Hampshire & Wight Trust for MARITIME Archaeology

ENGLISH HERITAGE

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

Project Assessment Report

February 2011

CONTENTS

i. DOCUMENT CONTROL

Project name	Solent Marine Heritage Assets
HWTMA ref	425
Other refs	EH: 5231
Title	Project Report
Author/s	Victoria Millership and Julie Satchell
Derivation	Project Design January 2009
Date of last revision	N/A
Version	2
Status	Draft for comment
Circulation	Relevant EH staff
Required action	
This project design has been prepared in accordance with MoRPHE guidelines (English Heritage 2006)	

ii. ACKNOWLEDGEMENTS

The Solent Marine Heritage Assets (SMHA) 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, Daisie 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.

The HWTMA would like to thank all those involved with the surveys on each site, for more detailed information concerning the individual site assessments the reports for each site are available on the HWTMA website at: www.hwtma.org.uk.

This report has been written by Victoria Millership and Julie Satchell. The project has been managed by Julie Satchell.

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 considers the success of the Solent Marine Heritage Assets project in completing regionally based site assessments for the *Fenna*, HMS *Invincible*, the Needles, HMS *Velox* and Yarmouth Roads.

The data resulting from the desk based assessment of the *Fenna*, and the diving and desk based research on HMS *Invincible*, the Needles, HMS *Velox* and Yarmouth Roads, is reviewed against the objectives for each site. The results achieved for each site are analysed to assess the approach and techniques employed.

The project reports for the SMHA project include recommendations for further work to be carried out and considerations for future management of the sites. The site assessments have contributed to management priorities through their evaluation of the current condition of archaeological material on the sites, and the resulting proposals for future action. The recommendations for each site are discussed, with the results that such future actions may achieve.

The effectiveness of combining the SMHA project work with other HWTMA projects is reviewed. The desk based research and diving on sites was undertaken in conjunction with other planned HWTMA projects, this allowed for monitoring dives to take advantage of ongoing HWTMA diving fieldwork by including additional diving days within other work.

The HWTMA are well-placed within the Solent region to respond to the assessment, investigation and monitoring needs of a range of archaeological sites on a regional basis. The regional remit of the project has allowed the HWTMA to use their experience in the Solent by selecting the best survey methods to use on these sites, and has allowed pre-existing site archives to be used as a resource.

The SMHA project has demonstrated that a regional basis for the assessment of submerged cultural heritage sites can be advantageous in terms both cost and localised expertise. A continuation of the project with HWTMA would allow for the ongoing assessment, investigation and monitoring of selected sites. The same potential advantages could be applied in other areas of the country, using the SMHA project as a model.

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 considers the success of the Solent Marine Heritage Assets project in completing regionally based site assessments for the *Fenna*, HMS *Invincible*, the Needles, HMS *Velox* and Yarmouth Roads.

1.2 Solent Marine Heritage Assets Project: Aims & Objectives

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

The project allowed for the flexible targeting of site investigation, monitoring and reporting. It supported:

- 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 were:

- 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.

2. PROJECT ASSESSMENT

2.1 Review of quantity and quality of data retrieved

The data resulting from the desk based assessment of the *Fenna*, and the diving and desk based research on HMS *Invincible*, the Needles, HMS *Velox* and Yarmouth Roads, will be reviewed against the objectives for each site.

The results achieved for each site will be analysed to assess the approach and techniques employed.

The site of the *Fenna* was subject to a desk based assessment in order to assess the sites current condition and potential, and inform its future management. The sites of HMS *Invincible*, the Needles, HMS *Velox* and Yarmouth Roads were subject to site surveys that enabled the identification and recording of structural elements with particular emphasis on the condition of exposed material. This allowed a comprehensive assessment of the sites in terms of their vulnerability and risk.

2.1.1 *Fenna*

The overall aim for the *Fenna* site was to undertake a desk based assessment of the site in order to inform its future management and to reach recording Level 1a as defined by EH in their Brief:

Level	Character	Scope
1a	Indirect (desk-based)	From documentary, cartographic or graphic sources, including photographic (incl. AP), geotechnical and geophysical surveys commissioned for purposes other than archaeology.

