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COASTAL EROSION SURVEY

GREAT ORME TO PENRHYN BAY (G1386)

REPORT NO. 253

Ymddiriedolaeth Archaeolegol Gwynedd

Gwynedd Archaeological Trust

COASTAL EROSION SURVEY

GREAT ORME TO PENRHYN BAY (G1386)

Compiled for Cadw: Welsh Historic Monuments

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Gwynedd Archaeological Trust Report No. 253

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"These noble rocks with their steep, rude, and whitened fronts" Rev Richard Parry (Davies 1949, 11).

SUMMARY

This short report covering the area from the north-western tip of the Great Orme to the old county boundary at Penrhyn Bay completes the coastal erosion survey of the county of Gwynedd. It has shown that the two headlands included in the survey area: the Great and Little Orme, are generally suffering only minor erosion, being composed of relatively resistant limestone cliffs, with the main vulnerable areas being the isthmus between the two headlands and the locations where glacial clay abuts the bedrock of the headlands. Some additional erosion has taken place around the Great Orme due to the unusually heavy rainstorm of 1993 which resulted in large quantities of surface and sub-surface water running off the headland and causing landslips.

The survey identified 70 sites which date from the Neolithic period to the Modern period and cover many aspects of life and work in the survey area. The submerged peat beds identified and their associated remains hold great potential for our understanding of late Neolithic/Late Bronze Age activity in the area and are one of the most threatened sites. The prehistoric period is well represented by a number of sites, but of particular importance are theBronze Age copper mines. The later, post-medieval, industrial activity is also represented by small-scale and large-scale quarries and trials. A number of sites reflecting the development of the area as a major tourist centre have been recorded. The remains of a Second World War gunnery school complete the archaeological remains within the survey area.

In response to the threats from natural and man-made erosion, this report lists and locates the archaeological sites identified along the coast, and the extent of the threat for each site. Management recommendations are made for sites under threat, to enable the evidence for this valuable area to be protected.

1 INTRODUCTION

This years (1996-7) survey of the impact of coastal erosion on the archaeology of the coastline of the island of Anglesey (including Holy Island) and mainland Gwynedd from the Great Orme's Head to Penrhyn Bay has been funded by Cadw: Welsh Historical Monuments. It completes the coastline survey of the old county of Gwynedd begun in 1993 by Smith (Great Orme's Head to Porth Cloch, Aberdaron) and continued in 1995-6 by Gwyn *et al* (Porth Cloch to the railway bridge over the Afon Dyfi) a combined distance of 309km or 60% of the total length of coastline of Gwynedd. As the two final areas for study are separate geographical areas two separate reports have been produced, one for each area. The coastline of Anglesey has been covered in Report No. 251 and this report shall cover the short stretch of coastline from the north-western tip of the Great Orme to the boundary of the old county of Gwynedd, a distance of 11.55km.

1.1 Objectives

Using the methodology developed by the previous two surveys of the Gwynedd coast, a desk-top study followed by a rapid field survey has produced:

a. a detailed overview of the archaeology of the coast, including 'new' sites identified;

b. an assessment of the present scale of coastal erosion;

c. an assessment of the present condition and future threat to archaeological sites and features; and

d. management prescriptions for specific sites.

1.2 Methodology

Prior to the field survey a desk-top study was carried out. This consisted of a thorough search through the Gwynedd Sites and Monuments Record identifying existing sites (each uniquely identified by a Primary Record Number) which were located on or near (within 1km) the present coastline. Further information on these identified sites was obtained from the noted bibliographical sources which included the Royal Commission's Inventory for Caernarvonshire (East) and the National Monuments Record, Aberystwyth. In the course of the project a number of other relevant organisations were consulted, notably: the Environmental Agency (formally the National Rivers Authority); the Marine Archaeology Department, the University of Wales(Bangor); the Archaeology Department, the University of Wales (Bangor) and the Countryside Council for Wales. Members of the Trust involved in the project have also attended meetings of the relevant Coastal Cell groups. General books and articles on the history and society of the survey area were also consulted.

Each known site's location and PRN was then transferred to a copy of the Ordinance Survey 1:10,000 maps of the coastline, to be used as base maps for the actual fieldwork.

1.3 Survey Recording

The field work was carried out in November 1996 by two members of the Trust staff. Whenever possible the field-walking was accomplished by one of the team walking on the cliff-top and the other walking on the foreshore covering both the intertidal zone and the actual coast edge. This proved impossible along much of the coast of the Great and Little Ormes, where high sea cliffs fell directly into the sea below only allowing for the cliff edge and adjacent coastal land edge to be inspected. The coast was walked in one direction, with one vehicle being left at the finish point and one driven back to the start point and collected at the end of the day.

The fieldwork itself consisted of rapid coverage of the coastal strip and immediate foreshore, with details of sites, as well as the nature of the land edge, coast edge, foreshore and erosion class recorded directly onto waterproof sheets of transparent paper overlain on the 1:10,000 base maps. Colour slides were taken of the majority of sites, examples of erosion and general shots of coast edge type.

