



## The Maritime Archaeology of the Welsh Slate Trade

Archaeological Desk-based Assessment





# THE MARITIME ARCHAEOLOGY OF THE WELSH SLATE TRADE

## ARCHAEOLOGICAL DESK-BASED ASSESSMENT

Prepared by:

**Wessex Archaeology**

Portway House  
Old Sarum Park  
Salisbury  
SP4 6EB

Prepared for:

**Cadw**

Welsh Assembly Government  
Plas Carew  
Unit 5/7 Cefn Coed  
Parc Nantgarw  
Cardiff  
CF15 7QQ

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### **Summary**

Wessex Archaeology was commissioned by Cadw to undertake a thematic desk-based assessment of the maritime archaeology of the trade in Welsh slate. This work was undertaken as part of the Contract for Archaeological Services in Relation to the Protection of Wrecks Act (1973).

The Welsh slate industry reached its peak in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, employing up to 17,000 people in numerous quarries, mainly located in North Wales. This peak was the culmination of a long history of slate extraction in Wales; the earliest evidence of slate as a roofing material dates to the Roman period.

The exploitation of slate was carried out on a small-scale basis throughout the medieval and most of the Post-medieval period. Slate was shipped from small harbours and beaches in Wales on to the larger ports of Britain and Ireland. Towards the end of the Post-medieval period the small slate workings were amalgamated into large industrialised operations to meet the increasing demand for slate. This resulted in a large increase in slate output and the development of harbours, settlements and infrastructure. By the middle of the 19<sup>th</sup> century the slate industry was the driving force in North Wales, with industries such as shipbuilding and exporting harbours existing to support the trade.

This report provides a synthesis of available information concerning the history of the slate industry and its maritime aspects. Primary and secondary data sources were reviewed to compile lists of known wrecks and recorded losses. Information on losses connected with the worldwide shipment of slate was also included to reflect the international character of the trade.

This assessment identified 126 recorded losses of slate-carrying vessels off the coast of Wales. However, only 29 known wrecks of slate-carrying vessels are known from UK territorial waters, of which 23 lie off Wales. Information regarding known wrecks was found to be limited, as the identity of the majority of these wrecks is unknown. Documented losses were generally recorded with additional information and these have been analysed based on vessel type, ports of registry and voyages to see how they fit within the context of current knowledge about the shipping of Welsh slate. Known wrecks and recorded losses have also been analysed with regard to their spatial distribution in order to highlight areas of high archaeological potential.

During the course of this assessment it was found that there is a relative lack of information with regard to the maritime archaeology of the Welsh slate trade. The report seeks to address that information gap and makes recommendations on how to further enhance the understanding of this industry.

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- UK Diving Forum.

The assessment was carried out by Niall Callan with contributions from Graham Scott. Kitty Brandon prepared the illustrations and Steve Webster edited the report and managed the project for Wessex Archaeology.

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# THE MARITIME ARCHAEOLOGY OF THE WELSH SLATE TRADE

## ARCHAEOLOGICAL DESK-BASED ASSESSMENT

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### 1. ASSESSMENT BACKGROUND

#### 1.1. INTRODUCTION

1.1.1. This document has been prepared by Wessex Archaeology (WA) for Cadw as part of a thematic assessment of the maritime archaeology of the Welsh slate industry.

1.1.2. The work was conducted as part of an agreed programme of works undertaken as part of the Contract for Archaeological Services in Relation to the Protection of Wrecks Act (1973).

#### 1.2. OBJECTIVES

1.2.1. The following objectives were set by Cadw:

- present a synthesis of the historical development of the maritime slate trade of Wales;
- against this background, identify and undertake a desk-based scoping assessment of known maritime losses and wreck sites connected with the slate trade in UK territorial waters bordering Wales.

#### 1.3. DOCUMENT PARAMETERS

1.3.1. This report represents a preliminary desk-based assessment of a complex subject. It should also be noted that whereas every attempt has been made to ensure that the facts within the report are correct; errors arising from the preliminary character of the desk-based study may be present.

### 2. METHODOLOGY

#### 2.1. INTRODUCTION

2.1.1. The methodology adopted reflects best practice in carrying out archaeological desk-based assessments, as codified by the Institute for Archaeologists (IfA) *Standard and Guidance for Archaeological Desk-based Assessment* (IfA 2006).

2.1.2. This report will assess the maritime archaeology of the Welsh slate trade in terms of known wrecks and known losses described as carrying cargoes of slate. The associations between these vessels and the main slate producing areas of Wales are examined in an attempt to suggest the potential for the presence of as yet undiscovered wreck sites in relation to these areas. The principal slate producing regions and slate exporting ports are depicted in **Figure 1**.



2.1.3. While it is not within the scope of this report to assess the archaeological character of the Welsh slate trade in terms of land-based monuments, the report includes a list of monuments relevant to the slate industry in order to illustrate the density of industrial activity with regard to the coastal landscape of Wales. **Figure 2** depicts the locations of the quarries, slate processing works and slate wharves around Wales.

## 2.2. DATA SOURCES

2.2.1. The principal sources consulted in this assessment are as follows:

- Records of wrecks and obstructions collated by the United Kingdom Hydrographic Office (UKHO);
- Records from the National Monuments Record of Wales (NMRW) Coflein database, held by the Royal Commission for the Ancient and Historical Monuments of Wales (RCAHMW), of known terrestrial sites, known wrecks and documented losses;
- Records of wrecks and documented losses from the *Shipwreck Index of the British Isles Volume 5 – West Coast and Wales*, compiled by Richard and Bridget Larn (Larn and Larn 2000);
- Records of wrecks and documented losses from the *Underwater Guide to North Wales* (Volumes I and II), compiled by Chris Holden (Holden 2003a and 2003b) and additional information collected by Mr. Holden through his own personal research;
- Information regarding wreck sites from personal experiences of members of the UK diving community, sourced through various diving internet forums;
- Various contemporary publications and sources;
- Various secondary and documentary sources.

2.2.2. Records of known wrecks and documented losses were compiled into gazetteers which are included as appendices to this report. Known wrecks were listed in a number sequence starting at **WA 1001** and are listed in **Appendix I**. Documented losses were listed in a number sequence starting at **WA 2001**; these are listed in **Appendix II**.

2.2.3. The distribution of known wrecks and documented losses is depicted in **Figure 3**, however it should be noted that the positions of the documented losses may not be reliable. The issues surrounding the reliability of records of documented losses are described in Section 4.4.

2.2.4. During the course of this assessment WA received information on a number of wrecks of slate-carrying vessels that occur outside of UK territorial waters. These wrecks are included in this report as they demonstrate the international character of this industry; they are listed in **Appendix III** in a number sequence starting at **WA 3001**.

2.2.5. Information on relevant terrestrial monuments such as slate quarries, processing works, wharves and quays held in the RCAHMW Coflein database was examined to provide a context for the maritime archaeology of the industry. These monuments are listed by name and type in **Appendix IV**, in a number sequence starting at **WA 4001**.

### **3. BACKGROUND TO THE WELSH SLATE TRADE**

#### **3.1. INTRODUCTION**

- 3.1.1. This section will examine the development of the slate industry over time and highlight its importance in terms of the cultural heritage of Wales.
- 3.1.2. Along with the coal industry, the slate industry was one of the biggest industries in Wales and the UK as a whole in the 19<sup>th</sup> and early 20<sup>th</sup> centuries. At its peak, the industry employed 17,000 men in various roles in the quarries (Richards 1995: 146), and Welsh slate was being shipped throughout the world.
- 3.1.3. From the 19<sup>th</sup> century onwards, slate was extracted on such a scale that the quarries of North Wales became the biggest exporters of slate in the world. The slate was exported as far afield as Australia and the Americas where it was used to give European architectural style to the developing settlements.
- 3.1.4. The exploitation of slate in Wales began long before the industrial quarrying that characterised the 19<sup>th</sup> century boom in the industry. The earliest evidence for the use of slate in buildings comes from the Roman period, and it is known that widespread slate extraction was occurring in the medieval and Post-medieval periods, albeit on a relatively small scale and individual basis. During this time, the maritime trade in slate began to develop and the earliest positive evidence for slate-carrying wrecks dates from the medieval period.
- 3.1.5. The closing years of the 18<sup>th</sup> century saw the consolidation of the numerous small slate extracting concerns into large quarries, as individual leases were bought out and amalgamated. This was the beginning of the industrialisation of the slate trade and its expansion, which would dominate the landscape and seascape of Wales, particularly in the north, until the early 20<sup>th</sup> century.
- 3.1.6. The location of the majority of the large slate quarries in the less densely populated north-west meant that the slate extraction industry contributed directly to the establishment of new villages, towns and ports which existed solely to service this industry. The impact of the industry on the culture and communities in these areas was considerable as it sustained populations through continued employment that would otherwise have suffered from the rural decline which was occurring all over 19<sup>th</sup> century Britain..

#### **3.2. THE SLATE DEPOSITS OF WALES**

- 3.2.1. Slate is a fine grained metamorphic rock derived from an original geology of sedimentary rocks based on clay and volcanic sediments. The slate deposits in Wales date to three geological series; the Cambrian, Ordovician and Silurian.
- 3.2.2. The slates of Caernarfonshire belong to the Cambrian group, running in a band roughly north-east to south-west from Conwy to Criccieth; they are generally reddish, purple or blue, with green slate occurring in some of the upper veins in the Nantlle Valley. The two bands of Ordovician slates are centred around Ffestiniog and Corris; Ffestiniog slates are generally grey-blue in colour while Corris slates have a rusty tint. Silurian slates occur to the east in the Dee Valley and can be dark and close to black in colour (Burn 1976: 52).

- 3.2.3. Slate extracted from the Welsh quarries was used primarily as a roofing material, 97 percent of the product of the quarries being used for this purpose (*ibid.*). Its suitability for roofing was due to several factors: it was waterproof, strong but moderate in weight, and it was incombustible.
- 3.2.4. The relative quality of the slate is determined by the metamorphic processes under which it formed. Metamorphic rocks are formed from sedimentary rocks that are subject to heat and pressure from the weight of overlying sediments. Excessive pressure would have formed an inferior product, as the slate would have crumpled and would not be easily cleaved to a smooth face. Similarly, too much heat would have introduced too many crystalline elements into the slate which would also have affected the cleavage; the manner in which the slate could be split.
- 3.2.5. The slates of Wales, in particular the Ordovician slates at Ffestiniog, were formed through a balance of geological processes that was ideal for producing a good quality slate (*ibid.*: 50). Welsh slate was considered superior to Scottish slate, in terms of both durability and appearance (Webster and Roberts 2007: 57).

### **3.3. HISTORY**

#### **Pre-medieval (to 1086 AD)**

- 3.3.1. There is evidence for the use of slate as a building material in Wales since at least the Roman period, although there is no apparent archaeological evidence for slate extraction or transport during this period.
- 3.3.2. Slate was used to roof the later phases of the Roman fort of Segontium near Caernarfon, having apparently superseded the tiles used in the initial construction. Finds in the later levels at this site reflect the use of slate in both roofing and flooring (Lindsay 1974: 18). The closest source of slate to Caernarfon is in the Cilgwyn area, over eight kilometres away. This, in combination with the apparent abandonment of the tiles favoured in earlier phases; suggests that slate was used as a building material by design, rather than because it was an immediately available resource.
- 3.3.3. A mass of shattered Prescelly slate was discovered behind the quay wall at the Roman fort of Isca at Caerleon in South Wales. Prescelly slate was used as a roofing material in the Roman town of Carmarthen, but at Caerleon it appears to have been waste (Murphy 2002: 55). It has been suggested that the slate fragments at Caerleon may represent ballast (Boon 1987: 38) that was taken on at a beach or quay where the nearby exploitation of slate may have generated waste suitable for this purpose (Murphy 2002: 55).

#### **Medieval Period (1086 to 1536 AD)**

- 3.3.4. Slate extraction was being carried out on a small scale in Wales during the medieval period. This is likely to have been the work of individual farmers who exploited slate on their land, or the land they had a lease on, in order to supplement their income.
- 3.3.5. During the medieval period Welsh seaborne trade would have mainly occurred around accessible beaches and coves where a variety of commodities could be landed (Jenkins 2006: 84). With the coming of the Normans, formal quays and harbours began to be developed, linked with the building of Norman castles which could be supplied by sea even when under siege (*ibid.*: 14).



- 3.3.6. The Pwll Fanog medieval wreck, which will be discussed further in Section 4.2, carried a cargo of approximately 20 tonnes of slate. This may represent the work of a number of part-time farmers and quarrymen (Illsley and Roberts 1979: 49). During the Post-medieval period, prior to the consolidation of the slate quarries in the late 18<sup>th</sup> and early 19<sup>th</sup> centuries; the slate industry is known to have had an individualistic structure of lone workers exploiting the resource on a small scale. It would be reasonable to assume that the industry had a similar character in the medieval period.
- 3.3.7. While there is little archaeological evidence regarding the slate workings of this period, there are references to slate extraction occurring at the site of the Cilgwyn quarry in the Nantlle Valley from the 12<sup>th</sup> century onwards (Lindsay 1974: 314). It would seem that slate extraction was occurring both in South and North Wales as there is reference to slate from Cilgerran in Pembrokeshire being exported from Cardigan from the Tudor period onward (Jenkins 2006: 196). This, combined with the proximity of the Pwll Fanog wreck to the major slate exporting ports which developed in the 19<sup>th</sup> century, suggests a continuity of use of similar slate deposits over several centuries.
- 3.3.8. General trade around the Irish Sea had increased significantly in the 14<sup>th</sup> and 15<sup>th</sup> centuries, primarily due to the expansion of herring fishing. Irish vessels were exporting herring from the towns of Dublin and Drogheda to Chester (O'Neill 1989: 29) and there is evidence for a considerable export of slate from North Wales to Ireland in the 16<sup>th</sup> century (Burn 1976: 36), most likely following similar sea routes. At this time there existed a reciprocal trade in herring and coal across the Irish Sea, whereby sea-going cottes from Wexford would land fish at Bridgwater and return to Ireland with coal (DeCourcy Ireland 1989:24). It would be reasonable to suggest that a similar arrangement may have existed with regard to slate with Irish fishing vessels, emptied of their catch, returning from the North Wales coast laden with slate.

#### **Post-medieval Period (1537 to 1799 AD)**

- 3.3.9. Commercial trade continued to expand in the Post-medieval period and there was an increase in maritime traffic around the Welsh coasts. By the early part of the Post-medieval period there was what has been described as 'a veritable armada' of locally owned vessels serving the Welsh coast (Jenkins 2006: 12). This period also saw the continuing expansion of the slate industry, with the consolidation of slate workings into large quarries as the extraction of slate took on an industrial character towards the end of the 18<sup>th</sup> century.
- 3.3.10. There are references to the shipment of slate from the beginning of the Post-medieval period. In 1570 the poet Sion Tudur sent a cywydd poem to the Dean of Bangor in which he petitioned him to send a shipment of slate from Aberogwen to Rhuddlan (Elis-Williams 1988: 12).
- 3.3.11. Prescelly slate was being exported from Newport in the 18<sup>th</sup> century (Jenkins 2006: 191) and there are detailed records of exports from Abercegin, which would later become Porth Penrhyn. It is recorded that as early as 1713 Abercegin was exporting 415,000 slates in 14 shipments to Dublin (Elis-Williams 1988:12). While the industry did not begin to develop fully until the early 19<sup>th</sup> century, it would appear that the foundations were being laid for the boom that was to come, as activity was

already focusing on areas such as Bangor and Abercegin that were central to the later expansion of the industry.

- 3.3.12. At this time however, the manner in which slate was being extracted had changed little since the medieval period. Quarrying would not be organised on an industrial scale until the end of the 18<sup>th</sup> century, and prior to this the extraction of slate continued to have an almost feudal character, being carried on an individual basis by men who leased their small, shallow workings from landowners and paid a small royalty on what they produced.
- 3.3.13. There was no real mercantile organisation of the slate trade and no real basis for a shipping industry. In certain places, slate appears to have been produced and shipped on an almost casual basis that merely responded to peaks in demand. There was, however, continuing growth in general shipping during this period around the Irish Sea. The expansion of trade during the 17<sup>th</sup> and 18<sup>th</sup> centuries led to an ever-increasing level of marine traffic. The economic advantages of transporting goods by sea as opposed to land generated a great deal of coastwise shipping which would continue unabated until the introduction of railways in the 19<sup>th</sup> century (Buchanan 1989: 8-9).
- 3.3.14. As the volume of general shipping increased, Welsh harbours and ports developed to cater for larger numbers of vessels. This is likely to have encouraged acceleration in the development of facilities focused on the repair and building of ships. In this way, the 18<sup>th</sup> century saw the emergence of basic infrastructure which would facilitate the rapid expansion which followed later.
- 3.3.15. The expansion of the industry in the second half of the 18<sup>th</sup> century was influenced by a number of factors. As previously mentioned, an increase in maritime traffic off the coasts of Wales had, over centuries, resulted in the development of better infrastructure for trade and export. The sources which were to become the major centres of slate production had been known about and exploited for centuries, in some cases apparently since the Roman period. New workings were continuing to be opened up, with Methusalem Jones starting to work on the site of the first large quarry in Blaenau Ffestiniog in the 1760s, which would become the Diffwys quarry (Lewis and Williams 1987: 6).
- 3.3.16. During the 18<sup>th</sup> century, the demand for slate grew rapidly, partly due to large population increases and the consequent need for building materials for housing. The population of England and Wales had grown from 5.5 million in the beginning of the 18<sup>th</sup> century to 9 million by the end of the century (Burn 1976: 36) and continued to grow at an exponential rate.
- 3.3.17. The structure of the slate industry began to change as landowners realised the income potential that the production of slate could bring to their estates. They ended the practice of the 'take-note', whereby individuals could lease and work their land and pay only a small royalty on the slate produced, and began to consolidate all of the small workings on their estates into unified operations.
- 3.3.18. The major consolidation of the slate quarries began with Richard Pennant of the Penrhyn Estate. For a century since the death of Sir Robert Williams in 1678, the Penrhyn Estate had been split between his two co-heiresses and their descendants,

the Warburtons of Cheshire and the Yonges of Devon. The development potential of the estate had largely been neglected as it was controlled by absentee landlords from two separate family branches (Elis-Williams 1988: 13).

- 3.3.19. When Richard Pennant married the Warburton heiress in 1765, he began to secure the estate and by 1781 he had control over both halves of the Penrhyn inheritance (*ibid.*: 14). Control of the entire Penrhyn Estate now rested with a single individual who was resident in the area. Richard Pennant had the capital through his father, a wealthy owner of Jamaican plantations, to develop the Penrhyn Estate and one of his first acts was buy out or eject those operating small-scale slate workings and gather together the 54 individual slate quarrying leases into a single industrial operation (*ibid.*). At this time he opened a new large quarry at Bethesda which would later become the main Penrhyn Quarry (**Plate 1**).
- 3.3.20. In 1787, a single large partnership set up the Dinorwig quarry, buying out small quarries in the area to consolidate the quarries of Bryn Glas and Allt Ddu. This quarry immediately ran into difficulties over transport costs incurred by quarrying on an industrial scale (Illsley and Roberts 1979: 49) and was later taken over by the land owner Thomas Assheton Smith in 1809.
- 3.3.21. Similar small slate workings continued to be bought out and amalgamated into large quarries throughout the 19<sup>th</sup> century. In this way the slate industry became transformed from an individualistic industry providing income for quarrymen and farmers on a domestic level, to a major industrial concern generating large incomes for landowners and quarry owners.
- 3.3.22. The initial years of expansion were hampered slightly due to the Napoleonic wars and high transport costs. The shipping of slate was considered hazardous, not just because of the danger from French ships, but also because experienced seamen were at risk of being targeted by press gangs (Elis-Williams 1988: 15).
- 3.3.23. In 1794 Pitt imposed a 20 per cent duty on slate carried by coastwise shipping (Burn 1976: 36) that impacted the Welsh slate trade in particular. As the Welsh slate quarries had no access to the network of canals that other producers benefited from (Lindsay 1974: 91-2), almost all slate had to be shipped coastwise and this situation continued until the abolition of the duty in 1830.
- 3.3.24. Despite these setbacks the industry began to thrive, and in 1790 Richard Pennant built a quay at Abercegin to export the slate from his quarries (Jenkins 2006: 20). Slate had been exported from the strand at Traeth Hiraël near Abercegin for many years before this (*ibid.*: 263), but the building of the quay marked the beginning of Porth Penrhyn, one of the first and most important of the purpose-built ports of the slate industry. In the period between the building of the quay and the outbreak of the wars with France it is recorded that a dozen slate ships were leaving Porth Penrhyn each month (Elis-Williams 1988: 14).

#### **Modern (1800 to Present)**

- 3.3.25. The growth of the slate industry in the final years of the 18<sup>th</sup> century had been phenomenal and by 1793 Wales was producing more than half of the United Kingdom's output of slate; a recorded 26,000 out of 45,000 tonnes (Williams 1991: 5). The Modern period saw the further expansion of the slate industry, the



development of its associated ports and harbours and the use of new technology to maximise production and transport.

- 3.3.26. At the beginning of the Modern period, the principal quarries were those owned by the Penrhyn family in Bethesda and the Dinorwig quarry in Llanberis. The Assheton Smith family took over operation of the Dinorwig quarry in 1809 (Illsley and Roberts 1979: 49) and began to develop Y Felinheli (Port Dinorwig) as a major harbour to export its slate.
- 3.3.27. The site of the Diffwys quarry was sold in 1800. This site had been worked for many years by a group of local people, led by Methusalem Jones; they put in a bid for the site but were unsuccessful and the sale went to a Lancashire speculator, William Turner, and his partners the Casson brothers (Burn 1976: 12).
- 3.3.28. The other main quarries of Ffestiniog began to be developed in the years that followed. Samuel Holland passed the management of the Rhiwbryfdir quarry, which he had leased from the Oakley family, to his son Samuel in 1821. The output from the quarry increased and the younger Samuel Holland opened an eponymous quarry in 1831 (*ibid.*).
- 3.3.29. In the 1830s John Whitehead Greaves took leases on two quarries in Caernarfonshire and Ffestiniog and began to work them. The output from these quarries was not particularly good and in 1846 he took a lease on another site and was fortunate enough to hit a rich vein of slate, known as the Old Vein, which became the massive Llechwedd quarry (*ibid.*: 12-13).
- 3.3.30. The infrastructure serving the Welsh slate trade was enhanced at this time by the founding of new harbours to handle the increased output of the quarries. William Alexander Madocks began to reclaim marshland on his estate and began construction of the harbour at Porthmadog which would become one of the busiest ports of the slate trade.
- 3.3.31. The main Ffestiniog quarry operators, Samuel Holland and John Whitehead Greaves, constructed their own wharves at Porthmadog (*ibid.*: 14) and the operation of the port was further enhanced with the constructions of tramways and railways which brought the slate directly from the quarries to the port.
- 3.3.32. Similar tramways and railways were constructed to link the harbours at Porth Penrhyn and Y Felinheli to the quarries they serviced. The harbour at Y Felinheli was completed with the construction of an enclosed dock in 1824 (Jenkins 2006: 261), and Porth Penrhyn was extended in 1829 and 1855 (Elis-Williams 1988: 14).
- 3.3.33. The slate industry grew steadily throughout the 19<sup>th</sup> century, providing employment and sustaining communities in North Wales in particular. The end of the Napoleonic wars had caused an agricultural depression and many men who had been farmers began to work in the quarries (Burn 1976: 36).
- 3.3.34. The duty which had been imposed by Pitt on the coastwise shipping of slate was abolished in 1830. This, combined with the replacement of pack horses by horse-

drawn tramways at many of the quarries, made the overall transportation of slate much more economical, and the slate trade became even more profitable.

