ARCHAEOLOGICAL MONITORING OF THE INTERTIDAL AND COASTAL ZONE PEMBROKESHIRE 2003

MARCH 2004

Paratowyd gan Archaeoleg Cambria
Ar gyfer Parc Cenedlaethol Arfordir Penfro
Prepared by Cambria Archaeology
For Pembrokeshire Coast National Park

ARCHAEOLEG CAMBRIA ARCHAEOLOGY

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RHIF YR ADRODDIAD / REPORT NO. 2004/37
RHIF Y PROSIECT / PROJECT RECORD NO. 48116

Mawrth 2004
March 2004

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2003

Gan / By

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Paratowyd yr adroddiad hwn gan / This report has been prepared by Pete Crane

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Yn unol â'n nôd i roddi gwasanaeth o ansawdd uchel, croesawn unrhyw sylwadau sydd gennych ar gynnwys neu strwythur yr adroddiad hwn

As part of our desire to provide a quality service we would welcome any comments you may have on the content or presentation of this report

Summary

During 2003 archaeological monitoring of beaches in Pembrokeshire in order to establish base-line information was undertaken. Four beaches south of Milford Haven and twelve to the north were examined. Peat deposits were visible at just three locations: Lydstep Haven, Aber Mawr and Frainslake Sands. On other beaches it was estimated that sand deposits were 100-150mm higher than normal. Nevertheless, new information was discovered, such as an antler pick at Frainslake Sands. In addition to the fieldwork, information from new sources was entered onto the regional Sites and Monuments Record, and this together with previously recorded data and the new fieldwork information is presented in this here.

Introduction

In the mid 1990s Cadw commissioned a complete Archaeological Survey of the Welsh Coast from the Welsh Archaeological Trusts (ref. CBA report). The purpose of the systematic coastal survey was to inform the future management of the coast and coincided with the development of Shoreline Management Plans for Wales. This process highlighted the lack of understanding of the on-going coastal processes, particularly coastal erosion, and its effect on the known historic environment resource.

The Pembrokeshire Coastal Survey (Murphy, 1996) identified the need for regular monitoring of the archaeological remains along the coast both to record the on-going erosion of known sites as well as to identify newly eroded sites. The need for more detailed recording of particular sites, to improve understanding of their location and extent as well as their precise nature, date and significance, was also identified. Of particular concern was the erosion of exposures of prehistoric peat.

The main aim of this project is to record and put in place archaeological monitoring of the coastal historic environment resource, including the prehistoric coastal peat deposits. All of the major beaches from Milford Haven north to Aber Mawr were inspected and four south of the Haven: Tenby South Beach, Lydstep Haven, Frainslake Sands and Freshwater East. The beaches of Lydstep Haven and Aber Mawr had exposed peat deposits, as did Frainslake Sands, where an antler pick was recovered, but as far as can be presently ascertained, the sand cover was 100-150mm higher than normal on the majority of the other beaches.

The submerged forest on Newgale was first mentioned in the medieval period by Giraldus Cambrensis (1908, 91) and was noted by antiquarians when uncovered by a gale in 1888 (Laws and Owen 1907, 48 No 9). Whitesands Bay submerged forest was also recorded in the 1800s (Laws 1888). However, no systematic work has been undertaken on recording these peat deposits other than work for an unpublished PhD thesis (Lewis 1992), see below, and to a limited extent the (again unpublished) work by Cambria Archaeology (Murphy 1996).

Lewis undertook sampling and data gathering on six of the fifteen sites in west Wales identified with buried peat deposits. However, Lewis's site 2, Marros is in

Carmarthenshire and site 15, Newport was riverine rather than coastal in location and both were therefore outside the scope of this project.

The threat to coastal buried peat deposits and intertidal archaeological sites was highlighted in February 1996 when the oil tanker *Sea Empress* grounded at the entrance to Milford Haven (James 1997). Fortunately, the contamination on the beaches was less than it might easily have been, and the subsequent clearance appears to have avoided the more sensitive beach peats.

Method

Following consultation with Heather and Terry James (both archaeologists with extensive knowledge of the archaeology of the southwest Wales coast) it was decided that the initial work should focus on the Pembrokeshire coast north of Milford Haven. Before commencing fieldwork, information was obtained from the regional Sites and Monuments Record (SMR) for those beaches containing submerged forests/peat, wrecks or other archaeological features. The Primary Record Numbers (PRN) of sites was noted and copies of the records made as necessary. Lewis's PhD thesis (1992) was also of considerable value. After site visits had been made to the beaches north of the Milford Haven, sufficient time and suitable autumn tides allowed inspection of four additional beaches south of the Haven.

The Beach work was undertaken at low tide springs where appropriate. The predicted low tide height at **chart datum** is given. Note chart datum is based on lowest astronomical tide **not Ordnance Survey Datum**. If the visit was not made at the time of low water, predicted tide height from low water was calculated (Appendix 1). The air pressure was also recorded as this affects tidal heights to a limited extent. Wind direction and force can have more considerable influence on predicted tide heights, but was not thought to be of influence at times of visits, when the weather was relatively calm. Where possible, a position was recorded at the low tide location by navigation grade Global Positioning System (GPS). Navigation-Grade GPS map accuracy and absolute accuracy is approximately 10m, which is good for finding location in relation to maps and relocating site, but is notoriously bad for height (information English Heritage 2003). Because of this, GPS inherent vertical limitation heights were not recorded. The low water limit was walked and the high water limit inspected at the top of the beaches. High cliffs and caves were considered to be outside the scope of this project, as were small beaches with no archaeological records.

Known archaeological locations taken from the SMR were also entered into the Global Positioning System so their position could be checked. A list of these site and locations adjacent to the beach is given in Appendix 2. A list of finds from the National Museums and Galleries Wales (NMGW) is given in Appendix 3; a number of these finds are from metal detectorists and amateur collection and their grid references are approximate and are not necessarily from the intertidal zone. New PRNs as a result of this project, mainly peat deposits, are listed in Appendix 4.

Radiocarbon dates have been calibrated using the Calib Rev 4.4.2 program to 2 sigma, 95.4% probability. A table of un-calibrated dates appears in Appendix 4

Results

from Tenby clockwise around the coast to Aber Mawr

Tenby South Beach: the beach is sandy except for the southwestern end which is very rocky below hard-rock cliffs. There is another thin band of stones near the western end. Areas of small pebbles are probably the result of recent erosion of the rocks and modern sea defences (Photo 1). The southern part of the top of the beach is bounded by sand dunes. Most of the beach, the dunes and the flat land behind are relatively modern, following the construction of sea walls in the early 19th century. There is some erosion of the dune edges showing the sand to be a recent accumulation. The northern part of the beach is bounded by cliffs below the town (Photo 2), and there appeared to be only a little erosion, with a similar situation on St Catherine's Island (Photo 3) at the northeast end of the beach. No archaeological features were observed except for the thin band of stones mentioned above which could be the relic of a fish trap (PRN 30040) recorded on Aldridge's Chart of Tenby and Caldey Roads 1856. This was rapidly surveyed in 1995 but by the following year was unrecognisable or buried. It is likely that the location of this fish trap is further up the beach than recorded in the SMR. Potentially dangerous cut metal rods were observed next to outfall PRN 30038 (Photo 4).

The low tide line was walked from just north of St Catherine's Island to Giltar Point. Visit 27/10/2003; low tide height 0.33m and with a barometric pressure of 1027 reducing this by 0.14m to 0.29m. Low tide GPS visit points SN1375500173; SS1329899816; SS129799352 partly out on Giltar Spit; SS 1254298620; SS1248198690.

Lydstep Haven: (Figure 3) the southern quarter of the beach is covered in stones and rocks, the upper portion of the beach within normal tidal range is pebbles and sand, the lower tidal limit is mainly sand (Photo 5). However, in the northern part there was one large fragment of peat and a number of small peat and timber deposits. There are very high cliffs, a quarry (PRN 32825) and former quay (PRN 32824) at the southern end of the beach (Photo 6). The northern end of the beach has a lower cliff. Neither of these cliffs appeared to be significantly eroding. The top of the beach between these cliffs is, all bar one small section, protected by modern sea defences (Photo 7) of large stones and a short length of gabions. There is a continuing erosion of the undefended section. The middle of the beach is used in the summer for launching powerboats by tractor and trailer.

This beach is known to have peat deposits towards its northern end near the low tide limit, where a pig skeleton and two microliths were recovered in 1917 (Jacobi 1980 171-175; also cited in Lewis 1992 101; PRN 33459 submerged forest, finds 12241 and 12242). It is obvious that these are from a much larger peat deposit than was surveyed in December 1930 (Lewis 1992 101). It has been suggested that this peat is likely to be late Mesolithic, (Jacobi 1980 174). A radiocarbon date of 5358-4781 BC at 96% probability confirms this suggestion. Lewis (1992) also sampled sediment from the beach head. A separately recorded submerged forest (PRN 11979) would appear to be wrongly located and may be the same as submerged forest PRN 33459.