1.4 Management Recommendations

Management recommendations are made for each site under the heading 'Management' in the site gazetteer. These recommendations are covered by a number of categories:

Basic Recording - recording by photograph and description
All the sites listed in the site gazetteer have a written description, some of the more complex have a sketch and most have been photographed (colour slide).

Monitoring
A number of sites vulnerable to erosion, though not necessarily immediately suffering such erosion, have been recommended for regular monitoring, to assess the degree of erosion and the condition of the site and to record any exposed features or artefacts.

Detailed Recording
Detailed recording requires a photographic record (including aerial photographs where appropriate), surveying (both topographical or buildings) and the production of a measured drawing.

Excavation
Archaeological excavation works may also be required depending upon the particular feature and the extent and effect of erosion. Some of the sites may require dismantling by hand, to provide a detailed record of the method of construction.

Information/Interpretation boards
With the importance of tourism to the local economy and the development of a number of nature and archaeological trails, a provision has also been included for the erection of information/interpretation boards relating to various archaeological sites.

1.5 Data Storage and Retrieval

Subsequent to the fieldwork sites, coast types, foreshore types, land edge types and erosion classes were noted directly onto 1:10,000 maps. Three databases (linked by the coast edge number) were created using the FoxPro database program:

G1386CE1.DBF

Field	Field Name	Type	Width	Dec	Index	Collate
1	CEDGENO	Numeric	6		Asc	Machine
2	CETYPE	Character	8		Asc	Machine
3	PLACENAME	Character	30		Asc	Machine
4	NGRSTART	Character	11		Asc	Machine
5	NGRFIN	Character	11		Asc	Machine
6	OSMAP	Character	13		Asc	Machine
7	LENGTH	Numeric	8	2	Asc	Machine
8	FACING	Character	3		Asc	Machine
9	GEOLOGY	Character	30		Asc	Machine
10	DATE	Date	10		Asc	Machine
11	INITIAL	Character	10		Asc	Machine
12	DESCR	Memo	10			
Total			153			

G1386ER1.DBF

Field	Field Name	Type	Width	Dec	Index	Collate
1	ERNO	Numeric	6		Asc	Machine
2	ERTYPE	Character	10		Asc	Machine
3	NGRSTART	Character	11		Asc	Machine
4	NGRFIN	Character	11		Asc	Machine
5	LENGTH	Numeric	6	2	Asc	Machine
6	CEGENO	Numeric	6		Asc	Machine
Total			51			

G1386SIT1.DBF

Field	Field Name	Type	Width	Dec	Index	Collate
1	SITENO	Numeric 4		Asc	Machine	
2	PRN	Numeric 8			Asc	Machine
3	SITENAME	Character	50		Asc	Machine
4	NGR	Character	11		Asc	Machine
5	CATEGORY	Character	1		Asc	Machine
6	CEDGENO	Numeric 6			Asc	Machine
7	ERNO	Numeric 6			Asc	Machine
8	ERTYPE	Character	3		Asc	Machine
9	LANDUSE	Character	10		Asc	Machine
10	THREATS	Character	25		Asc	Machine
11	MANAGEMENT	Character	25		Asc	Machine
12	CLASS	Character	30		Asc	Machine
13	SITETYPE	Character	40		Asc	Machine
14	PERIOD	Character	30		Asc	Machine
15	PERIODCL	Character	1		Asc	Machine
16	CONDITION	Character	20		Asc	Machine
17	STATUS	Character	6			
18	INITIAL	Character	6		Asc	Machine
19	DATE	Date	8		Asc	Machine
20	NOTES	Memo	10			
Total			301			

Copies of the site database (G1386SIT1.DBF) have been passed on to the Gwynedd Sites and Monuments Record where PRN's will be allocated to each 'new' site and incorporated into the Record and information pertaining to existing PRN's will be up dated.

The archive of the survey will be retained by GAT under the project number G1386 and a copy deposited with the Gwynedd Sites and Monuments Record.

2 THE STUDY AREA

2.1 Definition of the study area

The area of study was defined as the coastal strip (including an area 150m inland from the high water mark) and the foreshore as defined as the intertidal zone between the mean high and low tide marks. The survey began at the north-western tip of the Great Orme, where the first survey of the northern coastline of Gwynedd ended (Smith 1994) and covered the remaining coastline of the old county of Gwynedd to the east as far as Penrhyn Bay.

2.2 Geology and Geomorphology

The Great and Little Ormes are part of a carboniferous limestone range which ran across north Wales from Clwyd in the east to Anglesey in the west. Subsequent erosion and folding of the range has resulted in the present promontories of the two Ormes. The limestone dates from the Lower Carboniferous period, some 340 million years ago (Smith 1988, 9). It consists of three main consecutive units of brown, white and grey limestones which are separated by layers of shale (Smith 1988, 9). The mineralisation within the Great Orme is almost exclusively copper although minor amounts of lead, native copper, chert, manganese and bitumen also occur along with a minor deposit of sandstone.

