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# Managing the Marine Cultural Heritage



Defining, accessing  
and managing the resource

*Edited by J Satchell and P Palma*



MANAGING THE MARINE CULTURAL HERITAGE:  
DEFINING, ACCESSING AND MANAGING THE RESOURCE







# MANAGING THE MARINE CULTURAL HERITAGE: DEFINING, ACCESSING AND MANAGING THE RESOURCE

*Edited by Julie Satchell and Paola Palma*

*With contributions by*

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Diver surveying on Needles wreck site (Kester Keighley/ HWTMA)

Foreshore Hulk, North Kent Coast Survey (Wessex Archaeology, Kent County Council and English Heritage)

Replica of a 17th-century astrolabe, found south of the Isle of Wight (Isle of Wight Heritage Service)

Alum Bay I Wreck, Site Plan (Hampshire & Wight Trust for Maritime Archaeology)

Diver on submerged peat bed (Emmy Kelly/ HWTMA)

*Pomone* striking the Needles (courtesy of Rev. Sutherland Bell)



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The conference was organised by the Maritime Affairs Group of the Institute of Field Archaeologists and was made possible due to generous sponsorship from English Heritage and the British Academy. Additional support was provided by a number of the speakers' respective organisations, in particular the Department of the Environment, Heritage and Local Government Ireland, English Heritage, Flinders University Australia, National Centre for Nautical and Underwater Archaeology in Portugal, National Maritime Museums of Sweden, National Service for Archaeological Heritage Netherlands, United States National Oceanic and Atmospheric Administration, and University of Leicester Faculty of Law.

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As with the establishment of any international conference a huge amount of effort was expended in making it happen. This was due to the hard work of the Committee of the Institute of Field Archaeologists Maritime Affairs Group which included: David Parham (Chair), Mark Dunkley (Secretary), Andrea Parsons (Treasurer), Annabel Lawrence, Douglas McElvogue, Paola Palma, and Julie Satchell. The employing organisations of the committee members supported the event through the provision of staff time; particular thanks are due to: Hampshire & Wight Trust for Maritime Archaeology, Mary Rose Trust, Bournemouth University, and Gifford and Partners. The design of the conference materials was kindly undertaken by Flora Lenihan.

Further vital support came from the Institute of Field Archaeologists and its office staff. MAG would like to extend particular thanks to Peter Hinton, Gina Jacklin and Alex Llewellyn for their time and commitment to the conference.

We would like to recognise the winners of the poster competition held at the conference. First prize was awarded to Chole Delgary and Simon Cragg for 'Distribution of *Ciliate Epibiota* on the exoskeleton of the wood-boring isopod *Limnoria quadripunctata*', second prize went to Pera Knott for 'Weighing down the trade routes'.

Final thanks must go to the speakers for preparing papers for this volume. We hope this publication is a full reflection of the conference; responsibility for any errors or omissions must lie with the editors.



## SUMMARY

This publication is the result of the international conference on Managing the Marine Cultural Heritage which was organised by the Maritime Affairs Group of the Institute of Field Archaeologists, held in September 2004. The conference invited speakers from around the world to share their experiences through presentations to an equally international audience which included representatives from five continents. The aim was to disseminate information on approaches to marine heritage management which included new ideas, trials, developments, and best practice models, in order to promote understanding and initiate dialogue between heritage practitioners, managers, and curators. This was achieved through three themed sessions that were held over two days.

The conference objectives were four-fold:

- To convene a range of international experts
- To present a series of papers on examples of managing submerged archaeology in themed sessions
- To provide a forum for discussion and exchange of ideas and approaches
- To publish the proceedings and disseminate to a wide audience.

The publication of the proceedings, and therefore the broad dissemination of the subjects discussed during the conference, completes the objectives and sets the basis for further communication and collaboration in this field.

In the first of three sections, approaches to *Defining and quantifying the resource* are presented. Papers include examples from Ireland, the United Kingdom, and Australia which explore a range of issues connected to the gathering, storage, presentation, and utilisation of data on submerged heritage. A variety of techniques for data gathering, include desk-based research, geophysical survey, and diver survey, all of which are key to the production and management of high-quality baseline data. The papers explore a number of ways in which these data are being used in specific management scenarios; they also highlight areas where a lack of data, or divergent approaches to the management of data, can create problems and difficulties for effective heritage protection.

Section two considers some broader areas of *Management themes and issues*, with papers from the UK, Portugal, and the Netherlands. These include discussion of legislative and management frameworks, pressures of development activities on marine heritage management, and the ability of the marine conservation sector to react to the recovery of collections. These expansive themes inevitably raise issues of resources and funding, problems which are at the heart of many of the management challenges presented within this volume.

The third section explores *Accessing the resource*. These papers from Sweden, America, and the UK focus on a range of methods and techniques for investigating and presenting marine cultural heritage. Approaches adopted by museums are considered through discussion of the role of traditional display and dissemination methods, and the requirement for innovative techniques to attract new audiences. The use of state-of-the-art technology in the form of deep sea exploration, remote communication, and effective internet and web-based dissemination, demonstrate the potential to reach and inspire the public.

The conference participants engaged in discussion of the issues presented during each of the sessions. Topics posing most urgent problems for marine heritage management tended to recur during discussion; these areas have been highlighted in the volume conclusion. In summary, the principal themes and issues raised at the conference which pose challenges now and in the future are:

- Legislative frameworks
- Management frameworks and research agendas
- Archives, collection, and disposal
- Professional development, standards, and guidance.

While there are also many other issues faced by marine heritage management, the presentation of these key areas within this volume demonstrate that international communication can create productive dialogue to advance approaches to quantifying, managing, and accessing the marine cultural heritage.

## ZUSAMMENFASSUNG

Dieser Bericht faßt die Ergebnisse des internationalen Kongresses zur Tiefseearchäologie zusammen, der unter dem Thema "Verwaltung des Meereskulturguts", von der 'Maritime Affairs Group' des 'Institute of Field Archaeology' im September 2004 abgehalten wurde. Zu diesem Kongreß kamen Experten aus aller Welt zusammen um Erfahrungen auszutauschen und Vorträge zu halten, die für ein ebenfalls internationales Publikum aus fünf Kontinenten bestimmt waren. Ein Ziel war es, Strategien aufzuzeigen, wie man das Kulturerbe der Tiefseearchäologie am besten schützen kann. Ein besseres Verständnis dieses Bereiches der Archäologie soll durch neue Ideen, Versuche, Entwicklungen und Modelle aus der Praxis gefördert werden und den Dialog zwischen Denkmalpflegern, Managern und Kuratoren anregen. Zu diesem Zweck wurden drei thematische Teilveranstaltungen über zwei Tage abgehalten.

Der Kongreß hatte vier Hauptziele:

- eine Vielfalt von internationalen Experten zusammenzubringen
- eine Reihe von Vorträgen zu präsentieren, die sich anhand von Beispielen und thematischen Teilveranstaltungen mit der Verwaltung von Tiefseearchäologie beschäftigen
- ein Forum zur Diskussion und Ideenaustausch zu bilden
- Ein Kongressbericht zu veröffentlichen, um die Ergebnisse einer breiteren Zuhörerschaft zugänglich zu machen.

Mit der Veröffentlichung dieses Berichtes und somit der Ideenverbreitung der Themen dieser Konferenz ist eines dieser Ziele erreicht und bildet die Basis für weitere Kommunikation und Zusammenarbeit auf diesem Gebiet.

Die ersten drei Teile werden unter dem Titel: „Defining and quantifying the resources“ (Definition und Quantifizierung der Ressource) vorgestellt. Beiträge aus Irland, des Vereinigten Königreiches und Australien untersuchen eine Reihe von Problemen, die bei der Sammlung, der Aufbewahrung, Ausstellung und Verwertung der Funde und Daten aus der Unterwasserarchäologie entstehen. Zu der Vielfalt der Datensammlung gehören Quellenstudien, geophy-

sische Prospektion und Taucherforschung. Sie bilden die Grundlage für die Sammlung und Verarbeitung von qualitativen Grundwissen. Die Abhandlungen untersuchen verschiedene Wege wie die Daten in bestimmten Management Szenaria verwendet werden, es werden auch Fälle hervorgehoben, wo ein Mangel an Daten oder divergierende Verfahren des Datenmanagements Probleme schaffen können, die einem effektiven Kulturschutz im Weg stehen.

Im zweiten Teil werden allgemeinere Themen behandelt unter dem Titel: „Management themes and issues“ (Themen und Streitpunkte im Kulturmanagement) mit Beiträgen aus dem Vereinigtem Königreich, Portugal und den Niederlanden. Es wird unter anderem der Gesetzes- und Verwaltungsrahmen diskutiert, der Druck der durch Erschließungen im Marinebereich auf das Kulturgut unter Wasser ausgeübt wird, und die Fähigkeit des maritimen Umweltschutzsektors auf die Bergung von Fundsammlungen zu reagieren. Diese umfassenden Themen bringen zwangsläufig Fragen der Hilfsmittel und Finanzierung zur Sprache die in diesem Bericht immer wieder eine Herausforderung an das Management bilden.

Der dritte Teil untersucht das Thema „Accessing the resource“ (Zugang zu Funden). Beiträge aus Schweden, Amerika und dem Vereinigtem Königreich richten ihren Schwerpunkt auf die Vielfalt der Methoden und Techniken, die bei der Tiefsee und Unterwasserarchäologie angewandt werden, und Möglichkeiten wie die Ergebnisse der Öffentlichkeit zugänglich gemacht werden können. Hier werden unterschiedliche Konzepte von Museen untersucht, die Rolle von traditionellen Ausstellungen diskutiert und die Notwendigkeit mit Hilfe innovativer Techniken ein neues Publikum anzusprechen, hervorgehoben. Die Anwendung neuester Forschungstechnologie, wie sie in der Tiefseeforschung angewandt wird, moderne Kommunikationstechnologie und effektive Nutzung vom Internet haben das Potential die Öffentlichkeit zu erreichen und zu inspirieren.

Die Kongreßteilnehmer haben an den engagiert an der Diskussion von Streitfragen innerhalb der thema-

tischen Teilveranstaltungen teilgenommen. Die dringenden Themen und Probleme des Kulturmanagements der Tiefseearchäologie die während der Diskussionen immer wieder auftraten, wurden in der Zusammenfassung dieses Berichtes hervorgehoben. Die Hauptthemen und Streitfragen die sich durch diesen Kongreß herauskristallisiert haben und für die Gegenwart und die Zukunft die größte Herausforderungen darstellen sind wie folgt:

- die Bildung eines allgemeinen Gesetzeswerk
- die Definition einer Managementstruktur und Forschungsthemen
- Archivierung, Fundsammlung und Unterbringung

- Professionelle Entwicklung, Richtlinien und Weiterbildung

Neben den vielen anderen Problemen die sich dem Kulturmanagement der Unterwasserarchäologie stellen, hat dieser Kongreß die Hauptzielepunkte zusammengefaßt und aufgezeigt, daß durch internationale Kommunikation ein produktiver Dialog eingeleitet werden kann, der den Grundstein für eine Weiterentwicklung von Methoden der Datensammlung, Verwaltung und Zugang zum Kulturerbe der Tiefsee Archäologie bildet.

## RÉSUMÉ

Cette publication est le fruit du congrès international sur la Gestion du Patrimoine Maritime Culturel, qui a été organisé par le Groupe des Affaires Maritimes de l'Institut des Archéologues sur le Terrain, et qui a eu lieu en septembre 2004. Le congrès avait invité des conférenciers du monde entier à partager leurs expériences par le biais de présentations à une assistance tout aussi internationale, dans laquelle se trouvaient des délégués en provenance des cinq continents. Le but de ce congrès était de diffuser des informations concernant les façons d'aborder la gestion du patrimoine maritime, avec de nouvelles idées, des essais, des développements et des modèles de bonne pratique, afin de promouvoir les connaissances et de lancer un dialogue entre ceux qui s'occupent activement du patrimoine, les administrateurs et les curateurs. Ce but a été atteint à travers trois séances sur des thèmes précis, qui se sont déroulées deux jours durant.

Le congrès avait quatre objectifs :

- Réunir divers experts du monde entier
- Présenter une série de communications sur des exemples de gestion de l'archéologie subaquatique lors de séances sur des thèmes précis
- Fournir une tribune pour les discussions et les échanges d'idées et d'approches
- Publier les débats et les diffuser auprès d'un plus grand public.

La publication des débats et, par conséquent, la diffusion générale des sujets discutés lors du congrès, remplit les objectifs et établit aussi une base pour une communication et une collaboration plus amples dans ce domaine.

Dans la première de trois parties, des approches à *La définition et la quantification des ressources* sont présentées. Les communications comprennent des exemples provenant d'Irlande, du Royaume-Uni et d'Australie, lesquels explorent toutes sortes de questions liées à la collecte, au stockage, à la présentation et à l'utilisation de données sur le patrimoine subaquatique. Diverses techniques de collecte des données englobent les recherches de bureau, les relevés géophysiques et les relevés effectués par des plongeurs, et

toutes ces techniques sont importantes pour la production et la gestion de données fondamentales de haute qualité. Les communications explorent plusieurs méthodes d'utilisation de ces données dans des scénarios précis de gestion ; elles mettent également en valeur des domaines dans lesquels un manque de données, ou des approches divergentes en ce qui concerne la gestion des données, risquent de susciter des problèmes et des difficultés pour la protection efficace du patrimoine.

La deuxième partie prend en considération certains aspects plus généraux des *Questions et thèmes liés à la gestion*, avec des communications du Royaume-Uni, du Portugal et des Pays-Bas. Ces communications comprennent une discussion des structures de législation et de gestion, des pressions exercées sur la gestion du patrimoine maritime par les activités de développement, et de la capacité du secteur de la conservation maritime à réagir à la récupération des collections. Ces thèmes de grande envergure posent inévitablement des questions concernant les ressources et le financement, questions qui sont au coeur de nombre des problèmes de gestion présentés dans ce volume.

La troisième partie explore *L'accès aux ressources*. Ces communications de Suède, d'Amérique et du Royaume-Uni se concentrent sur diverses méthodes et techniques d'enquête et de présentation du patrimoine maritime culturel. Les approches choisies par les musées sont prises en considération à travers une discussion du rôle des méthodes traditionnelles d'exposition et de diffusion, et du besoin de techniques innovantes pour attirer un nouveau public. L'utilisation des technologies de pointe sous les formes de l'exploration sous-marine en profondeur, des communications à distance, et de la diffusion efficace sur la Toile et sur Internet, démontre le potentiel pour atteindre et pour motiver le grand public.

Les participants au congrès se sont lancés dans une discussion des questions présentées lors de chaque séance. Les sujets qui posent les problèmes les plus urgents pour la gestion du patrimoine maritime avaient tendance à réapparaître lors des discussions ; ces sujets ont été soulignés dans la conclusion de ce volume. En

résumé, les principaux thèmes et questions soulevés lors du congrès qui lancent des défis et à l'heure actuelle et à l'avenir sont les suivants :

- Structures législatives
- Structures de gestion et agendas pour les recherches :
- Archives, collecte et disposition
- Développement professionnel, normes et conseils.

Bien que la gestion du patrimoine maritime doive faire face à de nombreux autres problèmes, la présentation de ces domaines clés dans ce volume montrent que la communication internationale peut susciter un dialogue producteur dans le but de faire progresser les approches à la quantification, à la gestion et à l'accès au patrimoine maritime culturel.



---

# INTRODUCTION

On 29 and 30 September 2004 an international group of renowned speakers and delegates gathered at Portsmouth Historic Dockyard for the Managing the Marine Cultural Heritage Conference. This event had

been conceived and formulated in response to the need for marine archaeology in Britain to learn from the experience of other nations, to promote debate, and to forge productive channels of contact for the future.

## Marine archaeology in the United Kingdom

The potential for marine archaeology in and around British waters has been highlighted through a number of activities and circumstances ranging from isolated finds to intensive investigations. Ever increasing pressure on the marine zone through recreation, industry, extraction, and development has brought the possible impacts and effects on submerged cultural heritage to the fore.

With increased understanding of the resource comes more awareness of the potential threats and challenges; this drives the need for effective management. Over the past 40 years maritime archaeology has been developing relatively rapidly, particularly in comparison with the time which terrestrial archaeology has taken to reach its current situation. Marine archaeology faces a number of challenges: a lack of knowledge of the extent, quality, and quantity of the resource; a lack of protective regime for all types of submerged

sites; and a small and increasingly overstretched number of professional maritime archaeologists. Responding to these challenges both within Britain and internationally has, to date, been largely reactive. Consequently there is an urgent need for a more strategic approach to common management issues.

A significant date for maritime archaeology in England was June 2002, when the National Heritage Act was passed, extending the remit of English Heritage below the low-water mark. This change has resulted in a number of developments particularly with regard to management of the resource, but it has also served to highlight further key themes and issues that are yet to be fully addressed. This situation is not limited to British waters: many nations are formulating management approaches in response to similar threats, pressures, and management needs.

## The role of the Institute of Field Archaeologists

The Institute of Field Archaeologists (IFA) is the professional organisation for all archaeologists. Its Maritime Affairs Group (MAG) recognised the urgent need to address management approaches for the continuing development of the maritime archaeological profession. Acting as a special interest group of the IFA, MAG has a remit to:

- promote professional standards for the management, conservation, understanding, and enjoyment of the maritime archaeological resource
- develop professional guidelines and standards for maritime archaeological work
- promote the training of archaeologists and

others in maritime archaeological practice

- facilitate the exchange of information and ideas about maritime archaeology and to communicate these to the wider profession.

MAG exists within the wider framework of the IFA. This ensures that specialist maritime issues are given consideration by the professional body which promotes standards and ethics. With the relatively rapid growth of the maritime archaeological sector it is vital that such standards and ethics are established, recognised, and enforced. This expansion is adding pressure to organisations working in the marine zone due to varying levels of funding and developing management frameworks.



It is the latter issue – management frameworks – that must underpin the effective development of heritage conservation and practice. In response to this situation

the Managing the Marine Cultural Heritage Conference was convened to bring practitioners together to discuss international issues and approaches.

## Conference rationale

The broad conference framework was developed around the aim of informing those involved in managing the submerged cultural resource of trials, developments, and best practice models from around the world. As such it represents one of the first attempts to establish a broader, more strategic, agenda. Additional objectives included:

- convening a range of international experts
- presenting a series of papers on examples of managing submerged archaeology in themed sessions
- providing a forum for discussion and exchange of ideas and approaches
- publishing the proceedings and disseminating to a wide audience.

## Session topics and issues

The conference was split into three themed sessions, which highlighted some of the most challenging issues and areas of development for marine archaeology.

### *Defining and quantifying the resource*

The collection, recording, interpretation, and storage of data encompasses many forms including desk-based studies, large-scale manual searches, remote sensing, and verification. These activities can involve a diverse range of organisations, groups or individuals including heritage agencies, contractual units, academic departments, local trusts, diving, and voluntary groups. This session examined a range of resource quantification approaches adopted as a response to the need to understand the components, extent, and potential of submerged cultural heritage. Such definition of the resource is essential for underpinning effective management.

### *Management themes and issues*

Threats and challenges to the resource take many forms across countries and areas; this is due to a variety of legislative frameworks, varying national and international priorities, and divergent approaches to funding. Submerged heritage, especially shipwrecks,

has a particularly international relevance, leading to multi-national conventions for remains outside territorial waters, and also to international legal battles over 'ownership'. The development of management frameworks in response to such situations has been piecemeal, with some taking a proactive stance to prevent problems emerging, others reacting as situations arise. This session presented a range of themes and issues involved in approaches to management.

### *Accessing the resource*

No management scheme must lose sight of the audience or end users of the resource. Making submerged heritage accessible to all provides particular challenges. Innovative methods of presentation such as diver access schemes, reconstructions, and displays have been used to promote public involvement. This area of marine archaeology is an expanding sector, particularly due to growing numbers of divers, developing technology, and the rising popularity of heritage matters. This session explored how the development of access initiatives poses an increasing challenge for managers.

### *Presenting the papers*

This publication reflects the papers presented during the conference sessions. Every attempt has been made to reflect the spirit of the conference, which included lively discussion and debate. Importantly the salient issues brought out both during the conference discussion and within the papers in this volume are summarised in the volume conclusion. The topics highlighted within this final section are those which pose a significant challenge for the future of marine archaeology and are likely to require many further conferences to promote debate surrounding management approaches.

It is hoped that this volume will serve as an accurate and informative account of the Managing the Marine Cultural Heritage Conference, as a statement of principal challenges for marine heritage, and as an inspiration for the development of management initiatives.



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## SECTION ONE

# QUANTIFYING THE MARINE CULTURAL HERITAGE

Effective resource management requires reliable data on which to base preservation and conservation priorities. There is an urgent need for the collection, interpretation, and storage of such data. This section presents a variety of different methodological and technical approaches to quantifying the resource, which have been adopted in different circumstances.

