PRN 30108

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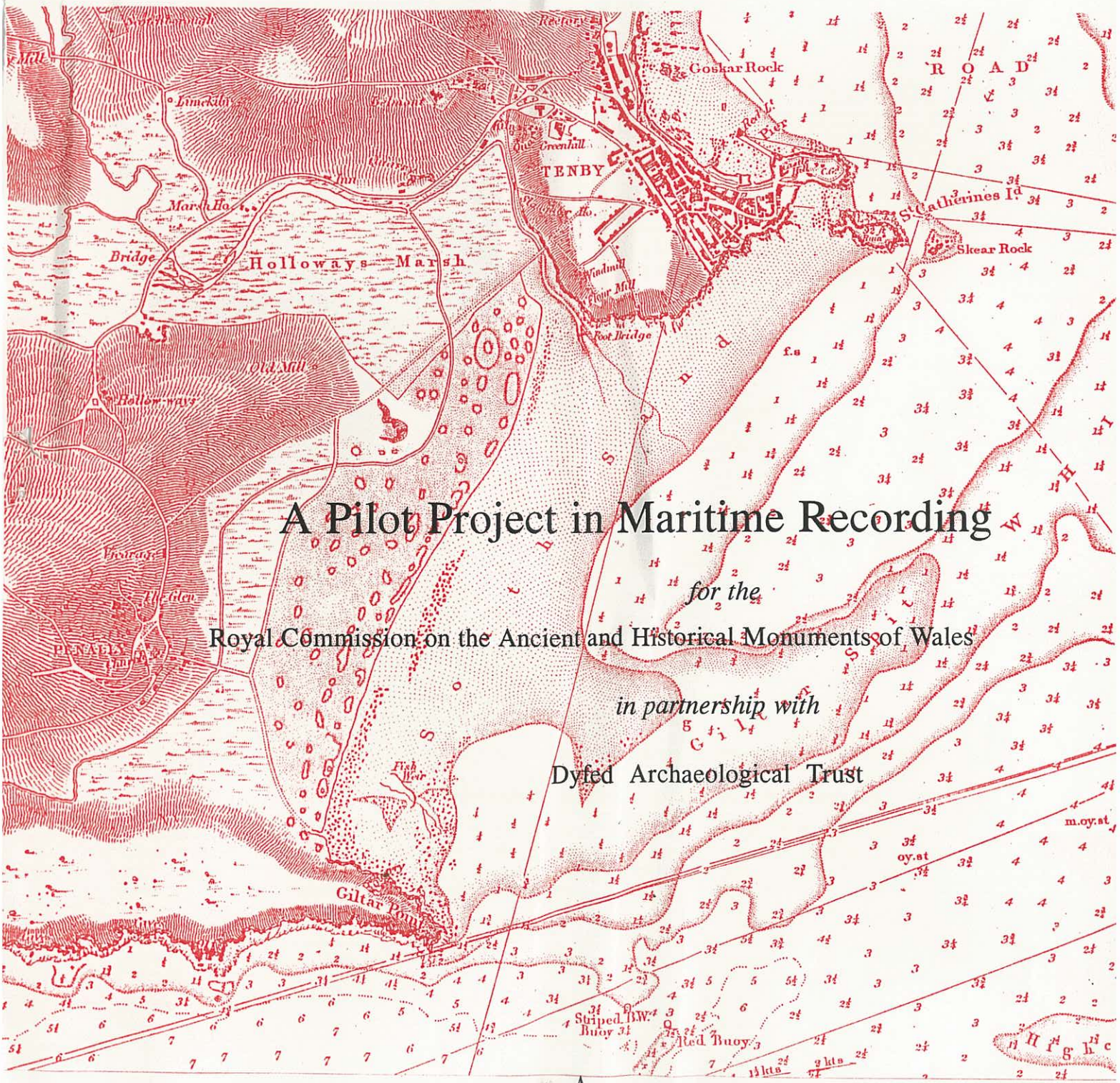
BETWEEN TIDES

A Coastal Survey of Carmarthen Bay



A Pilot Project in Maritime Recording

for the

Royal Commission on the Ancient and Historical Monuments of Wales

in partnership with

Dyfed Archaeological Trust

Alison Gale

February 1995

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PART II - THE DATA

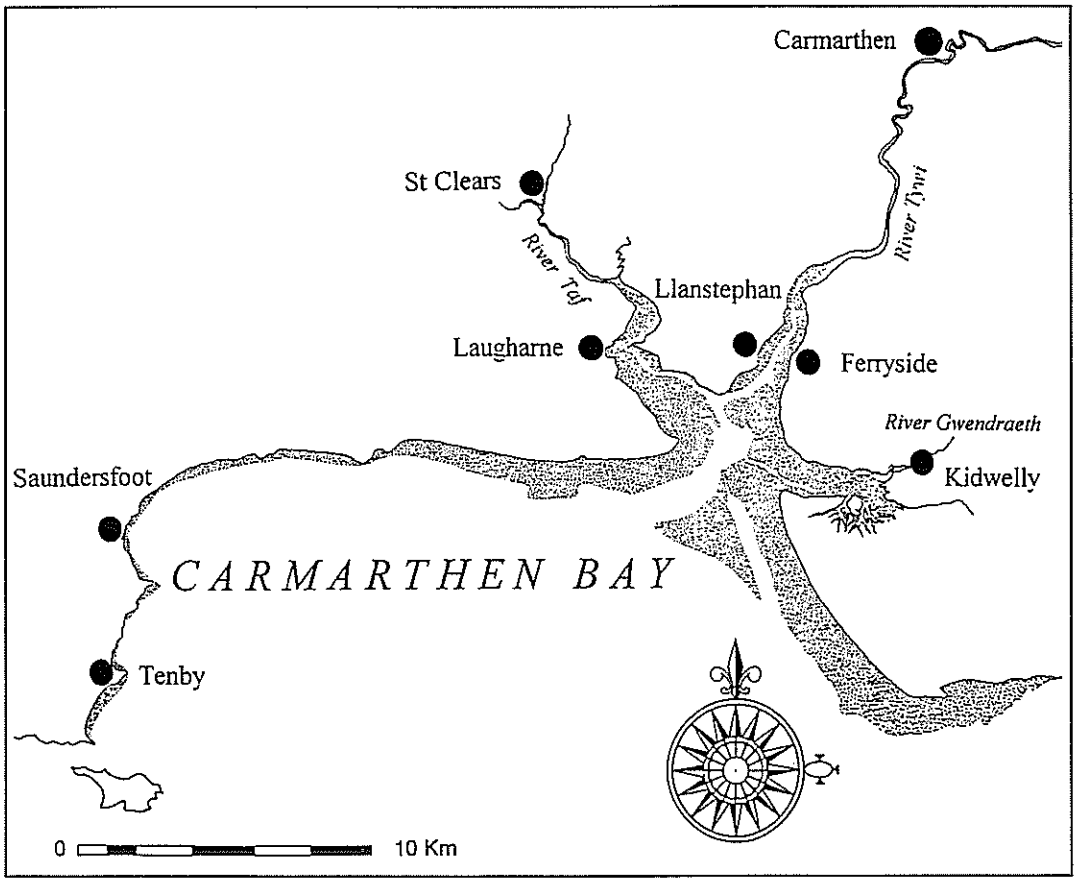


Figure 1. Carmarthen Bay: the study area

1 BACKGROUND

Being familiar with the rich maritime history of their area, the Dyfed Archaeological Trust (DAT) has long recognised the importance of coastal archaeology. This awareness has been heightened by individual projects, undertaken in response to management requirements, including reports on Kiln Park, Tenby and Ramsey Island. Members of staff have assisted the Archaeological Diving Unit with inspection of the Designated Historic Wreck on the Smalls and have taken a personal interest in wrecks on the intertidal sands of Carmarthen Bay. The DAT Sites and Monuments Record (SMR), therefore, already includes this site type which is only now becoming commonly accepted elsewhere in Wales, and England and Scotland. However, without targeted funding, it was not possible to begin systematic recording of coastal features.

In 1992 the remit of the Royal Commission on the Ancient and Historical Monuments of Wales was extended to the territorial seas. In late 1994 resources were identified to appoint an officer and to allocate funding for a new Maritime Section of the National Monuments Record (NMR). This initiative enabled RCAHMW to commission DAT to design and carry out the present study as a pilot project. DAT in turn engaged the services of Alison Gale, a maritime archaeological consultant, who has carried out the survey and written the report, with clerical and administrative support from DAT.

2 AIMS

The aims were defined in discussion between DAT and RCAHMW and specified in the project proposal:

'To enhance RCAHMW's maritime database, via ENDEX, from the regional Sites & Monuments Record for Dyfed with **foreshore** & **intertidal** sites on a selected length of Dyfed coastline within the framework of RCAHMW's maritime archaeological remit'.

'To use this data-capture and registration process as a **Pilot Study** to assess:

* The range and density of foreshore & intertidal sites & features within the selected area.
* The relative productivity in terms of sites and features of the desktop (ie cartographic, documentary, aerial photographic) sources used.
* The role of fieldwork (used on a selective basis) to validate sites & to discover new material not recorded in the desk-top sources.
* The costs and logistics of the project in terms of outputs.
* The weaknesses and limitations of the project.'

3 STUDY AREA: CARMARTHEN BAY

Camarthen Bay (Figure 1) was chosen because it combined three characteristics. Firstly, it is known historically as an area of maritime activity. Secondly, it is known from exposures of submerged forest as a flooded prehistoric landscape. Thirdly, it contains a variety of coastal features including cliffs, sand dunes, sand banks, salt marshes and tidal rivers. It was considered, therefore, to provide potential for foreshore and intertidal archaeology and the opportunity to examine evidence for their identification in a variety of coastal environments.

4 TIMING & SCHEDULE

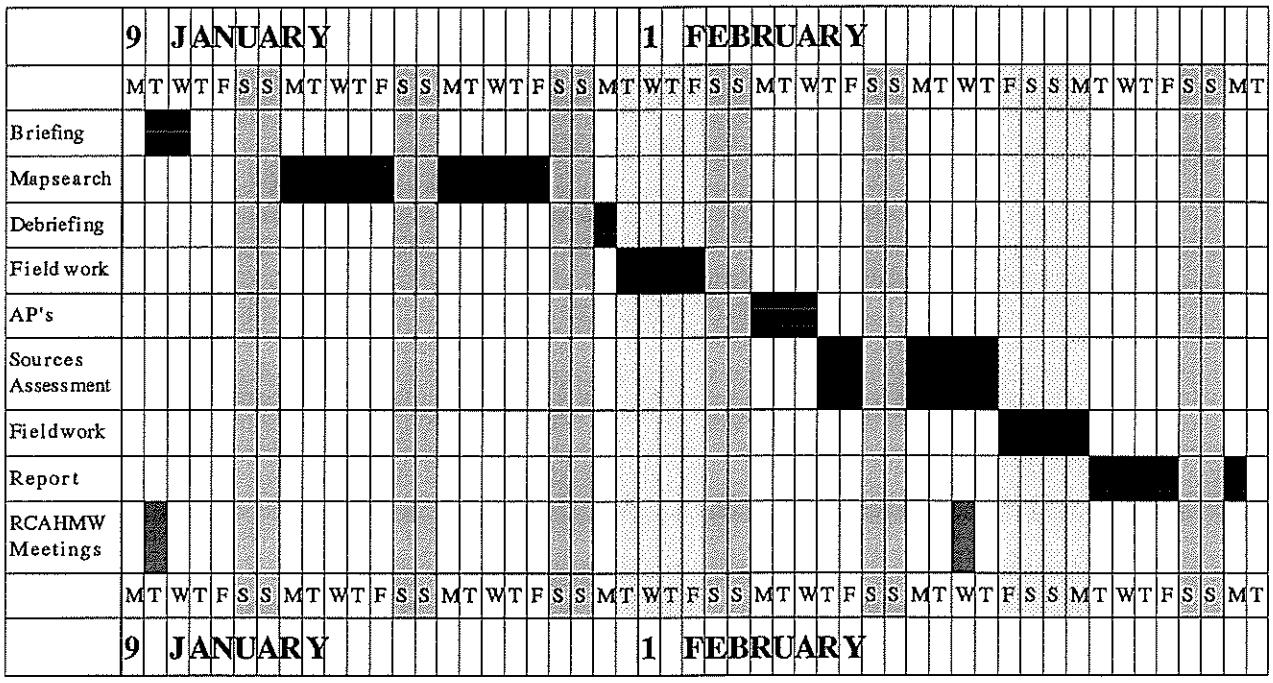
From funding bid to completion the project can be seen as four phases which were spread over five months (Figure 2.)

Phase		Nov	Dec	Jan	Feb	Mar	DAYS	Personnel
I	Proposal & Funding	**********					4	DAT
II	Preparation			****			14	DAT
III	Data-Collection				********		35	Consultant
IV	Data Entry					****	6	Agency/DAT

Figure 2. Timing of Pilot Project

The 35 days of PHASE III formed the core of the Pilot Project. The overall timing and specific scheduling of this Phase was dictated by external factors. RCAHMW, through budgeting requirements, had requested an end-point of 28th February but work could not begin until DAT had gathered the necessary source material. The fieldwork was tide dependent. Spring tides, which would provide the greatest exposure of, and access to the intertidal area, would only occur on **31 January - 03 February and 17 - 20 February.**

These constraints were recognised during the briefing in early January and the schedule for PHASE III was determined as shown below:



= Spring tides

Figure 3. Scheduling of PHASE III with day allocations

5 METHOD

5.1 PHASE II: PREPARATION

DAT collected the base materials for transferring sites from historic maps to the SMR base maps. This comprised three elements.

1 Existing SMR Data
A working set of SMR maps and a site list was prepared for 18 of the 19 1:10000 Quarter Sheets crossed by the coastline of the study area (there is no SMR sheet for SN30SW). See Figure 4.

The working copies were taken from the SMR base maps alone because it was found that the image produced from base map plus overlays was too blurred. They lacked, therefore, a number of plotted sites. Each working Quarter Sheet was made up of at least three A3 overlapping copies.

The site project list was compiled by visually selecting sites from the SMR base maps and overlays which were 'on the coast'. This was done without recourse to a rigorously defined inland limit. For each site on the list a computer printout of the Site Record Form and information copied from the detailed Site Record Files was obtained. The project site list, record forms and back up information were organised first by Quarter Sheet and then in Primary Record Number (PRN) order.

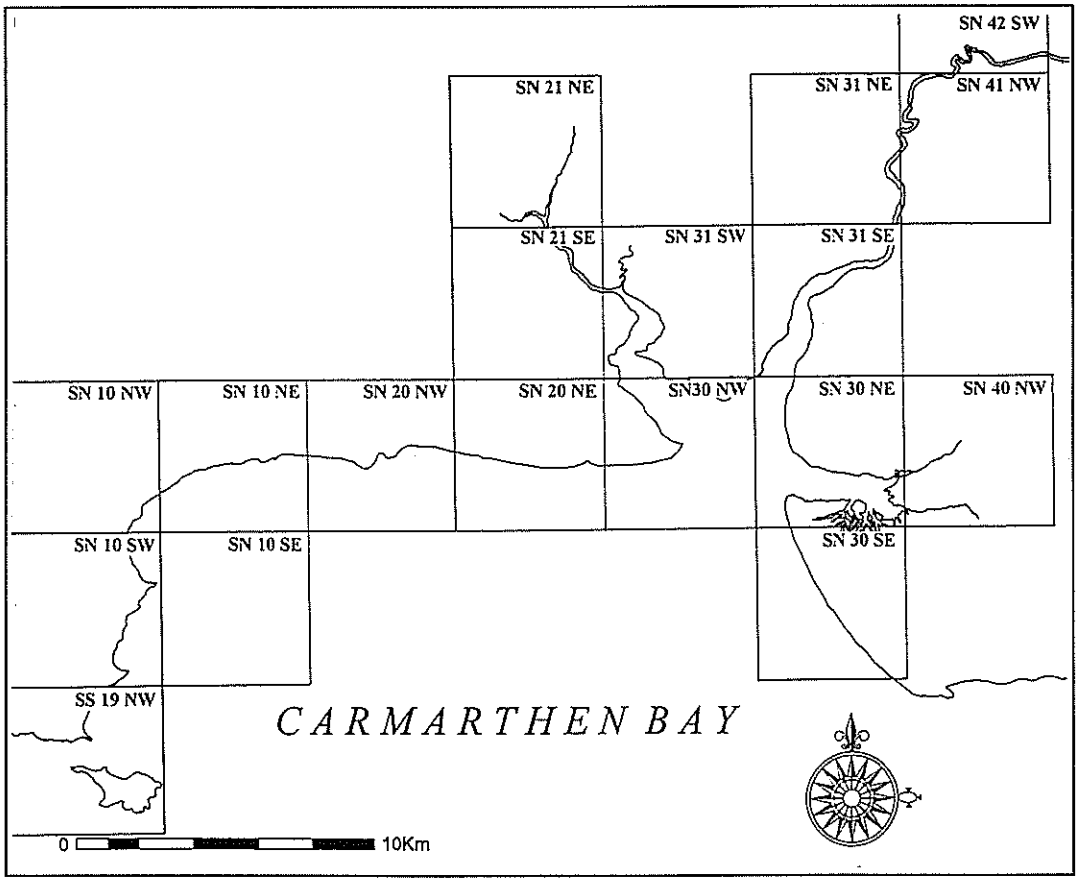


Figure 4. SMR base maps included in the study area

2 OS 1:2500 1st and 2nd Edition
A set of working maps was obtained in the form of photocopies from the National Library of Wales. Each map sheet was made up of four overlapping copies of A2 size.

The study area is covered by 56 1:2500 sheets (Figure 5). The availability is summarised below and a full list given in Part 2.

Not Available	07
1st Ed. Only	15
2nd Ed. Only	09
3rd Ed. Only	01
2nd & 1st Eds	49

ISSUE 1: *Although DAT held a partial set of photocopies of 1:2500 1st and 2nd Edition OS maps, further photocopying to assemble working maps was rejected due to distortion and the lack of an in-house A0 photocopier. DAT therefore obtained a fresh set of working copies from the National Library.*

3 OS 6":1mile 1st and 2nd Edition
The working maps came partly from DAT and partly from the National Library. Those copied at DAT consisted of two overlapping copies of A3 size, those from the National Library were on single A2 sheets.

The study area is covered by 34 6": 1 mile sheets (Figure 6). There availability is summarised below and a full list given in Part II.

Not Available	06
1st Ed. Only	06
2nd Ed. Only	07
3rd Ed. Only	01
Ist & 3rd Eds	01
1st & 2nd Eds	13

ISSUE 2: *Obtaining the OS 1:2500 and 6": 1 mile map cover was more time consuming than had been anticipated. The organisation of the large and numerous photocopies is physically slow during procurement and use.*

4 Published Material
A selection of published material dealing with maritime history of the study area and of south and west Wales was photocopied.

5.2 PHASE III: STAGE 1 - BRIEFING

A two day briefing session was held at DAT on 10 & 11 January. This included a meeting with RCAHMW. The session was used to work through the project proposal, define a schedule for PHASE III and to check and confirm the preparation and supply of resource material from DAT and RCAHMW. The source material which had already been gathered was collected ready for use. In addition familiarisation visits were made to the coast on the east and west of the River Tywi.

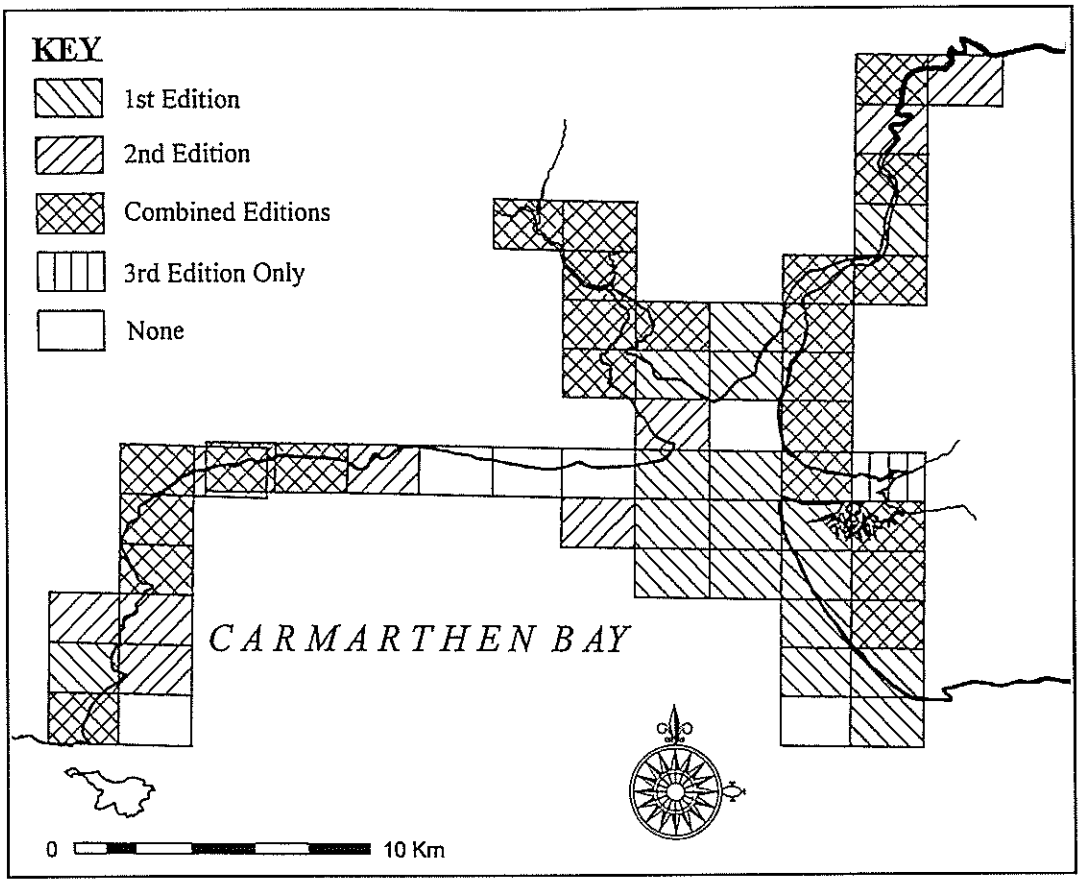


Figure 5.