The copper mineralisation occurs exclusively where the limestone host rock has undergone a process of dolomitisation, usually associated with faults and joints within the host rock (Lewis 1993, 2). These vertical fractures generally occur along a north-south axis through the promontory running parallel to one another. East-west fracturing also occurs but to a smaller extent. This dolomitisation process leads to a softening of the host rock to an extent that it can be removed by scratching with a finger nail. As a result, because of the association of the copper minerals with softened dolomitic limestone and soft shales and mudstones which define it's limits, the extraction of these ores would have been relatively easy for early miners.

The Little Orme's Head covers an area of about four square miles and reaches an elevation of 141 metres OD. It is formed of Middle White Limestone overlying irregular beds of dolomite. The limestone is faulted in places and occasional bands of brecciated conglomerate have been thrown up (Roberts *et al* 1996, 1).

Both the promontories are covered in a thin deposit of glacial till most of which has been removed by marine action from around the headlands (a process still on-going on the south-western side of the Great Orme around Gogarth). The isthmus which connects the two headlands and on which the present town of Llandudno is built, is formed of alluvium overlain near the two shores by sand and which until the middle of the nineteenth century, when it was extensively drained, was a mixture of marsh and sand dunes.

The two Ormes exhibit many of the classic geomorphological features that are traditionally associated with limestone landscapes. The most obvious and striking of which are the impressive crags and sea cliffs which reach a maximum height of c. 120m on the Great Orme. At the base of many of the inland cliffs and larger limestone scars are areas of limestone scree, the result of weathering of the relatively soft limestone bedrock. Weathering along geological faults has produced numerous deep gullies and which have often resulting in the formation of numerous caves, particularly around the bases of the cliffs.

Heavy flooding in 1993, in which five inches of rain fell in three hours, resulted in at least twenty landslips around the Great Orme. These were created by a combination of surface run-off together with 'blow-outs' where layers of more impermeable limestone meet vegetation slopes. The resulting erosion was dramatic, up to 1m in deep in places.

2.3 Sea Level and Coastal Change

Since the ending of the last glaciation, c. 12,000 BP, global sea levels have been rising as the water locked up in ice sheets was released as the ice melted. However, this effect has, to a degree, been offset by gradual land uplift or isostatic rebound as land which was covered by the ice sheets has been released from the massive downward pressure. These two effects have made the history of the coastline of the survey area extremely complex, especially as these effects have not been consistent as fluctuating temperatures have caused the ice to advance and retreat at different times. This fluctuating has produced many layers of raised beaches clearly visible around the now uplifted cliffs of both headlands. Submerged peat beds have also been formed by this along the coasts of north Wales and Anglesey. To the west of the survey, off the Conwy Morfa such submerged peat beds with fossilised tree remains have been recorded and within the survey area itself submerged peat beds and fossilised tree remains have been recorded along the North Shore of Llandudno (site no 50). Recently an alder stump found in this area produced a radio carbon date of c. 5,000 bc. The recovery of two bronze axes and one bronze dagger from an area near theses beds demonstrates the archaeological potential of these peat beds.

Both the promontories are covered in a thin deposit of glacial till most of which has been removed by marine action from around the headlands (a process still on-going on the south-western side of the Great Orme around Gogarth). The isthmus which connects the two headlands and on which the present town of Llandudno is built, is formed of alluvium overlain near the two shores by sand and which until the middle of the nineteenth century, when it was extensively drained, was a mixture of marsh and sand dunes.

The isthmus of land on which the town of Llandudno is built is particularly vulnerable from sea erosion as is demonstrated by frequent flooding. As a result a programme of coastal defence recently undertaken by the local authorities on both the west and north shores of the town.

3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

3.1 Prehistoric to 400 AD.

The earliest archaeological evidence from the survey area comes from a number of limestone caves on both the Great and Little Ormes. At Kendrick's Cave on the Great Orme artefacts spanning from the Upper Palaeolithic period to the Bronze Age have been recovered, including an incised horses jaw bone. While on a ridge just to the south-west of the Little Orme two caves: Tan y Bryn and Pant y Wenol have produced evidence of Mesolithic and Neolithic occupation. Three cave sites were covered by the survey including Ogof Tudno on the Great Orme, which although not firmly dated contained numerous limpet and mussel shells, similar to assemblages found in occupied caves and it presently being investigated as a possible early mine working. On the Little Orme Ogof Rhiwledyn (site no. 57) has produced evidence of Neolithic to Bronze Age occupation, while Letterbox Cave (site no. 53) has produced undated human remains.

The only other known prehistoric evidence from the Little Orme is a female skeleton found during quarrying work at the limestone quarry in 1890. This has recently been dated using radio carbon techniques to a calibrated date of 3640 to 3360 years BC, and is therefore of Neolithic origin (Basset *el al* 1996).

Indications of early mining activity on the Great Orme first emerged in 1831 when miners in the "Old Mine' broke into areas of early workings and found stone, bone and antler tools. Similar discoveries were again made in 1849, but it wasn't until the 1970's that the radio carbon dating of artefacts from within the mines began to reveal the prehistoric origins of copper mining on the Great Orme.