The specific objectives and the actions taken to fulfil them were to:

- *Undertake desk based research to confirm the identity of the Fenna and research to identify other known losses of 19th century Dutch schooners.*

The desk based assessment of the site known as the *Fenna* addressed the question of the identity of the site, mainly through a correlation between the preserved in-situ cargo and the historically recorded cargo of the *Fenna*. Comparison may also be drawn between the observed seabed remains and the likely dimensions/attributes of the *Fenna* The recorded location of the abandonment and sinking of the *Fenna* is subject to some inaccuracies, but remains within the vicinity of the present remains. There seems no reason to doubt the identification that the present site represents the remains of the *Fenna*.

A NMR search was conducted for Dutch registered schooners lost prior to 1901 around the coastline of England. This produced twenty-three casualties between 1782 and 1897, including that of the *Fenna*. The *Fenna* is therefore situated within a wider, albeit limited in quantity, corpus of Dutch schooners lost in English waters during the late 19th century.

- *Confirm the position and extent of the site from archive dive logs, including likely accuracy of the position, and determine whether the site lies in an area of current environmental designation.*

The position and depth of the site has been confirmed by Mr David Wendes, a local maritime historian who has been diving on the site since 2000, using a combination of GPS and sonar equipment. Previous diving on the site has

established that the vessel remains lie upright, partially subsumed into a flat seabed comprised of sand and gravel. The extant remains of the vessel measure 30m in length by c.10m in width at the widest point. Although the upper elements of the wooden hull have disappeared, parts of the lower hull of the vessel are preserved. The site does not lie in any areas of current environmental designation though the characteristics of the site mean that it plays the role of a reef, within an otherwise featureless seabed. As a result of this the site has been colonised by a range of marine life, much of it recorded under the OASIS project.

- *Determine ownership of the site.*

It is currently unclear who ownership of the *Fenna* resides with. The *Fenna* was a two-masted sailing schooner of 172 tons, built in 1862, probably in Hoogezand by J. A. Hooites. The vessel was owned by J. A. Hooites, possibly in conjunction with T. A. Hoviks and registered in Amsterdam (NMR Monument Report, ID 901153; www.scheepsindex.nl). The owner of the *Fenna* at the time of sinking was J. A. Hooites of Hoogezand. The *Fenna* was one of forty-nine ships under the ownership of Hooites at various times between 1851 and 1896 (www.scheepsindex.nl).

- *Determine the location of material previously recovered from the site.*

Material previously retrieved from the site has been limited, enquiry with the Receiver of Wreck (RoW) has indicated that only a very small number of objects have been raised and declared to the RoW. These consist of twenty-three 5" wrought iron nails and a heavy brass object. The latter is thought to be associated with minesweeping equipment, rather than the shipwreck (Alison Kentuck, pers.comm.). The relatively small number of artefacts that have been declared is probably a function of the fact that diving has only taken place on the site in a limited way since 2000. The materials remains in private collections, with a selection of the nails given to the HWTMA to enable further research.

Following the submission of the draft report, EH informed the HWTMA that a barrel had been raised from the site by Wessex Archaeology on behalf of the New Forest National Park Authority. Detail of this recovery was added to the report.

- *Identify gaps in understanding of the site to inform any future site management.*

More detailed research into the history of the *Fenna* was completed establishing the identity of the *Fenna* and relating the vessel to its wider context, specifically in relation to various maritime practices at the time including shipbuilding, trading patterns and cargo stowage.