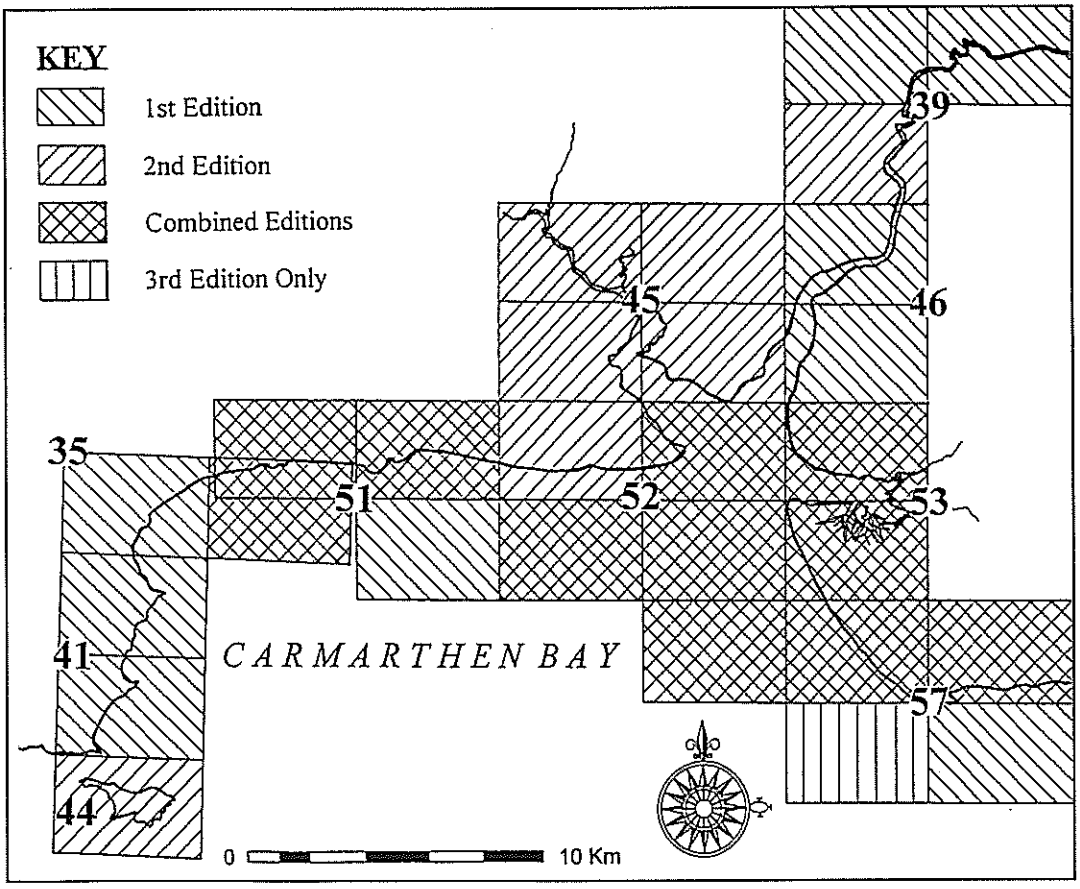


Figure 6.

1: Mark all existing SMR sites in the study area on the working maps using the prepared site list. At this point check the character of the sites using the Site Record Forms. This exercise gives a picture of the known archaeology and the character of as yet unrecorded sites which might be expected to occur in the project area.

2: List SMR sites differentiating between above coast margin, intertidal (MHW - MLW), and underwater (ie sub-tidal).

3: Type a description of the coastline and measure the linear extent of different environments.

4: Examine working SMR map and ring any coastal features which have not been allocated PRNs, for example docks, slipways etc.

5: Examine 1st edition 1:2500 and ring any appropriate features.

6: Examine 2nd edition 1:2500 for the above features and ring any additional features.

7: Complete SMR forms for features, referencing to the maps. Use the SMR Data Dictionary and Glossary.

8: Mark up the working SMR maps.

9: Check all editions of 6": 1 mile maps for any additional features and complete any necessary project record forms. (In general, the SMR forms will only be referenced to the 6": 1 mile if a site appeared on no other map).

10: List the new records differentiating between:

Coast margin
Intertidal (MHW - MLW)
Underwater (below MLW).

Figure 7. General procedure for transfer of data during map search

5.3 PHASE III: STAGE 2 - MAPWORK

The transfer of sites from the historic OS editions to the working SMRs was undertaken Quarter Sheet by Quarter Sheet. The exercise was also used to describe and quantify the coastal environments within the study area. The general procedure is shown in Figure 7 as a series of numbered tasks.

Time Allocation: 10 days **Time Used:** 10 days

ISSUE: *The time allocated to mapwork was dictated by the approach of spring tides. Everything had to be completed within 10 days in order that priorities could be set for fieldwork. This time was too short with all tasks being completed in haste.*

The map search provided three products:

1 A set of typed notes for each quarter sheet. These were split under five headings

* Cover by historic OS sheets
* Description of the foreshore and coast margin
* Measurements of the foreshore
* List of sites in the DAT SMR
* List of new sites.

These *Quarter Sheet Notes* were updated throughout subsequent stages of the project and form the core of the results presented in Part 2.

2 SMR record forms completed by hand for each new site. The search resulted in 133 new records to add to the 115 which were selected from the SMR.

3 Annotated base maps showing the location of SMR sites and new sites.

ISSUE: *Two factors made annotation particularly time consuming. First was the need to check the positions of SMR sites which did not appear on the photocopied base map because they were featured on overlays (see above section 5.1). Second was the difficulty of establishing positions using maps composed of multiple photocopies.*

Assessment of Results: This is given below under a number of headings

5.3.1 Working Definition of Area

The geographic limits were defined as Giltar Point to Pembrey Burrows and inland on the tidal rivers to the highest limit of normal tides as shown on SMR base maps. On the Taf, Tywi and Gwendraeth respectively these occur just above St Clears, Carmarthen and Kidwelly. In the west the area excluded Caldey Island. In the east the southern boundary was arbitrarily defined by Northing SN 00.

To seaward the limit was defined as the Lowest Astronomical Tide (LAT) or Chart Datum as shown on current Admiralty Chart 1076 *Linney Point to Oxwich Head.* The landward the limit was defined as the Highest Astronomical Tide (HAT).

ISSUE : *In practice, most work employed Ordnance Survey maps which do not show LAT and HAT but the line of the lowest and highest ordinary or medium tides (MLW and MHW). Value judgements were therefore made on the inclusion/ exclusion of sites. Those in the intertidal area on OS maps were always included as were foreshore sites, that is those on beaches between MHW and features which delimit the land edge such as the foot of cliffs, sand dunes and sea walls. In addition sites were selected which abutted the foreshore such as quays and boathouses or which were on its margin such as limekilns and flood defence works on river banks. In areas of sand dunes and salt marsh, sites were included inland as far as the next delimiting feature, such as a railway embankment.*

5.3.2 Character of the Coast

The different types of foreshore and coast margin were recorded and their linear extent measured along HWM. The sum of these measurements taken from the working SMR maps gave a total coast length of approximately 134 km. A tabulated listing was compiled. The following example is from SN10NE.

Foreshore	**MHW metres**	**NGR**	**Coastal Margin**
Rock/Sand	1250m	SN 1500 0614 - SN 1605 0688	Cliff
Sand	1450m	SN 1605 0688 - SN 1752 0752	Built. Foreshore Defence
Boulders/Sand	2900m	SN 1752 0752 - SN 2000 0748	Cliff

Foreshore was taken as the intertidal area between MLW and MHW, plus areas of beach in front of man-made and natural features delimiting the coast edge (ie cliffs, embankments). Its character was recorded from information available on the base maps. Five categories emerged:

Mud
Mud/Sand
Sand/Mud
Boulder
Rock

In many cases two of these categories were used in the tabulated listing. This reflected the change of material across a broad foreshore. For example a wide stretch of intertidal sand with a storm beach of boulders behind, or a foreshore of boulders with outcrops of solid rock.

From field observation the term *Boulder* is the most difficult to apply. The OS marking of loose material gives little help in distinguishing material ranging through the sizes of shingle, pebbles, stones, boulders and rocks.

Coastal Margin is a broad term used to cover both the point at which the foreshore stops and the character of land behind. In general, where there is a natural barrier forming the edge of the foreshore only one term has been used (eg *Cliff* or *Marsh*). Where the barrier is not natural a second term has been used (eg *Pasture*, *Flood Defence*, or *Marsh*, *Railway Embankment*). The descriptions have again been drawn from the information available on the SMR base maps. The exception being that observation permitted the introduction of *Pasture* in place of *Rural.*

Built	applied to any settlement regardless of size.
Cliff	
Dunes	where appropriate, *afforested* and *Golf Course* have been appended.
Flood Defence	applied to banks and ditches following rivers but not immediately on MHW.
Foreshore Defence	applied to seawalls, embankments, groynes etc. on MHW or just above, usually on open coastline.
Marsh	
Pasture	
Rail Embankment	
Rising Ground	applied where the relief, in removing the need for flood defences, rather than the land use appeared of more consequence to the current study
Salt Marsh	
Undefended	

Working from the tabulated lists characteristic coast types have been noted. These are identified primarily with the material of the foreshore and secondly with the character of the coastal margin. There are three main groups which are further divided into 18 sub-groups. The groups are shown in Figure 8 with the total length of coast within each. A full listing appears in Part 2.

Assessment - Time: The description and measurement of coast types added pressure within the short time available for mapwork, but provided a relatively quick method of recording basic coastal environments. However, with the information embedded in the *Quarter Sheet Notes*, arranging the data for analysis proved very slow.

Assessment - Accuracy: Measurements were given to 10m initially but accuracy can only be relied on to 50m, or on long stretches to 100m. For rapidity, minor changes were not noted, for example, small sandy coves within a general stretch of cliff fronted by rock outcrop. In most cases fieldwork showed the material of the foreshore to be correct, exceptions usually related to boulders (see above). Inaccuracies in describing the coastal margin usually arose from the age of the SMR base maps.

Assessment - Value: This exercise has provided a body of consistent information on the coast types within the study area. Its main advantage is the ease with which it can be repeated for any area of coast in order to provide standard data. Though not incompatible, the method does not match perfectly with the technique applied in Gwynnedd (Smith 1994). In contrast to a broad description, the field-based Gwynedd survey described each discrete section of coast. It also included descriptions of the *Coast Edge* which depended on observing cliffs, embankments and other features in elevation. This is clearly impossible with a map-based method.

ISSUE: *Further work is necessary to develop a seamless approach whereby surveys using desk-top methods can be combined with field survey. This requires close definition of what should be recorded and standardisation of terms across the two methods.*

Figure 8. Coastal types in the study area

GROUP	LENGTH	DESCRIPTION
1		**Upper reaches of rivers with mud intertidal area**
1.1	38400m	River with mud intertidal area in rural areas without flood defences
1.2	2700m	River with mud intertidal area in rural areas with natural defences
1.3	11900m	River with mud intertidal area in rural areas with flood defences (banks)
1.4	1900m	River with mud intertidal area in rural areas with flood defences of hard character
1.5	8000m	River with mud intertidal area in rural areas of settlement with flood defences
1.6	1300m	River with mud intertidal area in rural areas of settlement without flood defences
Total	**64200m**	
2		**Lower reaches and mouths of rivers with broad intertidal area of mud and sand**
2.1	900m	River with broad intertidal area of mud and sand in rural areas without flood defences
2.2	2500m	River with broad intertidal area of mud and sand in rural areas with flood defences
2.3	800m	River with broad intertidal area of mud and sand in rural areas with natural flood defences
2.4	7000m	River with broad intertidal area of mud and sand in rural areas with flood defences of hard character
2.5	1400m	River with broad intertidal area of mud and sand in areas of settlement with flood defences
2.6	200m	River with broad intertidal area of mud and sand in areas of settlement without flood defences
Total	**12800m**	
3		**Open coast with sand intertidal area, including those with storm beaches or with rock/boulder strews**
3.1	20700m	Open coast with intertidal area of sand backed by dunes
3.2	3400m	Open coast with intertidal area of sand and natural defences
3.3	5500m	Open coast with intertidal area of sand backed by settlement with foreshore defences
3.4	800m	Open coast with intertidal area of stones and sand without foreshore defences
3.5	14800m	Open coast with intertidal area of rock or boulders (sand in the lower intertidal area) and with natural defences
3.6	3300m	Open coast with intertidal area of rock or boulders (sand in the lower intertidal area) with foreshore defences
Total	**48500m**	

5.3.3 Record Enhancement

The effectiveness of the use of historic OS maps can be assessed by considering five factors:

* Number of sites recorded
* Geographic distribution of sites recorded
* Character of sites recorded
* Quality of information on sites recorded
* Compatibility of information with SMR forms

Number of sites. A coarse breakdown of recording in all phases of the project is given in Figure 9. The total number of new sites is 197, of which 133 (68%) were added from the map search. This element of the project increased the SMR (115 records) for the study area by 115%.

Geographic distribution. The sites recorded from the map search are split 80:20 between the coastal margin and the intertidal area. This compares with a split of 66:32 in the SMR for the study area. This difference can be accounted for by the SMR intertidal sites including three types which would not figure on maps: shipwrecks (06); submerged forest (05); and finds (07).

The map search has not produced any geographic *foci* which are not discernible in the SMR. It has however enhanced existing *foci*, especially around the waterfronts of centres such as Tenby, St Clears and Carmarthen. The exception is the large number of records created for the area between the River Taf and the River Cynin where an extensive system of flood defences was recorded from the maps.

Character of Sites. The Generic Types encountered during the project are presented under broad thematic headings in Figure 10.

The map search mainly contributed sites under the headings *Communications*, *Foreshore & River Engineering* and *Industrial*. The number of sites for some Generic Types was greatly increased. For example, 13 lime kilns were added to the single SMR entry which had previously existed for the study area.

Flood Defence was the most common Generic Type used, with 35 entries (32% of map search records from the coastal margin) being created. While this number partially reflects the recording process which allocates PRNs to different elements of a single Flood Defence System, the significance of the project's contribution to recording these features should not be under-estimated, only one record having already existed in the SMR.

The map search contributed a negligible number of sites to the Generic Types listed under *Miscellaneous*. This may be attributed to this group having no specific maritime character.

ISSUE: *Consideration should be given to a more hierarchical ordering of SMR data, which groups individual features within broad functional categories.*

Quality of information. In general the map search provided little beyond a site name, Generic Type, locational information (i.e. quarter sheet, parish, national grid reference) and a brief description which focused primarily on changes in a site discernible from different editions of the historic maps. Dating was rarely possible although some indication of sites becoming redundant was available.

The accuracy with which sites could be plotted was adversely affected by the use of photocopies. On the source maps and the working SMR maps there was a margin of distortion within each map sheet and differences between map sheets. This problem was compounded by each map sheet being composed of several photocopy sheets. This prevented the use of a simple internal scale for taking distances from source map to working SMR map. It also impeded the use of bearings from known points. This was particularly troublesome when trying to fix the position of intertidal sites in front of, for example, sand dunes. The only reasonably certain points of reference often occurred on a separate photocopy sheet and the process of matching the edges of sheets showed an unreasonable error.

ISSUE: *In most cases eight figure NGR have been given in order to give the closest guide for locating sites during fieldwork validation. However, it may be necessary to reduce the NGR to only six figures to ensure consistency with accuracy levels with DAT SMR and RCAHMW databases. The alternative is to introduce a qualifier.*

Compatibility of information with SMR forms.
Several fields proved difficult to complete through lack of appropriate terms. Most notably Descriptive Type, which is ill-fitted to built structures such as wharves and slipways, to structures of unknown function and to ships; and Form/Condition which is hard to complete from map evidence.

Land Use was rarely completed. The term list could be extended to provide an indication of environment in areas where land use is not appropriate eg. Intertidal - River; Intertidal - Beach; Sub-tidal - River; Sub-tidal sea-bed; Riverbed. Test entries were made.

A number of new generic types have been used:

Area of Maritime Activity	For parts of the foreshore or coastal margin where there is evidence that activities such as fishing, landing of ships and boats have taken place but where surviving physical evidence has either not been discovered or does not ad equately reflect the full range of activity. This was applied at Penally prior to locating material through fieldwork, and to Tenby to reflect boating linked with maintaining communica tions between Caldey Island and Tenby.
Coastguard Station	
Jetty	Applied to structures extending outwards from the coast edge towards deeper water.
River Crossing	Where use of a ferry is not confirmed.
Range	Military
Range -Rifle	
Range - Butts	
House	
Culvert	For retained but not piped drains
Foreshore Defence	For engineering works protecting the coast edge (e.g. sea walls, groynes) from natural attack.
Promenade	

Figure 9. Sites shown by source & environment (A = Coastal Margin; B = Intertidal; C = Sub-tidal)

SOURCE	DAT SMR				MAP SEARCH			FIELD WORK			DAT AP's			OTHER AP's			RESEARCH			TOTAL
Environment	A	B	C	T	A	B	T	A	B	T	A	B	T	A	B	T	A	B	T	
SN 19 NW	07	-	01	08	05	03	08	02	05	07	-	-	00	-	-	00	-	-	00	23
SN 10 SW	10	06	01	17	07	05	12	02	05	07	-	-	00	-	-	00	05	03	08	44
SN 10 NW	02	01	-	03	03	-	03	04	02	06	-	-	00	-	-	00	-	01	01	13
SN 10 NE	02	05	-	07	02	-	02	-	04	04	-	01	01	-	-	00	-	-	00	14
SN 20 NW	05	06	-	11	-	-	00	-	-	00	-	01	01	-	-	00	-	-	00	12
SN 20 NE	08	-	-	08	11	-	11	-	-	00	-	03	03	-	-	00	-	-	00	22
SN 21 SE	03	-	-	03	11	02	13	-	-	00	-	01	01	-	-	00	-	-	00	17
SN 21 NE	06	01	-	07	10	01	11	-	-	00	-	-	00	-	-	00	-	-	00	18
SN 30 SW	No	suitable	source	material																
SN 30 NW	02	03	-	05	06	01	07	-	-	00	-	-	00	-	-	00	02	-	02	12
SN 31 NW	03	02	-	05	17	03	20	-	-	00	01	-	01	-	-	00	-	01	01	27
SN 30 SE	04	01	-	05	03	-	03	-	-	00	-	02	02	-	01	01	-	01	01	12
SN 30 NE	02	08	-	10	06	01	07	01	05	06	-	-	00	-	-	00	-	-	00	23
SN31 SE & SN41 SW	08	02	-	10	08	07	15	01	03	04	-	-	00	-	-	00	-	01	01	30
SN 31 NE	01	01		02	-	-	00	01	01	02	-	-	00	-	-	00	-	01	01	05
SN 40 NW	09	-	-	09	03	-	03	-	-	00	-	-	00	-	-	00	-	-	00	12
SN 41 NW	04	01	-	05	15	03	18	-	-	00	-	-	00	-	-	00	01	02	03	26
SN 42 SW	-	-	-	00	02	-	02	-	-	00	-	-	00	-	-	00	-	-	00	02
TOTAL	76	37	02	115	107	26	133	11	25	36	01	08	09	00	01	01	08	10	17	312

Assessment - Time: The map search would have benefited from at least 30% more time. Recording was rushed with, for example, linear features being allocated fewer NGR than were needed. The records are mainly of marked, and therefore 19th century, sites as there was insufficient time for the considered reading of a map which is necessary to identify less readily recognisable sites.

Assessment - Accuracy: See above

Assessment - Value: This exercise revealed the inconsistency with which the SMR had previously included industrial sites, especially of a maritime character. It was of great value in upgrading the SMR in terms of the character of sites. The map search, however, was only of value within a narrow chronological band.