Since 1987 tonnes of modern mining waste have been removed at the Pyllau Valley site to expose an area of approximately 500 square metres of prehistoric opencast mining and mined out veins (Dutton *et al* 1994, 64) and elsewhere underground prehistoric workings have been excavated to reveal the largest known Bronze Age mine in Europe. No definite known prehistoric workings fall within the survey area, however, a possible such site is presently being investigated at Ogof Tudno (site 13). Two possible ore washing sites are also covered by the survey at Ffynnon Rhufeinig and Ffynnon Galchog (site no.'s 19 & 32), the latter of which has recently suffered erosion by unusually large amounts of ground and stream water running off the cliff at this point during the major floods of 1993.

The best preserved burial monument on the Great Orme is the Irish Group 'A' Dolmen, known as Llety'r Filiast which is situated less than 200m from the entrances of the early mine workings at the Pyllau Valley site and, although no dating evidence survives from the dolmen itself, it may be contemporary with the earliest phases of copper exploitation (Lewis 1993, 13). At least four cairns, one possible standing stone, one possible stone row, one other possible megalithic tomb and one probably barrow, now destroyed, are recorded on the Great Orme. At the foot of the Great Orme where the present town of Llandudno is situated, there was reported an 'oval-shaped mound' (Roberts 1909) called 'Y Gorseddau' or 'high places/throne'. When the mound was levelled in the nineteenth century 'several earthen urns containing what was believed to be cremated human remains' were uncovered (Roberts 1909), probably suggesting the presence of a Bronze Age burial. No prehistoric monuments are recorded in the survey area east of Llandudno, but just to the south of Penrhyn Bay there was located a now destroyed 'tumulus' (PRN 4541).

A number of undated, isolated huts and groups of long and round huts have been recorded on the headland, including seven sites recorded in the survey. The most notable settlement site is the promontory fort of "Pen y Dinas'. Precipitous cliffs and earth and stone ramparts defended approximately sixty five huts. The only piece of dating evidence is a sherd of Samian ware recovered in the nineteenth century.

By local tradition the Romans are said to have exploited the copper mines on the Great Orme, however, no direct evidence has yet been recovered to confirm this. A number of copper cakes or ingots stamped with Imperial numbers have been identified around north Wales (notably two found at Dinarth, Llandrillo-yn-Rhos) indicating copper trading and possibly production in the area. A number of Roman coins were also said to have been found in old shafts and workings by nineteenth century miners (Willoughby Gardner 1958, 69). The most often cited evidence for Roman exploitation of the Great Orme mines are the two Roman coin hoards found at the beginning of the twentieth century in the pass to the south at the Little Orme (Willoughby Gardner 1958, 64).

3.2 Early medieval to late medieval

Evidence from the post-Roman/early medieval period from the survey area comes in the form of a Latin inscribed stone, recording the burial of 'Sanctanus'. The Tyddyn Holland Stone as it is known is now kept in Llanrhos Church, but originally stood on the old road from Llanrhos to the Little Orme (Dibble 1993, 7) . The church of St. Tudno on the Great Orme is thought to have been an early foundation, possibly dating to the sixth century. However, the present church dates from the twelfth century. The area around the church has fine examples of undated, but probably medieval, field systems of ridge and furrow (site no. 15) and associated long huts (site no.s 25 & 26). To the south-east of the church on Pen-Trwyn, there are similar examples of ridge and furrow (site no. 37) with associated long huts.

The Viking influence that spread throughout the Irish Sea and especially along the important trading and communication routes from Dublin to the Wirral and Chester is evident in the survey with placename *orme* which is thought to have been derived from the Norse *Horma Heva* 'the great Serpent'. The Great Orme in particular is an important navigational marker along the north Wales coast. The coin hoard found near St Tudno's Church (site no. 28) which contained coinage of King Cnut is the only site with Viking connections included in the survey, but appears to confirm the known historical and archaeological connections between north Wales and Viking culture at this time.

In the pre-conquest period the survey area lay within the *cantref* of Arllechwedd and the *commote* of Creuddyn, its location between the important royal *maedref* sites at Deganwy and Bryn Euryn has led to the suggestion that this area may have provided food and resources for these courts. Later the manor of Gogarth, on the western side of the Great Orme, was granted by the English crown to the Bishop of Bangor in 1277, and it was here that a substantial hall house was constructed (Rh. Gwyn 1996, 3). The early thirteenth century surveys collectively known as *The Record of Caernarvon*, indicate that the episcopal manor of Gogarth included three townships on the Great Orme - Gogarth itself, Cyngreawdr and Yr Wyddfid (Rh. Gwyn 1996, 2). While near or on the slopes of the Little Orme lay the township of Rhiwledin (Bassett *et al* 1977, 72).