- *Undertake a Risk Assessment with reference to English Heritage's* Risk Management Handbook *(November 2008).*

Documentary sources, along with practical experience of the site were used to generate a risk management assessment of the site according to the

guidelines set out by English Heritage in their *Risk Management Handbook* (2008). The desk-based assessment drew upon the knowledge and experience generated by the HWTMA's diving operations on the site, in conjunction with that held by Mr Wendes derived from his own research into the site and supplemented by documentary research into sites and monuments records and historical source material held mainly in the UK. The assessment concluded that the site is stable, but must be considered very vulnerable because of the highly preserved nature of the artefactual relationships of the cargo. The main threat to the site must be considered to be cultural threats, occurring from sports diving, fishing activity or accidental damage due to the anchoring of vessels on the site. The highly coherent nature of the remains, in particular the cargo, means that even minor damage has the potential to greatly reduce the archaeological potential of the *Fenna*. Risk should be considered as MEDIUM.

- *Provide, as an appendix, an assessment of the site against the non-statutory criteria used to inform designation under Section 1 of the Protection of Wrecks Act 1973.*

Assessment of the significance of the site against the Department for Culture Media and Sport's non-statutory criteria for the designation of shipwreck sites under the Protection of Wrecks Act (1973) was also conducted and included in the report. The assessment concluded that the *Fenna* is a very rare site that exhibits a very high level of preservation, the site also has a high potential for future research into many different aspects of mid/late 19th century shipbuilding, cargo handling, vessel use and shipping practices. The *Fenna* provides the potential to investigate ordinary human activity within the maritime context of the 19th century. As such, the site of the *Fenna* should be considered of high significance with the UK's corpus of historic shipwreck remains.

Since the submission of the report the HWTMA has put forward the *Fenna* site for Designation under the PWA. HWTMA believes it should be of urgent importance to provide the site with formal protection as any damage to the seabed archive will have a detrimental impact on its integrity and research potential.

- *Provide recommendations on scope, planning, objectives and delivery of a site assessment.*

Recommendations for future work relating to the site have been offered, based on the current understanding of the site and drawing on the assessment of significance of the vessel, as mentioned above, in relation to the Department for Culture Media and Sport's non-statutory criteria. This encompasses management strategies such as formalised monitoring of the site in addition to work more concerned with specialist analysis and research to further understand its research potential. This gives rise to a number of strategies and approaches that could be applied in the future to further determine and refine the significance of the *Fenna*.

The overall aim for the *Fenna* site was to undertake a desk based assessment of the site in order to inform its future management. This aim has been completed through an assessment of the site against the objectives detailed by EH in their Brief. Recommendations have also been made for future site management.

2.1.2 HMS *Invincible*

The overall aim for HMS *Invincible* site was to reach recording Level 2a as defined by EH in their Brief:

Level	Character	Scope
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.

The specific objectives and the actions taken to fulfil them were to:

- *Undertake survey of the site, identifying and recording in detail any vulnerable elements of the structure, with particular emphasis on the conditions of any exposed material.*

The assessment of HMS *Invincible* site took place during one day of diving on the site on Tuesday 27th October 2009 from the dive boat *Wight Spirit*. The survey tasks were undertaken in the window of slack or near slack water. The site was subject to a diver survey to monitor the site for any significant recent change, including the recording of any vulnerable elements of the structure subject to possible degradation.

- *Produce a structured record of field observations. Key elements are to be subject to detailed examination and recording (position by diver survey, taped measurements, photographs and video and written database entries).*

A record of observations was produced, which included taped measurements and a photographic record. The cultural remains at HMS *Invincible* site consist of both larger, structural remains and smaller objects. Artefacts not previously observed were located in relation to previously recorded and positioned objects, and identified in relation to these on the site plan. The survey also identified points that could potentially be used for future monitoring, with photos that could act as baseline data taken of features at known positions.

- *Undertake a Risk Assessment with reference to English Heritage's* Risk Management Handbook *(November 2008).*

A Risk Assessment was carried out for the site. The diver survey revealed that HMS *Invincible* protected wreck site is relatively stable in terms of the structural remains extant on the seabed. These are subject to the degrading processes of seabed erosion and biological decay but there is limited alteration from season to season. Other objects recorded on the seabed are at higher risk, with vulnerable elements of cable/cordage observed

deteriorating as they are revealed by seabed erosion. Smaller items are at risk of removal through swell or tide and consideration must be given to the need to recover exposed artefacts at risk of loss. The gradual degradation of the seabed archive over time is resulting in the loss of information from this nationally important historic asset. This led to the conclusion that the risk could be assessed as MEDIUM.