The beach was visited on 27/09/2003. The predicted low tide height was 0.4m and a barometric pressure of 1025 reduced this by 0.1m to 0.3m. Low tide GPS visit point SS 0949598439. There was no exposed beach head section as investigated by Lewis.

However, there were scattered small peat and peat and timber deposits in the northern third of the beach, which are listed below:

PRN 48124 (Photo 8), small fragment of grey clay and one fragment of wood SS0936098378

PRN 48125 (Photo 9), intermittent timber and clay, south end SS0935798390

PRN 48126 (Photos 10), expanse of peat/clay *c*. 1.5m wide and nearly 20m long running SSE to NNW, southern end SS 0949798449

PRN 48127 (Photo 11), northernmost peat/clay, semi-linear deposit, SS0950898499

PRN 48128 (Photo 12), timber *c*. 3.5m long and possibly another below at right angle *c*. 1.5m long, SS0935298430

PRN 48129 small fragment of peat, most westerly deposit, stands 0.2m high, SS0933098410

PRN 48130 Lump of peat *c*. 3m x 2m and 0.15m high about 7m south of PRN 48128, SS0935298423

Frainslake Sands: (Figure 4) this beach is normally only accessible from Freshwater West as the landward side is bounded by Ministry of Defence land. The beach is sandy with a north-south line of beach pebbles just below the high water limit in the southern third of the beach. In the northern quarter there are outcropping rocks and north of this there are dense rocks extending between the promontories of Great Fursnap and Little Furznap, separating this beach from Freshwater West. At its southern end is another outcrop of rocks known as The Pole, which separates this beach from Blucks Pool. The northern- and southern-ends of the beach are bounded by cliffs (Photos 13 and 14). Between these cliffs the top of the beach is characterised by fairly stable grass covered sand dunes (Brownslade Burrows). Further south there is some erosion of these dunes.

An expanse of peat (PRN 515) has produce a large number of flint implements, including a number of microliths of Mesolithic date (10,000 to 4,000 BC) and a bone tool. This peat reportedly contained gorse, birch, hazel and alder as well as producing charcoal and it is suggested that this peat is likely to be late Mesolithic, *c*. 4,000 BC (Jacobi 1980 174), although it has not been independently dated. The primary sources of this information have not been checked, but they may relate to an area just inland, rather than to deposits on the beach. Other sites (PRNs 1255, 7465, 7508, 7747, 12244 and 12461) are poorly located and probably come from Brownslade Burrows, just inland of the beach.

This beach was visited on 26/10/2003; the predicted low tide height was 0.4m and a barometric pressure of 1022 reduced this by 0.1m to 0.3m. Three linear peat deposits, one quite large, were observed below the pebbles in the upper part of the beach, as well as peat deposits at the bottom of the tide limit, all in the southern part of the beach. These peat deposits are listed below but collectively were probably originally recorded under the single PRN 515. Recovered in this visit was a deer antler (PRN

48132; Photo 15; short report in Appendix 6), from the largest peat deposit PRN 48120. These peat deposits would appear to be the most archaeologically rich of all those on the Pembrokeshire coast.

Low tide GPS visit points visited: SR 8882197790, SR8864297975, SR8858098185, SR8849198568 and SR8831298989.

PRN 46118 (Photo 16) peat deposit *c*. 20m NS, 5m NW at bottom edge of pebbles, SR8900097862

PRN 46119 (Photo 255 17) linear peat deposit *c*. 18m long at bottom edge of pebbles, SR8898597766

PRN 48120 (Photos 18 and 19) large peat deposit *c*. 65m E-W, 19m N-S and 0.5m deep. This deposit is cut by water action on its southern side (photos 19 and 20) as well as being eroded by a stream on its western edge. The antler PRN 48132 was recovered from the southeastern part of this deposit. SR8897897627 and SR8961297627

PRN 48121 peat lump c. 1.5m x 1.5m and 0.3m high, very near the low tide limit, SR8885497750

PRN 48122 peat and timber c. 0.75m x 0,75m, near the low tide limit, SR8888897804

PRN 48123 (photo 21) length of exposed peat at the low tide limit, extending north of the low tide line before turning inwards on an inlet where there is a long timber, SR8881897829, SR8881297869, SR8880197885, SR8885097900

Freshwater West: (Photo 22) the beach is sandy with rocks to the south between the promontories of Little Fursenip and Great Furzenip. There are cliffs at either end of the beach and between these are massive sand dunes (Photo 23) with some erosion, apparently mostly caused by visitors rather than natural processes. Between the upper tide limit and the dunes there is a considerable amount of rubbish.

A submerged forest PRN 11976 is recorded off Little Fursnap promontory; possibly this should be recorded just to the north as this is where Lewis (1992 127) records a foreshore peat deposit. A sample of wood and peat from this location was radiocarbon dated to 5209-4543 BC at 96% probability (Seymour 1980 349). Lewis's test pit C2 in the dunes at the far north of the bay produced two flints PRN 48131 (1992 131). Mesolithic occupation (PRN 503) and Bronze Age finds are recorded at the low tide limit, also a substantial bronze age hoard (PRN 14393) was found by a detectorist about two thirds of the way down the beach. This hoard consisted of twenty eight bronzes, of which five are recognisable objects as three socked axes and two blades.

This beach was visited on 26/10/2003; the predicted low tide height was 0.4m and a barometric pressure of 1022 reduced this by 0.1m to 0.3m. There was no evidence of the submerged forest PRN 11976 either off Little Furznip or just to the north. The beach was well covered in sand and only slightly cut into by the stream draining from Castlemartin Gorse. The high tide and low tide limits of the beach were walked as

well as an intermediate transect. Low tide GPS visit points visited: SR8831298989, SS8813199553, SM8783200108 and SM8754100562.

Westdale Bay: the beach is sandy with scattered rocks. There was a little erosion of the soft glacial-deposit cliffs but no archaeological features of any antiquity were seen. However flints have been found near this location in the past (PRN 7589; 3007). The beach appeared slightly sandier than noted in the past. Visit 5/7/2003; tide not that low or fully out. Visit 13/8/2003, low tide height 0.87m.

Marloes Sands: (Photo 24) the beach is sandy with a few large scattered rocks; the cliffs are generally high and steep. A waste flint (PRN 11202) is recorded at the far northwest end of the beach near Gateholm Sound. Visit 14/6/2003, low tide height 0.69m. Nothing of antiquity was seen.

Albion Sands: (Photo 25) the beach is sandy with a good scattering of rocks, becoming very rocky towards the cliff. On this beach are the remains of the 1837 wreck of the Albion (PRN 32756; Photos 26, 27 and 28). She was a paddle steamer 150 feet in length. The paddle wheel shaft, a wheel and a few other bits of iron can still be seen. From photographs taken in 1997 the sand would now appear to be *c*. 150mm higher. The Nautical Archaeology Society was contacted; there is no known detailed record of this wreck. Visit 14/6/2003, low tide height 0.69m.

St Brides Haven: (Photo 29) a small rocky cove with drying sandy centre, low eroding cliff around limekiln to east. In the exposed cliff edge a number of graves have been exposed (PRN 7606; Photos 30 to 33). Bones from one stone-lined (cist) grave were dated to possibly pre-Norman times (radiocarbon date AD 894-1209 at 96% probability). However, bones from another grave date only from around the 1800s. This part of the low cliffs continues to slowly erode and is now 1.15m to 1.25m in front of a wooden fence. As far as can be ascertained from photographs from 1990, only about 150mm has eroded over the last 14 years. There are still a number of probable exposed graves including possible stone-lined graves in the cliff face. The slow losses of these graves are of considerable archaeological concern. The slow steady erosion will continue but more dramatic loss is a distinct possibility during severe winter storm and. A small amount of loss was noted between June 2003 and March 2004 (Photos 32 and 33). Visit 14/6/2003 about 1 hour before low tide height 0.69m (*c*. 1.19m).

Little Haven and Broad Haven: (photo 34) both beaches were well covered with sand with a few rocks protruding. Visit 16/6/2003, low tide height 0.77m. High pressure probably reduced tide height by further 0.1m. Nothing of antiquity was seen.

Druidston beach: (Photo 35) the beach was well covered with sand with a few rocks protruding. There are very high cliffs at its northern and southern ends. Visit 16/6/2003, 1 hour before low tide height 0.77m (*c*. 1.24m). High pressure probably reduced tide height by further 0.1m. Nothing of antiquity was seen.

Nolton Haven: (Photo 36) the beach was well covered with sand with a few rocks protruding. Visit 16/6/2003, 1.5 hours before low tide height 0.77m (*c*. 1.47m). High pressure probably reduced tide height by further 0.1m. Nothing of antiquity was seen.