Connie Kelleher explains the approach of the Irish Underwater Archaeological Unit (UAU) through a range of strategies for the quantification and *in situ* management of the underwater archaeological resource in Ireland. Diverse quantification methods are used for the equally diverse archaeological resource, which includes examples such as lakeshore dwellings, river fords, fish traps, and coastal shell middens. But the Irish approach goes beyond this, by taking a proactive approach to mitigating potential threats to the cultural heritage. One of the important commitments UAU has been dealing with since 1997 is the Shipwreck Inventory of Ireland, with more than 10,000 wrecks recorded. When published in four volumes, it will constitute a unique and useful resource. The author presents a variety of approaches to quantification, in addition to demonstrating how such information is subsequently used in planning and development for archaeological mitigation and public consultation. Such archaeological strategies increasingly involve the deployment of a variety of survey technology for the quantification of the heritage on and within the seabed, which is a rapidly expanding and developing field.

Researchers are developing geophysical survey methods to advance from the prospection of the seabed for archaeological sites to more accurate and thorough understanding of site characteristics, including mapping, site formation processes, and sediment and material characterisation. Justin Dix's paper presents a variety of new developments and methods that could be considered as the *avant-garde* of technological and scientific approaches for data gathering and assessment of the submerged cultural heritage.

A different aspect to quantification of the resource is presented by Mark Staniforth. The state legislation in Australia for the protection of historic shipwrecks has been in force for the last three decades. The wreck resource is thought to number around 6500 shipwrecks, and funding has been quite conspicuously directed mainly to the preservation of shipwrecks rather than other submerged sites. On the other hand, legislative protection has ensured shipwrecks have been preserved for present and future public enjoyment. Underpinning management approaches is the Australian Shipwrecks Database (ASD) and similar state databases, which have been developed by Australian maritime archaeologists and shipwreck managers for more than twenty years.

The combination of desk-based research, field prospection, and verification can provide a solid knowledge base for managing the marine heritage. The following approaches represent a variety of international case studies.





# QUANTIFICATION OF THE UNDERWATER ARCHAEOLOGICAL RESOURCE IN IRELAND AS A MEANS TO ITS MANAGEMENT AND PROTECTION

*By Connie Kelleher*

## Introduction

Ireland has a remarkable wealth of underwater archaeological remains ranging from Mesolithic coastal and estuarine sites through to early medieval ecclesiastical island settlements, post-medieval industrial quay structures to modern historic shipwrecks. With over 7000km of coastline, the seabed, foreshore, and coastal fringe all contain sites and areas of archaeological significance. Equally the rivers, streams, and lakes of the inland waterways have been a focus for settlement from the earliest times, and this is clearly reflected in the diverse range of archaeological sites and artefacts recorded from these locations in the past. It is only in the recent past, however, that awareness has grown in Ireland, both from the state and public perspective, of the potential for archaeology to be present in the underwater environment. With this increasing knowl-

edge and respect for Ireland's underwater heritage, the need to have a management strategy to protect this fragile resource was recognised and accepted. To ensure the implementation of a proper management and protection strategy, there is a requirement for the resource to be properly quantified and its true nature, extent, and future protection needs identified.

This paper sets out to provide a general overview of how quantification of the underwater archaeological resource is undertaken by the Irish State and how such quantification is central to the implementation of proper management strategies for the protection of that resource. Selected coastal and inland waterways sites and specific commercial developments have been chosen to illustrate this process with implemented management strategies detailed.

## Heritage legislation

Ireland has several strong pieces of legislation under which its heritage is managed and protected. The National Monuments Act 1930–2004 is the primary legislation, with the 1987 and 1994 (Amendments) Acts specifically addressing the protection of underwater archaeology. Within the Department of the Environment, Heritage and Local Governments (DEHLG), The National Monuments Service has responsibility for the management and protection of the archaeological resource. The Service advises the Minister on the application of the National Monuments Act for the protection of archaeology. The National Monuments Service maintains and updates

the Record of Monuments and Places, and the Inventory of Shipwrecks of Ireland – the two main archives for the archaeological resource. The Record of Monuments and Places lists over 120,000 archaeological sites, including many lake, river, and coastal sites, and the Inventory of Shipwrecks of Ireland has a listing of some 10,000 wrecks recorded to date.

The strength of the National Monuments legislation lies in its blanket approach to the protection of the underwater archaeological resource. All recorded monuments and objects underwater are protected under the legislation and all wrecks over 100 years old are automatically protected under the 1987 Amend-

ment Act. Further to this the Act provides a mechanism for protecting wrecks less than 100 years old by way of an Underwater Heritage Order that can be placed on a site due to its intrinsic historical or artistic value. One site presently protected by Underwater Heritage Order is that of RMS *Lusitania*, wrecked in 1915 off the southern coast of County Cork. Under this legislation, diving on known protected wreck sites or for the purpose of looking for archaeology underwater or wrecks is licensed by DEHLG. The use of detection devices (hand-held metal detectors, geophysical equipment, etc) on protected sites underwater or for the purpose of prospecting for archaeology requires a licence. Applications are made to DEHLG, which is responsible for issuing both types of licence. Under the same legislation, all archaeological excavation is subject to licensing requirements and the excavation director, as licence holder, is responsible for completing the work to the required standard.

### The Underwater Archaeology Unit (UAU)

As a means of implementing a management and protection strategy and in recognition of its own responsibilities with regard to underwater archaeology under the National Monuments Act 1930–2004, in the year 2000 an underwater unit was established within the National Monuments Service of DEHLG.

The UAU has a wide brief in that it has responsibility for both the quantification and management of this aspect of Ireland's heritage. Presently the UAU has four fully qualified and commercially dive-trained

archaeologists who carry out the extensive work brief of the UAU in Ireland using full surface supplied diving equipment (Fig 1.1). This work ranges from assessing licence applications, planning and development applications, and liaising with the general public, to undertaking underwater archaeological survey and excavation. The UAU is also closely involved in writing up a number of Codes of Practice with interested parties, including the Port Authorities and the Irish Underwater Council for sports diving.

### Other relevant legislation

Several other pieces of legislation are available to the Minister for the Department of Environment, Heritage and Local Government to protect archaeology should the need arise. These include the Continental Shelf Act of 1968 which can be drawn upon to protect archaeology beyond the twelve-mile limit of Ireland's territorial waters and the Merchant Shipping (Salvage and Wreck) Act 1993, under which the recovery from the sea of all objects of archaeological or historical potential have to be reported to the Receiver of Wreck and to the Director of the National Museum of Ireland within twelve days.

### The nature of the resource and quantification methods

The potential of the inland waterways to retain sites and artefacts of archaeological importance was first recognised in the 19th-century during drainage works, when thousands of artefacts were recovered from rivers and lakes, and numerous crannog sites were identified in the midlands. Similarly from the 1960s onwards, following the discovery of several Spanish Armada wrecks dating to 1588 on the west coast, the importance of our coastal waters was highlighted. The nature of the underwater archaeological resource in Ireland is diverse and can range from intertidal fish traps to coastal shell middens, from marine shipwrecks to lakeshore dwellings, from river fords to harbour works. The fragility of this resource, however, is often

overlooked or ignored completely, with the result that many sites were destroyed in the past before their significance was realised.

Quantification of this resource therefore has to be tailored to its needs – not only to assess the known record but also to quantify the potential threats to the resource before a site, feature, or artefact can be affected or destroyed. Within the UAU work brief quantification is undertaken through a variety of processes, ranging from specific projects and inspections to results being obtained through the planning and development process, recreational diving or projects carried out by academic institutions.

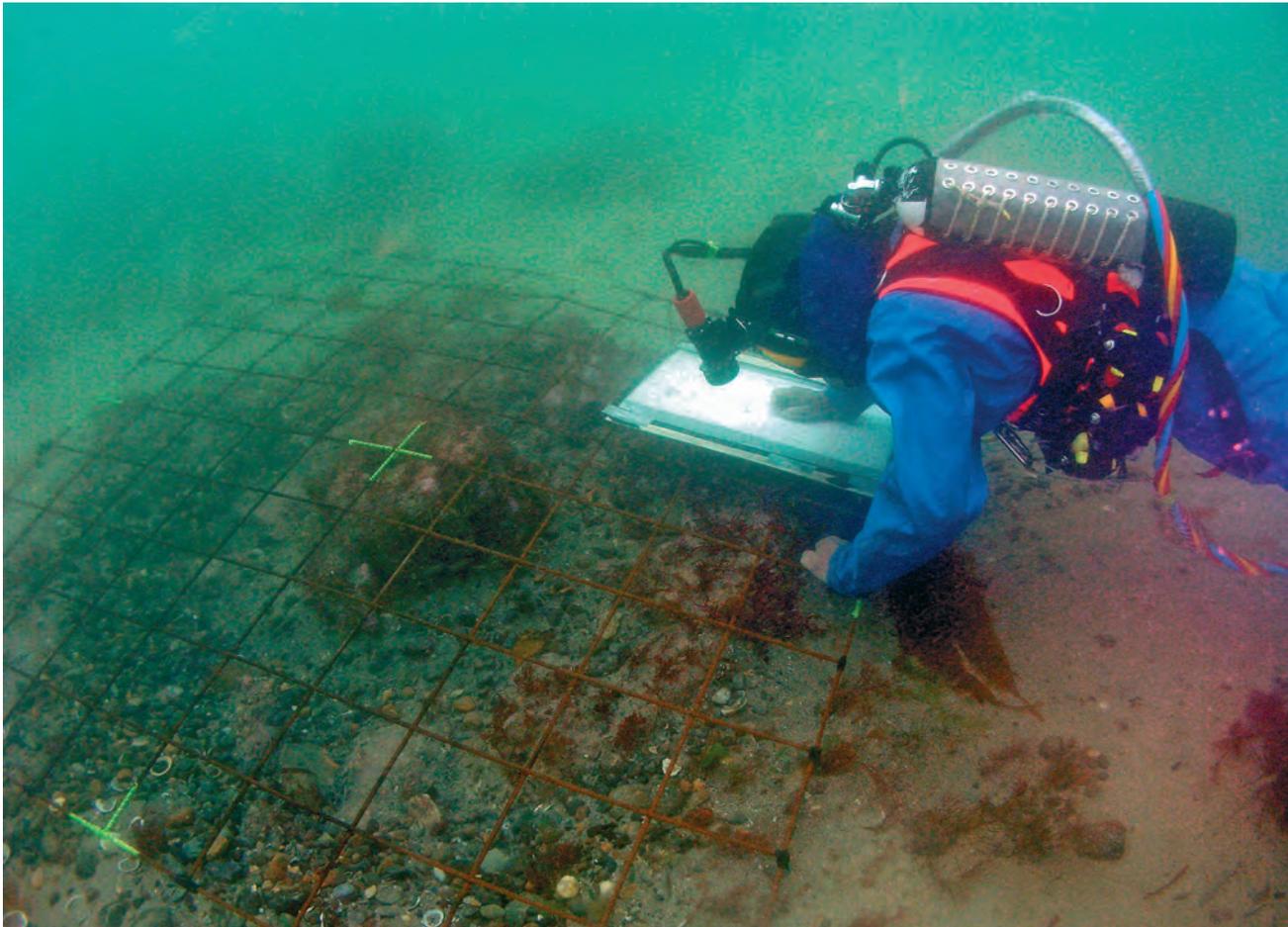


Figure 1.1 UAU archaeological diver recording a large siege carriage wheel on the site of the 1588 Spanish Armada wreck *La Trinidad Valencera*

### The Shipwreck Inventory of Ireland and selective survey

The UAU is currently focusing its brief on two main areas of activity – the publication of a Shipwreck Inventory of Ireland and the survey of selected sites from around the coast and inland waterways. Work began on the Inventory in 1997 when DEHLG established a maritime unit to undertake a paper-based survey of all recorded shipwrecks from around the coast of Ireland. This work has progressed steadily over the years and is at an advanced stage. There are over 10,000 wrecks recorded to date and this figure is increasing as research continues. The present plan is that the Shipwreck Inventory will be published in four volumes, with Volume 1 – Shipwrecks from the coasts of Counties Louth to Wicklow – due for publication in 2006 (Brady 2006). Research for the Shipwreck Inventory primarily focuses on historical and cartographic material, as well as previously published works on shipwrecks.

The UAU is presently devising GIS-based zone

maps that will also act as location maps for the wrecks around the coastline. This zoned method of representing the possible locations of wrecks has been formulated because a large majority of wreck locations are either approximate or unknown. Zones will now represent the history of wrecking in an area, rather than a single dot denoting a wreck location. Thus, areas of more intense colour will represent areas of high wreck potential. Each zone will be accessible through the GIS database, with various drop-down fields providing key information on each recorded wreck in that particular zone. These zone maps are still at a preliminary stage, but, when finalised, will provide a user-friendly and interactive means to acquire detailed information on potential wreck sites in each zone around the coast. The Shipwreck Inventory of Ireland will be the most comprehensive publication to date on wrecks from around the Irish coast and will be a valuable resource for a wide audience ranging from local divers to archaeologists and from developers to the general public.

In tandem with ongoing work on the Shipwreck

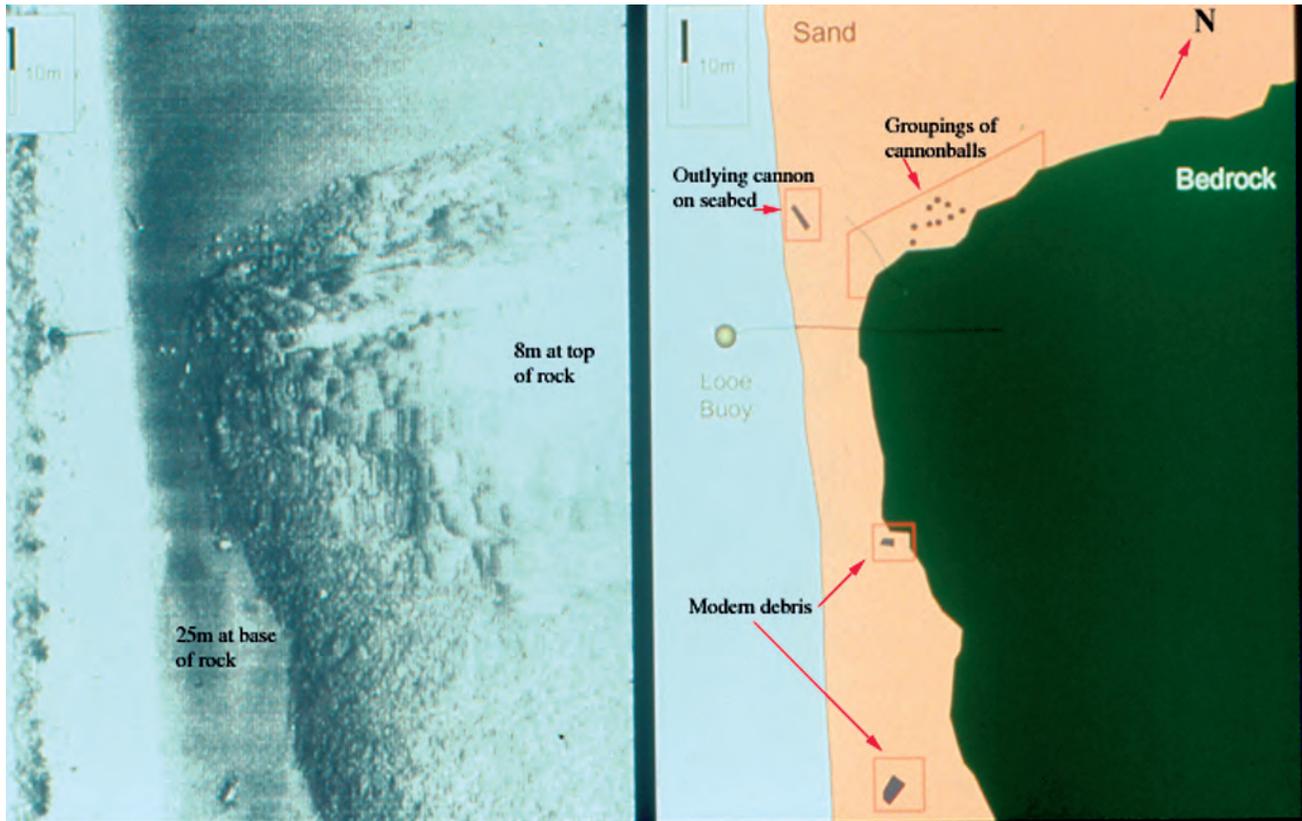


Figure 1.2 Side-scan sonar image of Looe Rock with interpretation of identified anomalies  
Image: Dr Rory Quinn, CMA, University of Coleraine

Inventory, and as part of its wider survey and management brief, the UAU undertakes select surveys of known sites and recently discovered underwater sites. Such survey can take a variety of forms involving diving, intertidal, geophysical, and aerial survey. Shipwreck surveys form a large part of the UAU brief, using a multi-disciplinary approach, with the results being added to the Shipwreck Inventory archive.

One ongoing survey is on the site of HMS *Looe*, wrecked in the year 1697. It is located at the narrow mouth of Baltimore Harbour on the south-west coast of County Cork in what is a highly dynamic environment. Cannons lie scattered at various depths. A single iron cannon was identified during the first survey undertaken at the site in 2001, lying between two gullies in the rock at a depth of 8m. Geophysical survey was also undertaken over the rock and immediate harbour mouth to add to the information being recorded, and results from this and the continuing diver survey identified a further two guns and numerous scatters of cannon balls. To date eleven guns have been recorded at various depths concreted to the rock, some in groups of three and four. All are iron and heavily concreted, though with no specific diagnostic features noted on the guns, all appear to be

contemporary, dating to the late 17th or 18th centuries. At a depth of 25m on the seabed to the west of the rock, two further iron cannons and a large Admiralty-pattern anchor were located. The Shipwreck Inventory of Ireland for Cork lists more than twenty wrecks for Baltimore Harbour. Three wrecks are recorded for the immediate area at the harbour mouth – HMS *Looe*, the earlier 1601 Spanish fleet flagship *Leon de Oro*, and the later *Lion* wrecked in 1782, a Liverpool transport ship. It is quite probable therefore that the recorded artefacts are representative of several ships from this multi-wrecking site. Nevertheless, the highest concentration of guns was located specifically on the Looe Rock, where the *Looe* is recorded as having wrecked, so it is likely that the cannons recorded to date come primarily from the wreck of HMS *Looe* (Fig 1.2).

Constructed at Plymouth in 1696, HMS *Looe* was a fifth rate 32-gun Man of War and would have carried a variety of 9-pounders, 6-pounders, and 4-pounders. Known as *demi-batterie* or one-and-a-half deck ships, the *Looe* was one of only 34 such ships built at that time following a radical design proposed by Lord Torrington, chief naval expert to King William's fleet (Gardiner 1992, 32–3). However, these

new design frigates had a short construction life and were superseded in the early 18th century by the true one-decked frigate. Due to the uniqueness of this type of ship, the importance of this site to the archaeological record cannot be underestimated. Work on the site is ongoing and, through historical research as well as the information being gathered on the ground, it is hoped to build up as complete a picture as possible, not only of this illusive ship type, but also of the wrecking event that led to its demise.

### Planning and development

A large part of the work of the UAU is its management and protection brief, with planning and development applications being referred to the UAU. These are assessed with regard to potential negative impacts on underwater archaeology. The UAU receives up to 1000 planning and development applications per year relating to marina, pier and harbour developments, dredging programmes, sewerage schemes, aquaculture licence applications, underwater gas pipeline developments and road schemes. Applications are assessed for developments in both the marine and inland waterways and the UAU makes recommendations for archaeological mitigation that may include underwater archaeological assessment in advance of development works or archaeological monitoring during the course of the proposed works. Archaeological excavation in advance of development work may be recommended, where known archaeology is present, with avoidance and preservation *in situ* being the preferred option of DEHLG.

Over the recent past large infrastructural projects have come online in Ireland and in particular main drainage schemes, offshore wind farm developments, and capital dredging schemes. The sheer scale of some of these meant that to ensure the long-term protection and management of underwater archaeology, the mitigation process for such schemes would need to have ensured co-operation between all interested parties. Initially interdepartmental discussions took place, in particular with the Department of Marine, which is the licensing body for all marine developments. This was followed by scheduled meetings with developers, the majority of who were initially, and not surprisingly, opposed to any proposed archaeological mitigation strategies. The Department of Marine agreed to include archaeological requirements within the conditions of licenses it issued for such schemes – primarily issued under the Foreshore Act 1992 and Dumping at Sea Act 1996. Private sector archaeologists are engaged by devel-

opers to implement the archaeological recommendations. In this way many private sector archaeologists have been responsible for the identification of a large number of underwater sites and several interesting discoveries have been made. To illustrate this a selection of such schemes are discussed below with details of the mitigation employed and results obtained.

### Dublin Bay project

During the course of the archaeological assessment in advance of the works for the main sewerage scheme across Dublin Bay, commissioned by Dublin City Council, the remains of up to eleven shipwreck sites were identified. During the works for the pipeline installation the archaeological monitoring, undertaken by Eachtra Archaeological Projects Ltd, also led to the discovery of a substantial shipwreck in the intertidal zone of Sutton Strand on the north side of Dublin Bay. The main part of the wreck lies buried in the sands, with the analysis of several of the recovered timbers indicating a mid-18th-century date for the wreck (Lar Dunne, pers comm) (Fig 1.3).