The overall aim for the *Invincible* site was to create a record of the site reaching recording Level 2a. This aim has been completed through an assessment of the site against the objectives detailed by EH in their Brief. Recommendations have also been made for future work on the site.

2.1.3 Needles

The overall aim for the Needles site was to reach recording Level 2a as defined by EH in their Brief:

Level	Character	Scope
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.

The specific objectives and the actions taken to fulfil them were to:

- *Undertake survey of the site, identifying and recording in detail any vulnerable elements of the structure, with particular emphasis on the conditions of any exposed material.*

On Friday 3rd July 2009 the dive operation took place and the assessment of the Needles site was completed. The tasks undertaken were limited by the diving conditions, restricted by the availability of slack or near slack water. The site was monitored for any significant recent change including the recording of any vulnerable elements of the structure.

- *Produce a structured record of field observations. Key elements are to be subject to detailed examination and recording (position by diver survey, taped measurements, photographs and video and written database entries).*

Taped measurements of observed archaeological features were not possible within the constraints of the diving conditions; instead artefacts were recorded and if not already shown on a previous site plan, were located in relation to those that were illustrated on the plan. The visibility ranged from two to four metres allowing a video record to be made of the site. During fieldwork on the Needles site a side scan sonar was also deployed to record images of the seabed remains, and possible further cannon were identified in the channel to the north east of the main site.

- *Undertake a Risk Assessment with reference to English Heritage's* Risk Management Handbook *(November 2008).*

The Needles wreck site lies on an exposed platform which consists of a series of gullies and crevices. A Risk Assessment was completed based on the diver survey, this revealed that the Needles protected wreck site remains a relatively stable site despite the dynamic environment. The cultural material at the site consists of robust, largely metal, objects with limited susceptibility to swift degradation. The artefacts on the site are in a generally satisfactory condition and environment, leading to the conclusion that the threat to the general stability of the larger remains is minimal and the risk can be assessed as LOW.

The overall aim for the *Needles* site was to create a record of the site reaching recording Level 2a. This aim has been completed through an assessment of the site against the objectives detailed by EH in their Brief. Recommendations have also been made for future work on the site.

2.1.4 HMS *Velox*

The overall aim for HMS *Velox* site was to reach recording Level 2a as defined by EH in their Brief:

Level	Character	Scope
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.

The Brief was drafted by EH 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 HMS *Invincible* sites.

The specific objectives and the actions taken to fulfil them were to:

- *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.*

The owner ship of the site of HMS *Velox* is unknown. 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). The owner would appear to be Metal Industries Ltd., previously known as Metal Industries (Salvage) Ltd. based in Glasgow and founded in 1944. This was a company based in Scotland that carried out salvage work on ships. This company is no longer in business, it has not filed accounts since 1987. It has not been possible to trace who would currently have ownership of their property.

- *Confirm position, extent, stability and character of the site. Confirm location of site with reference to the 12nm limit.*

The site location and depth have been confirmed by Mr David Wendes, a local maritime historian, through the use of a combination of DGPS and sonar equipment. The site is at a depth of 11-14m and consists of a dispersed scatter of archaeological remains. Diver survey has confirmed that the immediate seabed around the *Velox* site is flat and level and comprises a mixture of sand and gravel. The site covers an area approximately 30 metres by 20 metres.

- *Locate and accurately position any visual archaeological material.*

The diving on 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 assessment of the site was 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.

- *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).*

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. The central area of the site has been subject to a measured survey with distances between the features and the dimensions of the features themselves recorded. The western section and the eastern section of archaeological features 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 the initial plan produced can be added to in subsequent fieldwork to create an overall and accurate site plan.

- *Undertake a Risk Assessment with reference to English Heritage's* Risk Management Handbook *(November 2008)* and extant site monitoring points.

