YNYSLAS HULKS, YNYSLAS, CEREDIGION: ARCHAEOLOGICAL INVESTIGATIONS 2014 INTERIM REPORT

Prepared by Dyfed Archaeological Trust
For Cadw

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CONTENTS

FIGURES

PHOTOGRAPHS

YNYSLAS HULKS, YNYSLAS, CEREDIGION: ARCHAEOLOGICAL INVESTIGATIONS 2014, INTERIM REPORT

SUMMARY

Three hulks, all designated Scheduled Ancient Monuments, lie close to the canalised, tidal channel of the Afon Leri at Ynyslas, Ceredigion. One of the hulks, Wreck 3 the main subject of the works undertaken in 2014, protrudes into the channel, and, due to changes in the river, is actively eroding.

According to a 2011 RCAHMW report, the three hulks were probably locally-built slate-carrying vessels operating out of quays on the Leri. By the early 1860s the construction of a railway to the west of Machynlleth effectively killed off the trade and shipbuilding on the Leri. It would seem that in 1868 the three hulks were placed on the west bank of the Leri to mark the approach channel. They are marked as wrecks on an 1892 Admiralty chart. There is a possibility the three vessels may have also been used as ferries between Ynyslas and Aberdyfi.

Works at the site were undertaken with grant aid from Cadw, with the aim of learning more about Wreck 3 and develop recording strategies that could be implemented in the future for longer-term management and monitoring at the site. The project was undertaken by Dyfed Archaeological Trust, in conjunction with Malvern Archaeological Diving Unit / Nautical Archaeology Society and RCAHMW. The 2014 works included a mix of excavation, profile recording through the use of measured probes, photographic record and topographic survey.

The work has confirmed that the three wrecks are of different sizes. As they are all obviously different vessels then they perhaps should all be seen as individual sites as opposed to one combined SAM, their significance also perhaps being increased.

Excavation on the exposed surface of Wreck 3 indicates that all remains of the original deck have eroded away, but that the base of the hold still survives. Objects have survived within the hold, including fragments of worked slate providing evidence that they were indeed involved in the slate trade. Other objects recovered included the remains of a bucket, a length of rope and small wooden box. Iron objects are also present including a possible ships stove, now fallen onto its side with cooking pot wedged within it.

The work has enabled strategies for further works in 2015 to be developed, to take into account potential exacerbation of erosion of the wreck by further excavation and risks from ordnance which was encountered during the 2014 works, and safely dealt with through the implementation of correct procedures. A written scheme of investigation is appended to this document detailing the proposed works in detail, including timber recording sheet and UXO risk assessment. The further works proposed will include assessment of the site by a Coastal Engineer; detailed recording and numbering of all visible timber elements; partial excavation of a small stretch of the bank of the Leri over the exposed wreck; and removal of silts from the exposed hold of the wreck.

INTRODUCTION

The sites of three wrecks lie on the bank of the Afon Leri on the southern side of the Dyfi Estuary at Ynyslas, Ceredigion (Figure 1). It is thought that the wrecks were locally built slate hulks and possibly part of the Derwenlas slate-carrying fleet. Following work undertaken by RCAHMW (2011), the significance of the wrecks was highlighted as being of national significance and they were designated as a Scheduled Ancient Monument in 2012 (SAM CD282).

According to the 2011 RCAHMW report, by the early 1860s the construction of a railway to the west of Machynlleth effectively killed off the trade and shipbuilding on the Leri. In 1868 the three hulks were apparently placed on the west bank of the Leri to mark the approach channel and are marked as wrecks on an 1892 Admiralty chart.

The three hulks are numbered Wreck 1 to 3, from north to south. Wrecks 1 and 2 lies some distance from the present edge of the Afon Leri and the surviving remains are mostly submerged in estuarine silts (Photos 1 & 2; Figures 1, 2 & 3). Wreck 3, the southernmost wreck, lies partially exposed on the banks of the river and is suffering from active erosion (Photo 3 & 4; Figures 1 & 4). Recording, including a laser scan by the RCAHMW, of the exposed sections of 3 has been undertaken, and the site continues to be monitored by the Malvern Archaeological Diving Unit (MADU).

A programme of recording and investigation was proposed by Dyfed Archaeological Trust, to learn more about Wreck 3 and develop recording strategies that could be implemented in the future for longer-term management and monitoring at the site. Detailed works including hand excavation, detailed survey, timber recording, photographic recording and probing was carried out by DAT on Wreck 3; further photographic recording and probing was carried out on Wreck 2 by MADU/NAS with surveying support from DAT; photographic recording and survey was carried out on Wreck 1 by DAT and MADU/NAS.

The works carried out by MADU/NAS have been reported upon in their report from 2014 (Cundy 2014).

Photo 1: Wreck 1, viewing northwest

Photo 2: Wreck 2, viewing northwest along centre line of submerged wreck (towards upright timber in centre of photo).

Photo 3: Wreck 3, viewing south on bank of Afon Leri

Photo 4: Wreck 3, viewing north on bank of Afon Leri

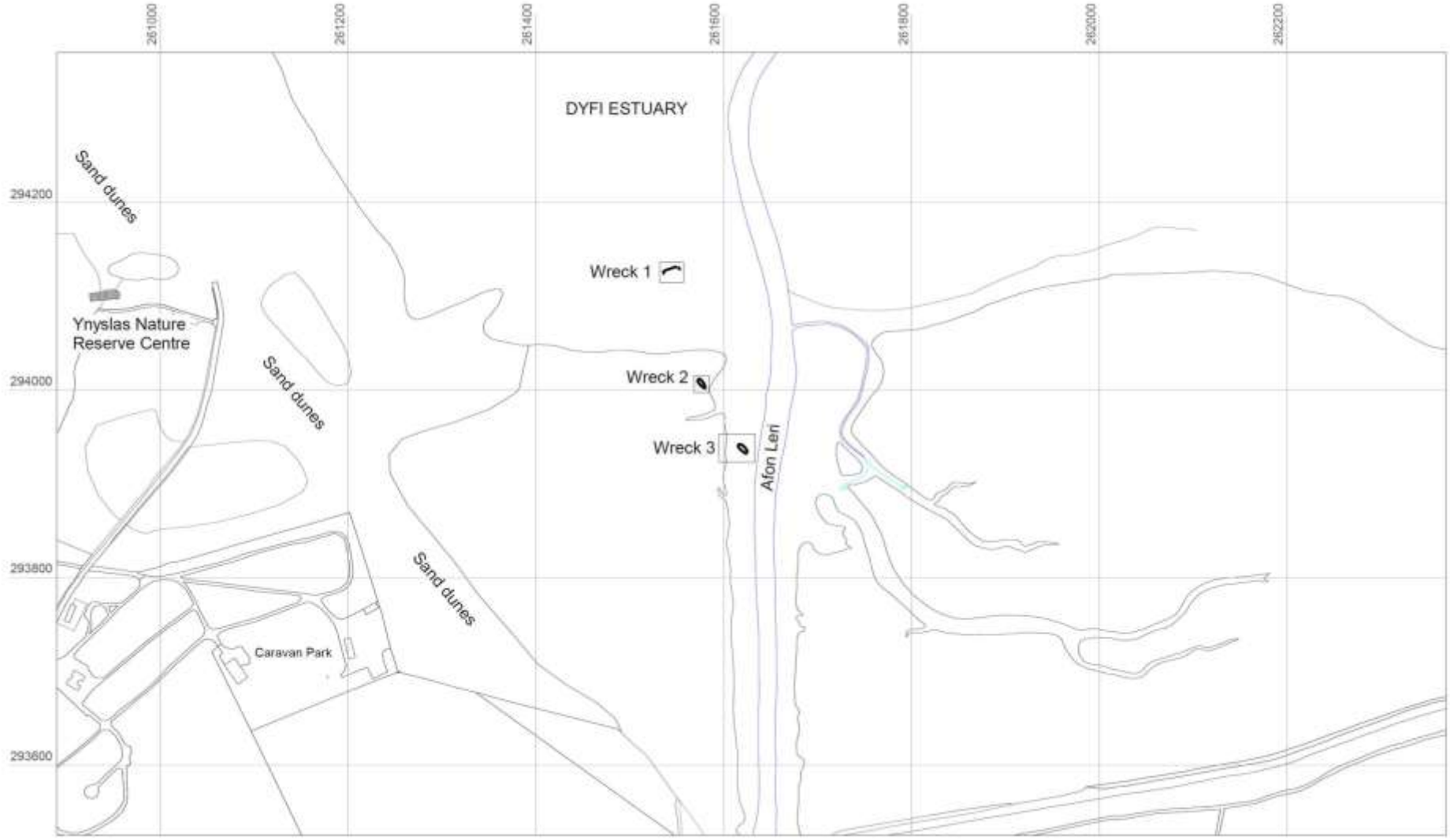


Figure 1: Location plan of the three slate hulks on the banks of the Afon Leri, in relation to Ynyslas Nature Reserve Centre and Searivers Caravan Park – with Ordnance Survey grid overlaid