- 3.3.35. The industry was further assisted by the growing demand from Germany, which became the biggest importer of Welsh slate in Europe following the Great Fire of Hamburg in 1842 (Elis-Williams 1988: 57). The international markets to slate continued to open up and the 1860s saw reduction of tariffs on slate imports to France (Burn 1976: 37).
- 3.3.36. By the 1860s the slate trade was thriving, with ships reportedly queuing for cargoes in the slate ports (*ibid.*) and 58 limited liability companies were recorded to be operating in the Welsh slate industry (*ibid.*: 36).
- 3.3.37. The industry began to decline in the 1870s as the UK entered a slump that lasted into the 1880s. Many quarries suffered from a lack of capital and many lost skilled workers to the emerging American slate operations, which usually offered better pay and opportunities to prospective emigrants.
- 3.3.38. Developments in international trade further accelerated the decline in the industry. After the Great Fire of Hamburg, the North Wales slate quarries, particularly those in the Ffestiniog area, began to rely on Germany as one of their main importers. Germany was importing 35 per cent of all Ffestiniog slate and in 1885 German quarry owners were pressuring their government to introduce tariffs on slate imports (*ibid.*: 37). This, in addition to the competition from imported American slate, led to further difficulties which would be worsened by competition from mass-produced roofing tiles (*ibid.*: 42).
- 3.3.39. The industry began to recover towards the end of the 19<sup>th</sup> century and North Wales continued to provide 80 per cent of the UK's slate output (*ibid.*: 37). The *Brisbane Courier* reported on 24<sup>th</sup> April 1893 that:
- ‘The North Wales slate trade is in a very satisfactory condition, and at Lord Penrhyn's Carnarvonshire quarries the wages have been advanced 5 per cent all round, and notices have been posted at the Llanberis quarries, belonging to Mr. Assheton Smith, of an average increase of 3 per cent at the close of the present working months.’
- 3.3.40. This boom did not last, however, and as the industry began its final decline at the turn of the 20<sup>th</sup> century, the situation was compounded by the strikes and lockouts at the Assheton Smith quarry in Dinorwig and the Penrhyn quarries in Bethesda.
- 3.3.41. There was a lockout at Dinorwig from late 1885 until February of 1886 and a strike at Penrhyn Quarry in 1896 (Jones 1981). The worst industrial dispute was the second Penrhyn lockout which lasted from 1900 to 1903 and reduced output from the Penrhyn quarries to such an extent that the dominance of the Welsh slate industry began to be eroded. It is thought that the decline in slate output led to the development of the tile industry to such an extent that it could effectively compete with slate as a roofing material (*ibid.*: 39). In addition to this, French slate producers took advantage of the situation by increasing their exports to Britain (*ibid.*: 40).

- 3.3.42. A number of Ffestiniog quarries began to cease operation prior to World War I, and the remaining quarries suffered during the war due to the loss of the German market. In addition to this, slate was not listed as an essential industry (*ibid.*: 41) and there were problems with the workforce as many skilled workers were killed or incapacitated during the war.
- 3.3.43. The demand for more houses after World War I resulted in a slight recovery for the slate industry, but it would never regain the levels of productivity and profitability that it had previously enjoyed. A similar slump and mild recovery occurred due to World War II; slate was used to repair some bomb-damaged buildings after the war but a ban was imposed on using all but the smallest sizes of slate to roof new houses. This ban existed until 1949 (Richards 1994:183-4).
- 3.3.44. With the demand for slate reduced, the majority of the remaining large quarries ceased operation in the decades after World War II; today slate is produced at a reduced capacity. The company Welsh Slate operates quarries at Bethesda, Pen y Orsedd, Cwt y Bugail and the old Oakley quarry at Gloddfa Ganol. Slate is still reclaimed from the Llechwedd Quarry by the company founded by John Whitehead Greaves and the Berwyn Slate Company operates a small quarry near Llangollen.
- 3.3.45. Some of the waste slate produced by the quarries is currently being recycled as secondary aggregates. The company Welsh Slate currently sells one million tonnes of waste slate aggregate per annum ([www.welshslate.com](http://www.welshslate.com)).

#### **3.4. PORTS AND SETTLEMENT**

- 3.4.1. The Welsh slate industry had a profound impact on the development of ports and settlements, particularly in North Wales. Prior to the development of railway branches linking the towns of Wales to the main railway lines in the later 19<sup>th</sup> century, the geography of North Wales necessitated the transport of slate by sea. Even the establishment of inland rail linkages did not overly diminish the importance of the Welsh slate ports, as many quarries had by this time constructed their own tramways and narrow gauge railways to take their product directly from the quarry to the wharves, thus the shipment of slate by sea continued to be important.
- 3.4.2. The dominance of the industry resulted in the development of existing small harbours into major exporting centres. In several cases, ports and harbours were constructed where none had existed before, solely to facilitate the export of slate. The settlement patterns of North Wales reflect the importance of the industry, with settlements expanding near the major quarries and ports.
- 3.4.3. During the Industrial Revolution, there was a pronounced population shift in Britain, with people moving away from more marginal or rural areas and settling in cities (McClellan and Dorn 2006: 279). North Wales was essentially a mountainous rural area, similar to many marginal regions which experienced large-scale depopulation during this period. However, the area experienced a population increase (rather than a decline) because it was able to sustain its population due to the employment offered by the slate industry (Morgan 1982: 5).
- 3.4.4. The settlement patterns also suggest some of the social issues pertaining to the interaction between quarry workers and quarry owners. The workers of the slate

industry had a strong sense of independence, considering themselves contractors rather than employees. As a result many of the new settlements that were founded to house workers reflected this. The town of Bethesda, for example, was sited in proximity to the Penrhyn quarries but was deliberately not sited on lands owned by the Lords Penrhyn (Gwyn 1992: 12).

- 3.4.5. The settlements which developed around the slate ports were populated by a range of people including shipbuilders, slate merchants, carpenters and mariners. While the population of the port towns was not as exclusively involved with the slate industry as the quarry settlements, the ports still relied on the slate industry for their prosperity and continued development. The dependence of these settlements on the Welsh slate industry led to an inevitable decline in populations as the industry ceased large-scale production after World War II (Morgan 1982: 326).
- 3.4.6. The development of the main slate-exporting ports will be briefly outlined below. Also, the current role of the port will be described in order to highlight the impact of the decline of the slate industry on the economic activities of the settlements it established.

#### **Caernarfon**

- 3.4.7. There is evidence for the use of slate as a building material at the Roman fort of Segontium near Caernarfon. While there is no evidence of a maritime trade in slate near Caernarfon for this period, it is possible that slate was exported using the Menai Strait as a route from Segontium to other parts of Britain.
- 3.4.8. The construction of Caernarfon Castle by Edward I is likely to have led to increased maritime activity in the area, as the castle would have been supplied from the sea via the Menai Strait. While there is no direct evidence for the export of slate from Caernarfon until the Post-medieval period, the medieval period is likely to have seen an increase in small-scale slate production and trade.
- 3.4.9. The quarry at Cilgwyn is thought to have been worked since the medieval period, and, as the largest nearby coastal settlement, Caernarfon is the most likely place to have been used for the export of Cilgwyn slate, as it was in later periods. Indeed the landing place for the medieval castle was sited in the area that would later become the main slate quay for the 19<sup>th</sup> century harbour of Caernarfon (Jenkins 2006: 267).
- 3.4.10. Caernarfon had been granted borough status in the medieval period and by the Post-medieval period it was a well-established town. Even before the consolidation and mass expansion of the slate industry, Caernarfon was exporting a large volume of slate from the quarries in the Nantlle Valley, recorded as having handled four million Cilgwyn slates in 1747 alone (Elis-Williams 1988: 12).
- 3.4.11. The harbour at Caernarfon was well established by the Post-medieval period, sited in the sheltered estuary of the River Seiont. In 1817 the harbour was improved by the reclamation of an extensive area which would become the slate (Llechi) quay (**Plate 2**). Llechi Quay was built to deal with the output from the Nantlle Valley quarries and export increased further with the construction of a narrow gauge railway in 1828 that directly linked these quarries to Caernarfon (Wynne Jones 2001: 86). Caernarfon became the centre of a wider network of slate distribution, with slate arriving not only by railway from the Nantlle Valley but also in river boats which

brought slate from the Dinorwig quarry via Llyn Padarn, Llyn Peris and the rivers Rhythallt and Seiont (Illsley and Roberts 1979: 47).

- 3.4.12. Caernarfon had been considered a subordinate port to Beaumaris, but from 1840 onwards it became the port of registry for every ship from Y Felinheli to Barmouth, including Porthmadog and Pwllheli (Jenkins 2006: 258). It is recorded that 85,044 tonnes of slate were shipped from Caernarfon in 1844 (Gwyn 2002: 68) and it is said that more slates were exported from Caernarfon than from those ports that were specifically built for the slate industry at Y Felinheli and Porth Penrhyn (Jenkins 2006: 256).
- 3.4.13. With the continuing expansion of the slate industry came the demand for more and more vessels; over 200 ships were built at Caernarfon between 1758 and 1898 (*ibid.*: 258). Most of these are likely to have been schooners, which were the most commonly used ships in the ports of western Britain at that time (Webster and Roberts 2007: 56). The port also relied on shipbuilders at Porthmadog and Pwllheli to meet demand. Space for shipbuilders was limited at Caernarfon in the mid 19<sup>th</sup> century as all other business had by then become subordinate to the slate trade (Jenkins 2006: 258-9).
- 3.4.14. The demand for quayside space was such that Llechi Quay was considered too small to suit the needs of the industry and in 1868 the Caernarfon Harbour Trustees decided to build new port facilities which resulted in the opening of Victoria Dock in the early 1870s (*ibid.*: 257).
- 3.4.15. During the height of its operation as a slate exporting centre, Caernarfon shipped slates throughout Britain and western Europe and established a considerable trade with cities in the United States of America, particularly New York and Boston (*ibid.*: 258). The links with American cities led to Caernarfon being a port of embarkation for emigrants travelling to the United States. Emigration was linked to the slate trade, as will be explained below, and passengers would travel to their new homes living among the slates in the cargo hold for the duration of their journey (*ibid.*: 258).
- 3.4.16. While still operating as a working harbour today, Caernarfon's activity as a slate exporting centre waned towards the end of the 19<sup>th</sup> century and in the early 20<sup>th</sup> century. It had been thought that the construction of Victoria Dock would lead to increased development along the Menai Strait, but this did not occur due to the establishment of an increasing number of railways and the decline in output from the Nantlle Valley quarries in the 1880s (*ibid.*: 257).

#### **Bangor and Porth Penrhyn**

- 3.4.17. Prior to the industrial expansion of the North Wales slate quarries, slate was exported from Abercegin near Bangor, with vessels frequently landing at the strand of Traeth Hiracl prior to the 19<sup>th</sup> century.
- 3.4.18. Following the consolidation of the Penrhyn Estate quarries, Richard Pennant, by then Lord Penrhyn, had a stone quay constructed at Abercegin to be exclusively used to handle the slate from his quarries. The stone quay was built in 1790 and a road was constructed from the Penrhyn quarries to the quay, enabling slate to be transported to the quay by horse-drawn wagons rather than the packhorses which had been used earlier (Elis-Williams 1988: 14).

- 3.4.19. By 1801, the stone quay at Abercegin had become Penrhyn harbour (Jenkins 2006: 20) and had been further developed with wharf offices for the slate reeve constructed by 1803 (Elis-Williams 1988: 14). The wharf was extended in 1829, and further extended with, in 1855, the addition of a breakwater that formed an inner basin for the harbour (*ibid.*).
- 3.4.20. A tramway was constructed in 1798 to link the Bethesda quarries to Porth Penrhyn. It was replaced by a narrow gauge railway in 1801 which was in turn superseded by a steam railway in the 1870s (Jenkins 2006: 264). By 1829 it was said that one hundred vessels could be accommodated at Porth Penrhyn, with room on both sides of the quay for the loading of slates (Eames 1991: 19). The increase in productivity facilitated by these infrastructural developments is evident in the amount of slate being exported from the harbour. Shipments of slate increased from 2,500 tonnes in 1782 to 130,017 tonnes in 1862 and in 1866 it is recorded that 764 ships sailed from Porth Penrhyn (Jenkins 2006: 20-21).
- 3.4.21. Porth Penrhyn continues to operate as a working harbour today, being primarily used by fishing vessels and coasters of up to 3000 tonnes deadweight. Many of the buildings representing Porth Penrhyn's origins as a slate harbour remain today, including the original warehouse, stables, port office and locomotive shed (Gwyn 2002: 69).

### **Porthmadog**

- 3.4.22. Porthmadog, another harbour constructed solely to service the slate industry, was built as a result of a land reclamation plan by the land owner William Alexander Madocks. William Madocks had founded the planned town of Tremadog, construction of which had been completed by 1811. In the same year he constructed an embankment known as the Cob (**Plate 3**) across the neck of the Glaslyn estuary and reclaimed the tidal basin of Traeth Mawr, adding thousands acres to his estate (Wynne Jones 2001: 27).
- 3.4.23. Lock gates were constructed to prevent the sea from passing the embankment. This, combined with the change in hydrodynamics as a result of re-routing the river, resulted in the scouring of a new deep channel around which the port was built (*ibid.*).
- 3.4.24. The construction of Porthmadog was completed by 1820 and by 1825 it was exporting slates from Blaenau Ffestiniog. Samuel Holland, John Whitehead Greaves and the Oakley family, the owners of the Ffestiniog quarries, who built their own wharves at Porthmadog to export their slates (Jenkins 2006: 245-6). The slates were exported in Porthmadog-registered brigs and schooners, some of which were invested in and part-owned by Greaves (Burn 1976: 14).
- 3.4.25. The location of the Ffestiniog quarries meant that it was not a simple task to bring slate to the port. Slates were carried down the steep mountain track on packhorses and horse-drawn carts to the rivers Glaslyn and Dwyryd where they were loaded on to boats which transferred them up the river to larger vessels in the port, or to the anchorage of Ynys Cyngar (Jenkins 2006: 247).
- 3.4.26. In 1836 the Ffestiniog Railway was built to link the quarries to Porthmadog. It was a narrow-gauge railway, originally operated as a gravity incline, whereby wagons were

brought down the graded slope by the force of gravity and then pulled back up by horses that had travelled down the line in dandy wagons (Burn 1976: 14). The railway, which became a steam railway in 1863 (*ibid.*) greatly increased the amount of slate being shipped through the port and was the impetus for Porthmadog's rapid development. Porthmadog later became the terminal for an additional three narrow gauge railways; the Gorseddau, Croesor and Welsh Highland railways (Jenkins 2006: 21).

- 3.4.27. The port grew dramatically throughout the second half of the 19<sup>th</sup> century, and its wharves were full of activity as it became one of the busiest slate exporting ports in Wales (**Plate 4**). An important shipbuilding industry developed in Porthmadog, the first ship having been launched from Traeth Mawr in 1824. Porthmadog became renowned for the building of the schooners known as Western Ocean Yachts, and in total 256 ships were built there (Jenkins 2006: 247).
- 3.4.28. The shipbuilding industry ensured that Porthmadog retained a level of economic prosperity even as the slate industry started to decline at the end of the 19<sup>th</sup> century. The Western Ocean Yachts had originally been schooners involved in the slate trade, shipping slates to Canada and returning with dried and salted fish (MacGregor 1993: 50-51). The development of these schooners into Western Ocean Yachts was linked to their increasing involvement in the North Atlantic fish trade (Starkey 1993: 146). As the main port for the building of these vessels Porthmadog was, to a certain degree, less reliant on the slate industry and continued to be prosperous until the outbreak of World War I.
- 3.4.29. Porthmadog's life as a commercial port was essentially over by the end of World War I. It is now mainly associated with tourism and has a large marina serving pleasure yachts.

#### **Y Felinheli (Port Dinorwig)**

- 3.4.30. The increasing output of the Dinorwig quarry led the Assheton Smiths to develop a major harbour at Y Felinheli. The importance of the quarry to development of the harbour can be seen in the adoption of Port Dinorwic as an alternative name to Y Felinheli during the years when the slate industry was dominant. The Dinorwig quarry was one of the largest in Wales, employing about 3,000 men during its peak production years (Webster and Roberts 2007: 57).
- 3.4.31. The harbour at Y Felinheli was enhanced with the construction of an enclosed dock in 1824 which had a sluice gate, a dry dock for the repair of ships, stone wharves and additional space for the storage and preparation of slate for export (Jenkins 2006: 261).
- 3.4.32. The port was linked to the Dinorwig quarry by a narrow-gauge railway built in 1824. The original railway was horse-drawn, like similar quarry railways in Wales. In 1843 a new track was constructed which was operated by steam locomotives and became known as the Padarn Railway (*ibid.*).
- 3.4.33. Like many of the slate exporting harbours of Wales, Y Felinheli built many of the ships which were to service this trade. Rees Jones, a Barmouth shipbuilder, moved to Y Felinheli in 1849 and was responsible to building 28 schooners in addition to a number of barques, barquentines and brigantines (*ibid.*: 262). One of these vessels



was the *John Preston*, which was wrecked in the Sound of Mull while carrying slate to Fraserburgh (Webster and Roberts 2007: 57), and will be further described below.

- 3.4.34. Like Porthmadog, Y Felinheli ceased to function as a slate exporting port following the general decline of the slate trade in the years leading up to World War I. The smaller ports such as Y Felinheli and Porthmadog did not experience an economic resurgence when the production of slate experienced a moderate recovery in the inter-war years. Y Felinheli is today, like Porthmadog, mostly involved in tourism and is equipped with a marina used by recreational vessels.

#### **Porth-gain**

- 3.4.35. In the south, the towns of Aberiddi and Porth-gain developed to service the slate industry. Porth-gain and Aberiddi were minor harbours prior to the 19<sup>th</sup> century, indeed Aberiddi was isolated enough to be one of the main beaches for smuggling wine and salt in the area (Jenkins 2006: 185). During the 19<sup>th</sup> century, the mineral resources of the area were identified, both Porth-gain and Aberiddi having not only slate deposits but also granite which was used in the production of bricks (*ibid.*: 21).
- 3.4.36. A lease was taken on the mineral resources of the whole area in 1849 and in 1850 a quarry was opened at Aberiddi. Its exposed location was unsuitable for the development of a large harbour and a tramway was constructed to convey the slates to Porth-gain where quays were developed in 1850.
- 3.4.37. Aberiddi's slates were considered to be of an inferior quality to those produced in North Wales and although it continued producing, the quarry was not the sole exporter at Porth-gain. Unlike the situation in North Wales, where the slate quarries dominated activity at the nearby ports, Porth-gain also exported granite paving stones and the granite dust used in brick manufacture.
- 3.4.38. As the importance of Aberiddi slate waned, the harbour at Porth-gain expanded to service the exporting of granite, trading primarily with the ports of South Wales and the Bristol Channel (*ibid.*: 22). Today the harbour of Porth-gain is primarily used by the local fishing industry and caters to recreational mariners during the summer months.

### **3.5. SOCIAL AND CULTURAL IMPLICATIONS**

- 3.5.1. The social and cultural impacts of the Welsh slate industry should be considered to be its most important legacy. Wales was one of the first industrialised countries in the world, with its coal and slate industries producing the majority of the UK's output in both commodities.
- 3.5.2. The industry reshaped the landscape of North Wales, with new settlements and new technology opening up an area that had previously been relatively isolated. However, while changing the settlement patterns and population of North Wales it can be said to have preserved much of the area's unique cultural identity; something which is not generally expected to result from large-scale industrialisation.

#### **Workers Disputes and Trade Unionism**

- 3.5.3. The social aspects of the slate industry are interesting in many ways, paramount among which is the manner in which some of the impacts the industry had on Welsh

society would later contribute to its decline. The slate industry was bound to create problems for itself, primarily due to the manner in which it developed. In the space of 50 years the industry had changed from being a small-scale enterprise based on the work of individuals paying a small rent to a landowner, to a large commercial concern and individuals who had been extracting slate from small workers were either bought out or simply ejected.

- 3.5.4. While the scale of the industry changed, many of the fundamental principles remained the same. Workers who had been dispossessed of the small leases they once held entered the large quarries and continued to operate on a highly individual basis. Welsh quarries may have employed hundreds of workers, in some cases thousands, yet they continued to work in small groups rather than being a unified workforce. These groups, known as 'bargain gangs' negotiated the 'bargain', essentially the right to work a certain area of the quarry, in which their pay was weighted based on the quality of the slate and the relative difficulty of extracting the slates from that particular rock face (Burn 1976: 16).
- 3.5.5. Several of the quarry owners were land-owning aristocracy and the manner in which slate had been extracted in small workings prior to the 19<sup>th</sup> century had an essentially feudal character, similar to the relationship between tenant farmers and landlords. This relationship apparently did not change much with the industrialisation of the industry and landowners such as Lord Penrhyn are described as having acted in a feudal and patriarchal manner towards those working in the quarries (Morgan 1982: 66). Tensions between workers and quarry owners were further exacerbated due to cultural and religious differences, the workers being mainly Welsh-speaking Nonconformists and the owners and managers being mainly Englishmen affiliated to the Church of England (Burn 1976: 23).
- 3.5.6. The quarry workers were initially slow to form unions, partly due to the fact that they did not consider themselves to be employees. The first of the unions, the North Wales Quarrymen's Union, was formed among Caernarfonshire workers in 1874. The response to unionisation by the quarry owners was to refuse to employ members of the unions and lockouts began at the Glynrhonwy, Dinorwig and Penrhyn quarries. The owners eventually relented and allowed the union members back to work. The reaction to the lockouts was such that it resulted in an increase in union membership among the other workers (*ibid.*: 26-27).
- 3.5.7. By the time the next Dinorwig lockout occurred in 1896, the majority of its workers were union members. The membership of unions increased as the Penrhyn lockouts occurred in 1896 and 1900, to the point where these industrial disputes were of such a scale that the production of slate effectively collapsed in a given area while a strike or lockout was going on. The drop in the supply in slates due to disputes in the 1890s and early 1900s was one of the factors which contributed to the overall decline of the industry, allowing competition from the tile industry and the French slate imports to erode the dominance of Welsh slate (*ibid.*: 39-40).

#### **Welsh Language**

- 3.5.8. The slate industry can be said to have had an impact on the Welsh language itself, being partly responsible for the continuing strength of the language in the communities of North Wales. The majority of those employed in the Welsh slate

industry used Welsh as their first language and as late as 1900 half of the population of Merioneth were monoglot Welsh speakers (Burn 1976: 23).