As part of the long-term management for the site a monitoring brief is now agreed between the UAU and Dublin City Council to have the wreck inspected and monitored over the course of each year at specific low tides. At present, following sandbagging, the wreck site is stable and lies almost totally buried on Sutton Strand. However, should the situation change and the site become unstable, it has also been agreed that mitigation in the form of reassessment, testing, or full excavation may be a future requirement.



Figure 1.3 Exposed timbers of a post-medieval wreck on Sutton Strand, Dublin, during sandbagging and stabilisation work

### *Limerick main drainage scheme*

In 1999 as part of the Limerick main drainage scheme it was decided by Limerick City Council to bund the Abbey River that flows through the medieval city of Limerick so as to dry out the riverbed to allow the drainage pipes to be buried in the river (ie to alter the flow of the river to enable the river bed to be exposed to allow archaeological work). The City of Limerick was established by the Vikings in the 9th century, with the Abbey River being an important link to the River Shannon, both of which run through the city. They remained a focus for maritime trade and transport, serving Limerick throughout the late and post-medieval periods. Recommendations put forward by the UAU for the proposed works included pre-bund underwater surveys and post-bund archaeological testing of the riverbed. During the course of the drainage works, full archaeological monitoring of all works was also requested by the UAU, along with full excavation of any features or structures discovered. Limerick City Council engaged the services of Ed O'Donovan of Margaret Gowen & Co Ltd to implement the archaeological mitigation.

The sheer scale of the main drainage scheme meant that there would be a substantial impact on the bed of the Abbey River. The UAU and Mr O'Donovan liaised closely, with numerous site visits made by the UAU during the course of the works to ensure that the required mitigation was being implemented. The

task of drying out the river was an onerous one and flooding was an ongoing problem. Conditions for archaeological work in the dry riverbed were also far from ideal particularly as several of Limerick's sewage outfall pipes emptied into the Abbey River, making health and safety a constant issue. However, over the course of the next two years as work on the scheme progressed, several quay structures and parts of the old City wall were recorded buried beneath the built-up silts of the river, and the medieval footings of the main bridge over the river were uncovered and excavated. Thousands of artefacts were excavated from the riverbed from all periods, including medieval stick pins, late medieval shroud pins, a post-medieval sword hilt, a wrist sun dial, and the 18th-century gold City seal of Limerick showing a representation of a three-masted ship with two anchors and the Irish harp (O'Donovan 2001, 26–33) (Fig 1.4).

### *Arklow Bank wind farm project*

Applications for wind farms have also increased in the recent past as this alternative energy source becomes more popular in Ireland. With a focus on the offshore sandbanks, the proposed locations for these wind farms are in areas of high underwater archaeological potential. Sandbanks, by their very nature, are natural shipping hazards and as such have been a focus of wrecking throughout history. When reviewing these applications the UAU recommends that a detailed underwater archaeological assessment be undertaken of the areas to be impacted. As a sandbank can be substantial in area, geophysical survey is generally requested, followed by ground-truthing by archaeological divers of any identified anomalies with archaeological potential. Discussions and negotiations with wind farm developers have run more smoothly in regard to underwater archaeology in as much as they tend to be large multi-national companies, rather than individual developers, who have factored in, well in advance, all-foreseeable possibilities of potential delays to the wind farm development, including that of underwater heritage. Such applications are referred to the UAU at an early stage and mitigation strategies have been implemented that allow meaningful discussions and workable systems to be in place between the state and the developer, this has, to date, proven successful. One example of this is the wind farm now in place on the Arklow Bank, off the east coast of Ireland. The pre-development assessment, undertaken by Boland Archaeological Services, identified the



Figure 1.4 Limerick City gold seal discovered in archaeological excavation during main drainage works in Abbey River  
Photo: Ed O'Donovan, MGL

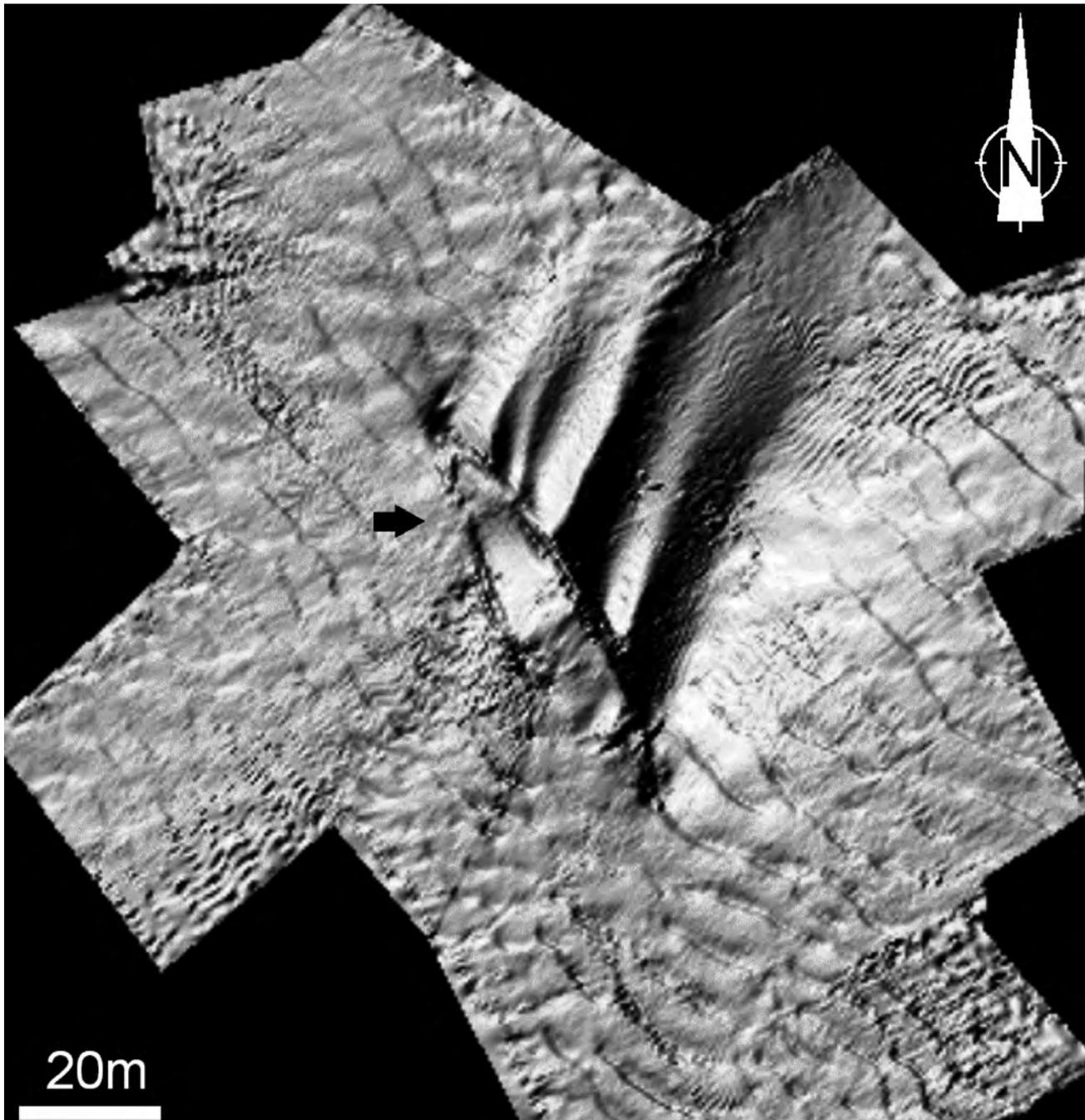


Figure 1.5 Side-scan sonar data acquired on the Arklow Bank wreck. The black arrow indicates the position of the wreck, showing a two-dimensional shaded relief model of the wreck site generated from multi-beam bathymetric data (Quinn 2006)

remains of at least seven wrecks, with a possibility of a further five sites also being mapped (Donal Boland, pers comm) (Fig 1.5).

Following archaeological diver survey of one of the wrecks that lay directly in the path of one of the proposed cable routes, it was agreed between the developers and DEHLG that the cable route and attendant turbines would be moved and the wreck site was avoided. The other identified wrecks were not in the footprint of the wind farm development and further survey is planned across the Arklow Bank by the UAU

in order to quantify the nature and extent of the sites and to determine the possible identity of the wrecks in question. Further to this is a monitoring programme that assesses long-term effects of wind farms – whether they lead to heightened sand and sediment movement resulting in exposure to other wreck sites, for instance. This will be more difficult to implement due to the fact that such wind farm developments are presently dealt with by the DEHLG as they arise. Such a programme of assessment cannot be undertaken in isolation, however, and Ireland will have to look further afield to

other wind farm developments and monitoring programmes. Liaison with other government agencies, academic institutions, and interested parties to discuss their strategies and consider results should form part of future management strategies here.

### *Waterford Port dredging scheme*

Dredging schemes, by their nature, are invasive to the underwater environment and have the potential to impact negatively on underwater archaeology. However, by extension, though not ideal by any means, the impact of dredging on a previously unknown site may be the first indication that archaeologists have of the very existence of that site. Due to the imperfect nature of dredging in regard to the quantification and protection of underwater archaeology, the UAU, in dealing with mitigation strategies for dredging schemes, has found that all such schemes need to be dealt with on an individual basis where devising suitable requirements for archaeological assessment and protection is concerned. Determining factors such as environment, depth of dredging, dredger type, scale of dredging, and the archaeological potential of the area are all critical considerations. Mitigation strategies for underwater archaeology are therefore tailored to suit the needs of each dredging programme, though with the requirement, agreed between DEHLG and the Department of Marine, that all areas if not previously assessed will be subject to pre-dredging assessment and on-board archaeological monitoring during the course of the dredging. Port companies in Ireland, which are commercially based, have been disinclined to take on the responsibility of dealing with underwater archaeology and the perceived extra cost that this will incur. This has been the subject of much heated debate and lengthy discussion between all involved parties but has, overall, been accepted by the port companies and developers, if perhaps begrudgingly.

As stated previously, the impact of a dredger on archaeology will be a negative one. It is imperative therefore that all steps be taken in advance of the actual dredging scheme to determine the archaeological potential of the area to be dredged, in order to lessen the probable impact on archaeology. Pre-dredging underwater archaeological assessments, geophysical survey and anomaly diver-truthing, and detailed desktop studies all serve to identify and locate archaeology before it is impacted by the works. However, even with this strategy, it is not always possible to identify and locate previously unknown

sites. In the summer of 2003 the UAU undertook a detailed survey and discreet evaluation of a shipwreck in Waterford Harbour on the south-east coast. The potential site had been located in the course of archaeological monitoring for the maintenance dredging in Waterford Harbour in 1999 when ship's timbers were recovered from the dredger head. However, no positive location was obtained for the wreck. The monitoring followed detailed pre- and post-dredging geophysical and underwater survey, both of which failed to identify positively the location of the wreck site in that area. An exclusion zone was imposed in the general area by the UAU within which and for the following three years Waterford Port Company was required to have archaeological monitoring undertaken for the duration of dredging activity in that part of the harbour. Waterford Port engaged the services of Dr Niall Brady and Dr David McCullough of the Archaeological Diving Company (ADCO) to undertake the monitoring, and in the years 2000 and 2001 further timbers and artefacts were recovered during dredging. Following each round of dredging, detailed underwater survey was undertaken but was unsuccessful in locating the wreck, which appeared to be buried in what is a difficult, low- to zero-visibility estuarine environment. In 2002 timbers blocked the dredger head and, following diver survey by ADCO, an exact location was confirmed for the wreck within the exclusion zone. The zone was then adjusted accordingly.

Following discussions with Waterford Port in 2002, it was agreed by DEHLG that a detailed survey of the site with select excavation would be undertaken by the UAU. The dual aim of the project was to gain further information as to the nature, extent, and potential identity of the shipwreck and to assist in the formulation of a definitive long-term management strategy for the site. A detailed geophysical survey, carried out by Dr Rory Quinn of the Centre for Maritime Archaeology in Coleraine for the UAU in advance of diver survey, mapped exposed timbers and cannon by side-scan survey. The sub-bottom profile results indicated extensive buried remains, suggesting that a substantial part of the hull structure survives largely intact beneath the seabed. The geophysical survey also revealed the presence of a second buried wreck some 100m north-east of the Duncannon wreck (see below), with the sub-bottom profile clearly showing evidence for possible decking beneath the seabed. Timbers recovered from the area have provided a dendrochronological date of 1546 for

the second wreck site (Nigel Nayling, pers comm). The existing exclusion zone around the Duncannon wreck was extended to encompass the new area around this second wreck site.

From details taken from six of the iron guns on the Duncannon wreck site a date ranging from post-1636 and pre-1670 has been obtained and it was discovered that they belonged to the Royal Naval foundry of the Browne Family of Britain (Robin Leigh and Charles Trollop, pers comm) (Fig 1.6). Further investigation will be needed to ascertain the true nature, extent, and possible identity of this wreck in Waterford (Kelleher 2004). With a record of some 150 wrecks for the harbour alone, there is always the possibility that it could be a previously unrecorded shipwreck (Fig 1.7). Discussions are ongoing between the UAU and Waterford Port with regard to the long-term management of the site and the existing extended exclusion zone around the Duncannon wreck and the second wreck site remains in place indefinitely.

### *Scotland to Ireland gas interconnector pipeline*

On board archaeological monitoring for offshore dredging has also produced positive results, as in the course of the works for the installation of the Scotland to Ireland gas interconnector pipeline. Dr Niall Brady of the Archaeological Diving Company (ADCO) was again engaged by the developers to undertake the mitigation and a suitably qualified archaeologist was on board the dredger for the duration of the dredging programme. The vast nature of the offshore environment means that locational details for archaeology in general, and wrecks in particular, is much more difficult to determine than in the confines of a bay or harbour, where records and sources may be more detailed. Pre-dredging archaeological assessment along the route for the gas pipeline, once again, did not identify the presence of archaeology. Following the recovery of a number of timbers from the dredge head, dredging was stopped and an underwater archaeological dive survey revealed the remains of a 12m-long wooden dugout canoe. The craft was located approximately 1km offshore from Gormanston in County Meath on the east coast. The wooden craft was excavated and recovered by ADCO and is now undergoing conservation in the Mary Rose laboratories in Portsmouth, England. Evidence from perforations along either side of the logboat suggests that out-riggers were present, indicating that the craft was used as a coastal vessel.

The discovery of such a vessel offshore is highly

significant, as very little evidence presently exists in Ireland for coastal logboats or such smaller craft. A date has yet to be obtained for the Gormanston logboat, but the possibility that it may have plied the coastal waters of the east coast of Ireland, possibly when sea levels were much lower, is extremely important to our current knowledge of such vessels and for such maritime activity. The existence and location of the Gormanston logboat was previously unknown in the archaeological record, and it could be argued that, if it had not been for the dredging, it might never have been discovered. However, it is clear that if the archaeologist had not been on board the dredger not only would the logboat have remained undiscovered but it would, in fact, have been destroyed. The locating of any archaeology through the impact of a dredger is far from ideal, but with the proper archaeological mitigation strategy employed to minimise the impact as much as possible, it can prevent the loss of, and ensure the future protection of, previously unknown archaeology. The discovery of the Gormanston logboat is an example of this. Its discovery is also indicative of the enormous potential that exists in these environments for underwater archaeology and why a quantification programme for such coastal areas that is proactive and research-based rather than reactive and development-led is so important.

### **Public consultation**

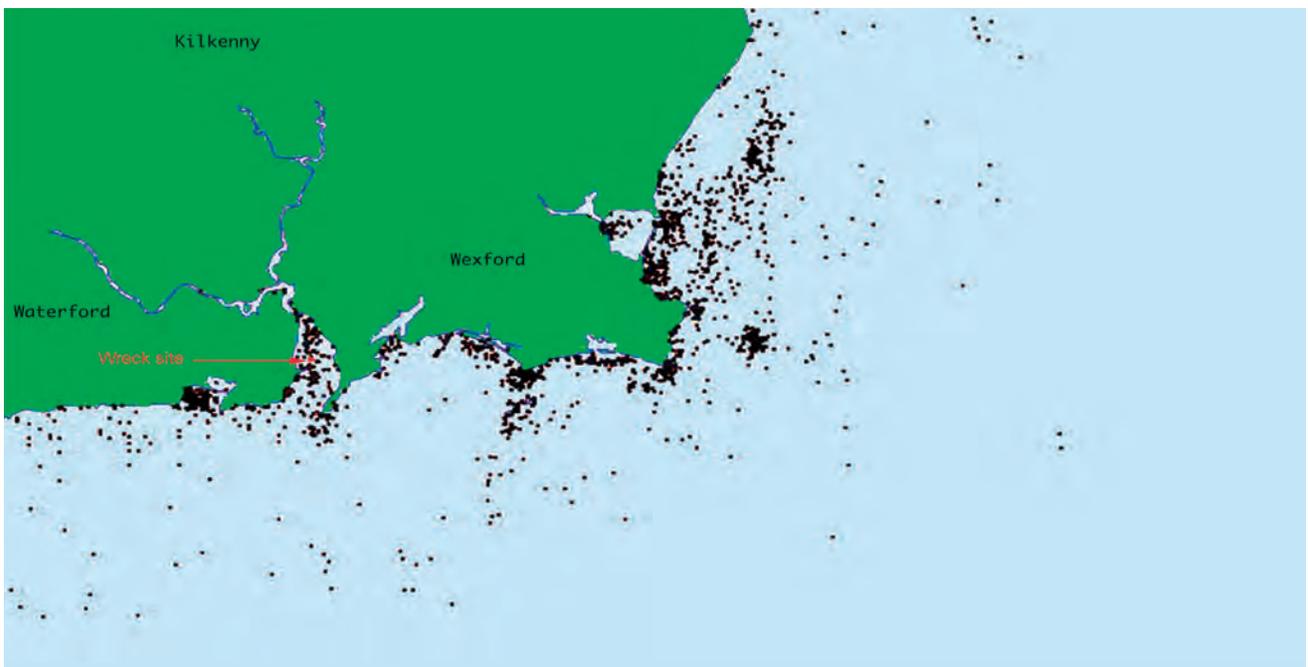
An important part of the work of the UAU is liaison with members of the public and responding to public enquiries, including reporting of sites or artefacts. Divers and fishermen are the obvious sources of communication but the general public too has a keen and genuine interest in underwater archaeology both from inland and coastal waters. A close liaison has been forged between the UAU and several sports diving clubs, with several shipwreck sites, including those of a number of Spanish Armada wrecks, being a focus for mutual co-operative survey. With clubs and individual divers applying to the UAU for dive survey licences, new information is also obtained through reports received on dives undertaken. Discussions have been initiated between the UAU and the Irish Underwater Council to formulate a Memorandum of Understanding so that greater co-operation and mutual understanding of each other's aims and objectives can be achieved.

The focus of the work of the UAU is not on coastal shipwreck sites alone; in fact members of the public



Figure 1.6 Detail of cascabel end of medium iron cannon lying horizontally on the seabed at site of Duncannon wreck in Waterford Harbour

Figure 1.7 UAU distribution map of wrecks around the south-east coast of Ireland. Site of Duncannon wreck indicated in Waterford Harbour



will often make contact to report potential sites from the inland waterways. For example, the UAU carried out a rescue excavation in 2000 in the River Ward in Swords in North County Dublin. A local resident reported that there were skeletal remains protruding from the bank of the river, which had been subject to erosion by recent floodwaters. The UAU inspected the site and identified the skull of an adult about 1m beneath the surface, visible in section in the bank. The site, located close to the town and in a public park, was under threat from interference or destruction and necessitated immediate excavation.

What was apparent when recording the bank section was that the human remains appeared to be lying within a midden. When a discreet 2m x 4m cutting was opened to recover the skeleton a further adult and two infant skeletons were found, with one being a neonate. The adults were both female and all four remains were lying within a shell midden site (Fig 1.8). The position of the skeletons, which had no defined orientation, suggested that they were deposited within the midden with no particular

reverence or ceremony. An Edward I penny was also recovered from the site, giving a date of the early part of the 14th century, a time when plague and pestilence were rife in Ireland as well as in Europe. From historical research undertaken and cartographic sources consulted it appears that the area where the River Ward now flows was used as the town dump during the 13th and 14th centuries. It may be that the human remains were dumped because they were plague victims. This would suggest that there is a high probability that further human remains lie buried in this area and that there may, in fact, be a far more extensive burial ground here (Brady and Kelleher 2000). The UAU inspects the site regularly to assess if any further erosion has occurred and if any more human remains are visible.

The effects of coastal erosion on archaeological remains is a major issue, but these effects go largely unquantified. At present resources are scarce to deal with such issues on a holistic level, and each case discovered or reported can only be dealt with on an individual basis.