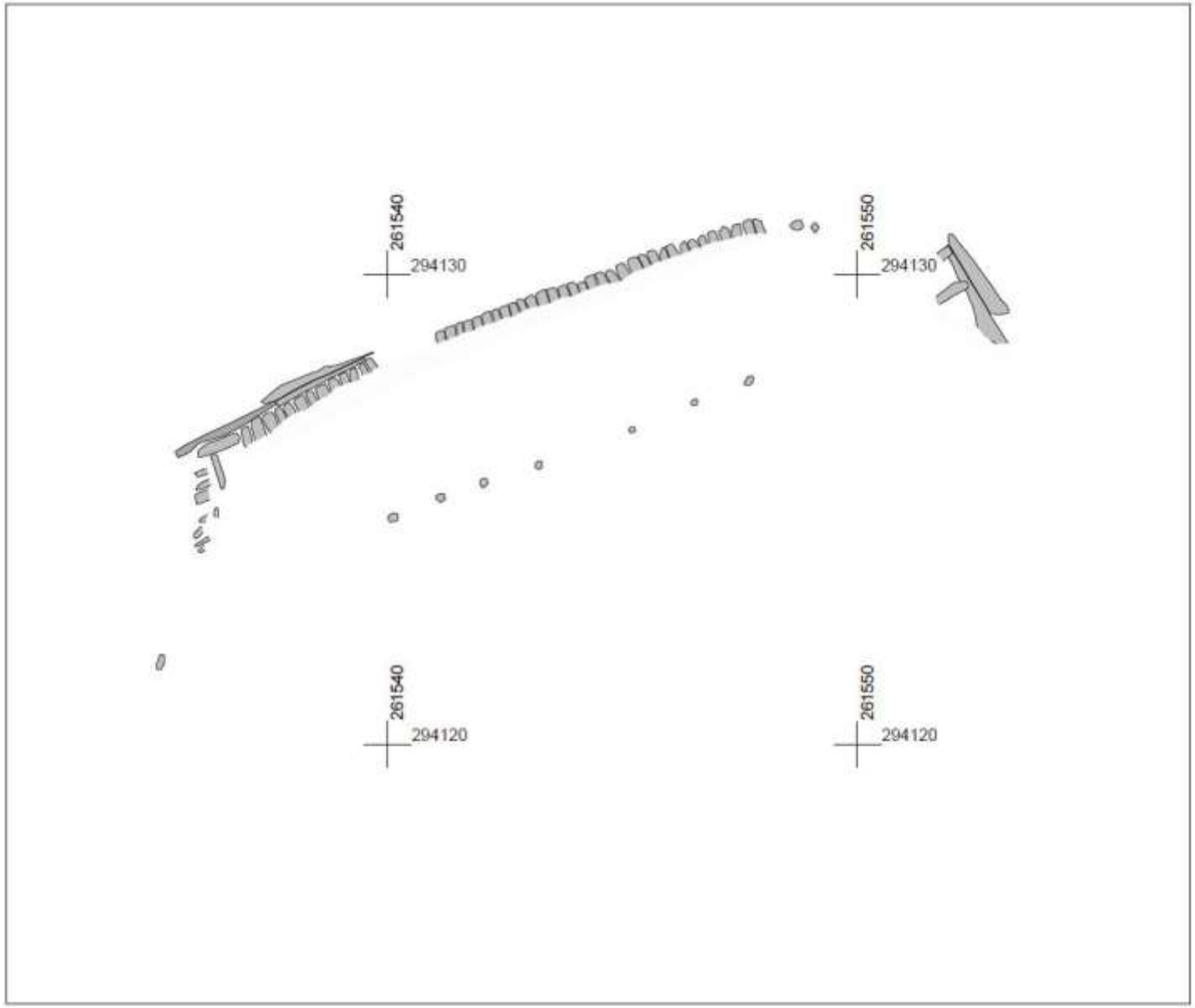


Figure 2: Schematic plan of exposed timbers of Wreck 1, with Ordnance Survey grid locations

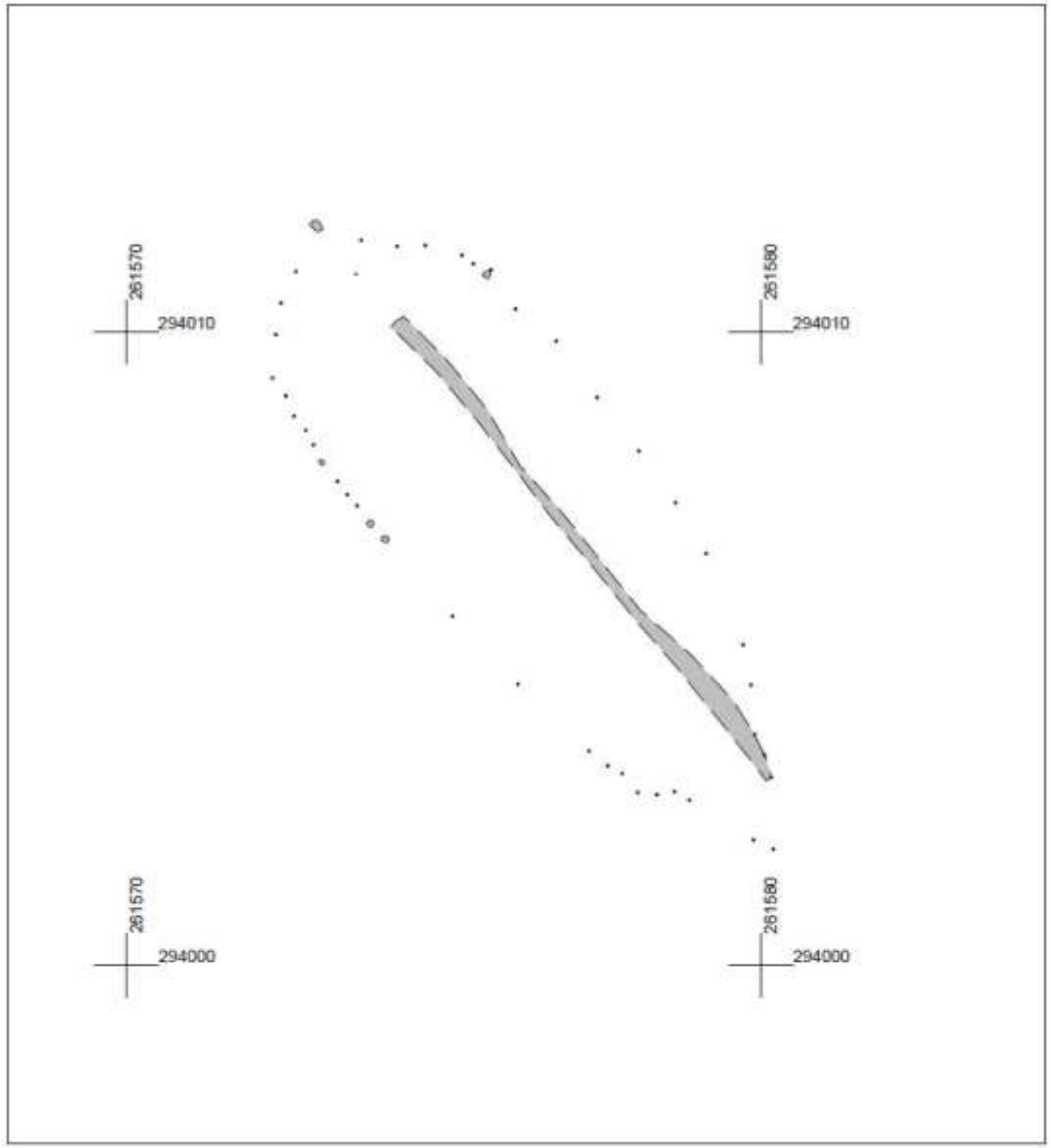


Figure 3: Schematic plan of exposed timbers of Wreck 2, with Ordnance Survey grid locations
Black dots represent extents of vessel as determined by MADU/NAS and possible central timber/mast using probing techniques

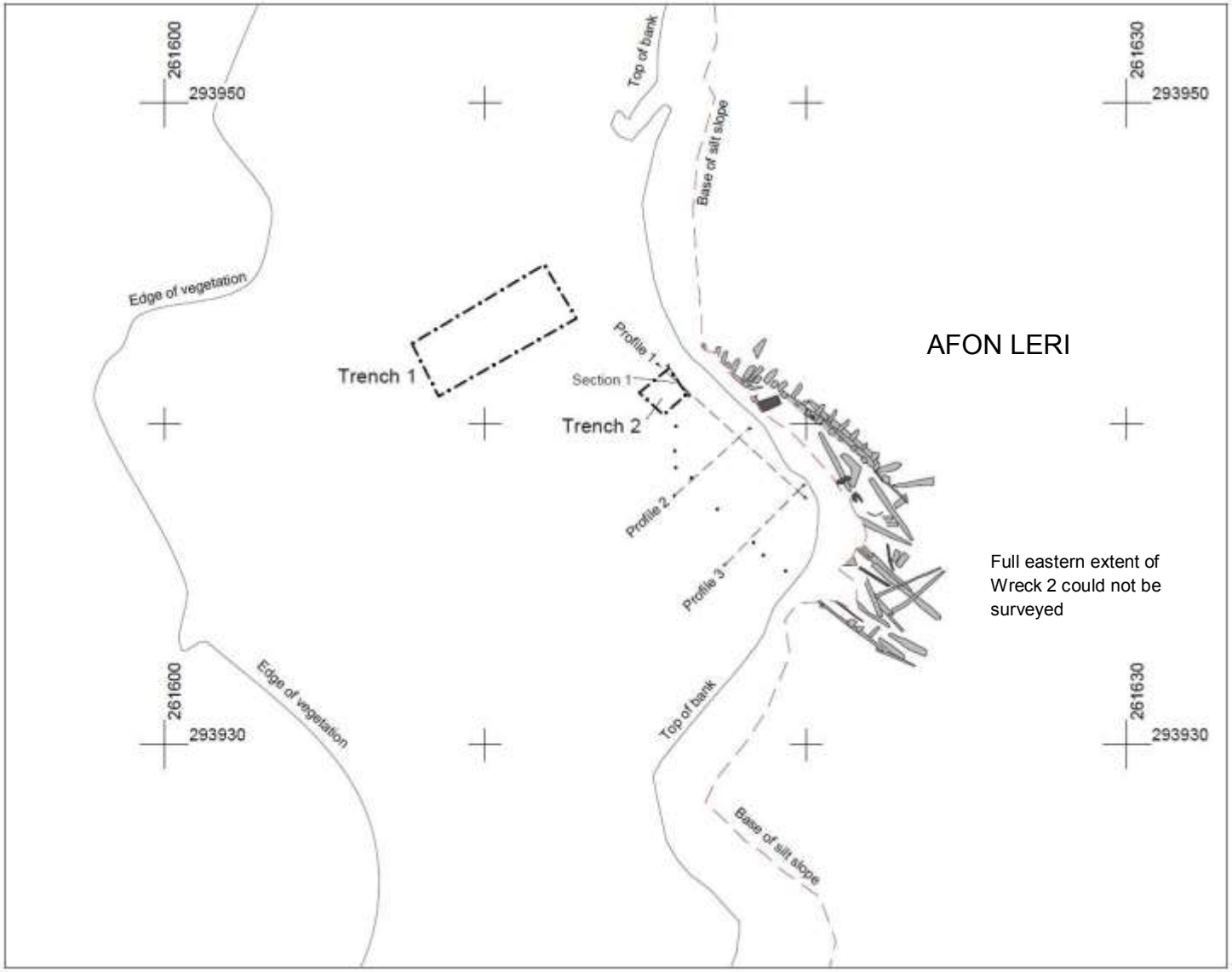


Figure 4: Schematic plan of exposed timbers of Wreck 3, with Ordnance Survey grid locations
Black dots represent extents of vessel as determined by DAT / MADU/NAS probing; showing present top of Afon Leri river channel, edge of salt marsh vegetation and upper slope of river channel

METHODOLOGY

A Written Scheme of Investigation was prepared by DAT which detailed the proposed works at the site (DAT 2014).

