



ENGLISH HERITAGE

Solent Marine Heritage Assets: Defining, investigating, monitoring and reporting 2008-2011

HMS *Velox* Wreck Site Report

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2011



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i. ACKNOWLEDGEMENTS

The Solent Marine Heritage Assets project was commissioned by English Heritage (EH) following a proposal from the Hampshire and Wight Trust for Maritime Archaeology (HWTMA). The project has been designed as a heritage partnership which promotes a mutually beneficial working relationship between EH and the HWTMA. The work undertaken, particularly the diving fieldwork is arranged in conjunction with other HWTMA research work, to allow most effective use of resources. The project also uses data and information gathered by the HWTMA over the past 19 years. The project results help fulfil the agendas of both EH and HWTMA.

The HWTMA would also like to acknowledge a range of funders who, through their support of work on the sites included within the Solent Marine Heritage Assets project and other complementary research have helped make this project possible. These include: Hampshire County Council, Southampton City Council, English Heritage, Defra's Aggregates Levy Sustainability Fund, The Crown Estate, the Heritage Lottery Fund, the ERDF part-funded Interreg IVA 2 Seas programme, the Gosling Foundation, Herapath Shenton Trust, Daisy Rich Charitable Trust, Aiken Foundation, D'Oyley Carte Trust, Roger Brookes Charitable Trust, John Coates Charitable Trust and the Charlotte-Bonham Carter Charitable Trust. Additionally we would like to acknowledge the help and support of the wide range of organisations and individuals without whose help the HWTMA would not be able to achieve the results it has obtained.

The assistance provided by Mark Dunkley and Alison James of the English Heritage Heritage Protection Department is gratefully acknowledged.

This report has been written by Victoria Millership, with Quality Assurance by Julie Satchell. The project has been managed by Julie Satchell.

ii. COPYRIGHT STATEMENT

This report has been produced by the HWTMA with the assistance of funding provided by English Heritage. Unless otherwise stated all images are copyright of the HWTMA. HWTMA provide EH permission to use images taken during the 2010 fieldwork, these should be recognised as 'HWTMA'.

The report also contains images whose copyright is owned by other parties, permission to use these for this report has been gained, however, these images must not be further reproduced or distributed without prior permission of their owners.

iii. SUMMARY

The Solent has long been recognised for the importance of its marine heritage. The diversity and density of sites makes it one of the highest potential marine areas of England. As a result, the Solent Marine Heritage Assets project has provided funding to enable the Hampshire & Wight Trust for Maritime Archaeology (HWTMA) to work together with English Heritage (EH) to target work on marine heritage assets to enable more effective

regional management and also provide a possible model for cost-effective support for developing national structures.

This report details the site survey which was undertaken on the HMS *Velox* wreck on 5th and 9th July 2010. The site is located one and a half miles to the East of Bembridge, Isle of Wight. HMS *Velox* was a British Destroyer sunk by a mine on the 25th October 1915. The vessel is significant within the development of ship propulsion as one of the earliest examples of the use of turbines.

The survey methods used during the assessment of the HMS *Velox* site were diver survey encompassing site photography and video. Taped measurements of observed archaeological features were recorded.

The diver survey revealed that HMS *Velox* wreck site appears to be relatively stable in terms of the structural remains extant on the seabed. The site lies at a depth of 11-14 metres in an area of flat, sandy seabed. The majority of the structural remains are in an area approximately 30 metres long. Larger metal objects make up the identifiable remains visible on the seabed. The remains are accessible on the seabed, however the risk of physical and/or biological decay is minimal due to the robust nature of the remaining artefacts on site. The artefacts are in a generally satisfactory condition and environment, leading to the conclusion that the threat to the stability of the larger remains is minimal and the risk can be assessed as **LOW**. The installation of monitoring points would help determine the stability of the site over time. HWTMA hope to continue work on the site in 2011 through the Interreg IVA 'Archaeological Atlas of the 2 Seas' project.

1. PROJECT BACKGROUND

1.1 Introduction

The Solent has long been recognised for the importance of its marine heritage. The diversity and density of sites makes it one of the highest potential marine areas of England. The HWTMA are well placed to respond on a regional basis to sites and finds which require investigation and monitoring whether these are underwater or are in the intertidal zone. The Solent Marine Heritage Assets project has provided funding to enable the HWTMA to work together with EH to target work on marine heritage assets to enable more effective regional management and also provide a possible model for cost-effective support for developing national structures.

This report particularly focuses on the monitoring that was undertaken on the HMS *Velox* wreck site on 5th and 9th July 2010. EH drafted a brief for work on the site, this was subsequently discussed with HWTMA as it would not be possible to complete all the outlined objectives within the available time and funding. It was then agreed that the work on the *Velox* site would follow the objectives as had been used for the other sites dived within the project – the Needles, Yarmouth Roads and *Invincible* sites.

1.2 Solent Heritage Assets Project: Aims & Objectives

The overall aim of the Solent Marine Heritage Assets project is for HWTMA and EH to work together to target work on marine heritage assets.

The project allows for the flexible targeting of site investigation, monitoring and reporting. It is supporting:

- Work on Solent Designated Historic Wreck Sites;
- Investigation and monitoring on non-designated wreck sites; and
- Investigation and monitoring of non-wreck sites.

The objectives comprise:

- To undertake investigation and monitoring of marine heritage assets to address specific management and/ or protection issues
- To involve students and volunteer divers in the investigation of marine heritage assets;
- To report on condition of a range of marine heritage assets to relevant regional and national curators and advisory bodies;
- To provide locally based, reactive, ability to investigate submerged heritage assets in fulfilment of aims and priorities of both the HWTMA and EH; and
- To assess the effectiveness of the project as a model for the support of locally based investigation, monitoring and reporting for marine heritage assets.

1.2.1 HMS *Velox* Objectives

The overall objective was to reach recording Level 2a as defined by EH.

Level	Character	Scope
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2a	Non-intrusive	A limited record based on investigations that might include light cleaning, probing and spot sampling, but without bulk removal of plant growth, soil, debris etc.
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Summary of Objectives

- Establish ownership and make contact with the owner to inform them of the planned work on site, including liaising with others who may have undertaken work on the site previously.
- Confirm position, extent, stability and character of the site. Confirm location of site with reference to the 12nm limit.
- Locate and accurately position any visual archaeological material.
- Produce a structured record of field observations; preferably including a photographic record of the site and a basic site plan. Key artefacts are to be subject to detailed examination and recording (position by taped measurements, photographs and video and written database entries).
- Undertake a Risk Assessment with reference to English Heritage's *Risk Management Handbook* (November 2008) and extant site monitoring points.

2. THE HMS VELOX SITE

The following section outlines the location of the site, a history of the recent and current investigations into the site is then provided, along with a description of the seabed structure, associated artefacts and the environment within which the site is located.

2.1 Site Identification

The subject of this report is the shipwreck remains believed to be HMS *Velox* (referred to as 'the site'). The site has been identified as HMS *Velox* in NMR and UKHO records, and in the guide *Dive Wight and Hampshire* (Pritchard & Kendal, 2001). The remains visible on the site match equipment that would have been expected as components of HMS *Velox*, though there is a lack of any larger structure or identifying marks to confirm this conclusively. Further research into the HMS *Velox* and the equipment the vessel was fitted with may enable a more accurate comparison between what is currently visible on the seabed and the fixtures and fittings of the working vessel.