Figure 10. Sites shown by generic type, source & environment (A = Coastal Margin; B = Intertidal; C = Sub-tidal)

SOURCE	DAT SMR				MAP SEARCH			FIELD WORK			AP's			RESEARCH			TOTAL
Environmental	A	B	C	T	A	B	T	A	B	T	A	B	T	A	B	T	
COMMUNICATIONS																	
Anchorage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	04	04	04
Area of Maritime Activity	-	-	-	-	-	02	02	-	01	01	-	-	-	-	-	-	03
Beach Access	-	-	-	-	-	-	-	01	03	04	-	-	-	-	-	-	04
Boat House	-	-	-	-	02	-	02	01	-	02	-	-	-	01	01	02	05
Bridge	07	-	-	07	-	-	-	-	-	-	-	-	-	01	01	02	09
Canal	01	-	-	01	-	-	-	-	-	-	-	-	-	01	-	01	02
Coastguard Station	-	-	-	-	01	-	01	-	-	-	-	-	-	-	-	-	01
Dock	-	-	-	-	-	01	01	-	-	-	-	-	-	-	-	-	01
Dock Gate	-	-	-	-	-	01	01	-	-	-	-	-	-	-	-	-	01
Ferry	-	02	-	02	-	-	-	-	-	-	-	-	-	-	-	-	02
*Ferry House	02	-	-	02	-	-	-	-	-	-	-	-	-	-	-	-	02
Harbour	-	03	-	03	-	-	-	-	-	-	-	-	-	-	-	-	03
Jetty	-	-	-	-	01	-	01	-	02	02	-	-	-	-	-	-	03
Landing Place	-	01	-	01	-	-	-	-	02	02	-	-	-	-	-	-	03
*Lifeboat House	-	01	-	01	-	-	-	-	-	-	-	-	-	-	-	-	01
Navigation Marker	-	-	-	-	-	05	05	-	-	-	-	-	-	-	-	-	05
Pier	-	02	-	02	-	01	01	-	-	-	-	-	-	-	-	-	03
Quay	-	04	-	04	-	01	01	-	-	-	-	-	-	-	-	-	05
River Crossing	-	-	-	-	-	01	01	-	-	-	-	-	-	-	01	01	02
Shipwreck	-	06	-	06	-	-	-	-	02	02	-	07	07	-	-	-	15
Slipway	-	-	-	-	-	07	07	-	-	-	-	-	-	-	01	01	08
Tramway	-	-	-	-	02	-	02	-	-	-	-	-	-	-	-	-	02
Tunnel	-	-	-	-	01	-	01	-	-	-	-	-	-	-	-	-	01
Wharf	01	-	-	01	-	04	04	-	-	-	-	-	-	-	-	-	05
DEFENSIVE/MILITARY																	
Castle	03	-	-	03	-	-	-	-	-	-	-	-	-	-	-	-	03
Motte	03	-	-	03	-	-	-	-	-	-	-	-	-	-	-	-	03
Fort	01	-	-	01	01	-	01	-	-	-	-	-	-	-	-	-	02
Gun Emplacement	01	-	-	01	-	-	-	-	-	-	-	-	-	-	-	-	01
Range	-	-	-	-	-	-	-	-	-	-	-	-	-	02	-	02	02
Range-Butts	-	-	-	-	01	-	01	01	-	01	-	-	-	-	-	-	02
Range-Rifle	-	-	-	-	03	-	03	-	-	-	-	-	-	-	-	-	03
WW2 Defence	-	01	-	01	-	-	-	-	-	-	-	-	-	-	-	-	01

SOURCE	DAT SMR				MAP SEARCH			FIELD WORK			AP's			RESEARCH			TOTAL
Environmental	A	B	C	T	A	B	T	A	B	T	A	B	T	A	B	T	
DOMESTIC/ ECCLESIASTICAL																	
Chapel	03	-	-	03	-	-	-	-	-	-	-	-	-	01	-	01	04
Cottage	02	-	-	02	01	-	01	-	-	-	-	-	-	-	-	-	03
Dwelling	02	-	-	02	-	-	-	-	-	-	-	-	-	01	-	01	03
House	-	-	-	-	01	-	01	-	-	-	-	-	-	-	-	-	01
FORESHORE & RIVER ENGINEERING AND WATER CONTROL																	
Culvert	-	-	-	-	-	01	01	02	-	02	-	-	-	-	-	-	03
Engine House	-	-	-	-	01	-	01	-	-	-	-	-	-	-	-	-	01
Flood Defences	01	-	-	01	35	-	35	-	-	-	-	-	-	-	-	-	36
Foreshore Defences	-	-	-	-	-	01	01	01	05	06	-	01	01	-	-	-	08
Pipeline	-	-	-	-	-	01	01	-	01	01	-	-	-	-	-	-	02
Pump	-	-	-	-	02	-	02	-	-	-	-	-	-	-	-	-	02
Sluice	-	-	-	-	02	-	02	-	-	-	-	-	-	-	-	-	02
Training Wall	-	-	-	-	-	-	-	-	02	02	-	-	-	-	-	-	02
INDUSTRIAL																-	
Brickworks	04	-	-	04	03	-	03	-	-	-	-	-	-	-	-	-	07
Clay Pit	-	-	-	-	02	-	02	-	-	-	-	-	-	-	-	-	02
Coalmine	01	-	-	01	-	-	-	-	-	-	-	-	-	-	-	-	01
Crane	-	-	-	-	01	-	01	-	-	-	-	-	-	-	-	-	01
Fish Trap	-	-	-	-	-	-	-	-	02	02	-	-	-	-	-	-	02
Fulling Mill	01	-	-	01	-	-	-	-	-	-	-	-	-	-	-	-	01
Gasworks	-	-	-	-	01	-	01	-	-	-	-	-	-	-	-	-	01
Iron Foundry	-	-	-	-	01	-	01	-	-	-	-	-	-	-	-	-	01
Lime Kiln	01	-	-	01	13	01	14	-	-	-	-	-	-	01	-	01	16
Mine	-	-	-	-	-	-	-	02	02	04	-	-	-	-	-	-	04
Quarry	02	-	-	02	01	-	01	01	01	02	-	-	-	-	-	-	05
Sand Pit	-	-	-	-	02	-	02	-	-	-	-	-	-	-	-	-	02
Saw Mill	-	-	-	-	04	-	04	-	-	-	-	-	-	-	-	-	04
Shaft	-	-	-	-	02	-	02	-	-	-	-	-	-	-	-	-	02
Timber Yard	-	-	-	-	01	-	01	-	-	-	-	-	-	-	-	-	01
Tin Mill	-	-	-	-	01	-	01	-	-	-	-	-	-	-	-	-	01
Smithy	01	-	-	01	-	-	-	-	-	-	-	-	-	-	-	-	01
Watermill	02	01	-	03	-	-	-	-	-	-	-	-	-	-	-	-	03

SOURCE	DAT SMR				MAP SEARCH			FIELD WORK			AP's			RESEARCH			TOTAL
Environmental	A	B	C	T	A	B	T	A	B	T	A	B	T	A	B	T	
MISCELLANEOUS																	
Building	01	-	-	01	05	-	05	01	-	01	-	-	-	-	-	-	07
Boundary Stone	-	01	-	01	-	-	-	-	-	-	-	-	-	-	-	-	01
Boundary/Trackway	-	-	-	-	09	-	09	-	-	-	-	-	-	-	-	-	09
Common Land	01	-	-	01	-	-	-	-	-	-	-	-	-	-	-	-	01
DMV	-	01	-	01	-	-	-	-	-	-	-	-	-	-	-	-	01
Enclosure	01	-	-	01	01	-	01	-	-	-	-	-	-	-	-	-	02
Find	19	07	02	28	-	-	-	-	-	-	-	-	-	-	-	-	28
Hearth	01	-	-	01	-	-	-	-	-	-	-	-	-	-	-	-	01
Hillfort	01	-	-	01	-	-	-	-	-	-	-	-	-	-	-	-	01
Look Out	-	-	-	-	01	-	01	-	-	-	-	-	-	-	-	-	01
Low Mound	01	-	-	01	-	-	-	-	-	-	-	-	-	-	-	-	01
Midden	06	-	-	06	-	-	-	-	-	-	-	-	-	-	-	-	06
Place-Name	-	-	-	-	03	-	03	-	-	-	-	-	-	-	-	-	03
Pond	-	-	-	-	02	-	02	-	-	-	-	-	-	-	-	-	02
Promenade	-	-	-	-	-	-	-	-	-	-	-	-	-	01	-	01	01
Settlement	03	-	-	03	01	-	01	-	-	-	-	-	-	-	-	-	04
Standing Stone	02	-	-	02	-	-	-	-	-	-	-	-	-	-	-	-	02
Structure	-	-	-	-	01	-	01	-	-	-	-	01	01	-	-	-	03
Unknown	-	-	-	-	-	01	01	-	01	01	-	01	01	-	-	-	02
Warehouse	-	-	-	-	-	-	-	-	-	-	-	-	-	01	-	01	01
NATURAL FEATURES																	
Cave	-	01	-	01	-	-	-	-	-	-	-	-	-	-	01	01	02
Submerged Forest	-	05	-	05	-	02	02	-	02	02	-	-	-	-	-	-	07

Italics indicate a new Generic Type

* indicates a Generic Type whose use should be reviewed

5.4 PHASE III: STAGE 3 - DEBRIEFING

Time Allocation: 1 day **Time Used:** 1 day

Once the mapwork was complete an intensive day was spent in debriefing. Each Quarter Sheet was worked through with DAT staff. Their local knowledge was vital to confirming the relative significance of newly recorded sites. They were also able to indicate where there still appeared to be gaps in the accumulated body of records. These gaps have to be regarded as two distinct groups.

In the first group information could have been selected during the map search but was not. There were two main instances: firstly elements of Tenby as a coastal resort such as its promenade and private access steps to the beach; secondly the ranges at Pendine and Pembrey. Appropriate new records were created.

In the second group information was not available to be selected from the maps but DAT staff, from knowledge of local historical research, were aware of the potential for archaeological material. Most instances concerned maritime activity such as anchorages on the Tywi and fisheries on the Taf. These were noted in order that they might be picked up through appropriate source material in Stage 5. Where possible DAT supplied references or photocopied appropriate articles.

The first four days fieldwork was planned and the working SMR maps photocopied for the selected areas.

5.5 PHASE III: STAGE 4 - FIELDWORK 31 January - 03 February

Time Allocation: 4 days **Time Used:** 4 days

At the initial briefing it had been planned to target the Rivers Tywi and Taf using a boat to gain access. Unfortunately extreme flooding made boat work unsafe and had rendered the banks unstable for work on foot. It was decided to target areas on the open foreshore and hope that conditions on the second set of spring tides would permit work on the rivers. Four locations were selected:

Giltar Point - Tenby	SS19NW SS10NW	Tenby Harbour was visited again on 16 February and this work is included in the results below.
Wiseman's Bridge - Amroth	SS10NW & SS10NE	
Telpyn Point - Ragwen Point	SS10NES & S20NW	
The Scars, St Ishmaels	SS30NE	

5.5.1 Method of Fieldwork

The fieldwork was undertaken by one person equipped with copies of the working SMR base maps which had been annotated during the map search. The aim was to walk the areas on spring

tides in order to view the maximum possible intertidal area. This was considered to give the best opportunity for checking the existence of recorded sites and identifying any further sites.

Arrival at the selected location was usually timed for two hours before predicted low water. The stretch of beach was then walked close to the low tide line. A return walk was then made along the top of the beach. The first pass focused on the flat expanses of sand. In these areas any features standing proud of the general beach level may be spotted from some distance. The second pass focused on the storm beaches and any area in cliffs, sand dunes or embankments where erosion might be exposing archaeological material.

Five to six hours were spent on each area. With preparation and travel this left little time from a conventional working day for writing up.

Notes of observations were made on transparent overlays to the base map using OHP pens. The overlays were an essential waterproofing mechanism and so were cleaned for re-use once information had been transferred. Notes were also made on waterproof notepaper which was similarly cleaned. The primary record, therefore, became the rapidly typed field notes which were prepared after each day.

Little time was given to more detailed recording of specific sites. Large features such as submerged forest exposures were paced to provide estimated dimensions. Efforts to obtain more accurate measurements of sites such as wrecks proved impractical with only one person seeking to combat the adverse weather conditions.

When weather permitted, black & white photographs were taken. These will provide an initial record of sites which were observed and have often been relied on to provide a visual record of size and appearance.

Assessment - Time: Two people undertaking this work would have more than doubled the amount of coast which was covered, thus taking better advantage of the tidal window, especially in areas where the beach cannot be passed at high water. One could walk the top of the beach and one the bottom, and they could come together to rapidly record any significant site.

Assessment - Accuracy: The above suggestion would ensure a higher level of information was returned.

The ability to fix sites by compass bearings was frequently impeded by poor visibility.

Assessment Value: Approximately 16Km (MHW measurement) of coast was covered. See comments under results, below

5.5.2 Results

The effectiveness of the fieldwork will be assessed against the same criteria used to assess the map search:

* Number of sites recorded
* Geographic distribution of sites recorded
* Character of sites recorded
* Quality of information on sites recorded

Number of Sites. Fieldwork added 24 sites to the 25 recorded during the map search and the 46 already in the SMR. It thus contributed 25% to the new total of 95 sites on the map sheets listed above.

Geographic Distribution. The sites recorded by fieldwork on sheets SS19NW, SN10SW, SN10NW, SN10NE and SN20NW are split 33:67 between the coastal margin and the intertidal zone (Figure 9). This compares with 57:39 in the SMR (4% are sub-tidal) and 68:32 from the map search. The disparity reflects two factors: first is the low occurrence of mapped feature in the intertidal zone, second is the intertidal focus of the fieldwork.

For sheet SN30NE, which includes the Scars of St Ishmaels, new sites are split 17:83 between coastal margin and intertidal areas. This reflects the fact that fieldwork was entirely on the beach. The combined SMR/map search split was 47:53.

The fieldwork re-emphasised *foci* already identified by the SMR and map search such as Tenby and Penally Beaches. In addition it created a new grouping of sites in the area of Amroth and Wiseman's Bridge which DAT staff indicated as having potential for industrial remains. Similarly on St Ishmael's Scars the fieldwork picked up sites known to DAT staff but not in the SMR. In contrast the beach in front of the isolated Marros Mill yielded no new sites.

Character of sites. New sites around Tenby relate predominantly to its resort function, for example including four accesses to the beach (Figure 10). Its wider maritime significance is illustrated by the addition of the town's second lifeboat house. The third was already in the SMR and the first was identified during the assessment of sources (Tenby Museum). These features were actually mapped but their significance was not recognised. In contrast the sites on the adjacent Penally Beach were not mapped but the importance of the area was noted from the overall set of mapped features. New sites included a landing place and limestone quarry, and a fishtrap.

The sites from Amroth and Wiseman's Bridge were of an industrial character. They were mainly openings in the cliff presumed to be for iron ore workings.

Sites on the Scars proved difficult to interpret. While man-made features were apparent amongst the natural, and inhospitable, strew of boulders, their origin and function was not immediately obvious. Most were noted as possible fish traps or training walls.

Quality of information: For most sites, beyond locational detail and physical description, the information level was relatively low. The majority of new sites recorded in these areas were enhanced from published sources. These provided contextual information rather than details of the actual sites. For St Ishmaels this information was not easily reconciled.

Assessment - Value: The first stint of fieldwork demonstrated the value of walking the intertidal area. The total count of sites was increased, the character of sites extended and the geographic spread given greater depth.

5.6 PHASE III: STAGE 5 - DAT AERIAL PHOTOGRAPHIC COLLECTION

Time Allocated: 02 **Time Used:** 05

DAT holdings of vertical aerial photographs (APs) were seen as a readily accessible collection through which to test APs as a source for coastal recording. The collection comprises an RAF series from 1946 and a Meridian Airmaps series from 1955, both in black & white. The cover is incomplete for both series and the exercise can only be regarded as a test of the potential for data-gathering.

The search of APs was combined with updating the map notes and SMR site forms with information from the debriefing session, including the use of published sources available at DAT and from the first session of fieldwork. The use of APs was, therefore, essentially structured around the quarter sheets. This was most appropriate for the Meridian series which is stored by quarter sheet, but less so for the RAF which is stored by flight run. It should be noted that where flight runs are parallel to the coast or the path of a river they provide the most efficient order of searching. With the subject of study seen as a coherent feature the eye can more easily spot anomalies. Where flight runs cross the feature, searching becomes more time consuming as many bundles of photographs have to be handled at once to gain a coherent view.

While cover is needed at low tide for the intertidal zone to be exposed, it is not necessarily the only form of useful cover. An additional test of colour vertical APs from 1992 held by the Countryside Commission for Wales showed that half tide could reveal useful information. Their photographs confirmed the shape of features observed during fieldwork on Salmon Point Scar. Being higher than the natural rock they were uncovered.

The results can be judged against the same criteria as used for the map search and fieldwork.

Number of sites. The search added nine sites, just 4.5% of the total new records. This low number is partially attributed to the lack of cover for the west side of Carmarthen Bay. Therefore the area from Giltar Point to Wiseman's Bridge which had yielded many sites from other sources was not featured. In addition, the count only includes new sites and not sites already recorded, the observation of which was referenced on existing SMR record forms.

In addition, a large number of features observed in Pendine Burrows were not recorded. The complex of roads and buildings had been partly recorded from the 2nd edition 1:2500 map to which they had been added by hand. The photographs showed that these almost certainly relate to military purposes. It was decided that there was insufficient time in the present project to record the area. The same decision had to be taken for Pembrey Burrows.

ISSUE: *A project should target recording within the military areas. Background research is needed to enhance the considerable information which is available from the APs.*

Geographic Distribution. The new sites are split 12:88 between the coastal margin and intertidal area. The spread across the area reflects the air cover and the decision not to record from within the Burrows.

Character of Sites. Seven of the nine sites are shipwrecks or possible shipwrecks. These are easily spotted in the great expanses of intertidal sands. However, it was not possible to see a known wreck

in the edge of marsh on the Tywi River. This is particularly surprising in view of the recording of abandoned vessels using APS which was undertaken by Kent County Council. While waterfront industrial sites, known from other sources, were checked, little new information was visible. For example, structural remains at known sites at St Clears were not visible on the AP's but fieldwork showed remains to exist, though concealed by bushes.

Quality of Information. Position fixing was difficult, particularly from the RAF cover. The problem was most acute for wrecks in the intertidal area for which reference points were scarce and at considerable distance. The distortion of the photographs impeded use of internal scales and bearings.

Assessment - Timing: This task took longer than anticipated and the time necessary for sorting and scanning photographs should not be overlooked. Moreover, the difficulty of fixing sites added to the time. The length of this task reduced the time available for the assessment of sources (see section 5.9 below).

Assessment - Accuracy: See Quality of Information above. In contrast, the modern photographs at CCW were used to gain improved positions for a number of known sites.

While features can be spotted, it is often difficult to assign an identity. This increases the need for Generic and Descriptive Types to cater for unknown structures.

Assessment - Value: This was a valuable exercise in that it greatly enhanced the content of the SMR for one site type characteristic of the study area, shipwrecks. In addition, observation of industrial sites added to knowledge on the date of their becoming redundant.

5.7 PHASE III: STAGE 6 - FIELDWORK

Time Allocated: 4 days **Time Used:** 3 days

This fieldwork was initially scheduled for the spring tides of 17 - 20 February. As the boat investigation of the Tywi had been cancelled through bad weather, it was intended to use the boat trip to visit wrecks on Cefn Sidan. However, there was a high probability that this trip would also be cancelled. For this reason opportunities for fieldwork were taken as they arose. Four locations were covered:

St Clears	SN21NE 12 February. Dry weather was used to check this upriver centre.
Tenby & Saundersfoot Harbours	SN10SW & SN10NW 16 February. A visit to Tenby Museum for source assessment was combined with a low water examination of these two harbours.
River Tywi	SN30NE, SN31SE & SN31NE 18th February. Gales prevented fieldwork on Cefn Sidan and access to the Tywi was pursued on foot.

The general procedure adopted for the first fieldwork was followed. At St Clears, however, the mud intertidal banks could not be walked. In places the river paths had been closed because flood water

had caused subsidence. This forced great caution which prevented close inspection of river fronts. The work on the Tywi was similarly hampered. The marsh was thoroughly waterlogged from flood water and spring tides. This and deep intertidal mud made progress very slow and in places it was impossible to follow the river. Access through woods at Green Castle proved dangerous due to the treacherous cover of leaf mould and mud on the steep hillside. An attempt to walk the intertidal area below was abandoned as entirely unsafe.

Number of Sites. No new sites were added from St Clears and the sites for Tenby and Saundersfoot were included in the earlier figures which covered sheet SN10SW. Five new sites were added in the limited area which could be reached on the Tywi.

The work at St Clears added valuable information to sites identified during the map search. The remains of two brick kilns and a lime kiln were located despite RAF cover suggesting that the sites were clear of structural remains. The character of the flood banks was also observed but were too distant from the footpaths for recording.

ISSUE: A project should target the floodbanks of the Taf and Cynin.

Geographic Distribution: Four of the five new sites were from the intertidal area which reflects the cover of fieldwork.

Character of Sites: The new sites comprised a quarry, two abandoned vessels and two jetties. One jetty is probably the oldest of three ferry landing stages at Llanstephan. Only the two more recent structures appear to have been known from maps and documents.

Assessment - Timing: The time of year and weather had severely handicapped the programme. The work at St Clears, and on the Tywi only covered approximately 4.5km. This is a measure of the difficulty of accessing the rivers from the land.

ISSUE: Boat access must be combined with walking in order to fully observe the banks of the rivers for evidence of waterfront structures. In good weather this will provide safer and more rapid access.

Assessment - Accuracy: The observation of built structures at St Clears has increased the accuracy of the SMR records. This identification of upstanding remains is a caution against reliance on maps and APs alone.

Assessment - Value: Despite the adverse weather enough was achieved to demonstrate that fieldwork is essential to both validate mapwork and to identify new sites.

5.8 PHASE III: STAGE 9 - OTHER SOURCES

Time Allocated: No specific allocation.

The project did not include time for a systematic programme of documentary research to enhance the new records. Background information came either from sources provided by DAT or from sources scanned during the assessment of sources (see Section 5.9). These were accessed during the use of DAT's APs and writing up of fieldwork notes.

5.9 PHASE III: STAGE 10 - ASSESSMENT OF SOURCES

Time Allocated: 7 days **Time Used:** 5 days (less RCAHMW meeting)

From the initial briefing it was clear that, in addition to the OS maps and APs used in Stages 2 and 4, DAT staff could point to more source material (predominantly published) than could be trawled during the time allocated to Phase II. Consequently it was agreed that the phase should include an element of source assessment.

DAT was requested to draw up a list of target bodies within Dyfed under the following categories:

*Archive Services	County Record Office and any district equivalents
*County Library	Library branches in main coastal centres
*Museums	Maritime themed or in main coastal centres
*Port /Harbour Authorities	
*Sea Fishery Committees	
*Aerial Photograph Collections	(Local Authority, Conservation Bodies)
*Private Researchers	

The extra time used on APs (see section 5.6) reduced the time available to carry out this assessment. Effort focused on telephone enquiries to identify the nature of material held and rapid test searches in local repositories. The results are presented in Section 7.

5.10 PHASE III: STAGE 11 - REPORTING, DATA COLLATION

Time Allocated: 5 days **Time Used:** 6 days

Throughout the project there has been a shortage of time for collating data. Time had not, for example, been allowed for writing up field notes or the creation and amendment of SMR records which the observations necessitated. Much of the five days allocated to report writing was absorbed in collating data on coast types and site (numbers/type/character) to permit analysis of the project's results. The project has been successful in gathering a large quantity of data from disparate sources. The short time allocated to the pilot project limited the exent to which the collected data could be synthesised and analysed as a bases for evaluating the methodology and main sources.

6 PHASE IV: DATA ENTRY

The SMR forms completed during Phase III were the raw product of the project. They have been processed by a data-entry agency. The agency works with a copy of the DELILAH database which is used for the DAT SMR. During entering of the new records additional terms were added to the field glossaries.

Once data-entry was complete the records, as a separate database, were returned to the DAT SMR Officer. The data was checked by an indexing process before merging with the main SMR database.

7 ASSESSMENT OF SOURCES OF INFORMATION

This exercise aimed to identify and assess potential sources of information for increasing and enhancing entries in the SMR for the coastal area. The following sources were targeted:

*Archive Services	County Record Office and any district equivalents
*County Library	Library branches in main coastal centres
*Museums	Maritime themed or in main coastal centres
*Port /Harbour Authorities	
*Sea Fishery Committees	
*Aerial Photograph Collections	(Local Authority, Conservation Bodies)
*Private Researchers	

Consideration was also given to the historic charts.

7.1 SCALE OF ENQUIRY

Most collections of material are stored or indexed by subject. The retrieval mechanisms are rarely structured to permit searches by geographic area other than by local administrative divisions such as parishes or topographic locations such as a villages or towns. This makes it difficult to select material for a geographic area which is essentially defined by environment, such as the present study.