Permissions, Consents and Agreements

The site area lies on Crown Estate land managed by Natural Resources Wales. The site lies in a number of areas with environmental designations, namely:

- Dyfi Estuary/Aber Dyfi Special Protection Area
- Pen Lyn a'r Sarnau/Llyen Pen Special Area of Conservation
- Dyfi Biosphere
- Dyfi Site of Special Scientific Interest
- Cors Fochno & Dyfi RAMSAR and
- Dyfi National Nature Reserve

The investigations were carried out following the granting of all relevant permissions and consents in respect of the above designations from Natural Resources Wales (NRW) and Scheduled Monument Consent from Cadw. It was confirmed with NRW that a Marine Licence was not be required for the works. It was also confirmed that a Flood Defence Consent was not needed. A licence from Crown Estates was also granted via NRW. The Receiver of Wrecks was contacted at the start of the works and subsequently to inform of finds from the site using the 'Report of Wreck and Salvage Form'.

Contact was made with the coastguard at Aberystwyth to ensure that the works would not cause any hazards to waterway users and also to discuss issues relating to ordnance. Ynyslas was formerly used as a projectile testing ground and occasional pieces of ordnance are washed up on the beach here. To ensure that the works did not cause a hazard to water craft a yellow warning buoy was set up at the site and the team phoned the coastguard at the start and end of work each day. Procedures in the event of the discovery of any ordnance or suspected ordnance was also agreed, namely: *where a suspected piece of ordnance is identified, the site area will be evacuated and all personnel will return to the car park leaving the object where it lies. The coastguard will then be called and the object reported. No more will be done at the site until the object is dealt with or confirmed as not dangerous.* During the site works ordnance was identified and this procedure was implemented.

Archaeological Methodology

A trench was hand excavated on the western side of the wreck, to uncover part of the bow of the vessel. In the event, the location of the first trench was beyond the bow of the vessel as it was smaller than anticipated, and a second smaller trench was opened directly on the bow of the vessel.

Estuarine silts were hand excavated using hand tools (mattocks/shovels/trowels). Spoil was stored close to the trench area, but far enough away to prevent material falling or washing back in to the trench. The spoil heap was covered

with a tarpaulin, pegged securely down to prevent the material from being washed away and enable it to be easily used to backfill the trench following the completion of the works.

All equipment was carried to the site by hand or wheelbarrow from the car parking area south of the National Nature Reserve Centre. The trenches and spoil heap areas were fenced using road irons and hazard tape to demarcate the area .

The site area was surveyed by DAT staff using a Trimble Total Station. Information collected has been registered to the Ordnance Survey National Grid.

Recording of all archaeological features or deposits conformed to best current professional practice and be carried out in accordance with the Recording Manual[1] used by Dyfed Archaeological Trust.

The hulk was photographed before, during and after excavation using high resolution digital format in RAW format and converted to lower resolution Jpeg and high resolution TIFF images, and stored on the Dyfed Archaeological Trust photographic server.

Once on site it was determined in consultation with MADU/NAS that using probes to measure the depth of timbers below the top of the estuarine silts was the best way of determining the size of the submerged Wreck 3 and Wreck 2. Probing involved the use of a rigid metal strip or pole being pushed into the ground until it met resistance indicating timbers below. This was initially used merely to determine the extents of Wrecks 2 and 3 below the ground surface (points shown on Figures 3 and 4). On Wreck 3 this technique was then used to obtain measured depths in relation to level datum lines strung along the centre line and two west-east lines across Wreck 3. The top of the silts was also recorded. The datum lines were surveyed.

On Wreck 2 MADU/NAS employed a similar technique to establish the extent of the wreck and measured depths then recorded along the outer edge of the vessel and the locations surveyed. The centre line of the vessel and the extents of a possible timber were also recorded.

Two areas of excavation were carried out on the surface of the exposed part of the hull of Wreck 3. This included an area containing a wooden bucket which had been monitored by MADU/NAS eroding over the last few years. The remains of a small collapsed wooden box were also recorded and excavated. The remains of the wooden bucket and box have been stored in plastic boxes containing water collected from the Afon Leri at the wreck site. More Afon Leri water has been collected to top up the boxes should the water level evaporate.

The works were a Dyfed Archaeological Trust, Nautical Archaeology Society (NAS)/MADU and RCAHMW partnership project. During 2014-15, RCAHMW involvement consisted of provision of advice and information.

[1] Dyfed Archaeological Trust Field Services have adopted the new Recording Manual developed by English Heritage Centre for Archaeology. A copy will be available on-site for inspection if required.

SUMMARY OF RESULTS

The investigations at Ynyslas were undertaken between 6th and 13th September 2014 during a spell of excellent weather. The evaluative investigation was carried out to trial methodologies for recording and excavation of the vessel, and determine the best strategies for future monitoring and recording of the hulks.

The work involved the hand excavation of trial trenches over and adjacent to the wreck site, small scale cleaning and excavation of the surface of the wreck, measurements of the depths of the wreck using probing techniques to obtain profiles across the top of the wreck, topographic survey and photographic survey. Additional work was also carried out to survey in the other two wreck sites and the NAS undertook probing to provide profiles and depths across Wreck 2.

Two hand excavated trial trenches were dug at the western end of Wreck 3. The first trench (Photo 5) had assumed the vessel was of similar length to the northern wreck site (Wreck 1), but it soon became clear that this wreck was smaller. It was excavated on Day 1, measuring some 4.8m northeast to southwest by *c*.1.9m in width. It was excavated to a depth of between 0.5m to 0.6m.

Through the use of simple probing techniques an outline of the vessel was established and demarcated using marker pegs. This confirmed that trench 1 was located beyond the northwestern edge of the vessel. The trench was backfilled on Day 2. Although the trench did miss the bow of the boat it did enable us to determine that following being covered by two tides, large trenches dug through the estuarine silts become very unstable, waterlogged and very difficult to work in (Photo 6). The weight and waterlogged nature of the material meant that backfilling was more difficult, time consuming and harder work than digging it out to start with.

Photo 5: Excavation of Trench 1 at end of first day

Photo 6: Bailing out of Trench 1 at start of Day 2

Following the probing exercise the bow of the boat was located and the smaller Trench 2 was excavated on Day 3 down onto the bow revealing the stempost, apron and part of the stemson (Photo 7; Figure 5). The trench was purposefully small to allow excavation, cleaning, recording and subsequent backfilling during a single low tide period.

Photo 7: Trench 2 showing exposed part of the bow of the wreck

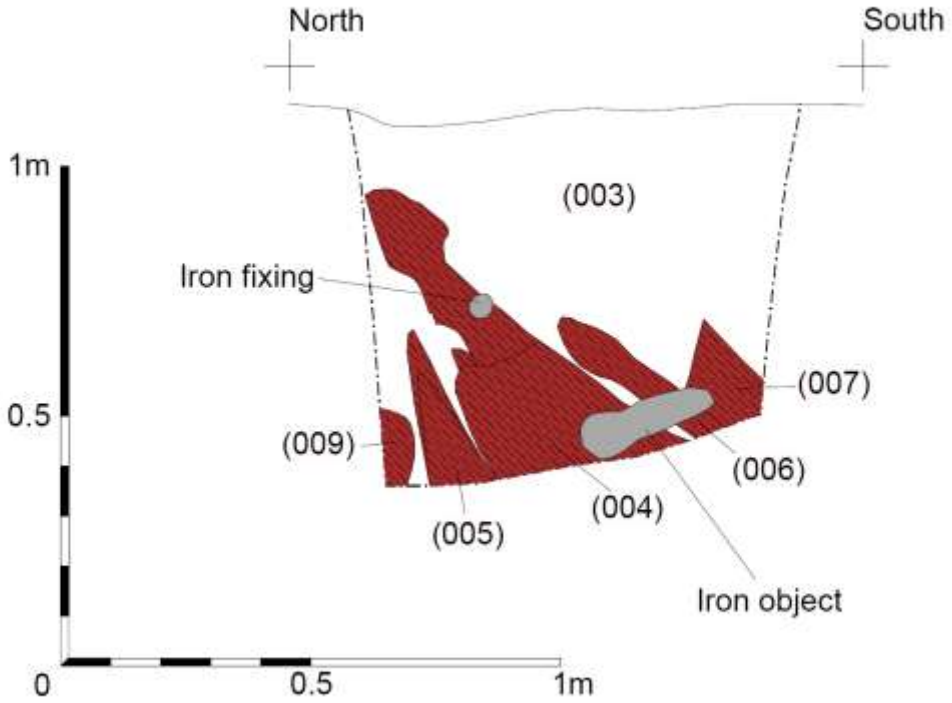


Figure 5: Southwest facing section of Trench 2 showing surviving elements of the timbers and possible identification below. (003) – estuarine silts (004) – stempost; (005) – cutwater; (006) – apron; (007) – stemson; (008) not shown and (009) – unknown loose timbers?

Profiles were recorded across the buried elements of Wreck 3 using a measured probing technique through the estuarine silts (Photos 8 & 9) along datum string lines. Profile 1 ran northwest to southeast along the centre of the buried part of the vessel from beyond the stempost identified in Trench 2 along its projected centre line (Figure 6). Two further profiles were also measured along the buried width of the vessel, in a southwest to northeast direction, Profile 2 to the north and Profile 3 to the south (Figures 7 & 8). The measurements were taken where solid timber appeared to have been reached and they thus provide information on the depth of the buried vessel.

Profile 1 (Figure 6) indicates that timber elements to survive to the northwest of the stempost, possibly associated with the collapsed bow itself, at depths of around 1.40m. The top of the stempost was not exactly crossed by the profile, but adjacent timbers were noted surviving at around 0.5m below the top of the silts. The profile indicates that timber elements survive as high as 0.3m below the top of the silts, but mostly average out at around 0.8m to the northwest to

0.6m to the southeast, as the silts drop down toward the bank of the river. Presumably the profile identifies the hold and objects or collapsed timbers on top of it.