Figure 1.8 Skeletal remains of two adult females located next to the River Ward in Swords, Co. Dublin, during archaeological excavation by UAU

## Quantification continues

The work of the UAU is ongoing. As quantification continues the body of evidence for underwater archaeological sites grows through research and fieldwork, and additions to the Shipwreck Inventory. Similarly, the growth of planning and development referrals in line with increasing economic prosperity in Ireland is also leading to new discoveries and greater awareness. This valuable information is being added to the existing archive of material and is accessible to all interested parties – to inform academic institutions, the archaeological community, planners and developers, divers, fishermen, and the public in general.

Of equal importance is the use of this growing knowledge of the diversity and potential of the underwater archaeological resource in assisting the state to devise management strategies to protect it. The strategies employed to date that deal with dredging programmes, such as those in Waterford Harbour, have successfully led to the discovery and protection of underwater archaeology. Additionally pre-development assessments, such as those undertaken on the Arklow Bank, have resulted in avoidance of impact to the submerged heritage and, again, to the discovery of several new sites. The success of such management strategies and resultant discoveries have led to a heightened awareness by the public of underwater archaeology, with the result that more and more people are contacting the

UAU with reports of new discoveries, of damage, or interference to sites.

Ireland's legislative base is strong but implementation of the National Monuments Act can only be successfully applied if the proper management strategies are in place to deal with current and future discoveries. What is evident in Ireland, however, and is mirrored in other countries, is that resources in the form of personnel are lacking. With only four members in the UAU to cover the whole of Ireland currently, the development of policies to protect underwater archaeology, though underway, is slow. Although the wheels are in motion on a number of Codes of Practice and Memoranda of Understanding, many issues are still only being dealt with on an individual site or report basis – coastal erosion and enforcement, for instance, to name but two.

It could be said that the quantification and management of underwater archaeology in Ireland is still at an early stage. Much has been achieved since the UAU was set up within DEHLG and this is clearly seen in the positive results from many of the management strategies put in place to date. However, to continue to build on this success more resources will be needed, particularly in the form of personnel, so that more definitive quantification can be achieved and management strategies developed to protect all known and potential underwater archaeology in Ireland.

# ACOUSTIC CHARACTERISATION OF ARCHAEOLOGICAL MATERIALS IN THE MARINE ENVIRONMENT: DEVELOPMENTS AND CHALLENGES

*By Justin Dix*

## Introduction

Over the last 30 years a variety of acoustic techniques have been used to investigate a range of submerged archaeological sites (Frey 1971; Chauhan and Almeida 1988; Rao 1988; Redknapp 1990). However, these early investigations focused principally on wreck site prospection and their success has often been limited by the workers' accessibility to the appropriate technology. The last decade has seen an increase in the accessibility of both modern acoustic instrumentation to marine archaeologists for specific surveys and high-quality commercial data that can be used expressly for the purposes of archaeological interpretation (Draper-Ali 1996; Wessex Archaeology 2004). This has been a result of both a market-driven reduction in the cost (of purchase or hire) of such equipment and a greater recognition of the role such approaches can play in the effective heritage management of the marine environment (Oxley and O'Regan 2001; Roberts and Trow 2002). In addition, the emphasis of acoustic archaeological research has moved away from pure prospection towards a fuller understanding of individual sites in terms of detailed site mapping, the wrecking and site formation processes, and ultimately the development of heritage management strategies for their conservation. A much wider range of archaeological targets and most significantly their broader environmental context are now the subject of interest to both academics and heritage managers. It is important to note, however, that there are still sections of the marine archaeological community that see such approaches as at best a luxury and at worst an irrelevance to good archaeology (Bass 2004).

These dominantly positive changes have resulted in a much stronger and more productive relationship

between marine archaeologists and the marine technology industry. No longer are practising archaeologists solely restricted to the generosity of the commercial sector to provide data on an *ad hoc* basis. Increasingly the technology sector sees the demanding challenges set by archaeological sites as an actual driver for the development or modification of new techniques. Such developments in the commercial sector are also being mirrored in the academic community, as witnessed by recent conferences bringing archaeologists, geophysicists, and acousticians together (Akal *et al* 2004) and the increasing presence of marine archaeological sessions at geophysics and acoustic conferences. Similarly, there is an increasing requirement for staff trained in marine archaeogeophysics, and the educational sector (both higher education and professional development programmes) has responded to this requirement. These developments appear to mirror the expansion of education for terrestrial archaeological geophysics that was triggered over a decade ago.

Yet there is still much more to be done. The challenges for those developing acoustic techniques specifically for marine archaeological investigation can be grouped into two broad areas:

1. The development of acoustic sources and processing techniques to provide the optimum resolution required to image individual artefacts (as well as coherent or incoherent clusters of material) exposed and/or buried beneath the seabed.

2. The ability to characterise acoustically and materially imaged objects.

The first area has arguably been the focus of the most intensive research, both for instruments that

image the seabed (side-scan sonars and swath bathymetry) and those that are designed to image fully and/or partially buried objects or land surfaces (sub-bottom profilers). Developments in the design of synthetic aperture side-scan sonars have resulted in systems which are capable of providing centimetric resolution independent of range and frequency, with commercial systems claiming 5–10cm resolution across a several hundred metre swath (Sternlicht and Pesaturo 2004; Hiller and Minto 2005). Similar developments are being made with both the beam forming and phase measurement (interferometric) swath bathymetry devices, both of which are striving towards resolution capabilities currently enshrined in the International Hydrographic Organisation Standards for Hydrographic Surveys Special Publication 44 (1998), their international equivalents and subsequent amendments. Although there are perpetual comparator trials made between the different swath techniques to establish which provide the very best imagery (Talbot 2006), there is no doubt that their role as frontline marine archaeological tools is now unquestionable (Dean and Frazer 2004; Mayer *et al* 2004). Much of the current research is now focused on different modes of deployment of these systems, for example the Rapid Archaeological Site Survey Evaluation (RASSE) project run by the University of St Andrews and partners, and the quantitative analysis of the backscatter component for object classification.

Although well established for the investigation of buried landscapes, recent developments in sub-bottom profiler technology have also been focused on enhancing their resolution capabilities for consistently penetrating a wide range of substrates for the detection of increasingly small objects. Developments over the last decade for enhanced resolution of Boomer (Simpkin 2005), Chirp (Gutowski *et al* 2002) and more recently parametric sonars (Wunderlich *et al* 2005) have provided a suite of instruments capable of giving decimetric vertical resolution through the majority of sediment substrates. These developments

still fail to resolve the issue of actual object detection as they do not tackle horizontal sampling, so their ability to identify targets is still dependent on survey line spacing (Wessex Archaeology 2004). However, the recent production of a high-resolution 3D Chirp system (Bull *et al* 2005) is demonstrably capable of decimetric resolution subsurface imaging (to depths of 10–20m) of areas hundreds of metres square, and thus ideal for the imaging of buried archaeological sites (Dix *et al* 2005). Finally, there have been recent proposals for the use of bi-static sonars (Blondel *et al* 2004; Ivakin and Jackson 2004), where the source and receiver are decoupled and thus enable a wide range of acoustic geometries to provide multiple aspect scattering measurements from subsurface reflectors, but these have yet to be tested directly on archaeological sites. Such methods can also be used with time reversal processing techniques (effectively retracing the path of echos from receivers to source) to enhance target identification to the centimetric level (Fink *et al* 2004).

Having briefly established the current abilities and future possibilities for actually detecting and measuring archaeological targets on or beneath the seabed, the second key issue is the ability to characterise materially the imaged objects. Despite successes in imaging small objects, it is still very difficult to establish an imaged object's archaeological potential (Quinn *et al* 2002). It is therefore essential to the effective use of these tools, for both prospection and more detailed site assessment, that we are capable of quantitatively determining key acoustic properties for a range of archaeological materials. This is a subject of interest not just restricted to archaeological studies, as the remote quantification of the acoustic properties of sediments and in turn their relationship with their geological properties (eg composition, grain size, porosity, and bulk density) is a major field of geoacoustic research. The rest of this paper will therefore focus on this critical field which by comparison to detection studies has been a relatively ignored area of research.

### Acoustic characterisation of archaeological materials

The study of the acoustic properties of sediments for classification purposes has focused, dominantly but not exclusively, on three principal acoustic parameters: impedance, attenuation, and backscatter. Acoustic impedance is a function of the actual material type of the seabed as it is the product of the bulk density and compressional wave velocity of the sediment or object.

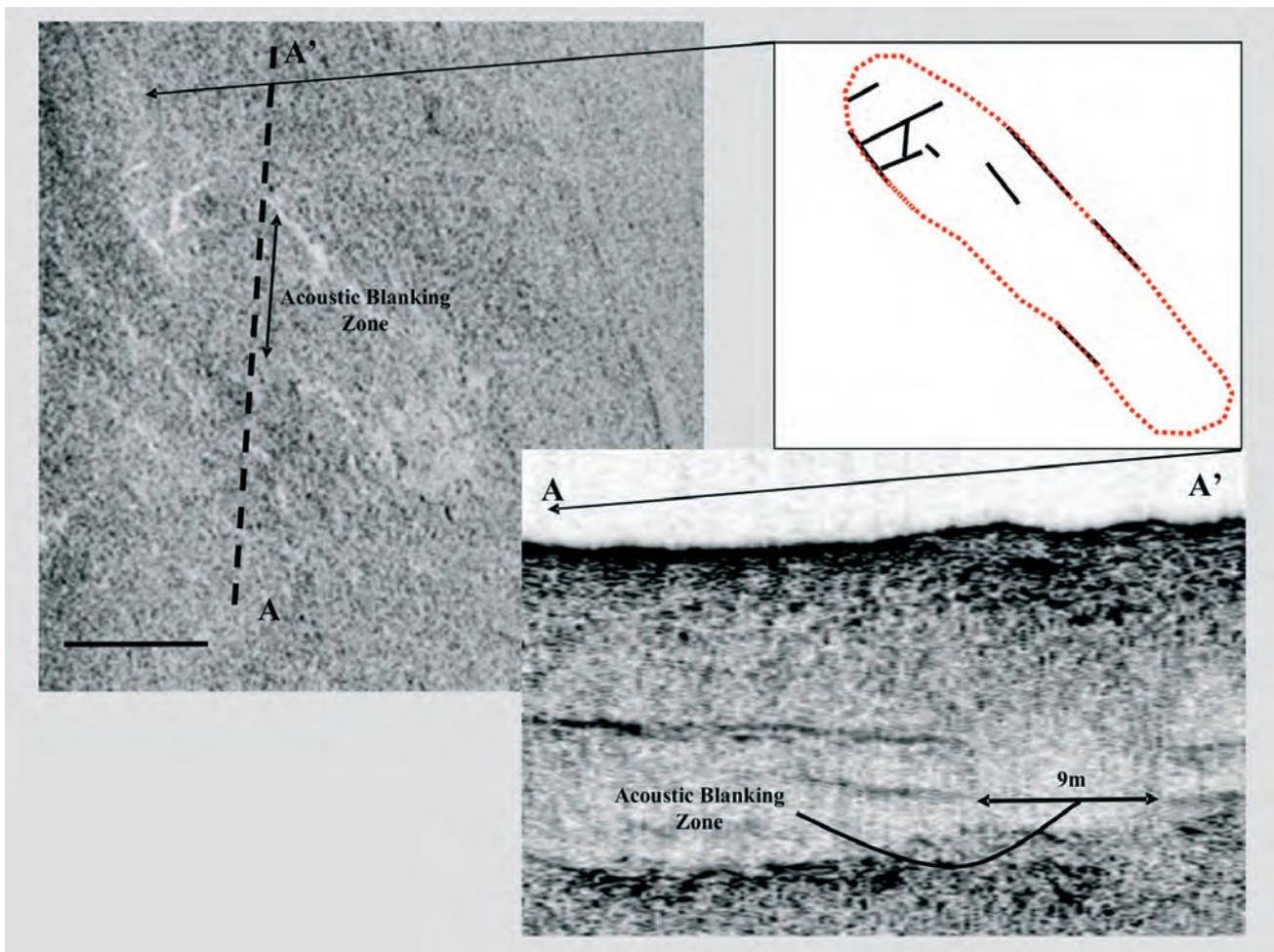
Impedance is typically expressed in terms of a reflection coefficient, which represents the acoustic impedance contrast between two materials. Compressional wave attenuation describes the ability of a sediment or target material to reduce the energy of the echo returning to the sonar device through the processes of absorption and volume scattering. It is typically

expressed in terms of an attenuation coefficient in  $\text{dBm}^{-1}$ . Finally, acoustic backscatter represents the degree of scattering of sound from an interface (the seabed in this instance), which is a function of the scale of the seabed or object roughness, the characteristics of the sound pulse (frequency, power, and beam pattern), and the angle of insonification.

In order to utilise these acoustic parameters to characterise the seabed and the immediate subsurface it is necessary to both measure the actual acoustic properties of different materials in a controlled environment and secondly to extract effectively the same acoustic properties from seismic reflection data acquired from the field. Laboratory and *in situ* measurements of the acoustic impedance of sediments suggest it has a strong correlation with a number of physical properties – porosity, bulk density, and mean grain size (Richardson and Briggs 1993). By comparison, the published literature concerning empirical relationships between attenuation coefficient and the

geotechnical properties of sediments is relatively limited. The geological properties with which compressional wave attenuation have been most successfully compared are mean grain diameter and porosity (McCann and McCann 1990), albeit the correlations are not as strong as for velocity.

In tandem with this work there has also been the development of theoretical models, dominated by Biot (1956a and b) and subsequent variants (Stoll 1985), to predict both the absolute values and frequency dependence of both compressional wave velocity and attenuation for different materials. However, much work has still to be done in terms of increasing the number and range of sediments measured, testing the potential frequency dependence of these measurements, and hence the effectiveness of the predictive models (Robb *et al* 2005). The frequency dependence issue is particularly important as the laboratory-based measurements are taken at frequencies of several hundreds of kHz whereas the majority of the swath bathymetry



2.1 Side-scan sonar image of the Colwell Bay wreck site (Isle of Wight), with the wreck outlined in black. The corresponding Chirp section shows the strong acoustic blanking associated with the location of the wreck timbers at shallow depth. Note that this causes a break in the strong, horizontal, geological reflector at 2.5m depth below seabed

systems and all the sub-bottom profilers are operating at less than 300kHz. Consequently, if a strong frequency dependence of the acoustic properties is established it would bring into question the validity of these established relationships and therefore their use for inferring material type from seismic reflection data acquired at lower frequencies.

The last decade has seen the start of similar research into the acoustic properties of archaeological materials. There are a number of different approaches to this work including laboratory (Dix *et al* 2001; Arnott *et al* 2002) and field-based (Lawrence and Bates 2001; Quinn *et al* 2005) empirical studies as well as application of acoustic theory (Quinn *et al* 1997; Arnott *et al* 2002 and 2005). In terms of directly measuring the acoustic properties of archaeological materials, the only studies to date have been undertaken on wood (Dix *et al* 2001; Arnott 2004; Arnott *et al* 2004). Although sediments can obviously exhibit physical heterogeneities on many scales, they can still be characterised by their bulk properties. In contrast, wood has very small scale, strongly defined, anisotropy as a product of its well-defined cell structure, which is typically described in terms of three principal structural axes: longitudinal, radial, and tangential. The laboratory work undertaken to date has been based on a series of ultrasonic transmission experiments for velocity (frequency ranges of 400–1200kHz), as well as bulk density measurements, of both saturated oak and pine, in varying states of degradation. Measurements have been taken along each principal structural axis to define effectively the end member measurements. These experiments established that within this frequency range, there was no statistically significant frequency dependent relationship but there are strong relationships between both structural axes and velocity and between degradation state and velocity. Further, a preliminary attempt to utilise Biot (Arnott *et al* 2002) to predict the velocity values of wood also identified frequency independence and suggested that this independence continues to the lower frequency range (down to 1kHz).

These results enabled the calculation of typical, frequency independent, reflection coefficients for saturated and variably degraded, tangential and radial (ie typical planking components in wrecks), oak and pine samples, lying on the seabed or buried within typical marine sediments (Arnott *et al* 2005). This work demonstrated that the strong and negative reflection coefficients (much larger than seen in typical geological scenarios) previously predicted for buried archaeo-

logical oak by Quinn *et al* (1997) were correct for undegraded oak buried in sandy sediments, but that in other sediment stratigraphies only the more degraded oak samples would have such high negative reflection coefficients. Indeed undegraded oak in very fine-grained sediments would give a high positive reflection coefficient. Finally, this work demonstrated a strong negative correlation between degradation state and reflection coefficient, suggesting that if a sensitive enough measurement of reflection coefficients from seismic data could be extracted it may even be possible to assess the degradation state of a wood-dominated archaeological site without excavation.

The work of Arnott (2004) also suggests that saturated wood, in all end-member orientations is typified by very high attenuation coefficient values with a strong, linear, frequency dependence between 400kHz and 1MHz. Typical average attenuation coefficients for saturated oak ranged from 400 to 4600 dB/m (but with very high measurement errors » 200 dBm<sup>-1</sup>) with the highest values being recorded for tangential samples. These values are supported by previous studies from the timber industry on fresh wood which also identify high attenuation coefficients (400–3000 dBm<sup>-1</sup>) from a similar frequency range for both hard and softwoods (Okyere and Cousin 1980; Bucur and Böhnke 1994; Bucur 1995). However, as described by Chivers (2000), attenuation measurements on wood are very difficult to take due to the effect of phase cancellation (different components of the acoustic wave may exit the sample out of phase, destructively interfere, and produce an artificially high apparent attenuation) and so large errors (> 150 dBm<sup>-1</sup>) were anticipated. Despite such a degree of uncertainty in the measurements, compared to typical sediment attenuation coefficients of 0.1–100 dBm<sup>-1</sup> (in the frequency range 1kHz to 1MHz) (Kibblewhite 1989; Bowles 1997), these values suggest that wood buried in sediments should exhibit a very distinctive attenuation anomaly, with little if any energy being able to penetrate a significant wood reflector. This hypothesis is currently being tested by researchers at Southampton, who are mapping acoustic blanking zones beneath highly attenuating surfaces, in seismic sections as an independent mode of positively identifying buried wood material (Fig 2.1).

Having established that there is an increasing but still very restricted database of the impedance and attenuation characteristics of archaeological material, it is necessary to look at approaches to extracting these same acoustic properties from seismic reflection data.

Again this is an area of intensive research for the sediment acoustic and object detection communities, and some archaeologically specific work has also been undertaken. Bull *et al* (1998) have presented a method for extracting reflection coefficients for Chirp data acquired over buried wreck sites. This approach utilised the amplitudes and depths of the seabed, target object, and the seabed multiple to estimate the reflection coefficients. This approach was tested on the wreck of the *Invincible*, a mid-18th-century wreck shallowly buried in a fine-grained sand bank in the East Solent. The extracted reflection coefficients compared well with the predictions of Quinn *et al* (1997) and stood up to the reanalysis of Arnott *et al* (2005) who went on to suggest that the reflection coefficients were indicative of relatively well degraded oak timbers, which diver investigation has confirmed. A variant of this approach, to be used where it is not possible to determine a ubiquitous seabed multiple, has been presented by Plets *et al* (2005). This has been similarly effective in establishing the characteristic degraded oak reflection coefficients for the buried wreck of Henry V's flagship the *Grace Dieu*.

Although the published work on impedance properties of archaeological materials has so far focused on wrecks, a single study by Dix *et al* (2006) has looked at the distinctive acoustic characteristics of buried peat horizons. Peat provides a wide range of essential data useful for archaeological site interpretation. Its successful identification and analysis can provide chrono-stratigraphic index points, vegetational and proxy-climatic records, a reliable indicator of sea level rise, and a source of well-preserved organic and non-organic archaeology. Consequently, the ability to be able to detect it remotely would have huge advantages for the investigation of submerged landscapes. Through the acoustic analysis of vibro-cores containing well-defined peat layers, the subsequent construction of synthetic models (theoretically constructed seismic sections based on the laboratory measured data) and comparison with actual seismic data acquired over the same site, it has been possible to ascertain that peat horizons correspond to a very large, negative polarity peak in the reflectivity series. This strong negative peak is driven by the very high porosities and low bulk densities of peat relative to many marine sediments rather than their velocity values. Although this signature is not exclusive to peat horizons (indeed it is very similar to the wreck reflectors described above but with a significantly lower attenuation component so horizons beneath are still imaged), when used in

tandem with a description of its spatial distribution it is proving to be a very reliable indicator.