A subject-based enquiry would be equally problematic. The record creation phases of the project had demonstrated the diverse character of sites in the study area. To discover what information is held by the various record-curating bodies would, therefore, depend on multiple subject enquiries.

Enquiries were therefore made by explaining the scope of the project to curators of collections and allowing them to indicate potentially relevant material. This approach created a focus on maps and plans, and information on industries and shipping.

7.2 BASIS OF ASSESSMENTS

Many enquiries were made by telephone. Where visits were possible, there was too little time for making the test searches of documents which should characterise an assessment of sources. Despite this the following pages include estimates of the time needed to use particular sources and the relative merit (*High, Medium* and *Low)* of their general information content. These 'assessments' have been made on the basis of the author's experience of comparable sources in other parts of Great Britain.

7.3 ARCHIVE SERVICES

The archive services within Dyfed reflect the old county divisions with offices for Camarthenshire in Carmarthen, Pembrokeshire in Haverfordwest and Cardiganshire in Aberystwyth. The study area falls primarily within the first two historic counties. Records for the Kidwelly area, however, are more likely to be held by Llanelli Library. Such division of holdings has implications for the time and travelling costs needed to access information.

The Carmarthenshire Record Office was assessed by a two hour search of their indices and catalogues.

7.3.1 Maps & Plans

These were accessed via two searches: one of the card index, which is arranged alphabetically by place, and one of catalogues to major collections. The search could have been confined to the former as this contained most of the entries in the catalogues. The majority of entries refer to 19th or 20th century maps and plans. Those which were selected as being of potential interest amounted to about half a dozen relating to development of either centres such as Carmarthen, facilities such as Kidwelly Harbour or to communications such as the Great Western Railway. In addition it was noted that a number of estate maps covered waterside settlements, such as Llanstephan, or areas such as Pinged Marsh.

Estimated Search Time: 1 day (Carmarthenshire RO holdings only)

Value: High for 19th century industry and engineering.

7.3.2 Photographs & Prints

These were accessed via the card index (two drawers, estimated 2000 entries) This was arranged alphabetically by place. Places were selected using a checklist of locations within the study area. The subject descriptions revealed popular themes, notably all the castles, Llanstephan ferry and the River Tywi at Carmarthen. From the index it is impossible to judge the value of individual images. This is because only the main subject is listed , giving no clues to additional subjects which may have been captured in the picture.

The use of this material, with the need to order many individual items would be exceedingly time consuming. It was noted, however, that many of the images were within the Collection of the Carmarthenshire Antiquarian Society. A search of the albums within this collection may prove a more effective approach. Alternatively an arrangement should be sought to access the photographs and prints collection by storage unit.

Time Estimated: Dependent on search technique 2 days - 1 week.

Value: High but only if the collections are accessed by someone with an intimate knowledge of the locations and known sites.

7.3.3Industry

This subject division within the main card index was scanned (2 drawers estimated 2000 entries). The following subdivisions were checked:

Brick & Tile	0 entries
Carpenters & Timber	
Clay	
Coal	Largest entry

Commerce	
Iron	
Iron foundries	
Engineering	0 entries
Gas	
Kiln	0 entries
Lime	
Minerals	
Quarries	
Saw mills	

Very few items referred to material of a general nature. Most entries related to records of property or accounts of businesses. The value of the records would be greatest, therefore, in researching specific sites or activities rather than in projects aimed at general enhancement of archaeological databases.

Time Estimate: This cannot be estimated.

Value: Low for SMR/NMR enhancement.
High for specific site or activity research

7.3.4Shipping

This information was obtained from the archivists. The holdings primarily comprise shipping registers and crew lists for the ports of Carmarthen and Llanelli

Shipping Register Llanelli	1824-1885
Shipping Register Carmarthen	1839-1849
Fishing Register Lanelli	1902-1923
Fishing Register Llanelli (Transactions)	1825-1852 & 1855-1931

The subject index includes a card index to these registers which is arranged alphabetically by ship. It is believed to contain 500 ships.

Such registers can provide information on shipping casualties. This occurs when the reason for the cancellation of registry is noted. In contrast to many national sources which focus on larger vessels, the shipping registers will include locally built and owned craft. Casualties recorded from this source are not restricted to the local area. The information on the cards is not consistent and a thorough search should use the originals.

Estimated Time:3 days

Value: Low as the number of recorded casualties is unlikely to be large and will be chronologically limited.

7.4 LIBRARY SERVICES

The County Library is in Carmarthen. Advice was sought on the existence of appropriate holdings in branch libraries. The holdings of the reference library and local studies collection in Carmarthen were assessed.

7.4.1 Llanelli Branch Library

The reference librarian provided information by telephone.

Although Kidwelly is within the administrative area of Llanelli it has not been a priority area for collecting local history material. Most holdings for maritime and industrial subjects are focused on the Burry inlet. The photographic collection does however contain some images of Pembrey and Kidwelly.

Estimated Time: 0.5 days

Value: Low

7.4.2 Tenby Branch Library

The librarian provided information by telephone.

There are few holdings apart from published material. Tenby Museum is the main source of historical information.

7.4.3 Carmarthen Library

The library's collections are predominantly published material with all archive being passed to the Carmarthenshire Record Office. A complete run of the *Carmarthen Journal* is the prime source of information on the history of the locality.

Transport Index

A card index has been prepared for entries in the *Carmarthen Journal* 1810 - 1900. This includes a number of subject headings which could be searched for information on the study area.

Bridges
Canals
Ferries
Coastal Incidents (eg strandings of vessels)
Lifeboats
Places
Railways
Rivers
Ships
Shipwrecks

Under the subject of *Ferry*, for example an entry was included of a notice from the Carmarthen Town Council relating to the building of two landing stages at Llanstephan. In Phase III of the project, three landing stages or jetties had been recorded.

Examination of the *Shipwreck* section revealed the character of the index. In reality it is a chronological listing of newspaper entries. The cards provide a continuous list of entries with several listed on each card. The shipwreck cards are separated into groups by place-name. The information in each entry comprises the date plus between six and ten words which give name of ship and place of loss (eg Carmarthen Bar).

The entries do not refer to unique casualties. Thus one shipwreck may be included several times on the cards as a result of a series of reports occurring in the Journal. A count was made to estimate the number of unique casualties. On the basis of casualties averaging five per card, the following count was prepared:

Cardigan Bay	26 cards	130 casualties
Carmarthen Bay	71	355
Milford Haven	44	220
N. Pembrokeshire	19	95
St Bride's Bay	08	40
St Georges Channel	03	15
Smalls Rocks	04	20
Swansea Bay	14	70
		879 Total Casualties

The most efficient means of transcribing the shipwreck index would be on pro forma with the locational detail (eg NGR, Quarter Sheet, Parish, District), type and references already complete. Tagging onto a standard template is an alternative. A rate of 20 casualties an hour might be achieved.

Estimated Time: 18 hours Shipwreck Section

Value: High for rapid establishment of low level records of casualties.

The other parts of the transport index would be more appropriately used for researching specific sites.

Local Studies Index (published material)
The index is arranged alphabetically and contains both subject and author entries. Test searches were made under a variety of the industrial headings such as *Lime Industry, Lifeboats,* and *Iron Ore*. In general this yielded few entries to material which would rapidly increase the number of sites. It was noticeable that the most promising items either occurred in the Journal of the Carmarthen Antiquarian Society or had already been recommended by DAT staff.

Estimated Time: This cannot be estimated.

Value: High for research of specific sites or activities

7.5 MUSEUMS

The assessment focused on local museums. It is recognised that national museums are likely to hold useful material. Three museums were suggested by DAT staff and no further possibilities could be identified from a national list of museums supplied by the Council of Museums for Wales.

7.5.1 Carmarthen Museum, Dyfed County Council

The curator supplied information by telephone. The museum does not have archive collections, and their maps are predominantly framed. The photographic collection contains little of relevance to the coast either geographically or thematically.

7.3.2 Kidwelly Industrial Museum

Contact was attempted by telephone without success. The collections of this volunteer-run museum have yet to be assessed.

7.5.3 Tenby Museum, Tenby Museum Trust

The collections were assessed through an interview with the curator. Viewing collections was not practical because building to redevelop the premises had necessitated temporary closure of some areas into which stored material had been moved. The collections comprise archive, a library of printed books, artefacts and illustrative material. The role of museum and art gallery are of equal consideration. Work is advancing towards full computerisation of catalogues which will permit access via a database.

Archive

The records of the Corporation of Tenby are housed in the museum. These commence with charters issued by Tudor monarchs but the bulk of material dates from the 18th century. The present indexes are in catalogue form with division by broad subject heading. Copies have been deposited at the County Record Office, Haverfordwest and the National Library of Wales.

The material includes harbour accounts (Class TR/5), notably the Quay Wardens Accounts. In addition to this class of definably maritime material, the records will undoubtedly include items of relevance to interpreting the maritime activities of the town. Discussions of redevelopment during early 19th century, as the resort emerged from the decayed town, will yield light on past and current structures. This was illustrated through the maps and plans collection.

Maps & Plans

The holdings include a number of published maps and charts such as Speed and Lewis Morris (see Assessment of Charts). In addition they hold material specific to the town. Two plans were viewed:

1 1811 Plan of Tenby in the County of Pembroke showing Property of the Corporation.

2 1811 Plan of Lands belonging to the Corporation in the Parish of St Mary's, Tenby.

This style of map, which is comparable with estate maps, provides little detail of the harbour area. They can, however, confirm the position and add to the chronology of cliff top buildings. Number 1 above, for example, showed the battery on the cliff (PRN 29926).

This source appeared to be of greater value for an area which is outside the geographical remit, but not the maritime theme, of the present project. The detailed mapping of land holdings reveal the use of the Ritec inlet prior to its closure by the railway embankment.

The final category comprises plans of specific areas within the town. Two examples were selected which showed the harbour.

1831 A Rough Plan of Tenby Pier: Denham.

1842 Mr Walker's Proposed Improvement to Tenby Harbour

Denham's plan had been drawn for the use of the Corporation during deliberations over improvements to the harbour. Showing both the existing harbour structures and outlines of the proposed structures, it includes features which have survived and those which have been removed or sealed by the redevelopment. In a rapid scan new information was gleaned for The Sluice (PRN 29925) and a new site was noted, a limekiln at the head of the harbour (PRN 30090). Closer inspection of this type of plan would yield detailed information on the harbour structures and changes to their size and shape.

The 1842 plan demonstrated the dangers of using these sources in isolation. It included a landing place which projected to low water on the seaward side and from the landward end of the south breakwater. This proposal was, as far as is known, never put in place.

Illustrative Material
The art collection could not be viewed. The value of local topographical views was demonstrated by reference to the work of Charles Norris who worked in Tenby between 1805 and the 1830s. In addition to the works appearing in published sources (eg Charles Norris, 1812. *Etchings of Tenby including many ancient edifices which have been destroyed and intended to illustrate the most striking peculiarities of Early Flemish architecture*) the curator has recently taken copies on slide of works held in Cardiff Public Library, one of three major Charles Norris collections. These include views of the harbour showing the lime kiln noted above (PRN 30090), Sleemans warehouse (PRN 30095), the partially constructed beacon on Woolhouse Rocks, and views across the Holloway water (River Ritec inlet).

The photographic collection was considered by reference to the lifeboat exhibition. This confirmed the suspected origin of a boathouse observed during fieldwork (PRN 30051) and identified a further lifeboat house (PRN 30092). The latter is in the harbour and its specific function would not have been recognised from inspection. Being of an early date, and funded by a non-lifeboat charitable organisation, it was not of the characteristic shape and size which made PRN 30092 instantly recognisable as the work of the RNLI.

Estimated Time: 1 week

Value: High for enhancing SMR records for a specific location. Accessing collections of this type, which have a high degree of coherence and are supported by the local knowledge of staff, will contribute to producing quality records. They are less suitable for rapid addition of large numbers of sites.

7.6 PORT & HARBOUR AUTHORITIES

Port and harbour authorities are likely to hold two forms of relevant information. The first is historical material related to the running of the harbour. In addition to providing information on the use of the harbours this can include detailed information on specific structures such as wharves, training walls and navigational beacons. The second relates to the maintenance of the modern navigation. Regular surveys are used to check the depths available for entering harbours and for berthing. In areas of shifting sands these can locate newly uncovered wrecks. Some authorities maintain files on known wrecks within their area of jurisdiction.

In general, it proved difficult to identify bodies with responsibility for the records of the harbours and navigation areas within the study area. There was insufficient time to pursue this further.

7.6.1 River Gwendraeth & Kidwelly

Kidwelly Town Council now own the quay - contact Mr Howells (0554 890203)

7.6.2 River Taf & St Clears

Information supplied by Mr Benson, Director DAT.

Responsibility for the River Taf rested with St Clears Borough Council. The records of the Corporation are, therefore, the main source. These include the records of three port reeves and contain information on matters such as fishing, discharge of goods at the quay, removal of obstructions, and levies such as keelage and haulage.

The records of the Corporation begin in the early 18th century and run up to its dissolution in 1889. The 19th century records have been indexed. They are the responsibility of the Town Trust.

7.6.3 River Tywi & Carmarthen

The town of Carmarthen is responsible for navigation of the River Tywi. Their authority included the right to hold an Admiralty Court.

An enquiry directed to the Town Clerk revealed that some records survive but their character and extent is unknown.

7.6.5 Saundersfoot Harbour

The present Harbour Commission was established by MAFF following the transfer from railway responsibility in 1958. They hold no records prior to this date.

7.6.6 Tenby Harbour

Records of the harbour are within the archives of the Town Corporation in Tenby Museum (See section 7.5.3).

7.7 SEA FISHERIES COMMITTEES

Sea Fishery Committees are local regulatory bodies under the jurisdiction of MAFF. Their officers and members can provide introductions to local fishermen who are a source of information on sea bed obstructions and artefacts recovered from the sea bed.

The study area is notable for its river-based fisheries which are now regulated by the National Rivers Authority. The river fisheries have employed a wide range of techniques including fixed engines. Fishermen on the Tywi, for example, have used stone fishtraps within living memory. Oral traditions are likely to prove a rich source of information.

This source of information has not been pursued since it appeared unwise to initiate personal contacts without time to follow through enquiries.

7.8 AERIAL PHOTOGRAPHS

The value of aerial photographs was demonstrated during the project using the DAT collection. For this assessment additional sources of vertical photographs were sought with the following results.

7.8.1 Planning Department Dyfed County Council

No holdings.

7.8.2 Central Registry for Air Photographs, Welsh Office

This organisation was formed in 1975 with the aim of collating details of all known air photography taken of Wales.

A written enquiry with the study area defined on a 1:50000 map secured a list of holdings. These comprise:

Year	Organisation	Scale	Material at Registry		
1946	RAF	1:10000	Prints	Sortie plot supplied	
1960	RAF	1:10000	Prints	Sortie plot supplied	
1964	OS	1:7500	Refer to Welsh Office		
1964	OS	1:7500	Refer to Welsh Office		
1965	OS	1:7500	Refer to Welsh Office		
1965	OS	1:7500	Refer to Welsh Office		
1965	OS	1:7500	Refer to Welsh Office		
1966	RAF	1:10000	Prints	Sortie plot supplied	
1967	OS	1:7500	Refer to Welsh Office		
1968	OS	1:7500	Refer to Welsh Office		
1969	OS	1:22,000	Refer to Welsh Office		
1969	RAF	1:62000	Film only		
1970s	Fairy Surveys	Various		Address List &	Sortie plot supplied
1983	J A Storey	1:10000		Address List &	Sortie plot supplied
1992	Geonex	1:10000		Address List &	Sortie plot supplied

7.8.3 Countryside Council for Wales (Local Offices)

The offices in Llandeilo and Haverfordwest hold 1:10000 colour cover for Carmarthenshire and Pembrokeshire respectively. The Llandeilo office has a 1992 flight and the Haverfordwest 1983 and 1992. The later cover is held as colour photocopies.

During the project a test search was made of the Llandeilo cover. This was a supplementary exercise to the use of DAT collections.

7.8.4 Pembrokeshire Coast National Park

The park holds colour 1:10000 cover for 1983 and 1992. This only extends east across the study area to SN1809.

Estimated Time: To use one series for the study area, 4 days

Value: High

7.9 PRIVATE RESEARCHERS

The majority of private researchers are either DAT staff or are known to them through the Carmarthenshire Antiquarian Society. Although this source could not be pursued further it is clear that individuals gather detailed information which can enhance the records created from map and AP searches.

Estimated Time: Cannot be estimated

Value: Low for rapid record compilation
High for thematic studies

7.10 SEA CHARTS

A list of charts and surveys predating 1930 was obtained from the Hydrographic Office, Taunton. This was supplied as both a chronological list and a visual key. It included 24 items, the earliest of which is by Murdoch McKenzie in 1772. The remainder are, however, post 1800. Tenby and Saundersfoot are the most common subjects.

The value of charts was considered during a visit to the National Library of Wales. Reference was made to:

Morris, L.	1748	Tenby Harbour & Roads & Caldy
Mckenzie, M.	1775	Carmarthen Bay
Denham, H.	1830	Bristol Channel, Tenby & Caldy Island
Aldridge, G.	1856	Wales, Tenby & Caldey Roads

The interpretation of coastal sites which are related to sea communication is facilitated by reference to contemporary charts. In addition this source is valuable for understanding processes of coastal change. For the addition of site-specific information their value is more limited. The following types are most commonly featured: navigation marks, lookouts and coastguard stations, prominent buildings such as churches, windmills and chimneys. Occasionally shoreline features such as fishtraps are included.

Estimated Time: 3 days for charts at Hydrographic Department

Value: Low for record creation (time estimate is for this)
High for background research.

8 CONCLUSION

The preceding description of the preparatory work, data-gathering and reporting demonstrates that, with regard to the number of tasks set, the project brief was very demanding. Determined adherence to the brief ensured that each task was addressed within the overall time limits. When it became necessary to adjust the schedule, decisions were guided by the overall aim that this should be a pilot project providing nationally applicable results. To this end, a reduced time was allocated to the assessment of sources of information, which had an essentially local focus; an increased time was given to on-going collation and correlation of information from the map search, aerial photographs and fieldwork in order that conclusions could be drawn from the data.

The quality of information produced by the project is due to the combination of experience available. The consultant drew on a solid background of SMR recording, maritime history and assessment of sources. Individual staff of DAT provided detailed personal knowledge of the study area, its history and its known and potential archaeological remains. Without this foundation the time of the consultant could not have proved so productive.

The project has provided information on: the need for coastal recording; the sources of information which can be employed; the results which may be expected; the demands of recording; and the structuring of projects.

8.1 THE NEED FOR COASTAL RECORDING

Bare statistics show that coastal recording will numerically extend the NMR/SMR, while consideration of site type and distribution reveal its potential enrichment of these archaeological databases.

The project was geographically targeted and the large number of new records must be seen as confirmation that the SMR is weak for the coastal zone. The present study covered 134 km of Carmarthen Bay and its tidal rivers, creating 197 new site records to add to the 115 already within the DAT SMR. This represents an increase of 171%.

The dramatic increase in numbers of particular site types demonstrates this geographic weakness. The increase in, for example, boat houses, flood defences, harbour structures, lime kilns, slipways and shipwrecks show that there were previously relatively few SMR sites characteristic of coastal activity.

SMRs which have followed a pattern of compilation similar to the DAT SMR are likely to show the same weakness in respect of Hydroarchaeology.

8.2 THE MAIN SOURCES OF INFORMATION

The project used three key sources of information: historic OS maps, aerial photographs and fieldwork. In addition, consideration was given to published and archive sources.

The historic maps contributed the greatest number of new records, 133 of 197. Once copies have been assembled, they are ideal for rapid numerical extension of archaeological databases providing relatively accurate locations and information for accurate assignment of site type. They are, however, chronologically limited to four decades around the turn of the 19th century and provide no clue to current survival. Moreover, few sites are mapped in the intertidal area.

The aerial photographs which were viewed were of value in locating shipwrecks on intertidal sand, flood defence banks alongside rivers, foreshore defences, and features in sand dunes. Elsewhere they have been used for locating abandoned vessels in estuaries with extensive mud flats and salt marshes. Aerial photographs taken at low water were expected to be the most useful. In addition, it was found that photographs taken at a point before full low water contained important information for some parts of the study area.

The present project used the collections of APs held by DAT. Unfortunately these did not provide complete cover of the area, and this resulted in fewer new sites being recorded than had been anticipated. A chronological series can show processes which have contributed to the preservation or destruction of particular sites.

Despite adverse weather conditions, the importance of fieldwork for validating map and aerial photographic searches and for locating additional sites was amply demonstrated. Many of the new sites were intertidal features and structures which were not mapped by the OS.

8.3 THE RESULTS TO EXPECT

Surveys with a three-pronged data-gathering strategy, employing historic maps, vertical APs and fieldwork, can be expected to increase the NMR/SMR records for the coastal zone by between 2 and 3 times. The records will be strengthened in respect of Hydroarchaeology but will remain chronologically limited. In addition to site specific information the three-pronged approach will provide a basic analysis of *foreshore* and *coast edge* types.

The map and AP search alone will produce relatively low quality records. These will include only locational information and basic entries under site type. Fieldwork is essential to validate these records and provide descriptions of the current condition of sites. Comprehensive surveys should extend to using additional sources both to enhance specific records and to provide contextual information through subject based studies.

Rapid surveys conducted at the level of the pilot project can identify areas where further work is required. Fieldwork is the main instrument in recognising these needs. A list for the current study area is given in Figure 11.

8.4 THE DEMANDS OF RECORDING

During recording, which used the DAT SMR forms and glossaries, a number of needs were identified.

1 **Features of unknown function**
The glossaries of *Generic* and *Descriptive Types* need to be extended to cater for the numbers of unknown features and structures recorded from the historic maps and APs.

2 **Elements of Flood Defence Systems**
A large percentage of new records referred to banks and ditches of flood defence systems. Consideration should be given to the best means of recording these essentially linear features in order to ensure the greatest available information is transferred from the maps and APs to the SMR record forms. This should take account of the manner in which the SMR records can then provide a base for developing field survey of the systems.

3 **Elements of Foreshore Defence Systems**
Structures built to defend the coast edge are of significance both in their own right as engineering works and as factors which may change the environment of sites in the coastal margin. It is important to determine the age of works which, for example, have closed tidal inlets.