Photo 8: Recording Profile 1 looking southeast along the centre line of the wreck (Photo: MADU)

Photo 9: Recording Profile 1 viewing northeast towards Aberdyfi (Photo: MADU)

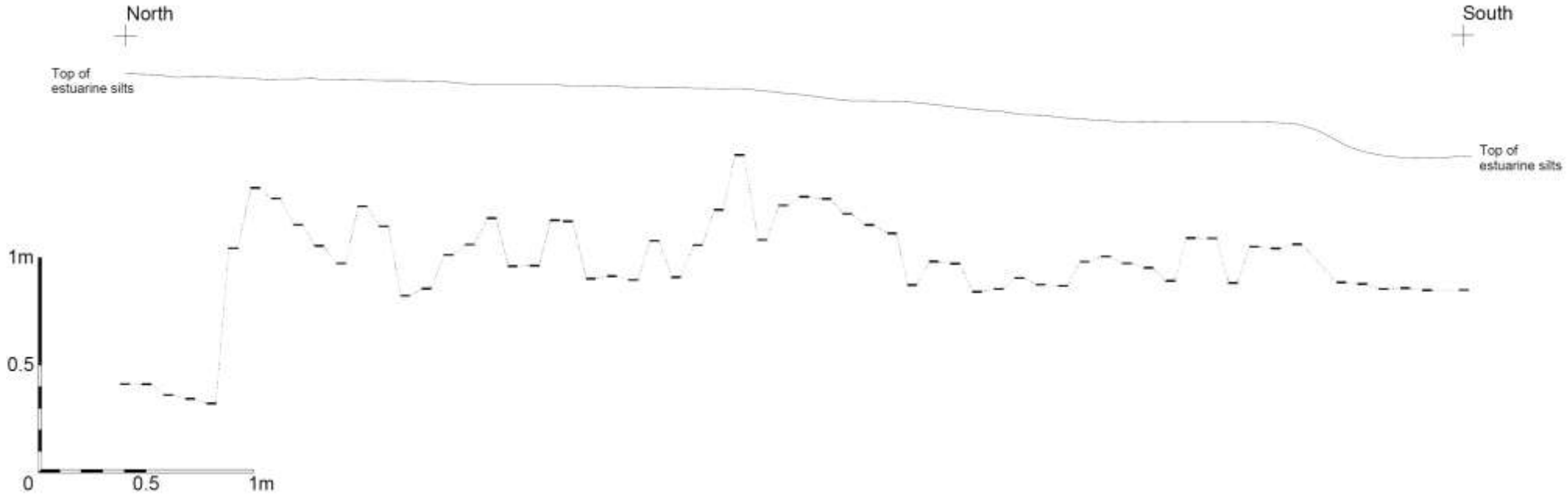


Figure 6: Profile 1 along the centre line of Wreck 2, with readings taken every 10cm. depths shown are to the top of solid timbers

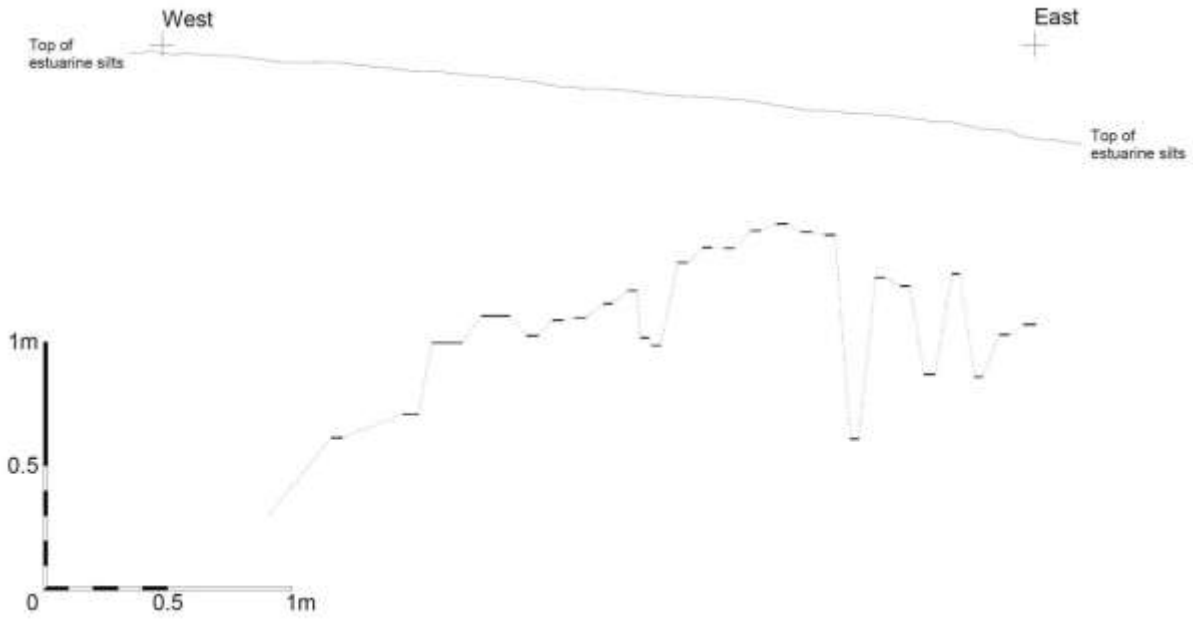


Figure 7: Profile 2 along the width of Wreck 2 (northern profile), with readings taken every 10cm. Depths shown are to the top of solid timbers (no timbers recorded to southwest

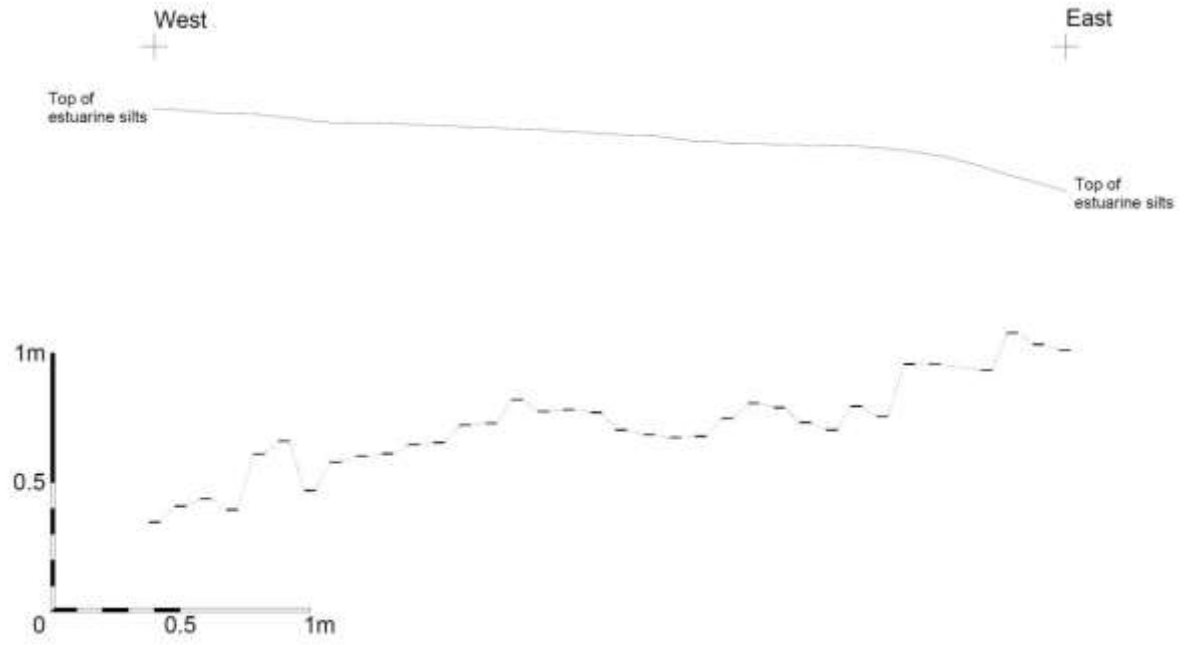


Figure 8: Profile 3 along the width of Wreck 2 (southern profile), with readings taken every 10cm. Depths shown are to the top of solid timbers

The results of Profiles 2 & 3 (Figures 7 & 8) both indicate a similar trend across the width of the vessel. Obviously the silt level drops towards the Afon Dyfi, but it would still appear that the depth of surviving timbers rises towards the southwest. At the northwestern end of Profile 2, no timbers were recorded within the 1.50m depth for which measurement was possible. At the southwestern end of both sections timbers were present at *c.*0.60m below the top of the silts. This may indicate that the vessel is either tilting towards the southwest, or that the port side of the boat had dropped perhaps as the keel had split.

Hand excavation on top of the wreck near its southeastern end was carried out to clean and record the locations of wooden artefacts located within the hold of the vessel (the deck having long since been eroded away). This work included the recording and recovery of the partial remains of a wooden bucket (Photo 10) which has been documented eroding from the wreck for a number of years. A length of rope was found preserved beneath the base of the bucket (Photo 11). Also recorded close by were some small thin wooden boards which appeared to have formed a small wooden box (Photo 12).

Photo 10: Bucket in the hold of the boat after cleaning and before removal

Photo 11: Short length of rope revealed beneath the base of the bucket

Photo 12: Small wooden boards which may have formed a small box located in the hold, with iron objects (parts of chains) around and beneath it.

Fragments of slate were also recovered from this area. Larger iron objects were also visible within the exposed part of the hold of the boat, including coils of iron chain (Photo 12), various unidentified fragments and a large rectangular box which could possibly have been the ships stove (Photo 12). An internally glazed mixing bowl or cooking pot was lodged within this box which could not be removed (Photo 13).

Photo 13: Possible ships stove with ceramic mixing bowl wedged within

CONCLUSIONS

One of the most interesting results of the work undertaken on the three hulk wrecks at Ynyslas is that it has confirmed that they are all of different sizes. Initially it had been assumed that they would all be of relatively similar construction and size, and hence the initial miscalculation in the length of Wreck 3 and misplaced trench. It is still possible that they all originated from the same shipyard, but this cannot be confirmed. As they are all obviously different vessels then they perhaps should all be seen as individual sites as opposed to one combined SAM, their significance also perhaps being increased.