3.3 Post-medieval

The history of the area in this period is dominated by the leading families: the Mostyns of Gloddaeth and the Pughs of Penrhyn. The Mostyns first became connected with area in the fifteenth century when they married into the Gloddaeth family of Gruffydd ap Rhys (Williams 1996, 1) and continued to consolidate their lands in the subsequent periods and developing their interests in the copper mining industry on the Great Orme. The Pugh family proved much less successful in their dealings, becoming well-known for their Roman Catholic sympathies in the sixteenth century, harbouring priests and assisting a group of priests in the publication of '*Y Drych Cristionogawl*' ('The Christian Mirror') the first book printed in Wales. The actual printing of this book was said to have taken place in a cave on the Little Orme (an area owned by the family) (Wynn Jones 1975, 11). Later in the seventeenth century Robert Pugh of Penrhyn was imprisoned for his part in the Titus Oates plot and a few decades later the last heir of the Pughs was mysteriously murdered (Wynn Jones 1975, 12).

The area remained relatively isolated throughout most of the seventeenth and eighteenth centuries, becoming a centre of espionage during William III's campaign against the Irish (Wynn Jones 1975, 13), until the gradually expansion of the copper industry in the nineteenth century and finally the rapid growth of the town as a resort in the later nineteenth and twentieth centuries.

3.3.1 Industry

The industrial history of the survey area is dominated by the copper mines on the Great Orme. The first historical recorded exploitation of the coppers ores appears in 1692 when a lease was given to Sir Thomas Mostyn (Williams 1979, 7). However, records of mining activities before the nineteenth century are very sparse. Lewis Morris's map of 1748 records the mines at Pyllau but indicates that they were no longer in use, having been 'drowned out' (Smith 1988, 11). However, by the end of the eighteenth century they were being worked as two separate ventures: the 'Old Mine' located at Bryniau Poethion and Maes y Facrell and the "New Mine' centred in the Pyllau area. At the height of production, between 18390-1850, the mines

employed up to 300 men (Smith 1988, 11), producing over a quarter of a million pounds worth of ore between 1835-1848 (Williams 1979, 6). However, in 1848 the abolition of import duties on copper combined with the large copper deposits discovered in Australia, north America and Chile ushered in the the end of the industry in Wales with the "New Mine' closing in 1864 and the 'Old Mine' in 1881.

The two main areas of copper mining fall outside the survey area, however, a number of small-scale workings/trials have been recorded (sites no.'s 13, 23 and 30). These may well have been the prospecting trials that have been undertaken privately by individual miners. The mine at Ty Gwyn down on what is now the main Promenade and entrance to the Pier are recorded in the survey. This mine (site no. 45) was the last to open and the first to close, but proved to be very productive until major flooding forced an end to work. It extends underground into Happy Valley, but the only surface indication surviving is one of the entrances, now covered by a modern man-hole cover.

Two stone quarries are also recorded in the survey: Rock Studio quarry near Happy Valley (site no. 70) and the quarry at Pigeon's Cave, stone from which is said to have been used to construct the Conwy Cob, Telford's Suspension Bridge at Conwy (1826) and later Stephenson's Tubular Bridge also at Conwy (1848).

On the Little Orme industrial activity centred around the limestone quarry which was opened in 1890 by the Little Orme's Head Limestone Company. The quarry was worked on three levels with a rope-worked incline (site no. 67) to the top and a locomotive-operated incline to the lower level (Wynn Jones 1975, 100). This site closed in 1931 and some of the features still survive, notably the incline with some of its winching equipment and the large stone quay built on the north-eastern side of the headland (site no. 61).

3.3.2 Tourism

The decline of the copper industry saw the development of the town of Llandudno as a major sea-side resort. The inspiration for this came mainly from the surveyor Owen Williams who first recognised the potential to develop the bay into a fashionable bathing resort and subsequently convinced the Mostyn family. The first enclosure act was passed by Parliament in 1843 and was soon followed by further acts. Development was tightly controlled, with the overall plan for the town being drawn up by Wehnert and Ashdown, a London firm of architects and surveyors(Williams 1996, 55). This meant that the street pattern was laid down by estate, and leaseholders could summit proposed buildings for approval to the estate, resulting in the present day variety of Victorian architecture in the town, and its remarkable homogeneity as a town (Rh. Gwyn 1996, 3).

The first pier at Llandudno was built in 1858. It had no practical purpose but had been built to protect the rights of the St George's Harbour & Railway Company, who had received Parliamentary approval to convert the undeveloped bay into a harbour (Wynn Jones 1977, 36). This was destroyed the following year by a major storm, but the footings are still visible on the foreshore (site no. 44). The second and present pier was built between 1876-7 by the Llandudno Pier Company to the designs of James Brunlees and Alexander McKerrow (Gwyn 1996, 3). Other recreational features identified during the study demonstrate the diverse nature of the entertainment's available i.e. the remains of the diving board (site no. 48), the nineteenth century gardens at Happy Valley (site no. 42) and the Marine Drive, which encircles the Great Orme and was built between 1875 and 1878 (Wynn Jones 1975, 45).