Figure 11 Areas for future work in Carmarthen Bay

The following 15 points have been extracted from the Quarter Sheet Notes. The order does not reflect priority.

1 Military uses of Penally Burrows and Giltar Point, Pendine Burrows and Pembrey Burrows should be thoroughly researched and the SMR up-graded.

2 The fish trap at Penally should be recorded and monitored.

3 Ritec tidal inlet should be researched and the SMR upgraded.

4 The constituent elements of Tenby Harbour should be surveyed and researched. Consideration should be given to the need to afford protection to structures such as the 17th century sluice.

5 The SMR should be further upgraded in respect of the resort function of Tenby.

6 Documentary research should be used to upgrade the SMR in respect of industrial activity between Saundersfoot and Amroth.

7 The vessel at Pilglas is collapsing as the stream erodes the bank. It should be recorded in advance of its loss.

8 SMR entries related to submerged forests should be rationalised with single PRNs applied to discreet areas of foreshore.

9 Flood defences, especially on the Taf and Cynin should be accurately recorded and surveyed.

11 More detailed records should be made of surviving remains of lime kilns and brick works St Clears.

12 Remains of ships on the intertidal sands between Pendine and Pembrey should be recorded and monitored. Stray timbers on Salmon Point Scar suggests that vessels are breaking up. Opportunities for recording should therefore be seized as they arise.

13 The SMR should be further upgraded in respect of reclamation and flood defences in Laugharne Township. Survey in this area should also consider use of Railsgate Pill as a shipping point.

14 A detailed survey should be made of the structures located on Salmon Point Scar. The whole area of the Scars should be investigate more fully.

15 Boat access to Towy, Taf and Gwendraeth, should be used to complete the preliminary surveys which proved impossible during the pilot project. This should include the built areas of Carmarthen and Kidwelly.

In order both to develop a rationale for recording and to extend the glossaries of *Generic* and *Descriptive Types* research is needed to clarify the precise terminology applied to works such as groynes, seawalls. Research into the development of these engineering works should aim to provide guidelines for dating during field observation.

4 Elements of harbour installations

The project has highlighted the need for more detailed recording of built structures within harbour complexes. Closer definition is needed of terms already within the glossaries of *Generic* and *Descriptive Types* such as *Pier*, *Dock*, *Sluice*, in order that relevant additions can be selected.

5 Ship/Boat Remains

Consideration should be given to the value of *Shipwreck* as a Generic Type. The term implies a process of site formation rather than a type of site. It has currently been applied to all vessels, including those probably deposited through laying-up or abandonment rather than wrecking. This site type also requires appropriate terms within glossaries for *Form*.

6 Development of Foreshore & Coast Edge Recording

Further work is needed to develop a method of recording the coast edge and foreshore types. This should enable recording from maps sources alone to stand alongside recording from field work. Consideration should be given to incorporating information on coastal environments into SMR entries, possibly through the *Land Use* field.

8.5 THE STRUCTURING OF PROJECTS.

The pilot project has confirmed that archaeological records are severely lacking for the coastal zone. The gap can be plugged by rapid recording surveys of the type undertaken during the pilot project. The results of such surveys should, however, be regarded as indicators of the extent to which detailed survey, recording and research are needed.

The following notes have been derived from the experience of the pilot project and are intended as an aide to formulating future rapid surveys.

8.5.1 Identification & Assessment of Sources of Information

This should be undertaken in advance of the main project as its results should inform the structure of, and time allocation for, data-gathering. This important task requires personnel with adequate background knowledge to evaluate sources of information. Their experience should include: gathering information from diverse organisations; using a wide range of source materials; and record compilation from a range of sources using a variety of data-entry techniques.

The assessment should consider the best source of material for the map search and aerial photographic search. The following comments are concerned with other sources of information.

The project has shown that sources can be regarded as three distinct types. Their character has implications for the allocation of personnel and time. The first type can provide rapid numerical extension of the NMR/SMR through the input of large numbers of low quality records, for example, the shipwreck section of the transport index to the Carmarthen Journal maintained by the County Library. This type of source can be successfully used by personnel capable of accurate and rapid transcription but with little subject knowledge. The second type can both numerically extend the NMR/SMR and enhance the quality of records by providing a deeper understanding of the coast. This group, which includes material such as historic charts, and other forms of terrestrial maps and plans, requires more time to access fruitfully. The work requires personnel to be familiar with the character of the coast and the sites within the SMR. The third type comprises sources which are best accessed on a thematic or topographic basis such as published material, photographic collections and archive collections. This material is essential to the production of quality records within the NMR/SMR and requires personnel with research skills and familiarity with coastal activities and the content of the NMR/SMR.

The repetition of assessments of sources for a series of coastal projects will involve unnecessary duplication. A single, well-designed assessment could address national and local sources throughout Wales. It should collate information on the wide range of subjects to which sites in the coastal zone relate. The advice of local archaeologists, such as those within DAT, would be essential to preparing the initial brief and their assistance would be crucial to reaching local organisations. An important aim of such an assessment should be to indicate which sources can be accessed for rapid extension of the NMR and which should be accessed within the coherent structure of more detailed coastal surveys conducted at a local level.

8.5.2 Assembling work materials

The efficiency with which the whole project can be conducted depends on the selection of material from the SMR and acquisition of copies of historic maps. Sufficient time must be allocated to this task which can be effectively undertaken by personnel with a methodical approach and clerical skills.

8.5.3 Map Search

This would be made easier if the copies of SMR base maps and the historic maps could be obtained on single sheets. An increase of 30% in the time allocation would have eliminated the need for undue haste. Using the maps requires considerable space and cramped conditions, therefore, reduce efficiency.

8.5.4 Aerial Photograph Search - vertical

To be most useful this should be undertaken after the map search but with the historic maps still to hand. Two, and preferably three, surveys should be accessed simultaneously. These should be of different dates with complete cover of the survey area. It is important to include a modern, colour survey of an accurate 1:10000 scale.

For areas comparable to that of the pilot project it should be possible to make the AP search in approximately 10 days. This time will however increase if there are a large number of new records to create, such as abandoned vessels or shipwrecks which will not have featured in the map search.

8.5.5 Fieldwork

The setting of priorities for fieldwork and the general planning drew heavily on the personal knowledge of DAT staff regarding sites, access routes and tidal conditions.

The fieldwork undertaken on the open foreshore areas was the most successful. It proved impossible to cover large distances on the rivers because there were few footpaths and flooding made conditions difficult or unsafe. However, where access was gained SMR records were validated and new sites identified. This confirms the importance of surveying both the open coast and the rivers.

Future projects should include provision for accessing sites by boat. It is essential, therefore, that they are timetabled to provide the maximum opportunity for fieldwork. This requires a flexibility in the schedule which was not available in the pilot project. In general fieldwork requires spring tides which uncover the greatest extent of the intertidal area. These tides occur on a roughly fortnightly cycle with the optimum heights coming on four consecutive days. The start and end dates of projects should be set sufficiently far apart that should one set of tides be missed through, for example, bad weather, a second set can be used without upsetting the overall schedule. This means that the number of days encompassed by the start and end dates will greatly exceed the number of days allocated to the project. As fieldwork should not be undertaken until after the map and AP searches are complete, this has implications for management of staff time.

While the pilot project suffered from heavy rain and flooding it should be remembered that projects scheduled later in the year may have other difficulties to contend with. Vegetation on the coastal marine, for example reeds on marshes, may obscure sites. Intertidal structures may be colonised by flora and fauna.

The following would improve the productivity of fieldwork: teams of two walking the foreshore; use of standard forms for recording *foreshore type* and *coast edge*; use of standard forms for reporting on known sites.

8.5.6 Presentation of information

A large percentage of the pilot project was devoted to collating and synthesising information. Although future projects will not require a report of the type presented here they will benefit from having considerable time allocated to presenting information. Adequate time must be allowed for updating the SMR entries as a result of each new source which is used. This is particularly time consuming after fieldwork when many continuation sheets were prepared for sites already in the SMR. Moreover, every project should include a detailed record of the information which has been used and the method by which it was searched. The *Quarter Sheet Notes* in Part II provide a useful model.

The notes presented in the above section have been used to produce a model for advancing coastal recording in Wales (Figure 12). This is based on partnership between RCAHMW, as lead agency, and the regional trusts, as curators of SMRs. It is underpinned by two principles. The first is that coastal surveys should be conducted at a local level through the auspices of bodies with intimate knowledge of each region. The second is that RCHAMW is best placed to foster the preparation of an improved methodology and recording practice, and to establish a thorough assessment of sources of information on coastal sites, which can provide a national standard and framework for the individual projects.

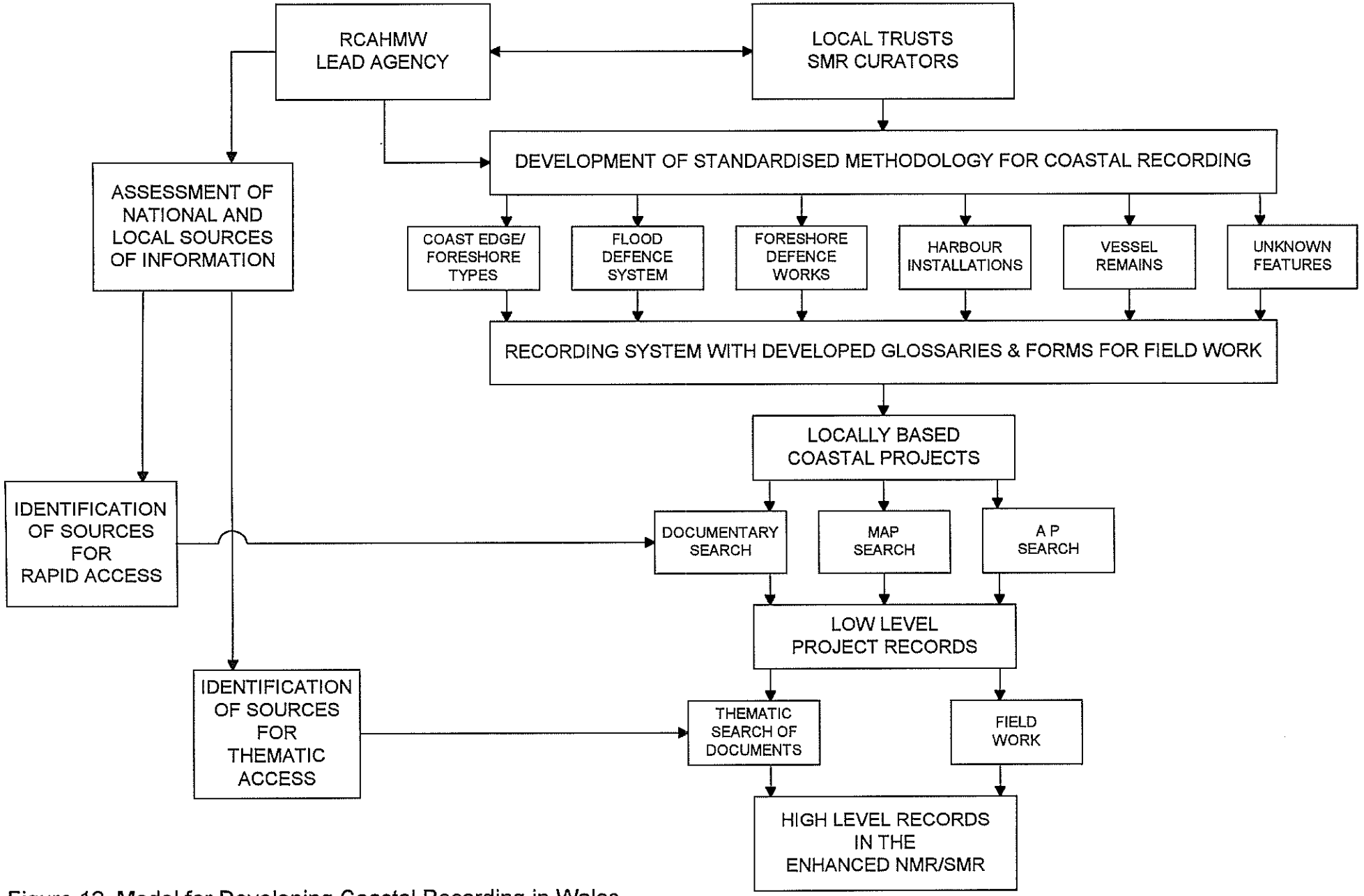


Figure 12. Model for Developing Coastal Recording in Wales

PART II

CONTENTS

1 QUARTER SHEET NOTES

The following pages reproduce the working notes made during the project. The *Description from 1:10000 of Foreshore and Coastal Margin* was made during the mapwork phase. Where necessary observations made during fieldwork were added. The lists of sites in the *Summary of Sites* were updated throughout all phases of the project. The descriptive sections (Known Sites, New Sites and Assessment) were written as part of the synthesising process which permitted the analysis of the data which has been presented in Part I of this report. The lists of *Foreshore* and *Coastal Margin* types employ a variety of terms which were rationalised to produce the listing in Figure 8 of Part I and Section 2 of Part II of this report. Similarly, the Generic Terms given in the *Summary of Sites* has been rationalised during preparation of the report (Figure 10) and during test-indexing prior to incorporation with the main SMR.

SHEET SS 19 NW GILTAR POINT to BLACK ROCK, PENALLY

Covered By 1st Edition 1:2500 XLI.15
2nd Edition 1:2500 XLI.15

No 6" available

Description from 1:10000 of Foreshore and Coastal Margin

The rocky promontory of Giltar Point forms the southern limit on the west side of Carmarthen Bay. The north side of the promontory falls to a narrow boulder beach. To the north is a broad sand beach which extends 230 -250 m between the mean high and low water lines. In places a narrow strip of shingle is shown above high water, but the beach is otherwise immediately backed by dunes, the Burrows, which are used as golf links. The coastal margin is separated from Penally by the railway.

A number of paths run from the high ground of Giltar Point to meet the path behind The Burrows. The latter is only crossed by four paths. Two run out from the road leading seaward from Penally Station, one continues the track which runs seaward from the school and the last leads out from Black Cottage.

Foreshore	HW Metres	NGR	Coast Edge
Boulder	450m	SS 1255 9831 - 1220 9854	Rock/Cliff
Sand	1700m	SS 1220 9854 - 1309 2000	Dunes/Golf Course
TOTAL	2150m		

Description Adjusted by Fieldwork

The beach beneath Giltar is completely covered by a strew of rocks and stones. At the junction of cliff and dunes there is erosion which has caused part of the rifle butts to tumble on to the beach. A short line of rocks and masonry has been positioned to protect the foot of the cliff. There is, however, no clear remains of the two groynes shown on the SMR base map. The shingle beach shown on the base map is a storm beach in front of the dunes. To the south of this, protection has been provided by pebble filled wire cages.

Known Sites

Sites within the DAT SMR were drawn entirely from the coastal margin. These were concentrated on the top of Giltar Point where Iron Age and Roman finds had been recovered. Within the Burrows a Bronze Age inhumation was discovered some 18 feet (6m) below the surface during pipe laying in 1880's.

The use of the Burrows for military activities was known but individual structures had not been added to the SMR.

New Sites

The map search added the different phases of the rifle ranges on the Burrows. A number of buildings and structures of uncertain function were also added. These were probably linked to the ranges or may relate to activity on the beach. A modern sand pit was also noted (PRN 29916). The maps showed few intertidal sites: a lime kiln (PRN 29910), groynes (PRN 30045) and piped outfall (PRN 30038) at the south end of the beach and the culvert of the River Ritec (PRN 30042) at the north end. Observation of the paths through the Burrows and the location of the lime kiln did suggest that the fronting beach should be noted as an *Area of Maritime Activity* (PRN 29914). This was borne out by fieldwork.

Fieldwork identified a fishtrap in front of the Burrows (PRN 30040) and, having confirmed the location of quarries (PRN 30043) on Giltar Point, identified a landing place beneath the cliffs (PRN 30044). The top of the cliffs were not examined. The Burrows is now partly a golf course, while dunes to the north are heavily covered by dense and impenetrable scrub. Consequently, little was observed of sites noted in this area. However, rifle butts being undercut by erosion were added (PRN 30041).

Assessment

The military uses of Penally and Giltar should be further recorded. This will require use of documentary sources and aerial photographs. The fish trap should be fully recorded and researched. Supplementary research on the shipping of limestone from Giltar Point would enhance understanding of the quarry and confirm use of the landing place.

Summary of Sites

Sites in DAT SMR - Coastal Margin			**Field Observation**
3343	Find	IA	-
3443	Find	Ro	-
4237	Inhumation	BA	Dunes Obscure
4238	Midden	Prehist; Ro	-
4239	Midden	Prehist; Ro	-
4240	Settlement	Prehist?; Ro?	-
5013	Finds	Ne	-
Sites in DAT SMR - Underwater			
10098	Find	Me	-
Sites from Map Search - Coastal Margin			
29911	Building	PM	Dunes Obscure
29912	Rifle Range	PM	Dunes Obscure
29913	Rifle Range	Mo	See 30041
29915	Structure	PM	Dunes Obscure
29916	Sand Pit	Mo	Dunes Obscure
Sites from Map Search - Intertidal			
29910	Lime Kiln	PM	Dunes Obscure/No trace
29914	Area of Maritime Activity	PM;Mo	See 30040
30038	Pipeline;Sewer?	PM	Observed
Sites from Field Walk - Coastal Margin			
30041	Rifle Butts	PM	(marked on 1st/2nd OS)
30043	Quarry	PM	(dated from documents)
Sites from Field Walk - Intertidal			
30040	Fishtrap	PM;Med?	
30042	Pipeline	Mo?	
30044	Landing Place?	PM	(dated from association)
30045	Groyne	Mo	
30046	Unknown;Groyne?	Mo	

DAT - RAF Photographs - NONE

DAT - MERIDIAN Photographs - NONE

SHEET SN 10 SW TENBY (South Beach) to SAUNDERSFOOT

AND 1:2500 TENBY SN 1200-1300
1:2500 SAUNDERSFOOT SN 1204 - 1304

Covered By	1st Edition 1:2500	XLI.11	
		XLI.07	N/A
		XLI.12	N/A
		XLI.08	N/A
		XLI.04	
	2nd Edition 1:2500	XLI.11	N/A
		XLI.07	
		XLI.12	
		XLI.08	
		XLI.04	
	1st Edition 6"	41 SE	N/A
		41 NE	N/A
		35 SE	N/A
	2nd Edition 6"	41 SE	N/A
		41 NE	N/A
		35 SE	

Description from 1:10000 of Foreshore and Coastal Margin

The urban area of Tenby occupies the headland and stretches north to North Cliff and First Point. Tenby's promenade overlooks a sandy beach to the north of the harbour. The latter is shown as drying. To the south of the headland are the sands of Castle Sands and South Beach which are backed by a low but rugged cliff. These give access to St Margaret's Island at low water. The eastern end of the mainland promontory and the island do not dry.

Northwards from First Point to Monkstone Point there are a series of small sandy coves divided by headlands and rocky foreshores. High water mark is at the foot of the cliffs. This type of cliff edge and foreshore continues north to Saundersfoot but with less pronounced coves there is a continuous sandy beach. Saundersfoot Harbour is shown as drying. The sand beach broadens to the north of the harbour.

Foreshore	HW Metres	NGR	Coast Edge
Sand	120m	SN 1309 0000 - SN 1369 0056	Cliff
Sand	800m	SN 1369 0056 - SN 1328 0092	Urban Defended. Seawall
Sand/Rock	6020m	SN 1328 0092 - SN 1382 0457	Cliff
Sand	700m	SN 1328 0457 - SN 13810500	Urban Defended. Seawall
TOTAL	7640m		

Known Sites

Sites in the DAT SMR formed two basic categories. The first group comprised miscellaneous finds from the cliff top and beaches around the promotory occupied by Tenby. These were mainly of Iron Age or Roman date. The second group comprised structures associated with the harbours of Tenby and Saundersfoot. While these represented the importance of Tenby as both a Medieval and Post-Medieval Harbour, the recording was not systematic as some component structures, such as Tenby south breakwater, were included while others were not.

New Sites

The majority of new sites relate to Tenby Harbour with the addition of structural components such as the sluicing dock (PRN 29924), Mayor's Slipway (30093) and Sleeman's Store (30095). In addition, sites related to the resort function of the town have now been included such as the 1813 Promenade (PRN 30039) and beach accesses (PRN 30048 - 30051).

Assessment

Tenby was identified by DAT staff as an area for attention during fieldwork. Brief visits combined with use of readily accessible published sources and interviews with Tenby Museum Staff has ensured that the main components of the 19th century harbour are now included in the SMR. This exercise has demonstrated the need to devote further time to this area.

1 Documentary research and field visits should be used to provide a comprehensive survey of surviving buildings and structures within the harbour area.

2 The survival of 17th century harbour structures is of note. In ports which expanded through Victorian engineering skills such structures have often been swept away. Therefore detailed recording should be undertaken of the 17th century sluice. Documentary research should be aimed at elucidating its history and ensuring identification of original structure.

3 This project has not been able to address the use of the Ritec tidal inlet. During the map search its importance was noted from the location of kilns, shafts and quarries along its boundary. This area is worthy of study as a Post-Medieval and possibly Medieval haven.

4 The inclusion of waterside facilities linked to Tenby's resort function should be married with consideration of the whole town in this respect. The newly entered sites will lack substance if left in isolation.

Saundersfoot was not looked at in the same detail as Tenby. Further documentary research could rapidly enhance the SMR in respect of the 19th century development of this facility.