The observable archaeological features at 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. The Risk Assessment based on 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 overall aim for HMS *Velox* site was to create a record of the site reaching recording Level 2a. This aim has been completed through an assessment of the site against the objectives detailed by EH in their Brief. A measured sketch has been produced of the site but there is still a need 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. Further recommendations have also been made for future work on the site.

2.1.5 Yarmouth Roads

The overall aim for the Yarmouth Roads site was to reach recording Level 2a as defined by EH in their Brief:

Level	Character	Scope
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.

The specific objectives and the actions taken to fulfil them were to:

- *Undertake survey of the site, identifying and recording in detail any vulnerable elements of the structure, with particular emphasis on the conditions of the sandbags and any exposed material.*

During the week of diving undertaken by HWTMA in the Western Solent in 2009 the dive on the Yarmouth Roads protected wreck site and the assessment of the site took place on Monday 29th June 2009. The tasks undertaken were limited by the diving conditions, and the requirement for slack or near slack water. One of the aims of the monitoring dive had been to record measurements of the exposed structure and to review the potential to install monitoring points to help assess the speed of erosion at the site.

- *Produce a structured record of field observations. Key elements are to be subject to detailed examination and recording (position by diver survey, taped measurements, photographs and video and written database entries).*

Unfortunately tidal conditions on the day limited the tasks that were able to be completed. A video record of the site was created providing evidence of the current conditions of archaeological material on site.

- *Undertake a Risk Assessment with reference to English Heritage's* Risk Management Handbook *(November 2008).*

The visible cultural material at the site consists of structural remains. The majority of material at the Yarmouth Roads wreck site lies in hollows in the

Eocene bed rock where the archaeological material is contained within fine silts, and is either still buried or has been protected using sandbags. The diver survey carried out in 2009 recorded extant structure on the seabed, and the sandbags which cover the site. The Risk Assessment concluded that the Yarmouth Roads protected wreck site remains a relatively stable site. No noticeable changes were observed in this monitoring dive compared to the last HWTMA dive on site in 2005, with the sandbags covering the site remaining in a similar state of degradation. Only limited amounts of wooden structure are visible above the seabed but these are at risk of physical erosion. The threat to the general stability of the larger buried remains is minimal but the possibility of degradation of vulnerable wooden structure leads to the conclusion that the risk can be assessed as MEDIUM.

The overall aim for Yarmouth Roads site was to create a record of the site reaching recording Level 2a. This aim has been completed through an assessment of the site against the objectives detailed by EH in their Brief. The work on the Yarmouth Roads site was severely limited by tidal conditions on the site. A brief survey was completed but it was not possible to create a more detailed record. Recommendations have been made for future work on the site.

2.2 Review of management actions in response to reports

The project reports for the SMHA project include recommendations for further work to be carried out and considerations for future management of the sites. The site assessments have contributed to management priorities through their evaluation of the current condition of archaeological material on the sites, and the resulting proposals for future action. The recommendations for each site are discussed, with the results that such future actions may achieve.

2.2.1 *Fenna*

The desk based assessment of the *Fenna* has suggested several future management actions as a result of the site assessment report:

- Ongoing monitoring – the baseline extent of the site could be established with a modern multi-beam bathymetric survey; effective monitoring of the site should be by regular archaeological diver survey and the installation of monitoring points on the site would provide a benchmark against which future monitoring surveys can be measured.
- Historical research – future research for this well preserved shipwreck could shed significant light on shipbuilding, cargo stowage practices and trading systems in 19th century northern Europe.
- Survey of hull remains - the current site plan of the *Fenna* was created during the initial survey of the site in 2002. Updating of this plan could further characterise the site by investigating the observable hull remains in greater detail. Further investigation of the hull remains would also serve to confirm whether or not the builders of the *Fenna* incorporated any iron reinforcement into the vessel and whether or not the hull is sheathed.
- Sampling – sampling targeted, specific elements of the hull structure would provide an identification of timber species. A sampling strategy for the hull

fastenings and any identified sheathing should also be developed. In order to underpin analysis of the cargo a sampling program of limited elements could be conducted.