2.2 Site Location

The site is located at 50° 41.557' North, 001° 02.164' West WGS84 (UTM 638711.63, 5617483.4), one and a half miles to the East of Bembridge, Isle of Wight (Figure 1). The site is at a depth of 11-14m and consists of a dispersed scatter of archaeological remains.

The site position and depth have been confirmed by Mr David Wendes, a local maritime historian, through the use of a combination of DGPS and sonar equipment.

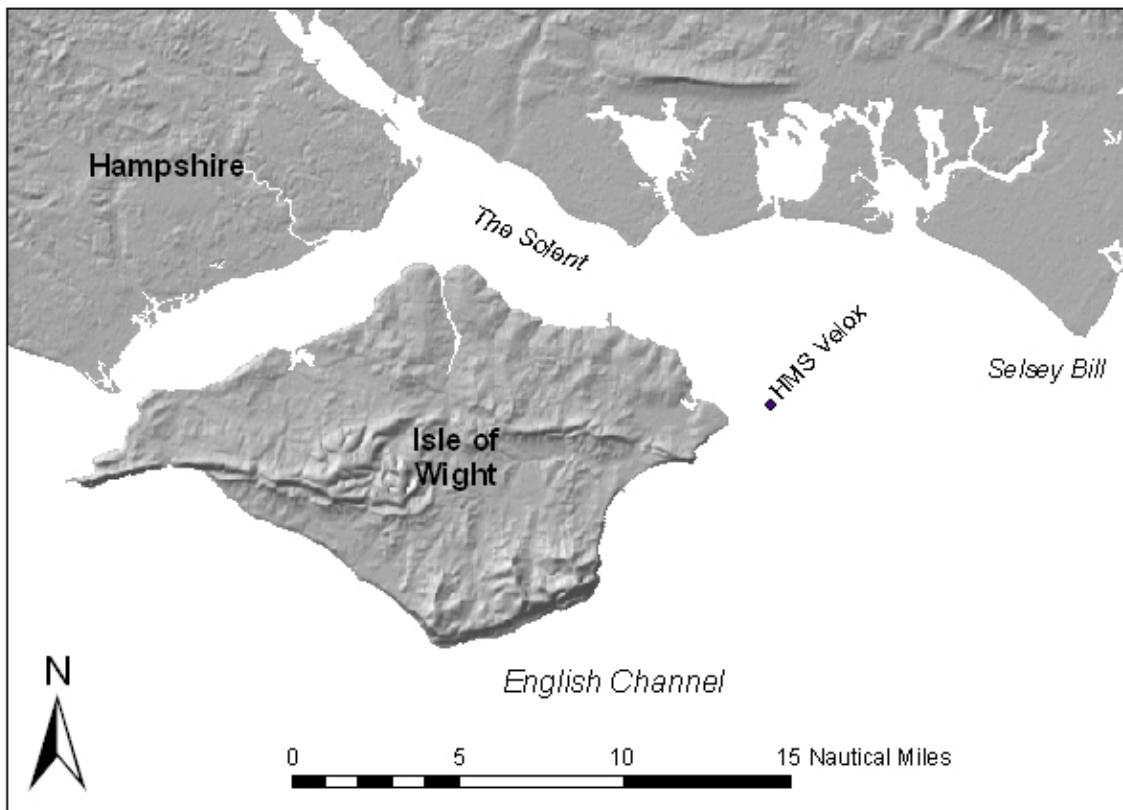


Figure 1. Dave Wendes location of the site, marked as HMS *Velox* to the east of the Isle of Wight.

It should be noted that there is some discrepancy between the location of the site given by Mr Wendes and that given by the National Monuments Record (NMR) which lies 120 metres to the south-east. The NMR have kindly provided the following information to explain this discrepancy:

The NMR record is based on UKHO OSGB36 co-ordinates. Most of the position difference appears to be due to the datum shift between OSGB and WGS84. This difference has been furthered due to the fact that the original compiler of the NMR records rounded up the UKHO co-ordinates.

The NMR co-ordinates are 50° 41.52' North, 001° 02.08' West OSGB36 (NMR Monument Report, ID 805467). The original UKHO co-ordinates from 1990 are 50° 41.516' North, 001° 02.083' West OSGB36. The conversion of these co-ordinates to WGS84 by the UKHO leads to a position of 50° 41.552' North, 001° 02.171' West WGS84 (UTM 638703.63, 5617473.92).

The UKHO co-ordinates give a position for the site which is only 12 metres to the south-west of the location of the site given by Mr Wendes (Figure 2). Following diving activity on the site, the HWTMA can confirm that the position provided by Mr Wendes is an accurate one.

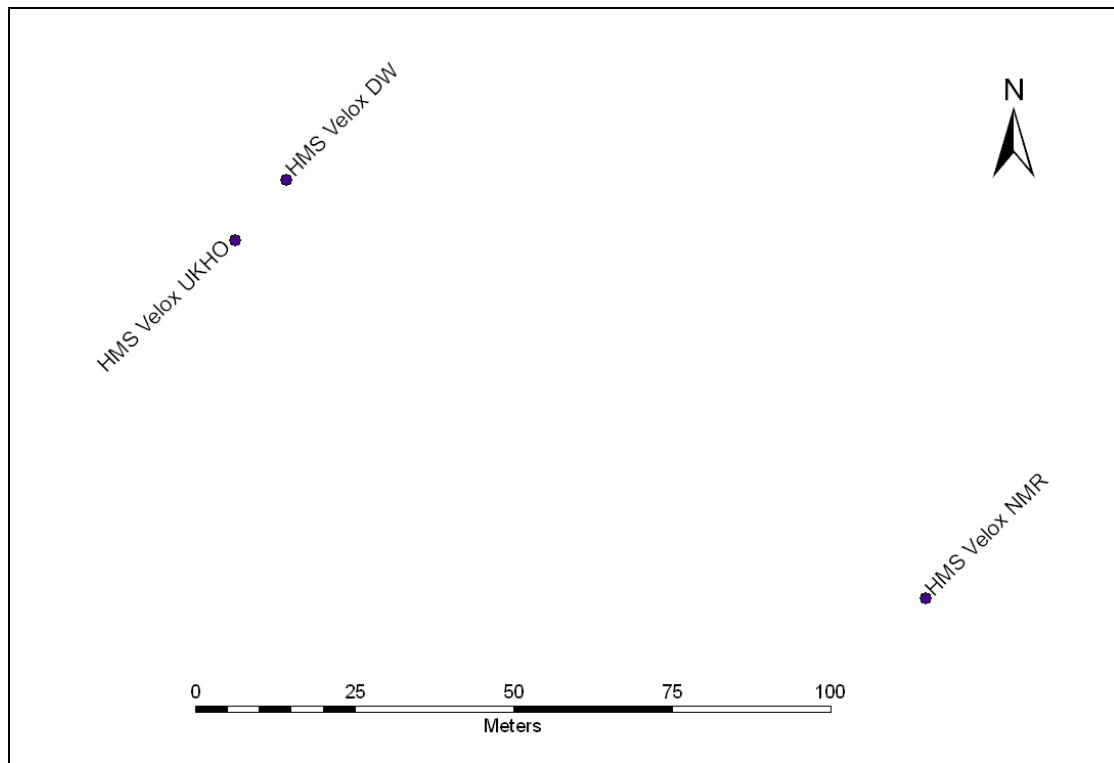


Figure 2. Relative co-ordinate positions of HMS *Velox*.