To date attenuation measurements from seismic reflection data over archaeological sites have not been presented in the published literature, yet the experimental work and qualitative observations described above suggest it may be a good parameter with which to try to characterise archaeological materials from acoustic data. A number of methods for extracting attenuation measurements from broadband (Chirp and Boomer) seismic data have been developed. These include instantaneous frequency measurements (LeBlanc *et al* 1992; Panda *et al* 1994) and spectral ratio methods (Jannsen *et al* 1985; Pinson *et al* 2006). The instantaneous frequency approach works on the observation that sediments preferentially attenuate higher frequencies. This effect is visible in the amplitude spectra of the echo from a broadband sweep, such as a Chirp signal (ie one that contains a range of frequencies), as a progressive downshifting of its central frequency. An estimate of the central frequency shift of the data can be extracted from the acquired signal using a variety of instantaneous frequency methods (Robb *et al* 2002) and then related to sediment type via an empirically based model. In terms of archaeological materials it may be possible therefore to see a significant downshift of the central frequency over highly attenuating wooden targets, although the relatively gross scale on which this method works is probably not appropriate for the small-scale fluctuations of spatially restricted archaeological sites.

The basic premise of the spectral ratio method involves calculating the log spectral ratio of two signals, ie the ratio of the Fourier Amplitude spectra of the signals, and relating this to the different degree of attenuation experienced by each signal. Its effectiveness has recently been demonstrated by Pinson *et al* (2006), who have applied this technique to combined Chirp and Boomer datasets for the calculation of Q (Quality Factor, an alternative way of expressing acoustic attenuation) and thence geological properties (grain size and porosity) via comparison with laboratory-based measurements (Shumway 1960). To be truly effective this technique requires a relatively large number of samples ( $10^1$ – $10^2$ ) to enhance the signal-to-noise ratio of the measurements, so achieving this over the relatively small spatial areas typical of an archaeological site is challenging. However, as described in the introduction, the newly developed 3D Chirp system (Bull *et al* 2005; Dix *et al* 2005) is capable of acquiring comparable sample magnitudes in every 12.5cm bin

over an area of 30 × 20m. Consequently, this approach may well be capable of relatively sensitive mapping of wood-based archaeological sites.

As yet there have been no published, laboratory-based, measurements or model results of the scattering properties of archaeological materials. In terms of acoustic scattering from different seabeds a number of theoretical (and frequently empirically tested) models to describe the angle, range, and frequency dependent scattering at rough interfaces have been published (see review in Lyons and Pouliquen 2004). However, the majority of this work has been undertaken below 100kHz and the physical mechanisms controlling scattering at very high frequencies (VHF: 300kHz–1MHz) have yet to be elucidated from experiment and formulated in theory. This is a significant issue if we consider the number of high-frequency, wide-angle, systems (ie almost all swath and side-scan systems) that operate above 100kHz.

However, there have been significant *in situ* empirical experiments looking at the calibrated backscatter variation in both normal and non-normal incidence systems for seabed classification and there is not the space to do a full review here. However, a number of field experiments have been undertaken specifically for archaeological sites. In terms of normal incidence classification Lawrence and Bates (2001) demonstrated the ability of EchoPlus™ to provide discriminating data for two contrasting wreck sites, the wood-dominated *Stirling Castle* and the metal-dominated *Markgraf*. This and other systems extract components of both roughness (backscatter term) and hardness (an impedance term) from a single returning echo to produce a bivariate plot. They conclude that although discrimination of the archaeological sites can be made, their results do not provide a ‘...definitive classification for the archaeological sites surveyed’ and that further work is required, primarily by cross-referencing with non-normal incidence data. This is currently being undertaken by these authors as part of the Aggregate Levy Sustainability Fund supported Rapid Archaeological Site Survey Evaluation project (RASSE).

Similarly, Quinn *et al* (2005) undertook a major control experiment on archaeological material placed on a test site in Belfast Lough. This experiment was used both to demonstrate the effective resolution limits of commercial side-scan systems for archaeological work and to establish the backscatter response of the known targets (which included timbers, pot sherd clusters, aggregate clusters, and even skeletal remains). They characterised the backscatter component through

statistical analysis of their tonal response. This approach was demonstrably successful for the test site but does require a good knowledge of both theinsonification angles and the sonar calibration parameters, as both of these will affect the tonal levels, in order for the results to be translated to other sites. This same data set has also been analysed using scale saliency techniques (algorithms that detect areas of local signal complexity or unpredictability) to identify successfully different or salient objects (Attalah *et al* 2005). These authors suggest that this approach is invariant to noise content, contrast, and intensity levels and so should be applicable to any acquisition/processing environment.

A comparable approach has been applied to a side-scan sonar data set taken from a Roman shipwreck near Elba Island, Italy (Blondel and Pouliquen 2004). These authors utilise Grey-Level Co-occurrence Matrices to quantify the relative frequency of occurrence of two grey levels at a specified distance and angle from each other, in particular utilising statistical indices of entropy (a measure of the lack of spatial organisation within the sample area) and homogeneity (proportional to the amount of local similarities within the sample area). The data underwent linear transformations of the grey levels so textures are detected irrespective of the acquisition/processing conditions.

Finally, as with the side-scan systems, one of the major areas of current research in terms of backscatter data is its derivation from swath bathymetry systems to characterise the seabed and water column reflectors. Much of this work is currently being driven by both the requirement for extensive and rapid biotope mapping and fisheries assessment. The typical approach taken is to correct the raw backscatter data for absorption and refraction of the sound pulse in the water column and the influence of the topography of the seabed and then produce a series of backscatter signal *versus* incident angle profiles for a series of flat, homogeneous, and calibrated seafloor sites. These results are then statistically compared with corrected backscatter data acquired from the survey area. To date there is no published information for the use of such approaches for characterising archaeological sites, but their applicability has been proposed Pace *et al* (2004). Attempts have been made to develop objective characterisation approaches that are not so reliant on comparison with known backscatter *versus* angle signatures, such as Bayesian statistics (Huseby *et al* 1993) and neural networks (Dimitri and Dimitris 1990), but these do not seem to have been fully developed.

## Conclusions

This paper has tried to demonstrate that the last few years have seen a significant increase in the use of a range of sonar systems not just to detect but also to characterise archaeological targets both exposed on and buried beneath the seabed. These approaches directly answer the concerns expressed by the heritage community in terms of managing our submerged cultural resources by providing non-destructive and non-intrusive techniques, capable of identification, quantification, and monitoring of sites. Such detailed archaeological descriptions can be used either in their own right or for the careful targeting of diver survey.

Yet, if we are to move to the next stage in the use of these tools to identify rapidly the archaeological potential of our oceans and thus best to focus the efforts of marine archaeologists there is still more to be done. Much of the recent work relies on a restricted number of field experiments, all of which provide invaluable information; however, extrapolation from single sites to a universal series of characterisation

parameters is always dangerous. It is therefore argued that continued theoretical, laboratory, and field-based research into the acoustic characteristics (impedance, attenuation, and backscatter), for normal and non-normal incidence geometries, of a wide range of archaeological materials is essential. As ever there are financial considerations in such a suggestion as the limited resources available to marine archaeology are always stretched. However, the prospect for knowledge transfer from this work to other marine sectors is high and therefore the potential for industrial funding plausible.

In addition to such research there needs to be a co-ordinated effort to demonstrate to marine archaeologists and heritage managers that these approaches are not just esoteric academic exercises but practical tools that should be available to the whole community. Ultimately, the ability remotely and rapidly to image and characterise our archaeological resource using acoustic tools has to be considered a worthy research goal.



# AUSTRALIAN APPROACHES TO DEFINING AND QUANTIFYING UNDERWATER CULTURAL HERITAGE: LEARNING FROM OUR MISTAKES

*By Mark Staniforth*

## Introduction

Australia is the world's largest island and the only single nation to occupy a continent entirely surrounded by ocean. The sea and shipping have played an important part in Australian history in a variety of areas including exploration, settlement, immigration, trade, commercial industries, sport, and recreation. In the past four centuries many thousands of ships have been wrecked in storms, on coastlines, in warfare, and in collisions around the Australian coastline.

Australia has nearly 30 years experience in the inventory of certain kinds of underwater and maritime cultural heritage. Legislation for the protection of shipwrecks, for example, has been enacted at both federal (or Commonwealth) and state level in Australia during the past three decades (Ryan 1977; O'Keefe and Prott 1978; Jeffery 1987; Hosty 1987; Cassidy 1991; Gurney 1994). Although the shipwreck resource is relatively small (about 6500 wrecks), the length of coastline is enormous. Unfortunately Australian shipwrecks legislation makes no attempt to cover other items of underwater cultural heritage such as aircraft or indigenous sites. It is not that such underwater cultural heritage items and sites cannot be protected through legislation, but simply that governments have chosen not to extend that protection beyond shipwrecks. This is unlike the situation in the Canadian province of Ontario, for example, where any wreck which is 50 or more years old from the date of sinking is considered a heritage wreck and the term 'wreck' includes 'boats, ships or other vessels and airplanes' (Save Ontario Shipwrecks 1993, 37). Similarly in South Africa the National Monuments Act 1969 states that 'no person shall disturb or remove any wreck which is 50 years old or older without a permit' and extends the definition of

'wreck' to include 'any portion of a ship or aircraft' (Deacon 1993, 2).

The Australian Commonwealth and various state governments, however, expend considerable amounts of funding on the preservation of the shipwreck component of Australia's underwater cultural heritage. Shipwrecks and their associated artefacts have been effectively raised into the public domain, where they are subjected to a different 'otherworldly' morality of 'public good' (Carman 1995, 23). Consequently it has become possible to claim that the Commonwealth Historic Shipwrecks Act 1976 'enshrines in legislation a national obligation to preserve the integrity of Australia's historic shipwrecks, for the benefit of present and future generations' (ACDO nd, 1).

In Australia the practice of underwater cultural resource management and public maritime archaeology has been, in part, derived from American, and more recently, worldwide models (McGimsey 1972; Schiffer and Gummerman 1977; Cleere 1989). Interestingly the vast majority of those administrators and bureaucrats involved in the day-to-day operation of the legislation and historic shipwrecks programmes in all the state and the Northern Territory governments are qualified maritime archaeologists with the important exception of the Commonwealth government. In a somewhat wider context John Carman has argued that there is an intimate link between 'the development of laws to govern the treatment of archaeological remains and the development of the discipline of archaeology itself' (Carman 1995, 20). Apparently the Australian states can see a direct link between historic shipwrecks legislation and the practice of maritime archaeology – a link which seems less apparent to the Commonwealth government.

## Federal legislation and administration

Australia has been seen as a world leader in the legislative protection of shipwrecks largely as a result of the early enactment of protective legislation in the 1960s and 1970s (Green and Henderson 1977; Finley 1988). To see the origins of historic shipwrecks legislation we need to go back to the early 1960s when a number of Dutch East India Company (VOC) shipwrecks in Western Australia were located by divers. At that stage the only existing legislation which could be applied was the Commonwealth Navigation Act 1912, largely based on the British Merchant Shipping Act 1896, which focused on the preservation of the property rights of the owners and the legal obligations relating to salvage. It is only in relatively recent times that legislation has been used to manage and protect archaeological heritage, particularly in the underwater environment.

In 1976 Alan Robinson, a diver, mounted a case in the High Court of Australia attempting to claim possession of the *Vergulde Draeck* wreck site (Robinson *versus* The Western Australian Museum (1977), 51 ALJR806). As part of its judgement the High Court found that the Western Australia Maritime Archaeology Act 1973 had over-reached the jurisdictional powers of the Western Australian state government. The flaw lay in the attempt to legislate to control waters from the low-water mark out to the three-mile limit. The judgement was that the Commonwealth government was, in fact, responsible for this part of the territorial sea based largely on the Seas and Submerged Lands Act 1973. Fortunately the Commonwealth government had drafted and subsequently enacted the Historic Shipwrecks Act 1976.

The Act allows access to declared historic shipwrecks for non-disturbance purposes. For example, SCUBA diving, underwater photography, and fishing are all allowed on declared historic shipwrecks, while the removal of cultural material or archaeological excavation requires a permit (ACDO nd). A relatively small number of shipwrecks lie within 'protected zones' or no-entry zones up to 800m in radius, which require a permit just to enter. A protected zone is declared when it is considered necessary to limit activities such as SCUBA diving, which may adversely affect particularly sensitive archaeological sites.

Until 1993 the Act required the Minister to declare each individual shipwreck site that was considered significant to be 'historic'. Amendments to the Act now give automatic protection to all shipwrecks 75 years after the date of sinking – so called 'blanket declaration' (Cassidy 1991). This was the single most significant change to the legislation in the past two decades as it increased the number of declared historic shipwrecks from just over 150 to more than 5000 literally overnight (MacIntyre 1992, 1–3). The implementation of 'blanket declaration' required an amnesty period, eventually of twelve-month duration, to be granted to allow members of the public who held shipwreck material to declare this to the authorities.

The Commonwealth government has largely passed responsibility for the day-to-day administration of the Historic Shipwrecks Act 1976 to a delegated authority in each state. The Commonwealth provides direct grants to the state and Northern Territory delegated authorities to investigate and document wreck sites, conserve artefacts, and develop management and public programmes.

## Problems at the federal level

Australian federal government legislation for the protection of historic shipwrecks has now been in existence for more than two decades. However, twenty years or so down the track the legislation can be viewed as less than cutting edge. Even the Commonwealth bureaucrats responsible for administering the Act have acknowledged that it 'may not adequately reflect developments since 1976 and current circumstances' (Cassidy 1991, 6).

One of the problems that has become increasingly evident in recent years arises as the result of the Commonwealth's attempt to skirt around the issue of

ownership. In framing the legislation the Commonwealth did not claim ownership or assert title to the shipwrecks or associated artefacts covered by the Act, unlike the more recent US legislation (Abandoned Shipwreck Act 1987). Some nations are prepared to interfere with ownership rights after a specified length of time. In Spain the state becomes the legal owner of a wreck after three years if the owner makes no attempt to exercise rights to it; in Portugal the period is five years and in Finland the remains are vested in the state 100 years after sinking. It could be suggested that it is this period of time, however long or short it

may be, that separates commercial salvage from archaeological investigations. Instead the Australian legislation deals with the issue by allowing the relevant Minister to make written directions about the possession, custody, and control of artefacts (Commonwealth Historic Shipwrecks Act 1976, 9) without the state making any claim to ownership.

One result is that it has proved impossible to prevent the sale of artefacts from historic shipwrecks on the open market. The Act allows the sale of artefacts providing they were raised prior to the declaration of the historic shipwreck, they were declared to the authorities during the 1993 amnesty, and the authorities are notified about the transaction. In fact it is likely that the monetary value of the existing pool of historic shipwreck artefacts has been substantially enhanced through this process. The amnesty has provided these artefacts with 'provenance' as well as largely preventing any more artefacts from being legally raised from the vast majority of Australia's shipwrecks (ACDO nd, 8).

Some shipwreck artefacts in Australia, particularly valuable items like coins, are quite clearly still not a part of the public domain and will continue to circulate through commercial transactions. The interesting

legal point is that the individual does not 'own' the artefact but effectively the Commonwealth government has established a system whereby the individual can transfer 'custody and control' of an artefact (usually in exchange for a sum of money) to another person. In addition, failure adequately to enforce the provisions of the shipwrecks legislation, and the Protection of Moveable Cultural Heritage Act 1986, is almost certainly allowing the illegal sale of coins from historic shipwrecks to overseas buyers through regular postal auctions and sales. The problems associated with the enforcement of the Protection of Moveable Cultural Heritage Act 1986 includes the lack of powers given to Customs officers to enforce the Act; this has been previously discussed by Wiltshire (1993, 3).

Over recent years the Commonwealth government has taken responsibility for the National Historic Shipwrecks Database which is located at: <http://www.deh.gov.au/heritage/shipwrecks/shipdata.html>.

One of the problems that has become obvious is that the national database is not as comprehensive as some of the state databases such as New South Wales Maritime Heritage online at: <http://maritimeheritage.nsw.gov.au/public/welcome.cfm>.

## State legislation and administration

In addition to the federal legislation some Australian states (Victoria, Western Australia, and South Australia) have also enacted specific legislation which covers shipwrecks in state internal waters including rivers and lakes. It should be noted that Victoria moved from specific shipwreck legislation to more generic heritage legislation and that other states (Queensland, New South Wales, Tasmania, and the Northern Territory) have opted to include shipwrecks under more general heritage legislation.

Each of the states and the Northern Territory has established programmes for the protection of historic shipwrecks, the administration of the Historic Shipwrecks Act 1976, and its own legislation. Experience has shown that such programmes need to be proactive and not reactive, and therefore the key elements need to include active fieldwork and active archival/historical research. This has funding, staffing, and equipment implications not all of which are met by every state. In fact the states have some very different ideas about how to go about implementing their responsibilities and have opted for a variety of organisations to administer the Act. Western Australia, Queensland,

and the Northern Territory have programmes based in state-run museums. On the other hand, South Australia, Tasmania, New South Wales, and Victoria have developed public archaeology programmes based in state government planning departments or similar agencies. In some states such as Queensland and the Northern Territory there is an administrative split, with responsibility for state shipwrecks resting with one organisation and Commonwealth shipwrecks with another. In the Northern Territory, for example, the Commonwealth Historic Shipwrecks Act 1976 is administered by the Northern Territory Museum and Art Gallery while the Heritage Conservation Act 1991 is administered by the Conservation Commission of the Northern Territory (Dennis 1993, 3–6).

Most of the states have opted to conduct regional studies, usually initially based on secondary sources but subsequently involving primary archival research. These regional studies and state shipwreck databases more generally are partly effective as a data source for planning and development applications but interestingly some states such as Queensland have never adopted the regional approach.

## Problems at the state level

Needless to say each of the state organisations has a different way of going about the protection and preservation of historic shipwrecks and their associated artefacts. One of the resulting problems is the potential for conflict of interest which exists where permits for the excavation of shipwrecks are under the control of organisations, such as museums, which have a vested interest in conducting the excavation (Staniforth 1993, 215–28). Excavation and *in situ* preservation can, in fact, be seen as being in opposition to one another and the excavation activities of maritime archaeologists are not necessarily in the best long-term conservation interests of shipwreck sites. In most other areas of public archaeology there is a deliberate separation between the assessment and control of archaeological excavation and the actual conduct of archaeological excavation. This potential for conflict between archaeological or scientific values and preservation *in situ* or conservation values has also been clearly recognised in the UK (Firth 1995a, 60–6).

Generally this sort of legislative and administrative ‘balkanisation’ seen in Australia results in some spectacular anomalies where some shipwrecks are protected while others are not. This results in an understandable level of confusion among members of the public, and

occasionally among the administrators, about the necessity, utility, and effectiveness of legislative protection. Shipwrecks in the Murray River region are a classic example of this phenomenon. Within New South Wales internal waters shipwrecks of 50 years or older are protected from disturbance under section 139 of the Heritage Act 1977; shipwrecks in the Victorian tributaries are protected only if they are older than 75 years, while in the South Australian section of the River Murray only one shipwreck is protected by legislation – the *Waterwitch* (Kenderdine 1993, 7; Kenderdine 1994, 5–6). This is because South Australia still operates on a case-by-case basis for the declaration of historic shipwrecks rather than a ‘blanket declaration’ approach. The South Australian state government has recently indicated that state legislation will be amended to bring it into line with the UNESCO Convention on the Protection of Underwater Cultural Heritage (2001).

Interestingly, despite the legislative and administrative differences between the various states, it was the River Murray that became the subject of one of the most holistic approaches to riverine heritage. A major heritage study that included both underwater and terrestrial heritage sites along the River Murray in three states (New South Wales, South Australia, and Victoria) was conducted in the early 1990s (Kenderdine 1993 and 1994).

## Enforcement or lack of it

Generally federal and state authorities involved in the administration of historic shipwrecks legislation have shown a marked reluctance to become involved in active enforcement. There have been a number of difficulties encountered in attempting to enforce the legislation, particularly with respect to offences against section thirteen of the Act involving illegal interference with, or damage to, a historic shipwreck or relic. There are inherent difficulties in proving an offence which occurs at some depth beneath the sea in the absence of direct observations of the fact by an investigating officer. As a result there have been relatively few attempted prosecutions under historic shipwrecks legislation and of these even fewer have been successful. This is despite a clear recognition that shipwrecks legislation needs to be enforced in order to be effective (Jeffery 1987, 17). One of the interesting consequences of the lack of enforcement is a serious deficiency of case law in this area, a remarkable degree of secretiveness by the bureaucrats, and a sense that prosecutions

mounted under shipwrecks legislation would have a very good chance of failing in court.

In the absence of effective efforts at enforcement of the legislation it is suggested that a significant part of the effect of Australian historic shipwrecks legislation is actually bluff and illusion – smoke and mirrors. The mere existence of the legislation is usually sufficient to keep many divers on the ‘path of righteousness’. As a result it can be argued that legislation still plays a role in changing public attitudes even when it is not actively enforced and where few successful prosecutions are mounted. It can also be argued, however, that a small minority of the diving public see historic shipwrecks legislation as a ‘paper tiger’ and almost certainly continue to remove material from historic shipwrecks, resulting in serious damage to the archaeological integrity of these sites. Sullivan, for example, has suggested that ‘it is not unacceptable to assume that illegal abalone divers are also associated with the plundering of our valuable shipwreck resource’ (Sullivan 1994, 52).