- 3.5.9. North Wales was a particular stronghold of the Welsh language; unlike South Wales it was not particularly close to any major English population centres apart from Liverpool and the area's geography limited the amount of population exchange that could take place. As previously mentioned, rural areas similar to North Wales experienced large-scale depopulation during the Industrial Revolution, but the employment opportunities presented by the slate industry prevented this from occurring.
- 3.5.10. While an erosion of the population of Welsh speakers from North Wales was prevented by the sustaining influence of the slate industry, the area experienced a sharp population increase directly linked to the industry in the later half of the 19<sup>th</sup> century. However, the industry was very much self-contained and from its early days relied on local craftsmen, carpenters and blacksmiths to design and build the infrastructure that served it. Therefore as the industry expanded there was no large influx of support workers from other areas of Britain, which could have diluted the Welsh speaking communities (Gwyn 1992: 12).
- 3.5.11. The population increase experienced in North Wales was therefore mainly an increase in the local population, being supported by the slate trade. The increase in population further contributed to the preservation of the language in this area, and the impact of the slate industry on the linguistic identity of North Wales is still evident today. The counties with the highest percentage of Welsh speakers are Gwynedd and Anglesey, and Welsh is still widely spoken in many of the settlements which served the slate industry, such as Caernarfon, Porthmadog, Y Felinheli, and Pwllheli.

### **Emigration**

- 3.5.12. Interestingly, although the slate industry can be said to have contributed to the preservation of populations in North Wales during the Industrial Revolution, it was also directly linked to facilitating depopulation through emigration.
- 3.5.13. Initially, emigration in connection to the slate trade involved emigrants booking passage on ships exporting slates to America. Many emigrants left Caernarfon on slate ships and the ship owners were able to make additional profits by carrying emigrants in less than favourable conditions (Jenkins 2006: 259).
- 3.5.14. As slate was heavy in relation to the amount of space it occupied, it left a lot of empty space in a vessel's cargo hold. These empty spaces were the accommodation sold to emigrants by ship owners. An advertisement for passage upon the barque *Hindoo* is described in Wynne Jones' *Shipwrecks of North Wales* which states that:
- 'Emigrants will find this conveyance most convenient for embarking for the United States, the vessel being properly fitted out for the accommodation of passengers'; (Wynne Jones 2001: 87).

In reality, emigrants, at a cost of £10 per family, were expected to provide their own bedding and their own food for the voyage, which could last anywhere from six to ten weeks. The vessel provided water and accommodation in the form of bays situated between the large stacks of slate in the cargo hold (*ibid.*).

3.5.15. As the industry expanded, new sources of slate were beginning to be exploited in North America and Australia. As slate had been quarried in Wales for centuries, and extracted on an industrial scale since the late 18<sup>th</sup> century, the Welsh quarrymen were deemed to be the most experienced and were highly sought-after as workers. Conditions were much better in the American quarries and Wales lost many skilled quarrymen to the American slate industry every year.

3.5.16. The motivation behind the emigration of skilled quarrymen is described in the Australian newspaper, *The Maitland Mercury and Hunter River General Advertiser* which reported on 15<sup>th</sup> November 1851:

‘Expected Emigration from Wales - It is stated that a large number of the best and most experienced of the men employed in the extensive slate quarries in North Wales are preparing to emigrate, during the course of the ensuing summer, to the United States. The rate of payment in the American quarries is nearly three times greater than the amount which can be realised in the Welsh workings.’

3.5.17. Welsh workers made up the majority of the workforce in the American slate quarries in the 19<sup>th</sup> century; a contemporary note on the slate industry of Maine from *Scientific American* reported in 1848:

‘At the village of Brownville in Maine there is a slate quarry. The workmen are all Welsh and make the slate by contract’ (Anon 1848: 50).

3.5.18. This indicates that the workers were taking not only their culture, but also their particular working arrangements from the Welsh quarries to the American ones. Making the slate by contract is similar to the ‘bargain gang’ principle by which the quarry workers in Wales negotiated their pay.

3.5.19. Another contemporary American source highlights the manner in which the Welsh quarry workers’ approach to their position was little different in American quarries than it had been in Wales. Welsh quarry workers continued to pursue fairness of conditions and the journal *Manufacturer and Builder* describes the Welsh workers in Vermont, perhaps somewhat unfairly, as follows:

‘The Welsh work together as a body to promote their own interests, often to the disadvantage of their employers. The Welshman believes in strikes, whether in the end he wins or loses’ (Anon 1869: 84).

3.5.20. In fact, in many cases, workers’ unions had encouraged the Welsh quarry workers to emigrate. During the decline experienced by the Welsh slate industry and the wider UK economy in the 1870s, the unions had facilitated the emigration of skilled workers as some of the smaller quarries closed down. By this time, Australia had also become a popular destination for emigrating quarry workers whose skills and experience would ensure that they found employment relatively quickly in the Australian slate quarries. *The Brisbane Courier* reported on 14<sup>th</sup> February 1879 that:

‘The North Wales Union has offered to grant to any of its members desirous of emigrating to America pecuniary assistance to the amount of £7, and those willing to go to Australia are to receive £14. The North Wales Slate Quarrymen’s Union offer

the same terms. It is believed that many of the men will accept the terms offered. Most of the smaller quarries are closed.'

- 3.5.21. The emigration connected with the Welsh slate industry is central to its importance as it gives the industry an international cultural impact. Place-names such as Bethesda, Merion and even North Wales are common in locations in North America and Australia where slate was extracted and it would be of academic interest to carry out further research into the links between these communities and those of the major slate-producing regions in North Wales.
- 3.5.22. However, the emigration of skilled workers was another one of the many factors that led to the eventual decline of the Welsh slate industry and the communities associated with it. The industry's dominance had in the past sustained communities in areas where emigration would otherwise have been the norm, but as it began to decline its workers found that their skills were highly prized elsewhere and they followed new opportunities. While the industry did recover in the 1890s, enjoying its peak years during that decade, it had by this time lost many of its most experienced workers to the markets which were to become its competitors.

## **4. MARINE ARCHAEOLOGY**

### **4.1. INTRODUCTION**

- 4.1.1. The list of known wreck sites has been compiled from a variety of sources, including UKHO charted wrecks and reports from recreational divers, covering not only the territorial waters off the coast of Wales but records of slate-carrying vessels around the UK and in the waters off countries known to have been large importers of Welsh slate.
- 4.1.2. The vast majority of the known wrecks take the form of scatters or coherent stacks of slate lying on the seabed, and in many cases no evidence for ship structure has been reported. It is therefore possible that some of these 'known wrecks' may actually represent cargoes of slate lost from a vessel, rather than actual shipwrecks. The lack of immediately recognisable ship structure does not however preclude the presence of a wreck. In these cases, further archaeological investigation would be required to ascertain the exact nature of the remains on the seabed.

### **4.2. KNOWN WRECKS IN WALES AND THE UK**

- 4.2.1. This report has identified 29 known sites in the UK where evidence suggests that wrecks of slate-carrying vessels may occur. As previously mentioned, a number of these sites are reported to comprise scatters of roofing slates rather than being described as coherent ship remains. Indeed, of the 29 known wrecks, only eight are described as showing any evidence for the survival of ship structure. However, the absence of information on ship structure does not necessarily preclude its survival; ship structure may exist buried beneath the seabed or the information may simply have been omitted, as many of the reports of known wrecks are relatively simple and brief accounts.

- 4.2.2. Of these 29 sites, 23 occur off the coast of Wales. They include four sites for which the identity of the vessel is thought to be known and one site designated under the Protection of Wrecks Act (1973).
- 4.2.3. The remaining six sites occur off the coasts of England and Scotland and include four sites for which the identity of the vessel is thought to be known. Wrecks with a known or suggested identity will be described in further detail below.
- 4.2.4. For periods associated with limited archaeological remains connected to the shipment of slate, an attempt will be made to suggest the potential for the existence of as yet undiscovered wreck sites based on archaeological evidence of seafaring in a wider context.

#### **Pre-medieval (to 1086 AD)**

- 4.2.5. No records of known wrecks that pre-date the medieval period were encountered during the course of this assessment. While it is possible that one or more of the unidentified sites may be from this early period, this is considered to be unlikely.
- 4.2.6. It is known that slate was being exploited in Wales since at least the Roman period, for example at Caernarfon and Caerleon. Taking into account the relatively challenging terrain in parts of Wales, it is likely that slate would have been much easier to transport by sea than by land so it is probable that slate-carrying vessels would have operated off the coast of Wales prior to the medieval period. Indeed it has been suggested that the smashed slate fragments found at Caerleon may even represent ship's ballast.
- 4.2.7. Vessels which pre-date the medieval period are rare in any context, let alone in the context of a particular industry, commodity or activity. It is difficult to suggest any vessels in the archaeological record which may be analogous to any potential vessels involved in the shipment of slate. The Barland's Farm vessel discovered in the Severn Estuary is one of the only pre-medieval vessels known from Wales (Bell and Neumann 1997). It is an example of the 'Romano-Celtic' vessel type, the design of which may have been influenced by contacts with continental Europe and the Roman Republic and later Empire.
- 4.2.8. Due to the rarity of vessels of this age in the archaeological record, any confirmed discovery of a vessel pre-dating the medieval period would be of national and probably international significance, whether connected to the slate industry or not.

#### **Medieval Period (1086 to 1536 AD)**

- 4.2.9. There is one confirmed slate-carrying wreck in Welsh waters that dates to the medieval period. The Pwll Fanog wreck, which lies in the Menai Strait, has been radiocarbon dated and has a date range which centres around 1470 (Wessex Archaeology 2007).
- 4.2.10. The wreck consists of a pile of stacked Llanberis slate under which some ship timbers were observed (Jones 1978: 152). The timbers observed in trenches excavated across the site suggest that the Pwll Fanog wreck is that of a small to medium sized clinker built vessel. It is designated under the Protection of Wrecks Act (1973).

- 4.2.11. Medieval trade in slate, as previously mentioned, is likely to have been conducted on a relatively limited scale and casual basis. Quarrying was undertaken by tenant farmers who would have paid a rent to a landowner in order to quarry slate from small open workings in order to supplement their income.
- 4.2.12. It is not possible to imply much about the representative vessel types likely to be in use during this period from the archaeological remains of a single vessel such as the Pwll Fanog wreck. However, based on the character of the slate industry at this time, vessels involved in this trade can be assumed to have been limited in size, and they may have shipped the combined slate output of a number of individuals, rather than anything approaching a co-ordinated industrial effort.
- 4.2.13. Indeed, it has been suggested that the cargo of the Pwll Fanog wreck, which is thought to have been approximately 20 tonnes, may represent the product of a number of part-time farmers and quarrymen working individually but sharing transport costs (Illsley and Roberts 1979: 49).
- 4.2.14. The trade in Welsh slate during this period was a small-scale and individualistic industry and it is likely that exports were carried by a wide variety of small locally built coastal vessels, each being characteristic of the particular settlement at which it was built.
- 4.2.15. It is possible that one or more of the unidentified sites may also date to this period. While it is unlikely that a medieval slate-carrying vessel would be discovered in a reasonable level of preservation, the dating of the Pwll Fanog wreck demonstrates the possibility for this to occur.

#### **Post-medieval Period (1537 to 1799 AD)**

- 4.2.16. Only one of the positively identified wrecks encountered during the course of this assessment pre-dates the 19<sup>th</sup> century. However, although the slate industry in the Post-medieval period did not take on a large-scale industrial character until the end of the 18<sup>th</sup> century, extraction and export of slate during this period had increased significantly when compared to the medieval period.
- 4.2.17. There was a pronounced expansion in general shipping and trade during this period, some of which was directly connected to the increased demand for slate, and the increase in maritime traffic along the coasts of Wales raises the potential for the discovery of slate-carrying wrecks. It is possible that one or more of the unidentified wrecks may date to this period.
- 4.2.18. Potential wrecks from the early part of this period are most likely to reflect small scale coastwise shipping or small channel crossing vessels similar to those used in the Irish Sea herring trade described above. However, towards the end of the 18<sup>th</sup> century, slate began to be frequently exported further afield and this period would have seen the use of new vessel types to cope with the longer distances and more varied sea conditions encountered by the exporters of slate.
- 4.2.19. There is minimal archaeological evidence for wrecks of these types directly related to the export of slate from Wales. However, during the Post-medieval period, prior to the large-scale industrialisation and infrastructural development of the slate trade, other vessels were also relied upon.



- 4.2.20. In the later part of the Post-medieval period and the early Modern period, the development of inclines and narrow-gauge railways transformed the transport of slate from the quarries to their ports of export. Prior to this, a variety of modes of transport were used, from horse-drawn carts travelling over the mountains from the quarries to small vessels which used the lakes and rivers of North Wales as conduits by which to access the harbours.
- 4.2.21. A vessel discovered in Llyn Padarn, adjacent to the village of Llanberis and the quarries at Vivian, is representative of the riverine and lacustrine transport of slate. The vessel, which was approximately seven metres long and was carrying a cargo of over 1300 slates, was a flat-bottomed boat in the bateau style (Illsley and Roberts 1979: 47).
- 4.2.22. Bateau style vessels were widely used in Europe and later in the American colonies during the 18<sup>th</sup> century. They were ideal for use in rivers and lakes as their flat bottoms provided a large loading area and their shallow drafts made them easy to beach in locations where formal jetties or quays may not have been available.
- 4.2.23. These vessels were ideal for use in overseas colonies as their simple construction precluded the need for a skilled shipbuilder; they could be assembled by a carpenter of limited skill using available timbers. This relative ease of construction and operational flexibility would have made a bateau style vessel ideal for use in the Post-medieval slate industry of Wales. In many locations slates were loaded and unloaded from a beach or strand rather than a harbour, and the self-contained nature of the industry during this period may have necessitated a simpler approach to vessel construction and maintenance.
- 4.2.24. The bateau style vessels were usually locally built and would incorporate elements of the local shipbuilding traditions in their design. It may be possible to make suggestions on the form of earlier local vessels based on the design of the Llyn Padarn wreck.

#### **Modern (1800 to Present)**

- 4.2.25. Of the 29 known slate wrecks, only one can be positively said to predate the Modern period. The majority of the wrecks are unidentified and little information is available about them apart from brief descriptions of the remains on the seabed. However, given the large expansion of the slate industry in the 19<sup>th</sup> century, which is reflected in the dates ascribed to the recorded losses (**Appendix II**), it is probable that most of the unidentified wrecks will date to this period.
- 4.2.26. The known wrecks around Wales are mainly concentrated in North Wales, clustered around the tip of the Llyn peninsula and Anglesey and the Menai Strait. This distribution is not surprising given the location of a number of slate-exporting harbours in and around the Menai Strait, and the dominance of Porthmadog as a slate harbour, despite its relatively hazardous approaches.
- 4.2.27. A wreck charted by the UKHO in Ramsey Sound (**WA 1001**) is thought to be that of the *Lewis*, a Beaumaris schooner, lost in 1894. The site was reported to the UKHO by divers in 1983 and consists of a mound of slate, surrounded by smashed and broken slates to a distance of ten metres. There are reported to be some possible

- structural elements on or near the wreck site, including some unidentified iron fragments and a two to three tonne anchor.
- 4.2.28. The identification of the site as the *Lewis* is most likely to be due to its obvious slate cargo and its location; as a recorded loss (**WA 2070**) the *Lewis* is described as having sunk off Ramsey Island. The *Lewis* was built in 1858 and owned by R. Owen of Moelfre, it was lost after encountering squally wind conditions while en route from Porthmadog to Folkestone (Larn and Larn 2000).
- 4.2.29. A cluster of known wreck sites and recorded losses is situated near Bardsey Sound, running from Bardsey Island in the west to Aberdaron Bay in the east. Known wrecks in this area include a pile of roofing slates to the west of Maen Ddu off the southern tip of Bardsey Island (**WA 1006**), stacks of slates charted by the UKHO off Pen-y-Cil headland (**WA 1004**) and a site thought to represent the wreck of the *Peter Varkevisser* (**WA 1002**).
- 4.2.30. The possible site of the *Peter Varkevisser* comprises a scatter of slates on a small reef to the east of Aberdaron Bay. No evidence of ship structure was reported by the UKHO but divers have reportedly found small pieces of timber with brass screws and a substantial but unidentified metal object at this location. It is also reported that part of a copper-sheathed wooden keel was washed up on the nearby beach in 2002 (Holden 2003: 56).
- 4.2.31. The *Peter Varkevisser* (**WA 2095**) is reported to have sunk in 1895 while en route from Porthmadog to Cardiff. The *Peter Varkevisser* has been referred to as a Milford ketch but is also recorded as having been registered in Porthmadog. It is not clear why the site **WA 1002** has been identified by the UKHO as the *Peter Varkevisser*, as it lies approximately 17 kilometres from the St. Tudwal's Islands and St. Tudwal's Roads where the vessel is recorded as having been lost.
- 4.2.32. Another slate wreck is reported to have been lost off the St. Tudwal's Islands, is the *Omnibus* (**WA 2101**), an Aberystwyth registered vessel lost on the Carreg-y-Trai reef while en route to London. The remains of a slate-carrying vessel (**WA 1023**) lie in this location, scattered among the remains of a UKHO chartered steamship wreck, the *Timbo* (UKHO-WO-10072). It has been suggested that these remains are likely to be those of the *Omnibus* (Holden 2003: 37), which would be feasible given its location, although it is also possible that these remains could be those of the *Peter Varkevisser*; also reported to have sunk on the Carreg-y-Trai reef.
- 4.2.33. A slate wreck is reported to lie in Puffin Sound (**WA 1009**) and has been subjected to some level of commercial salvage (Chris Holden pers. comm.). Chris Holden has suggested that this may be the site of the *Arthur* (**WA 2008**) which is recorded to have been lost in 1893. The *Arthur* was a Liverpool flat, built in 1860 and owned by J. G. Best of Liverpool. It was stranded and lost en route from Y Felinheli (Port Dinorwig) to Liverpool.
- 4.2.34. There are six sites of possible slate wrecks in UK territorial waters outside of Wales. Of these only one, the *John Preston* in Scotland, has been positively identified and can be said to certainly date to the Modern period. Although it is not within the remit of this report to examine wrecks outside of the territorial waters administered by

Wales in detail, these wrecks are part of the maritime archaeology of the Welsh slate trade and will be discussed in context below.

- 4.2.35. There are two reports of known slate wrecks west of Folkestone (**WA 1024** and **1027**). WA received a report of a slate wreck (**WA 1024**) from a diver, Paul Oliver, through the British Sub-Aqua Club (BSAC) internet forum. Mr. Oliver provided co-ordinates and suggested that this could be the wreck of the *Jane Anwyl*, a Caernarfon schooner which sank in 1889 following a collision with the SS *Plymothian*. The vessel was carrying a cargo of slates from Porthmadog to Colchester when lost.
- 4.2.36. The UKHO charted wreck **WA 1027** is located less than 150 metres from the position given by Mr. Oliver for the *Jane Anwyl*. Although the UKHO wreck report (UKHO-WO-14812) makes no mention of a slate cargo, the online Wreck Site wreck database ([www.wrecksite.eu](http://www.wrecksite.eu)) describes this as the site of a slate wreck. Given the short distance between **WA 1024** and **1027**, it is possible that these two sites are actually one and the same wreck, for which slightly different positions have been recorded. However, although it seems unlikely that two wrecks of slate-carrying vessels could occur less than 150 metres apart, it is not impossible.
- 4.2.37. A similar duplication appears to have occurred in the case of the UKHO charted wrecks the *Arab* (**WA 1025**) and the *Robert* (**WA 1026**) off the Lizard in Cornwall. The UKHO charts the two wrecks in exactly the same position. The *Arab* is described as being a slate-carrying sailing vessel which was lost after striking the rocks in thick fog while en route from Swansea to Poole. The *Robert* is recorded as having been carrying slates from Y Felinheli (Port Dinorwig) to Southampton when lost.
- 4.2.38. Given that the two wrecks lie in exactly the same position, it is almost a certainty that this is the site of a single wreck, duplicated in the records of the UKHO through error. It is likely that this is a site for which two possible identities were suggested and that subsequently each possible identity was generated as a wreck report.
- 4.2.39. As most of the known wrecks encountered during the course of this assessment are unidentified and only briefly described, they are not particularly informative in terms of the character of the shipping industry which served the Welsh slate trade. One of the few known slate wrecks to have been subjected to archaeological investigation is the *John Preston* (**WA 1028**), located in the Sound of Mull. The wreck was discovered in the late 1970s and was subjected to extensive salvage, with 250,000 slates reportedly recovered from the wreck in 1986. It was surveyed by the Sound of Mull Archaeological Project (SOMAP) over six years starting in 1994 (Webster and Roberts 2007: 46).
- 4.2.40. The *John Preston* was built in 1855 at Y Felinheli (Port Dinorwig) by Rees Jones, a respected shipbuilder of large ships for the Atlantic trade. It is recorded to have been schooner-rigged with a square stern, carvel planking and a standing bowsprit (*ibid.*). The wreck is described as being typical in construction of a smaller two-masted schooner or coasting brig (*ibid.*: 56).
- 4.2.41. In many ways, the *John Preston* can be said to be typical of the vessels which were used in the slate trade. While it is not possible to draw many conclusions on the character of the maritime transportation of Welsh slate based on a single known

wreck, the *John Preston* reflects many of the main trends, such as vessel type, place of construction and trading activities that can be seen in the information from recorded losses (see below).

- 4.2.42. Like many vessels involved in the slate trade it transported a variety of commodities during its working life; in its last six months of operation it voyaged between the harbours of Y Felinheli (Port Dinorwig), Lancaster and Glasgow carrying iron, slate and coal (*ibid.*: 47). The *Shipwreck Index of the British Isles* (Larn and Larn 1998) describes the *John Preston* as a schooner, which by the 19<sup>th</sup> century had become the dominant vessel type used in the transport of slate.
- 4.2.43. Schooners began to be used off the coasts of Britain as early as the 18<sup>th</sup> century (Webster and Roberts 2007: 56) and were considered to be a versatile and efficient ship type. Schooners were the dominant vessel type in Britain until the end of the age of sail and the advent of the steamship.
- 4.2.44. Schooners are thought to have reached their peak with the design of the schooners known as Western Ocean Yachts, which originated in Porthmadog and were directly involved in the Welsh slate industry.
- 4.2.45. Western Ocean Yachts were initially involved in the export of slate to the principal European importers such as Hamburg and the north German ports (Greenhill 1993: 101). With the advent of the age of steam schooners began to be superseded by steamships in the trades they had previously been dominant in. Schooners began to become less common in coastal packet services and short sea carrying trades from 1860 onwards (Starkey 1993: 146).
- 4.2.46. The schooner's advantages as a vessel were its economic capacity, speed and ability to handle relatively difficult seas (Webster and Roberts 2007: 56). These factors, among others, allowed the schooners and Western Ocean Yachts to resist competition for steamships in the North Atlantic trade until the early 20<sup>th</sup> century (Starkey 1993: 146).
- 4.2.47. The particular advantage of the Western Ocean Yachts was their size; as they weighed less than 200 tonnes they were exempt from the requirement to carry a licensed mate which was imposed on larger vessels under the Merchant Shipping Act (Jenkins 2006: 244). Their design was that of a small sailing ship which could trade in all conditions with a crew of seven or eight, which gave them an economic advantage over steamships in the North Atlantic trade.
- 4.2.48. Schooners that exported slate to Canada returned to Wales with salted and dried cod produced in Newfoundland (MacGregor 1993: 50). While not a strictly defined reciprocal trade, the main trade link between North Wales and Canada had been due to the export of slate and later developed to include the import of salted and dried fish to Wales and the ports of the Mediterranean. The link between the two trades led to the refinement of schooner design which produced the Western Ocean Yachts and resulted in Porthmadog surviving as a shipbuilding centre for some time after the decline of the slate industry.