Summary of Sites

Sites in DAT SMR - Coastal Margin			**Field Observation**
3423	Finds	IA?;Ro	
3693	Finds	Ro	
3694	Finds	Ro	
3698	Castle	Med	
3703	Chapel	Med	
3706	Finds	Ro	
3709	Chapel	Med	
7641	Enclosure	DA	
10529	Finds	Med?;PM;	
24450	Fort	PM	
Sites in DAT SMR - Intertidal			
7428	Harbour	Med	See Field Notes 7
7442	Pier	PM	See Field Notes 7
7443	Harbour	PM	See Field Notes 7
10153	Landing Place	DA	-
11605	Pier	Med	-
26704	Life Boat House	Mo	See Field Notes 7
Sites in DAT SMR - Underwater			
17304	Finds	PM	
Sites from Map Search - Coastal Margin			
29917	Building	PM	-
29918	Lime Kiln	PM	-
29919	Shaft	Mo	-
29920	Quarry	PM	-
29922	Coastguard Station	Mo	Not seen
29926	Fort	PM	Not seen
29228	Shaft	PM	Dunes obscure

Sites from Map Search - Intertidal

29921	Pier	Mo;PM?	Not seen
29923	Slipway	Mo	Not seen
29924	Dock	PM	See Field Notes 7
29925	Dock Gate	PM	See Field Notes 7
29927	Culvert	PM	See Field Notes 4

Sites from Fieldwork - Coastal Margin

30051	Boat House	PM	
30052	Slipway/Beach Access	PM	

Sites from Fieldwork - Intertidal

30048	Beach Access	PM	
30049	Beach Access	PM	
30050	Beach Access	PM	
30053	Area of Maritime Activity	PM;Mo;Med?	
90091	Jetty	PM	See Field Notes 7

Sites from Subsidiary Research - Coastal Margin

30039	Promenade	PM	
30090	Lime kiln	PM	
30092	Boat House	PM	See Field Notes 7
30094	Chapel	PM	See Field Notes 7
30095	Warehouse	PM	See Field Notes 7

Sites from Subsidiary Research - Intertidal

30047	Merlin's Cave	U	
30054	Brdige	PM	See Field Notes 7
30093	Slipway	PM	See Field Notes 7

DAT - RAF Photographs - NONE

DAT - MERIDIAN Photographs - NONE

SHEET SN 10 NW NORTH OF SAUNDERSFOOT to WISEMAN'S BRIDGE

Covered By	1st Edition 1:2500	XXXV.16	N/A
	1st Edition 1:2500	XXXV.12	
	2nd Edition 1:2500	XXXV.16	
	2nd Edition 1:2500	XXXV.12	
	1st Edition 6"	35.SE	
	2nd Edition 6"	35.SE	N/A

Description from 1:10000 of Foreshore and Coastal Margin

This sheet covers a short stretch of coastline. The southern portion is a sandy beach backed by the northern end of the urban area north of Saundersfoot. From Coppet Hall Point there are cliffs with a rocky foreshore. This is broken by low land at Wiseman's Bridge where the rocky foreshore gives way to boulders and then sand. Rocks and cliff recommence at Windy Ridge.

Foreshore	HW Metres	NGR	Coast Edge
Sand	280m	SN 1383 0500 - SN 1387 0525	Urban Defended. Seawall
Sand	140m	SN 1387 0525 - SN 1413 0532	Urban Defended Bank
Rock	750m	SN 1413 0532 - SN 1445 0596	Cliff Defended. Seawall
Boulder	280m	SN 1445 0596 - SN 1465 0611	Built. Defended. Seawall
Sand	120m	SN 1465 0611 - SN 1473 0618	Built. Defended. Seawall
Rock	350m	SN 1473 0618 - SN 1500 0634	Cliff
TOTAL	1920m		

Description Adjusted by Fieldwork

From Coppet Point to Wiseman's Bridge the coast edge is formed by the seawall which carries the disused tramway to Saundersfoot. In front of Wiseman's Bridge itself there is a seawall, giving way to a grass-topped storm beach close to the actual bridge.

Known Sites

Despite the well-known industrial activity in the 19th century, the SMR contained only 3 sites: a brick-works, a coalmine and exposures of submerged forest.

New Sites

The map search picked up a small number of sites on the coastal margin which are linked to the coal of mining and iron industries. Fieldwork identification was limited to seawall construction and openings in the cliff for iron ore workings. Little use was made of published sources beyond works by Price which were immediately available at DAT.

Assessment

There appears to be little surviving physical evidence of maritime activity in connection with extractive and manufacturing industries at Wiseman's Bridge. Further documentary work is needed to provide background for the interpretation of the area.

Summary of Sites

Sites in DAT SMR - Coastal Margin			Field Observation
23790	Coalmine	PM	-
23792	Brickworks	PM	See Field Notes 2
Sites in DAT SMR - Intertidal			
7994	Submerged Forest	Prehist	See Field Notes 2

Sites from Map Search

29929	Iron Foundry	PM;Mo	-
30055	Tramway	PM	See Field Notes 2
30056	Tunnel	PM	See Field Notes 2

Sites from Fieldwork - Coastal Margin

30057	Mine	PM	See Field Notes 2
30058	Mine	PM	See Field Notes 2
30096	Culvert?	PM?	See Field Notes 7
30097	Culvert?	PM?	See Field Notes 7

Sites from Fieldwork - Intertidal

30059	Seawall	PM	See Field Notes 2
30061	Unknown	Mo?	See Field Notes 2

Sites from Supplementary Research

30060	Canal	PM

DAT - RAF Photographs - NONE

DAT - MERIDIAN Photographs - NONE

SHEET SN 10 NE WISEMAN'S BRIDGE to MARROS SANDS

AND 25" SN 1807 - 1907

Covered By	1st Edition 1:2500	XXXV.12	
	1st Edition 1:2500	XXXVI.09 Pembrokeshire	N/A
	1st Edition 1:2500	LI.05 Carmarthenshire	
	1st Edition 1:2500	LI.06 Carmarthenshire	
	2nd Edition 1:2500	XXXV.12	
	2nd Edition 1:2500	XXXVI.09 Pembrokeshire	
	2nd Edition 1:2500	LI.05 Carmarthenshire	N/A
	2nd Edition 1:2500	LI.06 Carmarthenshire	
	6" 1st Edition	35.SE	
	6" 1st Edition	36.SW	
	6" 2nd Edition	35.SE	N/A
	6" 2nd Edition	36.SW	

Description from 1:10000 of Foreshore and Coastal Margin

From Wiseman's Bridge northwards to Amroth there are cliffs. The foreshore at their foot is composed of rock outcrops but sand forms the lower intertidal area. The sandy beach increases in width to become some 250m wide in front of Amroth. Between Amroth and Watersedge there is a break in the cliffs and the waterfront behind the sandy beach is defended by a seawall and groynes. Cliffs then recommence but are fronted by a broad sand beach. There is a heavy boulder strew between Telpyn Point and Top Castle Fort.

Foreshore	HW metres	NGR	Coastal Edge
Rock/Sand	1250m	SN 1500 0614 - SN 1605 0688	Cliff
Sand	1450m	SN 1605 0688 - SN 1752 0725	Built. Defended. Seawall.
Boulders/Sand	2900m	SN 1752 0725 - SN 2000 0748	Cliff
TOTAL	5600m		

Known Sites

The small number of sites were clustered on the foreshore in front of Amroth. These comprised exposures of submerged forest and associated mesolithic material, including a hearth. Recent additions to the SMR were drawn from a National Trust survey which identified the remains of a building, believed to be a smithy, and a quarry. These were both located on the cliffs to the west of Amroth.

New Sites

The map search identified further features, but of unknown character, on the cliffs west of Amroth. During fieldwork submerged organic deposits were observed in the new location given for PRN 30065.

Assessment

The cliffs to the west of Amroth present difficult terrain. In this area of past quarrying, and rock falls, there are several platforms between the very top of the cliff and the beach. These could not all be covered during the fieldwork which meant that verification of the sites was not completed.

Observation of the foreshore defences in front of Amroth provided information for inclusion in the SMR. However, detailed documentary research and fieldwork are necessary to discover the process by which the present artificial shoreline was developed. Only this will show the potential for the watercourses at Amroth and Watersedge to have supported maritime activity.

Observation of the submerged forest suggests a need to rationalise SMR numbering. With the periodic covering and uncovering of these deposits it would be more reasonable to allocate a PRN to a beach. Any new observations can be added under the single number.

The feature on Telpyn Point which was identified from RAF aerial photographs should be checked on the ground. This area was not fully covered by fieldwork.

Summary of Sites

Sites in DAT SMR - Coastal Margin			**Field Observation**
24785	Quarry?	PM	Unclear
24786	Smithy?	PM	Not seen
Sites in DAT SMR - Intertidal			
3658	Finds	Me	-
3660	Finds	Me	-
7999	Submerged Forest	Me	See Field Notes 2
8000	Submerged Forest	Me	See Field Notes 2
8495	Boundary Stone	PM	-
Sites from Map Search - Coastal Margin			
29930	Building/Enclosure	PM	Not seen
29931	Enclosure	PM	See Field Notes 2
Sites from Fieldwork - Intertidal			
30062	Mine	PM	See Field Notes 2
30063	Mine?	PM	See Field Notes 2
30064	Foreshore Defence	PM?;Mo?	See Field Notes 2
30065	Submerged Forest	Prehist	See Field Notes 2

DAT RAF Photographs - Intertidal

Frame Numbers:	1160 - 1163	
30066	Unknown	U

DAT MERIDIAN Photographs - NONE

SHEET SN 20 NW MARROS MILL to PENDINE BURROWS (Llanmiloe)

AND 25" SN 2007 - 2107 and SN 2207 - 2307

Covered By	1st Edition 1:2500 LI.06	
	1st Edition 1:2500 LI.07	N/A
	1st Edition 1:2500 LI.08	N/A
	2nd Edition 1:2500 LI.06	
	2nd Edition 1:2500 LI.07	
	2nd Edition 1:2500 LI.08	N/A
	1st Edition 6" 36.SW	Pembrokeshire
	1st Edition 6" 51.NW	Carmarthenshire
	1st Edition 6" 51.NE & SE	Carmarthenshire
	2nd Edition 6" 36.SW	Pembrokeshire
	2nd Edition 6" 51.NW	Carmarthenshire

Description from 1:10000 of Foreshore and Coastal Margin

Following a short length of cliff there is low coast in the area of Marros Mill. The land then rises again to cliffs at Ragwen Point. A small valley breaks the cliff line between Ragwen and Gilman Points. The foreshore comprises shingle at the cliff foot with sand extending to low water. Close to Ragwen Point there are rock outcrops running across the beach from the cliff base.

Beyond Gilman Point the cliffs run on to Dolwen Point, forming the north west limit of Pendine Sands. These sands which are some 500m wide, have their low water mark level with Gilman Point which forms their northwest extreme

Foreshore	HW Metres	NGR	Coastal Edge
Stone/Sand	400m	SN 2000 0758 - SN 2038 0741	Cliff
Stone/Sand	820m	SN 2038 0741 - SN 2123 0738	Undefended
Boulder/Sand with Rock outcrops	1400m	SN 2123 0738 - SN 2235 0750	Cliff
Boulder/Sand	380m	SN 2235 0750 - SN 2266 0749	Undefended
Boulder/Sand	900m	SN 2266 0749 - SN 2327 0783	Cliff
Sand	1700m	SN 2327 0783 - SN 2500 0759	Dunes
TOTAL	5600m		

Adjustment to Description from Fieldwork

The low area in front of Marros Mill comprises a huge storm beach of flat stones. In places this over-tops the land behind. At either end it is piled against the low cliffs.

Known Sites

Within Marros Sands the submerged forest (PRN 11618) is the main feature of the SMR. In addition, a small number of prehistoric finds have been recorded from the cliff top near Ragwen Point. Between Ragwen Point and Gilman Point the SMR includes two intertidal sites: a shipwreck (PRN 26518) and 1939-1945 defences (PRN 26520). On the edge of Pendine Burrows the record includes a Post-Medieval Chapel (PRN 20524)

New Sites

The only new site was a shipwreck added from the RAF aerial photographic cover.

Assessment

The low yield of sites probably reflects the inaccessibility of this area. The location of Marros Mills and the limekilns which are eroding from the low cliff to seaward, are indicative of maritime activity. However, with the beach providing an open, flat area for taking the ground there is unlikely to be any direct evidence of this.

The submerged forest was seen to be more exposed than had been the case in recent years. However, this degree of exposure was apparent on the RAF cover. It should however be monitored at least annually.

The shipwrecks (PRN 11618 and 26518) might be recorded. Any reduction in sand levels would make this both easier and more urgent.

Sites in DAT SMR - Coastal Margin

3834	Hearth	Prehist	-
3837	Finds	U	-
7636	Finds	Prehist	-
13380	Finds	Prehist	-
20524	Chapel	PM	-

Sites in DAT SMR - Intertidal

11618	Submerged Forest	Prehist	See Field Notes 1
11656	Watermill	Med?;PM?	Y - Continuation sheet
11699	Caves		
26518	Shipwreck	PM	See Field Notes 1
26519	Shipwreck	PM	-
26520	WWII defence	PM	-

Sites from Map Search - None

DAT - RAF Photographs
Frame Numbers: **1165 - 1171**

30067	Shipwreck	U	-

DAT - MERIDIAN Photographs - NONE

SHEET SN 20 NE PENDINE SANDS

Covered By
1st Edition 1:2500 LI.08 N/A
1st Edition 1:2500 LII.05 N/A

2nd Edition 1:2500 LI.08 N/A
2nd Edition 1:2500 LII.05 N/A

1st Edition 6": 1 mile LII.SW
2nd Edition 6": 1 mile LII. SW & NW

Description from 1:10000 of foreshore and coastal margin

Broad sandy beach, which increases in width to the east, backed by dunes.

Foreshore	HW Metres	NGR	Coastal Margin
Sand	5100m	SN 2500 0758 - SN 3000 0778	Dunes

Known Sites

The sites within the DAT SMR comprise finds of Neolithic to Medieval date from within the Burrows. Nothing was recorded for the intertidal area.

New Sites

The sites printed on the Ordnance Survey maps were confined to an engine house and trackway (PRNs 29932 & 29933). The second edition, however, had been annotated with a series of trackways and buildings. These were also allocated PRNs. The search of RAF cover held by DAT showed that these features had existed in 1946. The photographs also showed the different shape of the Burrows. Two shipwrecks and one unidentified structure were also recorded from this source (PRNs 30068 - 30070).

Assessment

The military use of Pendine Burrows is one reason for the dearth of recorded sites in this area. Moreover, the military activity itself has not been recorded in detail. This work should be undertaken both to provide a record of military use and to provide information on the disturbance of the area. Aerial photographs, such as those held by DAT, will be a key source.

Summary of Sites

Sites in DAT SMR - Coastal Margin — **No Field Observation**

3430	Midden?;Settlement?	U
3845	Finds	Ne
3846	Settlement	IA?:Ro
3847	Settlement	Ro
3849	Finds	Dark Ages
3850	Finds	Ro
12916	Finds	Med
22789	Cottage	PM

Sites from Map Search - Coastal Margin

29932	Engine House	Mo
29933	Trackway/Boundary	Mo
29934	Possible Sluice	Mo
29935	Possible track/boundary	Mo
29936	Witchett Pill	
29937	Possible building	Mo
29938	Possible track/boundary	Mo
29939	Possible track/boundary	Mo
29940	Salt House/Building	PM
29941	Trackway/Boundary	PM
29945	Pump	PM

DAT - RAF Photographs
Frame Numbers: 1172 - 1175
3074 - 3076

Intertidal

30068	Shipwreck	U
30069	Shipwreck	U
30070	Structure	U

DAT - MERIDIAN Photographs - NONE

SHEET SN 21 SE RIVER TAF

Covered By	1st Edition 1:2500	XLV.06	
	1st Edition 1:2500	XLV.01	
	2nd Edition 1:2500	XLV.06	
	2nd Edition 1:2500	XLV.01	
	1st Edition 6": 1mile	XLV.SW	N/A
	2nd edition 6": 1mile	XLV.SW	

Description from 1:10000 of Foreshore and Coastal Margin

The tidal River Taf has a narrow mud foreshore between high and low tide. The bends on both the east and west banks of the river contain marshy areas. Those on the east have been subject to flood control by construction of banks.

Foreshore	HW Metres	NGR	Coastal Margin
Mud	3500	SN 3000 1282 - SN 2816 1500	Marsh/Pasture
Mud	3500	SN 2819 1500 - SN 3000 1291	Marsh/Pasture. Flood Defence
TOTAL	7000		

Known Sites

The SMR contained only three sites: a brickworks and a lime kiln, and a system of flood defence banks on the west side of the river.

New sites

Most of the records created for this area referred to elements of the flood defence system on the east of the river. These are particularly concentrated, and possibly show two phases, beneath Trefenty. In addition a possible river crossing (PRN 29962) was noted from the alignment of paths between Trefenty and Brixtarw. A Post-Medieval boathouse and slipway (PRNs 29959 & 29960) were identified in the same location.
Finally, a possible wreck was identified from Meridian aerial photographs.

Assessment

The northern bank of the Taf between St Clears and its confluence with the River Cywyn has seen considerable engineering effort applied to flood defence. The age of the works are unknown and the whole system requires assessment. Aerial photographs will provide a good initial mapping tool.

There are few public routes to the river. Further work therefore requires careful planning and prior liaison with landowners. Access may be easier by boat.

The lack of access further heightens the significance of the possible river crossing (PRN 29962). This and the paths which lead north and south should receive further attention.

Summary of Sites

Sites from DAT SMR - Coastal Margin			Field Observation
8047	Brickworks	PM	-
15024	Lime Kiln	PM	-
24388	Flood Defences	PM	-

Sites from Map Search - Coastal Margin			
29950	Flood Defences	PM	-
29951	Flood Defences	PM	-
29952	Pump	PM	-

29953	Sluice/Pond	PM	-
29954	Flood Defence	PM	-
29955	Flood Defence	PM	-
29956	Flood Defence	PM	-
29957	Flood Defence	PM	-
29959	Boat House	PM	See Field Notes 6
29961	House?	PM	Not seen

Sites from Map Search - Intertidal

29960	Slipway	PM	See Field Notes 6
29962	River Crossing?	PM	See Field Notes 6

DAT - RAF Photographs

Frame Numbers: 3193 - 3196; 5192 - 5196

DAT - MERIDIAN Photographs

Frame Numbers: SN21SE 210/220: 26971 -26969

Intertidal

30073	Shipwreck	U	-

SHEET SN 21 NE RIVER TAF to TIDAL LIMIT (ST CLEARS)

Covered By	1st Edition 1:2500	XLV.01
	2nd Edition 1:2500	XLV.01
	1st Edition 6": 1 mile	XLV.NW
	2nd Edition 6": 1 mile	XLV.NW

Description from 1:10000 of Foreshore and Coastal Margin

Close to their tidal limits, the meandering Taf and its tributary the River Cynin have a negligible foreshore. St Clears is located on a promontory at the confluence of the two rivers.

Foreshore	HW Metres	NGR	Coastal Margin
Mud	2000m	SN 2817 1500 - SN 2675 1553	Pasture
Mud	1600m	SN 2677 1553 - SN 2791 1536	Pasture
Mud	750m	SN 2791 1536 - SN 2818 1564	Built. Undefended
Mud	1600m	SN 2818 1564 - SN 2819 1500	Pasture. Flood Defence
TOTAL	5950m		

Known Sites

The SMR focused on the Medieval features of St Clears. The Post-Medieval activity along its waterfront was represented only by two brickworks sites.

New sites

The map search was fruitful in providing a more complete picture of 19th century activity. Three lime kilns and a third brickworks were added to the existing record. In addition records were created for the flood defences which characterise the west bank of the Taf and the Cynin.

Assessment

There were more upstanding remains of the industrial sites than had been anticipated from aerial photographs. Structures in the brickworks (PRNs 15069 & 21537) and the site of the lime kiln (PRN 29965) should be recorded in more detail. Evidence should be sought for wharf structures fronting the brickworks A boat may provide the easiest access to the steep mud banks.

The flood defence banks are very low and slightly flattened. They appear to provide a continuous system with a number of field boundaries. The whole pattern of banks and ditches would warrant study. In places the river has cut the banks and this may provide useful sections. These points could not be reached during this project.

Summary of Sites

Sites from DAT SMR - Coastal Margin			Field Observation
5054	Motte	Med	See Field Notes 6
12613	Watermill	Med	-
15069	Bridge	PM	-
21536	Brickworks	PM	See Field Notes 6
21537	Brickworks	PM	See Field Notes 6
22777	Cottage	PM	-
Sites from Map Search - Intertidal			
13803	Wharf	Med	-

Sites from Map Search - Coastal Margin

29963	Flood Defences	PM	-
29964	Flood Defences	PM	Seen not noted
29965	Lime Kiln	PM	See Field Notes 6
29966	Flood Defences?	PM	See Field Notes 6
29967	Clay Pit	PM	See Field Notes 6
29968	Lime Kiln	PM	See Field Notes 6
29970	Brickworks	PM	See Field Notes 6
29971	Lime Kiln	PM	See Field Notes 6
29972	Flood Defences	PM	-
29973	Flood Defences	PM	-

Sites from Map Search - Intertidal

29969	Slipway	Mo	See Field Notes 6

DAT - RAF Photographs

Frame Numbers: 5195 - 5198

DAT - MERIDIAN Photographs

Frame Numbers: SN21SE 210/220: 26986 -26987

SHEET SN 30 SW CARMARTHEN BAR

This sheet is not included in the SMR map base. It covers the mouth of the River Taf and Cefn Sidan sands which extend from Pembury Burrows.

The 1st and 2nd edition 1:2500 and 6": 1 mile show a dramatic change in the shape of the sand banks. This is difficult to describe or assess as the cover is provided by a combination of the editions with neither being complete.

In essence the 1880s 6" maps show: Cefn Sidan extending westwards to provide the low water definition of the east bank of the River Tywi; a triangular sand bank called Middle Patch forming the east bank of the low water Tywi; a small c-shaped bank to the south of Cefn Sidan and Middle Patch, like a stopper in the mouth of the Tywi. The map also shows, to the west of Middle Patch, another channel leading seawards. It is unclear if this is a branch of the Tywi or if the Taf is turning seaward without joining the Tywi because there are no 1st edition 52 NW and 52 NE maps.

The 1907 6": 1 mile shows a channel opened through Cefn Sidan forming a detached tip of considerable size. The status of Middle Patch and the relationship of the channels cannot be judged as there is no 2nd edition 52.SW

DAT - RAF Photographs
Frame Numbers: 3163 - 3168

DAT - MERIDIAN Photographs - NONE

Assessment

This area includes a large expanse of intertidal sands. The shifting nature of these is locally well-known, as is the large number of ships which have become casualties while attempting to navigate the channels.

There is a great need to extend the SMR map base to cover this area. Admiralty Charts would provide an appropriate means of filling the gap in present OS holdings at DAT.