Newgale Sands: (Photo 37) the beach was almost totally covered with sand with no exposed pebbles or peat deposits. The top of the beach is mostly a storm-beach bank of pebbles but with high cliffs at both the northern and southern ends. Over the last few years the peat deposits and submerged forest (PRN 12991) have been exposed during winter gales. A number of Mesolithic flints (PRN 9835) have been recovered from the far north end of the beach (Cwm Beach), possibly coming from the eroding cliff top. A Bronze Age palstave (axe) (PRN 14279) was found *c*.1990 approximately opposite to the former filling station. Further Bronze Age artefacts including a dirk, not yet on the SMR or NMGW data bases, were found early in 2000 after winter storms when a metal detectorist was working the beach, from about 150m west of Pinch Cottage. A number of medieval and post-medieval artefacts, also found by detectorists, have been recorded under the recent Portable Antiquity Scheme by the National Museum of Wales. However, these later finds are not accurately located. This beach was viewed on a number of occasions during the summer, including 30/8/2003 low tide height 0.58m. Nothing of antiquity was seen.

Solva harbour entrance: (Photo 38) high cliffs surround the entrance. At low tide there is an expanse of sand with a small pool of water. This beach was viewed on a number of occasions during the summer including 29/8/2003 low tide height 0.63m. Nothing of antiquity was seen. Around the inner part of the harbour there are a number of features (see appendices); the only one that is vulnerable is the remains of a wall base to the east of the Sand Quay, which may relate to the earlier crossing point across the harbour bed.

St Justinians: (Photo 39) this is a rocky inlet with a little shingle immediately below the cliffs, and it is dominated by the Lifeboat Station. Lewis (1992 5) records Porth Stinnian as a location of foreshore peat on his location map (see Figure 1): no other reference to this has been found. Visit 10/09/2004. Prodicted low tide height 0.56m. High pressure 0f 1032 probably reduced tide height by further 0.2m. Nothing of antiquity was seen and it seems an unlikely location for foreshore peat.

Whitesands Bay: (Photo 40) the beach was well covered with sand and there was no visible sign of the submerged forest or peat deposits (PRN11978). Lewis (1992, 152) reported finds published in 1885 included a flint from “the clay below the forest”, and also discovery of red deer antlers, a jaw bone from a brown bear and insect remains from unspecified foreshore locations (PRN 48233). Recovered from the foreshore peat were the remains a red deer and two aurochs (very large prehistoric wild cattle), one female (radiocarbon date 3503-2941 BC at 96% probability), the other probably male (PRN 13360). At least two Bronze Age palstaves (PRN s11234 and 14278) have come from near the peat deposits on the beach and it is possible that others have been recovered but not reported. A small gold nugget of possible Late Bronze Age date was found by a metal detectorist in 1996 and is in the NMGW collection but apparently not on their data base yet. There have been rumours of a Bronze Age wreck but this cannot be confirmed. A spindle whorl, slag, and a flint scraper recorded from the north of the beach probably derive from Trwynhwrddyn promontory – their grid references are imprecise. Lewis (1992, 153) records another flint from this promontory in a test pit. A considerable number of artefacts, mostly flints, are recorded by NMGW but again are poorly located and likely to be from just inland (Appendix 4).

There are high cliffs along the southern half of the beach, becoming lower towards the middle section. There was little or no active erosion. North of this is an area of sand dunes and a mound covering St Patrick's Chapel (PRN 2638). Adjacent to the mound, the sea defences have been breached in one small place and erosion is taking place (Photo 41); this could easily be repaired.

Visit 12/6/2003 low tide height 1.06m. High pressure probably reduced tide height by further 0.1m. Nothing of antiquity was seen.

Aber Mawr: (Photo 42 and Figure 5) the beach is well covered with sand with an upper storm beach of pebbles. In the southern part of the pebble bank stream scours (Photo 43) expose peat deposits and wood of the submerged forest PRN 32832 (Photos 44 and 45). These peat deposits were re-plotted (PRN 48117) and start nearly 60m south of the stone outcrop in the pebble beach. Note that the GPS locations for these peat deposits (PRN 48117) may have a relative bias to the east.

Nearly 50 flints or fragments of flints (PRN 7390) were recovered in a tilled area behind the storm beach and are probably Mesolithic (Dunn 1968). Another assemblage (PRN 48134) including a microlith were found by an archaeological tutor and students beneath the intertidal peat. Lewis (1992, 172, 177) found three more flints (PRN 48135) from one of his test pits behind the storm beach. Radiocarbon dating on the peat deposits in one of these test pits indicated that the valley peat commenced 7028-6110 BC at 96% probability with later peat dated to 3366-2933 BC at 96% probability. Timber and peat is recorded on the seaward side and below the pebble beach-head; unusually these timbers are not oak (pers comm Nigel Nailing; Seymour 1980 348).

Brunel had proposed Aber Mawr as a rail and sea terminus to Ireland. Remains can still be seen of embankments, piers, breakwaters and a ledge for the station. This construction was abandoned in 1848 and the terminus was later located at Fishguard. The large pebble bank has only been here since 1859 when a fierce storm forced mountainous seas into the bay. The first Atlantic telegraph cable was laid from the north end of this beach across to Ireland in 1873.

This beach was visited at the beginning of January 2003 when more timber was visible below the storm beach just into the sand (Photo 46). These timbers may now have been lost. Visit 12/6/2003 low tide height 1.06m. High pressure probably reduced tide height by further 0.1m.

Discussion and General Recommendations

Peat deposits were only visible at Lydstep Haven, Frainslake Sands and Aber Mawr. The general impression is that sand cover is about 100mm to 150mm higher than normal on most of the beaches. This increase in sand height would appear to be borne out by the wreck of the Albion where the height difference can be clearly seen between the photographs of 1997 and 2003. It is known that the gales of early 2000 damaged the peat deposits on Newgale Beach and similar rapid erosion is likely to occur to these deposits on any of the exposed beaches of Pembrokeshire whenever there is severe weather; it is also known that this is the most likely time for the peat to be revealed. It is evident that the fish trap recorded in the report of the Sea Empress

Oil Spill (James 1997) on Tenby South Beach has become unrecognisable within the last few years.

There are few foreshore peat deposits around the coast, and these would appear to date from the Mesolithic period. What is surprising is the number of these deposits that have produce artefacts from the later part of that period: Lydstep Haven, Frainslake Sands, Freshwater West, Whitesands Bay and Aber Mawr. Bronze Age artefacts have been found in the peat at Newgale and Whitesands Bay. These object would appear to represent a preference for prehistoric activities within these environments.

What is manifest is that the foreshore peats are of prime archaeological importance and also have considerable palaeoenvironmental value. It is important that any planned foreshore work, which may be on or adjacent to these peat deposits, should be avoided if at all possible: if not, a programme of archaeological work and analysis must be undertaken beforehand. Additionally, it is paramount that any emergency work, for example after an oil spill, should have within their procedures actions which should either avoid these important areas or again implement archaeological processes as part of any actions.

From time to time substantial natural erosion, which cannot be stopped, takes place on the foreshore peats. It is imperative therefore that archaeological rescue procedures of recording, sampling and analysis, with funding, are in place so that immediate action can be taken. An additional threat to the foreshore peat artefacts come from metal detectorists. This detecting activity is difficult to control, and those that undertake this activity should be encouraged to report their results. This activity needs to be monitored and/or evaluated, possibly necessitating by-laws and or supervised screening and recovery.

Individual Recommendations

The other beaches in South Pembrokeshire that have foreshore peat deposits sould be inspected as soon as possible: **Amroth**, **Wisemans Bridge**, **Saundersfoot**, **Manorbier** and **Freshwater East**.

Lydstep Haven: it is recommend that those operating tractor launching of boats from the beach are made aware of the peat deposits to the northern end of the beach and if possible a programme of rescue recording and sampling should be implemented. As these peat and wood deposits are patchy major excavation of the larger remaining areas could be justified given their eroded and eroding nature.

Frainslake Sand: given that this would appear to be the most archaeologically significant foreshore peat deposit, an accurate (EDM) survey, surface collection and sampling should take place in the immediate future, then monitor on a yearly basis, possibly with- re-survey in 5 years time.

Albion Sands: The remains of the wreck of the Albion should be properly recorded.

Whitesands Bay: repair sea defence and erosion in front of St Patrick’s Chapel.

Aber Mawr: recommend that the National Trust and/or Countryside Council for Wales, who already have a vested interest in the environment there, be asked to monitor the erosion on the beach peats and timbers several times per year. It would be expected that further sampling and analysis would be undertaken within the near future.

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Acknowledgments

Martin Locock for his report on the antler. Marion Manwaring Cambria SMR for assistance with data. Ken Murphy of Cambria for useful suggestions and checking the report.