### 4.3. KNOWN WRECKS OUTSIDE UK TERRITORIAL WATERS

- 4.3.1. Known wrecks outside of UK territorial waters have been included in this report to give an impression of the international character of the Welsh slate industry. As this report's objective is to analyse the potential maritime archaeology of this industry with reference to Wales only, it was not possible to conduct exhaustive research into the potential archaeology of the slate industry within an international context. Therefore the list of known wrecks outside of UK territorial waters was compiled only from the most readily available sources and should not be considered to be comprehensive.
- 4.3.2. A wreck site off Maghold Head on the Isle of Man was reported to WA following enquiries made on the Divernet internet forum ([www.divernet.com](http://www.divernet.com)). The wreck (**WA 3001**) is described as being a discrete heap of well-packed dressed roof slate, with timber structure buried under shallow sediment near the areas thought to represent the bow and stern of the wreck. It has been suggested that this is the wreck of the *Lady Louisa Pennant*.
- 4.3.3. WA could not find any information on the loss of the *Lady Louisa Pennant* in the sources used to compile the list of recorded losses. The Anglesey County Record Office holds the Registrar General of Shipping and Seamen for Beaumaris, and there is mention of a vessel named the *Lady Louisa Pennant* in this. It includes, in addition to numerous crew lists and log books for the vessel, a letter from the Registrar General asking if the owner of the vessel will amend the crew list to include the words 'supposed drowned' if no further details on the fate of the ship and crew come to light. This would appear to suggest that the vessel had disappeared, but WA has no further information on this at this time.
- 4.3.4. There is a report of a wreck of a small slate-carrying coaster (**WA 3002**) in Kerjouanno Bay in France in 1992 ([www.archaeosousmarine.net](http://www.archaeosousmarine.net)). Archaeological investigations carried out on the wreck have included dendrochronological analysis that suggests that the vessel was constructed in the early 19<sup>th</sup> century, a date which is further reinforced by the discovery of a coin of two sols with a *terminus ante quem* of 1791. The dendrochronological evidence also indicated that the timbers used in the construction of the vessel came from the Morbihan region of France. It therefore appears likely that this is a French vessel, used in the coastal trading of slate from French sources in Brittany. However, given the fact that the UK both exported Welsh slate to France and imported French slate to the UK, a link between this wreck and the Welsh slate industry cannot be completely ruled out.
- 4.3.5. As Germany was one of the main importers of slate following the fire of Hamburg, WA contacted the Archaeological State Service of the federal state of Schleswig-Holstein which holds record of wrecks lost in the approaches to the port of Hamburg. Some records list Harburg as the vessel's destination; Harburg was considered a separate city until being incorporated into Hamburg in 1937.
- 4.3.6. The Archaeological State Service held records of five Welsh slate wrecks which were stranded at north German and southern Danish islands while en route to Hamburg and the then German port of Stettin, now Szczecin in Poland.

- 4.3.7. Two schooners were stranded at the German island of Sylt while en route to Harburg. These are the *Annie Maude* (WA 3003), lost in 1888 and the *Martha Percival* (WA 3004), lost in 1901. Few details are available about these vessels, but they are both described as being schooners carrying slate to Harburg and the *Martha Percival* is reported to have been en route from Porthmadog.
- 4.3.8. Two schooners were stranded at the German island of Amrum while en route to Hamburg or Harburg. These are the *Ellen Morris* (WA 3005), lost in 1871 and the *Sarah* (WA 3006), lost in 1898. The master of the *Ellen Morris* is recorded as being E. Evans and the *Sarah* is recorded to have been en route from Porthmadog with a William Rowlands as master.
- 4.3.9. One wreck is recorded as having been stranded at the Danish island of Romo. This vessel was the *Janet* (WA 3007), described as a Welsh schooner en route from Porthmadog to Stettin, now Szczecin in Poland.
- 4.3.10. Outside Europe, Australia and British possessions in South America, particularly Argentina, were among the largest importers of Welsh slate. It was not possible to conduct much research into known wrecks off Argentina, given the inherent language barrier, but an effort was made to assess the potential for wrecks of Welsh slate exporting vessels off the coast of Australia.
- 4.3.11. The Australian National Shipwreck Database holds one record of a wreck of a slate-carrying vessel. This is the *Geltwood* (WA 3008); a three-masted iron barque lost in 1876 while en route from Liverpool to Melbourne with a cargo of general merchandise. Although slate is not mentioned in the record as a specific element of the vessel's cargo, it is reported that part of the wreck site consists of a massive stack of slates. The *Geltwood* is recorded as being en route from Liverpool, rather than one of the slate ports of Wales. This is not surprising, given the scale of the voyage and the fact that the vessel was not exclusively carrying slates. Although Welsh slate is not specifically mentioned, it is probable that the slate the *Geltwood* was carrying was of Welsh origin, given the proximity of the port of Liverpool to the slate harbours of Wales.

#### 4.4. RECORDED LOSSES

##### Introduction

- 4.4.1. In addition to known wrecks and charted sites recorded by the UKHO, there are records of vessel losses for which the exact position and extent of survival is not known. Recorded losses of this type are allocated arbitrary positions at 'Named Locations', i.e. points which represent losses within a broader area, and therefore any losses recorded at these locations will not lie at the positions ascribed to them.
- 4.4.2. Due to the nature of historical record-keeping with respect to maritime losses, the current data on which assessments of maritime archaeology is based have a bias towards vessels lost in the last 250 years. In addition to this it should be noted that although records of losses from the 18<sup>th</sup> century onwards are relatively extensive, they will only reflect a proportion of the wrecks lost during this period.

- 4.4.3. While the baseline data may account for archaeological sites that are already known, the potential for the existence of previously unknown archaeological remains limits the reliability of current data sources as a guide to archaeological potential.
- 4.4.4. Records of documented losses were obtained from the *Shipwreck Inventory of the British Isles* (Larn and Larn 2000); from the Coflein database of the NMRW, maintained by the RCAHMW and from the personal research of Mr. Chris Holden (author of *Underwater Guide to North Wales*), which he kindly shared with WA.

#### **Analysis**

- 4.4.5. During the course of researching this project 126 recorded losses of slate-carrying vessels were identified in the area off the coast of Wales. The information available for these vessels has been collated and analysed in terms of how they correspond to the broader context of the Welsh slate industry. A list of recorded losses is included in **Appendix II**.
- 4.4.6. Most of the records detail the date or approximate date on which the vessel was lost, 124 of the records contain this information. The date range for these losses corresponds to the busiest years of the slate industry; the earliest loss is that of the brig *British Queen* (WA 2014) in 1820 and the most recent is the *Notre Dame de Boulogne* (WA 2090) in 1924.
- 4.4.7. Whilst it is known that vessels would have been carrying slate around the coasts of Wales from at least the medieval period and possibly since the Roman period, it is not surprising that there are no recorded losses of an early date, given the smaller scale of the industry in those periods and the nature of historical record-keeping.
- 4.4.8. The Welsh slate industry began to expand in the later half of the 18<sup>th</sup> century, at the same time that more systematic wreck reporting became commonplace. It would therefore have been expected that some recorded losses of late 18<sup>th</sup> century date would be encountered. The list of recorded losses was compiled based on vessels for which the cargo, i.e. slate, was known. The lack of late 18<sup>th</sup> century recorded losses in this list may therefore reflect the recording of losses for which details of their cargo were not included.
- 4.4.9. In terms of the types of vessels lost, the information suggests that the recorded losses correspond to what is known about the character of the Welsh slate industry. Of the 126 losses identified, 116 included information on the construction or type of vessel in question.
- 4.4.10. It was found that the vast majority of these vessels (56) were recorded as being schooners, which would reflect the increasing use of these vessels throughout the 19<sup>th</sup> century. Other coastal vessels that form a significant proportion of the recorded losses include smacks (18), sloops (13), ketches (9), brigs (9) and flats (8). Jiggers and dandys are less well represented; only one of each is present in the list of recorded losses.
- 4.4.11. The role of the schooner in the Welsh slate trade has already been discussed with reference to known wrecks; the presence of a variety of other vessel types in the list of recorded losses is also to be expected. While the large quarries operated their own fleets of ships to export slates, smaller quarries continued to operate and would have



used local vessels to ship their product. Domestic trade around the UK was carried out by a variety of small coastal vessels in the 19<sup>th</sup> century. Smaller vessels could operate more economically than schooners, and vessel types such as the ketch were deployed in greater numbers during in the second half of the 19<sup>th</sup> century (Starkey 1993: 146)

- 4.4.12. Surprisingly, there is only one vessel in the list described as being a steamship. This is unusual as it is known that the owners of two of the largest quarries, Baron Penrhyn and the Assheton Smiths, operated fleets of steamships (**Plate 5**). Although sailing vessels had dominated the Welsh slate trade for most of its existence, steamships came into use in the latter half of the 19<sup>th</sup> century when output was at its peak and maritime traffic in and out of the Welsh ports was at its highest (Jenkins 2006: 261). Therefore, it would be reasonable to expect steamships to feature more prominently in the records of vessel losses.
- 4.4.13. The list of recorded losses reflects the variety of different vessels used in the Welsh slate trade, with vessels known to have been more common or popular strongly represented in terms of numbers. The list does not, however, show a similar focus on the known shipbuilding ports of Wales. Of the 126 recorded losses, only 43 were recorded with information on the location where the vessel was built. Some of those ports known to have been centres of shipbuilding for the Welsh slate trade are represented in slightly higher numbers such as Porthmadog (7), Pwllheli (3) and Bangor (3). However, only one of the recorded losses is listed as having been built at Caernarfon, although over 200 vessels are known to have been constructed there.
- 4.4.14. A total of 21 other locations feature in the list of recorded losses, each having built two vessels or less. This gives a much more varied picture of shipbuilding than that which is generally described for the slate industry; one in which vessels built at a wide range of locations are participating in the shipment of slate. The information available from documentary sources generally describes a more focused character than this, with the majority of ships being constructed at the slate-exporting ports themselves, particularly Porthmadog, Pwllheli, Caernarfon and Y Felinheli.
- 4.4.15. The information available regarding the final voyages undertaken by the recorded losses correlates better with the character of the Welsh slate trade as described in documentary sources. Of the 126 recorded losses, 103 list the port from which their final route originated and 104 list their destination. The majority of the recorded losses were embarking from the dominant slate-exporting ports such as Porthmadog (36), Bangor (23), Y Felinheli (13) and Caernarfon (12). Interestingly, Porth Penrhyn is not mentioned in this list; however it may be the case that vessels loaded at Porth Penrhyn are described as having embarked from Bangor, as Porth Penrhyn would have been included within the boundaries of the town of Bangor. Only three recorded losses had started their voyage at UK ports outside of Wales and only one loss was of a vessel embarking from a non-UK port.
- 4.4.16. As would be expected, the majority of voyages originated from a small number of major slate ports and the ships were bound for a large number of ports and harbours around the UK and Europe. This fits well with the known character of the slate trade; the commodity is produced in a relatively small corner of the UK and is exported to numerous ports in a range of locations. The major ports of Wales and the UK feature

most prominently as destinations in the list of recorded losses, with Liverpool (9), Cardiff (7), London (6), Belfast (5) and Bristol (4) being the most frequent.

- 4.4.17. A small number of voyages to harbours outside of the UK feature in the list of recorded losses, however the majority of these were to ports in the Republic of Ireland; seven vessels being recorded as en route to Dublin (2), Cork (2), Donegal (1), Limerick (1) and Waterford (1). These should not however be considered as non-domestic voyages, as Ireland did not gain its independence until 1922 and therefore was part of the UK during the busiest years of the slate industry.
- 4.4.18. Apart from the Irish ports, the only non-British destination to feature in the list of recorded losses is Hamburg; three of the vessels were en route to that port when lost. Germany, and the port of Hamburg in particular, was the biggest foreign market for Welsh slate following the Great Fire of Hamburg.
- 4.4.19. The relative lack of recorded losses of vessels travelling to more distant locations should not be considered unusual. While the Welsh slate trade had a very international market, exporting to British possessions in Argentina, the West Indies, South African and Australia; the list of recorded losses was compiled with reference to vessels lost off the coasts of Wales. While vessels lost off Wales may have been destined for distant locations, those vessels would have been lost on the very earliest stage of their voyage and therefore are statistically less likely to be present in large numbers than vessels which were undertaking voyages exclusively in Welsh or UK waters.

#### **4.5. SPATIAL DISTRIBUTION OF KNOWN WRECKS AND RECORDED LOSSES**

- 4.5.1. This section discusses the spatial distribution of known wrecks and recorded losses off the coasts of Wales. Areas that exhibit dense concentrations of wrecks and recorded losses will be discussed in more detail and the likely reasons for these wreck clusters will be explored in an effort to ascertain their potential to contain additional unknown sites.
- 4.5.2. The areas where the concentrations of known wrecks and recorded losses are highest are Anglesey and the Menai Strait, the Llyn Peninsula and the approaches to Porthmadog, and St. David's Head and Milford Haven (**Figure 3**).
- 4.5.3. Several factors are likely to explain the prevalence of sites around these areas. These will primarily include environmental factors such as navigational hazards, coastal geomorphology and prevailing weather conditions and the relative density of maritime traffic in close proximity to important slate harbours.
- 4.5.4. There is little detailed information available regarding the manner in which the vessels which represent the known wreck sites were lost as the identity of the majority of these vessels is unknown. However, recorded losses generally contain information on the manner in which the vessel was lost. Descriptions can vary from simply 'sank' or 'lost' to more detailed information including prevailing wind conditions, details of damage to the vessel and numbers of crew lost. Of the 126 recorded losses, 109 describe the circumstances of the loss with a reasonable level of detail.

- 4.5.5. Vessels which have been described as stranded have been considered as having been lost due to environmental conditions, as have vessels described as having run aground or broken up on navigational hazards. Vessels described as having foundered are also included under the broader consideration of environmental conditions, unless they are described as having foundered following a collision, leak or fire, as it is considered likely that their foundering may have been caused by weather conditions. Of the 126 recorded losses, 85 are considered to have been lost due to environmental factors.
- 4.5.6. Areas of higher density shipping are likely to occur around the ports and harbours associated with the slate trade. While it is usual for harbours and ports to naturally develop around the more accessible, sheltered and therefore safer areas of a coastline, the higher density of marine traffic around a port creates its own difficulties. These areas may have a disproportionately higher incidence of wrecks due to the inherent hazards involved when numerous vessels operate in close proximity to each other. Collisions, which can generally be considered to be a reflection of the relative density of maritime activity, account for five losses in the list of recorded losses.
- 4.5.7. The high density of shipping in proximity to ports and harbours also raises the probability of wrecking occurring, regardless of whether it is due to environmental factors or otherwise. A proportion of all vessels are likely to become wrecks and it is therefore reasonable to assume that higher levels of shipping in an area will provide a guide to the number and spatial distribution of wrecks.
- 4.5.8. A total of 19 of the recorded losses were lost due to factors that are not necessarily relevant in terms of the spatial distribution of the wrecks. These are factors related exclusively related to the ship itself, such as destruction by fire or springing a leak in otherwise fine weather. While the distance of the vessel from shore may have had an impact on these losses, as a leaking vessel is more likely to be completely lost if it is at long distance from a harbour, it is not possible to assess the probability of losses occurring due to unseaworthiness or accidents on board the vessel based on spatial distribution.

#### **Anglesey and the Menai Strait**

- 4.5.9. The waters around Anglesey present a number of natural hazards to shipping. Exposed cliffs at Carmel Head and Point Lynas and rocky outcrops such as the Skerries and the trio of West Mouse, Middle Mouse and East Mouse are examples of areas that present difficulties for navigation.
- 4.5.10. The situation is further complicated at Carmel Head, the Skerries and West Mouse, Middle Mouse and East Mouse where strong tidal rips combine with the coastal geomorphology to create a dangerous environment for shipping. Three known wrecks and seven recorded losses are situated around these hazards, running from Point Lynas in the east to the Skerries in the west.
- 4.5.11. The presence of islands such as Dulas Island and Puffin Island, and numerous sandbanks and spits such as Four Fathom Bank and Dutchman Bank and the Lavan Sands contribute to hazardous conditions on the east coast of Anglesey and the approach to the Menai Strait. Two known wrecks and ten recorded losses occur along this stretch of coast, from Point Lynas to the Lavan Sands.

- 4.5.12. The Menai Strait is known for its fast running currents and the orientation of the strait can act as a funnel which can exacerbate strong wind conditions. Apart from one recorded loss of a steamship, all of the known wrecks and recorded losses encountered during the course of this assessment were sailing vessels, which were the most vulnerable to strandings due to adverse wind conditions. The risk of strandings in the Menai Strait is heightened by shallow waters around Traeth Gwyllt and Traeth Melynog near Caernarfon and sandbanks such as the Lavan Sands, the North Sands, South Sands and Caernarfon Bar on the western approaches to the strait. Three known wrecks and five recorded losses occur in the Menai Strait, from the Lavan Sands in the east to the western approaches to the strait around Llanddwyn Island.
- 4.5.13. The hazardous nature of the waters around Anglesey is reflected in the relative frequency of navigational beacons and lights around the coastline. Lighthouses currently in operation at Point Lynas, South Stack, Trwyn-Du, Holyhead Breakwater, Great Orme's Head and Moelfre have been maintained since the early part of the 19<sup>th</sup> century.
- 4.5.14. In addition to the environmental hazards evident in this area, the area around Anglesey and the Menai Strait experienced some of the most frequent maritime traffic related to the export of slate. The Menai Strait is home to some of the most important and busiest slate harbours at Porth Penrhyn and Bangor, Y Felinheli and Caernarfon.
- 4.5.15. Whilst none of the known wrecks or recorded losses around Anglesey was lost as a direct result of high density shipping, such as collision; the relative frequency of ship movements in this area heightens the potential for wrecks in the area.

#### **The Lleyn Peninsula and Approaches to Porthmadog**

- 4.5.16. A number of significant hazards mark the approach to Porthmadog from the tip of the Lleyn peninsula, starting at Bardsey Island. Ships repeatedly mistook Bardsey lighthouse for somewhere on the east coast of Ireland and in their disorientation would be swept into Cardigan Bay (Wynne Jones 2001: 21).
- 4.5.17. Travelling east from Bardsey Island, vessels would have to contend with tidal rips around Pen-y-Cil headland and the submerged rocks and reefs in Aberdaron Bay. Ships would have kept close to the rocky coastline despite other hazards, in order to avoid the tidal rips and shallow waters around Devil's Ridge to the south.
- 4.5.18. The two major hazards on the approach to Porthmadog are Porth Neigwl (Hell's Mouth) and Sarn Badrig (St. Patrick's Causeway). These hazards were described by Thomas Pennant in *A Tour of Wales* as being similar to Scylla and Charybdis in Homer's tales; where the mariner avoids one, only to be trapped by the other (Holden 2003a: 43).
- 4.5.19. Despite being described as the worst hazards along this stretch of coastline, none of the known wrecks or recorded losses encountered during the course of this assessment was found to lie near either Porth Neigwl or Sarn Badrig. The UKHO has details of eight known wrecks on Sarn Badrig, none of which are known to have been carrying slate cargoes. In comparison, Ian Cundy has suggested that at least 459 wrecks have been lost on or near Sarn Badrig (Cundy 2004).

- 4.5.20. This disparity highlights the limitations of the readily available data sources for known wrecks and recorded losses. The wrecks described by Mr. Cundy are recorded losses and due to the problems with the accuracy of recorded losses described previously, it does not necessarily follow that all of these wrecks exist on Sarn Badrig. The relatively small number of wrecks charted by the UKHO here may be due to the difficulties inherent with surveying a feature which is a major navigational hazard. If even a small proportion of the wrecks described by Ian Cundy were to exist on Sarn Badrig it could constitute a significant increase on the number of charted wrecks.
- 4.5.21. There have been navigational issues in Tremadoc Bay and Porthmadog harbour itself; Lewis Morris wrote in 1748 that a large number of vessels had been lost near Tremadoc and Barmouth as mariners relied on Captain Collins' inaccurate charts, which gave clear water depths for areas which were actually foul ground (Wynne Jones 2001: 29). Porthmadog itself had not been established in 1748, and the Blaenau Ffestiniog quarries were not yet exporting slate on an industrial scale, however there is some potential for vessels involved in the slate trade from the Bethesda and Llanberis quarries to have encountered difficulties in Tremadoc Bay.
- 4.5.22. Further problems could be faced by vessels attempting to navigate the approach to Porthmadog in the form of Porthmadog Bar, formed by the shifting sands and action of the Dwyryd and Glaslyn rivers. The dynamic nature of the sediment movement in this area resulted in a navigational hazard which could frequently vary in terms of size, shape and position.
- 4.5.23. Vessel traffic in relation to the slate trade would have been particularly high in this area, as the harbours of Porthmadog and Pwllheli were central to the slate industry. While not being a large exporter of slate, Pwllheli was one of the most important shipbuilding centres in North Wales and supplied vessels to the harbour at Porthmadog, which was among the busiest slate-exporting harbours of the 19<sup>th</sup> century.
- 4.5.24. A total of 23 sites are listed in this area, comprising eight known wrecks and 15 recorded losses, distributed from Bardsey Island in the west to Tremadoc Bay in the east. This includes a cluster of six known wrecks between Bardsey Island and Aberdaron Bay.

#### **St. David's Head**

- 4.5.25. St. David's Head and Milford Haven are situated on two exposed headlands on a peninsula jutting out in to the path of the prevailing south-westerly winds blowing into Cardigan Bay.
- 4.5.26. Rugged sea cliffs and exposed beaches make up much of the coastline from St. Bride's Bay to Dinas Head and the presence of offshore islands and islets such as Ramsey Island contributes to strong tidal rips around these features. One known wreck and 16 recorded losses lie along this stretch of coastline.
- 4.5.27. Numerous rock outcrops and islets constitute further hazards to shipping in the area, particularly around the Bishops and Clerks and Skomer Island. One known wreck and fifteen recorded losses occur along the coast from St. Bride's Bay to Milford Haven.