The SMR includes wrecks on the fringes of this area in SN20SE and SN30SE. Identification of collections of aerial photographs which cover this area would provide one means of rapidly plotting sites. Periodic visits to the sands to locate and record exposed remains is necessary and to monitor attrition of remains by natural or human activity.

SHEET SN 30 NW PENDINE BURROWS - RAILSGATE PILL

Covered By	1st Edition 1:2500	XLV.14	
	1st Edition 1:2500	XLV.02	
	1st Edition 1:2500	LII.06	N/A
	1st Edition 1:2500	LII.10	
	2nd Edition 1:2500	XLV.14	
	2nd Edition 1:2500	XLV.02	
	2nd Edition 1:2500	LII.06	N/A
	2nd Edition 1:2500	LII.10	N/A
	1st Edition 6": 1mile	XLV.SW	N/A
	1st Edition 6": 1mile	LII.NW	N/A
	1st Edition 6": 1mile	LII. NE	N/A
	2nd Edition 6":1 mile	XLV.SW	
	2nd Edition 6":1 mile	LII.NW	
	2nd Edition 6":1 mile	XLV.NE & SE	

Description from 1:10000 of Foreshore and Coastal Margin

Pendine Sands continue eastwards to Ginst Point as broad intertidal sands backed by sand dunes. To the south the main channel of the River Taf flows south westwards, pushed towards Pendine Sands by the sweeping hook of Cefn Sidan. The channel is divided by other sand banks.

North of Ginst Point, the intertidal area remains broad and sandy - Laugharne sands. Since 1906 (2nd Edition 1:2500), marsh has formed on the outside of the ditch and bank sea wall. This is some 25 - 40m broad with its eastern edge being defined by mean high water mark.

North east of Laugharne Township is Wharley Point. The cliffs drop into the main channel of the River Taf.

Adjustment from Aerial Photographs

The marsh had only formed in a series of isolated patches by the time of the RAF photography in 1946.

Foreshore	HW Metres	NGR	Coastal Margin
Sand	4350m	SN 3000 0537 - SN 3255 0825	Dunes
Sand	2500m	SN 3255 0825 - SN 3077 1000	Marsh/Flood Defence
Sand	3100m	SN 3205 1000 - SN 3500 0993	Cliff
TOTAL	9950m		

Known Sites

The SMR contained only five sites: from the Burrows two middens of unknown date and from the inter-tidal area two shipwrecks and some Roman finds. The development of Laugharne Township and the construction of flood defence banks for land claim has interested several local researchers but this is not reflected in the SMR.

New Sites

The majority of sites added from the map search relate to Railsgate Pill. In the 19th century as quay was placed there and connected to Coygan Quarry by a tramway. Only flood defences immediately behind the marsh on the north west side of Laugharne Township were included. A PRN was raised for the military range on Pembrey Burrows (PRN 30071) but no additional detail was added.

Assessment

The dearth of sites in the SMR invites activity in three areas:

1 Full recording of the engineering works which have contributed to the development of the low lying Laughame Township.

3 Documentary research on the use of Railsgate Pill as a landing point and for salt production.

3 Recording of the military activity on the burrows (see Sheet SN20NE above).

4 Preliminary examination of Wharley Point from both the cliff top and by boat.

Summary of Sites

Sites in DAT SMR - Coastal Margin		**No Field Observation**
2103	Midden	U
2107	Midden	U

Sites in DAT SMR - Intertidal		
14364	Shipwreck	PM
14671	Shipwreck	PM
14683	Finds	Ro

Sites from Map Search - Coastal Margin		
29942	Cottage	PM
29943	Tramway	PM
29944	Boundary/Trackway	PM
29946	Boundary/Trackway	PM
29947	Building	PM
29948	Jetty/Platform	PM

Sites from Map Search - Intertidal		
29949	Quay?	PM

Sites From Supplementary Research - Coastal Margin		
30071	Range	Mo
30072	Dwelling	Mo?;PM?

DAT - RAF Photographs
Frame Numbers: 1177 - 1183; 3075 - 3080

DAT - MERIDIAN Photographs - NONE

SHEET SN 31 SW RIVER TAF from LAUGHARNE to RIVER CYWYN

Covered by:			
	1st Edition 1:2500	XLV.02	
	1st Edition 1:2500	XLV.06	
	1st Edition 1:2500	XLV.10	
	1st Edition 1:2500	XLV.14	
	1st Edition 1:2500	XLV.11	
	1st Edition 1:2500	XLV.15	
	2nd Edition 1:2500	XLV.02	
	2nd Edition 1:2500	XLV.06	
	2nd Edition 1:2500	XLV.10	Top half only available
	2nd Edition 1:2500	XLV.14	
	2nd Edition 1:2500	XLV.11	Top half only available
	2nd Edition 1:2500	XLV.15	
	1st Edition 6": 1 mile	XLV.SW	N/A
	1st Edition 6": 1 mile	XLV.SE	N/A
	1st Edition 6": 1 mile	XLV.SW	
	1st Edition 6": 1 mile	XLV.SE	

Description from 1:10000 of Foreshore and Coastal Margin

Below the confluence with the River Cywyn, the Taf forms a broad tidal river. This swings eastwards before bending west around Black Scar and then turning east again towards the River Tywi. The low water channel follows the west bank from the Cywyn to Laugharne Ferry House, then swings to the east bank around Black Scar. The River Coran flows through Laugharne and crosses the intertidal mud to join the Taf. For most of the area there is a narrow area of mud between the line of MHW and the main expanse of intertidal sand/mud.

Foreshore	HW Metres	NGR	Coastal Margin
Mud/Sand	600m	SN 3063 1000 - SN 3046 1040	Cliff
Mud	500m	SN 3046 1040 - SN 3032 1076	Built. Marsh
Mud	900m	SN 3032 1076 - SN 3097 1141	Cliff
Mud/Sand	2400m	SN 3097 1141 - SN 3000 1282	Marsh
Mud	4500m	SN 3000 1290 - SN 3094 1435	Pasture. Flood Defence
Mud	4500m	SN 3096 1434 - SN 3140 1251	Pasture. Flood Defence
Mud/Sand	200m	SN 3140 1251 - SN 3146 1241	Cliff
Mud	2100m	SN 3146 1241 - SN 3102 1085	Marsh
Shingle	200m	SN 3102 1085 - SN 3120 1075	Marsh
Mud/Sand	1000m	SN 3120 1075 - SN 3197 1023	Marsh
Mud	250m	SN 3197 1023 - SN 3204 1000	Cliff
Mud	400m	SN 3226 1000 - SN 3265 1000	Cliff
TOTAL	17550m		

Known Sites

The SMR includes a Neolithic axe found in Laugharne Harbour. Other sites were, with the exception of a Medieval dwelling, confined to the Laugharne - Llanstephan ferry and the ferry houses.

New Sites

The additions from the map search fall into two categories. Nine records were created for the flood defence banks which are located on both banks of the River Cywyn. Lime kilns were recorded in Laugharne itself and on the cliffs on the Llanstephan side of the river. In addition an *Area of Maritime Activity* was noted for Laugharne, as well as individual facilities including a wharf and a slipway.

Assessment

The flood defences on the Cywyn are linked with those on the Taf which run up to St Clears (see SN21SE & SN21NE above). They warrant study to ascertain their date and significance in local land use.

Little direct evidence of maritime activity in Laugharne has been recorded for the SMR. However, the importance of water transport in the 19th century is indicated by the concentration of lime kilns which have been recorded. Further study should seek to identify surviving remains in Laugharne and establish patterns of activity for the industrial sites around the lower Taf.

Summary of Sites

Sites from DAT SMR - Coastal Margin			**Field Observation**
8827	Dwelling	Med	-
21310	Ferry House	PM	-
21311	Ferry House	PM	See Field Notes 6
20469	Lime Kiln	PM	-

Sites from DAT SMR - Intertidal			
2173	Finds	Ne	-
12645	Ferry	Med	See Field Notes 6

Sites from Map Search - Coastal Margin		
29974	Flood Defence	PM
29975	Flood Defence	PM
29976	Flood Defence	PM
29977	Flood Defence	PM
29978	Flood Defence	PM
29979	Flood Defence	PM
29980	Lime Kiln	PM
29982	Lime Kiln	PM
29983	Lime Kiln	PM
29985	Flood Defence	PM
29988	Lime Kiln	PM
29989	Lime Kiln	PM
29990	U/Pond?	PM
29991	Flood Defence	PM
29992	Flood Defence	PM
29993	Lime Kiln	PM

Sites from Map Search - Intertidal			
29984	Slipway	PM	See Field Notes 6
29986	Area of Maritime Activity?	U	-
29987	Wharf	U	-

Sites from Supplementary Research - Intertidal		
30075	River Crossing	U

DAT - RAF Photographs

Frame Numbers: 3077 - 3078; 1183 - 1186; 3189 - 3192

Intertidal		
30074	Foreshore Defence?	U

DAT - MERIDIAN Photographs

Frame Numbers: SN31SW 230/210: 26944 - 26958;— 27111 - 27113

SHEET SN 30 SE PEMBREY BURROWS

Covered by	1st Edition 1:2500	XLVII.01	
	1st Edition 1:2500	XLVII.02	
	1st Edition 1:2500	XLIII.13	
	1st Edition 1:2500	XLIII.14	
	1st Edition 1:2500	XLIII.09	
	1st Edition 1:2500	XLIII.10	
	2nd Edition 1:2500	XLVII.01	N/A
	2nd Edition 1:2500	XLVII.02	
	2nd Edition 1:2500	XLIII.13	N/A
	2nd Edition 1:2500	XLIII.14	
	2nd Edition 1:2500	XLIII.09	N/A
	2nd Edition 1:2500	XLIII.10	
	3rd Edition 1:2500	XLVII.02	
	3rd Edition 1:2500	XLVII.14	
	1st Edition 6": 1Mile	LIII.SW	
	1st Edition 6": 1Mile	XLVII.NW	
	2nd Edition 6": 1Mile	XLVII.NW	N/A
	3rd Edition 6": 1Mile	XLVII.NW	

Description from 1:10000 of Foreshore and Coastal Margin

Broad sand beach and intertidal zone, backed by dunes which in the south are afforested.

Foreshore	HW Metres	NGR	Coastal Margin
Sand	3000m	SN 3612 0500 - SN 3754 0245	Dunes
Sand	3200m	SN 3754 0245 - SN 3973 0000	Dunes Afforested
TOTAL	6200m		

Known Sites

Apart from an intertidal shipwreck the DAT SMR included only four records. The latter comprised three find spots and a midden from a small area of the Pembrey Burrows.

New Sites

The map search produced just three records: a large duck pond within the Burrows, and parts of a flood defence system to the south of the marshes. From RAF aerial photographs three shipwreck sites were recorded in the intertidal area.

Assessment

The lack of sites in this area arises in part from the military use of the area. As with the Pendine Burrows, the SMR should include records which reflect the military activity. This project has registered a PRN for Pendine Range but no detail has been added. The RAF photographs show trackways and buildings which appear neither on the historic OS maps nor on the SMR base maps. Such photographs could provide a first source for recording.

The identification of shipwrecks from aerial photographs substantiates local knowledge of remains in the sands. Such sites should be recorded in the field. Where the sands are mobile regular monitoring is required.

Summary of Sites

Sites from DAT SMR - Coastal Margin **No Field Observation**

2130	Finds	Prehist
2131	Midden	U
2132	Finds	Med
2133	Finds	PM

Sites from DAT SMR - Intertidal

14366	Shipwreck	PM

Sites from Map Search - Coastal Margin

29994	Flood Defence	PM
29995	Flood Defence/Drainage	PM
29996	Pond	PM

Sites from Supplementary Research - Coastal Margin

30076	Pembrey Range	Mo

DAT - RAF Photographs

Frame Numbers: 3169 -3175; 2138 - 2141; 5161 - 5165

Intertidal

30085	Shipwreck	U
30086	Shipwreck	U

DAT- MERIDIAN Photographs - NONE

Countryside Council - Geonex 1992 Survey

Frame Number: Line 115: 14992 118

Intertidal

30088	Shipwreck	U

SHEET SN 30 NE PEMBREY BURROWS to FERRYSIDE

Covered by	1st Edition 1:2500	LIII.09
	1st Edition 1:2500	LIII.05
	1st Edition 1:2500	LIII.01
	1st Edition 1:2500	LIII.06
	2nd Edition 1:2500	LIII.09N/A
	2nd Edition 1:2500	LIII.05
	2nd Edition 1:2500	LIII.01
	2nd Edition 1:2500	LIII.06N/A
	1st Edition 6": 1 mile	LIII.SW
	1st Edition 6": 1 mile	LIII.NW
	2nd Edition 6": 1 mile	LIII.SW
	2ndEdition 6": 1 mile	LIII.NW
	3rd Edition 6": 1 mile	LIII.SW
	3rd Edition 6": 1 mile	LIII.NW

Description from 1:10000 of Foreshore and Coastal Margin

North to Tywyn Point the broad sand beach and intertidal area is backed by sand dunes. The Gwendraeth flows east-west with its low water channel on the north side of the sandy estuary, whose southern side comprises extensive salt marsh. To the north, marsh lies in front of Kidwelly and a narrow band of marsh continues along the northern side of the estuary. As the coast curves northwards towards St Ishmaels and Ferryside boulders and rocks characterise the upper foreshore. On Pastoun Scar and Salmon Point Scar these extend to low water mark. There is high ground between St Ishmaels and Ferryside but the land edge is formed by the embankment carrying the Great Western Railway.

Foreshore	HW Meteres	NGR	Coastal Margin
Sand	1600m	SN 3092 0500 - SN 3072 0639	Dunes
Sand/Mud	5000m	SN 3072 0639 - SN 4000 0539	Salt Marsh
Sand/Mud	1400m	SN 4000 0563 - SN 3993 0653	Built. Salt Marsh
Sand/Mud	150m	SN 3993 0653 - SN 4000 0675	Built. Flood Defence
Sand/Mud	3100m	SN 4000 0675 - SN 3744 0694	Marsh. Rail Embankment
Rock Scars	2300m	SN 3744 0694 - SN 3615 0842	Rail Embankment
Boulder/Sand	900m	SN 3615 0842 - SN 3621 0931	Rail Embankment
Boulder/Sand	700m	SN 3621 0931 - SN 3640 1000	Built. Rail Embankment
TOTAL	15150m		

Known Sites

The sites in the DAT SMR are concentrated on two locations: the Scars below St Ishmaels and around Kidwelly. The former comprise observations related to a lost village and a group of miscellaneous finds. The collection of the latter may appropriately be attributed to local knowledge of the lost village. From the coast behind the Scars a gun emplacement and a building of unknown function have been recorded.

The second group comprises three quays. This recording reflects the use of the Gwendraeth by shipping but does not adequately reflect the status of Kidwelly as a harbour.

New Sites

The map search provided sites on the coast edge at St Ishmaels and along the northern edge of the Gwendraeth Estuary. The number of sites on the Scars was increased by fieldwork.

Assessment

Curtailment of fieldwork meant that the Gwendraeth east of the Scars was not visited. The lack of recording in along this river and around Kidwelly, therefore, remains to be addressed.

The increase in sites around St Ishmaels and fieldwork on the Scars has only served to illustrate that this intertidal area has seen much activity of which little is as yet understood.

Modern aerial photographs were valuable in providing a better NGR for the shipwreck Paul (PRN 14365) and for sites observed on the Scars (eg PRN 30087).

Summary of Sites

Sites in DAT SMR - Coastal Margin			**Field Observation**
7826	Building	PM	
23600	Gun Emplacement	PM	See Field Notes 3
Sites in DAT SMR - Intertidal			
2113	DMV	Med	-
2121	Finds	Prehist	-
7808	Quay	PM	-
11304	Finds	Ro	-
11607	Submerged Forest	Prehist	See Field Notes 3
14365	Shipwreck	PM	-
17329	Quay	PM	-
23433	Quay	PM	-
Sites from Map Search - Coastal Margin			
29997	Lookout	PM;Mo	See Field Notes 3
29998	Trackway	Mo	-
29999	Sand Pit	Mo	-
30000	Settlement	PM;Mo	-
30002	Flood defence	PM	-
30002	Flood defence	PM	-
Sites from Map Search - Intertidal			
30001	Sea Defence	Mo	-
Sites from Fieldwork - Coastal Margin			
30100	Building	Mo	See Field Notes 3
Sites from Fieldwork - Intertidal			
30087	Training Wall?; Fish Trap?	U	See Field Notes 3
30101	Unknown; Fish Trap?	U	See Field Notes 3
30102	Training Wall?; Fish Trap?	U	See Field Notes 3
30103	Submerged Forest	Prehist	See Field Notes 3
30104	Foreshore Defences	Mo	See Field Notes 3

DAT - RAF Photographs
Frame Numbers: 1184 - 1191

DAT - MERIDIAN Photographs

SHEET SN 31 SE & SN 41 SW RIVER TYWI, LLANSTEPHAN to PEN-Y-CLUN

Covered by	1st Edition 1:2500	XLVI.06	
	1st Edition 1:2500	XLVI.05	
	1st Edition 1:2500	XLVI.09	
	1st Edition 1:2500	XLVI.13	
	1st Edition 1:2500	XLV.16	
	1st Edition 1:2500	XLV.12	
	2nd Edition 1:2500	XLVI.06	
	2nd Edition 1:2500	XLVI.05	
	2nd Edition 1:2500	XLVI.09	
	2nd Edition 1:2500	XLVI.13	
	2nd Edition 1:2500	XLV.16	N/A
	2nd Edition 1:2500	XLV.12	
	1st Edition 6": 1 mile	XLV.SE	
	1st Edition 6" : 1 mile	XLVI.SW	
	1st Edition 6" : 1 mile	XLVI.NW	
	2nd Edition 6": 1 mile	XLV.SE	
	2nd Edition 6" : 1 mile	XLVI.SW	
	2nd Edition 6" : 1 mile	XLVI.NW	

Description from 1:10000 of Foreshore and Coastal Margin

Llanstephan Castle stands on cliffs above the Tywi. Immediately behind this eminence the land drops and Llanstephan beach has dwellings close to the shore defended by groynes. The intertidal area is sand giving way to sand and mud as the shore is followed upstream. From Ferry Point the western bank is usually fronted by a narrow marsh giving onto the sand and mud and then mud of the river.

Ferryside on the east of the Tywi, like Llanstephan, is low lying and protected by flood defences. These take the form of the Great Western Railways embankment which hugs the riverfront. Only at Morfa Uchaf and Coed Marshes is there land between the railway and the river. In both cases this is marsh.

Foreshore	HW Metres	NGR	Coastal Margin
Sand	400m	SN 3517 1000 - SN 3530 1025	Cliff
Sand	800m	SN 3530 1025 - SN 3580 1093	Built. Foreshore Defence, Bank
Sand & Mud	1300m	SN 3580 1093 - SN 3639 1205	Marsh
Marsh & Mud	2300m	SN 3639 1205 - SN 3800 1341	Pasture. Undefended
Mud	500m	SN 3800 1341 - SN 3847 1375	Pasture. Undefended
Mud	1400m	SN 3847 1375 - SN 3977 1427	Marsh
Mud	800m	SN 3977 1427 - SN 3988 1500	Rural. Undefended
Mud	900m	SN 4000 1497 - SN 3982 1400	Marsh. Rail Embankment
Mud	1000m	SN 3982 1400 - SN 3900 1348	Rail Embankment
Mud/Sand	3300m	SN 3900 1348 - SN 3713 1168	Marsh. Rail Embankment
Sand & Mud	600m	SN 3713 1168 - SN 3700 1105	Rail Embankment
Sand	1300m	SN 3700 1105 - SN 3640 1000	Built. Rail Embankment
TOTAL	13600m		

Adjustment from Fieldwork

Note that the foreshore defence may be considered as extending from SN3530 1025 - SN3625 1140. The shore has been armoured with large rocks, including 2 groynes, between the two Ferry Points. The marsh shown on the SMR base map no longer exists.

Known Sites
Sites within the SMR are focused on Llanstephan and periods of fortification from Iron Age to Medieval, and the Medieval ferry. A single intertidal find has been recorded: a Bronze Age socketed axe from the area of Ferry Point (south).

New Sites
The information on the ferry has been enhanced by the addition of three relic landing stages. Maritime activity has been further featured by the inclusion of five navigation markers around Morfa Uchaf and Coed Marsh. Two vessels have also been included, one of which is associated with a Post-Medieval anchorage. The latter is also the site of two of three lime kilns noted from this area.

Assessment
This area has illustrated the potential for the preservation of vessels within marshes, especially in areas of past maritime activity. It is also important to note that neither of the vessels located during fieldwork were seen on aerial photographs. In contrast the jetty identified at Ferry Point was also seen on a photograph. In contrast to the boats, which were in the edge of the marsh, one largely buried, this extended across the open expanse of the intertidal area.

Extension of the hard standing for boats at Pilglas should be regarded as a threat to known and unknown material within the banks of the pill itself. More detailed survey would provide a clearer picture of the physical evidence which survives from this anchorage.

The other marsh areas on the Tywi should be investigated. It is important to reach vantage points for observing the base of the mud banks both of the main river and the minor water courses.