Through further research by Deanna Groom of RCAHMW it is known that three ferries of different sizes operated between Ynyslas and Aberdyfi. The three ferries were known as Y Ferry Fawr for cattle and heavy vehicles; Y Ferri Ganol for slow traffic; Y Ferri Fach for transporting people. It is possible that the three wrecks at Ynyslas are the remains of the vessels used for the ferries – Wreck 1 being the largest at 18m length (Y Ferri Fawr); Wreck 2 the smallest at 12.2m (Y Ferri Fach); and Wreck 3 (the eroding wreck) the mid-sized vessel at around 14m (Y Ferri Ganol). The fact that it is known that there were three ferries does not mean that the vessels purely acted as ferries, but they could still have primarily been involved with slate transportation from Derwenlas, but made available when necessary. The recovery of worked slate from the hold of Wreck 3 would indicate it was used in the slate trade.

Excavation on the exposed surface of Wreck 3 indicates that all remains of the original deck have eroded away, but that the base of the hold still survives. As noted above, fragments of worked slate have been recovered from the hold as were the remains of a bucket and small wooden box. A small length of rope was also recovered, which was preserved beneath the base of the bucket. Iron objects are also present including remains of chains and possible fastenings or fixings. The function of the rectangular metal box with pot inside is uncertain, but could be the remains of a stove used within the hold of the vessel. Any similar objects within the hold of the vessel are under imminent threat of erosion or deterioration if the silts are removed and the objects are open to the elements (such as the length of rope which only survived where it was sealed in silts beneath the base of the bucket).

Further Works and Limitations

In January 2015 a draft written scheme of investigation for further works at Ynyslas was prepared by DAT and circulated for comment to Cadw, NAS, MADU and RCAHMW (DAT 2015). The comments on the proposed works have led to a second version of the document being prepared to address the comments received and enable a proposal for further works at the site to be issued to Cadw for 2015. This revised WSI is included in Appendix 1. The following sections summarise the revised WSI and proposals for 2015.

As part of the future management and monitoring of the wreck site it is proposed that a coastal engineer is brought in to provide a rapid assessment of the likely future erosion pattern around the wreck, as well as to provide advice on the

potential impacts of carrying out further investigations and also any longer term management solutions for preservation of the wreck *in situ*.

The wreck contains a significant number of timbers, a number of which are loose or collapsing (such as the outer planking and the cant frames). A number of loose pieces are present on the exposed hold. These are under threat of being lost through further erosion and tidal movement. A systematic record of the timbers should be carried out to number and record as much detail about the exposed timbers or parts thereof before they are lost. Timbers should be individually numbered and record sheets made of each (using assistance from MADU/NAS as to their function/name). Dimensions as exposed should be recorded. It is not anticipated that any further excavation or exposure of timbers would be needed, except in a few cases, in order to minimise any subsequent erosion. The recording of profiles across parts of the vessel are proposed, which should provide enough information to obtain a projected profile across the vessel as a whole (albeit one that would have large conjectural elements based on knowledge of other similar vessels).

Working on the Ynyslas site is a slow process. The silts are very slippery and stick to everything making movement around the site slow. Recording is also slow as it is necessary to keep equipment and drawing sheets/paper clean. It is proposed that the excavation phase and initial timber recording phase are kept separate.

The excavation of the test pit through the estuarine silts has identified issues in excavating through such material. It is initially easy to spade or shovel out as the soil matrix remains intact. Once the excavated material has become waterlogged through being covered by the incoming tide, the soil structure breaks down and the material turns to a heavy sludge. This is not only more difficult to handle, but also presents issues when backfilling as the material takes so long to stabilise again. It was noted during a site visit in February 2015 that the backfilled area of Trench 1 from the September investigations was still very soft in comparison to the silts around it. When Trench 1 was open, it also became filled with water during the high tides, resulting in unstable trench edges and the base of the trench turning to sludge. It is proposed in 2015 to excavate only the exposed part of the hold of the wreck and the existing slope of silts back to the existing river bank edge. This would enable water to drain every day from the excavation area, reduce the amount of material being removed from the bank itself, and possibly enabling easier backfill and retention of material across the hold of the boat (where it would be laid on a geotextile membrane to hold the material and protect exposed timbers beneath). By excavating only a small section of the coastal edge (covering the existing slope of eroding river edge), this will minimise any exacerbation of further erosion of the surface of the vessel in the short term.

The location of the site adjacent to the Afon Leri means that there is a risk of slipping into the channel or being caught by the rising tide. From the 2014 works, this risk can be minimised by ensuring that two people are always on-site and that one of the two is always on the upper bank if the other is working in the channel itself. At last one life-ring and rope should be taken to site, lifejackets should be used if working in the lower part of the Leri channel during low tide.

The tides are quick moving, as recorded clearly on the time-lapse photographic record prepared by Deanna Groom of RCAHMW, but as long as the height of the tide is monitored, the risk to archaeologists on-site is minimised.

The risk of ordnance on the site is high, but by minimising the extent of new excavation and working on the exposed hold of the boat, which has already been searched for ordnance by the Royal Navy Bomb Disposal Squad and a potential UXO removed and safely detonated, the risk of finding further UXO at the site is lowered considerably. Advice has been given by Anthony Clark, an expert on Explosives Ordnance Disposal (EOD) regarding preparations of risk assessments, the work proposed and he is prepared to advise on-site archaeologists on the potential hazards from Unexploded Ordnance (UXO).

Volunteers and Community Engagement

The various risks associated with the site and difficult working conditions are such that it is not considered one which would be suitable for volunteers to be involved with fieldwork. As the beach is a publically accessible area further works at the site could include some supervised guided walks (where potential risks are explained to participants before they access the site area).

Where there may be further opportunities for community engagement in the project could be through research, specifically into the potential use of the craft as ferries. The RCAHMW has already looked at information relating to the possible names and dates of the vessels, but has exhausted these sources. By focussing more on the potential ferry aspect of the wreck sites, this could reveal more locally significant information to Ynyslas and also for Aberdyfi in Gwynedd.

Other possibilities which have been considered are through the use of further recorded information on the wreck being used as projects for educational establishments (possibly supported through funding from Crown Estates). There are obvious possibilities through younger age groups to learn more about the local trade in slate, the ferry crossings and the general former importance of maritime trade in the region. Projects could also look at the military use of Ynyslas and the internationally significant contributions it made to fuel and rocket technology. Opportunities to learn about the potential risks of UXO at Ynyslas would also be beneficial.

The proposed detailed records of profiles across the wreck could be used by higher education establishments as projects to build virtual or 3D reconstructions of the vessel. It is acknowledged that any records will include significant amounts of conjecture to be able to provide full profiles of it width and length, but this would not prevent comparison with contemporary craft to be used to provide well informed reconstructions. The opportunities to use the information to build artistic representations of the vessel may also be explored.

ACKNOWLEDGEMENTS

The investigations were directed by J Meek with support from A Day and R Kemp of Dyfed Archaeological Trust and Ian Cundy and Sue Barker of Nautical Archaeological Unit / Malvern Archaeological Diving Unit. Deanna Groom of RCAHMW provided on-site advice and pictorial and documentary information.

The report and proposed programme of further works has been prepared in consultation with Polly Groom of Cadw, Deanna Groom and Toby Driver of RCAHMW, Ian Cundy of MADU, Mark Beattie-Edwards of NAU, Mike Bailey and John Evans of NRW and Tony Clark (Explosive Ordnance Disposal expert).

The report and illustrations were prepared by J Meek.

BIBLIOGRAPHY

Cundy, Ian, 2014, Monitoring and recording of the Scheduled Hulks on Ynyslas Beach, Ceredigion, Malvern Archaeological Unit for nautical Archaeology Society (report Ref: MADU-Ynyslas-2014)

RCAHMW, 2012, Ynyslas Nature Reserve: Aberdyfi Estuary, Non-Intrusive Survey, © RCAHMW 2012

DAT, 2014 Ynyslas Hulks, Ynyslas, Ceredigion: Written Scheme of Investigation For Archaeological Evaluation, June 2014

DAT, 2015 Ynyslas Hulks, Ynyslas, Ceredigion: Written Scheme of Investigation For Archaeological Investigation (version 1), January 2015

APPENDIX 1: YNYSLAS HULKS, YNYSLAS, CEREDIGION; WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL RECORDING AND EXCAVATION - VERSION 2 – MARCH 2015

1 INTRODUCTION

1.1 This written scheme of investigation presents a proposed detailed methodology for further archaeological recording and partial excavation of the eroding hulk on the bank of the Afon Leri, at Ynyslas, Ceredigion (Photo 1). The hulk is one of three located at the junction of the Afon Leri and the Afon Dovey. The hulk to be investigated is eroding from the western bank of the Leri located at NGR SN 61594 93942. The wreck is suffering from significant and constant erosion, exacerbated by the winter storms of 2013-2014.

Photo 1: Showing the hulk eroding into the Afon Leri, viewing south

1.2 The importance of the site of the three wrecks has been recognised by them becoming a Scheduled Ancient Monument in 2012 (SAM CD282).

1.3 In September 2014 an evaluative investigation was carried out to trial methodologies for recording and excavation of the vessel, and determine the best strategy for future monitoring and recording of the hulks. This WSI is appended to the interim report on the results of the 2014 works.

1.4 The works were undertaken by Dyfed Archaeological Trust with assistance from the Nautical Archaeology Society and RCAHMW.

1.5 The site lies in a number of areas with environmental designations, namely:

- Dyfi Estuary/Aber Dyfi Special Protection Area
- Pen Lyn a'r Sarnau/Llyen Pen Special Area of Conservation
- Dyfi Biosphere
- Dyfi Site of Special Scientific Interest

- Cors Fochno & Dyfi RAMSAR and
- Dyfi National Nature Reserve

1.6 Permission for the works was arranged and consented /licenced through Natural Resources Wales (NRW), Cadw, Crown Estates, The Receiver of Wrecks and the coastguard.

1.7 It was confirmed with NRW that neither a Marine Licence nor Flood Defence Consent was required for the works.

1.8 A small display was prepared for visitors and exhibited in the Ynyslas National Nature Reserve Centre, so that they were informed of the works. A web dig diary and social media postings were also produced during the excavation.

1.9 The specification is in accordance with the relevant Chartered Institute for Archaeologists Standard and Guidance (Institute for Archaeologists (CIfA), 1994, revised 2001 & 2008). This version (2) of the WSI addresses comments and suggestions provided by Cadw, MADU, NAS and RCAHMW.