Appendix 1 Effects of atmospheric pressure on tide height

(from Practical Boat Owner)

Barometric Pressure	Difference in cm
963	+50
973	+40
983	+30
993	+20
1003	+10
1013 (norm)	0
1023	-10
1033	-20

Tidal height calculations used to adjust for time of low water

The tide will rise or fall according to approximate proportion of its range as below. Figures in brackets are the decimal multipliers

1st hour	= 1/12 (0.08)
2nd hour	= 2/12 (0.16)
3rd hour	= 3/12 (0.25)
4th hour	= 3/12 (0.25)
5th hour	= 2/12 (0.16)
6th hour	= 1/12 (0.08)

Appendix 2 Sites and Monuments Record

Pre-dating this project
from Tenby clockwise around the coast to Aber Mawr

Tenby South Beach

PRN	NAME	NGR	TYPE	PERIOD
3443	GILTAR POINT	SS124984	FINDS	Iron Age
3444	GILTAR POINT	SS124984	FINDS	Roman
4238	GILTAR POINT	SS12319841	MIDDEN	Prehistoric;Roman
4239	GILTAR POINT	SS12419840	MIDDEN	Prehistoric;Roman
4240	GILTAR POINT	SS124984	SETTLEMENT?	Prehistoric?;Roman?
4241	GILTAR POINT	SS124984	FINDS	Neolithic
5013	GILTAR POINT	SS124984	FINDS	Neolithic
29910	THE BURROWS PENALLY	SS12219870	LIME KILN	Post Med
29913	THE BURROWS PENALLY	SS12359895	FIRING RANGE	Modern
29914	PENALLY BEACH	SS12409910	LANDING POINT	Post Med;Modern
29927	SOUTH BEACH CULVERT	SN131000	SEWER?	Post Med
30038	PENALLY BEACH	SS12259860	PIPELINE?;SEWER?	Post Med?
30040	PENALLY BEACH	SS122983	FISH TRAP	Medieval;Post Med
30042	SOUTH BEACH	SS13279984	PIPELINE	Modern
30043	GILTAR POINT	SS12349845	QUARRY	Post Med
30044	GILTAR POINT	SS12499863	LANDING POINT?	Unknown
30045	PENALLY BEACH	SS12219864	GROYNE	Modern
30046	PENALLY BEACH	SS124988	STRUCTURE	Post Med?;Modern?

Lydstep Haven

PRN	NAME	NGR	TYPE	PERIOD
11678	LYDSTEP HAVEN	SS094985	FINDS	Prehistoric
11979	LYDSTEP HAVEN	SS092978	SUBMERGED FOREST	Prehistoric
32824	LYDSTEP HAVEN	SS09269779	QUAY	Post Med
32826	LYDSTEP HAVEN	SS09109820	SLIPWAY	Modern
33459	LYDSTEP HAVEN	SS094984	SUBMERGED FOREST	General

Frainslake Sands

PRN	NAME	NGR	TYPE	PERIOD
515	FRAINSLAKE BEACH;BROWNSLADE BURROWS	SR889979	OCCUPATION SITE	Mesolithic
1255	BROWNSLADE BURROWS	SR8998	FINDS	Neolithic
7465	BROWNSLADE BURROWS	SR8998	FINDS	Medieval
7508	BROWNSLADE BURROWS	SR8998	FINDS	Prehistoric
7747	BROWNSLADE BURROWS	SR8998	FINDS	Mesolithic; Neolithic
12244	BROWNSLADE BURROWS	SR8998	FINDS	Mesolithic
12461	BROWNSLADE CHAPEL	SR8998	CHAPEL	Medieval

Freshwater West

PRN	NAME	NGR	TYPE	PERIOD
503	FRESHWATER WEST	SR88109970	OCCUPATION SITE	Mesolithic
504	FRESHWATER WEST	SR88109970	FINDS	Bronze Age

10094	FRESHWATER WEST	SR885995	FINDS	Mesolithic
11976	FRESHWATER WEST	SR882993	SUBMERGED FOREST	Prehistoric
14393	FRESHWATER WEST	SR882999	HOARD	Bronze Age
33440	ANGLE	SM88040063	WEAPONS PIT	Modern

Westdale Bay

PRN	NAME	NGR	TYPE	PERIOD
3007	LONG POINT	SM797049	FLINT WORKING FLOOR	Mesolithic; Neolithic
7589	LONG POINT	SM797049	FLINTS	Mesolithic
32757	WESTDALE BAY	SM79930588	HOLLOW WAY	Post Med?

Marloes Sands

PRN	NAME	NGR	TYPE	PERIOD
2936	RUNWAYSKILN	SM77750778	FLINTWORKING FLOOR	Mesolithic
2937	RUNWAYSKILN	SM77750778	FLINTWORKING FLOOR	Mesolithic;Neolithic
11202	GATEHOLM STACK	SM773075	FINDS	Neolithic
32632	MARLOES SANDS	SM78120765	MILL	Post Med
32756	ALBION SANDS	SM77010750	WRECK	Post Med

St Brides Haven

PRN	NAME	NGR	TYPE	PERIOD
3138	CLIFF COTTAGES	SM80231094	CHAPEL	Medieval
7606	ST BRIDES CIST CEMETERY	SM80231094	CEMETERY	Early Medieval
23815	ST BRIDES	SM8021510926	LIME KILN	Post Med

Little Haven

PRN	NAME	NGR	TYPE	PERIOD
12814	HAROLD STONE	SM8614	FINDS	Prehistoric
23819	HAROLDSTON	SM86101409	LIME KILN	Post Med
32726	BROAD HAVEN	SM86071408	ROCKET POST	Modern?
32727	BROAD HAVEN	SM86091406	SHAFT	Post Med
32728	BROAD HAVEN	SM86131406	SEA DEFENCES	Post Med;Modern
33296		SM86131404	TANK TRAP	Modern
33297		SM86061370	TANK TRAP	Modern
33298		SM85811339	DEFENCE POST	Modern

Druidston Haven

PRN	NAME	NGR	TYPE	PERIOD
3113	DRUIDSTON HAVEN	SM8617	FINDS	Neolithic
3114	DRUIDSTON CHINS	SM86171650	FINDS	Palaeolithic?
7598	DRUIDSTON CHINS	SM86171650	FINDS	Prehistoric
7599	DRUIDSTON CHINS	SM86161668	FINDS	Palaeolithic?
7600	DRUIDSTON CHINS	SM86161668	FINDS	Prehistoric
32724	DRUIDSTON HAVEN	SM86121686	SUMMERHOUSE	Post Med;Modern

Nolton Haven

PRN	NAME	NGR	TYPE	PERIOD
5444	NOLTON HAVEN	SM858183	FINDS	Mesolithic

Newgale Sands

PRN	NAME	NGR	TYPE	PERIOD

2779	CWM MAWR	SM843229	BURNT MOUND	Prehistoric
12227	PEN Y CWM	SM844228	FINDS	Mesolithic
12991	NEWGALE	SM846220	SUBMERGED FOREST	Prehistoric
14279	NEWGALE SANDS	SM84702207	FINDS	Bronze Age
30172	CWM MAWR	SM84322290	FINDS	Prehistoric

Solva

PRN	NAME	NGR	TYPE	PERIOD
2797	SOLVA	SM8024	FINDS	Roman
4645	SOLVA KILNS	SM805242	LIME KILN	Post Med
6387	CAER FARCHELL	SM8024	DWELLING	Post Med
9834	SOLVA	SM8024	FINDS	Iron Age
11178	SOLVA AXE	SM8024	FINDS	Neolithic
12228	SOLVA HARBOUR	SM800240	FINDS	Mesolithic
12348	SALVACH	SM8024	SETTLEMENT	Medieval
32621	SOLVA	SM80152410	LIFEBOAT STATION	Post Med
32622	SAND SLIP;SAND QUAY	SM80312417	QUAY;SLIPWAY	Post Med
32710	SOLVA	SM80182412	SPRING	Post Med?
32711	TRINITY QUAY	SM80212412	QUAY	Post Med
32712	SOLVA	SM80212412	QUARRY	Post Med?
32713	SOLVA HARBOUR	SM80232399	LANDING POINT	Modern?
32714	SOLVA HARBOUR	SM80532427	SLIPWAY	Modern

St Justinians

PRN	NAME	NGR	TYPE	PERIOD
9842	PORTH STINAN	SM723252	FINDS	Mesolithic
26670	SAINT JUSTINIAN'S	SM72332517	LIFEBOAT STATION	Post Med

Whitesands Bay

PRN	NAME	NGR	TYPE	PERIOD
2634	TY-GWYN	SM73312740	INSCRIBED STONE	Early Medieval
2638	ST PATRICKS CHAPEL	SM73372723	CHAPEL	Early Medieval;Medieval
7353	PWLLEUOG	SM733274	FINDS	Prehistoric
7355	TY GWYN	SM732273	FINDS	Prehistoric
11234	WHITESANDS BEACH	SM73272715	FINDS	Bronze Age
11371	TRWYN HWRDDIN;RAM'S NOSE	SM731274	FINDS	Neolithic
11978	WHITESANDS BAY	SM733270	SUBMERGED FOREST	Prehistoric
13360	UNKNOWN	SM73252715	FINDS	Prehistoric?
13949	TRELEDDYN	SM728262	COMMON LAND	Medieval;Post Med
14278	WHITESANDS BEACH	SM73182714	FINDS	Bronze Age
25484	PORTHSELAU	SM726260	MINING FEATURE	Post Med
30677		SM73302726	FINDS	Unknown
32605	CRAIG Y CREIGWYR	SM73152762	QUARRY	Unknown
32611	PORTH MAWR	SM73222663	QUARRY	Unknown