2.2.2 HMS *Invincible*

The assessment of HMS *Invincible* led to a series of recommendations for future management as a result of the site assessment report:

- There is a need to continue to monitor the site as the level of risk can be subject to change.
- The installation of monitoring points may aid in the evaluation of how fast seabed erosion is occurring and help to determine potential future requirements for surface recovery of artefacts at risk.
- The situation in relation to exposed artefacts at risk of loss requires further consideration. There is currently only a survey licence for the site, so any potential recovery work would require an additional level of licensing.

2.2.3 Needles

The assessment of the Needles site led to a series of recommendations for future management as a result of the site assessment report:

- Due to the dynamic nature of the site and the changing levels of exposure of artefact remains regular monitoring of this site is crucial as the level of risk can be subject to change.
- In the survey, iron knees not previously recorded were observed in the Needles Channel to the north east of the main site. Scattered wreckage has been located to the north east of the main site over the previous few years. It is currently unclear which wrecks this material is associated with. Therefore, the HWTMA believe that further targeted survey work in this area would contribute to clarify this issue.

2.2.4 HMS *Velox*

The assessment of HMS *Velox* site led to a series of recommendations for future management as a result of the site assessment report:

- The installation of monitoring points may aid in the assessment of how fast seabed erosion is occurring on the site and the stability of the environment within which the remains are situated, and aid in developing a future plan for the management of the site.
- The confirmation conclusively of 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.
- There is also a need 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.
- 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. Further archival research into both

the *Velox* and the other ships in the same class, the *Viper* and the *Cobra*, should also be considered.

2.2.5 Yarmouth Roads

The assessment of the Yarmouth Roads site led to a series of recommendations for future management as a result of the site assessment report:

- The degraded state of the sandbags and the fact that vulnerable remains are situated above seabed level means that regular monitoring of this site is crucial as the level of risk can be subject to change. As there are no monitoring points on the visible structure it is not known how quickly the seabed and the visible structure may be eroding.
- Physical erosion is possible due to the location of vulnerable wooden remains on the surface of the seabed. The condition of the remaining sand bags has been assessed and a more detailed survey of any wreck structure may now be undertaken.
- The HWTMA has submitted a proposal to English Heritage to address the urgent need to progress the work undertaken on the site in the 1980s through archive audit, assessment, analysis and publication. EH have put this project 'on hold' while a more detailed consideration of maritime archive backlogs is undertaken. The Isle of Wight Museum Service hold the archive for the site and the HWTMA are working with them to ensure this important collection is analysed and published, to release the full research potential of the site.
- A further interesting avenue of research would be to ground truth the results of the 3-D seismic survey modelling, undertaken by the University of Southampton in 2006. Such a project could also add to a range of research related to in-situ preservation if areas excavated in the 1980s were re-opened for examination.

2.2.6 Summary and Future Planning

The SMHA project has allowed the detailed consideration of potential management actions on the sites considered. These recommendations can now be utilised by both EH and the HWTMA. In relation to the currently protected wreck sites the outcomes provide information for the on-going monitoring of these important heritage assets.

The HWTMA will draw on the recommendations for future work planning and also fundraising to enable the recommendations to be taken forward. It is likely that the results will be used within applications to EH and a number of other potential funders.

2.3 Review combining SMHA with other HWTMA projects

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 SMHA project is based on being able to undertake diving on sites in conjunction with other planned HWTMA projects.

This allows necessary monitoring dives to take advantage of ongoing HWTMA diving fieldwork by including additional diving days within other work.

2.3.1 Diving Methodology

The HWTMA is registered as a diving contactor with the Health and Safety Executive (HSE). Diving involving HWTMA staff conformed to the Diving at Work Regulations 1997 (DWR 1997), and will followed best practise laid out in the HSE Scientific and Archaeological Approved Code of Practice.

Prior to each diving project 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 was 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

All HWTMA staff professional divers have experience of supervising and undertaking maritime archaeological investigations within the Scientific and Archaeological Code of Practice. The diving supervisor is appointed by letter.

