary Newsletter*, **80**, 17–25.

TOMS, P.S., HOSFIELD, R.T., CHAMBERS, J.C., GREEN, C.P. and MARSHALL, P. 2005. *Optical dating of the Broom Palaeolithic sites, Devon & Dorset*. Centre for Archaeology Report 16/2005. English Heritage, London.

TRATMAN, E.K., DONOVAN, D.T. and CAMPBELL, J.B. 1971. The Hyena Den (Wookey Hole), Mendip Hills, Somerset. *Proceedings of the University of Bristol Speleological Society*, **12**, 245–279.

WENBAN-SMITH, F.F. and HOSFIELD, R.T. (eds) 2001. *Palaeolithic Archaeology of the Solent River*. Lithic Studies Society Occasional Paper 7. Lithic Studies Society, London.

WESSEX ARCHAEOLOGY. 1993. *The Southern Rivers Palaeolithic Project. Report No. 2. 1992–1993. The South West and South of the Thames*. Wessex Archaeology and English Heritage, Salisbury.

WYMER, J.J. 1968. *Lower Palaeolithic Archaeology in Britain*. John Baker, London.

WYMER, J.J. 1999. *The Lower Palaeolithic Occupation of Britain*. Wessex Archaeology and English Heritage, London.