Aber Mawr

PRN	NAME	NGR	TYPE	PERIOD
7390	ABER MAWR	SM882345	FLINTWORKING FLOOR	Mesolithic;Neolithic
16505		SM881344	QUARRY	Post Med
32650	ABER MAWR	SM88283467	BUILDING	Post Med?
32672	ABER MAWR	SM88113437	TUNNEL	Post Med?
32832	ABER-MAWR	SM88103455	SUBMERGED FOREST	General

Appendix 3 Finds from National Museum And Galleries Wales

from Tenby clockwise around the coast to Aber Mawr

Tenby South Beach

Record no	NGR	Material	Object name	Title	Period
20850	SS124991	copper	Token	Private Haverfordwest	Post Medieval

Frainslake Sands

Record no	NGR	Material	Object name	Title	Period
8336	SR889977	chert	natural object	Chert nodule	
18586	SR889977	flint	flake	Prehistoric flint flake	Prehistoric
18587	SR889977	flint	flake	Prehistoric flint flake	Prehistoric
18588	SR889977	flint	flake	Prehistoric flint flake	Prehistoric
18589	SR889977	flint	flake	Prehistoric flint flake	Prehistoric
18590	SR889977	flint	flake	Prehistoric flint flake	Prehistoric
18591	SR889977	flint	flake	Prehistoric flint flake	Prehistoric
18592	SR889977	flint	flake	Prehistoric flint flake	Prehistoric
18593	SR889977	flint	flake	Prehistoric flint flake	Prehistoric
18594	SR889977	flint	flake	Prehistoric flint flake	Prehistoric
8338	SR889977	flint	core	Prehistoric core	Prehistoric
18582	SR889977	flint	core	Prehistoric core	Prehistoric
18585	SR889977	flint	core rejuvenation flake	Flint core rejuvenation flake	Prehistoric

Freshwater West

Record no	NGR	Material	Object name	Title	Period
13883	SM882000	bone	metapodial	Red deer metapodial	Prehistoric

Newgale Sands

Record No	NGR	Material	Object name	Title	Period
65665	SM8422	lead	weight	Medieval lead weight	Medieval
13539	SM8422	lead	weight	Post-Medieval lead weight	Post-Medieval
1117	SM8422	brass	Edward IV halfgroat (counterfeit)	Edward IV halfgroat (counterfeit)	15th century, Late
13709	SM8422	lead	shot	Medieval lead shot	Medieval
13849	SM8422	bronze	annular brooch	Medieval bronze ring brooch	Medieval
13850	SM8422	lead	shot	Post-Medieval	Post-Medieval

				lead shots	
70094	SM8422	lead	shot	Post-Medieval lead shots	Post-Medieval
70095	SM8422	lead	Post-Medieval iron object	Post-Medieval lead sheet	Post-Medieval
70096	SM8422	copper alloy	spike	Post-Medieval copper spike	Post-Medieval
13913	SM8422	lead	shot	Post-Medieval lead shots	Post-Medieval
70097	SM8422	copper	bolt	Post-Medieval copper bolt	Post-Medieval
70098	SM8422	wood	tree nail	Post-Medieval wood tree nail	Post-Medieval
70099	SM8422	lead	pipe (smoking)	Post-Medieval lead scupper pipe	Post-Medieval
70093	SM8422	lead	shot	Post-Medieval lead shots	Post-Medieval

Whitesands Bay

Record no	NGR	Material	Object name	Title	Period
12335	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
10107	SM7327	flint	transverse arrowhead	Bronze Age flint transverse arrowhead	Bronze Age
37468	SM7327	flint	knapping debitage	Prehistoric flint debitage	Prehistoric
37469	SM7327	flint	flake	Prehistoric flint retouched flake	Prehistoric
37470	SM7327	flint	flake	Prehistoric flint retouched flake	Prehistoric
37360	SM7327	flint	end scraper	Prehistoric flint scraper	Prehistoric
37361	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
37362	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
37363	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
37364	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
37365	SM7327	flint	core	Prehistoric flint core	Prehistoric
37366	SM7327	flint	core	Prehistoric flint core	Prehistoric
37367	SM7327	flint	blade	Prehistoric flint blade	Prehistoric
38702	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38703	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38704	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38706	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric

38707	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38708	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38709	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38711	SM7327	flint	knife	Prehistoric flint scraper	Prehistoric
38713	SM7327	flint	flake	Prehistoric flint retouched flake	Prehistoric
38714	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38715	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38716	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38717	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38718	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38720	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38721	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38722	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38723	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38724	SM7327	flint	knapping debitage	Prehistoric flint debitage	Prehistoric
38726	SM7327	flint	flake	Prehistoric flint retouched flake	Prehistoric
38727	SM7327	flint	transverse arrowhead	Bronze Age flint transverse arrowhead	Bronze Age
38728	SM7327	flint	plano convex knife	Neolithic / Bronze Age flint plano convex knife	Late Neolithic
38729	SM7327	flint	core	Prehistoric flint core	Prehistoric
38730	SM7327	flint	flake	Prehistoric flint flake	Prehistoric
38816	SM7327	flint	core	Prehistoric flint core	Prehistoric
38818	SM7327	flint	flake	Prehistoric flint flake	Prehistoric
38819	SM7327	flint	flake	Prehistoric flint flake	Prehistoric
38821	SM7327	flint	blade	Prehistoric flint blades	Prehistoric
38823	SM7327	flint	scraper	Prehistoric flint scraper	Prehistoric
38826	SM7327	flint	flake	Prehistoric flint flakes	Prehistoric
38828	SM7327	flint	knapping debitage	Prehistoric flint debitage	Prehistoric

38830	SM7327	flint	flake	Prehistoric flint retouched flake	Prehistoric
38831	SM7327	flint	core	Prehistoric flint core	Prehistoric
38833	SM7327	flint	knapping debitage	Prehistoric flint debitage	Prehistoric
38836	SM7327	chert	flake	Prehistoric chert flake	Prehistoric
38838	SM7327	stone	flake	Prehistoric stone flake	Prehistoric
38842	SM7327	bronze	metalworking waste	Undated copper alloy metalworking waste	
38979	SM7327	flint	scraper	Neolithic / Bronze Age flint scraper	Late Neolithic
38980	SM7327	flint	scraper	Neolithic / Bronze Age flint scraper	Late Neolithic

Appendix 4 New Primary Record Numbers

from Tenby clockwise around the coast to Aber Mawr

PRN	SITE NAME	NGR	Sitetype	Description	VisitDate
46118	FRAINSLAKE SANDS	SR890097862	PEAT	Linear peat deposit 5m x 20m	22/10/2003
48119	FRAINSLAKE SANDS	SR889859776	PEAT	Linear peat 18m long	26/10/2003
48120	FRAINSLAKE SANDS	SR8897897627	PEAT	Large peat and timber deposit	26/10/2003
48120	FRAINSLAKE SANDS	SR8896129762	PEAT	Large peat and timber deposit	26/10/2003
48121	FRAINSLAKE SANDS	SR8885497750	PEAT	Peat lump 1.5mx1.5mx0.3m	26/10/2003
48122	FRAINSLAKE SANDS	SR8888897790	PEAT	Peat and timber 0.75mx0.75m	26/10/2003
48123	FRAINSLAKE SANDS	SR8881897829	PEAT	Large peat and timber deposit	26/10/2003
48123	FRAINSLAKE SANDS	SR8881297869	PEAT	Peat	26/10/2003
48123	FRAINSLAKE SANDS	SR8880197885	PEAT	Peat	26/10/2003
48123	FRAINSLAKE SANDS	SR8885097900	PEAT	Peat and long timber	26/10/2003
48124	LYDSTEP HAVEN	SS0936098378	PEAT	Small frag of grey clay and ti	27/10/2003
48125	LYDSTEP HAVEN	SS0935798390	PEAT	S. end of long timeber and cla	27/10/2003
48126	LYDSTEP HAVEN	SS0949798449	PEAT	Linear Peat deposit 1.5m wide	27/10/2003
48127	LYDSTEP HAVEN	SS0950898499	PEAT	Peat and clay northern most	27/10/2003
48128	LYDSTEP HAVEN	SS0935298430	PEAT	Large timber 3.5m long with an	17/09/2003
48129	LYDSTEP HAVEN	SS0933098401	PEAT	Small frag of peat 200mm above	27/09/2003
48117	ABER MAWR	SM8820834532	PEAT	Peat and timber	12/06/2003
48117	ABER MAWR	SM8822534554	PEAT	Peat and timber	12/06/2003
48117	ABER MAWR	SM8825034584	PEAT	Peat and timber	12/06/2003
48130	LYDSTEP HAVEN	SS0935298423	PEAT	Lump 3m x 2m and 0.15m high	27/09/2003
48131	FRESHWATER WEST	SM8798000678	FINDS	Flints Lewis 1992 132	16/03/2004
48132	FRAINSLAKE SANDS	SR8897697626	FINDS	Antler pick	26/10/2003
48133	WHITESANDS BAY	SM733270	FINDS	Lewis 1992 152 ref to finds	19/03/2004
48134	ABER MAWR	SM188203455	FINDS	Lewis 1992 170-2 by John Evans	19/03/2004
48135	ABER MAWR	SM8830034590	FINDS	Lewis 1992 177 three flints	19/03/2004

Appendix 5 Radiocarbon Dates

CALIB REV4.4.2 Copyright 1986-2004 M Stuiver and PJ Reimer.