2.3 Site History and Significance

HMS *Velox* was a British Destroyer lost in the eastern Solent after hitting a German contact mine off the Nab Tower on 25th October 1915. *Velox* was out on patrol as one of the Portsmouth Local Defence Flotilla destroyers when it hit the mine. 42 of the 54 crew members were lost when the vessel sank (Larn & Larn, 1995 cited in NMR Monument Report, ID 805467). The *Velox* was originally named HMS *Python*, and was part of the Snake class of Naval vessels along with HMS *Viper* and HMS *Cobra*. This class was notable for signalling the beginning of Royal Naval vessels using steam turbine propulsion. Prior to these vessels the reciprocating piston steam engine was used. This changed with the experimental craft *Turbinia*, the motor of which was invented by C. A. Parsons. The *Turbinia* used a compound steam turbine and impressed the Admiralty to the extent that in 1898 they commissioned Charles Parsons to build a destroyer using turbine machinery. This was the first turbine powered Naval vessel, HMS *Viper* (Laird Clowes, 1997).

Delivery of the *Viper* was to be made in 15 months and a speed capability of 31 knots was to be guaranteed. Parsons sub-contracted the construction of the hull and provision of the boilers to Hawthorn Leslie and Company at Hebburn on the River Tyne, but his firm took full responsibility for the design, construction and speed. The engines were a quadruple screw arrangement with Parsons turbines on four shafts (Lyon, 1996). High pressure turbines drove the outer shafts and low pressure units the inner shafts, with astern motors on the two inside shafts. There were two propellers on each shaft, one inboard and one outboard of the shaft A-bracket. The sea trials were successful in terms of speed with a one hour full power trial at 36.58 knots and the three hour trial giving an average speed of 34.32 knots (Ships

Nostalgia, 2005a). The ship was accepted into service in June 1900 as HMS *Viper* (Figure 3). It was only after this that *Viper*'s operational problem emerged, with consumption of coal increasing as speed dropped. This resulted in a ship with an uneconomical engine and a performance reliant on the stamina of the stokers onboard. This coal consumption compared unfavourably with that of contemporary reciprocating engine powered Destroyers. The *Viper* did improve on these vessels in other ways, those powered with reciprocating engines had been shown to be unsuited to sustained high speed, suffering from severe vibrations. By contrast the *Viper* only suffered from vibration at high speeds, and then comparatively little (Lyon, 1996). The *Viper* had a short career, on 3rd August 1901, whilst taking part in manoeuvres in the Channel Islands, the *Viper* ran over the Renonquet reef whilst travelling at speed in fog. The vessel foundered heavily in shallow water and was heavily salvaged. Following this the remains of the *Viper* were destroyed by the Navy, possibly to prevent information regarding the turbine propulsion systems becoming public knowledge.

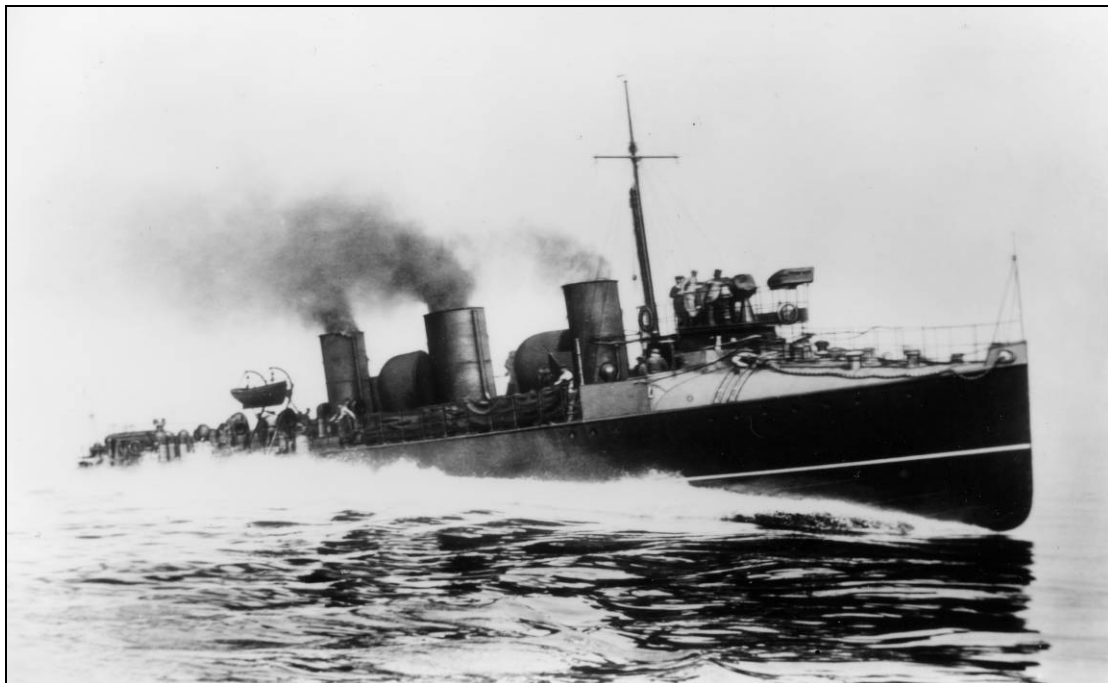


Figure 3. HMS *Viper* steaming at 36 knots during full power trials in 1900 (copyright Maritime Photo Library).

While Charles Parsons was negotiating with the Admiralty for the construction of the turbine powered destroyer that became HMS *Viper*, Armstrong's were also negotiating with Parsons for a set of turbines and boilers for a stock destroyer they intended to build at Elswick. The Armstrong's contract was signed by Parsons in February 1898 and in December 1899 Armstrong's offered the vessel to the Admiralty. It was inspected by the Admiralty Assistant Constructor and found to be structurally below Royal Navy standards, but after prolonged negotiations the destroyer was purchased in September 1901 and named HMS *Cobra* (Figure 4). As well as the structural problems the *Cobra* had the same coal consumption issues as the *Viper*, and could maintain full speed for no more than three or four hours. On 17th

September 1901 HMS *Cobra* sailed from the Tyne bound for Portsmouth, where the armament was to be fitted. Soon after passing Flamborough Head the vessel met bad weather and on 18th September the *Cobra* broke into two, sinking stern first with about 30 feet of the vessel remaining above the water for a short time. This could have been due to the stresses of wave action, but it is also possible that the *Cobra* struck an item of floating debris which caused enough stress to split the hull in two (Lyon, 1996). The Committee of Enquiry decided that HMS *Cobra* had been inadequately designed and constructed. *Cobra* is the only Royal Navy destroyer ever to be lost by foundering through stress in heavy weather (Ships Nostalgia. 2005b). The *Cobra's* position is unknown, it was marked shortly after the time of the wreck by a Swedish salvage vessel *Herakles* and a Swedish diver made a number of dives on the bow, but later searches were not able to relocate it (Young, 2003).