## Conclusion

There is no doubt about the need for legislative protection of Australia's underwater cultural heritage. Some of the problems with the existing situation stem from the unsuitability and outdated approach of the Historic Shipwrecks Act 1976. This legislation desperately needs to be completely rewritten and in the process needs to assert ownership of shipwreck material on behalf of the state. New legislation needs to address a much wider definition of underwater cultural heritage including, at least, aircraft and it needs to change the date of application from 75 years to 50 years in line with the New South Wales Heritage Act 1977 as well as recent overseas trends. Changes to legislation could be addressed during the development of the proposed National Maritime Heritage Strategy by the Commonwealth government in collaboration with the states. Unfortunately the Commonwealth government has consistently

shown a marked reluctance to fund the increased workload that would arise from the effective implementation of this and similar previous proposals such as the Historic Shipwrecks National Research Plan (1995) that recommended themes for national research but was never effectively implemented.

The Commonwealth and state governments also need to address seriously the issue of the potential conflict of interest faced by some of the organisations that currently administer the historic shipwrecks legislation. A sharper dividing line between underwater cultural resource management or 'public' maritime archaeology and research- or excavation-oriented maritime archaeology needs to be established. Finally, far more emphasis needs to be placed on the effective enforcement of the legislation, including the appointment of inspectors under the legislation and building a case law base for the legislation.



## SECTION TWO

# MANAGEMENT THEMES AND ISSUES FOR MARINE CULTURAL HERITAGE

International responses to the effects on the marine cultural heritage of both natural forces and human activities take diverse forms. This section explores a range of management themes and issues which encompass local, national, and international problems and priorities. One thing is certain – the marine cultural resource provides distinctive challenges for heritage management, challenges which require distinctive solutions.

The legislative frameworks for the protection of the marine cultural heritage are complex, as demonstrated by Staniforth (this volume). Responses to heritage within territorial waters is governed by national policies and priorities, but sites in international waters illicit a varied response. Sarah Dromgoole explores the issues, approaches, and potential solutions to the protection of submerged heritage in international waters. This paper focuses on shipwrecks which, by their very nature, often have particular international relevance; this has led to positive approaches through multinational conventions, and conversely to less positive international legal battles over ownership and exploitation. The slow progress being made towards the ratification of the UNESCO Convention on Underwater Cultural Heritage is fueling the need for interim approaches to protection. Such legislative responses are a reflection of the social value attributed to heritage assets; it appears that while concern over the progress of the UNESCO convention should be voiced, there is also cause for cautious optimism due to new responses to old problems.

Even though the UNESCO convention has not yet been ratified by enough countries to come into force, the annex of the convention is being used by a growing number of countries as a benchmark for their approach

to underwater cultural heritage. One such example of this is Portugal; Francisco Alves outlines the many challenges that the country has faced, especially through development-led archaeology in the coastal and marine zone. These pressures are familiar in many maritime nations.

Portugal has witnessed a relatively recent and rapid development of maritime archaeological approaches and techniques. In contrast to the frenetic pace of Portuguese changes, we then move to the Netherlands. Thjis Maarleveld's paper demonstrates how Dutch maritime archaeology has developed in relation to terrestrial archaeology and wider heritage conservation agendas. Maarleveld considers specific management challenges faced by maritime sites and promotes a reflexive approach through the examination of management practice.

Further management challenges are faced in the field of conservation. Ian Panter explores issues of capacity, skills, and resources within the conservation sector. The present preference for *in situ* preservation has resulted in limited numbers of marine archaeological collections being raised; this has conserved sites on the seabed, but it has also contributed to a shortage of facilities and professionals. Consideration of future conservation demands highlights the need to 'be prepared' in order to ensure positive management outcomes.

A key theme running through all of the papers is the need for productive and sustained international discussion and collaboration to aid the development of management approaches. The examples and situations outlined by the authors demonstrate that responses to the demands of marine cultural heritage are as diverse as the resource itself. Sharing these experiences is essential for successful management.



# THE LEGAL FRAMEWORK FOR THE MANAGEMENT OF THE UNDERWATER CULTURAL HERITAGE BEYOND TRADITIONAL TERRITORIAL LIMITS: RECENT DEVELOPMENTS AND FUTURE PROSPECTS

*By Sarah Dromgoole*

## Introduction

In 2001 UNESCO adopted a new Convention for the Protection of the Underwater Cultural Heritage, which is designed to provide a comprehensive legal framework for the management of the underwater cultural heritage (UCH) beyond traditional territorial limits. However, the convention is politically controversial and it may be many years before the framework it sets out becomes widely applicable, if indeed it ever does. Nonetheless, the main purpose of this paper is to demonstrate that there are a number of other legal mechanisms that states may employ to protect and manage the UCH in international waters. If full and appropriate use is made of these mechanisms, they could be quite effective in controlling the activities of treasure hunters until such time as a conventional regime is in place.

The focus of this paper is on methods for regulating activity in international waters. These are the waters beyond the generally accepted territorial limit, which is now 12 miles. International waters are divided into a number of zones, with different legal regimes applying to each. For example, running adjacent to the territorial sea is the 'contiguous zone', a 12-mile broad strip of sea extending out to 24 miles from coastal baselines. There is also the 'continental shelf', which extends to the edge of the continental margin. Along some coastlines there is very little continental shelf, but in other places it may extend out for more than 200 miles. A further zone recognised in law is a 200-mile 'Exclusive Economic Zone' or EEZ, which is open to states to claim if they wish to do so. In

places, EEZs may overlie the continental shelf. Beyond these zones is the deep seabed: the technical legal term for this zone is 'the Area'. The legal regime in respect of each of these zones is remarkably technical and complex, but for the purposes of this paper it is not necessary to go into the technicalities.

To give a broad-brush summary of the current legal framework in international waters, it can be said that it is still governed in the main by the traditional legal principle of 'freedom of the high seas'. In practice this means that treasure salvors are largely free to locate and recover material, and bring it ashore in a jurisdiction of their choice. The jurisdiction of choice is very often the United States. There are various reasons for this. Among other things, the US admiralty courts are well used to dealing with cases involving historic shipwreck salvage so their approach to such cases tends to be predictable; instinctively they are inclined to favour the commercial interests of the salvor. Furthermore, somewhat controversially, they are willing to exercise *extra-territorial* jurisdiction over shipwrecks, in other words adjudicate over the fate of shipwrecks lying in international waters. As the protracted litigation in respect of RMS *Titanic* illustrates, the US courts are prepared to award exclusive salvage rights to the first person to reduce a wreck site to his/her possession, and to then protect that 'salvor-in-possession' by imposing injunctions on the activities of competing salvors (although it should be noted that, in international waters, these are enforceable only against the flag

vessels and nationals of the US). The salvor's rights may be protected by the courts for a number of years, until the salvage work is completed. Eventually, when that time comes, the salvor is likely to be awarded a sum approaching the commercial value of the recovered property as a reward for its recovery.

The United Nations Law of the Sea Convention 1982<sup>1</sup> includes two articles that relate specifically to the UCH: articles 149 and 303. Unfortunately, the legal framework that these articles provide is so insub-

stantial that to date it has had very little, if any, tangible impact. However, significantly it does impose a legal duty on states to protect the UCH in all sea areas, and to co-operate for that purpose. It also makes some potentially useful provision in respect of the contiguous zone, the continental shelf, and EEZ. The new UNESCO convention 2001 adds flesh to the skeletal framework in the Law of the Sea Convention but, until the UNESCO convention comes into force, its regime is not part of international law.

### UNESCO Convention on the Protection of the Underwater Cultural Heritage 2001

The regulatory system envisaged by the UNESCO convention is extraordinarily complex. There are various reasons for this, but to a large extent it is because of political pressure exerted by the major maritime states in respect of a number of issues. Most importantly, these states oppose any extension of coastal state jurisdiction in respect of shipwrecks beyond the limits already established in international law. As maritime states, they are keen to limit interference with the freedom of their ships to use the seas and are concerned that an extension of coastal states' jurisdiction for one purpose, however desirable, might encourage extensions of jurisdiction for other, less desirable, purposes. For this reason, the most obvious and straightforward way to control treasure salvage in international waters, which would be to extend coastal state jurisdiction in respect of the UCH out to 200 miles, or to the edge of the continental margin (thereby effectively creating an 'archaeological zone' over this area), was found to be a politically unacceptable option. A good deal of creative thinking was required to develop alternative control mechanisms that did not interfere with the delicate balance between coastal state and flag state jurisdiction. The end result is a convention that relies heavily on the application of existing jurisdictional mechanisms. A major drawback of the scheme adopted is that it is dependent for the most part upon a large number of states supporting the convention and co-operating together. Unless the convention is widely adopted, its effectiveness will be patchy to say the least.

In many respects the UNESCO convention is a remarkably favourable instrument from an archaeological point of view. It covers a broad swathe of cultural material (see the definition of UCH in article 1(1) of the convention), including warships and other state vessels, which at one time were in real danger of

being excluded. The precautionary principle lies at the core of the convention. Its starting point is that protection *in situ* must be considered as the first option and interference may be authorised only where scientifically justified. Where authorisation is granted, activities must be undertaken in accordance with the benchmark standards set out in the rules in the annex, which derive from the ICOMOS Charter of 1996. This enshrining of archaeological principles and standards in the convention has a significance that is really quite profound. The impact is likely to be felt in all sorts of ways in the future, whether or not the convention ever comes into force or becomes widely accepted.

While UNESCO's aim of achieving unanimous support for the final text of the convention from its member states was not achieved, a significant majority did vote in favour (there were 87 votes in favour, four against, and fifteen abstentions). Since the convention requires just twenty ratifications to come into force, on the basis of the vote one would have thought that it should do so eventually. However, it is rather sobering to compare the progress of the UNESCO convention 2001 with that of a more recent UNESCO instrument, the Convention for the Safeguarding of the Intangible Cultural Heritage. As at 10 April 2006, the UCH convention (adopted in November 2001) had achieved just six ratifications (Panama, Bulgaria, Croatia, Libya, Spain, and Nigeria), while the Intangible Cultural Heritage Convention (adopted in October 2003) had achieved 46 ratifications. Indeed, at present, the process of bringing the 2001 convention into force appears to have stalled.

Assuming that the 2001 convention does eventually become legally effective, the greatest impediment to its ultimate success is that a number of major maritime states did not feel able to accept the text,

including the US, the UK, France, and Russia. These states are of particular significance because they all have flag vessels and nationals with the capability to undertake deepwater salvage. If they do not accede to the convention, this will leave gaping holes in the regulatory regime. For the most part, the objections these states hold are technical and are not objections to the general tenor of the convention, including its fundamental principles and objectives. The UK, for its part, has made it clear that it accepts most of the provisions of the convention, including the rules in the annex, and that its specific objections relate to

the provision made for sunken warships and also to the blanket nature of the protective framework. Nonetheless, however technical the objections may be, there should be no doubt that they represent significant obstacles and it is highly unlikely that any of these states will ratify the convention in the foreseeable future.

In summary, therefore, assuming that the convention does gain sufficient momentum to come into force, it is likely to be many years before it has widespread application and there is a serious prospect that it will only ever have marginal effectiveness.

### Alternative legal mechanisms

Despite the problems with the UNESCO convention 2001, the outlook may not be quite as bleak as it seems. Over recent years there have been a number of other developments that can give us some cause to be positive about the prospects for the UCH in international waters. These developments demonstrate that there are a number of ways in which individual states can take action now, within the confines of existing international law, to protect UCH outside territorial limits. They also demonstrate that states around the world are increasingly making use of these mechanisms to counter the activities of treasure hunters. This means that there is a growing body of state practice for other states to examine and follow.

Interestingly, the mechanisms that states have identified and begun to use are reflective of the legal scheme set out in the UNESCO convention. While this is largely due to the quirks of international law, there are signs that the convention is having a subtle – but really quite profound – influence, on law, policy, and practice.

#### Controlling activities in the contiguous zone

The contiguous zone is a 12-mile strip of sea adjacent to the territorial sea in which states have some limited powers of jurisdiction over foreign flag vessels and foreign nationals. As mentioned earlier, the Law of the Sea Convention makes some specific and potentially useful provision in respect of this zone. Unfortunately, that provision – in article 303(2) of the convention – is somewhat ambiguous. What it clearly does do is provide coastal states with some power to control the recovery of UCH within the 24-mile contiguous zone. However, the difficulty is in determining the extent of

that power. Nonetheless, it is strongly arguable that the provision permits a coastal state to extend the legislative regime that it applies to control the recovery of UCH in its territorial waters out to the 24-mile limit and to enforce that regime against foreign flag vessels and nationals, as well as its own. This means that, for example, the UK could extend the application of the Protection of Wrecks Act 1973 out to 24 miles. This is certainly the interpretation taken by a number of other European countries. For example, France extended its legislation in this way as far back as 1989 (Law No. 89-874) and Italy amended its law in 2004 so that it could regulate activities in the contiguous zone and apply to those activities the standards set out in the UNESCO annex. It appears that the Netherlands too may be planning to take similar action.

In order to exercise any form of control over the contiguous zone, a state probably first needs to take the step of making a formal declaration of a contiguous zone. About one-third of coastal states have done this (Churchill and Lowe 1999, 136), some of them specifically so that they could take action in respect of the UCH. Significantly, in 1999 the US proclaimed a contiguous zone and in President Clinton's proclamation he made explicit reference to the need for prevention of the removal of the cultural heritage. While further action has not yet been taken by the US in this regard, the very fact that it has proclaimed a contiguous zone and done so with reference to the UCH sends a powerful signal that it is prepared to take positive action. The UK government, among others, should be encouraged to proclaim a contiguous zone. Once it has done so, consideration can be given to exactly what action it can legitimately take to protect sites out to 24 miles.

The assertion of power over the contiguous zone would be in accordance with the UNESCO convention 2001, article 8 of which provides that states parties may regulate and authorise activities directed at the UCH in their contiguous zone. Whether or not the UNESCO convention comes into force, its reaffirmation of the basis for action in article 303(2) of the Law of the Sea Convention is likely to encourage even more states to exert jurisdiction over the contiguous zone for the purposes of protecting the UCH. In fact it seems likely that the recent moves in this regard in Italy and the Netherlands have been prompted by their deliberations over the UNESCO convention.

### Controlling activities on the continental shelf/in the EEZ

Beyond the contiguous zone the legal basis for a coastal state to exert jurisdiction over the activities of foreign vessels and nationals becomes more precarious. Nonetheless, over fairly recent years a number of states, including Australia, Ireland, and Spain, have extended their jurisdiction in respect of the UCH beyond the 24-mile limit. Some of these states have done so over the continental shelf; others in a zone coinciding with the 200-mile EEZ. Essentially what most of them have done is to extend the legislation they apply in their territorial waters across the whole of this zone and in this way they directly and quite explicitly regulate activities on UCH sites over a broad area of sea.

There is almost certainly no basis in international law for this action. By virtue of the Law of the Sea Convention, coastal states have sovereign rights over the natural resources to be found on their continental shelves and in their EEZs, and have the exclusive right to explore and exploit those natural resources and to regulate 'marine scientific research'. However, the general view is that the UCH is not a 'natural' resource, and that marine scientific research is probably confined to research relating to the natural environment and its resources, and would not extend to other forms of research, such as archaeological research. While it is the case that, if enough states take the same action unilaterally, and other states do not formally object to it, it can become part of customary international law, the action taken to date is not sufficiently common or consistent to be said to have formed a custom and it seems likely that any further unilateral extensions of this kind would lead to formal objections by the US and other maritime states.

There is, however, another course of action that is open to states in respect of their continental shelf or EEZ that has much more legitimacy. This is to provide protection for the UCH as an indirect consequence of protecting other aspects of the marine environment. This can be referred to as the 'piggy-back' approach. The US has taken this form of action in its National Marine Sanctuaries Act (1972). This allows it to designate areas of the marine environment as 'national marine sanctuaries' out to 200 miles offshore. The first such sanctuary to be declared was the wreck site of the USS *Monitor*. While the *Monitor* sanctuary is comparatively small, at just one mile in diameter, the largest sanctuary is over 5300 square miles. Within any sanctuary area, the unauthorised removal of historic sanctuary resources, or their injury, is an offence (Varmer 2006, 360). Through this sort of legislation, it is possible to control activities in relation to the UCH essentially under the guise that such control is protecting the natural resources, living and non-living, in the vicinity. Where there is a close association between a wreck and marine life of one sort or another, then it may well be the case that interference with the wreck may interfere with the marine life; in other cases the notion that natural resources will be imperilled by salvage activities may be largely fictitious. Nonetheless, it is highly unlikely that any state would challenge the means by which another state chooses to protect its sovereign rights (O'Keefe 2002, 90).

Again, this form of action accords with the UNESCO convention. In fact, arguably the most powerful provision in the convention is article 10(2), which provides that states parties have the right to prohibit or authorise any activity directed at the UCH in their EEZ or on their continental shelf, provided that their sovereign rights or jurisdiction under international law are threatened. This provision essentially confirms that there is a legitimate link between interference with natural resources and interference with the UCH, and reinforces rights that already exist by virtue of the Law of the Sea Convention. However, the very fact that the UNESCO convention makes use of this basis for action adds force to its legitimacy and means that more states may be inclined to make use of it, whether or not the convention comes into force.

While it is inconceivable that the UK would take direct unilateral action of the sort taken by Australia, Ireland, and Spain, it should be encouraged to take indirect action, following the example of the US

Marine Sanctuaries legislation. The proposed new Marine Bill, which will introduce a new regulatory framework for marine areas within the jurisdiction of the UK, may provide a suitable legislative vehicle on which the UCH can 'piggy-back'.

### Domestic legislation utilising well-established principles of international jurisdiction

The forms of action outlined so far demonstrate mechanisms by which a state can control (or at least attempt to control) not only the activities of its own flag vessels and nationals, but also of the flag vessels and nationals of other states as well. The most effective form of protection for UCH sites is obviously protection that will be enforceable against everyone ('the whole world', as it sometimes expressed in legal circles). Nonetheless, it should not be forgotten that under accepted principles of international jurisdiction it is perfectly legitimate for a state to introduce domestic legislation to restrict the actions of its own flag vessels and nationals, in whatever waters they happen to be. The relevant principle of jurisdiction is the 'nationality principle', which encompasses the notion of 'flag state jurisdiction'. While the enforceability of legislation based on this principle will inevitably be limited, it does send out an official signal that a site is off-limits and such signals can be surprisingly effective.

At present one of the few examples of legislation utilising the nationality principle of jurisdiction to protect wreck sites in international waters is the UK's Protection of Military Remains Act 1986. Among other things, this provides for the designation of a 'controlled site' or 'protected place' in international waters. In 2002 five wrecks in international waters were designated as protected places, including HMS *Hood*, HMS *Prince of Wales*, and HMS *Repulse*, and further designations may be announced in the future. The powers afforded by the Act, for example to stop and search vessels, and the ability to bring prosecutions under it, are enforceable only against British flag vessels and nationals; so, legally, there is nothing that can be done to stop the flag vessels and nationals of other states from interfering with the sites. Nonetheless, the very fact that the sites have been officially designated in this way may act as a psychological deterrent. While the 1986 Act was designed to protect the wrecks as war graves, there is no reason why the UK and other states could not introduce similar legislation specifically to protect wreck sites of historical significance.

Another accepted principle of international jurisdiction is known as the 'territorial principle'. Under this principle, a state can exercise jurisdiction over any vessel or national that comes within its territory, including its territorial sea and ports. Again, a state can make imaginative use of this principle as a weapon to control interference with wreck sites in international waters. For example, it could use this principle to hamper the activities of foreign vessels operating outside territorial waters by restricting or prohibiting use of its ports, or by making their use dependent upon consent. It could also restrict or ban the importation of material raised from particular sites. While there are certain limits on a state's powers to take such action that need to be borne in mind (particularly the right of innocent passage through the territorial sea), such measures – especially if implemented by a number of states in a region – could be quite effective.

An interesting example of legislation utilising the territorial principle is the UK's Dealing in Cultural Objects (Offences) Act 2003. This new Act creates an offence of 'dealing in tainted cultural objects'. Among other things, an object will be 'tainted' if it is removed from a wreck site of historical or archaeological 'interest'. The site does not need to be of historical or archaeological 'importance'; nor does it matter whether the site is in UK waters or elsewhere, provided that the removal constitutes an offence under UK law or the law of any other country. The scope of this offence is remarkably broad. For example, if someone (anyone) acquires, disposes of, imports, or exports an item from, say, the *Prince of Wales*, which has been recovered from the wreck without authority under the Protection of Military Remains Act, he may well be guilty of this new offence, and he may find himself punished by a prison sentence of up to seven years.

It is interesting to note that the regulatory regime under the UNESCO convention relies heavily on the exercise by individual states parties of the nationality and territorial principles of jurisdiction. The advantage of the convention is that states parties would be under a legal duty to exercise these principles, and obviously the more states in any particular region that do exercise them, the more effective these controls will be.