- 4.5.28. The dangerous nature of the Bishops and Clerks and Skomer Island rocks are further emphasised by the presence of navigation beacons at these locations. Other lighthouses in operation in the area are at Great Castle Head and St. Anne's Head, where a lighthouse has been in operation since the early 18<sup>th</sup> century.
- 4.5.29. The prominence of Milford Haven as a harbour would have resulted in an increased level of general marine traffic around St. David's Head. This harbour was of more importance to the coal trade of South Wales; only two of the recorded losses of slate-carrying vessels list Milford Haven as a port of registry and place of build, and none of the recorded losses list Milford Haven as a port of embarkation or destination.
- 4.5.30. Although none of the recorded losses were described as being bound for Milford Haven, South Wales ports and the ports of southern England feature prominently in the destinations of slate exporting vessels. Voyages to southern English ports and the European ports which imported slate in great quantities would have required vessels to round around St. David's head and negotiate the navigational hazards described above.

## **5. ARTEFACTUAL AND DOCUMENTARY EVIDENCE**

- 5.1.1. In addition to records of known wrecks and losses, this assessment collated other available evidence on the maritime aspects of the Welsh slate trade. This includes evidence for artefacts that have been removed from the context of a wreck site, evidence arising from previous archaeological investigations of wrecks, and an assessment of the available documentary evidence related to the Welsh slate trade.

### **5.2. ARTEFACTUAL EVIDENCE**

#### **Previous Archaeological Investigations**

- 5.2.1. Three known slate wrecks have been subjected to formal archaeological investigations incorporating some level of excavation and, in one case, the lifting of the entire wreck. These are the Pwll Fanog and Llyn Padarn wrecks in Wales and the wreck of the *John Preston* in the Sound of Mull, Scotland.
- 5.2.2. The Pwll Fanog wreck is the only slate-carrying wreck designated under the Protection of Wrecks Act (1973). It was discovered in the Menai Strait in 1976 and subjected to a detailed survey by J.J. Carroll and P. Bensley in 1977. A cross-sectional trench was excavated by Owain Roberts, Welsh Institute of Maritime Archaeology and History, University College of North Wales, Bangor, with the aid of the Gwynedd Branch of the BSAC (Roberts 1979: 249). The trench revealed timbers characteristic of a clinker-built vessel preserved below the slate mound. A part of the keel and one or two fragments of planking were recovered, as well as the anchor next to the site (WA 2007).
- 5.2.3. In 1980, a radiocarbon date on a sample of planking was published, placing the sinking sometime between 1570 and 1690. In 1998, a part of the keel that had been recovered in 1978 was subjected to AMS dating, providing results that clustered around the period 1470 AD with a range between 1430 AD and 1530 AD (*ibid.*).
- 5.2.4. The wreck was subjected to numerous further survey visits between 1981 and 2001, carried out by the licensed divers of the University of North Wales, Bangor and the

Maritime Archaeology Group Wales as well as the contractor in relation to the Protection of Wrecks Act (1973), the Archaeological Diving Unit (ADU) of St. Andrew's University. WA undertook a survey visit to the site in 2007, in its role as Cadw's current contractor for the Protection of Wrecks Act (1973).

- 5.2.5. The Llyn Padarn boat was discovered in 1977 by a team of commercial divers surveying Llyn Padarn for the Central Electricity Generating Board. Initial examination of the site revealed a pile of stacked slated and the frames and stern of a small boat. Following analysis of some slates raised from the wreck at the North Wales Quarry Museum, an 18<sup>th</sup> century date was suggested for the wreck and it was subjected to comprehensive survey.
- 5.2.6. The boat was found to be largely intact and just over 7m long. It was constructed in the bateau style, popular throughout Europe and the American colonies in the 18<sup>th</sup> century (Illsley and Roberts 1979: 49). Following detailed survey, it was decided to remove the slate cargo and completely lift the wreck. It was lifted in 1978 and transferred to the North Wales Quarry Museum at Llanberis for conservation.
- 5.2.7. The *John Preston* was discovered in the late 1970s in the Sound of Mull. When first discovered, little of the vessel was visible, being covered by a mound of slate and a thin layer of sediment. Approximately 250,000 slates were salvaged from the site in 1986. In 1994 the Sound of Mull Archaeology Project began six years of archaeological survey of the site.
- 5.2.8. Continuing exposure of areas of ship structure resulted in a major hull recording programme taking place, in combination with the excavation of three trial trenches. The surviving timber structure was found to be 18.9m long by 5.3m wide and in terms of construction the wreck was found to resemble a two-masted fore-and-aft rigged schooner (Webster and Roberts 2007: 55).

#### **Other Salvage**

- 5.2.9. Information obtained from recreational divers contacted through the internet forums of BSAC ([www.bsacforum.co.uk](http://www.bsacforum.co.uk)) and Diver Magazine ([www.divernet.com](http://www.divernet.com)), suggests that a number of slate wrecks are being subjected to commercial salvage by divers.
- 5.2.10. Two wrecks off the Great Orme and Little Orme (**WA 1019** and **1020**) have allegedly been subjected to salvage as has a slate wreck at Puffin Island, thought to be the *Arthur* (**WA 1009**).
- 5.2.11. The website of Julie-Anne Charters, a fishing and diving charter boat service run by Elfyn Jones ([www.julie-anne.co.uk](http://www.julie-anne.co.uk)), mentions that nine slate wrecks are known to him and that five are deemed worthy of salvage, one of which is a wreck off Puffin Island.

#### **Ships in Preservation and Reconstructions**

- 5.2.12. The only slate-carrying vessel known to be preserved in Wales is that of the Llyn Padarn boat. Following its excavation and lifting it was put in the care of the North Wales Quarry Museum at Llanberis, now known as the Amgueddfa Lechi Cymru or National Slate Museum.



- 5.2.13. The boat was immersed in polyethylene glycol (PEG) solution until 1981 (Cadi Iolen, pers. comm.), and is now displayed with its cargo of slates in the museum's Locomotive Shed, along with the steam locomotives from various slate tramways and railways.

### **5.3. DOCUMENTARY EVIDENCE**

- 5.3.1. As the Welsh slate industry was most dominant during the 19<sup>th</sup> century and early 20<sup>th</sup> century, many primary sources of documentary evidence survive in the various archives in Wales. Due to the way in which the industry developed, a relatively large amount of archival information was found through a simple initial scoping study with regard to key persons or families and ports and harbours.
- 5.3.2. WA conducted several searches of the Access to Archives website of the National Archives ([www.nationalarchives.gov.uk](http://www.nationalarchives.gov.uk)) and found a number of holdings that may contain relevant information regarding the Welsh slate trade. While it is not within the remit of this report to provide a full and in-depth archive assessment, it is hoped that the information provided will form a useful base on which further work can be undertaken.
- 5.3.3. The website was searched using terms such as the names of key persons such as the various Lords Penrhyn and the other main quarry operators and by looking at the information available on shipping, customs and excise and shipbuilding in the key slate exporting ports. A list and description of the records found is available in **Appendix V**.

## **6. DISCUSSION**

### **6.1. THE IMPORTANCE OF THE WELSH SLATE INDUSTRY**

- 6.1.1. The Welsh slate industry, while having a mainly 19<sup>th</sup> and 20<sup>th</sup> century focus, has a history which stretches back as far as the Roman period at least. The extraction of slate can be seen as a consistent exploitation of an available resource throughout Wales' entire historic period.
- 6.1.2. The impacts of the industry highlight its importance to the cultural heritage of Wales. It changed the landscape of North Wales, resulting in its development and a marked change in its demographics in the 19<sup>th</sup> century. It preserved communities in that area, sustaining their populations while many rural areas throughout the rest of the UK were being abandoned in favour of cities.
- 6.1.3. The international aspects of the slate trade were significant, as the export of slate contributed to the architectural heritage of many of the developing towns of North and South America and Australia. In addition to this, the export of slate brought emigrants which added Welsh identity to the cultural of these countries.
- 6.1.4. When considering the international aspect of the slate trade, or even the export of slate to domestic markets, the importance of the investigation of the maritime archaeology of the industry is clear. However, during the course of this assessment it was difficult to find a great deal of information related to the maritime aspects of the slate industry.

- 6.1.5. While archaeological investigations have been carried out on several wrecks and there is information on recorded losses to a certain degree, an assessment of the overall maritime archaeology of the industry appears to be lacking. It is hoped that this report has succeeded in synthesising the most relevant information on the maritime archaeology of the slate industry and can be a starting point from which to further our understanding of the cultural heritage of this industry.
- 6.1.6. A number of recommendations are outlined below for additional work which could follow this assessment.

## **6.2. SUGGESTIONS FOR FURTHER WORK**

### **Publicity and Dissemination of Results**

- 6.2.1. At the beginning of this assessment, WA posted requests for information on slate wrecks on the internet forums of several recreational diving websites. The responses, while not by any means numerous, were very positive and the majority of interested parties were more than willing to share information on slate wrecks they had dived.
- 6.2.2. The importance of the Welsh slate industry in contributing to the current character of Welsh society, and the communities of North Wales in particular, has been discussed. It is recommended that the results of this assessment be disseminated to a wide range of interested parties to further inform people on the cultural heritage of this important industry.
- 6.2.3. It is recommended that the dissemination of this assessment be initially achieved by making this report freely available on the internet, through the websites of Cadw, the RCAHMW or WA. Further to this, the results of this assessment could be published as a number of non-technical reports suitable for different audiences including both academic journals and the recreational diving press.
- 6.2.4. Given the positive response of the divers contacted by WA, it is recommended that an educational pack be produced which could be circulated among the recreational diving community. Such a pack could include information on the history and importance of the slate trade, the types of vessels used and the existing maritime archaeology of the industry. Education and outreach can promote a greater understanding of the cultural heritage connected with this industry and may engender more responsible diving practice with regard to archaeological sites and may result in an increase in the reporting of newly discovered wrecks of archaeological potential.

### **Archival Research**

- 6.2.5. As mentioned in Section 5.3, a considerable amount of primary source data is available in various records offices and archives in Wales. A limited search of these holdings was carried out during the compilation of this report, and a list of relevant records is available in **Appendix V**.
- 6.2.6. WA's search of these holdings should not be considered comprehensive; rather it may form a useful starting point from which in-depth archival research may be carried out. Of the 126 recorded losses compiled, only 22 were found through searches of the NMRW Coflein database.

- 6.2.7. A number of the holdings listed in **Appendix V** are described as comprising sources particular to the Welsh slate industry. Such specialised sources are not often considered when compiling lists of known losses, as it is not feasible to examine all data sources in existence.
- 6.2.8. It is suggested that a research project focusing on archival research and collation of historical documents be undertaken. Such a project would not only contribute to the understanding of the broader history of the Welsh slate industry, but may result in the discovery of new records of losses and enhancement of the current dataset held by the NMRW.

#### **Geophysical Survey and Diver Investigation**

- 6.2.9. Geophysical survey is recommended, which could take the form of an area-based or site specific survey. If significant archaeological remains are encountered, geophysical survey could be followed up with a targeted diver investigation
- 6.2.10. An area-based survey could investigate a tract of seabed in an effort to indentify previously unknown wreck sites. An area such as the approaches to Porthmadog, which would have had a high density of marine traffic in combination with a number of hazards to shipping, would be a suitable target for such a survey. Such a survey would seek to address the disparity between the numbers of recorded losses and the numbers of known wreck sites. However, an area-based survey would need to cover a large amount of seabed and would be time-consuming and high in operational costs. In addition, there is no guarantee that geophysical prospecting would encounter any significant archaeological material which would add to the understanding of the slate industry.
- 6.2.11. A site-specific survey would concentrate on a single site or a number of sites. It would have the advantage of being able to target known wreck sites, and even if significant archaeological remains are not present, the survey would at least serve to establish the extent of the remains.
- 6.2.12. Only four of the known wrecks encountered during the course of this assessment are described as having any evidence of timber structure. Investigation of sites which are composed solely of stacks of slate cargo is not likely to add much information to the understanding of the maritime archaeology of the slate trade. Although analysis of the slates themselves may provide information as to which quarry or slate producing area they originated from, without evidence of ship structure there is no way of knowing whether the site actually represents a shipwreck or is just jettisoned cargo.
- 6.2.13. While it is possible that ship structure exists, buried beneath the seabed, on a number of the other sites, initial geophysical survey and diving investigations would be most productive on wrecks where evidence for ship structure is known to exist. These sites are **WA 1002, 1003, 1021 and 1022**. Site **WA 1003**, the Pwll Fanog Medieval slate wreck, has previously been subjected to archaeological diving investigations (Section 5.2).
- 6.2.14. Sites **WA 1021 and 1022** are described as having limited wooden elements, and **WA 1022** is described as having a windlass and an admiralty pattern anchor. The sites are situated off Anglesey and the Great Orme and Little Orme and as they are over 50 kilometres apart, it would not be feasible, either in terms of operational or economic

efficiency, to survey both sites as part of the same session of work. Therefore, for either of these sites to be surveyed, one site would have to be selected as having more merit than the other and there is not currently enough evidence on which to make such a selection.

- 6.2.15. The most effective option, in terms of potential results and maximum use of operational time, would be to survey an area in which there was a cluster of known wrecks within a relatively small area. This would produce geophysical results for a number of sites, from which one or more could be selected for diver investigation. This option also presents the advantage of having several sites which can be investigated as part of a contingency plan, should the initial site prove to be disappointing in terms of the preservation of archaeological remains or prove to present environmental conditions too challenging for effective survey.
- 6.2.16. A cluster of known wreck sites exists off the Lleyn peninsula; there are six known wreck sites and six recorded losses distributed in a rough line, running for nine kilometres from Bardsey Island to Aberdaron Bay. The relative proximity of these sites would enable geophysical survey or diver investigation to be carried out within a reasonable timescale.
- 6.2.17. However, in terms of potential for archaeological remains, the area immediately around Bardsey Island, in which the known wrecks **WA 1006** and **1013** are situated, is lacking in any sediments that are likely to preserve timber ship structure. The seabed in this area is composed of mainly pre-Quaternary rock outcrops with bold topography (BGS 1988). Archaeological remains in this area are likely to comprise stacks of slate cargoes which are substantial enough not to be removed by the high energy hydrodynamic processes which have prevented sedimentation of the area. Elements of timber structure may still survive in this area however, trapped in rock crevices or gullies, but the presence of any coherent ship structure in this area is unlikely.
- 6.2.18. To the north of Bardsey Island is a small area of sandwaves, and moving from Pen-y-Cil headland eastwards the seabed sediment is made up of sandy gravel. While this sandy gravel is less mobile than sandy sediments, it may be up to 0.2m thick in places (Tappin *et al.* 1994: 90) and may form sufficient sediment cover to preserve some elements of ship structure. This area includes Pen-y-Cil headland and Aberdaron Bay and the known wrecks **WA 1002, 1004, 1011 and 1012**.
- 6.2.19. The wreck **WA 1002** is one of only four known wrecks encountered during the course of this assessment that is described as having any evidence of timber structure. It is hoped that geophysical survey of this and the other wrecks off Pen-y-Cil and Aberdaron Bay will show evidence of some coherent structure that could warrant a diving investigation.
- 6.2.20. As previously mentioned, it is possible that **WA 1002** is a duplicate of **WA 1011** and that the same situation exists for **WA 1004** and **1012**. Therefore this area may contain as little as two known wrecks as opposed to the four described. However, there are six recorded losses around Bardsey Island, Pen-y-Cil headland and Aberdaron Bay and there is therefore the possibility that additional wrecks exist in this area.

- 6.2.21. If the results of geophysical surveys indicate that diver investigation would provide further information on the wreck, a strategy for diver investigation would need to be formulated. Consideration should be given as to how the study of any selected wreck would add to the current knowledge of the maritime archaeology of the slate trade.
- 6.2.22. Diver investigations could focus on the construction of the vessel in order to attempt to ascertain the type of vessel the wreck represents and therefore place it in the broader context of vessel usage with relation to the slate trade. The identification of types and sizes of the slates carried should also be undertaken, and samples of slate removed in an attempt to identify the area in which they were produced.
- 6.2.23. **WA 1002** is one of the few wrecks for which the identity of the vessel has been suggested; it is thought to be the wreck of the *Peter Varkevisser*. Additional information on the *Peter Varkevisser* may be available in archives and public records and could be collated prior to diver investigation in order to inform the strategy for investigating this wreck.
- 6.2.24. Using background information on the *Peter Varkevisser* would assist in formulating a list of key issues and questions that diver investigation could address. The approach to investigating other known slate wrecks should endeavour to answer similar questions and the strategy for diver investigation should not need to change substantially, should **WA 1002** prove not to be the *Peter Varkevisser*.

## 7. ARCHIVE

- 7.1.1. The project archive consisting of a GIS work space and linked shape and other files, miscellaneous digital files and hardcopy documents, are currently stored at WA under project code 53111.

## 8. REFERENCES

### 8.1. CONTEMPORARY SOURCES

The sources below were accessed through the digital collections of the National Library of Australia and the Making of America digital archive.

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### 8.2. PUBLISHED SOURCES

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#### **8.4. ONLINE SOURCES**

Access to Archives: The National Archives

<http://www.nationalarchives.gov.uk/a2a/>

Australian National Shipwreck Database

<http://www.environment.gov.au/heritage/shipwrecks/index.html>

Berwyn Slate: Company website

<http://www.berwynslate.com>

British SubAqua Club internet forums

<http://www.bsacforum.co.uk>

Divernet internet forums

<http://www.divernet.com/Forums/>

Greaves Welsh Slate Company Ltd.: Company website

<http://www.welsh-slate.com>

Julie-Anne Charters website

<http://www.julie-anne.co.uk>

L'Épave aux Ardoises (The Slate Wreck) on the website of Épaves du Ponant (Wrecks of Ponant)

<http://www.archeosousmarine.net/ardoises.html>

Making of America: Digital library

<http://quod.lib.umich.edu/m/moagrp/>

National Library of Australia: Australian newspapers

<http://ndpbeta.nla.gov.au/ndp/del/home>

Welsh//Slate: Company website of the Welsh Slate company

<http://www.welshslate.com>

Wrecksite Online Database

<http://www.wrecksite.eu>

UKDiving website: Wreck list

<http://www.ukdiving.co.uk/wrecks/index.php>

**APPENDIX I: KNOWN WRECKS IN WALES AND THE UK**

ID	Country	Vessel	Date lost	Details	Easting	Northing	Sources
1001	Wales	<i>Lewis</i> (possibly)	Unknown	Divers reported in 1983 that a mound of slate, with pieces of iron about 18m to the west, was found in this location. There are reports of smashed slate around the site to a distance of 10m. A two to three tonne anchor lies 10m away.	340671	5747457	UKHO (UKHO-WO-12172)
1002	Wales	<i>Peter Varkevisser</i>	January 1895	The wreck at this position is thought to be the <i>Peter Varkevisser</i> , which sank in St. Tudwal's Pond on 11 <sup>th</sup> or 13 <sup>th</sup> January 1895 while en route from Porthmadog to Cardiff. It has been referred to as a Milford ketch, owned by E. Jones of Milford Haven, but is also recorded as being registered in Porthmadog. Slates were found on a small reef in this location, and divers have reportedly found small pieces of timber with brass screws in this location and a substantial but unidentified metal object. It is also reported that part of a copper sheathed wooden keel was washed up on the nearby beach in 2002.	385527	5850853	UKHO (UKHO-WO-10113)  Coflein database (NPRN-271633)  Richard Larn  Chris Holden
1003	Wales	Pwll Fanog wreck site	Unknown	The wreck in this location is thought to be the remains of a mid 16th century sailing barge with a slate cargo. It is designated under Protection of Wrecks Act 1973.	420102	5896639	UKHO (UKHO-WO-7160)  Coflein database (NPRN-390)
1004	Wales	Unknown	Unknown	Rows of slates were found in this location during surveying in 1989. This is thought to be the remains of a slate carrier, though no evidence of ship structure has been found.	383129	5849270	UKHO (UKHO-WO-10111)
1005	Wales	Unknown	Unknown	Some ship structure and many roofing slates have been reported by SCUBA divers just out of Martin's Haven.	345030	5734194	Len Bateman of Dive Pembrokeshire
1006	Wales	Unknown	Unknown	Roofing slates have been found on the seabed west of Maen Ddu and are thought to represent a wreck site.	378207	5845579	Underwater Guide to North Wales: Volume I
1007	Wales	Unknown	Unknown	Roofing slates have been found on the seabed south of Pilot's Cove and are thought to represent a wreck site.	405494	5888221	Underwater Guide to North Wales: Volume I
1008	Wales	Unknown	Unknown	Roofing slates have been found on the seabed in this location and are thought to represent a wreck site.	394082	5868366	UKDiving Website <a href="http://www.ukdiving.co.uk">www.ukdiving.co.uk</a>
1009	Wales	<i>Arthur</i> (possibly)	Unknown	Slates have been salvaged from a wreck in Puffin Sound by Elfyn Jones of Amlwch. C. Holden has suggested that this may be the wreck of the <i>Arthur</i> .	431067	5907771	Chris Holden
1010	Wales	Unknown	Unknown	Some slates have been found by Chris Holden at Pen-y-chain headland. However the presence of a wreck is not confirmed.	411308	5860978	Chris Holden

ID	Country	Vessel	Date lost	Details	Easting	Northing	Sources
1011	Wales	Unknown	Unknown	A reef at the east side of Aberdaron Bay has a considerable number of roofing slates scattered about the seabed, but no evidence of wreckage. This is almost certainly a duplicate position for wreck <b>WA 1002</b> .	385686	5850813	Chris Holden
1012	Wales	Unknown	Unknown	Two anchors and neatly stacked slates were found off Pen-y-Cil, Aberdaron Bay, in 28 metres of water, about 10 years ago. This is almost certainly a duplicate position for wreck <b>WA 1004</b> .	383143	5849316	Chris Holden
1013	Wales	Unknown	Unknown	There is a trail of roofing slates running north-west from the southern tip of Bardsey Island, an anchor and chain at the tip of the island may be related to this. An unknown sloop sank on 13/10/1822 one mile south-east of Bardsey Island with the loss of all hands; these archaeological remains may be connected with this reported loss ( <b>WA 2126</b> ).	380854	5846988	Chris Holden
1014	Wales	Unknown	Unknown	C. Holden states that there is a slate wreck off Porthdinllaen. The slates have a curve on one edge.	395966	5867520	Chris Holden
1015	Wales	Unknown	Unknown	There are slates on the seabed near Llanddwyn Island, which may or may not be from a wreck.	405332	5888687	Chris Holden
1016	Wales	Unknown	Unknown	C. Holden has dived a slate wreck near the Skerries.	393327	5920653	Chris Holden
1017	Wales	Unknown	Unknown	C. Holden states there is a slate wreck off Point Lynas which has been dived recently. The ship's bell has apparently been recovered.	414937	5920434	Chris Holden
1018	Wales	Unknown	Unknown	Slates have been found off Puffin Island. C. Holden has a sample, including one marked with the characters '25S'.	431919	5908192	Chris Holden
1019	Wales	Unknown	Unknown	C. Holden has dived a slate wreck off the Great Orme.	442137	5911402	Chris Holden
1020	Wales	Unknown	Unknown	C. Holden has dived a slate wreck off the Little Orme.	448430	5909522	Chris Holden
1021	Wales	Unknown	Unknown	The remains of a wooden sailing vessel. The wreck is 2m proud of the seabed and consists of a limited amount of ship structure and thousands of stacked slates. Metal detector searches have suggested that the ship's fittings are almost all iron fittings.	446870	5912505	Underwater Guide to North Wales: Volume II
1022	Wales	Unknown	Unknown	The remains of a wooden sailing vessel and its cargo of roofing slates. The vessel remains are limited to some wooden elements, a windlass, an admiralty pattern anchor and various metal fittings.	393537	5920823	Underwater Guide to North Wales: Volume II
1023	Wales	<i>Omnibus (possibly)</i>	02/02/1869	An Aberysthwyth vessel lost on the Carreg-y-Trai reef, off the St. Tudwal's Islands while en route to London. C. Holden reports that the remains of this slate carrier are scattered among the remains of the steamship <i>Timbo</i> (UKHO-WO-10072) which is known in this location.	402354	5851040	Chris Holden UKHO (UKHO-WO-10072)