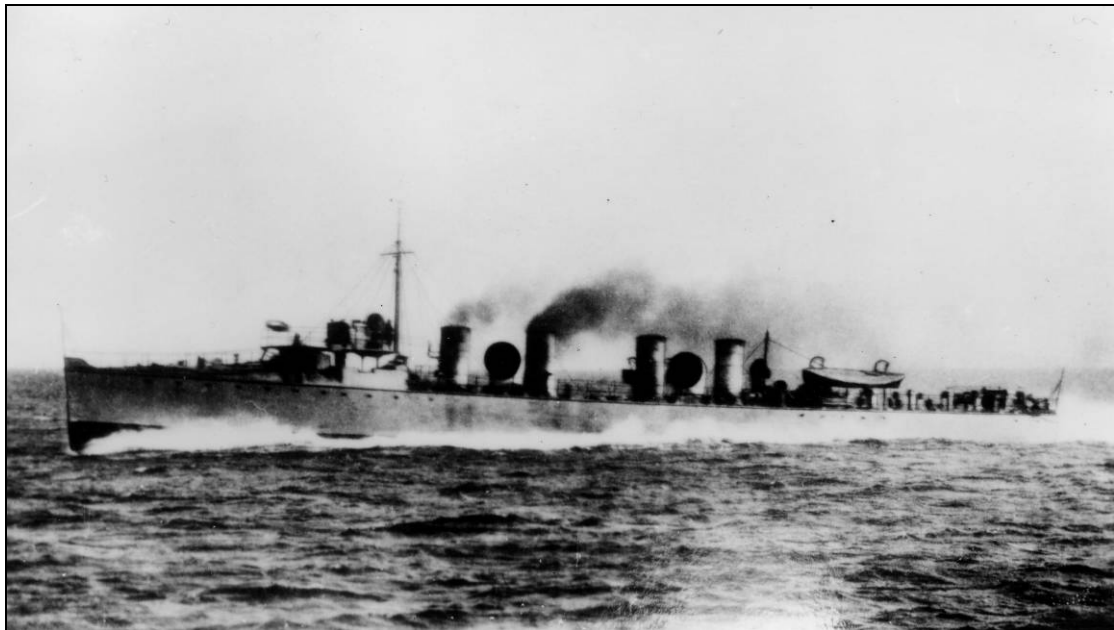


Figure 4. HMS *Cobra*, the second steam powered turbine destroyer
(copyright Maritime Photo Library).

The loss of the *Viper* and the *Cobra* meant the loss of both prototype turbine Torpedo Boat Destroyers. Parsons were already building a private venture vessel with parts being sub-contracted from Hawthorn Leslie and Company. The construction of the ship was financed by C J Leyland, one of Parsons directors. The ship had very similar dimensions to *Viper* but there were some changes to the machinery layout. The low pressure and astern turbines were combined and the space saved was used to provide two high pressure reciprocating engines, in line and coupled to an extension to the low pressure turbine shaft to be used when cruising speeds of up to 12 knots were required (Lyon, 1996). Therefore during high speeds the turbines operated alone but when the vessel was cruising, steam was supplied to the reciprocating engines which then exhausted to the turbine plant (Griffiths, 1997 cited in NMR Monument Report, ID 805467). The ship was also equipped with a hand operated retractable bow rudder for going astern. Parsons expected the

vessel to match the high speed of the *Viper* with the same coal consumption rates, and to use around half as much coal as the *Viper* at cruising speeds (Lyon, 1996).

The new Torpedo Boat Destroyer was launched as HMS *Python* on 11th February 1902, but discussions over the price and terms continued. The vessel was finally purchased by the Admiralty in June 1902 and renamed *Velox*, as following the loss of the *Viper* and *Cobra* in 1901, the Royal Navy did not again use snake names for Destroyers. On trials in January 1903 HMS *Velox* achieved a maximum of 34.25 knots and an average speed of 27.25 knots in the four hour trial. The slow speed reciprocating engines producing a cruising speed of only 10.35 knots. With plans to increase the fleet cruising speed to 15 knots, this was too slow. In terms of coal consumption, despite Parsons expectations *Velox* had a similar operational rate to the *Viper* and *Cobra*. There was no gain from the reciprocating engines of the *Velox*. In 1907 the reciprocating engines were replaced with cruising turbines but this did not produce much improvement in efficiency. Other problems reported with the vessel included a limited speed astern of 5 knots, a need to warn the Engine Room in advance of going astern, generally awkward handling, and a lack of seaworthiness due to the condensers being fitted above the water line. In 1909, following an engine breakdown off Land's End, *Velox* was removed from its division and assigned as an instructional vessel attached to HMS *Vernon*. *Velox* stayed in active service until its loss during World War One but was never completely satisfactory as an example of a successful turbine powered Destroyer (Lyon, 1996). Images of HMS *Velox* exist, but it was not possible to gain copyright permission to include these within this report.

Despite their issues with operational speeds and efficiency the Torpedo Boat Destroyers did demonstrate that turbines could be used as a propulsion system in ships. These vessels served an important purpose as prototypes, and their construction set an example that led to the installation of turbines in all subsequent British destroyers after the River or E class of 1903. HMS *Dreadnought* is the most significant example of the next stage in the use of steam powered turbines in the Royal Navy. *Dreadnought* entered into service in 1906 as a battleship of the British Royal Navy. The vessel was so significant in terms of the development of naval technology that the name 'Dreadnought' came to be associated with an entire generation of battleships, while the generation of ships it made obsolete became known as pre-Dreadnoughts. The *Dreadnought* was important in terms of the development of armament, but was also key as an example of a successful vessel powered by steam turbines, making it the fastest battleship in the world at the time of completion. The use of steam powered turbines in the *Dreadnought* signified a key advancement that would not have been possible without the earlier development of the steam turbine powered vessels the *Viper*, the *Cobra* and the *Velox*. HMS *Velox* is the only pre-Dreadnought turbine equipped Royal Naval vessel found within the coastal limits of England.

2.4 Site Environment

The site of HMS *Velox* lies approximately 1.5 miles east of Bembridge on the southern margin of the east Solent (Figure 5). To the west of the *Velox* site

between Brambles Bank and an approximately north to south line connecting Ryde to Southsea Castle, the east Solent morphology is defined by the shorelines of the mainland and the north-east Isle of Wight. Mean depth in the Solent increases from west to east but is nowhere deeper than 20 metres, except in the main channel where it reaches nearly 30 metres in the extreme east. Several banks, of both sand and sandy gravel, have been in stable positions over at least the past 200 years. The morphology of the seabed is diversified by several wide, sub-horizontal surfaces, which come to an end in steep slopes in a seawards direction. The area also contains the dredged main navigation channel, extending from east of the Nab Tower to the entrances of Portsmouth Harbour and Southampton Water (SCOPAC, 2004).