1.10 The Trust always operates to best professional practice. Dyfed Archaeological Trust Field Services has its own Health and Safety Policy, and all works are covered by appropriate Employer's Liability and Public Liability Insurances. Copies of all are available on request.

2 WAYS IN WHICH THE PROJECT WILL CONTRIBUTE TO WELSH GOVERNMENT PRIORITIES

Programme for Government (2011)

- Widen access to our culture and heritage

Conservation Principles (2011)

- Manage historic assets to sustain their value
- Understand the significance of historic assets
- Assist in promoting the historic environment as a shared resource
- Enable everyone to participate in sustaining the historic environment
- Document and learn from decisions on the historic environment

Historic Environment Strategy for Wales (2013)

- Heritage protection and sustainable development
- Skills and opportunities
- Public participation, understanding and enjoyment
- Partnership and delivery

Cadw Community Archaeological Framework

The following criteria set out in the framework document apply to this project:

- The asset is under a management threat
- The project has a clear research focus and is linked to objectives in the Wales Archaeological Research Framework
- The project will endeavour to engage with young people and those that feel socially excluded
- The project will support the development of skills
- The project will maximise opportunities to learn about and care for local heritage

Pan-Wales Heritage Interpretation Plan (2012)

- Enhance local and national pride in our heritage assets
- Make connections between people and places
- Provide opportunities for people to learn something new
- Increase appreciation of the historic environment and so contribute towards its conservation

Figure 1: Site location plan on 1:50000 Ordnance Survey map – Grid reference – SN 61594 93942

3. AIM AND OBJECTIVES OF THE PROJECT

3.1 This document provides a scheme of works for:

The implementation of programme of timber recording and excavation on the eroding hulk on the western bank of the Afon Leri at Ynyslas, Ceredigion. The works will involve participation with the Nautical Archaeological Society and Royal Commission on the Ancient and Historical Monuments of Wales. A report on the results and archive will be prepared which will inform further management plans for the site in the future.

3.2 The following tasks will be completed:

- Provision of a written scheme of investigation to outline the methodology by which DAT Archaeological Services will undertake the archaeological excavation (this document);
- To establish the character, extent and date of the eroding hulk;
- To appropriately investigate and record any archaeological deposits within the excavation area;
- To produce an archive and report on any results to be used to inform a management plan for the constantly eroding Scheduled site.

4. ARCHAEOLOGICAL RECORDING AND EXCAVATION METHODOLOGY

4.1 Archaeological Timber Recording

4.1.1 It is proposed that in the first instance a timber recording exercise is undertaken to provide as much detailed evidence about the timber components of the wreck before further erosion takes place. The information could also then be used to construct a model of an interpretation of how the vessel originally looked.

4.1.2 In terms of timber recording the following information would be needed:

a) Individual numbering of the timbers, with timber recording sheets completed for each one;

b) Dimensions of exposed areas of timbers;

c) Section drawing of the shape of the surviving frames of the vessel, which mostly lie on the northern side of the wreck;

d) Photographs of the timbers, including individual timbers and groups of timbers;

e) Identification of the function/technical name of the timber elements;

f) Timber species identification;

4.1.3 The timbers of the vessel will be allocated individual numbers for ease of identification and recording. These will be allocated using a simple index system. Once numbered, timbers will be tagged using impressed metal labels with the individual numbers on, tacked on to the timbers (where feasible). Using impressed metal labels will withstand erosion from tidal movement and silt for identification in the future. DAT Archaeological Services timber recording sheets will be used to record the timbers.

4.1.4 The dimensions of the exposed areas of the timbers will be recorded as best as possible within the confines of the wreck. Although some small scale silt removal may be undertaken on some timbers to ascertain extents, this will be limited to prevent increased erosion. No *in-situ* structural timbers of the wreck should be moved during this process.

4.1.5 In order to obtain enough information to potentially have reconstructions of the vessel built in the future, it is proposed to draw profiles/sections across the *in-situ* frames where possible. These are mostly visible and accessible on the northern side of the vessel. As it is very likely the frames on the north side of the boat would have been symmetrical with those to the south, it is assumed that the information from each recorded frame can be extrapolated to show that on the opposite side of the vessel, thereby giving a near complete profile across the boat in several places. This will only be able to be undertaken for a short window when the tide is at its lowest exposing the Afon Leri bank and the underside of the vessel. A vertical rule or pole will be inserted to the north of the wreck in front of each frame. This will be made true vertical and a measure attached. A spirit level or similar will be used to measure horizontally across from this line to the timber, and a number of measurements will be made to record the profile of the timber frames. The collapsed cant frames will also be recorded where possible. In most cases the width of the timber frames should be possible to record, and the face of the inner planking behind. Profiles across the top of the vessel in line with the frames will also be possible using measured probing techniques to obtain as best a profile across the top of the boat to ascertain its width.

4.1.6 Although individual photos of timbers would be ideal, due to the nature of the wreck and the proximity and important juxtaposition of timbers, photos of groups of timbers may be more likely. This will be done using digital photographs with an ongoing photographic index maintained throughout. It is also proposed that photographs of the vessel are also taken around its perimeter, with at least a 60% overlap of each photo, in order that they can be utilised using to create 3D models using various forms photographic manipulation software.

4.1.7 It is also proposed that with assistance from Ian Cundy of NAS, each timber element will be identified in relation to its technical name and function within the boat. Similarly it is proposed that Nigel Nayling or Rod Bale of University of Wales Trinity St David will be used to identify the species of the timbers. All of this information will also be added to the timber recording sheets.

4.2 **Excavation Methodology**

4.2.1 Following the 2014 works and comments received from the original draft WSI, it has been determined that it is impractical to work within trenches. It is proposed that a small area of new excavation will be opened along the sloping edge of the existing river bank (the steep sloping element directly on the northwestern edge above the hold of the wreck). It is also proposed to undertake further clearance of the silts from the surface of the hold where it is already exposed to enable further artefact recovery of the part of the of the wreck most liable to erosion and loss in the short term.

4.2.2 By excavating only a small stretch of new material any exacerbation of the erosion of the wreck will be minimised. By cleaning up the already exposed surface of the wreck means that works will be carried out in areas already observed by the Royal Navy Bomb Disposal Squad and therefore the risk of further ordnance being present is low. Such works should enable the full size of the possible ships stove being uncovered and recorded.

4.2.3 Evidently a number of artefacts do still survive within the hold (bucket, rope, slate fragments etc), which will be lost overtime. It is proposed that these items are recorded *in-situ* and then removed from the wreck for temporary storage in stable conditions before a detailed programme of conservation can be determined for future years. They will be temporarily stored in lidded plastic

boxes with water taken from the Afon Leri channel. The boxes will be located in a cool and dark area.

4.2.4 This work will be undertaken by hand using mattocks, shovels and trowels. Spoil can be stored relatively close to the excavation area for backfilling/consolidation after the works. Prior to backfilling across the hold, a geotextile membrane will be laid down and secured, and backfilled material laid on top and consolidated as best as possible. The hopeful slow water movement anticipated in the later summer period (ie unlikely to be stormy weather), will mean that backfilled material is less likely to wash away and will have time to consolidate. As with the 2014 works, spoil will need to be stored close to the excavation area and covered with a tarpaulin between tides prior to being backfilled.

4.2.5 Where artefacts are uncovered, they will be carefully cleaned using trowels. They will then be photographed and drawn prior to being carefully removed. The Receiver of Wreck will be informed regarding any artefacts removed from the vessel.

4.2.6 Recording equipment and tools will be brought to site using wheelbarrows from the car parking area south of the National Nature Reserve Centre. Artefacts will be returned the same way.

4.2.7 The excavation area and spoil heap will be fenced using road irons and hazard tape to demarcate the area when we are not on-site and prevent accidental ingress by pedestrians and also as a guide to any vessels that may be using the channel. A yellow hazard buoy will also be attached to one of the road irons to warn shipping of a new hazard.

4.3 General Recording Methodology

4.3.1 The site area will be surveyed either by DAT staff using a Trimble Total Station possibly with assistance from RCAHMW using GPS equipment. Information will be registered to the Ordnance Survey National Grid. Existing survey points used during the 2014 survey should be present and be able to be reused.

4.3.2 Recording of all archaeological deposits will conform to best current professional practice and be carried out in accordance with the Recording Manual[2] used by Dyfed Archaeological Trust. A new timber recording sheet (based on those by MOLAS /English Heritage /ULAS will be used).

4.3.3 The hulk will be photographed throughout both phases of works using high resolution digital format and possible black and white colour print if the remains are of significant quality. Digital photographs will be taken in RAW format and converted to lower resolution Jpeg and high resolution TIFF images, and stored on the Dyfed Archaeological Trust photographic server.

4.3.4 Plans of the excavated area will be hand drawn, including details of any significant structural elements, artefacts or features within. Sections through deposits and profiles across the wreck will be hand drawn. Datum lines will be tied in to Ordnance datum. Hand drawn plans and sections will be drawn at scales of 1:10 or 1:20. Plans will also be combined with those recorded by NAS.

4.3.5 All archaeologically significant finds will be related to the contexts from which they derived.

[2] Dyfed Archaeological Trust Field Services have adopted the new Recording Manual developed by English Heritage Centre for Archaeology. A copy will be available on-site for inspection if required.

4.3.6 The relevant standards and guidance as laid down by the Chartered Institute for Archaeologists (CIfA) will be used followed during the excavations. The guidelines laid out in 'Waterlogged Wood – Guidelines on the recording, conservation and curation of waterlogged wood', English Heritage 2010, will be used.

5. POST-FIELDWORK REPORTING AND ARCHIVING

5.1 All data recovered during the fieldwork will be collated into a site archive structured in accordance with the specifications in *Archaeological Archives: a guide to best practice in creation, compilation, transfer and curation* (Brown 2007), and the procedures recommended by the National Monuments Record, Aberystwyth. The *National Standards for Wales for Collecting and Depositing Archaeological Archives* produced by the Federation of Museums and Art Galleries of Wales will also be adhered to.

5.2 The results of the fieldwork will be assessed in local, regional and wider contexts.

5.3 The report will include a summary desk-based assessment element and the some of the results already obtained from other elements of the previous work undertaken by MADU/NAS and RCAHMW. The report will be based on standard DAT report structure generally including the following sections: Summary; Introduction; Project Commission and Scope; Site location; Archaeological and Historical Background; Methodology; Results; Discussion; Conclusions; Sources; Figures; Photographs.