ID	Country	Vessel	Date lost	Details	Easting	Northing	Sources
1024	England	<i>Jane Anwyl</i>	05/04/1889	The slates found in this location are thought to represent the remains of the <i>Jane Anwyl</i> : a Caernarfon registered schooner. The vessel was en route from Porthmadog to Colchester when it sank following a collision with the SS <i>Plymothian</i> .	791938	5663794	Paul Oliver, BSAC Internet Forum <a href="http://www.bsacforum.co.uk">www.bsacforum.co.uk</a>
1025	England	<i>Arab</i>	Unknown	Remains found in this area are thought to be the sailing ship <i>Arab</i> which sank while carrying a cargo of slates after striking rocks in thick fog whilst en route from Swansea to Poole. The UKHO also charts the slate ship <i>Robert</i> in the same location; it appears there has been some duplication of records.	342413	5536471	UKHO (UKHO-WO-22597)
1026	England	<i>Robert</i>	Unknown	Remains found in this area are thought to be the sailing ship <i>Robert</i> , lost while carrying slate from Y Felinheli to Southampton. The UKHO also charts the slate ship <i>Arab</i> in the same location; it appears there has been some duplication of records.	342413	5536471	UKHO (UKHO-WO-22596)
1027	England	Unknown	Unknown	A slate wreck is charted in this area by the UKHO. Due to its proximity to wreck <b>WA 1024</b> , it is possible that this represents a duplicate record.	791819	5663833	UKHO (UKHO-WO-14812)  Wreck Database <a href="http://www.wrecksite.eu">www.wrecksite.eu</a>
1028	Scotland	<i>John Preston</i>	02/12/1882	Substantial archaeological remains were found on the seabed and subject to archaeological investigation. The <i>John Preston</i> was en route from Y Felinheli to Fraserburgh (Aberdeenshire) when stranded west of Lochaline Pier.	327586	6268930	UKHO (UKHO-WO-58347)
1029	Scotland	Unknown	Unknown	The remains of a wreck, reportedly carrying a cargo of slate and coal, were uncovered during movement of sand dunes just west of the airport building on the Isle of Barra.	229752	6329143	UKHO (UKHO-WO-1906)

**APPENDIX II: RECORDED LOSSES IN WALES**

<b>ID</b>	<b>Named Location</b>	<b>Vessel</b>	<b>Date of loss</b>	<b>Details</b>	<b>Sources</b>
<b>2001</b>	Cemlyn Bay, Anglesey	<i>Ada and Alice</i>	27/10/1892	An Aberystwyth schooner, built in 1863 and owned by Mrs. C. Thomas; it was stranded and lost en route from Y Felinheli to Peel, Isle of Man.	Coflein database (NPRN-272045) Richard Larn
<b>2002</b>	10 miles SSW of St. Ann's Head	<i>Alexander</i>	13/04/1902	A Beaumaris schooner, built at the Prince Edward Islands in 1861 and owned by Mrs. M. Parry of Bangor; it foundered and was lost en route from Porthmadog to Grimsby.	Richard Larn
<b>2003</b>	3 miles NNE of the Menai Light	<i>Amity</i>	11/08/1877	An Aberystwyth smack, built there in 1802 and owned by J. Rees & Co. It foundered and was lost after developing a leak en route from Bangor to Preston. It was carrying 85 tonnes cargo stowed in bulk in tiers lengthwise and crosswise, with straw between each tier. Its mate attributed the cause of the leak to a stone piercing the ship's bottom.	Richard Larn
<b>2004</b>	Friar's Road, Menai Strait	<i>Ann</i>	02/08/1876	A Chester smack, built in 1841 and owned by R. Edwards of Connah's Quay; it was stranded without loss of life en route from Connah's Quay to Caernarfon.	Richard Larn
<b>2005</b>	23 miles NE of South Bishop lighthouse, St. George's Channel,	<i>Ann</i>	30/10/1875	A Caernarfon schooner, built in 1848 in the Prince Edward Islands and owned by T. Jones of Penrhynchdraeth; it foundered en route from Porthmadog to Cardiff. It was carrying 128 tonnes of slates stacked in tiers, which was deemed too heavy given the age and unseaworthiness of the vessel and the time of year the voyage took place.	Richard Larn
<b>2006</b>	Off Point Lynas, Anglesey	<i>Ann and Catherine</i>	11/12/1881	A schooner which foundered en route from Beaumaris to Paisley.	Coflein database (NPRN-271876) Richard Larn
<b>2007</b>	Wild Roads, River Dee	<i>Ant</i>	19/02/1907	A Liverpool jigger, built in 1863 and owned by Clare's Lighterage Co. of Lancashire. It foundered and was lost following a collision with the Liverpool registered SS <i>Jane</i> while en route from Y Felinheli to Sankey Bridges. It has been described as a flat by C. Holden, and there appears to be some disagreement as to whether the date of loss was 1867 or 1907.	Richard Larn Chris Holden.
<b>2008</b>	Menai Strait, Anglesey	<i>Arthur</i>	16/11/1893	A Liverpool flat, built in 1860 and owned by J. G. Best of Liverpool; it was stranded and lost en route from Y Felinheli to Liverpool.	Richard Larn
<b>2009</b>	Conway Bank	<i>Atlas</i>	26/11/1852	A flat, registered at Y Felinheli, it hit Conway Bank, capsized and sank en route to Runcorn.	Chris Holden
<b>2010</b>	Milford Haven	<i>Azorean</i>	10/04/1884	A Caernarfon schooner, built in 1834 and owned by D. Morris; it foundered and was lost after developing a leak while en route from Caernarfon to Cork.	Richard Larn

<b>ID</b>	<b>Named Location</b>	<b>Vessel</b>	<b>Date of loss</b>	<b>Details</b>	<b>Sources</b>
<b>2011</b>	Driven ashore near Porthdinllaen	<i>Bardsey</i>	03/12/1863	A sloop, lost during a tremendous gale, along with many others. According to C. Holden, R. Larn's book states that this vessel was carrying slates, although it was not mentioned in the Shipwreck Index viewed by WA. There appears to be some confusion as to the vessel's port of registry with both Pwllheli and Caernarfon being suggested.	Chris Holden Coflein database (NPRN-271599)
<b>2012</b>	South of Mawddach Estuary	<i>Bertolly</i>	21/01/1843	A Newport schooner, master Jones, came ashore under Celynin Church, to the south of the Mawddach estuary. It had left St. Tudwal's and was near the Bishops when it encountered a gale. The master and two of the crew lashed themselves to the rigging and were safely landed. One man came ashore on a raft soon after the vessel struck. Another crewman, Hugh Roberts of Porthmadog, who had been too ill to ascend the rigging, was later found dead in the hold.	Chris Holden
<b>2013</b>	Off South Bank of Caernarfon Bar	<i>Betty and Jane</i>	25/06/1836	This sloop struck the South Bank of Caernarfon Bar. The vessel was refloated but sank later in deep water.	Chris Holden
<b>2014</b>	2 miles SW of Bardsey Island, Cardigan Bay	<i>British Queen</i>	23/09/1820	A Caernarfon brig en route to London with slates; it sprang a leak in Cardigan Bay and sank. The crew were saved in their own boat.	Richard Larn Chris Holden
<b>2015</b>	Beach at Llandudno, opposite Adelphi hotel	<i>Brothers</i>	01/12/1867	A Beaumaris schooner which broke up after being driven onto the beach at Llandudno while en route from Bangor to Garston.	Chris Holden
<b>2016</b>	Dulas Island, Anglesey	<i>Busy</i>	14/05/1890	A smack, owned by G. Williams of Plasgwyn, Anglesey; it foundered and was lost offshore en route from Bangor to Donegal.	Richard Larn
<b>2017</b>	15 miles NW by W of South Bishop rock, Pembrokeshire	<i>Cambria</i>	20/12/1903	A Caernarfon schooner, built at Bangor in 1860 and owned by Mrs. F. Evans; it foundered and was lost en route from Porthmadog to Cardiff.	Richard Larn
<b>2018</b>	Bardsey Sound, Caernarfonshire	<i>Cambria</i>	21/07/1878	A Beaumaris smack, built in Pwllheli in 1811 and owned by H. Jones of Porthmadog; it sprang a leak, became unmanageable and was abandoned while carrying 57 tonnes of slates from Porthmadog to Belfast.	Richard Larn Chris Holden Coflein database (NPRN-271616)
<b>2019</b>	Milford Haven entrance, at Watwick Point	<i>Caroline</i>	02/01/1896	A London schooner, stranded and lost while seeking shelter in the Haven	Richard Larn
<b>2020</b>	Alongside the quay, Holyhead	<i>Catherine</i>	02/02/1873	An Amlwch vessel, sunk alongside the quay, en route from Bangor to Dublin.	Chris Holden
<b>2021</b>	Skokholm Island, Milford Haven	<i>Catherine and Jane</i>	21/10/1858	An Aberdyfi schooner, built there in 1853 and owned by Lewis & Co.; it was stranded and lost on Skokholm Island.	Richard Larn
<b>2022</b>	Fishguard Roads, Pembrokeshire	<i>Charlotte</i>	07/10/1878	A Caernarfon schooner, built in Porthmadog in 1852 and owned by R. Humphreys & Co.; it was stranded and lost after parting with its moorings while en route from Porthmadog to Stockton-on-Tees.	Richard Larn

ID	Named Location	Vessel	Date of loss	Details	Sources
2023	Strumble Head, offshore, 20 miles SW by W of the lightship	<i>Charlotte</i>	23/02/1879	A Beaumaris schooner, built in 1839 and owned by W. Owen and R. Owen of Holyhead. It was en route from Bangor to London carrying 109 tonnes of cut slate in tiers, when it sprang a leak and was seen to go down. It was thought to have been too old a vessel to carry such weight.	Richard Larn Coflein database (NPRN-272602)
2024	Chester Flats, 3 miles NE of Rhyl	<i>Clare</i>	06/02/1895	A Liverpool flat, built in 1849 and owned by R. Williamson of Sankey Bridge. It foundered en route from Y Felinheli to Liverpool.	Richard Larn
2025	Liverpool Bay, Mockbeggar, near Leasowe lighthouse	<i>Cousins</i>	02/10/1895	A Beaumaris schooner, built in 1813 and owned by W. Williams of Pwllheli; it was stranded and lost en route from Pwllheli to Birkenhead.	Richard Larn
2026	Anglesey, Menai Strait, Dutchman Bank	<i>Crane</i>	07/01/1879	A Beaumaris smack, built in 1842 and owned by O. Owens of Bangor. It was stranded and lost en route from Chester to Beaumaris.	Richard Larn
2027	SW of the Bishop and Clerks Rocks	<i>Crusader</i>	10/03/1891	An Aberystwyth brig, lost south-west of the Bishop and Clerks Rocks while en route from Caernarfon to Harburg.	Coflein database (NPRN-274580)
2028	Moelfre Bay, Anglesey	<i>Dart</i>	28/03/1888	A Beaumaris schooner, built in 1836 and owned by E. Hughes of Moelfre; it was stranded and lost en route from Y Felinheli to Glasgow.	Richard Larn
2029	Cardigan Bar, Cardiganshire	<i>Dewiwyn</i>	21/01/1861	A Porthmadog schooner, built in 1852 and owned by Jones & Company; it was stranded and lost while carrying a cargo of slate.	Richard Larn
2030	Off Cemaes Head, Pembrokeshire	<i>Dispatch</i>	22/07/1878	A Milford smack, built there in 1852 and owned by D. Owen of Aberforth. It was en route from Aberdovey to Portsmouth carrying 52,000 slates in tiers, with straw between each tier. It sprang a leak and was lost; it was thought that as an old vessel she was unfit to carry such a heavy dead-weight cargo.	Richard Larn
2031	Dulas Island, Anglesey East	<i>Douglas Pennant</i>	21/01/1868	An Y Felinheli schooner, built in Bangor in 1841; it hit the rocks at Dulas Island and broke up while en route from Ramsey to Bangor.	Chris Holden
2032	Skomer Island, St. Ann's Head, Pembrokeshire	<i>Dreadnought</i>	04/12/1902	An Aberystwyth schooner, built in Liverpool in 1859 and owned by J. Thomas of Aberystwyth. It foundered and was lost in St. Bride's Bay while en route from Porthmadog to Littlehampton.	Richard Larn
2033	Ramsey Sound, St. David's Head, Pembrokeshire	<i>Elizabeth</i>	11/08/1841	A Porthmadog sloop, lost while carrying slate.	Richard Larn
2034	Ramsey Island, Pembrokeshire	<i>Elizabeth</i>	16/11/1882	A Cardigan schooner, built there in 1836 and owned by J. Jones; it was stranded and lost with all hands on Ramsey Island while carrying slate from Porthmadog to Cardiff.	Richard Larn
2035	Little Haven, St. Bride's Bay, Pembrokeshire	<i>Elizabeth</i>	16/11/1882	A Caernarfon schooner, built in 1850 in Porthmadog and owned by W. Lloyd & Co.; it was stranded and lost en route from Porthmadog to Teignmouth.	Richard Larn
2036	Off SE point of Bardsey Island, Caernarfonshire	<i>Elizabeth and Jane</i>	27/04/1899	A Preston schooner, built in 1861 and owned by J. Mostyn of Amlwch; it was stranded and lost en route from Porthmadog to Great Yarmouth.	Richard Larn Coflein database (NPRN-271417)

ID	Named Location	Vessel	Date of loss	Details	Sources
2037	Ramsey Sound, St. Ann's Head, Pembrokeshire	<i>Elizabeth Davies</i>	10/01/1883	An Aberystwyth schooner, built in 1858 in Newport and owned by D. Thomas of Aberystwyth; it was stranded and lost en route from Porthmadog to Portsmouth.	Richard Larn
2038	East Hoyle Bank, Liverpool Bay	<i>Emma Maria</i>	24/03/1909	A Liverpool ketch, built in 1872; it was stranded and lost en route from Y Felinheli to Liverpool.	Richard Larn
2039	Pwllheli Beach, Tremadog Bay, Caernarfonshire	<i>Endeavour</i>	08/12/1886	A Caernarfon smack, built in 1845 and owned by H. Jones of Porthmadog; it was stranded and lost en route from Caernarfon to Newport.	Richard Larn Coflein database (NPRN-271624)
2040	Off Great Orme's Head, Denbighshire	<i>Ernest</i>	1890	A Chester schooner, built in 1865 and owned by R. Ferguson of Connah's Quay; it went missing en route from Connah's Quay to Haverfordwest.	Richard Larn
2041	Off Skokholm Island, Pembrokeshire	<i>Fancy</i>	29/10/1852	An Aberystwyth sloop which sank following collision with the Aberystwyth schooner <i>Reform</i> while en route from Y Felinheli to Bristol.	Richard Larn
2042	Irish Sea, east side	<i>Gateforth</i>	May 1891	A Whitehaven ketch, built in 1868 and owned by W. McMillan of Gatehouse; it disappeared while en route from Bangor to Kirkcudbright.	Richard Larn
2043	Strumble Head, Pembrokeshire	<i>Geraldine</i>	15/04/1894	A Caernarfon brig, built in 1860 in Barmouth and owned by H. Parry of Porthmadog; it foundered and was lost en route from Porthmadog to Harburg.	Richard Larn
2044	Off Little Orme's Head	<i>Glory</i>	11/10/1821	A Liverpool registered vessel which sank en route from Bangor to Liverpool.	Chris Holden
2045	14 miles NW of Bardsey Island lighthouse, Lleyl Peninsula	<i>Great Britain</i>	03/03/1881	A Caernarfon schooner, built in 1840 and owned by G. Griffiths of Porthmadog; it foundered and was lost offshore while en route from Porthmadog to Plymouth.	Richard Larn Chris Holden Coflein database (NPRN-271701)
2046	Amlwch, Anglesey	<i>Gwen Jones</i>	03/05/1853	A Porthmadog sailing vessel, built there in 1848 and owned by J. Jones of Porthmadog, master Edwards. It was lost while carrying a cargo of slate.	Richard Larn
2047	Jack Sound, Skomer Island, Pembrokeshire	<i>Gwendoline</i>	16/09/1891	A Milford ketch, built there in 1887 and owned by J. Davies of Llandyssil; it foundered after collision with the Cardigan steamship <i>Seaflower</i> while en route from Caernarfon to Cardiff.	Richard Larn
2048	Linney Head, St. Govan's Head, Pembrokeshire	<i>Hannah</i>	12/03/1897	A Bridgewater ketch, built in 1867 and owned by A. Johns of Gloucester; it was stranded and lost en route from Newlyn to Bristol.	Richard Larn
2049	Taylor's Bank, Liverpool Bay	<i>Hero</i>	09/03/1892	A Liverpool steamship, built there in 1861 and owned by J. J. King of Manchester; it was stranded and lost while en route from Y Felinheli to Preston. It was later blown up as a navigational hazard.	Richard Larn
2050	Puffin Island	<i>Hope</i>	09/03/1827	A Caernarfon schooner, Captain Edwards, totally lost on Puffin Island while en route from Caernarfon to Liverpool.	Chris Holden
2051	Goultrop Roads, Newport, Fishguard Pembrokeshire	<i>Hope</i>	20/01/1877	A Newport sloop, owned by John Harvard & Son lost en route from Pembroke to Newport.	Richard Larn



ID	Named Location	Vessel	Date of loss	Details	Sources
2052	Abercastle, Pembrokeshire	<i>Hope</i>	12/10/1870	A Caernarfon schooner, built in Porthdinllaen in 1856 and owned by T. Williams of Porthmadog; it sprang a leak while carrying 110 tonnes of cut slates from Porthmadog to Newport.	Richard Larn
2053	2 miles off the lightship	<i>Industry</i>	15/10/1859	A flat which sprang a leak and sank en route to Runcorn.	Chris Holden
2054	Salisbury Bank	<i>James</i>	07/02/1839	A flat, lost en route from Y Felinheli to Voryd.	Chris Holden
2055	Amlwch, Anglesey	<i>James and Maria</i>	20/02/1877	A Beaumaris flat, built in 1857 and owned by W. Evans of Amlwch; it was stranded and lost en route from Bangor to Belfast.	Richard Larn
2056	6 miles off Orme	<i>Jane</i>	26/04/1898	A smack, described by C. Holden as a slate wreck, which dismasted and sank while en route from Caernarfon to Runcorn.	Chris Holden
2057	10 miles SSE of St. Anne's Head, Pembrokeshire	<i>Jane</i>	September 1867	A Caernarfon schooner, built in 1827 in Pwllheli and owned by R. Jones of Morfa; it foundered and was lost en route from Porthmadog to Southampton and London.	Richard Larn
2058	Off Bardsey Island, St. George's Channel	<i>Jane Pringle</i>	08/12/1899	A Beaumaris schooner, built in 1854 and owned by W. Thomas of Amlwch; it foundered and was lost offshore while en route from Porthmadog to Faversham.	Richard Larn
2059	Off The Skerries, Anglesey	<i>John and Ann</i>	22/12/1880	A Caernarfon sloop, built in 1831 and owned by J. Ellis of Caernarfon; it foundered and was lost en route from Bangor to Downpatrick.	Richard Larn Coflein database (NPRN-271870)
2060	Breakwater, Holyhead New Harbour	<i>John and Edward</i>	06/10/1859	An Aberystwyth schooner which struck the breakwater in Holyhead Harbour and sank after dragging its anchor; it had been en route from Bangor to Chelmsford.	Chris Holden
2061	St. Tudwal's Roads, Tremadog Bay, Caernarfonshire	<i>John and Margaret</i>	02/08/1912	A Caernarfon schooner, built in 1857; it caught fire while at anchor in the Roads, burned to the water line and foundered while en route from Porthmadog to Dublin.	Richard Larn Coflein database (NPRN-272816)
2062	St. Bride's Bay, Pembrokeshire	<i>John O'William</i>	17/12/1887	An Aberystwyth schooner, built in 1862 and owned by J. Jones of Borth; it was stranded and lost en route from Porthmadog to Bristol.	Richard Larn
2063	16 miles NW of The Smalls lighthouse, St. George's Channel	<i>John Williams</i>	25/12/1895	A Caernarfon schooner, built in 1848 and owned by H. Davies of Porthmadog; it foundered and was lost while en route from Porthmadog to London.	Richard Larn
2064	Off The Skerries, Anglesey	<i>Kate</i>	24/07/1897	A Chester schooner, built in 1864 and owned by D. Rees of Borth; it foundered and was lost after developing a leak while en route from Porthmadog to Belfast.	Richard Larn Chris Holden Coflein database (NPRN-272077)

ID	Named Location	Vessel	Date of loss	Details	Sources
2065	4 miles off Porth Colmon, Caernarfonshire, Llyn Peninsula	<i>Lady Zetland</i>	05/12/1877	An Aberystwyth schooner, built in 1851 in Sunderland and owned by H. Hughes of Borth; it sprang a leak in fine weather while carrying 95.5 tonnes of slate from Bangor to Cork. The cause of leak was unknown; the owner told the inquiry that vessel had spent two months on a mudbank and he thought that the oakum caulking had come out of the seams.	Richard Larn Chris Holden Coflein database (NPRN-271517)
2066	Fishguard Bay, Pembrokeshire	<i>Laura</i>	13/11/1898	A Caernarfon ketch, built in 1845 in Porthmadog and owned by L. Roberts of Borth; it was stranded and lost en route from Porthmadog to Cardiff.	Richard Larn
2067	Off Milford Haven	<i>Laura and Ellen</i>	January 1867	A schooner, built in 1838; it foundered and was lost in heavy weather conditions while attempting to enter Milford Haven.	Richard Larn
2068	16 miles SWS of St. Bee's Head	<i>Leander</i>	08/04/1878	A Carlisle brig, built in 1839 and owned by T. Longcake of Silloth; it foundered and was lost en route from Bangor to Silloth.	Richard Larn
2069	Lavan Sands, Caernarfonshire	<i>Letty</i>	01/11/1894	A Liverpool flat, built in 1865 and owned by J. J. Best; it was stranded and lost in squally wind conditions en route from Y Felinheli to Runcorn.	Richard Larn
2070	Ramsey Island, St. David's Head, Pembrokeshire	<i>Lewis</i>	23/03/1894	A Beaumaris schooner, built in 1858 and owned by R. Owen of Moelfre; it foundered and was lost in squally wind conditions while en route from Porthmadog to Folkestone.	Richard Larn
2071	Goodwick Sands, Fishguard, Pembrokeshire	<i>Llaethliw</i>	07/12/1882	A Cardigan schooner, built in 1846 in Newquay and owned by J. Davies of same; it was stranded and lost en route from Bangor to Limerick.	Richard Larn
2072	St. David's Head, Pembrokeshire	<i>Louisa</i>	04/09/1895	A Caernarfon schooner, built in 1849 in Porthmadog and owned by D. Morris of same; it foundered following a collision with the Brixham fishing ketch <i>Ethel</i> en route from Porthmadog to Lymington.	Richard Larn
2073	Near Penmon	<i>Lovely Lea</i>	25/11/1852	A vessel lost en route from Preston to Caernarfon. There appears to be some confusion as to the identity of the vessel, Richard Larn states that this is <i>Lively Land</i> , a wooden flat.	Chris Holden
2074	Off Point Lynas, Anglesey	<i>Madryn</i>	24/06/1892	A Caernarfon schooner, built in 1836 and owned by Mrs. E. Lewis of Y Felinheli; it foundered and was lost after developing a leak while en route from Y Felinheli to Belfast.	Richard Larn
2075	Maen Bugail Rock, Bardsey Island, Caernarfonshire	<i>Maid of Meirion</i>	19/10/1900	An Aberystwyth dandy, built in 1869 and owned by Mrs. M. Jones; it was stranded and lost en route from Porthmadog to Larne. Lloyd's List states the vessel went ashore in Bardsey Sound and became a total wreck.	Richard Larn Chris Holden Coflein database (NPRN-271328)
2076	Mostyn Roads, River Dee, Flintshire	<i>Margaret</i>	07/11/1890	A Chester schooner, built in 1848 and owned by J. G. Roberts of Connah's Quay; it was stranded and lost en route from Connah's Quay to Belfast.	Richard Larn