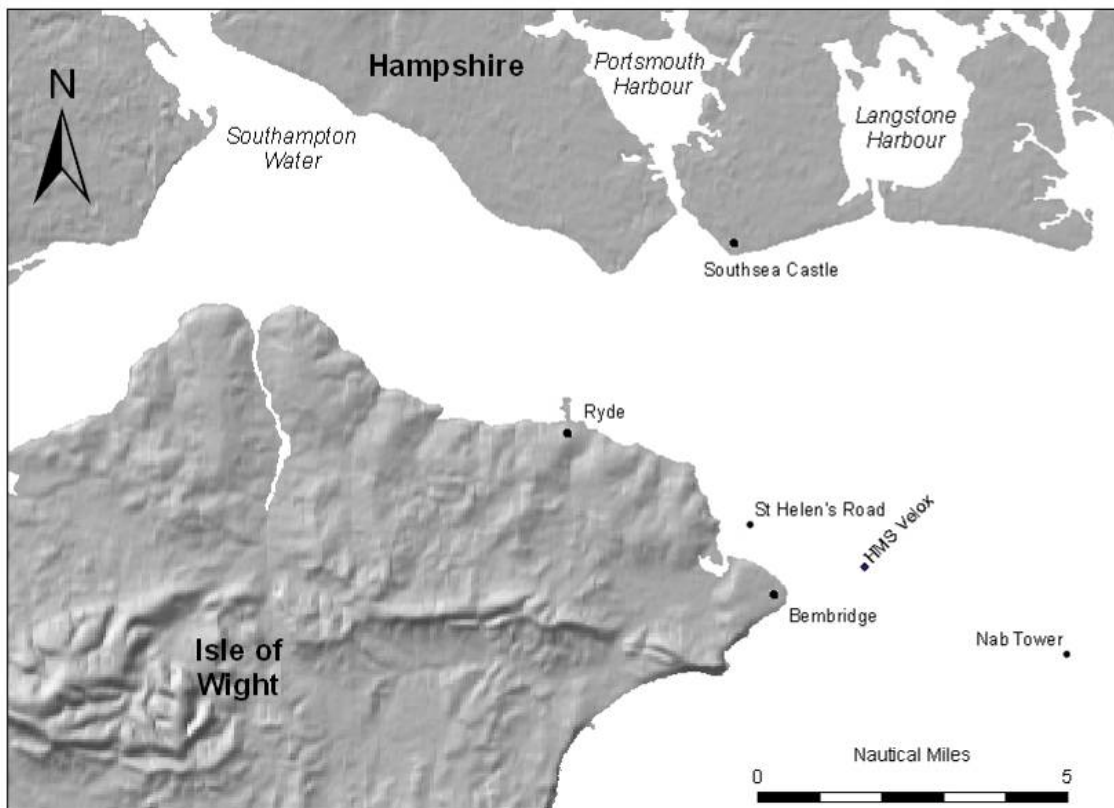


Figure 5. Illustration of key locations in the Eastern Solent.

Tidal currents in the east Solent are generally less rapid compared to the west Solent, with diving on the site possible during a two hour window for some tides. The speed of the tidal currents results in only sediments of medium sand being regularly mobile in these depths. Wave action is primarily from refracted swell moving into the east Solent from west or south-west. Winds from the east, south-east and north can occasionally generate waves in excess of 3m in height. The height and energy of waves decline progressively westwards, particularly once waves have entered the east Solent west of Selsey and Bembridge (SCOPAC, 2004). The *Velox* site is situated on this margin to the east of Bembridge, so can be subject to significant wave heights.

The dominant sediment type to the east of a boundary between Southsea Castle and St Helen's Road is fine sand (Figure 5). The sediment types become progressively coarser in an eastwards direction, with first sandy gravels, then gravelly sands and finally, gravels successively becoming the main type as the outer Solent approaches become co-adjacent with English Channel sediments. This pattern of eastward coarsening is complicated slightly by several large patches of sediments that are not characteristic of the area where they are found. Examples include Ryde Middle Bank, Medmerry Bank and Princessa Shoal (SCOPAC, 2004).

The immediate seabed around the *Velox* site is flat and level and comprises a mixture of sand and gravel, and as such fits into the pattern of sediment types for the area as described above. The sediment movement and tidal/wave regime does not appear to be impacting upon the wreck, but future monitoring over a period of years will provide more information in this respect. The echo sounder survey of the site in January 1990 noted that there was no scour around the wreck (UKHO wreck report cited in NMR Monument Report, ID 805467). The impression of stability is further reinforced by reference to the recorded height of the vessel above the seafloor. Echo sounder surveys conducted in 1977, 1980, 1985 and 1990 record a difference of 1.9 to 2.8 metres between the general depth and the least depth obtained during survey (NMR Monument Report, ID 805467). Similarly, diver survey conducted by the HWTMA in 2010 recorded the height of the remains above the seafloor as 0.5-2 metres, except for a section of pipe standing approximately 3 metres above the seabed, marking no significant change in height since the 1990 survey.

2.5 Site Ownership

The wreck was sold by the Ministry of Defence in 1925 to the Southern Salvage and Towing Company. In 1970 the wreck is reported as sold to either Metal Recoveries (Orkney) Ltd. or Metal Industries (Orkney) Ltd. of Newhaven, Sussex (NMR Monument Report, ID 805467). There is a current company listed as Metal Recoveries (Newhaven) Ltd., but this has only been trading since 1989 so is not a likely candidate. The other possibility would appear to be Metal Industries Ltd., previously known as Metal Industries (Salvage) Ltd. based in Glasgow and founded in 1944 that has not filed accounts since 1987. This was a company based in Scotland that carried out salvage work on ships.

Following this sale it was reported that nothing remained but lifting cables and it was presumed that the wreck was recovered.

2.6 Summary of Investigations

Survey prior to the 1970s focused on sweeps and echo soundings to establish the least depth over the wreck. The wreck was relocated in a survey in 1976 when it was said to lie in two parts. Survey in 1978 recorded the wreck as lying north to south with the bows missing and the boilers the highest part. Reports from 1985 describe the site as a spread of broken wreckage 100 metres by 25 metres and hardly proud of the bottom, except for a section of

pipe that has been snagged and hauled off the seabed to stand clear to approximately 5 metres (NMR Monument Report, ID 805467).

The wreck is a popular dive site and has been frequently dived by sports divers over a period of years. The site was adopted under the NAS Adopt a Wreck Scheme by Douglas McElvogue in January 2004.

A series of artefacts have been retrieved and reported to the Receiver of wreck. These include:

- a thermometer, a lamp, five brass fittings and five lamp reflectors, position 50 41.52N 001 02.12W. (Droit A/779)
- a porthole and railing flange recovered off Bembridge. (Droit A/1281)
- a 8" porthole and a 9" porthole, both complete with cover and glass, and a brass ship's light, recovered off Bembridge Ledge. (Droit A/1305)
- an abrasive block, a plate, and a porthole, position 50 41.52N 001 02.08W. (Droit A/2114)
- a gauge, 2 thermometers, and turbine blades, position 50 40.13N 001 30.55W. (Droit A/2785)
- a brass lamp, 2 empty shell cases, and 5 dining plates, position 50 41.31N 001 02.05W. (Droit A/3863)

A case of artefacts recovered from the site are known to be currently on display at the Isle of Wight Shipwreck Centre and Maritime Museum in Arreton, and a small number of artefacts at the Warship *Hazardous* display at Earnley Butterflies and Gardens near Chichester. The artefacts listed above as being reported to the Receiver of Wreck are likely to be distributed between these displays and private ownership, it is not currently known which of the artefacts are in the respective collections.

3. MONITORING METHODOLOGY

3.1 Diving

The HWTMA is registered as a diving contactor with the Health and Safety Executive (HSE). Diving involving HWTMA staff was undertaken under the HSE Scientific and Archaeological Approved Code of Practice.