5.4 The project archive, including all significant artefacts and ecofacts (excepting those which may be deemed to be Treasure) will be deposited with an appropriate body following agreement with the landowner and Receiver of Wrecks. Ceredigion Museum at Aberystwyth will be approached to house all finds and the archive following approval from the Receiver of Wrecks, and conservation of the artefacts.

5.5 A summary of the project results may be prepared for wider dissemination (e.g. Archaeology in Wales and special interest or period-specific journals).

5.6 A report on the results will be prepared in accordance with the relevant CIfA *Standards and Guidance*.

5.7 Bound copies of the reports will produced for the funding bodies of the excavation. Digital copies in pdf format will also be supplied if required. Bound copies of the reports will also be produced for the Dyfed Archaeological Trust Historic Environment Record.

5.8 The report will be made available online through the DAT website.

6 TIMETABLE

6.1 The first phase of fieldwork, timber recording, is anticipated to be undertaken during the late Spring / early Summer 2015, to tie in with a Spring Tide period where 8 consecutive days of low tides of *c.*1m height or under are present.

6.2 The excavation phase will take place over a five day period in late Summer 2015, again to tie in with a Spring tide to maximise daylight working time on-site.

6.3 Post excavation work will commence as soon as possible after the fieldwork, for completion within three months depending on other commitments.

7 STAFFING

7.1 The timber recording works will be carried out by three members of DAT, a supervisor and two archaeologists. It is intended that Ian Cundy of NAS will assist with these works to provide invaluable information on the structure and technical names of the timbers within the vessel. It is also the intention that a specialist from RCAHMW will be able to attend the site for a few days to provide further advice, assist with recording and survey.

7.2 The excavation phase will again be undertaken by three members of DAT (supervisor and two archaeologists). It is hoped that the NAS will be able to assist with the works and that again RCAHMW can attend to assist with survey and provide advice.

7.3 DAT staff would be required to undertake reporting and illustration.

7.4 The project will be managed by J Meek CMIfA, Head of DAT Archaeological Services.

8. MONITORING

8.1 Cadw, NRW and representatives of DAT Heritage Management will be afforded reasonable access to the site at all times for the purposes of monitoring. Such visits will ensure that the works being undertaken are to the correct standard.

9. HEALTH AND SAFETY

9.1 All permanent members of DAT Archaeological Services staff are CSCS[3] registered.

9.2 DAT Archaeological Services will carry out a health and safety risk assessment to ensure that all potential risks are minimised.

9.3 All relevant health and safety regulations must be followed. These will be made clear to all volunteers at the site, who will be given H&S inductions and will need to sign the site risk assessment to indicate that they have understood and will follow any procedures identified.

9.4 DAT Archaeological Services are not aware of any existing services running through the area.

9.5 Following the works undertaken in 2014 it will be essential for site staff to be equipped with some or all of the following waders, waterproofs, wellingtons, gloves and a hi-vis vest or coat. There is no need for hard hats. Life-rings and ropes will be taken to site in the event of falling in the river. Lifejackets will be available, and should be worn where working near the water's edge.

9.6 The site area lies at the edge of a tidal salt marsh, adjacent to the Afon Leri channel. All site staff will be responsible for ensuring that they are aware of safe areas to walk and access and will watch to check that no other party is walking into dangerous areas. Existing knowledge of the area indicates that the route to the site, from the southern side of the beach at Ynyslas is safe heading east adjacent to the upright timber boundary posts before the salt marsh, and then heading in a direct line to the site area at the end of these posts. Only a single stream channel needs to be crossed using this route and the ground is mostly firm underfoot. The area is slippery and all site staff will be made know of the slip hazards. The risks from ordnance whilst accessing the site are considered

[3] Construction Skills Certification Scheme (Health and Safety Tested)

very low, although in the event that any possible ordnance is identified, then the standard procedures will be followed.

9.7 It is likely that most of the work undertaken during the timber recording phase will be carried out on the lower banks of the Afon Leri. These areas are covered in slippery, fairly soft and deep estuarine silts. Site staff will not work in this area alone and will ensure that they are very aware of the state of the tides. A further member of staff should always be present on the higher estuary level when others are working in the channel.

9.8 Working times will be chosen to access the site as the tide goes out and the vessel is uncovered and to complete works prior to the tide reaching the top of the Leri channel, leaving plenty of time to pack up equipment, erect warning fencing and leave safely and unhurriedly from the site area.

9.9 Following the works in 2014 it is known that the Milford Haven coastguard will need to be contacted at the start of works and end of works every day to inform them of when we are on and off site in order that it can be made known to users of the waterway.

9.10 The site area has a high potential for Ordnance to be present. Prior to the site works commencing, DAT staff who will be at the site will attend a short training session on identifying unexploded ordnance that will be provided by Anthony Clark, an expert on Explosives Ordnance Disposal (EOD).

9.11 In the event that potential ordnance is identified, the site area will be evacuated and all personnel will return to the car park leaving the object where it lies. The coastguard will then be called and the object reported. The coastguard will come and assess the object and determine whether they think it is safe or if they need the services of the Royal Navy Bomb Disposal team from Plymouth. No more will be done at the site until the object has been dealt with, even if this causes delays to the works program. This is unlikely to be an issue during the timber recording phase as the Royal Navy Bomb Disposal team did look over the exposed area of the wreck and removed a suspect item during the works in 2014.

APPENDIX 2:
TIMBER RECORDING SHEET TO BE USED DURING FURTHER WORKS AT YNYSLAS
Version 1

TIMBER RECORDING FORM

DAT Archaeological Services

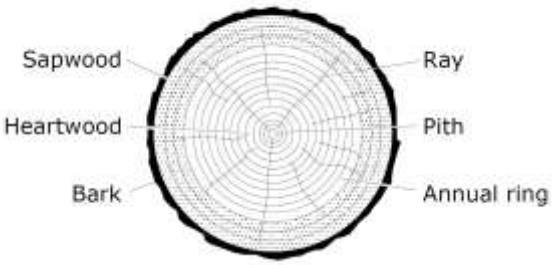
Site Name	Project Code/Year	Timber No
Simple Name / form	**Species**	**Area**

Co-ordinates	E	N	E	N
Length	Width		Thickness	Diameter

Condition

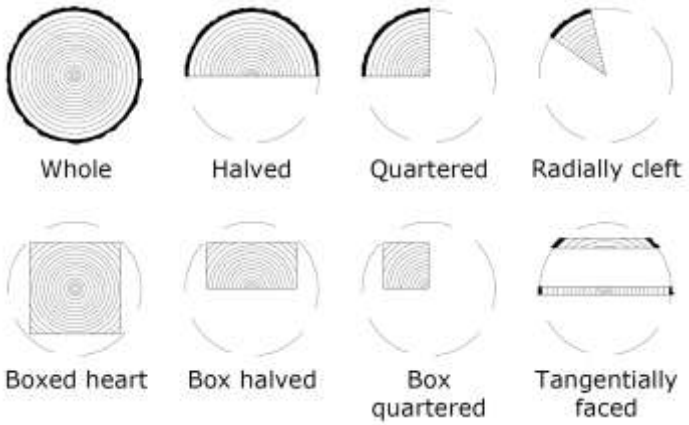
Ancient or recent damage? | **Reused?** Yes No Unsure

Timber Elements



Bark	Yes	No
Sapwood	Yes	No
Knotty	Yes	No
Straight grained	Yes	No

Timber Conversion Identification



Conversion (see above)

Woodworking technology

Tool marks

Joints

Fixings and Fittings

Intentional Marks

Surface Treatment

Other

Structural element / timber name

EXCAVATION DETAILS

Recorded by/date	Checked by/date
Drawing Nos	
Photo Nos	

Site Name	Project Code	Context No

PHYSICAL RELATIONSHIPS	
Jointed to	
Joint type	
Cut by	
Butted by	
Butts	
Bonded with	

INTERPRETATION	
Preliminary Phase	Preliminary Date
Associated Contexts	
Part of	
Interpretation / Comments	

SKETCH Plan/elevation/section/profile with annotation (circle as appropriate)

APPENDIX 3:

DRAFT RISK ASSESSMENT REGARDING UNEXPLODED ORDNANCE

Draft prepared by Anthony Clark an expert on Explosives Ordnance Disposal (EOD) for Dyfed Archaeological Trust as an example of how a risk assessment for UXO should be approached and is one that he feels would be suitable for the any further works undertaken at Ynyslas.

DYFED ARCHAEOLOGICAL TRUST

RISK ASSESSMENT

UNEXPLODED ORDNANCE

DAT Project Name and Reference number:

DAT 135 – YNYSLAS HULKS, YNYSLAS, CEREDIGION

GENERAL

This risk assessment relates specifically to the risk of Unexploded Ordnance (UXO) at the Ynyslas site. It is based on a sample risk assessment provided by Anthony Clark, an expert on Explosives Ordnance Disposal (EOD).

Prior to working at Ynyslas all site staff will be required to attend a short training session on identifying unexploded ordnance that will be provided by Anthony Clark, EOD expert.

Monitor risks during the course of the project and revise assessment accordingly if necessary.

The assessment must be approved by a member of DAT's Senior Management Team (Director, Principal Archaeologists or the Office Manager) before the start of the project.

All staff, volunteers and others directly engaged on the project should be made aware of the potential hazards identified in the risk assessment and should sign the risk assessment to acknowledge that they have been made aware of the potential risks.

A fully stocked First Aid kit must be available on the project at all times.

At least one member of staff must have undertaken an Emergency Aid course.

Working conditions must be adequately lit at all times.

You must check on the best means of summoning medical assistance if needed (e.g. nearest telephone) and that all staff engaged on a project are aware of what the procedure they should adopt in an emergency. Try to ensure that a mobile phone is available in the case of remote working. Please note that in the event that possible ordnance is identified, no mobile phone should be used in its proximity – but the user should walk to a safe distance (>100m) from the object before using.

A copy of this assessment and any amendments to it must be retained with the project archive and a copy must be deposited in the risk assessments main file (in the Admin office).