ID	Named Location	Vessel	Date of loss	Details	Sources
2077	Maen Piscar, Rhoscolyn Head, Holy Island, Anglesey	<i>Margaret Jones</i>	08/01/1896	A Caernarfon schooner, built in 1854 and owned by E. Jones of Y Felinheli; it was stranded and lost on Maen Piscar rocks en route from Caernarfon to Bowling.	Richard Larn Chris Holden Coflein database (NPRN-272055)
2078	Cardigan Island, Cardiganshire	<i>Margaret Lloyd</i>	25/10/1859	An Aberystwyth smack, built in 1854 and owned by W. Lloyd of Aberystwyth; it foundered and was lost just off Cardigan Island.	Richard Larn
2079	Abererch, 1 mile E of Tremadog Bay, Pwllheli	<i>Margareta</i>	13/01/1843	A Porthmadog smack; one of three vessels lost in the northern part of the bay in the storm of 13th January 1843, it was en route from Porthmadog to Amlwch.	Richard Larn
2080	Castellmarch beach, Abersoch	<i>Maria</i>	23/11/1872	A schooner, registered either in Aberystwyth or Aberdovey; Lloyd's List states the ship parted from her anchors in the roads and drifted onto the beach under Castell March, two miles east of Abersoch while en route from Aberdovey to Derry. The Lifeboat Society's Mabel Louise saved the crew.	Chris Holden
2081	Near Abercastle, Strumble Head, Pembrokeshire	<i>Mary</i>	24/12/1895	A Cardigan sloop, built in 1829 in New Quay and owned by J. Morgan of Pembrokeshire; it was stranded and lost en route from Porthdinllaen to Cardiff.	Richard Larn
2082	Pwllheli Beach, Tremadog Bay, Caernarfonshire	<i>Mary Ann</i>	08/12/1886	A Cardigan sloop, built in 1841 and owned by J. Jones of New Quay; it was stranded and lost en route from Caernarfon to Swansea.	Richard Larn Coflein database (NPRN-271620)
2083	Point Lynas, Anglesey	<i>Mary Coles</i>	05/05/1882	A schooner which struck a rock on the coast then foundered close in shore after being abandoned while en route from Bangor to Lossiemouth.	Richard Larn Coflein database (NPRN-272031)
2084	Fishguard Roads, Pembrokeshire	<i>Mary Jane</i>	12/01/1886	An Aberystwyth schooner, built in 1844 and owned by D. Daniel of Borth; it foundered and was lost en route from Porthmadog to Newport.	Richard Larn
2085	Porthdinllaen	<i>Miss Madock</i>	02/02/1873	A Caernarfon vessel, lost en route to Swansea. Lloyd's List reported on 4/2/1873 that the <i>Miss Madock</i> was stranded in Porthdinllaen Bay and likely to become a total wreck. On 5/2/1873 Lloyd's list reported that the <i>Miss Madock</i> was sunk and badly damaged but that the cargo would be saved.	Chris Holden
2086	Ashore at Abersoch	<i>Mouse</i>	07/10/1896	A Cardigan schooner which drifted ashore while en route from Porthmadog to Gloucester.	Chris Holden
2087	Broad Haven, St. Bride's Bay, Pembrokeshire	<i>Nanteos</i>	25/01/1883	An Aberystwyth schooner, built there in 1840 and owned by J. Watkins; it was stranded and lost en route from Porthmadog to Southampton.	Richard Larn
2088	Off Garth Point	<i>Nelly</i>	August 1813	A Wexford smack which sank off Garth Point following a collision.	Chris Holden
2089	Newton Noyes Pier, Milford Haven, Pembrokeshire	<i>Neptune</i>	28/12/1900	A Caernarfon brig, built in Spain in 1846 and owned by J. Williams of Porthmadog; it was stranded and lost en route from Aberdovey to Littlehampton.	Richard Larn

ID	Named Location	Vessel	Date of loss	Details	Sources
2090	St. Patrick's Causeway	<i>Notre Dame de Boulogne</i>	14/09/1924	The Barmouth lifeboat rescued 4 French sailors from the <i>Notre Dame de Boulogne</i> which had stranded on St. Patrick's Causeway 8 miles from Barmouth. The vessel had left Porthmadog with 70 tons of slates and 2 hours later was seen signalling distress on the causeway.	Chris Holden
2091	Off St. David's Head, Pembrokeshire	<i>Orion</i>	26/10/1859	A smack which foundered while carrying a cargo of slate.	Richard Larn
2092	0.25 miles NE of Angle Point, Milford Haven, Pembrokeshire	<i>Pausilippo</i>	30/01/1895	A schooner, registered in Ramsey on the Isle of Man. It was built in Bangor in 1828 and owned by J. Jones of Bangor; it foundered and was lost en route from Bangor to Swansea.	Richard Larn
2093	Holyhead Bay	<i>Pelican</i>	11/03/1827	A Barmouth brig which sprang a leak and sank in Holyhead Bay en route from Bangor to Swansea. The crew escaped in their own boat.	Chris Holden
2094	Off Rhyl, possibly	<i>Pennington</i> (possibly)	23/10/1900	A vessel, thought possibly to have been carrying slate, lost en route from Porthmadog to Widnes.	Chris Holden
2095	Carreg-y-Trai Reef, St. Tudwal's Pond	<i>Peter Varkevisser</i>	January 1895	Sank in St. Tudwal's Pond on 11 <sup>th</sup> or 13 <sup>th</sup> January 1895 while en route from Porthmadog to Cardiff. It has been referred to as a Milford ketch, owned by E. Jones of Milford Haven, but is also recorded as being registered in Porthmadog.	Chris Holden Richard Larn Coflein database (NPRN-271633)
2096	New Brighton Beach, River Mersey	<i>Pheasant</i>	04/01/1887	A Caernarfon smack, built in 1837 and owned by G. Owens of Pwllheli; it was stranded and lost en route from Caernarfon to Liverpool.	Richard Larn
2097	West Mouse	<i>Phoenix</i>	20/09/1827	A Newry sloop; it sailed to Newry but turned back to Holyhead when within 20 miles of Newry due to strong wind. Unable to enter Holyhead Bay, it went through the race of the Carmels and was driven on to the West Mouse and sank.	Chris Holden
2098	Off Abersoch, Tremadog Bay, Caernarfonshire	<i>Princess Royal</i>	29/11/1885	A Caernarfon schooner, built in 1858 in Barmouth and owned by W. Williams of Pentrefelin; it foundered and was lost en route from Porthmadog to Lynn.	Richard Larn Coflein database (NPRN-271337)
2099	Fishguard Rocks, Pembrokeshire	<i>Progress</i>	26/03/1898	An Aberystwyth ketch, built in 1853 and owned by R. Jones of Aberystwyth; it broke from its moorings while laying at anchor and foundered while en route from Aberdovey to Dover.	Richard Larn
2100	4 miles NE of Bardsey Island, Lleyn Peninsula, Caernarfonshire	<i>Pwllheli Packet</i>	30/09/1873	A Caernarfon smack, built in Porthmadog in 1833 and owned by O. Jones of Caernarfon. It sprang a leak when 4 miles north-east of Bardsey Island while carrying 33 tons of cargo from Caernarfon to Haverfordwest. The water-level rose so rapidly that crew were forced to abandon ship. It was thought she had started a butt joint due to unseaworthiness.	Richard Larn Coflein database (NPRN-271445)
2101	Carreg-y-Trai reef, St. Tudwal's Islands	<i>Omnibus</i>	02/02/1869	An Aberystwyth vessel lost on the Half-Tide Rocks, off the St. Tudwal's Islands while en route to London.	Chris Holden
2102	Off Strumble Head, Pembrokeshire	<i>Queen of Britain</i>	09/09/1880	A Caernarfon schooner, built in Gloucester in 1838 and owned by W. Owen of Holyhead; it foundered en route from Bangor to London.	Richard Larn

ID	Named Location	Vessel	Date of loss	Details	Sources
2103	10 miles NNW of Bardsey Island, Carreg-y-Trai Reef, St. Tudwal's Islands, Abersoch	<i>Reindeer</i>	20/10/1874	A Caernarfon schooner, built in 1841 and owned by H. Griffith of Caernarfon; it foundered and was lost while en route from Y Felinheli to London, possibly after developing a leak.	Richard Larn Chris Holden Coflein database (NPRN-274761)
2104	Moelfre Bay beach, Anglesey	<i>Riviere</i>	28/04/1892	A Plymouth schooner, built there in 1861 and owned by T. Hughes of Moelfre; it was stranded and lost while en route from Bangor to Newcastle-upon-Tyne.	Richard Larn
2105	Abercastle Island, Strumble Head, Pembrokeshire	<i>Robust</i>	18/10/1854	An Aberystwyth schooner; built in Miramichi in 1837; it was wrecked on Abercastle Island while en route from Aberdovey to Newport.	Richard Larn
2106	0.25 miles S of the breakwater, Port Talbot, Glamorgan	<i>Sage</i>	01/01/1907	Stranded and lost outside of the breakwater in W 7	Richard Larn
2107	Off the Calf of Man	<i>Sarah Pringle</i>	Unknown	A Liverpool schooner, lost off the Calf of Man.	Coflein database (NPRN-271325)
2108	Tremadog Bay, Pwllhelli, Caernarfonshire	<i>Scotia</i>	08/12/1886	A Caernarfon schooner, built in 1837 and owned by Mrs. Parry of Caernarfon; it was stranded and lost en route from Caernarfon to Bristol.	Richard Larn Coflein database (NPRN-271622)
2109	Castellmarch, Abersoch, Caernarfonshire	<i>Seaman</i>	02/02/1903 or 27/02/1903	A Beaumaris ketch, built 1847 and owned by W. Morgan of Cardiff; it foundered off Abersoch en route from Porthmadog to Cardiff and was in a sinking condition when reached by the Abersoch lifeboat. 4 crew were rescued and taken to Castellmarch beach, Llanbedrog.	Richard Larn Chris Holden
2110	Mockbeggar Wharf, Wallasey	<i>Sefton</i>	02/01/1899	A Liverpool flat, built in 1848 and owned by W. Morgan of Cardiff; it was stranded and lost en route from Caernarfon to Birkenhead.	Richard Larn
2111	12 miles SW of the Calf of Man	<i>Seven Brothers</i>	12/08/1880	An Aberystwyth smack, built in 1863 and owned by D. Davies of Borth; it foundered and was lost en route from Bangor to Coleraine.	Richard Larn
2112	East Hoyle Bank, Liverpool Bay	<i>Shamrock</i>	18/10/1887	A Runcorn schooner, built in 1850 and owned by William Jones of Caernarfon; it was stranded and lost en route from Bangor to Liverpool.	Richard Larn
2113	Off Point of Lynas, Anglesey	<i>Sir Edward</i>	19/06/1875	A Chester schooner, built in 1836 in Mostyn and owned by William Jones of Caernarfon; it sprang a leak and foundered in fine weather while en route from Bangor to Silloth. The cause of sinking was thought to be unseaworthiness.	Richard Larn
2114	2 miles N of Great Orme's Head, Caernarfonshire	<i>Speedwell</i>	06/01/1875	A Caernarfon smack, built in 1808 in Pwllheli and owned by R. Williams of Porthgolman; it foundered and was lost while carrying 47 tonnes of cargo from Porthdinllaen to Liverpool. It sprang a leak, probably due to unseaworthiness.	Richard Larn
2115	Off South Bishop Lighthouse, Pembrokeshire	<i>St. Helen</i>	01/03/1883	A Caernarfon brig, built in 1844 and owned by R. Ellis of Barmouth; it foundered and was lost en route from Porthmadog to Hamburg.	Richard Larn

ID	Named Location	Vessel	Date of loss	Details	Sources
2116	Off Dinas Head, Fishguard, Pembrokeshire	<i>Swansea Trader</i>	26/10/1859	A smack which foundered while carrying a cargo of slate.	Richard Larn
2117	40 miles WSW of South Stack lighthouse, Anglesey	<i>Symmetry</i>	28/10/1876	A Truro schooner, built in Tredwen in 1829 and owned by J. Owen of Truro; it sprang a leak in calm fine weather, the crew pumped for 6 hours before being forced to abandon ship. The cause of the leak is unknown. The vessel was travelling from Bangor to Waterford, carrying 140 tonnes slates in tiers lengthways and crosswise. It was originally registered in Padstow.	Richard Larn
2118	West Mouse	<i>Trafalgar</i>	27/09/1838	A Dublin schooner, it struck on the West Mouse and sank. Its cargo of slates lies close to West Mouse.	Chris Holden
2119	Mumbles Flats, Swansea, Glamorgan	<i>Venus</i>	13/11/1852	An Aberystwyth sloop, built in 1821; it foundered and was lost en route from Porthmadog to Gloucester.	Richard Larn
2120	10 miles E by S of Great Orme's Head, Denbighshire	<i>Vine</i>	05/06/1877	A Liverpool sloop, built in Northwich in 1788 and owned by O. Thomas of Runcorn; it sprang a leak during bad weather while carrying 105 tonnes cargo from Y Felinheli to Liverpool.	Richard Larn Chris Holden
2121	W of H-5 Red Buoy, East Hoyle Bank, Liverpool Bay	<i>Walter Dean</i>	01/02/1894	A sailing vessel lost while carrying a cargo of slate; the wreck was dispersed by explosives on 02/06/1894.	Richard Larn
2122	Near Porthcawl, Glamorgan	<i>Welcome</i>	25/02/1855	A Goole schooner, built in 1852 and owned by its master Wright.	Richard Larn
2123	Fishguard Roads, Pembrokeshire	<i>Xanthus</i>	06/12/1882	An Aberystwyth brig, built in 1860 in Great Yarmouth and owned by H. Morgan of Aberdyfi; it was stranded and lost en route from Bangor to Harburg.	Richard Larn
2124	Fisherman's rock, east of Aberdaron	Unknown	Unknown	Local information suggests a slate wreck near Fisherman's rock, east of Aberdaron.	Chris Holden
2125	Caernarfon Bar	Unknown	1830s	Carnarvon and Denbigh Herald of 19/4/1834 refers to a Plymouth brig with a cargo of slate being lost on Caernarfon Bar some years previously. Stated that wreck showed 8 feet above the bank.	Chris Holden
2126	One mile south-east of Bardsey Island	Unknown	13/10/1822	An unknown sloop sank south-east of Bardsey Island. This may be connected to the remains described as <b>WA 1013</b> .	Chris Holden

**APPENDIX III: KNOWN SITES OUTSIDE UK TERRITORIAL WATERS**

<b>ID</b>	<b>Country</b>	<b>Vessel</b>	<b>Date lost</b>	<b>Details</b>	<b>Sources</b>
<b>3001</b>	Isle of Man	<i>Lady Louisa Pennant</i> (possibly)	Unknown	A discrete heap of well packed dressed roof slate is report to lie east of Maghold Head off the Isle of Man. The slate is reported to be lying on a firm flat sand seabed. Some timber is reported to be buried beneath the seabed near the areas thought to represent the bow and stern of the wreck. It has been suggested that this may be the wreck of the <i>Lady Louisa Pennant</i> .	Divernet Internet Forum <a href="http://www.divernet.com">www.divernet.com</a>
<b>3002</b>	France	Unknown	Unknown	A wreck of a small coaster, discovered in 1992 in Kerjouanno Bay. Dendrochronological analysis indicates that the timbers from which the vessel was constructed were felled in the first quarter of the 19 <sup>th</sup> century. It is likely that this vessel was a Breton vessel involved in the trade of slate from Brittany, however there is insufficient data to completely rule out a link to the Welsh slate industry.	<a href="http://www.archaeosousmarine.net">www.archaeosousmarine.net</a>
<b>3003</b>	Germany	<i>Annie Maude</i>	22/11/1888	A Welsh schooner, stranded at Sylt while en route to Harburg with a cargo of slate.	Martin Segschneider, Archaeological State Service, Schleswig-Holstein
<b>3004</b>	Germany	<i>Martha Parcival</i>	01/04/1901	A Welsh schooner, stranded at Sylt while en route from Porthmadog to Harburg carrying a cargo of slate.	Martin Segschneider, Archaeological State Service, Schleswig-Holstein
<b>3005</b>	Germany	<i>Ellen Morris</i>	30/09/1871	A Welsh schooner, master E. Evans, stranded at Amrum while en route to Hamburg with a cargo of slate.	Martin Segschneider, Archaeological State Service, Schleswig-Holstein
<b>3006</b>	Germany	<i>Sarah</i>	21/10/1898	A Welsh schooner, master William Rowlands, stranded at Amrum while en route from Porthmadog to Harburg with a cargo of slate.	Martin Segschneider, Archaeological State Service, Schleswig-Holstein
<b>3007</b>	Denmark	<i>Janet</i>	09/11/1910	A Welsh schooner, stranded at Romo while en route from Porthmadog to Stettin with a cargo of slate.	Martin Segschneider, Archaeological State Service, Schleswig-Holstein
<b>3008</b>	Australia	<i>Geltwood</i>	1876	A three-masted iron barque which was en route from Liverpool to Melbourne with a cargo of general merchandise. It is reported that part of the wreck site consists of a massive stack of slates.	Australian National Shipwreck Database

**APPENDIX IV: RELEVANT MONUMENTS IN WALES**

<b>ID</b>	<b>Monument type</b>	<b>Name</b>	<b>Coflein ID</b>
4001	Slate wharf or quay	Caernarfon Slate Quay	NPRN-34153
4002	Slate wharf or quay	Cemlyn Quay	NPRN-91425
4003	Slate wharf or quay	Gelligrin Slate Quay	NPRN-34291
4004	Slate wharf or quay	Trefor Pier	NPRN-34166
4005	Slate wharf or quay	Greaves and Oakley's Wharves; Pothmadog Harbour	NPRN-34160
4006	Slate wharf or quay	Penarth Slate Wharf	NPRN-309748
4007	Slate wharf or quay	Porthmadog Harbour Slate Wharf	NPRN-34162
4008	Slate wharf or quay	Porthgain Harbour	NPRN-34343
4009	Slate quarry	Abercweiddaw Quarry	NPRN-40582
4010	Slate quarry	Abercweiddaw Quarry	NPRN-400832
4011	Slate quarry	Aberllefenni Slate Quarry	NPRN-40584
4012	Slate quarry	Alexandra Quarry	NPRN-400656
4013	Slate quarry	Blaen-y-Cae	NPRN-40530
4014	Slate quarry	Braich Goch	NPRN-40585
4015	Slate quarry	Braich Rhyd	NPRN-400649
4016	Slate quarry	Braich Slate Quarry	NPRN-400648
4017	Slate quarry	Brondanw Slate Quarry	NPRN-40588
4018	Slate quarry	Bryn Glas Quarry	NPRN-305785
4019	Slate quarry	Bryn Hafod-y-Wern	NPRN-400680
4020	Slate quarry	Bryn Hafod-y-Wern	NPRN-40532
4021	Slate quarry	Bryn-Fferam	NPRN-400657
4022	Slate quarry	Bryn-Mawr	NPRN-400669
4023	Slate quarry	Bryneglwys	NPRN-40589
4024	Slate quarry	Bwlch y Ddeufgen	NPRN-275505
4025	Slate quarry	Cae-Abatty	NPRN-310051
4026	Slate quarry	Cardigan Slate Works	NPRN-308083
4027	Slate quarry	Quarry south of Cedryn	NPRN-400572
4028	Slate quarry	Cefn Cam	NPRN-405421
4029	Slate quarry	Cefn Clawdd Slate Extraction Complex	NPRN-400873



<b>ID</b>	<b>Monument type</b>	<b>Name</b>	<b>Coflein ID</b>
4030	Slate quarry	Chwarel Bwlch-y-Groes	NPRN-400672
4031	Slate quarry	Chwarel Cae'r-Meinuiau	NPRN-400671
4032	Slate quarry	Chwarel Cefn-Du	NPRN-400667
4033	Slate quarry	Chwarel Fawr	NPRN-400668
4034	Slate quarry	Chwarel Ty'N-y-Coed	NPRN-310141
4035	Slate quarry	Cilgwyn	NPRN-400647
4036	Slate quarry	Cloddfa Gwanas	NPRN-401448
4037	Slate quarry	Cloddfa'R Lon	NPRN-275743
4038	Slate quarry	Clogau	NPRN-40577
4039	Slate quarry	Conglog	NPRN-40590
4040	Slate quarry	Cook and Ddol	NPRN-400670
4041	Slate quarry	Craig Rhiwarth	NPRN-40609
4042	Slate quarry	Craig-y-Gribin	NPRN-309734
4043	Slate quarry	Croesor	NPRN-40593
4044	Slate quarry	Cwn Eigiau	NPRN-400571
4045	Slate quarry	Cwm Gloywfa	NPRN-295361
4046	Slate quarry	Cwm Machno	NPRN-40535
4047	Slate quarry	Cwm Maen Gwynedd Quarry I	NPRN-295378
4048	Slate quarry	Cwm Maen Gwynedd Quarry II	NPRN-295340
4049	Slate quarry	Cwm Tywyll	NPRN-295409
4050	Slate quarry	Cwm y Llan	NPRN-401443
4051	Slate quarry	Cwmorthin	NPRN-40594
4052	Slate quarry	Cymerau Quarry (North)	NPRN-400826
4053	Slate quarry	Cymerau Quarry (South)	NPRN-400829
4054	Slate quarry	Dinas Mawddwy Slate Quarry; Carlyle Slate and Slab Works	NPRN-310049
4055	Slate quarry	Dinorwic Slate Quarry	NPRN-40538
4056	Slate quarry	Disused Slate Quarriesw, Talysarn	NPRN-402462
4057	Slate quarry	Drum Quarry, ffestiniog	NPRN-305779
4058	Slate quarry	Dulyn Slate Quarry	NPRN-276704
4059	Slate quarry	Ffridd-Glyn Slate Quarry	NPRN-400670
4060	Slate quarry	Ffriddlys Slate Quarry	NPRN-275507
4061	Slate quarry	Ffynnon Badarn, slate workings SE of	NPRN-400828