All diving was conducted using open circuit Self Contained Underwater Breathing Apparatus (SCUBA), all HSE team members utilised an Alternate Air Source (AAS). By using SCUBA equipment it is possible to have multiple divers in the water concurrently and also use several waves of divers (depending on the conditions). This maximises the time available on the seabed and hence increases the productivity of survey and data gathering.

The diving also provided an opportunity for volunteers to dive alongside professional divers. The inclusion of volunteers working alongside the professional team helped promote inclusivity, aided volunteers with training and developed an understanding of the marine historic environment and raised capacity within the profession. Volunteers gained a chance for hands-on survey experience and involvement within the project team. Volunteer divers dived according to the rules and regulations of their certifying organisations, but were under the duty of care of the HWTMA.

2.3.2 Survey Methodology

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

2.3.3 Diving Conditions

The Solent is subject to tidal influence, therefore diving has to take place during the slack water windows. The length of time available varies from site to site, as the tidal conditions are different on each site.

Visibility on sites can be variable depending on the weather and tidal conditions. Visibility on the sites surveyed as part of the SMHA project varied from 2m to 4m.

The weather can affect the diving plan, challenging conditions can lead to the decision to dive in more sheltered waters, and bad weather can lead to a cancelled day. One of the principle problems caused by windy weather conditions is the deployment and recovery of divers.

The Needles site can be a particular challenge to dive, with the funnelling effects of the western Solent resulting in water either being forced into the narrow Needles channel or racing out on the ebb tide. The weather can have a significant effect on the diving conditions. A south westerly wind will quickly increase swell and pick up wave heights at the surface making dive preparation uncomfortable and potentially more hazardous. Underwater, the surge can quickly increase as some parts of the site are only six metres deep and this can soon make diving difficult.

2.3.4 Results of combining SMHA with other HWTMA projects

The logistics behind a diving operation are complex and time consuming to organise. These include, amongst other issues, the organisation of the HSE diving paperwork; the application of permissions from various authorities to dive on sites; the reservation for the dive boat and accommodation for the project team as needed; the creation of an archaeological project plan and a diving operations plan; the organisation of the diving and survey equipment; and the establishment of a project team including HSE professional divers and volunteers.

The inclusion of the SMHA surveys within other planned HWTMA projects has allowed a more cost-effective mobilisation than organising all associated logistics for a single days diving on one site.

Fenna

Work on the *Fenna* took the form of a desk based assessment, without a diving survey. However, this site benefitted from the HWTMA's regional expertise through access to the HWTMA site archive. The HWTMA has been working on this site for a number of years, hence, holds a significant archive of information. The work on the *Fenna* also had the advantage of being carried out whilst the HWTMA's Interreg IVA 'Archaeological Atlas of the 2 Seas' project was ongoing, allowing for more extensive research than would otherwise have been possible due to the match funding provided through this project.

HMS *Invincible*

Diver minutes on site: 338
Number of divers: 5

The diving carried out on the *Invincible* varied from the other dives, as this was a single days diving specifically arranged for the purpose of diving on the site. This was due to issues with timing, which meant that diving on this site did not fit in with other planned work.

Needles

Diver minutes on site: 176
Number of divers: 4

During the week of diving undertaken by HWTMA in the Western Solent in 2009 two attempts were made to dive on the Needles site. On Monday 29th June 2009 a dive was aborted due to poor weather conditions. Conditions improved and on Friday 3rd July 2009 the dive operation was completed and the assessment of the Needles site took place. The Needles can be a challenging area to dive being exposed to the extremes of wind, weather and tide. If a single days diving had been organised it is likely that the dive on the Needles would not have taken place. Having the flexibility of a week in which to select the best time to dive on the Needles site allowed a return visit to the site under more favourable weather conditions.