Sites in DAT SMR - Coastal Margin			Field Observation
2193	Low Mound	U	-
2197	Castle	Med	-
2198	Hillfort	IA	-
5248	Standing Stone	BA	-
7373	Motte	Med	-
7374	Finds	Ro	-
11748	Standing Stone	BA	-
13770	Common Land	Med	-
Sites in DAT SMR - Intertidal			
12641	Ferry	Med;PM	See Field Notes 5 & 8
9821	Finds	BA	-
Sites from Map Search - Coastal Margin			
30005	Boat House	PM	-
30008	Place-name	PM	-
30009	Place-name	PM	-
30010	Lime kiln	PM	See Field Notes 8
30011	Lime kiln	PM	-
30012	Flood Defence	PM	-
Sites from Map Search - Coastal Margin			
30017	Flood Defence	PM	-
30018	Flood Defence	PM	-
Sites from Map Search - Intertidal			
30006	Slipway	PM	-
30007	Slipway	PM	-
30013	Navigation Marker	PM	-
30014	Navigation Marker	PM	-
30015	Navigation Marker	PM	-
30016	Navigation Marker	PM	-
30019	Navigation Marker	PM	-

Sites from Fieldwork - Coastal Margin

30078	Railway Embankment; Foreshore Defence	PM	

Sites from Fieldwork - Intertidal

30089	Jetty?; Causeway?	U	See Field Notes 5 & 8
30099	Shipwreck	PM	See Field Notes 5 & 8
30105	Shipwreck	PM	See Field Notes 5 & 8

Sites from Supplementary Research - Intertidal

3007 7	Anchorage	PM; Med?	See Field Notes 8

DAT - RAF Photographs

Frame Numbers: 3081 - 3084; 1174 - 1179; 5176 - 5182

DAT - MERIDIAN Photographs

Frame Numbers: SN31SE 230/210 27457 - 27461

SHEET SN 31 NE RIVER TYWI, GREEN CASTLE

Covered by	1st Edition 1:2500	XXXIX.14	
	1st Edition 1:2500	XXXIX.10	N/A
	1st Edition 1:2500	XLVI.02	
	2nd Edition 1:2500	XXXIX.14	
	2nd Edition 1:2500	XXXIX.10	
	2nd Edition 1:2500	XLVI.02	N/A
	1st Edition 6": 1 mile	XXXIX.SW	N/A
	2nd Edition 6": 1 mile	XXXIX.SW	

Description from 1:10000 of Foreshore and Coastal Margin

This map includes the west bank only of the River Tywi opposite Penhen. To the north it includes a meander in the River Tywi beneath Green Castle. The river has a narrow mud intertidal area. Green Castle Harbour lies on the west of the meander.

Adjustment from Fieldwork

The intertidal area beneath the steep slope and cliff at Green Castle is composed of rock fragments which form a steep bank.

Foreshore	HW Metric	NGR	Coastal Margin
Mud	300m	SN 3986 1500 - SN 4000 1530	Rising Ground
Stones	800m	SN 4000 1635 - SN 3961 1703	Cliff
Mud	600m	SN 3961 1703 - SN 4000 1717	Pasture/Marsh
Mud	800m	SN 4000 1653 - SN 4000 1707	Pasture/Marsh
TOTAL	2500m		

Known Sites

Green Castle Harbour (PRN 16375) has been allocated a NGR which corresponds to the inlet or waterway on the west of the Tywi just upstream of the cliffs under the Green Castle. A quarry on the road north of the Green Castle is the only site from the coastal margin.

New Sites

The character of sites has not been altered: entries have been made for Black Pool itself, a quarry on the waterfront and a possible jetty or landing place.

Assessment

The project has confirmed the importance of this as an Area of Maritime Activity. Further work is necessary to identify the manner in which vessels used the area. Black Pool could clearly provide deep water anchorage even at low tide while the waterway denoted as Green Castle Harbour could provide mud berths.

The deposition of river mud in Green Castle Harbour and the pill below the quarry (PRN 30107) offers potential for waterfront structures to be preserved. The dumping on the upstream site may have further sealed material but the addition of piped drainage may reduce the potential for preservation of organic structures and artefacts.

Summary of Sites

Sites in DAT SMR		Coastal Margin	Field Observation
15635	Quarry	PM	-

Sites in DAT SMR - Intertidal

16375	Harbour	PM	See Field Notes 8

Sites from Map Search

No sites added

Sites from Fieldwork - Coastal Margin

30107	Quarry	PM	See Field Notes 8

Sites from Fieldwork - Intertidal

30106	Jetty?; Landing Place?	U	See Field Notes 8

Sites from Supplementary Research

30079	Anchorage	PM; Med?	See Field Notes 8

DAT - RAF Photographs

Frame Numbers: 2164 - 2165

DAT - MERIDIAN Photographs

Frame Numbers: SN31NE 230/210: 26777 - 26776

SHEET SN 40 NW KIDWELLY

Covered by:	1st Edition 1:2500	LIII.06N/A
	1st Edition 1:2500	LIII.05
	2nd Edition 1:2500	LIII.06N/A
	2nd Edition 1:2500	LIII.05
	3rd Edition	LIII.06
	1st Edition 6": 1 mile	LIII.SW
	1st Edition 6": 1 mile	LIII.NW
	2nd Edition 6": 1 mile	LIII.SW
	2nd Edition 6": 1 mile	LIII.NW
	3rd Edition 6": 1 mile	LIII.SW
	3rd Edition 6": 1 mile	LIII.NW

Description from 1:10000 of Foreshore and Coastal Margin

Kidwelly lies between two rivers, the Gwendraeth Fawr to the south and Gwendraeth Fach to the north. On the south bank of the former saltmarsh extends to the tidal limit. The north bank, like the Gwendraeth Fach is lined by flood defences. The rivers have a narrow intertidal area of mud.

Foreshore	HW Metres	NGR	Coastal Margin
Mud	1300m	SN 4000 0539 - SN 4111 0555	Salt Marsh
Mud	1300m	SN 4111 0557 - SN 4000 0565	Flood Defence. Marsh
Mud	2000m	SN 4000 0673 - SN 4162 0738	Built. Flood Defence
Mud	2000m	SN 4162 0738 - SN 4000 0683	Built. Flood Defence
TOTAL	6600m		

Known Sites

In this central area of Kidwelly the SMR is focused on major structures. It includes the Castle (PRNs 1621 & 1622); transportation which is represented by four rail and road bridges and Kymers Canal (PRN 5777); and a Medieval fulling mill (PRN 12943).

New Sites

Only three records have been created, all for flood defence banks.

Assessment

This area was poorly covered by the historic OS maps which had been obtained. Further work is needed to at least bring the Kidwelly and Gwendraeth area in line with others covered by this project.

Summary of Sites

Sites in DAT SMR - Coastal Margin

1621	Motte	Med
1622	Castle	Med
1628	Finds	BA
5328	Bridge	PM
5777	Canal	PM
8422	Bridge	PM
8423	Bridge	PM
12943	Fulling Mill	Med
16302	Bridge	PM

Sites from Map Search - Coastal Margin

30002	Flood Defence	PM
30003	Flood Defence	PM
30004	Flood Defence	Mo

DAT - RAF Photographs - None

DAT - MERIDIAN Photographs - None

SHEET SN 41 NW RIVER TYWI - CARMARTHEN

and 25" Sheets: SN 4019, 4119

Covered By:			
	1st Edition 1:2500	XLVI.02	
	1st Edition 1:2500	XXXIX.10	N/A
	1st Edition 1:2500	XXXIX.06	
	1st Edition 1:2500	XXXIX.07	N/A
	2nd Edition 1:2500	XLVI.02	N/A
	2nd Edition 1:2500	XXXIX.10	
	2nd Edition 1:2500	XXXIX.06	
	2nd Edition 1:2500	XXXIX.07	

Description from 1:10000 of Foreshore and Coastal Margin

In this section the tidal River Tywi is a narrow meandering river with only a small exposure of intertidal mud. For most of its length it flows through marshy fields. To the east, the Great Western Railway shadows the river's route.

Foreshore	HW Metres	NGR		Coastal Margin
Mud	10800m	SN 4000 1500 - SN 4055 1923	Rural.	Undefended
Mud	4000m	SN 4055 1923 - SN 4220 2000	Built.	Defended
TOTAL	14800m			

Known Sites

The SMR contained few waterfront sites from the Camarthen area. Only a dwelling and a watermill of Medieval date, and two Post-Medieval Bridges were extracted.

New Sites

These focused on the industrial sites which clustered along the urban waterfront, such as brickworks, saw mills and tin mills. From the rural area downstream two further anchorages were recorded.

Assessment

The new sites came predominantly from the historic OS maps and published sources. They are only new in respect of the SMR and not in terms of local knowledge. Much more could be done to ensure that the urban waterfront has been accurately represented within the SMR.

Summary of Sites

Sites in DAT SMR - Coastal Margin			No Field Observation
58	Bridge	Med	
198	Dwelling	Med?	
8681	Bridge	Med	
12758	Watermill	Med	

Sites in DAT SMR - Intertidal		
186	Quay	PM

Sites from Map Search - Coastal Margin		
30020	Flood Defence	PM
30022	Saw Mill	PM
30023	Tin Mill	PM
30024	Gasworks	PM/Mo
30025	Clay Pit	PM
30026	Brick Works	PM

30027	Saw Mill	PM
30028	Flood Defence	PM
30029	Flood Defence	PM
30030	Flood Defence	PM
30031	Timber Yard	Mo
30032	Saw Mill	Mo
30033	Crane	Mo
30035	Saw Mill	Mo
30036	Kiln	Mo

Sites from Map Search - Intertidal

30021	Wharf	PM
30034	Wharf	Mo
30037	Slipway	Mo

Sites from Supplementary Research - Coastal Margin

30082	Bridge	PM

Sites from Supplementary Research - Intertidal

30080	Anchorage	PM
30081	Anchorage	PM

DAT - RAF Photographs

Frame Number: 6677

DAT - MERIDIAN Photographs

Frame Number: SN41NW 240/230: 27082; 27092; 24130

SHEET SN 42 SW RIVER TYWI: CARMARTHEN to the TIDAL LIMIT

and 25" Sheets: SN 4220

Covered By 1st Edition 6": 1 mile 39 NE

Description from 1:10000 of Foreshore and Coastal Margin

The intertidal area of the Tywi and its tributary the Gwili are negligible at this point. Upstream of Carmarthen the river flows through land used as pasture.

Foreshore	HW Metres	NGR		Coastal Margin
Mud	7200m	SN 4200 2000 - SN 4375 2020	Rural.	Undefended

Assessment

This final length of the Tywi, though included in the project brief, has barely featured in data-gathering. It is known that a recent detailed Archaeological Assessment and Evaluation has been carried out for Welsh Office Highways on the proposed route of the A40 Carmarthen By-Pass covering part of this area, but its results have not yet been accessed to the SMR.

Summary of Sites

Sites in DAT SMR

No List

Sites from Map Search (SMR Base Map only)

30083	Butts	Mo
30084	Rifle Range	Mo

DAT - RAF Photographs

Frame Numbers: 4085 - 4087

DAT - MERIDIAN Photographs

Frame Numbers:	SN42SW	240/220: 24104 -24106
	SN42SW	240/220: 24131 - 24133
	SN42SW	240/220: 12750 - 12757

COASTAL SURVEY OF CARMARTHEN BAY

COASTAL ENVIRONMENTS IDENTIFIED DURING THE STUDY

Quarter	Foreshore	MHW Metres	NGR	Coast Edge
1 Upper reaches of rivers with mud intertidal area				
1.1	***River with mud intertidal area in rural areas without flood defences***			
SN40NW	Mud	1300m	SN 4000 0539 - SN 4111 0555	Salt Marsh
SN31SW	Mud	2100m	SN 3146 1241 - SN 3102 1085	Marsh
31SE41SW	Mud	1400m	SN 3847 1375 - SN 3977 1427	Marsh
SN21SE	Mud	3500m	SN 3000 1282 - SN 2816 1500	Pasture/Marsh
SN21SE	Mud	3500m	SN 2819 1500 - SN 3000 1291	Pasture/Marsh Foreshore Defence
SN31NE	Mud	600m	SN 3961 1703 - SN 4000 1717	Pasture/Marsh
SN31NE	Mud	800m	SN 4000 1653 - SN 4000 1707	Pasture/Marsh
SN21NE	Mud	2000m	SN 2817 1500 - SN 2675 1553	Pasture?
SN21NE	Mud	1600m	SN 2677 1553 - SN 2791 1536	Pasture?
31SE41SW	Mud	2300m	SN 3639 1205 - SN 3800 1341	Pasture?
31SE41SW	Mud	500m	SN 3800 1341 - SN 3847 1375	Pasture?
31SE41SW	Mud	800m	SN 3977 1427 - SN 3988 1500	Pasture?
SN41NW	Mud	10800m	SN 4000 1500 - SN 4055 1923	Pasture?
SN42SW	Mud	7200m	SN 4200 2000 - SN 4375 2020	Pasture?
1.2	***River with mud intertidal area in rural areas with natural defences***			
SN31SW	Mud	900m	SN 3032 1076 - SN 3097 1141	Cliff
SN31SW	Mud	250m	SN 3197 1023 - SN 3204 1000	Cliff
SN31SW	Mud	400m	SN 3226 1000 - SN 3265 1000	Cliff
SN31NE	Mud & Stone	300m	SN 3986 1500 - SN 4000 1530	Cliff
SN31NE	Mud	800m	SN 4000 1635 - SN 3961 1703	Rising Ground
1.3	***River with mud intertidal area in rural areas with flood defences (banks)***			
SN21NE	Mud	1600m	SN 2818 1564 - SN 2819 1500	Pasture. Flood Defence
SN31SW	Mud	4500m	SN 3000 1290 - SN 3094 1435	Pasture. Flood Defence
SN31SW	Mud	4500m	SN 3096 1434 - SN 3140 1251	Pasture. Flood Defence
SN40NW	Mud	1300m	SN 4111 0557 - SN 4000 0565	Pasture. Flood Defence
1.4	***River with mud intertidal area in rural areas with flood defences of hard character***			
31SE41SW	Mud	900m	SN 4000 1497 - SN 3982 1400	Marsh. Rail embankment
31SE41SW ment	Mud	1000m	SN 3982 1400 - SN 3900 1348	Rail embank-
1.5	***River with mud intertidal area in areas of settlement with flood defences***			
SN40NW	Mud	2000m	SN 4000 0673 - SN 4162 0738	Built. Flood Defence
SN40NW	Mud	2000m	SN 4162 0738 - SN 4000 0683	Built. Flood Defence
SN41NW	Mud	4000m	SN 4055 1923 - SN 4220 2000	Built. Flood Defence
1.6	***River with mud intertidal area in areas of settlement without flood defences***			
SN21NE	Mud	750m	SN 2791 1536 - SN 2818 1564	Built
SN31SW	Mud	500m	SN 3046 1040 - SN 3032 1076	Built. Marsh

2 *Lower reaches and mouths of rivers with broad intertidal area of mud and sand*

2.1 River with broad intertidal area of mud and sand in rural areas without flood defences

SN31SW	Shingle on mud	200m	SN 3102 1085 - SN 3120 1075	Marsh
SN31SW	Mud/Sand	2400m	SN 3097 1141 - SN 3000 1282	Marsh
SN31SW	Mud/Sand	1000m	SN 3120 1075 - SN 3197 1023	Marsh
SN30NE	Sand/Mud	5000m	SN 3072 0639 - SN 4000 0539	Salt Marsh
31SE41SW	Sand/Mud	1300m	SN 3580 1093 - SN 3639 1205	Marsh

2.2 River with broad intertidal area of mud and sand in rural areas with flood defences

SN30NW	Sand	2500m	SN 3255 0825 - SN 3077 1000	Flood Defence. Marsh

2.3 River with broad intertidal area of mud and sand in rural areas with natural defences

SN31SW	Mud/Sand	600m	SN 3063 1000 - SN 3046 1040	Cliff
SN31SW	Mud/Sand	200m	SN 3140 1251 - SN 3146 1241	Cliff

2.4 River with broad intertidal area of mud and sand in rural areas with flood defences of hard character

SN30NE	Sand/Mud	3100m	SN 4000 0675 - SN 3744 0694	Marsh. Rail Embankment
31SE41SW	Mud/Sand	3300m	SN 3900 1348 - SN 3713 1168	Marsh. Rail Embankment
31SE41SW	Sand/Mud	600m	SN 3713 1168 - SN 3700 1105	Rail Embank ment

2.5 River with broad intertidal area of mud and sand in areas of settlement with flood defences

SN30NE Marsh	Sand/Mud	1400m	SN 4000 0563 - SN 3993 0653	Built. Salt

2.6 River with broad intertidal area of mud and sand in areas of settlement without flood defences

SN30NE	Sand/Mud	150m	SN 3993 0653 - SN 4000 0675	Built. Flood Defence

3 Open coast with sand intertidal area, including those with storme beaches of stone and rock or boulder strews

3.1 Open coast with intertidal area of sand backed by dunes

SN20NW	Sand	1700m	SN 2327 0783 - SN 2500 0759	Dunes
SN20NE	Sand	5100m	SN 2500 0758 - SN 3000 0778	Dunes
SN30NW	Sand	4350m	SN 3000 0537 - SN 3255 0825	Dunes
SN30SE	Sand	3000m	SN 3612 0500 - SN 3754 0245	Dunes
SN30NE	Sand	1600m	SN 3092 0500 - SN 3072 0639	Dunes
SN30SE	Sand	3200m	SN 3754 0245 - SN 3973 0000	Dunes, afforested
SS19NW	Sand	1700m	SS 1220 9854 - 1309 20	Dunes/Golf Course

3.2 Open Coast with intertidal area of sand and natural defences

SN10SW	Sand	120m	SN 1309 0000 - SN 1369 0056	Cliff
SN30NE	Sand	3100m	SN 3205 1000 - SN 3500 0993	Cliff
31SE41SW	Sand	400m	SN 3517 1000 - SN 3530 1025	Cliff

3.3	***Open Coast with intertidal area of sand backed by settlements with foreshore defences***			
SN10NW	Sand	120m	SN 1465 0611 - SN 1473 0618	Built. Foreshore Defence - Seawall
SN10NE	Sand	1450m	SN 1605 0688 - SN 1752 0725	Built. Foreshore Defence - Seawall
31SE41SW	Sand	1300m	SN 3700 1105 - SN 3640 1000	Built. Foreshore Defence - Rail embankment
31SE41SW	Sand	800m	SN 3530 1025 - SN 3580 1093	Built. Foreshore Defence - Seawall
SN10SW	Sand	800m	SN 1369 0056 - SN 1328 0092	Built. Foreshore Defence - Seawall
SN10SW	Sand	700m	SN 1328 0457 - SN 13810500	Built. Foreshore Defence - Seawall
SN10NW	Sand	420m	SN 1383 0500 - SN 1413 0532	Built. Foreshore Defences - Seawall/Bank
3.4	***Open coast with intertidal area of stones and sand without foreshore defences***			
SN20NW	Stone/Sand	820m	SN 2038 0741 - SN 2123 0738	Undefended
3.5	***Open coast with intertidal area of rock or boulders (sand in the lower intertidal area) and with natural defences***			
SN20NW	Boulder/Sand	380m	SN 2235 0750 - SN 2266 0749	Low Cliff
SS19NW	Boulder	450m	SS 1255 9831 - SS1220 9854	Cliff
SN20NW	Boulder/Sand	400m	SN 2000 0758 - SN 2038 0741	Cliff
SN10SW	Sand/Rock	6020m	SN 1328 0092 - SN 1382 0457	Cliff
SN20NW	Boulder/Sand	900m	SN 2266 0749 - SN 2327 0783	Cliff
SN10NE	Boulders/Sand	2900m	SN 1752 0725 - SN 2000 0748	Cliff
SN30NE	Boulder/Sand	900m	SN 3615 0842 - SN 3621 0931	Cliff
SN20NW	Boulder/Sand	1400m	SN 2123 0738 - SN 2235 0750	Cliff
SN10NE	Rock/Sand	1250m	SN 1500 0614 - SN 1605 0688	Cliff
SN10NW	Rock	350m	SN 1473 0618 - SN 1500 0634	Cliff
SN10NW	Rock	750m	SN 1413 0532 - SN 1445 0596	Cliff. Foreshore Defences - Rail embankment
3.6	**Open coast with intertidal area of rock or boulders (sand in the lower intertidal area) with foreshore defences**			
SN10NW	Boulder	280m	SN 1445 0596 - SN 1465 0611	Built. Foreshore Defence
SN30NE	Boulder/Sand	700m	SN 3621 0931 - SN 3640 1000	Built. Rail Embankment/settlement
SN30NE	Rock Scars	2300m	SN 3744 0694 - SN 3615 0842	Rail Embankment

ORDNANCE SURVEY SHEETS USED DURING MAP SEARCH

The list is ordered west to east and south to north. Each column of sheets (as they would appear on the map) is separated by a line.

1:2500 SHEET	1ST	2ND	3RD EDITIONS
41.15	Y	Y	
41.11	Y		
41.07	N/A	Y	
41.16	N/A	N/A	N/A
41.12		Y	
41.08		Y	
41.04	Y	Y	
35.16	Y	Y	
35.12	Y	Y	
36.09		Y	
51.05	Y	Y	
51.06	Y	Y	
51.07	N/A	Y	
51.08	N/A	N/A	N/A
52.05	N/A	N/A	N/A
45.01	Y	Y	
52.10	Y	N/A	
52.06	N/A	N/A	N/A
45.14	Y	Y	
45.10	Y	Y	
45.06	Y	Y	
45.02	Y	Y	
52.15	Y	N/A	
52.11	Y BOTTOM HALF ONLY		
52.07	Y	N/A	
52.03	N/A	Y	
45.15	Y	N/A	
45.11	Y	Y TOP HALF ONLY	
52.16	Y	N/A	
52.12	Y	N/A	
52.08	Y	N/A	
52.04	N/A	N/A	N/A
45.16	Y	N/A	
45.12	Y	N/A	
57.09	N/A	N/A	N/A
57.05	Y	N/A	
57.01	Y	N/A	
53.13	Y	N/A	
53.09	Y	N/A	
53.05	Y	Y	
53.01	Y	Y	
46.13	Y	Y	
46.09	Y	Y	
46.05	Y	Y TOP HALF ONLY	
57.10	Y	N/A	
57.06	Y	N/A	
57.02	Y	Y	Y
53.14	Y	Y	Y
53.10	Y	Y	
53.06	N/A	N/A	Y
46.06	Y	Y	
46.02	Y	N/A	
39.14	Y	Y	
39.10	N/A	Y	
39.06	Y	Y	
39.07	N/A	Y	

6 INCH SHEET	1ST	2ND	3RD EDITIONS
44 NE		Y	
41 SE	Y		
41 NE	Y		
35 SE	Y		
36 SW	Y	Y	
51 SW			
51 NW	Y	Y	
51 SE	Y	Y	
51 NE	Y	Y	
52 SW	Y	Y	
52 NW		Y	
45 SW		Y	
45 NW		Y	
56 NE	Y	Y	
52 SE	Y	Y	
52 NE	Y	Y	
45 SE		Y	
45 NE		Y	
57 SW			Y
57 NW	Y		Y
53 SW	Y	Y	Y
53 NW	Y	Y	Y
46 SW	Y		
46 NW	Y		
39 SW		Y	
39 NW	Y	Y	
57 SE	Y		
57 NE	Y	Y	
53 SE			
53 NE			
46 SE			
46 NE			
39 SE			
39 NE	Y	Y	