### Interstate agreements

Apart from signing up to a major multilateral convention such as the UNESCO convention, a number of states can co-operate to protect a particular wreck site, or a number of sites, by negotiating an 'interstate'

agreement, under which they agree to co-ordinate use of the nationality and territorial principles of jurisdiction. Essentially interstate agreements are 'mini' conventions that are legally binding on the states that ratify them, in much the same way as a contract legally binds the contracting parties. Over the last ten or fifteen years a number of these agreements have been negotiated, sometimes between just two states (perhaps to protect the flag vessel of one of them that lies in the territorial waters of the other, eg the 2003 agreement between France and the US in respect of Cavalier de la Salle's vessel *La Belle*) and sometimes between four or five states to protect a wreck that lies in their vicinity (eg the 1995 agreement between a number of Baltic States in respect of the passenger ferry *M/S Estonia*). The most topical such agreement at present is the Titanic Agreement, and it is also the most pertinent one because it relates to an historically significant site lying in international waters (see Dromgool 2006).

The Titanic Agreement was negotiated by the US, the UK, France, and Canada, and to date has been signed by the UK and the US. France and Canada are expected to follow in due course. The Agreement will not come into force until the US Congress passes implementing legislation, which may take some time. The Agreement requires states parties to control the activities of their own flag vessels and nationals at the site, and to control the use of their territorial waters and ports by anyone interfering with the wreck. The intention is to encourage all those states in the general geographical vicinity of the wreck, together with all those states whose nationals and flag vessels have the deepwater technology to access the wreck, to become state parties. If this aim is achieved, the protection could be very effective.

Under the Agreement, each state party is required to control the activities of its own flag vessels and nationals on the site, and to establish a licensing system along very much the same lines as that set out in the UNESCO convention. According to the Agreement, the 'preferred management technique' for the *Titanic* is *in situ* protection, and authorisations will be granted only 'when justified by educational, scientific, or cultural interests'. Any activities that are authorised will be required to comply with rules set out in an annex to the Agreement, which – like the UNESCO rules – are based on the ICOMOS Charter. As well as controlling the activities of its nationals and flag vessels at the site, each state party must also take action to prohibit activities in its territory, including

its ports and territorial sea, that are 'inconsistent' with the Agreement.

In many respects the Titanic Agreement bears a striking degree of similarity to the UNESCO convention. The similarity is surprising given that three of the four negotiating states have serious objections to the convention. It shows the extent to which these states accept the principles and objectives of the UNESCO convention and also demonstrates the degree to which the UNESCO convention is already having an influence on law and policy. A key point of difference, however, is that the Titanic Agreement relates to only one site of manifest public and historical interest. It is therefore directly in line with the position that the UK in particular takes that only sites of particular 'significance' should receive legal protection.

One of the problems with interstate agreements such as the Titanic Agreement, that are designed to protect specific sites, is that the significance of a site will not usually be known until after it has been discovered and interfered with. As is graphically illustrated in the case of the *Titanic*, by the time an agreement is finally negotiated and implemented, substantial interference may have taken place. However, there is no reason why interstate agreements cannot be drawn up to protect all the sites in a particular region, whether or not they have yet been discovered or their significance assessed. Regional agreements of this nature, particularly in respect of enclosed or semi-enclosed sea areas, have the potential to have the greatest impact. The Siracusa Declaration of 2001, which is not a legal instrument but rather a statement of principles by a group of experts, exhorts the Mediterranean countries to consider the possibility of adopting a regional agreement to protect the Mediterranean UCH. It is to be hoped that in time this initiative will be fruitful. If it is, it will provide a useful example that other regions can be encouraged to follow.

Again, the development of interstate agreements, including regional agreements, is a course of action that is entirely in line with the UNESCO convention. Article 6 of the convention encourages the development of such agreements, recognising that in certain circumstances they can provide a greater degree of protection for particular sites, or regions, than the convention's regime itself. The Titanic Agreement and the Siracusa Declaration also demonstrate the influence that the convention is already having on international developments, since both enshrine the

convention's principles and objectives. It is interesting, as well, that the Siracusa Declaration refers to the possible involvement in any decision-making regarding a particular site of countries having a 'verifiable link' with the heritage in question. This notion of a state

having a 'verifiable link' derives from the UNESCO convention and it shows that very specific aspects of the convention are becoming embedded in our thought processes as we consider how the law should be developed.

## Conclusions

Throughout this paper the emphasis has been on what states can do to protect the UCH in international waters. As can be seen, there is quite a lot they can do. However, as in all things, governments are unlikely to take action unless they are put under pressure to do so and for this reason the fate of the UCH beyond territorial limits is as much in the hands of the international archaeological community as in the hands of lawyers and government officials.

As a starting point, states need to be reminded that the Law of the Sea Convention places them under a specific legal duty to protect the UCH in all maritime zones, not just in their territorial seas. Arguably, among other things this means that they are under a duty to investigate, and make the best use of, every option available to them. One of these options is obviously to ratify and implement the UNESCO convention. Without further ratifications soon, there is a real prospect that the political momentum behind the convention will be lost. It is therefore vital that the states that voted in favour of

the convention are put under internal pressure to ratify it. In the UK and other states where there are serious objections to the convention, the attention of governments should be drawn to the other mechanisms that are available to help them fulfil their duty under the Law of the Sea Convention. If well-planned and co-ordinated efforts are taken to make full use of these mechanisms, they could be quite effective. As has been seen, a fortunate 'by-product' of implementing these mechanisms is that states will be bringing their domestic regimes more closely in line with the convention's regime, facilitating the possibility of ratification in the future. While such a possibility may seem unlikely now, it is worth noting that the UK recently ratified the UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import and Transfer of Ownership of Cultural Property 1970, overcoming longstanding objections to that convention.<sup>2</sup> (The fact that it took 32 years to overcome these objections is probably best forgotten!)

## Notes

1 The Law of the Sea Convention is the most successful convention in history, its regime having now been accepted by 149 countries (as of 10 April 2006): see <http://www.un.org>. Note that the acronym that is most frequently used for this convention, UNCLOS, is technically incorrect. UNCLOS is in fact an acronym for the UN *Conference* on the Law of the Sea, not the convention itself. A technically correct acronym for the convention is LOSC. However, to avoid confusion this

paper will refer to the convention simply as the Law of the Sea Convention.

2 The UK ratified the 1970 convention in 2002. For a discussion of the objections it held and the ways that they were overcome, see Department for Culture, Media and Sport, Ministerial Advisory Panel on Illicit Trade (Chairman: Professor Norman Palmer) Report, December 2000, especially paras 56–9.



# UNDERWATER CULTURAL HERITAGE MANAGEMENT AND SHIP ARCHAEOLOGY – THE PORTUGUESE EXPERIENCE

*By Francisco J S Alves*

## Abstract

In the last ten years, three interrelated circumstances have completely changed the field of underwater cultural heritage in Portugal. The first was the progressive adoption of mitigation policies in waterfront works, following procedures established across many European Union countries. The second was the creation of an Underwater Cultural Heritage (UCH) specialist branch within the Portuguese Institute of

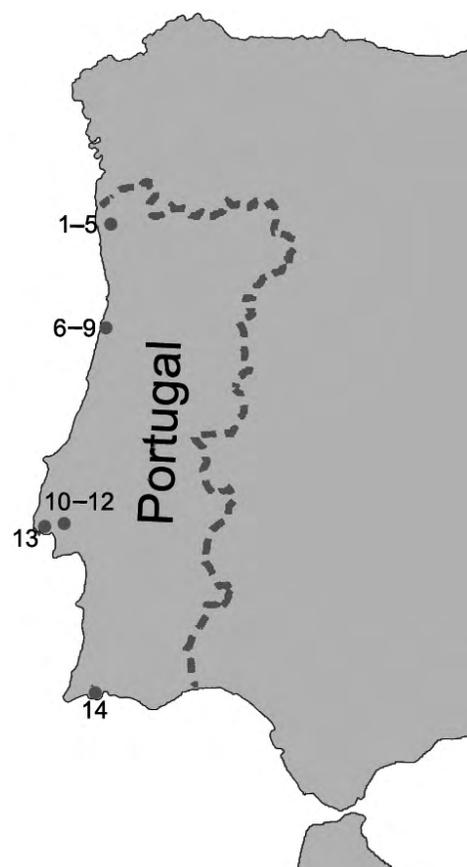
Archaeology of the Ministry of Culture – the National Centre for Nautical and Underwater Archaeology (CNANS). The third was the discovery of shipwrecks every year, in foreshore, freshwater, and maritime environments. These discoveries have presented an enormous challenge for both management and research.

## Introduction

Portugal is located in the extreme south-west of Europe. Its coastline stretches almost 1000km and is incised by rivers and lagoons that provide excellent harbour conditions (Fig 5.1). Some rivers like the Tagus have a wide estuary which can be navigated far upstream, these conditions have been recorded since antiquity (Strabo, *Geography*, 3.3.1). Founded as a kingdom in 1147 and geographically unified in the early 13th century Portugal had a continuous maritime tradition between the Mediterranean and the Atlantic.

There is a long tradition of maritime usage of Portugal's inland and coastal waters. Additionally, from the early 15th century, the islands of Madeira and the Azores formed part of the national territory. The geography and climate of these islands played a fundamental role in European expansion. Therefore, it is easy to imagine the huge potential for UCH in Portuguese waters.

Figure 5.1 Map of Portugal. 1–5: Lima river dugouts 1 to 5; 6–9: Ria de Aveiro A, E, F and G shipwrecks; 10–12: Cais do Sodré and Corpo Santo shipwrecks, and Praça do Município Ribeira das Naus shipyard timbers (Lisbon); 13: *Nossa Senhora dos Mártires* shipwreck (Tagus river bar); 14: Arade 1 (Arade river estuary)



## Developing capacity

Up until the early 1980s it could be said that more was known about the ships of the Roman period than of the Portuguese caravels, *naus*, and galleons (Barata 1989). This situation began to change due to the formulation of an UCH project developed within the framework of the National Museum of Archaeology (Blot and Blot 1990–92a; Blot and Blot 1990–92 b; Alves ed 2001b). One of the central priorities of this project was the establishment of the national UCH inventory.

To date almost 8000 sites of different types have been recorded on the inventory. These include ballast, ecofacts with anthropogenic association, artefacts, ship graveyards, airplanes, balloons, artificial reefs, harbour structures, shipyards, habitats, graveyards, fortresses, bridges, *cetariae*, kilns, tide mills, salt ponds, and fish traps. Of course shipwrecks are well represented in the

inventory, with many references being derived from written and iconographic sources (Fig 5.2). These ships have been lost in a variety of circumstances and environments including open water, against the coast (or the shore), abandoned in foreshore contexts, and sometimes in urban land environments. A model for this inventory was developed by Paulo Monteiro, a member of the Azores CNANS team (between 1997 and 2000); this was based primarily on archival sources. This example now represents around 10% of the total data of the national inventory (Fig 5.3) (Monteiro 2000).

Until the early 1990s an impressive amount of information on the UCH was collected, but shipwreck material of archaeological significance was never found and recovered. It was commented that only ‘ghost ships’ existed (Alves 1991–93). It has often been remarked that ancient ship remains were there ‘under our noses’. Even if we had not then seen them it was only a matter of time before they were discovered due to the extensive development of waterfront areas. Areas targeted for development were those occupying the foreshore and urban areas of estuaries and harbours; these are precisely the areas which often hold important archives of underwater cultural heritage. It turns out that these predictions were premonitory serendipity.

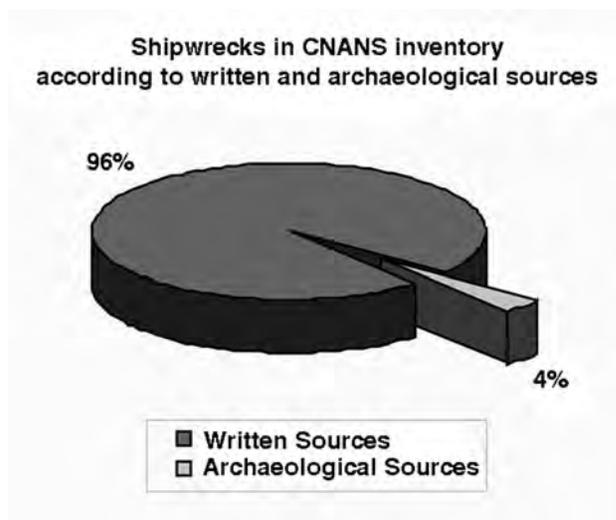
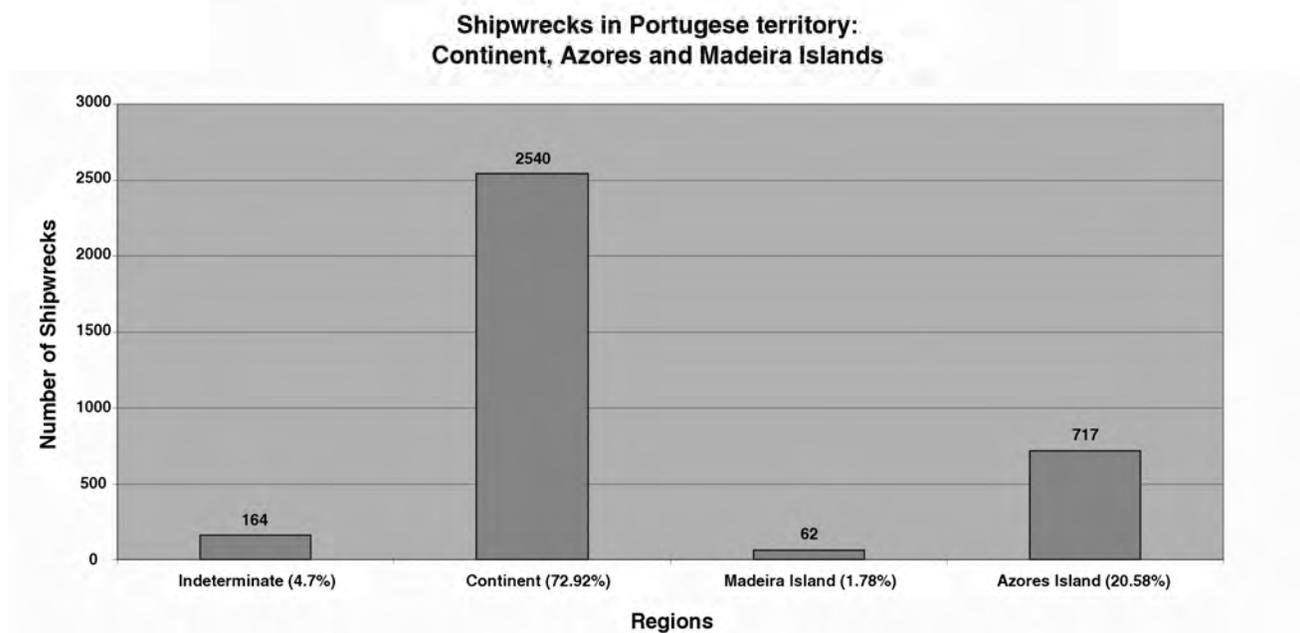


Figure 5.2 Diagram of UCH remains derived from written or archaeological sources in CNANS Inventory

Figure 5.3 Distribution of shipwrecks in Portuguese waters in CNANS Inventory



## A wealth of discoveries

Suddenly, in 1994, a 15th-century shipwreck was identified in the Aveiro lagoon (Fig 5.4) (Alves and Rieth 2000; Alves *et al* 2001a; Alves *et al* 1998; Bettencourt *et al* 2003a and 2003b). In 1995, a late 15th- or early 16th-century shipwreck, Cais do Sodré, was discovered during the construction of a gallery of the Lisbon underground, in the riverside (Rodrigues *et al* 2001). In 1996, only 500m from the previous find, a shipwreck from the 14th century was discovered in Corpo Santo Square, inside a giant concrete circular vent (Alves *et al* 2001b). In 1997, not far from the last one, two dozen roughly prepared shipyard timbers were discovered; these were also on the Lisbon riverside, at Praça do Município. This site was being developed for underground car parking and was in the exact location of the historic shipyard of Lisbon, Ribeira das Naus. Some of these timbers dated from

the 13th century (Alves *et al* 2001b; J Alves 2002).

In the same year a Portuguese team, assisted by ten individuals representing seven different nationalities, began the rescue of two shipwrecks located under the breakwater of a proposed marina at Angra bay, Terceira Island, Azores. These vessels were found at the last minute during a mitigation survey (Garcia *et al* 1999a and 1999b; Garcia and Monteiro 2001) (Figs 5.5 and 5.6). At the same time an underwater archaeology project was initiated in the area of the Pavillion of Portugal. It centred around an area of wreckage and on-hull remains presumed to be those of an Indiaman – the *nau Nossa Senhora dos Mártires* (baptised by Filipe Castro ‘The Pepper Wreck’), lost on its return from India in 1606 on the Tagus bar, off Lisbon (Alves *et al* 1998; Castro 2000; Castro 2001; Alves 2003; Castro 2005a) (Fig 5.7).

## A national response

The above discoveries and activities did not originate without any background. In 1997 Portugal created a UCH management branch – the National Centre for Nautical and Underwater Archaeology (CNANS) – within the framework of the Portuguese Institute of Archaeology (IPA) of the Ministry of Culture. The establishment of this organisation was followed by the adoption of the project *Nossa Senhora dos Mártires* (The Pepper Wreck) by the Pavilion of Portugal in the International Exhibition of Lisbon (Expo’98). Stimulated by this event and by the significance of the recent discoveries, CNANS organised in the same year an International Symposium on the Archaeology of Medieval and Modern Ships of Iberian Atlantic Tradition (Alves 2001b). The symposium attracted some of the most renowned international specialists in the field.

The conference programme included a session dedicated to the UNESCO convention, from which rose the Lisbon Declaration. The symposium had in this sense a symbolic meaning, which has been emphasised worldwide by UNESCO and ICOMOS. In fact, in 1997 Portugal passed a law specifically concerning UCH, following the principles of the Sofia Charter, which was later adopted as an annex to the convention

(UNESCO 2001). These changes in legislation are set against a background in which a law, passed in 1993, had introduced the principle of commercial underwater heritage exploration which allowed the selling and trading of artefacts – the modern version of treasure hunting (Alves and Castro 2000). The 1997 law revoked this earlier piece of legislation.

George F Bass, in the keynote speech captured *l’état d’esprit* of the Symposium of Lisbon with the following:

*Wow! What an explosion of discovery there has now been in Portugal! One must walk carefully here, it seems, to avoid stepping on wooden hulls of that very time. Dig for a subway system, and you run into a fourteenth-century hull! Dig for worms for your fishhooks, and you run into a fifteenth-century hull! Be careful where you build a marina, or you’ll cover up sixteenth- and seventeenth- century hulls, with perhaps a nineteenth-century blockade-runner on top! And that’s not counting the offshore wrecks we’ve already been told so much about, like the Nossa Senhora dos Mártires that blackened nearby beaches with pepper, and whose timbers are even now being preserved.*



Figure 5.4 The Ria de Aveiro A shipwreck in 1999, at the moment of dismantling



Figure 5.5 The Angra C shipwreck, Angra bay, Terceira Island, Azores



Figure 5.6 The Angra D shipwreck, Angra bay, Terceira Island, Azores

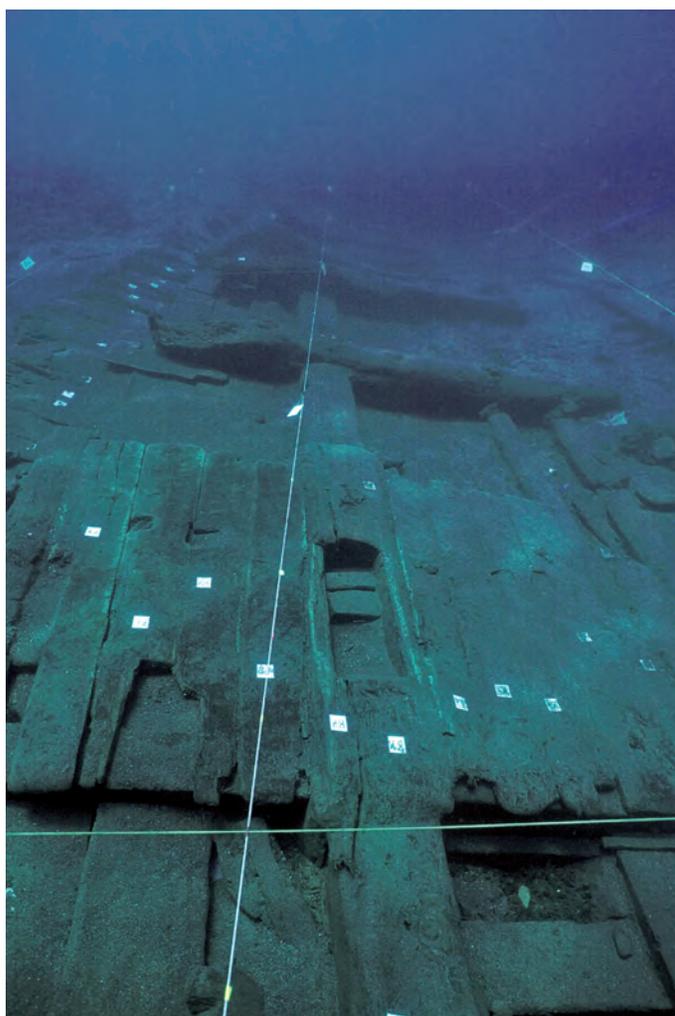


Figure 5.7 The hull remains of the presumed Indiaman *nau Nossa Senhora dos Mártires* (The Pepper Wreck), lost in 1606 in the Tagus bar, off Lisbon





Figure 5.8 The Lima 5 dugout

Figure 5.9 The full scale model of Ria de Aveiro A shipwreck



## Continuing challenges

The years following the symposium have not provided any rest for the CNANS team. In 1999, during an impact survey in the Mira channel of Aveiro lagoon, the fragmentary remains of another 15th-century shipwreck, Ria de Aveiro E, were discovered, having been scattered by dredgers (Alves 1999a). In 2001, CNANS relocated a 16th-century shipwreck, Arade 1, in the mouth of Arade River, in the Algarve; this site was discovered in 1970 during dredging and subsequently had been covered in layers of silt (Alves 1999b; Castro 2003; Rieth *et al* 2004; Castro 2005b; Loureiro and Alves 2005; Alves *et al* 2005). In 2002 and 2003, again in Aveiro harbour (Aveiro lagoon), dredgers had

almost completely destroyed two shipwrecks: the first one, Ria de Aveiro F, dated from the 14th century (Rodrigo 2002), and the second, Ria de Aveiro G, was a clinker-built vessel from the 15th century (Alves and Ventura 2005). Also in 2003, two logboats, Lima 4 and Lima 5, both dated to around the 3rd or 2nd century BC were discovered near each other in the Lima river, north of Oporto, and were recovered by CNANS (Alves *et al* 2004) (Fig 5.8). The first one has the curious and rare detail of having in its port side a filling plank fixed by the system of mortise-and-tenon joint, typical from Mediterranean antiquity (Pulak 2003).