LYDSTEP
Radiocarbon Age BP 6150 +/- 120
Calibration data set: intcal98.14c (Stuiver et al., 1998a)

68.3 (1 sigma)	cal BC 5258- 5239	0.052
	5233- 5218	0.043
	5213- 4941	0.894
	4867- 4862	0.011
95.4 (2 sigma)	cal BC 5358- 5351	0.003
	5340- 5330	0.005
	5323- 4781	0.992

FRESHWATER WEST
Radiocarbon Age BP 5960 +/- 120
Calibration data set: intcal98.14c (Stuiver et al., 1998a)

68.3 (1 sigma)	cal BC 4998- 4707	0.977
	4702- 4692	0.023
95.4 (2 sigma)	cal BC 5209- 5165	0.028
	5144- 5108	0.019
	5101- 5089	0.005
	5083- 4543	0.948

ST BRIDES
Radiocarbon Age BP 1000 +/- 70
Calibration data set: intcal98.14c (Stuiver et al., 1998a)

68.3 (1 sigma)	cal AD 980- 1067	0.608
	1082- 1125	0.259
	1137- 1157	0.134
95.4 (2 sigma)	cal AD 894- 925	0.058
	932- 1193	0.931
	1199- 1209	0.011

WHITESANDS
Radiocarbon Age BP 4540 +/- 70
Calibration data set: intcal98.14c (Stuiver et al., 1998a)

68.3 (1 sigma)	cal BC 3362- 3306	0.259
	3301- 3264	0.128
	3238- 3168	0.327
	3163- 3102	0.285
95.4 (2 sigma)	cal BC 3503- 3428	0.074
	3381- 3017	0.922
	2977- 2971	0.002
	2946- 2941	0.002

ABER MAWR: Lower peat
Radiocarbon Age BP 7640 +/- 150
Calibration data set: intcal98.14c (Stuiver et al., 1998a)

68.3 (1 sigma)	cal BC 6645- 6375	0.876
	6361- 6345	0.032
	6311- 6297	0.028
	6292- 6262	0.065
95.4 (2 sigma)	cal BC 7028- 7015	0.004
	7012- 6967	0.014
	6949- 6932	0.006
	6916- 6881	0.013
	6831- 6206	0.951
	6188- 6181	0.002
	6171- 6162	0.003
	6132- 6110	0.007

ABER MAWR: Upper peat
Radiocarbon Age BP 4500 +/- 60
Calibration data set: intcal98.14c (Stuiver et al., 1998a)

68.3 (1 sigma)	cal BC 3341- 3258	0.381
	3243- 3205	0.178
	3203- 3148	0.247
	3141- 3099	0.194
95.4 (2 sigma)	cal BC 3366- 3016	0.981
	2979- 2966	0.009
	2949- 2933	0.010

References for calibration datasets:
Stuiver, M., and Braziunas, T.F., (1993), The Holocene 3:289-305.
Stuiver, M., Reimer, P.J., and Braziunas, T.F., (1998b)
Radiocarbon 40:1127-1151. (revised dataset)
Stuiver, M., Reimer, P.J., Bard, E., Beck, J.W., Burr, G.S.,
Hughen, K.A., Kromer, B., McCormac, F.G., v.d. Plicht, J., and
Spurk, M. (1998a), Radiocarbon 40:1041-1083.
McCormac, F.G., Reimer, P.J., Hogg, A.G., Higham, T.F.G., Baillie, M.G.L.,
Palmer, J., Stuiver, M., (2002), Radiocarbon 44: 641-651.

Appendix 6 Assessment of Antler Pick PRN 48132

Martin Locock

The antler is a large example of a red deer, with the brow tine intact, but the bay tine missing, and the upper parts of the antler decayed and shattered. The antler has been shed. Patination around the last 30mm of the surviving brow tine suggests that it had been utilised by humans, and the absence of the tip may be a result of breakage. There is no surviving evidence of deliberate shaping (apart from the patination), but it is likely that it was used as a pick. A Mesolithic date is likely.

It would be interesting to date the peat surface in the vicinity of the find spot to establish the relative chronology of the end of peat growth and the deposition of the antler (and it may be possible to get some palaeo evidence for the latter stages of peat growth). Other features to watch for on the peat surface are the characteristic pock-marks filled with silt created by animal hoof prints in the top of the peat.

Appendix 7 Archive Catalogue

The project archive has been indexed and catalogued according to National Monument Record (NMR) categories and contains the following:

A. Copy of interim and final report

B. Records made during fieldwork, including context record sheets and site notebook.

D. Site photographs – digital only

M. Miscellaneous correspondence.

There is no material for classes C, E- L and N.

The archive is currently held by **Cambria** Field Operations, Llandeilo, Carmarthenshire, as project number 48116.

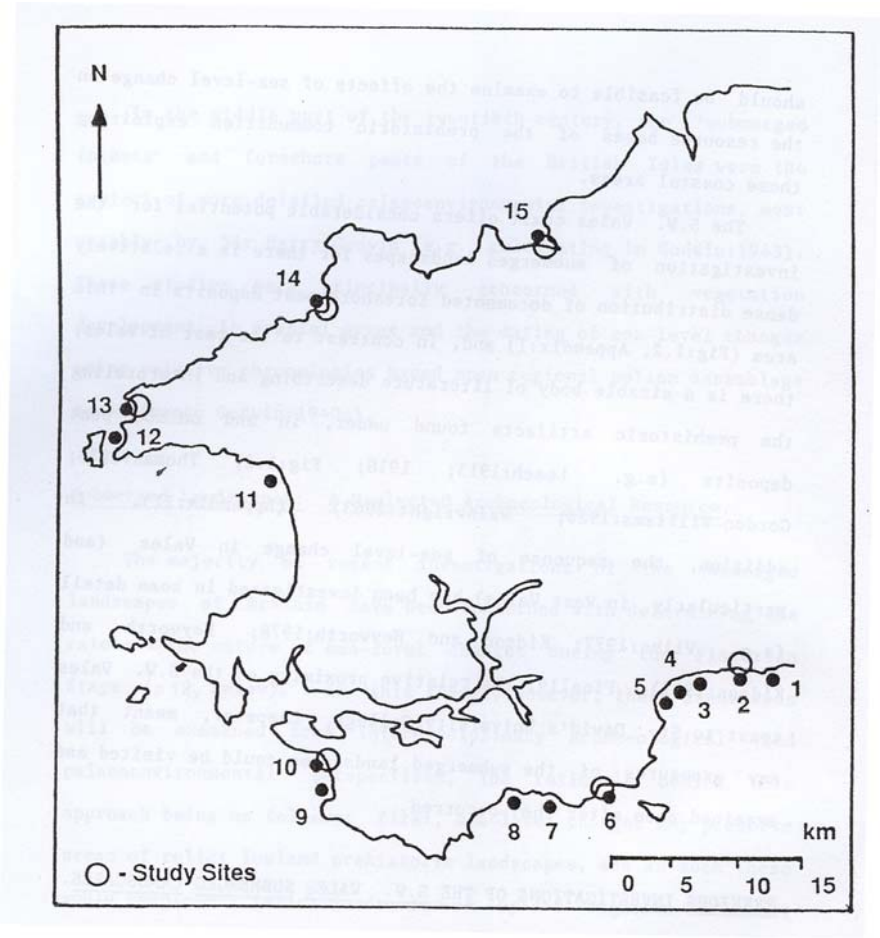
Figures

Photographs

Contents

Front cover: Whitesands Bay

Figures



Key

1- Morfa Bychan	6- Lydstep	11- Newgale
2- Marros	7- Manorbier	12- Porth Stinian
3- Amroth	8- Freshwater East	13- Whitesands
4- Wisemans Bridge	9- Frainslake	14- Aber Mawr
5- Saundersfoot	10- Freshwater West	15- Newport