Risk assessment by (name, signature, date	James Meek, based on one provided by Anthony Clark, EOD expert
Approved by (name, signature, date)	
Project Manager/supervisor	
Person with Emergency Aid	
Personal safety equipment (confirm appropriate equipment is available)	
First aid kit (confirm first aid kit is available	
Mobile phone number(s) in field	
Nearest A & E department	Bronglais Hospital, Aberystwyth
Address of site and grid reference (if appropriate)	Ynyslas Beach, Ynyslas, Ceredigion. Grid reference of site is: SN 61619 93937

IN AN EMERGENCY

Phone the emergency services (999 or 112) giving a precise description of what has happened and also provide the location of the emergency.

Administer emergency first aid if required.

Once the emergency has been dealt with inform DAT's office – Director or Office Manager of the emergency.

In the event that potential ordnance is identified, the site area will be evacuated and all personnel will return to the car park leaving the object where it lies. The coastguard will then be called and the object reported. The coastguard will come and assess the object and determine whether they think it is safe or if they need the services of the Royal Navy Bomb Disposal team from Plymouth. No more will be done at the site until the object has been dealt with, even if this causes delays to the works program. This is unlikely to be an issue during the timber recording phase as the Royal Navy Bomb Disposal team did look over the exposed area of the wreck and removed a suspect item during the works in 2014

THE RISK ASSESSMENT PROCESS

1. Select the appropriate generic risk assessment form for the activities, which will be carried out as part of the project.

2. Tick which of the hazards listed on the assessment are relevant to the activity.

3. Check whether the activity will involve any other hazards, which are not covered by the generic risk assessments, or whether there are amendments which should be made to the hazards or precautions listed on the generic risk list assessment. If appropriate revise the generic risk assessment.

4. Carry out a full risk assessment for an activity not covered by the generic risk assessments.

5. Decide which groups of people may be at risk from the activity, e.g. project staff, visitors, volunteers, members of the public etc.

6. Prior to any precautions or controls being put in place to reduce the risk level, assess the severity of each hazard and the likelihood of it occurring using the table below **as a guide**, and then assess the significance of risk.

7. For each hazard identify the precautions - including training, personal protective equipment, etc - that will be used to reduce or control the risk level, and list any other measures that will be taken.

8. Once precautions are in place to reduce or control the risk, reassess the risk level. The risk level should now be low or low/medium.

9. If after precautions to reduce and control risks the risk level is still assessed as **medium/high or high then the activity should not take place**.

10. Get the risk Assessment approved by a member of the Senior Management Team before the start of a project and file a copy with the project paperwork, provide a copy to the Administration Office and if fieldwork is being undertaken ensure that a copy is available on site.

11. Ensure that all staff, volunteers and others directly involved in the activity are made aware of the potential hazards in the risk assessment and ensure that they sign the risk assessment to acknowledge that they are aware of and understand the potential hazards.

12. If minor changes occur to the activity being undertaken during the course of a project then the risk assessment should be amended to take account of these changes. If major changes occur then a new risk assessment must be produced.

	Very Likely Common occurrence	**Likely** Easily foreseeable	**Possible** Foreseeable under normal circumstances	**Unlikely** Unlikely sequence of events	**Very Unlikely** freak event
Catastrophic	Very High	Very High	High	Moderate	Mod/Low
Critical	Very High	Very High	High	Moderate	Mod/Low
Serious	High	High	Moderate	Mod/Low	Low
Moderate	Moderate	Moderate	Mod/Low	Low	Low
Slight	Mod/Low	Mod/Low	Low	Low	Low
Negligible	Low	Low	Low	Low	Low

SEVERITY DEFINITIONS

Catastrophic (Ca): Multiple fatalities and or 3rd party fatality or severe widespread environmental damage

Critical (Cr): Single fatality and / or multiple severe injuries and/or 3rd party severe injuries, occupational illness or environmental impact

Serious (S): Single severe injury or occupational illness and/or multiple minor injuries or minor occupational illness and/or 3rd party minor injuries

Moderate (Mod): Minor injury/short term absence or 3rd party trivial injury, heavy bruising, deep flesh wound. Lost-time accident.

Slight (Sl): Minor cuts, bruising, no long-term effects, trivial injury

Negligible (N): No visible injury, no pain

The following staff, volunteers and others directly engaged on the project have been made aware of the potential hazards identified in the risk assessment:

Name	Signature	Date

Dyfed Archaeological Trust: Risk Assessment for Excavation, Field Evaluation, Watching Briefs, Detailed Survey, Building Recording

Hazards	Who's at risk and how	Likelihood	Severity	Initial Risk level	Precautions to be put in place to reduce the risk level	Likelihood	Severity	Initial Risk level
Major Hazards Associated with the discovery of Unexploded Ordnance (UXO) through archaeological excavation activities. Explosive related effects: Blast; Overpressure, Primary and Secondary fragmentation, Thermal effects, Fire, Hazards from Toxic materials, Hazards from products of detonation/combustion (toxic and/or asphyxiant gases) and Noise.	Archaeological staff. Leading to the possibility of: Death, Serious ballistic trauma, Injury/slight injury, Pulmonary distress, Deafness.	P	Cr	High	Archaeological staff are not to handle legacy Unexploded Ordnance (UXO) under any circumstances but are to seek appropriate assistance from the local authority police or; if below the high tide mark, the Coastguard. UXO disposal is a local police responsibility (HM Coastguard below high tide mark and at sea in UK waters) but it is handed over by the police or Coastguard to the Ministry of Defence (MoD). MoD task the appropriate Naval, Army or RAF Bomb Disposal Teams to clear UXO - dependent on the type of ammunition and where it is located. The following information is to be passed to the Local Police, Marine Control on 01239 813760 or the International Maritime Mobile (IMM) channels 16 and 11 when a UXO incident is reported: Name; appointment & contact details of the finder. The circumstances surrounding the discovery. An accurate Latitude & Longitude; or bearing and range from a prominent land or sea mark (even if marked with a buoy) and the depth and its GPS position. Description of the item. Archaeological staff are to have undergone UXO Awareness Training.	U	Cr	Mod
Incorrect identification of UXO leading to unintentional initiation of explosive munitions.	As above	P	Cr	High	Markings. Where genuine and clear, markings are an extremely useful aid to identification.Shape. Does the item compare in shape to a known item of ammunition? Size. Size is very important, as this will give a good indication of	U	Cr	Mod

Hazards	Who's at risk and how	Likelihood	Severity	Initial Risk level	Precautions to be put in place to reduce the risk level	Likelihood	Severity	Initial Risk level
					the quantity of explosive which may be involved if demolition is the only safe method of disposal. Size and shape together very often lead to the elimination of certain items during the course of identification, e.g. a spherical object of 350 mm diameter would not be a hand grenade. Physical Characteristics. With badly corroded items, the physical characteristics of the munition are sometimes the only real clue to identification. However, one must take into account that fittings may be broken or partially corroded in such a manner as to resemble something quite different, for example, Fuzes manufactured from Mazak when badly corroded look like a concrete plug, often leading to the item being incorrectly identified as concrete filled. Common indicators include: Fins. These may be on the body of the object on a tail tube and of the same diameter as the body. They may be fixed fins or flexible. Driving, centring or obturating bands. Is there a band or bands present? Is it in an unused, used or engraved condition? Where is it in relation to the nose or base of the object? Venturi. Is there a venturi? How many are there? Is the venturi angled in relation to the body of the UXO? Is it an open venturi? Are there any leads or wires present? Fly-off Lever. Is there one present? Is it secure? What material is it made from? Lugs. How many are there? Where are they? Fuzes. Is a fuze fitted? Is it nose, base or side? What material is it made from? .			

Hazards	Who's at risk and how	Likelihood	Severity	Initial Risk level	Precautions to be put in place to reduce the risk level	Likelihood	Severity	Initial Risk level
Movement of UXO causing unintended initiation of UXO.	As Above	P	Cr	High	NO DELIBERATE ATTEMPT IS TO BE MADE BY ARCHAEOLOGICAL STAFF TO MOVE OR HANDLE A SUSPECTED UXO. If the object has been accidentally moved during or since its excavation; the EOD Officer must be given this information, he will then take into account when, how and how far it has been moved. The very fact that an object has been safely moved prior to his arrival is not to be taken as a guarantee that further movement can be carried out safely.	U	Cr	Mod
Drying out of exposed UXO causing unintended initiation of UXO.	As Above	P	Cr	High	The item is to be kept covered up and damped down. (This is important because any explosive which may have become exposed to the atmosphere is liable to become very sensitive to shock if allowed to dry out.)	U	Cr	Mod
Hazards Associated with the discovery of Unexploded Ordnance (UXO) containing White Phosphorus; through archaeological excavation activities. Explosive related effects: chemical poisoning and burns if handled and the formation of Phosphoric	Archaeological staff. Leading to the possibility of: Death, Serious burns/slight burns, Chemical Poisoning	P	Cr	High	hosphorous devices require special care. Phosphorous is an extremely hazardous chemical with the ability to cause serious injury and under no account should non-qualified personnel touch or handle a phosphorous device. Phosphorous devices may be leaking with toxic smoke and whilst considerable leakage runs a significant fire risk, massive and sudden exposure of dry phosphorous may cause an explosion.The item is to be kept covered up and damped down.	U	Cr	Mod

Hazards	Who's at risk and how	Likelihood	Severity	Initial Risk level	Precautions to be put in place to reduce the risk level	Likelihood	Severity	Initial Risk level
and Phosphine gasses.								
Rough or careless handling.	Archaeological staff. Leading to the possibility of: Death, Serious balistic trauma Injury/slight injury, Pulmonary distress, Deafness.	P	Cr	High	Under no circumstances should attempts be made to clean the weapon for identification purposes, open it or tamper with it in any way. Suspect items should not be subjected to any form of impact or given sudden jolts.	U	Cr	Mod

YNYSLAS HULKS, YNYSLAS, CEREDIGION: ARCHAEOLOGICAL INVESTIGATIONS 2014:

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Cadw Project No. DAT 135

Mawrth 2015
March 2015

Paratowyd yr adroddiad hwn gan / This report has been prepared by J Meek

Swydd / Position: Head of Field Services

Llofnod / Signature ....  .... Dyddiad / Date 31 March 2015

Mae'r adroddiad hwn wedi ei gael yn gywir a derbyn sêl bendith
This report has been checked and approved by K Murphy

ar ran Ymddiriedolaeth Archaeolegol Dyfed Cyf.
on behalf of Dyfed Archaeological Trust Ltd.

Swydd / Position: Trust Director

Llofnod / Signature  Dyddiad / Date 31 March 2015

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

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

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