3.3.3 Defence

During the Second World War the Coastal Artillery School was relocated from the south of England to the Great Orme's Head. The remains of this gunnery school can be found on the north-western corner of the headland. The previous coastal survey (Smith. 1993) covered the majority of sites but a small number are included in this survey, including the observation huts (site no. 1) and the remains of concrete structures at site 8 and 69). The pill box (site 36) also dates from this period and protects the coast guard hut nearby. Gun emplacements of the school were also located on the Little Orme's Head, the lookout (site no. 58) probably dates from this period.

One of the earliest radar stations was also located on the summit of the Great Orme, however, none of the installations connected with this fell into the survey area.

4 DESIGNATION OF ARCHAEOLOGICAL IMPORTANCE

Each site recorded in the survey has been evaluated in order to assign it a value of importance. The categories follow those used by the Gwynedd Archaeological Trust for assessments projects, and are:

Category A - Sites of National Importance

Presently Schedule Ancient Monuments and Listed Buildings as well as those sites which would meet the requirements for scheduling (ancient monuments) or listed (buildings) or both.

Category B - Sites of Regional Importance

Sites which would not fulfil the criteria for scheduling or listing, but which are nevertheless of particular importance within the region.

Category C - Sites of District or Local Importance

Sites which are not of sufficient importance to justify a recommendation for preservation if threatened.

Category D - Minor and Damaged Sites

Sites which are of minor importance or so badly damaged that too little remains to justify their inclusion in a higher category.

Category E - Sites needing further investigation

Sites the importance of which is as yet undetermined and which will require further work before they can be allocated to categories A-D are temporarily placed in this category, with specific recommendations for further evaluation.

5 SITE CONDITION

The category in the site gazetteer indicates the present level of preservation for each site and is defined as below:

A - Very Good

B - Good

C - Fair

D - Poor

E - Bad

U - Unknown (usually refers to a find)

6 RECORDING THE COASTLINE

The 11.55km of coastline surveyed comprised of 9 units of changes in the coast edge. Each unit was defined by four categories.
The records use three descriptive types: *coast edge*, *land edge* and *foreshore*. *Coast edge type* describes the actual interface between the land and the tidal zone. The *land edge type* describes the land-use of the land

immediately adjoining the coast edge. The *foreshore type* describes the intertidal area up to highest storm tide height at the coast edge.

6.1 Coast Edge Type

This includes 12 categories:

1 Man-made wall
2 " " bank
3 " " mixed rubble dump
4 " " boulder dump
5 " " other
6 Mainly rock
7 Rock with drift cover
8 Rock to tide line with drift cover
9 Drift, boulder clay
10 Drift, sand/blown sand
11 Alluvial/marine mud
12 Other

6.2 Land Edge Type

This relates to land-use rather than physical type, ordered in terms of the extent of human interference.

1 Man-made structures
2 Arable
3 Improved pasture
4 Scrub/heath/rough pasture
5 Coppice/woodland
6 Other

Man-made structures can be any kind of building, road or structure. Arable use is infrequent and spasmodic and for the area investigated

6.3 Foreshore Type

This was recorded because it gives some clues as to the state of erosion - for instance, a mud foreshore shows a lack of erosion. It also shows the effect of post-glacial rising sea-levels. A steep rocky coast will change little as sea-level rises while a very shallow foreshore will change considerably. The following are the types used:

1 Rock
2 Boulder
3 Shingle
4 Sand
5 Mud
6 Marsh
7 Mixed
8 Other

6.4 Erosion class

This depended on a visual assessment of the condition of the coast edge, and is therefore not a strict quantification. The survey looked for immediately evident signs of erosion such as soil exposures, slumps, the presence and type of covering vegetation and the condition of land-edge field boundaries.

The following are the classes used:

1	Stable	-	No erosion, accretion or man-made protection.
2	Slight	-	Some soil exposure but well vegetated and post-medieval boundaries largely intact.
3	Medium	-	Widespread soil exposure, intermittent slumping. Post-medieval boundaries largely gone.
4	Major	-	General soil exposure, frequent slumping, little vegetation, no post-medieval boundaries.
5	Severe	-	Widespread slumping, no vegetation, recent boundaries undercut.

For the purpose of the database, sites were assigned to the categories *Prehistoric*, *Roman*, *Early Medieval*, *Medieval*, *Post-Medieval and Modern* (twentieth century).

Erosion classification as allocated to sites is not a simple reflection of erosion classification as applied to the coastline; for instance, a feature or site inland of a stretch of eroding coast will have been allocated a lower erosion category than the adjacent coast if it is better protected.