Prior to diving a Project Plan was developed which included detailed information on:

- Diving team composition
- Boat (including safety features and facilities, numbers allowed on board, etc.)
- Tides (times and strengths)
- Site Risk Assessment (this is a general assessment of potential risk, it is augmented by a daily risk assessment completed on site)
- Provisional daily operations plan
- Procedures for use of any archaeological survey equipment
- Daily supervisor check list

3.2 Survey

The survey methods used during the assessment of the HMS *Velox* site were diver survey encompassing tape measurements and site photography. Two half-days of diving were undertaken on the site.

Recording was based on the MoLAS recording system, on which the HWTMA recording sheets have been based. The main adaptation of the MoLAS system for work in the underwater zone is the addition of a 'Dive Log Sheet' and an 'Archaeological Record Sheet', the former are used as the primary numbering system and are used for logging individual divers. Each diver fills in an Archaeological Record Sheet which provides details of specific work undertaken on each dive and references any numbers utilised e.g. context numbers, feature numbers and artefact numbers.

In summary the principal record sheet system includes:

- Dive Log Sheet
- Archaeological Record Sheet
- Context Log and Record Sheets
- Drawing Index
- Finds Index and Record Sheets
- Sample Index and Record Sheets
- Timber Index and Record Sheets
- Photo Index
- Video Index and Log Sheets

4. SURVEY RESULTS

The survey of the site enabled the identification and recording of structural elements with particular emphasis on the condition of exposed material. This allowed a more comprehensive assessment of the site in terms of its vulnerability and risk (see **Section 5.2**).

4.1 Diving Operations

The diving on the HMS *Velox* site took place on Monday 5th July 2010 from the dive boat *Wight Spirit*, and Friday 9th July 2010 from the dive boat *Wight Diver*. The diving activities on the site were undertaken by HWTMA staff, French and Belgian colleagues and volunteer divers. The tasks were undertaken in the window of slack or near slack water. The main purpose of the diving activities on the site were to confirm the position, extent, stability and character of the site. Taped measurements of observed archaeological features were recorded. The visibility was around four metres allowing a video and photographic record to be made of the site. Diver survey and side scan sonar were utilised to confirm the extent of the wreckage. A measured sketch of the site was produced (Appendix I). The dives were conducted to a maximum depth of 13 metres with a total of 843 minutes bottom time (see Appendix II for dive logs).

During the diving operation on Monday 5th July 2010 four waves of divers

were deployed. The first pair of divers were Lawrence Moran and Victoria Millership who dived to conduct a preliminary site inspection and lay a tape measure as baseline through the central portion of wreckage. The second and third waves of divers consisted of Réjane Gyssens and Ivan Verkempinck, and Jane Maddocks and Ine Demerre, who recorded key archaeological features through taped measurements offset from the baseline. The fourth diving team were Alexandre Poudret-Barré, Olivia Hulot and Andy Williams who focused on photographing and videoing key archaeological features on the wreck site.

In the course of the diving operation that took place on Friday 9th July 2010 four sets of divers were deployed. The first wave of divers were Victoria Millership and Alexandre Poudret-Barré who lay a tape measure as baseline through the central portion of wreckage and recorded key archaeological features through taped measurements offset from the baseline and direct measurements of the features themselves. The second diving team were Victoria Millership and Trevor Jenkins who conducted a video survey of the wreck site. The third pair of divers consisted of Sara Hasan and Lauren Tidbury who continued the process of recording key archaeological features through the use of taped measurements offset from the baseline and direct measurements of the features themselves. The fourth diving team were Réjane Gyssens and Ivan Verkempinck who concentrated on photographing key archaeological features on the wreck site, and Alexandre Poudret-Barré who continued the process of recording key archaeological features through the use of taped measurements offset from the baseline and direct measurements of the features themselves.

4.2 Archaeological Features

The vessel remains lie scattered around a flat seabed comprised of sand and gravel. The site covers an area approximately 30 metres by 20 metres. The observable archaeological features at the HMS *Velox* site consist of a dispersed range of vessel parts. There is no coherent hull structure visible on the site, presumably as a result of the salvage operations believed to have been carried out on the vessel (see Section 2.4). The features recorded have been located on the annotated measured sketch of the site seen below in Figure 6. The survey also identified points that could potentially be used for future monitoring, and recorded a photographic and video survey of the features on the measured sketch.

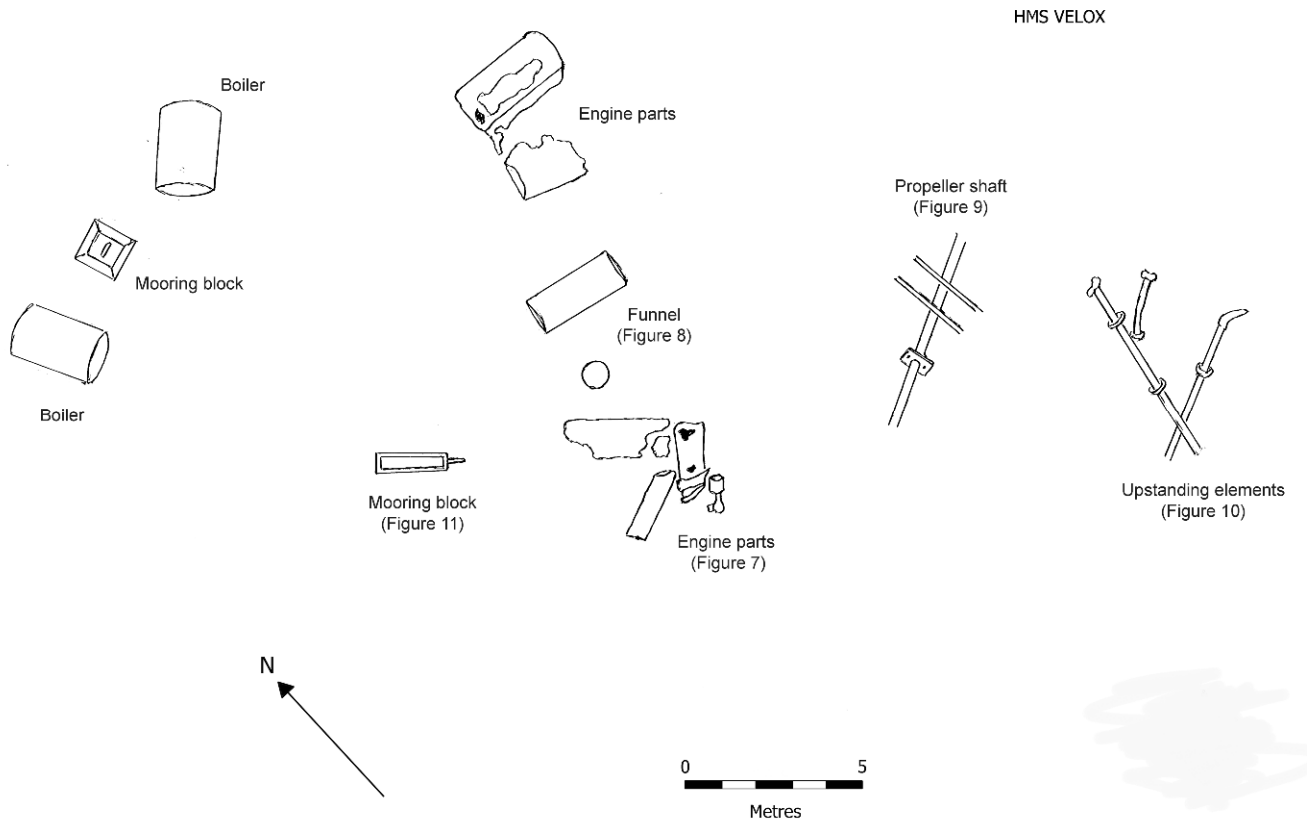


Figure 6. Annotated measured sketch of HMS Velox site.