Figure 1 From Lewis 1992

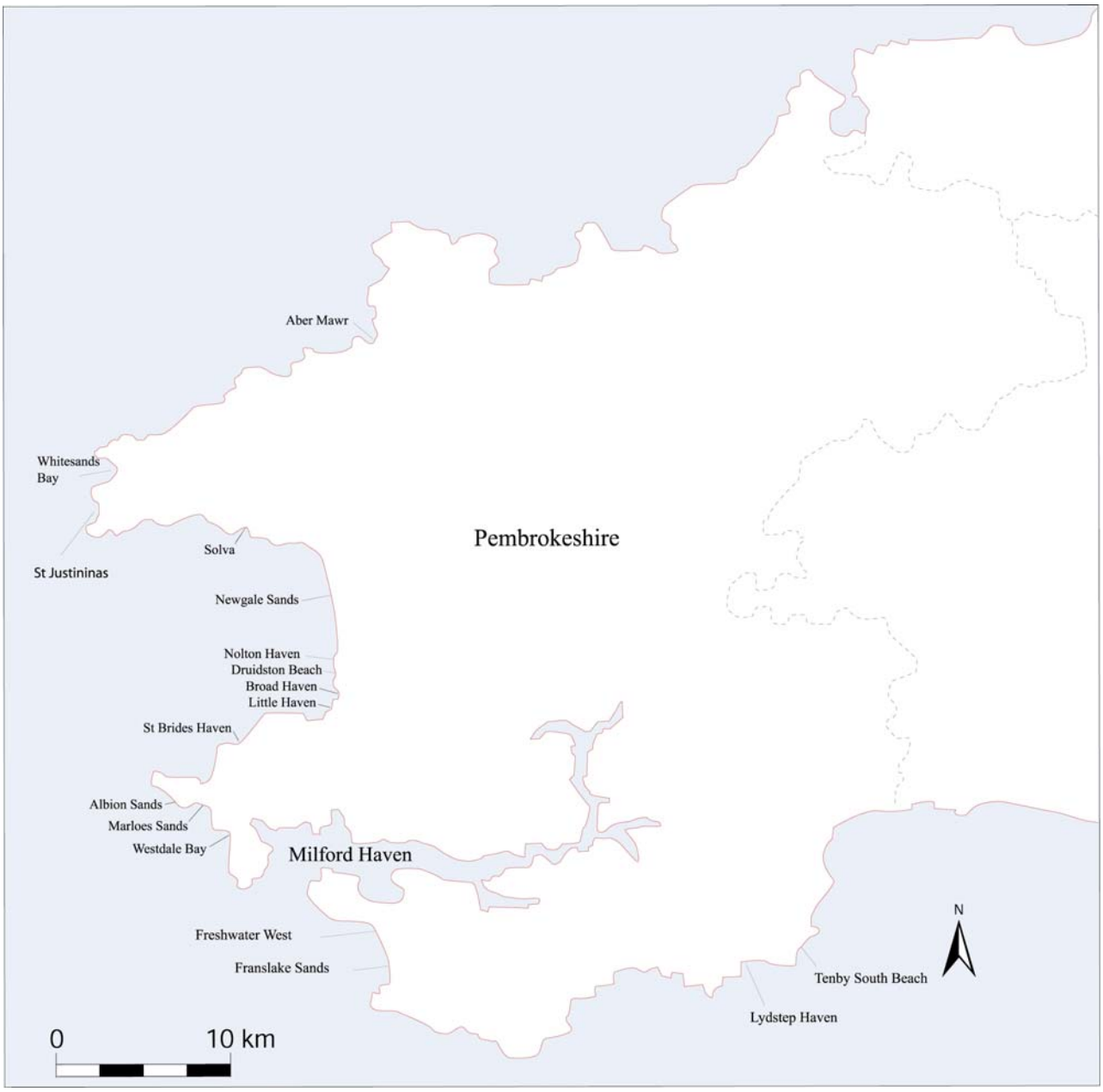
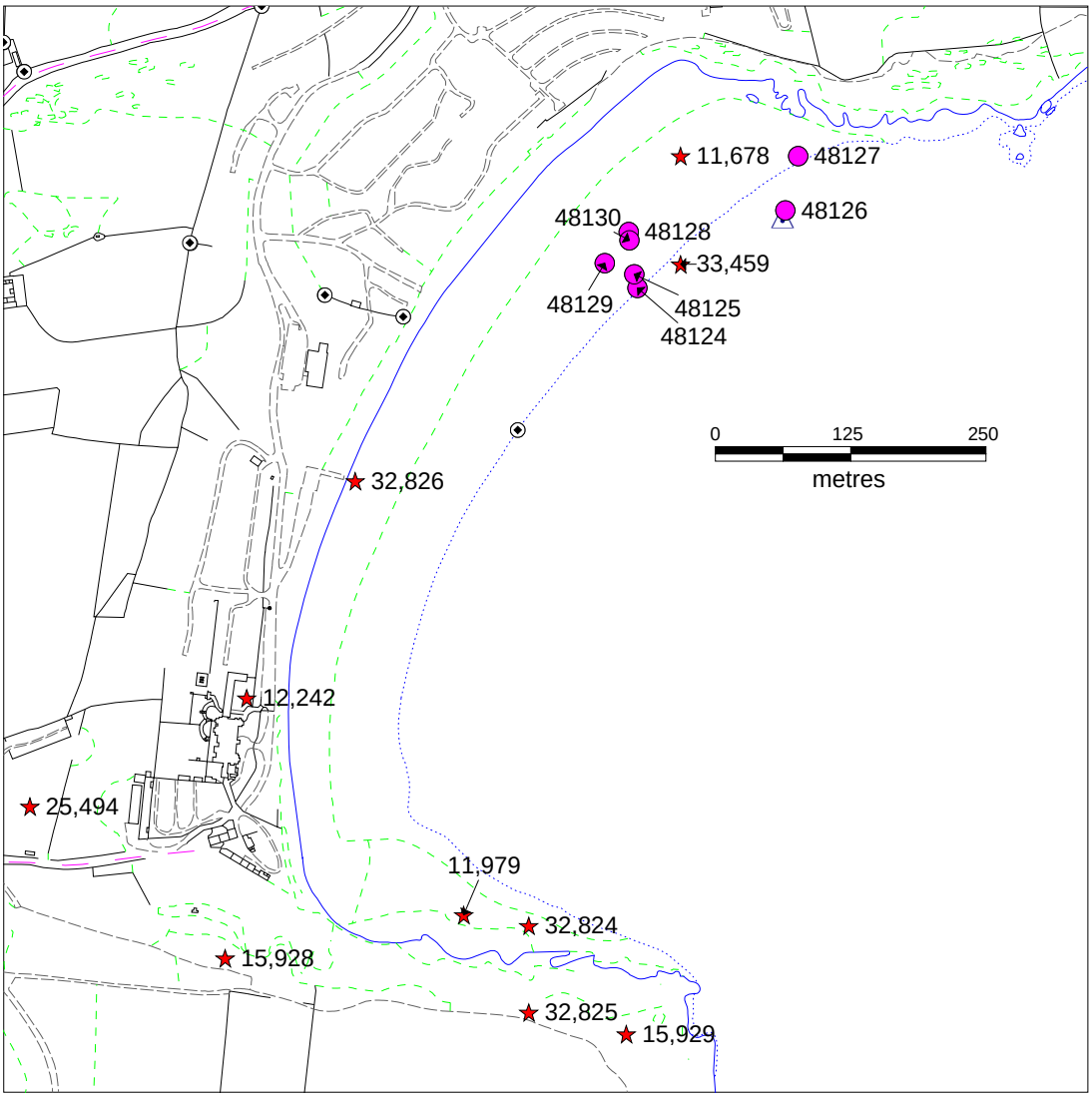
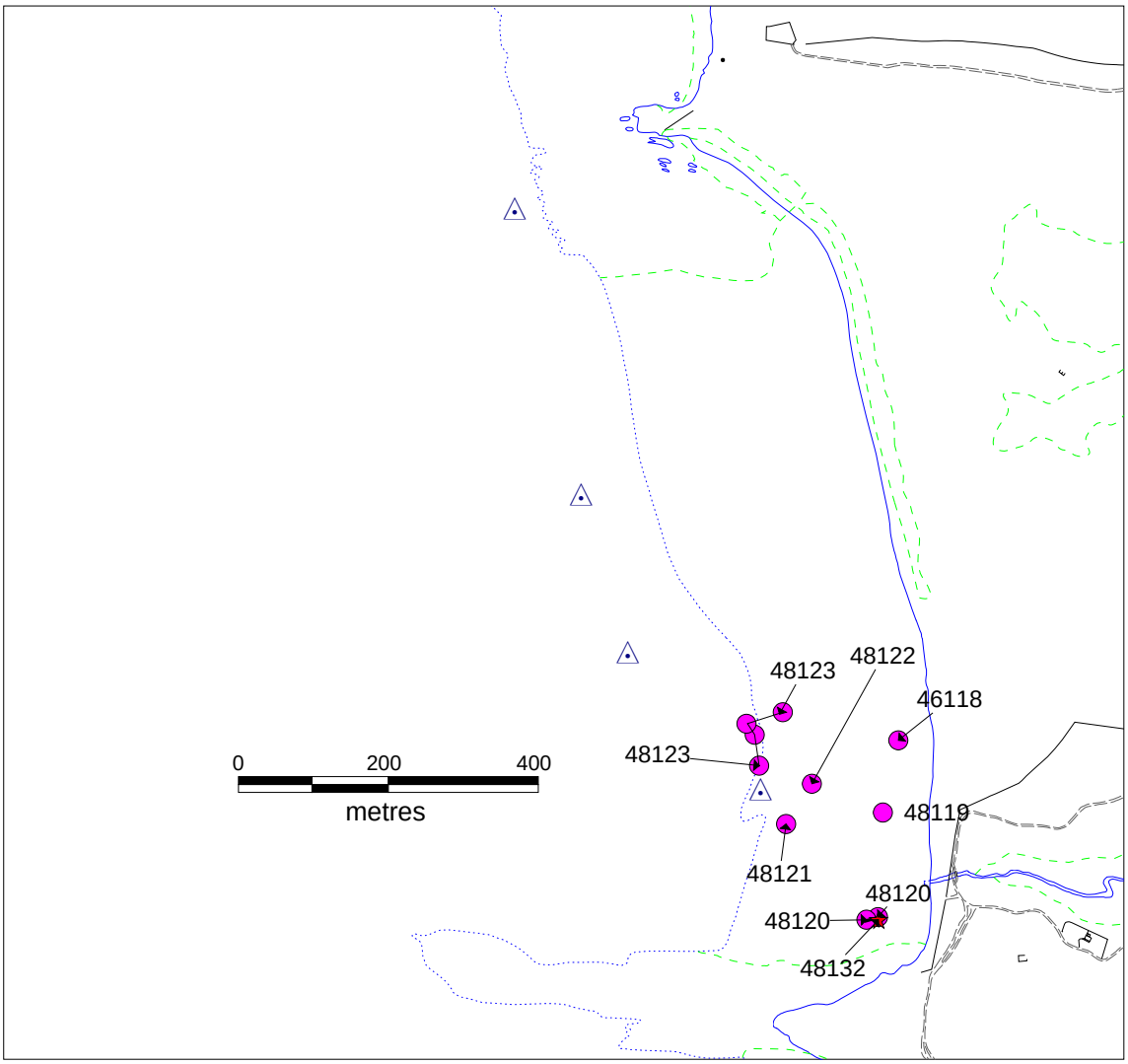