HMS *Velox*

Diver minutes on site: 843
Number of dives: 19

The diving on the *Velox* site had the benefit of being able to take advantage of two good tidal windows on the site on two separate days as the diving took place as part of the week-long Eastern SolMAP Project. Although it is possible to dive two slack waters in a single day, one of these is usually better in terms of a longer slack water diving window, or there being better visibility on site. The division of diving over two separate days allowed work on this site to benefit from two good slack waters. If only a single day of diving had taken place this would not have achieved similar results. Additionally the ability to

use successive waves of divers on the site allowed the collection of more data than would otherwise have been possible.

Yarmouth Roads
Diver minutes on site: 60
Number of divers: 4
The dive on the Yarmouth Roads took place within a week of other diving, so benefited from the logistical advantages previously mentioned. The project week also had the advantage of involving volunteers in the HWTMA diving operations, allowing more dive personnel to be in the water concurrently, resulting in a wider range of survey results than would otherwise have been possible.

Summary
There are significant benefits in including the work for the SMHA project in conjunction with other HWTMA planned fieldwork and research. These include:

- Shared cost of dive logistics and planning
- Use of best tidal windows for appropriate sites
- Maximising new data collection
- Access to extensive site archives
- Access to extensive experience of individual archaeologists
- Ability to use match funding (when available) to enhance work and results

2.4 Stakeholder Assessment of Project

During the course of the project a spreadsheet of all those contacted in relation to the sites, fieldwork, permissions and reporting was developed. On completion of the final assessment they were all contacted via email and asked to fill in an online questionnaire. Questions were tailored to the project aim and objectives to allow the success of the project to be reviewed against these. The five questions were:

Question 1 - To what extent do you feel the SMHA project is enhancing understanding and management of heritage assets?

Question 2 - To what extent do you feel the SMHA project has reported on the condition of a range of marine heritage assets to the relevant stakeholders?

Question 3 - How effective do you feel the SMHA project has been as a model for the support of locally based investigation, monitoring and reporting for marine heritage assets?

The matrix of responses for the above three questions was:

	Very Successfully	Successfully	Average	Unsuccessfully	Very Unsuccessfully	NA
Percentage of Respondents						

Question 4 - Were you happy with communication in relation to the SMHA project?

The matrix of responses for the above question was:

	Very Happy	Happy	Neither Happy or Unhappy	Unhappy	Very Unhappy	NA
Percentage of Respondents						

Question 5 – Do you have any other comments regarding the SMHA project?

Unfortunately none of the individuals contacted chose to fill in the on-line questionnaire. The only responses received were queries whether the HMS *Velox* report was available, but at the time of the survey this hadn't been signed off for circulation.

2.5 Review of Project in National Context

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 project has proven successful with the flexibility created through combining the SMHA work with other HWTMA projects allowing for the selection of the best windows for diving on site, and sharing logistical costs for the SMHA diving operations.

The surveys completed under the SMHA project have allowed for an assessment of the current condition of the sites, and for the compilation of management considerations pertaining to and recommendations for future work on the sites.

The cost-effective nature of the surveys, combined with the access to regional expertise, are strong indicators in favour of the potential to develop similar schemes in other regions of England where local organisations are able to carry out survey assessments of submerged cultural heritage sites in their locality.

3. CONCLUSIONS AND RECOMMENDATIONS

The HWTMA are well-placed within the Solent region to respond to the monitoring needs of a range of archaeological sites on a regional basis. The regional remit of the project has allowed the HWTMA to use their experience in the Solent region in selecting the best survey methods to use on these sites, and has allowed pre-existing site archives to be drawn on when assessing the condition of exposed material on the sites, its vulnerability to degradation, and the condition trend in comparison to surveys carried out in earlier years.

The SMHA project has demonstrated that a regional basis for the assessment of submerged cultural heritage sites can be advantageous in terms both cost and localised expertise. A continuation of the project with HWTMA in the Solent region would allow for the ongoing monitoring of selected sites, and the capability to carry out primary assessments on sites not previously subject to archaeological survey.

The same potential advantages could be applied in other areas of the country, using the SMHA project as a model. This would of course be dependent on the availability and capability of regional organisations in other areas..

4. BIBLIOGRAPHY

English Heritage. 2008. *Protected Wreck Sites at Risk: A Risk Management Handbook.*