The central area of the site, the engine parts, the funnel, and the eastern mooring block (as seen on the measured sketch in Figure 6) have been subject to a measured survey with distances between the features and the dimensions of the features themselves recorded. The western portion consisting of the two boilers and the mooring block, and the eastern portion consisting of the two sections of shaft, have been located by measured distances to the central features, but these elements have not had their dimensions recorded. This was due to time constraints and it is hoped that this sketch can be added to in subsequent fieldwork to create an overall and accurate site plan.

Diver searches were carried out around the area represented in Figure 6, and it is believed that this represents the majority of the features at the site, but there is a possibility that more material may lie further to the west of the site.



Figure 7. Engine part visible on seabed.

The site consisted of a number of individual features separated by areas of seabed. In the central area of the site the diver survey recorded the remains of part of the engine (Figure 7) and a funnel (Figure 8).

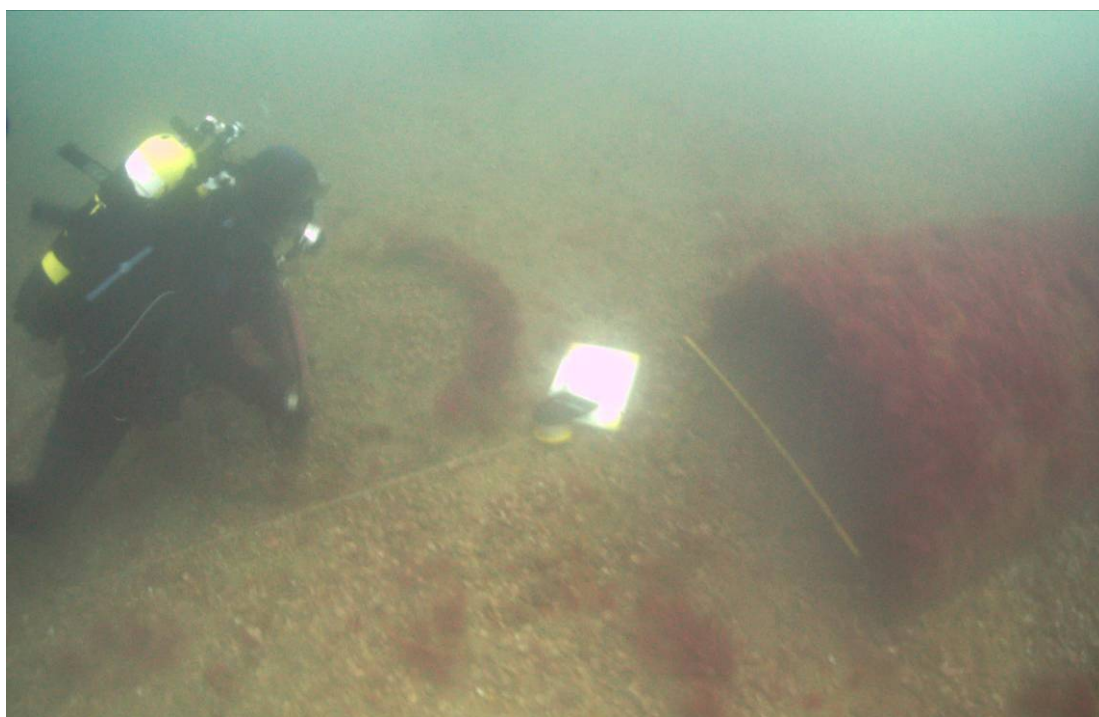


Figure 8. Diver and funnel.

Also in evidence on the seabed were the remains of what was presumed to be a portion of the propeller shaft (Figure 9).

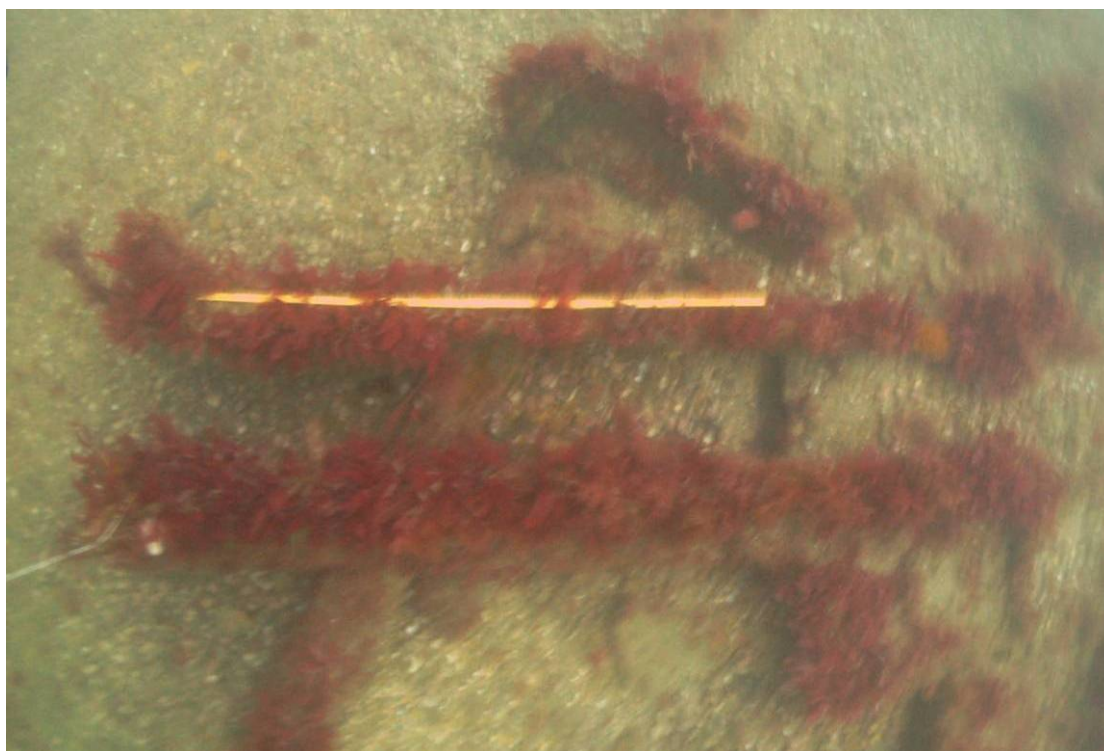


Figure 9. Shaft visible on seabed.

To the far east of the site were some upstanding elements, reaching a height of approximately 3 metres (Figure 10). These appeared to be more sections of the shaft seen in Figure 9, presumed part of the propeller array.



Figure 10. Upstanding elements of structure.

The site also showed evidence of previous salvage / diver activity, with a series of concrete mooring blocks scattered across the area (Figure 11).