Figure 2 Beaches visited in this programme



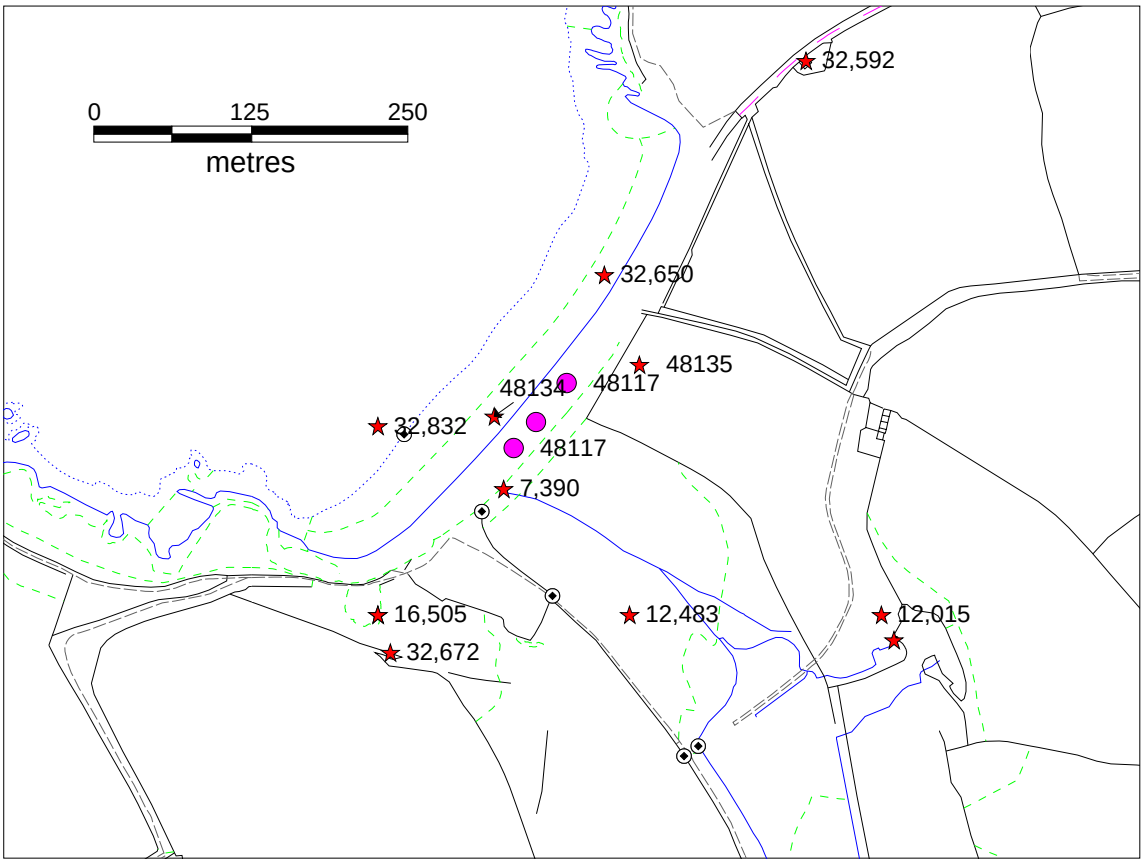
Key Star = PRN Circles = Peat Triangle = Low tide point

Figure 3 Lydstep Haven



Key Star = PRN Circles = Peat Triangle = Low tide point
Pre project PRNs omitted for clarity

Figure 4 Frainslake Sands



Key Star = PRN Circles = Peat Triangle = Low tide point

Figure 5 Aber Mawr

Photographs

Photo 1: Tenby South Beach from south west end. View NE

Photo 2: Tenby South Beach below the town. View NE

Photo 3: Tenby South Beach, View NE to St Catherine's Island

Photo 4: Tenby South Beach.. Potentially dangerous cut off metal rods projecting above sand were noted just to the south west of the outfall at SN1329899816. Scale 0.5m

Photo 5: Lydstep Haven at low water View N

Photo 6: Lydstep Haven quarry (PRN 32825) and former quay (PRN 32824). View SW

Photo 7: Lydstep Haven. View NNE

Photo 8: PRN 48124, Lydstep Haven, small fragment of grey clay and one fragment of wood SS0936098378, View NW. Scale 0.5m

Photo 9: PRN 48125, Lydstep Haven, intermittent timber and clay, south end SS0935798390 View NE. Scale 1m

Photos 10: PRN 48126, Lydstep Haven, expanse of peat/clay SS 0949798449. View NNW. Scale 1m

Photo 11: PRN 48127, Lydstep Haven, northern most peat/clay, semi linear deposit, SS0950898499. View W. Scale 1m

Photo 12: PRN 48128, Lydstep Haven, timber and possibly another below at right angle, SS0935298430. View NW. Scales 0.5m and 1m

Photo 13: Frainslake Sands at low tide. View S

Photo14: Frainslake Sands at low tide. View N

Photo 15,PRN 48132, Frainslake Sands, antler. View E. Scale 0.5m

Photo 16: PRN 46118, Frainslake Sands, peat deposit, SR8900097862. View E

Photo 17: PRN 46119, Frainslake Sands, linear peat deposit, SR8898597766. View SW

Photos 18: PRN 48120, Frainslake Sands, large peat deposit. SR8897897627 and SR8961297627. View E. Scale 0.5m

Photo 19: PRN 48120, Frainslake Sands, large peat deposit. SR8897897627 and SR8961297627. View N. Scale 0.5m

Photo 20: PRN 48120, Frainslake Sands, large peat deposit. SR8897897627 and SR8961297627. View NE. Scale 0.5m

Photo 21 PRN 48123, Frainslake Sands, length of exposed peat at the low tide limit, SR8881897829, SR8881297869, SR8880197885, SR8885097900. View N

Photo 22: Freshwater West. View S

Photo 23: Freshwater West, dunes on beachhead. View E

Photo 24: Marloes Sands. View SW

Photo 25: Albion Sands. View S

Photo 26: PRN 32756 The Albion 14/6/2003, view NE, scale 1m

Photo 27: PRN 32756 The Albion, fragment 14/6/2003, view N, scale 1m

Photo 28: PRN 32756 The Albion, paddle wheel? 14/6/2003, view S, scale 1m

Photo 29: St Brides Haven. General view W

Photo 30: St Brides Haven, PRN 7606 exposed cliff with at least one cist grave remains. View E

Photo 31: St Brides Haven, PRN 7606 exposed cliff with at least one cist grave remains. View SE. Scale 1m

Photo 32: St Brides Haven, PRN 7606 another exposed cliff section with remains of one probable cist grave above scale. View SW. Scale 1m. June (more exposed by March 2004 see photo 33)

Photo 33 St Bride's Cist Grave? PRN. View SE March 2004

Photo 34: Broad Haven beach with Little Haven beach at the far end, low tide. View S

Photo 35: Druidston beach at low tide. View N

Photo 36: Nolton Haven from the low tide line. View N

Photo 37: Newgale at low tide. View S

Photo 38:Solva harbour entrance. View SE

Photo 39 St Justininas, north side of Lifeboat Station at low tide View SW

Photo 40: Whitesands Bay at low tide. View SW

Photo 41: Whitesands Bay. St Patrick's Chapel (PRN 2638). View E. Scale 1m.

Photo 42: Aber Mawr. View S

Photo 43: Aber Mawr, scours. View SSE

Photo 44: Aber Mawr, timber (PRN 32832). View E

Photo 45: Aber Maw, peat and timber (PRN32832). View E

Photo 46: Aber Mawr, exposed timbers (PRN 32832) 4/1/2003. View NE