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7 STATUTORY AND NON-STATUTORY DESIGNATED AREAS AND SITES

a. Country Park

Much of the Great Orme, in the ownership of Conwy County Council and Mostyn Estates, was designated as a Country Park (under the provisions of The Countryside Act 1968) in 1981.

b. Heritage Coast

This describes lengths of unspoilt coastline defined in the past by the Countryside Commission (whose role has now been taken over by the Countryside Council for Wales - CCW) and local authorities. The Great Orme Heritage Coast was defined by the Countryside Commission in 1974 in view of the site's outstanding coastal landscape qualities. This is not a statutory designation, but is given consideration in the local land-use planning process.

c. Sites of Special Scientific Interest

This is a designation applied to land of special conservation value. Its management is usually controlled by the owner or tenant according to an agreement made with the Countryside Council of Wales. Most of the Great Orme is designated as an SSSI as is the Little Orme.

d. Landscape Conservation Area

The whole of the Great Orme is designated as a Landscape Conservation Area in Llandudno and Conwy Local Plan 1982.

e. Local Nature Reserve

These areas are examples of the best natural or semi-natural ecosystems in Britain. The responsibility for National Nature Reserves lies with the Countryside Council for Wales. Parts of the Great Orme were covered by this designation in 1981.

f. Special Area of Conservation

Most of the SSSI is a candidate SAC, resultant from E.C. Habitats Directive. The Great Orme has been included on the list of candidates SACs to be sent to the European Commission for formal consideration (1996).

The Great Orme is also included in both the Nature Conservation Review and the Geological Conservation Review, indicating its national importance.

8 RECOMMENDATIONS

Specific management recommendations for each individual site can be found in the site gazetteer (section 9), however, management recommendations for one important site thought to be under threat is summarised below:

The submerged peat beds/forest (site no. 50) at the eastern end of the north shore at Llandudno appears to be increasingly exposed as sand is removed from this area, apparently as the result of recent sea defence work west of the site. It would appear that these remains are present along most of the north shore but are being exposed at certain points due to changing beach levels. As a number of artefacts dating to the Bronze Age have already been recovered from the areas of the submerged peat beds, the archaeological as well as environmental potential from these deposits is clear. It is, therefore, recommended that a programme of archaeological recording and monitoring is put into place so that the full archaeological potential of the site can be realised.

GAZETTEER OF ARCHAEOLOGICAL SITES AND LIST OF COASTAL UNITS

Abbreviations used in the gazetteer:

SITENO - Site number (for project)