Figure 11. Concrete mooring block.

5. CONCLUSIONS

The main aims of the survey of the HMS *Velox* wreck site in 2010 were to undertake a survey of the site to Level 2a. This was to identify and record in detail any vulnerable elements of the structure, with particular emphasis on the conditions of any exposed material; and to undertake a Risk Assessment with reference to English Heritage's *Protected Wreck Sites at Risk: A Risk Management Handbook* (2008).

5.1 Survey Assessment

The diver survey revealed that HMS *Velox* wreck site is relatively stable in terms of the structural remains extant on the seabed. These are of a robust nature, consisting of metal objects with limited susceptibility to swift degradation.

Only one season of diving has been carried out on the site by HWTMA, the installation of monitoring points may aid in the assessment of how fast seabed erosion is occurring on the site and aid in developing a future plan for the management of the site.

5.2 Historic Wreck Site Risk Assessment

Wreck/Site Name	SI Number
HMS <i>Velox</i>	

NMR / UKHO No.	EH Region	Restricted Area	Principal Land Use
NMR 805467	South East		Coastland 1

Latitude (WGS84)	50° 41.557' N
Longitude	001° 02.164' W

Class Listing	Period	Status
Torpedo Boat Destroyer	Pre-WWI	Non-Designated Wreck Site

Licensee	Nominated Archaeologist	Principal Ownership Category
		Other – Unknown at Present

Seabed Owner	Navigational Administrative Responsibility
Crown Estate	nil

Environmental Designations
none

Seabed Sediment	Energy
Sandy Gravel	Low

Survival
Very Poor

Overall Condition	Condition Trend	Principal Vulnerability
generally satisfactory but with minor localised problems	Stable	Nat, ANCH, DIVE

Amenity Value: visibility
limited above bed structural remains and finds scatter with limited visibility and only 'legible' with further interpretative information

Amenity Value: physical accessibility	Amenity Value: intellectual accessibility
Full: no restrictions on access and no impediments to appreciation of the wreck	No interpretation

Management Action	no action required (routine monitoring by the licensee / archaeological contractor)													
Management Prescription	A	B	C	D	E	F	G	H	I	J	K	L	M	N
			✓									✓		
Notes	The site lies at a depth of 11-14 metres in an area of flat, sandy seabed. The majority of the structural remains are in an area approximately 30 metres long. Larger metal objects make up the identifiable remains visible on the seabed. The remains are accessible on the seabed. The risk of physical and/or biological decay is minimal due to the robust nature of the remaining artefacts on site. The artefacts on the site are in a generally satisfactory condition and environment, leading to the conclusion that the threat to the stability of the larger remains is minimal and the risk can be assessed as LOW.													

5.3 Potential for Further Work

Further research should be considered for this site, this could include investigation into the current location of artefacts recovered from the site, and their examination where possible. The quantification of the material from the Isle of Wight Shipwreck Centre and Maritime Museum in Arreton, and the Warship *Hazardous* display at Earnley Butterflies and Gardens near Chichester would form part of this process. Such artefacts may offer further information about the *Velox* unavailable elsewhere. Further archival research should also be considered.

The dispersed nature of the remaining archaeological features on the site, the lack of any elements of the hull and the details in the NMR Report (ID 805467) indicate a salvage operation was carried out on the wreck. More details of this operation from documentary sources (if available) would be favourable. There is also a need to confirm conclusively the identity of the site, with further research into the HMS *Velox* and the equipment the vessel was fitted with possibly leading to a more accurate comparison between what is currently visible on the seabed and the fixtures and fittings of the working vessel. More detailed research on the role of the *Velox* in the development of steam powered turbine propulsion in the early 20th century would also provide further context for the vessel and its assessment. The preliminary research that has accompanied the preparation of this report has highlighted the significance of *Velox* and its class ships in the development of this new propulsion system and its deployment in later Royal Naval vessels. Part of the evaluation of this class could also include a detailed review of the documentation associated with the *Viper* and the *Cobra*. A full study of these comparative vessels was outside the scope of this project but would aid future research into the development of steam powered turbine propulsion.

In terms of diving investigation the HWTMA recognises the need to continue to monitor the site as the level of risk can be subject to change. The nature of the archaeological remains extant on the seabed means that they are relatively stable, but the installation of monitoring points may help with an assessment of the stability of the environment within which the remains are situated. Monitoring will record of the speed of erosion or sediment accumulation taking place and help establish the stability of the site and any likelihood of further material being exposed. Further tasks include to establish the absolute extent of the site through diver survey, and to add to the measured sketch produced in 2010 in order to create an accurate site plan. The positive identification to a more detailed level of some of the remains on site would also be an objective. With the physical remains of the *Viper* and the *Cobra* not available for archaeological study, the examination of the *Velox* site can be seen as a singular opportunity to further understand the successes and the limitations of these prototype vessels.

The HWTMA may be able to combine this monitoring and survey work with other planned fieldwork in 2011, through the Interreg IVA 'Archaeological Atlas of the 2 Seas' project.

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APPENDIX I – DIVE LOGS**Diving Operation One**

Supervisor	Location	Date
Garry Momber	HMS <i>Velox</i> wreck site	05/07/2010

Vessel	Vessel Cox	Dive Method
<i>Wight Spirit</i>	Dave Wendes	SCUBA

Weather (sea state)	HW/LW (slack water)	Underwater Visibility
Slight to moderate	HW slack - HW 18:07 BST	4-6 metres

Log No.	Diver Name	Left Surface	Arrive Surface	Duration (mins.)	Max Depth
01	Lawrence Moran	15.57	16.27	30	12 metres
01	Victoria Millership	15.57	16.27	30	12 metres
02	Réjane Gyssens	16.05	16.45	40	12 metres
02	Ivan Verkempinck	16.05	16.45	40	12 metres
03	Jane Maddocks	16.38	17.25	48	12 metres
03	Ine Demerre	16.38	17.25	48	12 metres
04	Alexandre Poudret-Barré	16.47	17.27	40	12 metres
04	Olivia Hulot	16.47	17.27	40	12 metres
04	Andy Williams	16.47	17.27	40	12 metres

Diving Operation Two

Supervisor	Location	Date
Lawrence Moran	HMS <i>Velox</i> wreck site	09/07/2010

Vessel	Vessel Cox	Dive Method
<i>Wight Diver</i>	Richard Mean	SCUBA

Weather (sea state)	HW/LW (slack water)	Underwater Visibility
Slight to moderate	HW slack - HW 09:56 BST	3-6 metres

Log No.	Diver Name	Left Surface	Arrive Surface	Duration (mins.)	Max Depth
05	Victoria Millership	08.48	10.15	87	13 metres
05	Alexandre Poudret-Barré	08.48	09.22	34	13 metres
06	Trevor Jenkins	09.28	10.15	47	13 metres
07	Sara Hassan	09.01	10.03	62	13 metres
07	Lauren Tidbury	09.01	10.03	62	13 metres
08	Réjane Gyssens	08.38	09.13	35	13 metres
08	Ivan Verkempinck	08.38	09.13	35	13 metres
09	Réjane Gyssens	10.28	11.13	45	13 metres
09	Ivan Verkempinck	10.28	11.13	45	13 metres
10	Alexandre Poudret-Barré	10.48	11.13	35	13 metres