<b>ID</b>	<b>Monument type</b>	<b>Name</b>	<b>Coflein ID</b>
4062	Slate quarry	Foel Lwyd Slate Quarry	NPRN-278683
4063	Slate quarry	Forest Quarries	NPRN-40619
4064	Slate quarry	Friog Quarry, Arthog; Goleuwern Slate Quarry	NPRN-268161
4065	Slate quarry	Fron Slate Quarry; Fron and Old Braich Slate Quarry	NPRN-400650
4066	Slate quarry	Gader-Wyllt Quarry	NPRN-287213
4067	Slate quarry	Gaewern Quarry	NPRN-400831
4068	Slate quarry	Gallt-y-Fedw Slate Quarry	NPRN-40552
4069	Slate quarry	Garreg-Fawr Slate Quarry	NPRN-40554
4070	Slate quarry	Glanafon Quarry, Capel Garmon	NPRN-305780
4071	Slate quarry	Glyn Rhonwy Quarries Complex	NPRN-40555
4072	Slate quarry	Glyn Rhonwy Slate Quarry	NPRN-400666
4073	Slate quarry	Gorseddau Slate Quarry	NPRN-40557
4074	Slate quarry	Greenarvon Slate Quarry	NPRN-400628
4075	Slate quarry	Hafod-Las Slate and Slab Quarry	NPRN-40558
4076	Slate quarry	Hafod-y-Maen	NPRN-295315
4077	Slate quarry	Hafod-y-Wern Slate Quarry	NPRN-40068
4078	Slate quarry	Hen-Ddol Slate Quarry	NPRN-310159
4079	Slate quarry	Hendre-Ddu Slate Quarry	NPRN-400824
4080	Slate quarry	Hendre-Ddu Slate Quarry near Plas Hendre	NPRN-401384
4081	Slate quarry	Llanfair Slate Quarry	NPRN-40596
4082	Slate quarry	Llechwedd Slate Caverns	NPRN-40597
4083	Slate quarry	Llechwedd Slate Quarries	NPRN-400426
4084	Slate quarry	Llwyngwern Slate Quarry	NPRN-407582
4085	Slate quarry	Maen-Offeren Slate Quarry	NPRN-400427
4086	Slate quarry	Manod Quarry	NPRN-40598
4087	Slate quarry	Marchlyn Slate Quarry	NPRN-400677
4088	Slate quarry	Moel Fferna Slatte Mine	NPRN-308669
4089	Slate quarry	Moel Siabod Slate and Slab Works	NPRN-400563
4090	Slate quarry	Moelwyn Slate Mine	NPRN-40599
4091	Slate quarry	Nant Cwm Tywyll Slate Quarry	NPRN-306586
4092	Slate quarry	Nantle Vale Slate Quarry; Ty Mawr West Slate Quarry	NPRN-400633
4093	Slate quarry	Oakley Slate Mine and Quarry; Gloddfa Ganol Quarry	NPRN-404307

<b>ID</b>	<b>Monument type</b>	<b>Name</b>	<b>Coflein ID</b>
4094	Slate quarry	Pen-y-Orsedd Slate Quarry	NPRN-40565
4095	Slate quarry	Penarth Slate Quarry, Corwen	NPRN-305774
4096	Slate quarry	Penarth Slate Quarry, E of Llwyngwriol	NPRN-402787
4097	Slate quarry	Pennant Slate Quarry I	NPRN-295412
4098	Slate quarry	Pennant Slate Quarry II	NPRN-295413
4099	Slate quarry	Pennant Slate Quarry III	NPRN-295414
4100	Slate quarry	Pennant Slate Quarry IV	NPRN-295416
4101	Slate quarry	Pennant Slate Quarry V	NPRN-295417
4102	Slate quarry	Pennant Slate Quarry VI	NPRN-295418
4103	Slate quarry	Pennant Slate Quarry VII	NPRN-295420
4104	Slate quarry	Penrhyn Slate Quarry	NPRN-40564
4105	Slate quarry	Porth-Gain Slate Quarries; St. Brides Slate Quarries	NPRN-40620
4106	Slate quarry	Precelly Quarry, Bellstone Quarry	NPRN-309254
4107	Slate quarry	Prince of Wales Slate Mine	NPRN-40567
4108	Slate quarry	Rathgoed Slate Quarries	NPRN-400827
4109	Slate quarry	Rhiw-Bach Slate Quarry	NPRN-40568
4110	Slate quarry	Rhosydd Slate Quarry	NPRN-40600
4111	Slate quarry	Rosebush Quarry	NPRN-309255
4112	Slate quarry	Singrig Slate Quarry	NPRN-400630
4113	Slate quarry	Cwm Eboi Slate Quarry	NPRN-286681
4114	Slate quarry	Ffridd Llwyn Hynydd	NPRN-286682
4115	Slate quarry	Godor Slate Quarry	NPRN-295356
4116	Slate quarry	Moel yr Ewig Slate Quarry	NPRN-295391
4117	Slate quarry	Mynydd Tarw South Slate Quarry	NPRN-295270
4118	Slate quarry	Rhaeadr Slate Quarry	NPRN-286683
4119	Slate quarry	Tal-y-Fan Slate Quarry	NPRN-275506
4120	Slate quarry	Tal-y-Fan Slate Quarry	NPRN-400517
4121	Slate quarry	Tan-yr-Allt Slate Quarry	NPRN-400631
4122	Slate quarry	Ty Mawr Slate Quarry	NPRN-400634
4123	Slate quarry	Ty'N-Y-Ceunant Quarry	NPRN-400833
4124	Slate quarry	Ty'N-Y-Garth Slate Works	NPRN-308084
4125	Slate quarry	Vale Slate Quarry; Ty'N-y-Werglodd Slate Quarry	NPRN-400632

<b>ID</b>	<b>Monument type</b>	<b>Name</b>	<b>Coflein ID</b>
4126	Slate quarry	Vivian Slate Quarry	NPRN-40571
4127	Slate quarry	Vronheulog Slate Quarry; New Vronheulog Slate Quarry; Fronheulog	NPRN-400629
4128	Slate quarry	West Llangynog Slate Quarry; Pengwern Quarry	NPRN-40615
4129	Slate quarry	Wrysgan Quarry	NPRN-40602
4130	Slate quarry	Yr Eifl Quarry	NPRN-40573
4131	Slate processing works	Crawia Slate Mills	NPRN-40534
4132	Slate processing works	Deanfield Slate Works Glanadda Bangor	NPRN-305475
4133	Slate processing works	Esgair-Geiliog Enamel Slate Works	NPRN-400466
4134	Slate processing works	Felin Fawr Slate Works Ffrancon View Bethesda	NPRN-570
4135	Slate processing works	Inigo Jones Slate Works; Tudor Slate Works; Groeslon	NPRN-308071
4136	Slate processing works	Mountain Square Slate Works	NPRN-305484
4137	Slate processing works	Pant-yr-Ynn Slab Mill	NPRN-28620
4138	Slate processing works	Pen-y-Lon Slate and Marble Works	NPRN-305485
4139	Slate processing works	Rhiw'r Gwreiddyn Slate Works	NPRN-402502
4140	Slate processing works	Slate Works Ambrose Street	NPRN-305486
4141	Slate processing works	Welsh Slate Museum	NPRN-40559
4142	Slate processing works	Writing Slate Manufactory Abergwyngregyn	NPRN-303148
4143	Slate processing works	Ynys-y-Pandy Slate Mill	NPRN-40572
4144	Slate processing works	Deeside Slate Works	NPRN-309751
4145	Slate processing works	Pentrefelin Slateworks	NPRN-405854
4146	Slate processing works	Aberystwyth Enamelled Slate and Marble works	NPRN-85062
4147	Slate processing works	Troed-y-Rhiw	NPRN-405577
4148	Slate yard	Saltney Slate Depot	NPRN-302009

**APPENDIX V: RELEVANT RECORDS IN WELSH ARCHIVES**

Title of Collection	Relevant Records	Records Office or Archive
Dinorwic Quarry records	Slate shipment records 1837 – 1969; Records relating to Dinorwic Dock 1884 – 1905; Records of the Dinorwic steamships 1902 – 1958; Port Dinorwic Dry Dock records 1829 – 1968; Records of Messrs Duff, Herbert and Mitchell Ltd. 1944 – 1954; Letter books 1870 – 1962; Miscellaneous papers 1864 – 1970.	Caernarfon Records Office
Dorothea Quarry records	Records relating to slate sales, 1835-1970; Slate shipment records, 1849-1969; Correspondence, 1842-1970; Miscellaneous papers, 1892-1965.	Caernarfon Records Office
Penrhyn Quarry records	Slate shipments, 1816-1967; Anglesey Shipping Company records, 1890-1953; Correspondence and related material, 1850-1973; Miscellaneous, 1865-1984; Newspaper cuttings, 1880-1978.	Caernarfon Records Office
Davies Brothers, slate merchants, Porthmadog, records	Sale particulars, 1912-1960; Shipment records, 1925-1976; Correspondence, 1927-1976.	Caernarfon Records Office
Caernarfonshire, shipping registers	Caernarfonshire shipping registers, 1786-1918; Registers relating to Port of Beaumaris, 1786-1901; Port of Caernarfon, 1840-1918; Port of Pwllheli, 1840-1851; List of ship registers, 1960.	Caernarfon Records Office
HM Customs and Excise, Caernarfon, records	Order books and station registers, 1856-1975; Acts and provisional orders for the development of ports and piers, 1793-1913; Registration of ships and seamen including the issuing of British seamen's Cards and Discharge Books, 1906-1978; Wreck records, 1926-1977; Records of arrivals and sailings, 1931-1975; Miscellaneous papers, 1881-1984.	Caernarfon Records Office
Garlandstone Museum, Porthmadog, collection	Documents relating to Porthmadog, 1872-1914; Porthmadog Harbour correspondence, 1872-1914; Papers of David Williams, shipbuilder, and others, 1880-1906; Photographs of various ships, including the Garlandstone, 1905-1958, and of Porthmadog Harbour.	Caernarfon Records Office

Title of Collection	Relevant Records	Records Office or Archive
Llechwedd Slate Quarry Collection	Sales records, 1862-1969, including orders, 1893-1969, ledgers, invoices, accounts and dispatch records, 1872-1969; Miscellaneous sales records, 1907-1958; Slate shipment records, 1898-1970; Letter books, 1895-1957.	Merionnydd Archives
Oakeley Slate Quarries Company Collection	Correspondence, 1925-1970; Sales records, 1860-1971, including orders, 1916-1971, accounts, 1860-1971, invoices, 1926-1970 and dispatch records; Correspondence relating to orders, supply and dispatch, 1917-1970; Miscellaneous sales records, 1941-1971; Slate shipment records, 1911-1971.	Merionnydd Archives
Croesor United Slate Company Ltd, records	Shipping records, 1863-1874; Correspondence, 1863-1877; Press-cuttings, 1866-1876.	Merionnydd Archives
Craig Ddu Slate Quarries, Blaenau Ffestiniog, papers	Craig Ddu Slate Quarries Company records, 1882-1941; Shipping of slates files, 1887-1900.	Merionnydd Archives
Rhiwbach Papers	Wharf accounts	Bangor University
Wreck register	Wreck register containing a chronological list of wrecks off the coast of the counties of Anglesey, Caernarfon and Merioneth, 1807-1911.  Much of the information is taken from local newspapers. There is variation in the amount of detail in which the locations of wrecking are described.	Bangor University
Moel-y-Don papers	Accounts, including bills of loading of slates shipped at Moel-y-don in Y Felinheli, Caernarfonshire by William Edwards and the Dinorwic Slate Company, 1820-1845. Contains details of ships, local and otherwise, engaged in slate traffic during this period.	Bangor University
North Wales Port Book	North Wales Port Book containing accounts of the ports of Beaumaris, Conwy, Pwllheli, Caernarfon and Holyhead. The ships are divided into inwards over sea, outwards over sea, inwards coasters and outward coasters. Includes full particulars of ships' names, masters' names, tonnage, manning, where bound, cargo.  Particular notice is made of the great export of slates from Beaumaris and Caernarfon early in the 18 <sup>th</sup> century as well as some details regarding smuggling in North-Western Wales.	Bangor University
Penrhyn B.R.A.	A collection of 540 papers relating to the Penrhyn Estate lands in English counties, North Wales and Jamaica together with some family documents. The collection includes the family papers of Douglas Pennant.	Bangor University
Port of Beaumaris Custom and Excise, records	Ships fees and deeds books, 1906-1988	Anglesey County Record Office
Registrar General of Shipping and Seamen (Beaumaris, Anglesey), records	Records of the Registrar General of Shipping and Seamen for the port of Beaumaris, Anglesey, 1863-1913, comprising mainly crew lists and log books.	Anglesey County Record Office
Royal National Lifeboat Institution (Anglesey) Archive	Records, 1830-1878, of the Royal National Lifeboat Institution in Anglesey, comprising letters, financial records, accounts of assistance given to ships, and other material relating to lifeboats.	Anglesey County Record Office

Title of Collection	Relevant Records	Records Office or Archive
Portmadoc (Porthmadog) records	Records from the Harbour Office, Porthmadog, including account books and registers of Portmadoc harbour, 1824-1917; Account books relating to slate quarries and to shipping, and miscellaneous Caernarfonshire material, 1723-19 <sup>th</sup> century.	National Library of Wales



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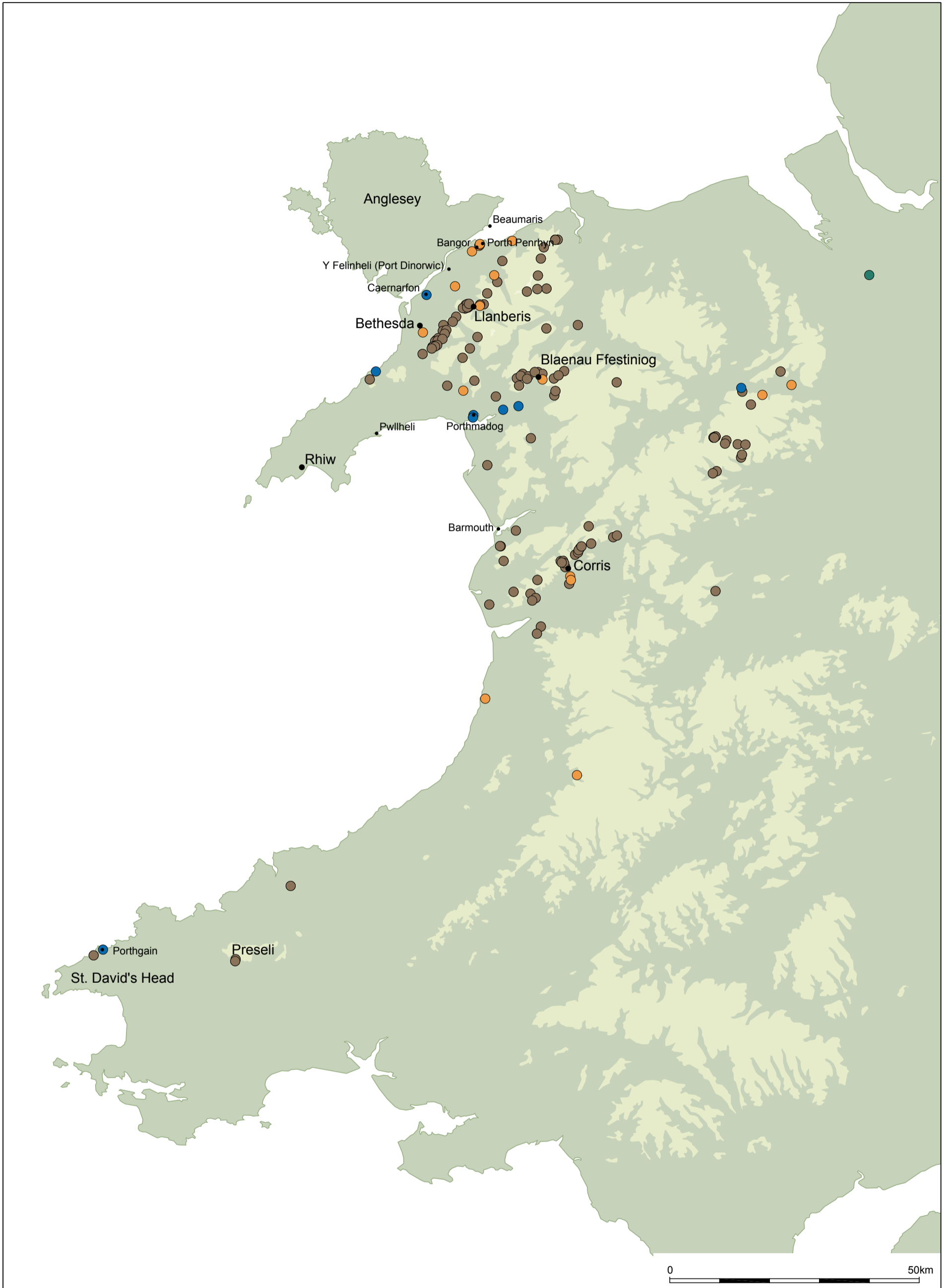
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Location of slate producing areas and ports

Figure 1

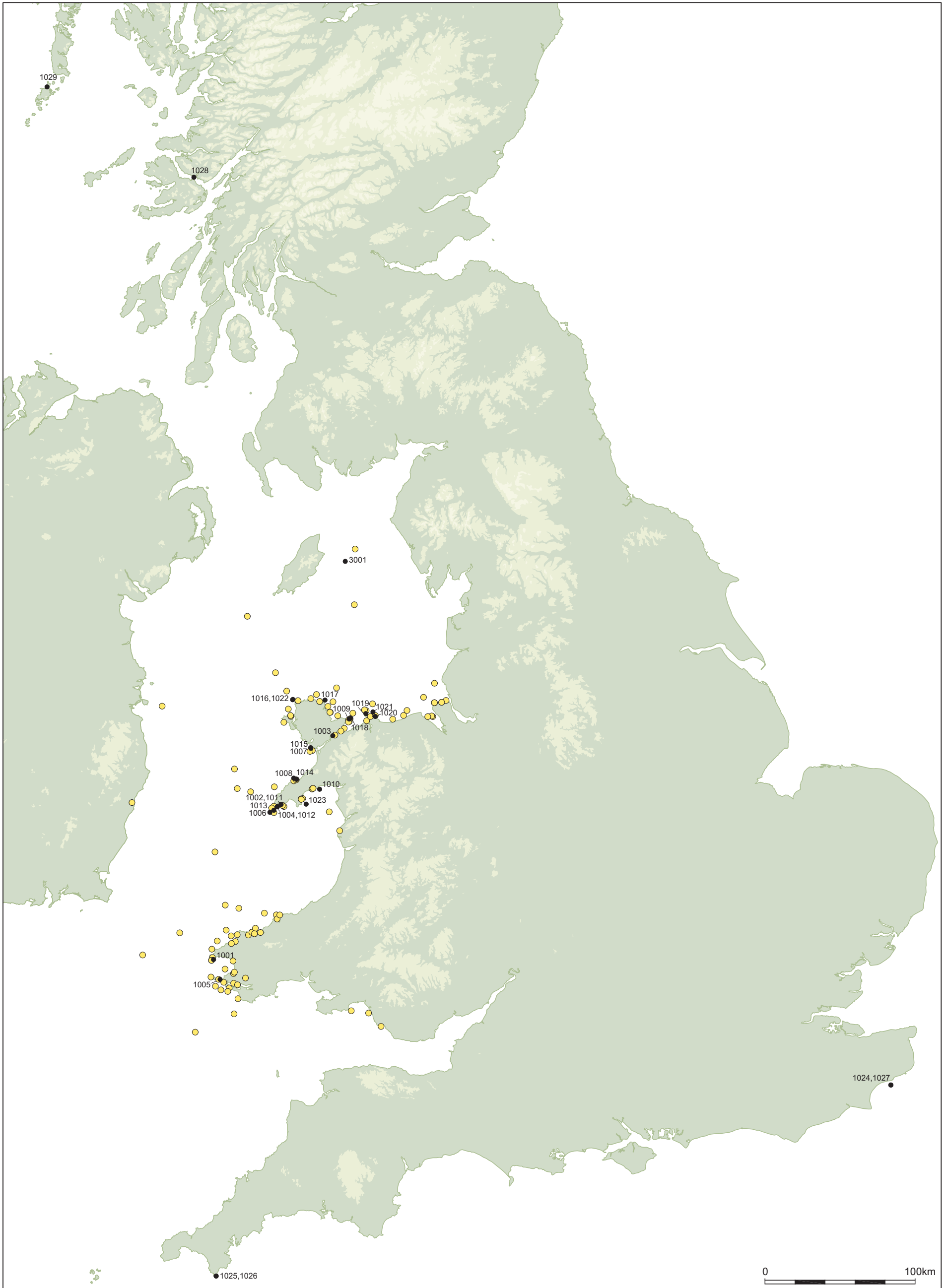




	<ul style="list-style-type: none"> <li><span style="color: brown;">●</span> Slate quarries</li> <li><span style="color: orange;">●</span> Slate processing works</li> <li><span style="color: green;">●</span> Slate yards</li> <li><span style="color: blue;">●</span> Quays and wharves</li> </ul>		<small>Digital Map Data © (2005) XYZ Digital Map Company. This material is for client report only © Wessex Archaeology. No unauthorised reproduction.</small>		
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Distribution of relevant terrestrial monuments

Figure 2



- Recorded loss
- Known wreck



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Distribution of known wrecks and recorded losses

Figure 3



Plate 1: Penrhyn Slate Quarry - courtesy of RCAHMW



Plate 2: Seiont River and Llechi Quay, Caernarfon – courtesy of Gwynedd Archives Service

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Plate 3: Painting of “The Cob”, Porthmadog – courtesy of RCAHMW



Plate 4: Slates waiting to be loaded, Porthmadog – courtesy of Gwynedd Archives Service

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Plate 5: Loading the SS *Pennant* for Germany - courtesy of Gwynedd Archives Service

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**WESSEX ARCHAEOLOGY LTD.**

**Head Office:** Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB.

Tel: 01722 326867 Fax: 01722 337562 [info@wessexarch.co.uk](mailto:info@wessexarch.co.uk) [www.wessexarch.co.uk](http://www.wessexarch.co.uk)

**London Office:** Unit 113, The Chandlery, 50 Westminster Bridge Road, London SE1 7QY.

Tel: 020 7953 7494 Fax: 020 7953 7499 [london-info@wessexarch.co.uk](mailto:london-info@wessexarch.co.uk) [www.wessexarch.co.uk](http://www.wessexarch.co.uk)