NGR - National Grid Reference

CON - Site condition

CATEGORY - Designation of archaeological importance

ERTYPE - Erosion type

MANAGE - Recommendations for management of sites

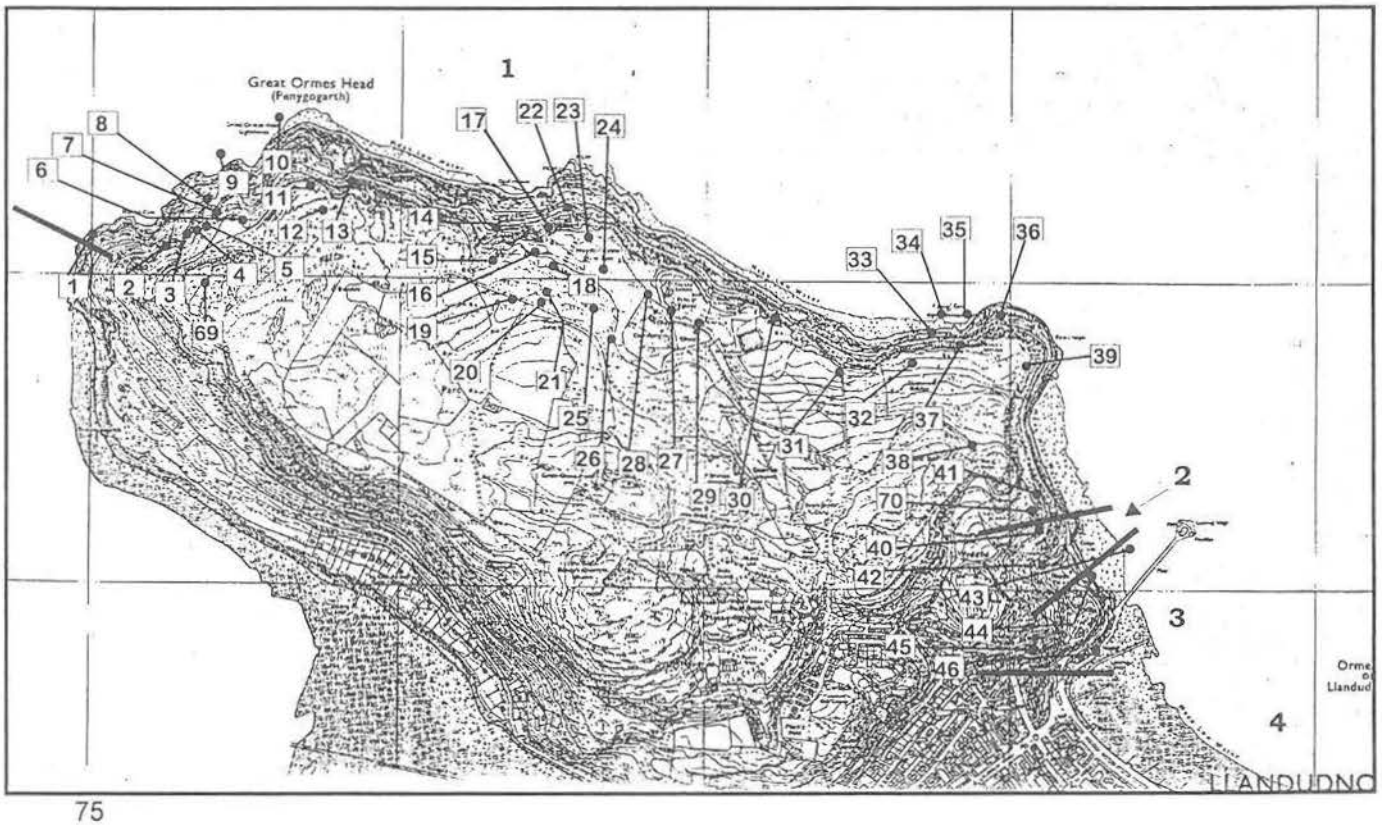
UNDETER - Undetermined date

CEDGENO - Coast edge number

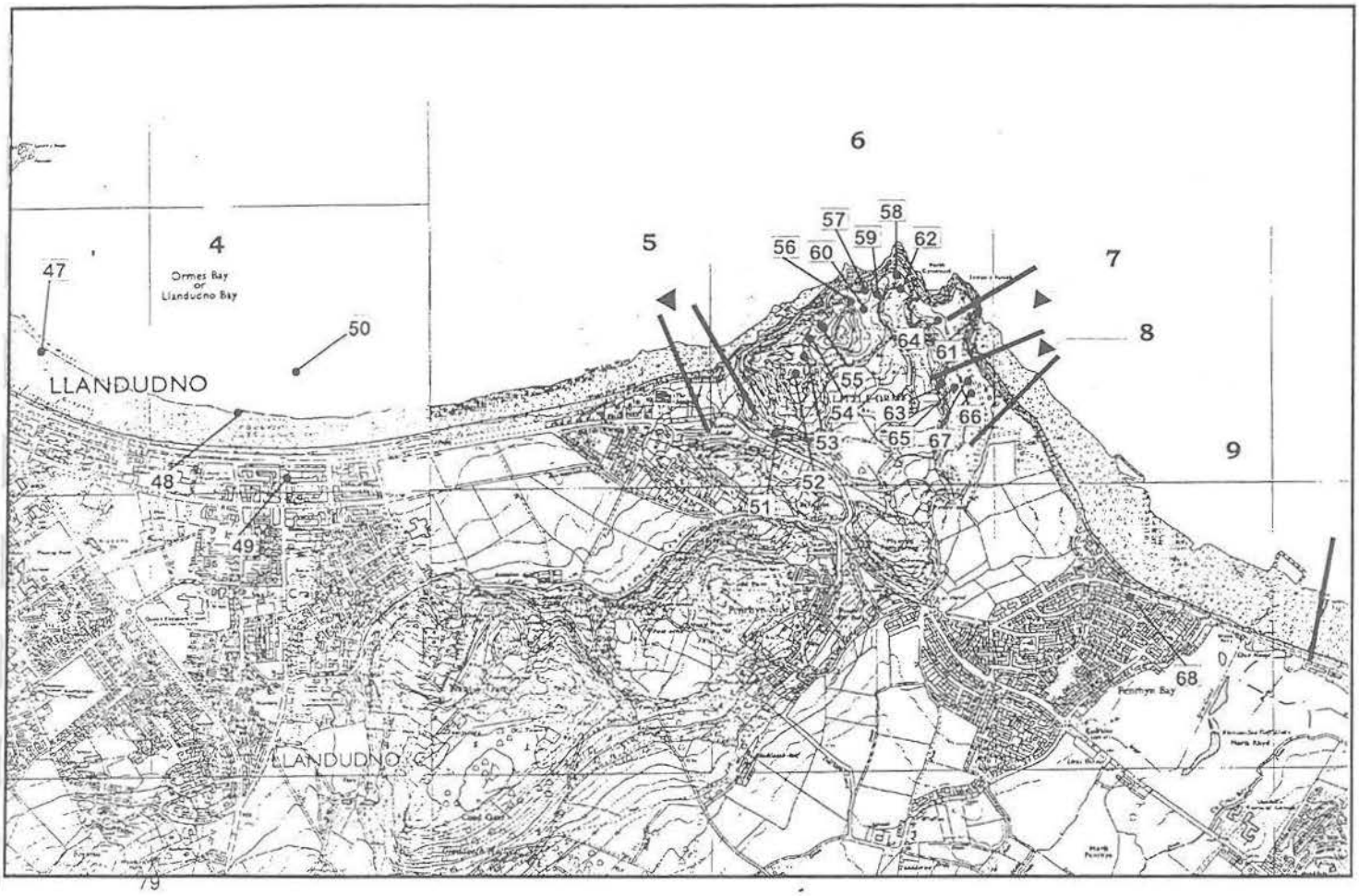
CETYPE - Coast edge type

Maps:

Map 1 Great Orme Head to Llandudno Bay



Map 2 Llandudno Bay to Penrhyn Bay



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