## Continuing to develop CNANS approaches

At this point the reader may be wondering ‘how do you deal with all those remains?’. This paper aims to outline the CNANS aims and objectives. The approach to shipwreck remains is based on two principal objectives: first, to collect as much scientific data as possible, second to develop a range of low-cost activities.

These approaches to shipwreck remains are additional to the strategic priorities of CNANS, which are:

- to promote understanding, awareness, and specialised training
- to emphasise mitigation policies
- to promote research on ship archaeology
- to generate synergies and resources
- to protect Portuguese UCH wherever it may be found
- to develop national and international co-operation.

These priorities are being achieved through a range of approaches. First, wooden structures are preserved *in situ* when their size exceeds available logistics, infrastructure, and financial resources (as in the case of Angra C and D). Second, vessels are carefully dismantled, paying particular attention to recording the hull’s

components based on 1:1 drawings of all their sides with a laser mouse, and then the waterlogged wood is stored in lab tanks while waiting for selective conservation treatment using PEG impregnation (like Ria de Aveiro A and Lima river logboats). This second (dismantling) option has incomparable advantages: it allows detailed archaeological analysis in the lab, extensive study of the hull, and subsequent display based on full-scale models in plywood and polyurethane, produced using methods developed by CNANS in its daily contact with shipwreck hull remains (Fig 5.9).

To undertake the research programme outlined above and all the normal routines of a management agency in the UCH field, CNANS requires a minimum level of financial resources. The problem of funding is one of the largest challenges of our time. However, public responsibility for UCH management, as in land archaeology, seems unquestionable. The alternative would be the progressive extinction of UCH in the shadows of the treasure hunting limelight – because it would mean ‘to sell the stars’ – in the sense evoked by George Bass in his now infamous metaphoric tale in his letter to *Sea History* (Bass 1979).



## MARITIME MANAGEMENT MATTERS

*By Thijs J Maarleveld*

### Abstract

Underwater archaeology and archaeological heritage management are just a specific aspect of the heritage continuum and its present-day utilisation. Or are they? It is not just peculiarities in practical matters such as diving that qualify our trade. In a sense we may, quite rightly, be convinced that the significance and meaning of archaeological remains are not affected by their being under land or underwater. On the other hand, whether we like it or not, the development of the archaeological and heritage disciplines demonstrates ample evidence to the contrary. This paper will try to

expose some of these differences from the perspective of research, management, and perception. Also, it will address the fundamental impact that these differences in significance and meaning have on present and future developments. Examples from curatorial practice, failures and successes alike, will serve to illustrate the point that while professing the similarities between terrestrial and maritime archaeology, one needs to be aware of fundamental differences as well. It is for this reason that specific maritime management matters.

### Introduction

It is gratifying to see that the Maritime Affairs Group of the Institute of Field Archaeologists attracts such an audience and has such a large number of active members. Recent involvement with the Institute of Field Archaeologists' sister Institution in the Netherlands, the 'Nederlandse Vereniging van Archeologen' (NVvA) established in 1995, has concentrated on the design and negotiation of an acceptable registration of professional competences. This work has demonstrated the importance of organisations like the IFA in representing professionals and setting professional standards on the basis of consultation and mutual assistance. Such standard setting and self-regulation has become crucial now that the Netherlands, like the UK, have moved towards the commercialisation of archaeological services and excavations. Until recently, archaeological research in the Netherlands (or rather intrusive archaeological research) has been the prerogative of government and academia. In a formal sense it still is. Although gradual review and change of the system started more than ten years ago, and although intermediate solutions and successive provisional regulations have

been put in place, the proposal for the necessary changes in legislation has only recently been submitted to Parliament (Kamerstukken 29259).

This paper concentrates on work undertaken within the government framework of the Netherlands. Governments are of course frequently (and unfortunately perhaps often quite rightly) blamed for narrow perspectives. Nevertheless, a subject like 'the government perspective' could be quite wide, so this paper will concentrate on a few maritime management matters. These maritime matters will be put in perspective, and in doing so the government's role will also be put into perspective.

Initially some particulars of the relationship of archaeology with maritime matters will be identified. Looking back, any specific positions will be identified before moving on to examine general trends in archaeology and governmental heritage management at large. An attempt will be made to identify some of the specific pitfalls that these developments have in store for maritime matters. Finally, it is impossible to avoid stressing some of the issues that are of the utmost importance for future development.

## Archaeologists and heritage

Archaeology as the prerogative of government and academia was a comfortably simple solution for archaeologists in the Netherlands when archaeology went through its first phase of expansion in the second half of the 20th century (Es 1972). Basically the social role of heritage, or at least of archaeological heritage, was an extremely limited one. Archaeologists, of course, promoted their work. They gave lectures to interested societies and local communities, and explained what archaeology was about. Moreover, their message was: archaeological remains are important and fragile and can only be interpreted by archaeologists. 'Archaeology is what archaeologists do' (Clarke 1973). Nothing wrong with that message. But of course it is limited. It only addresses one single function of heritage: informing the public on history through learned research. In consequence, both frugal management and measures for protection aimed at long-term fulfilment of that specific function. This approach is absolutely justifiable, and is the situation in which many of today's archaeologists have been educated. As an archaeologist of my generation it is hard – and perhaps even quite unnecessary – to think along different lines.

At one of the first annual conferences organised by IFA, the then director of the National Service for Archaeological Heritage in the Netherlands, Professor W A van Es, was invited to speak on rescue archaeology on our side of the North Sea, just as he had done at the Rescue AGM back in 1974 (Es 1974). On the one hand he congratulated British archaeologists on their new Institute, IFA, on the other hand he sort of congratulated himself and his Dutch colleagues on the fact that they did not need such an organisation; in fact not at all: the simple regulations ensured that archaeology was in the hands of a very limited number of government and academic institutions. They knew what they were doing, they knew what archaeology was, and beyond the regular redefining of research aims and excavation planning, there was no need to reflect on that!

This perspective has changed much in the last 25 years. The role of the archaeologist – government and otherwise – has become much more complicated (and interesting by the way). The introduction of commercial services to the Netherlands has been mentioned above. That development profoundly affects the organisation of field archaeology, as well as its results. On the one hand it calls for explanation of procedures, aims, cost-effectiveness, and relations. It makes self-reflection, ethical discourse, and standard setting, as well as a platform like IFA or NvVA, crucial. It also forces us to consider whether organisations – and in consequence organisational changes – affect what we get to know (Cooper *et al* 1995).<sup>1</sup> There can be no doubt they do. Nevertheless, the introduction of commercial services in itself is no more than a symptom of the dramatic changes that are occurring.

With or without commercial services, one can still define archaeology as 'what archaeologists do' and one can still try to define archaeologists, magnanimously serving the general public with the outcome of their lofty research, as the single or at least the principal stakeholder in archaeological heritage. Or can one? It has certainly become slightly more difficult to do so. Client-operator relationships have become more subdivided as well as more explicit, as is well known here in the UK. But in fact it has always been no more than an illusion that archaeologists own the past (McBryde 1985) or that archaeologists can single-handedly set the agenda (Yoffee and Sherratt 1993). This is an illusion, however, that unconsciously influenced Dutch archaeology quite a bit, and no doubt an illusion that – despite all the differences – has now and then cropped up in British archaeology. It still persists here and there, although it is now dissolving through the changing appreciation of heritage and of archaeological practice, as well as through the emancipation of stakeholders other than professional specialists. Those are perhaps the most dramatic changes that continue to occur.

## Government and archaeology – the early years

This paper will now present a superficial review of the first 25 years of government archaeology in the Netherlands before indulging in maritime matters. The National Service ROB (then known as the State Service) was established in 1947. It was obvious who the client was: the national government. After a long

period of preparation (interrupted by World War II), the government had become convinced that wise treatment of monuments and archaeological sites was in the public interest and that an enlightened government should take some form of responsibility. The Dutch government was relatively late in adopting this

approach compared with other European countries. Rather than taking regulatory measures (it was only in 1961 that the simple regime of the first *Monumentenwet*, Ancient Monuments and Historic Buildings Act, came into force), it saw a need for practical measures. The post-war reconstruction justified such an approach.

What practical measures should be taken? The answer was simple: let specialists decide on that within the framework of a limited budget. This was a rather realistic approach of government, wasn't it? It put the professional employee in a comfortable position. The specialists were recruited and started to define what could and needed to be done, at the same time more or less defining what Dutch archaeology was to be or not to be. Archaeology after all, was what archaeologists do. Under those circumstances the idea that they set the agenda, was not an illusion, but could more or less be appreciated as fact.

Choices were mostly made for good reasons of both a practical and a research nature and need neither apology or critique, but it is fascinating to observe how early choices have qualified later developments as well as institutional entropy, but that is not a theme to consider too deeply here (Maarleveld 1997), at least not where it transcends maritime matters. Some choices, however, are relevant and need some consideration.

Were maritime matters considered important? No! Was post-medieval archaeology considered important? No! Is this situation that surprising? No, perhaps not. At least not for post-medieval archaeology. It had hardly any status as a discipline in the late 1940s and 1950s, so no specialist promoted its importance. But the choices of the 1940s and 1950s persisted and were only formally abandoned in the National Service when fusion with the maritime departments brought a wider scope and mission. What about maritime matters as such? Is it surprising they were not considered important? In a way, it is. This is not to say that it is surprising that no specific attention was given to the underwater world. It went unsurveyed in the 1940s and the 1950s and the notion that deep fluvial or marine sediments offer exceptional deposition and conservation was not yet really developed (Maarleveld 2004).

Specific emphasis on ship and boat archaeology would not have been strange in a maritime nation like the Netherlands, not in the 1940s, nor before or after, for that matter. Nevertheless a strange awkwardness occurred. It was definitely not the archaeologists that

thought that the safeguarding of ship finds should be considered important. This is quite different from England, of course, where the discovery of the image of a ship in the Sutton Hoo burial mound was seen as a great challenge by the very competent excavator C W Phillips (Phillips 1987). Ships found in the Netherlands were not normally discovered by archaeologists, thus putting them at a disadvantage. Actually most ships were found far beyond the archaeologists' normal orbit, looking as they were for the unravelling of occupation and habitation history in the best traditions of *Siedlungsarchäologie*. Well-buried, deep, well-watered sediments produced well-preserved remains but no puzzling challenge for a field archaeologist, unless one specifically indulges in trying to understand the ship's construction, the philosophy of ship-building, as it was recently called (Hocker and Ward 2004). It was only in exceptional circumstances that an archaeologist was prepared to do this, despite a great number of enthusiasts from the maritime world.

When the Utrecht ship was discovered in 1930, it was not the interest of archaeologists that led to its careful treatment. It was the maritime industry that provided for its reconstruction and conservation (Wijk 1933). It did so on the correct assumption that this was important heritage, but on a totally simplified and utterly mistaken interpretation that the ship represented Frisian dark age seagoing trade. Detailed archaeological scrutiny could have helped, but was only engaged in much later (Vlek 1987; Moortel 2003). The ship was preserved as heritage, not as a source for history (Lowenthal 1996). Evidently there were stakeholders in archaeological heritage other than professional archaeologists!

A similar situation occurred when the first ships were discovered during the reclamation of the polders in the former Zuiderzee. It was the holistic approach of the governors of the mammoth project that decided these ships should be recorded, not any interest from the archaeological discipline. This was simply not what archaeologists did. There is always the odd exception, of course: relatively early on, during the German occupation in 1942, the Archaeology student P J R Modderman (the later prehistorian and Leiden Professor) was put in charge of archaeological observations in the desolate Noordoostpolder. His approach was comprehensive. It concentrated on understanding the genesis and the palaeo-landscapes in the vast area, but integrated ship archaeological research as part of that agenda (Modderman 1945), as illustrated by his



Figure 6.1 The excavation of an 18th-century inland trader in Flevoland in the mid-1980s. Archaeology as part of the reclamation project was taken up 1942. It took the form of excavating and documenting ships as found during the process of putting the new land to use. After the Second World War this activity was integrated into the State Service for Archaeological Excavations. In 1954 it was back with the development agency. Excavating one ship after another was considered a technical routine rather than what archaeologists do. It took another twenty years before maritime archaeological research questions and considerations of frugal management of the resource started to influence what happened in the 'ship-archaeological department' (photo: RIJP)

exemplary research of a medieval cog. Nevertheless, it was not archaeologists but other stakeholders that stressed the importance of this ship archaeological heritage.

However, archaeology was not really prepared to accept the dominance of other stakeholders. What happened shortly after the war is illustrative. The National Service was established, with specialists to set the agenda. There were some troubles, mainly to do with the position of the director and the relationships of the new service with the long-established archaeological institute of Groningen University. During the course of this wrangling, taking care of the ship finds of the polders, that now cropped up in great numbers, actually became one of the explicit missions of the new 'service'. However, the specialists that were to define what archaeology was about had their interests elsewhere (largely within studies of settlement patterns and local history rather than with the disparate evidence of transport and trade) and the job was left

to technical and museum staff, with obvious consequences (Ypey 1952; Heide 1974).

The other stakeholders, the governors of the reclamation and the new inhabitants of the developing area, were well served, but archaeological research was not and the archaeological agenda did not include maritime matters. In 1954 the National Service's management therefore concluded that maritime matters were not 'core business' and that they should be disposed of, as was subsequently arranged with the reclamation authority. It was simply not accepted that other stakeholders had a dominant influence on what archaeologists do. To put it cynically, the people involved were not archaeologists and as archaeology is what archaeologists do, this was not considered archaeology. It was heritage management though. It had a social function, perhaps more so than archaeology as defined by the specialists. The emerging public, the new population of the polders, was served as a serious stakeholder, decades before article 9 of the Valletta

Convention urged archaeologists to adopt this view of the public (Heide 1955; Hoffland 2004). But this wider heritage agenda was far beyond the archaeological priorities of the time; archaeology was the prerogative of professionals in government and academia and

there was no need for reflexive discourse beyond the inner circle, let alone with other stakeholders. Archaeologists knew what they were doing and knew what archaeology was.

### Maritime and mainstream

If maritime matters were to be dealt with in archaeology or heritage management, this was to be outside the archaeological mainstream. The fact that this situation occurred and that it continued for at least another 30 to 35 years is remarkable, to say the least, particularly if you look at maritime heritage issues and the maritime archaeological potential in the Netherlands. On the other hand, however, it will sound all too familiar to a British audience. It was at least as remarkable that it took another 20 years, until the mid-1970s, before maritime archaeological research questions started to influence what happened in the excavation and recording of one historic shipwreck

after another in newly reclaimed land (Reinders 1986) (Fig 6.1).

Simultaneously, underwater heritage issues began to become serious. Again it was definitely other stakeholders rather than archaeologists that pressed government for action. But in the late 1970s mainstream archaeology, as the prerogative of government and academia, was in the same comfortable position as before, and simply did not want to address the complicated issues of intensive wrecking and treasure hunting or the impracticable circumstances for research that qualify the UCH. Nor did it really want to extend its priorities to the post-medieval period.

### Awkward interim solutions

In response to the Council of Europe (Roper 1978), problems confronting local and national museums, and questions in Parliament, government decided to take practical measures. What practical measures? The answer was as simple as in 1947: let specialists decide on that within the framework of a limited budget. Just like the previous example it took several years finally to take that decision, but nevertheless it was taken. Again this rather realistic approach of government put the professional employee in a comfortable position. But of course there were differences between 1947 and 1980, between mainstream archaeology and maritime management matters. It was not a range of specialists that were recruited to define what could and needed to be done, but a part-time employee, and getting regulatory clarity was actually the first priority. It took until 1985 before UCH was unequivocally brought under the blanket protection of an obligation to report accidental finds and the prohibition of excavation

without permit (at that time still the prerogative of government and academia), and before a decision was made that the provisional underwater archaeological research that had started with the collaboration of many volunteers was to be extended and that more staff could be recruited. In view of the urgency of maritime heritage matters and the political will to do something about it, a new, albeit small, government agency was set up alongside the heritage establishment (Fig 6.2).

Many will be at least superficially aware of some of the work that was carried out in the subsequent 20 years. Rather than completing this, admittedly somewhat historical, exposé with ever more detail of contemporary dilemmas, successes, and failures, the paper will now try to link the background presented to some of the contemporary developments in the orientation of government and the way maritime matters are assessed.

### Developments in government

The decisions of 1980 and 1985 were an institutional anomaly and provisional for that reason. Government had already started to redefine its position and was working towards less rather than more government

involvement and fewer rather than more government agencies. Already in the Ministry of Culture the general ideas that were being developed went in the direction of redefining government's role and of inte-



Figure 6.2 The small department of archaeology underwater (AAO) at Alphen aan den Rijn was established in 1985. It made a considerable contribution to development-led archaeology. The picture shows the first interventions in the large-scale 'Slufter' project in 1986. This project consisted of building a 90,000,000m<sup>3</sup> storage site for contaminated sludge, seaward of the Rotterdam port area. During the building process six shipwreck sites, dating from the Middle Ages through the 19th century were discovered, investigated and mostly excavated. Simultaneously the department invested in research-led maritime archaeology in the Waddenzee, in order to set an example of what can be done with important sites rather than just collecting goodies (Photo: AAO)

grating the several government agencies involved in the heritage continuum. The rather isolated position of underwater archaeology was therefore provisional and untenable in the long run and perhaps quite rightly so. Isolation can be regarded as 'splendid' isolation, but has major drawbacks as well, as the isolated development of maritime archaeology in reclaimed land had shown all too clearly.

Rather, maritime matters were to be accepted as just one aspect of the heritage continuum, with their own idiosyncrasies, of course. The other institutions, like the National Service, however, could not easily accept any integration with additional aspects of archaeology or heritage management other than those they had themselves defined as important. Developments at

government level continued and proved them wrong: 1994–98 saw the integration of all maritime archaeology under the aegis, within the organisational brief, of the National Service for Archaeological Heritage. 2004–06 sees the integration of the archaeological, landscape, and built heritage services.

This tendency towards integration of government services is not just an efficiency operation, although it is sometimes presented as such (both by proponents and by opponents). Everyone who has ever observed such operations knows how much of a certain kind of efficiency is lost as soon as another efficiency principle is introduced. Everyone knows how much capital (human and otherwise) tends to be destroyed, so efficiency cannot really be the reason, can it? Fundamentally, governments are trying to redefine their role, in an unstoppable way. Previously, government adopted public interests, just because they had been accepted as public interests. When practical measures had to be taken, the approach was simple: 'let specialists decide on that within the framework of a limited budget' (a phrase that is now familiar), putting the professional in a responsible and in some ways comfortable position. Nowadays, public interests are more or less constantly redefined. When a dilemma does occur and measures have to be taken, the approach is as simple in principle, but fundamentally different, and much more complicated in practice: let society decide on that within the framework of the budget it is prepared to allot. Professional advice, of course, is still much needed, but the professional employee is in a totally different position.

This redefining of the role of government goes hand in hand with another tendency, at least in the Netherlands, although the same tendency can be seen in many other European countries. More and more decisions prioritising public interests are deferred to the local or regional level of government. Discussion over whether local government can or cannot decide wisely between heritage issues, housing, local development, schooling or safe traffic, will not be considered here, because of course local government can. But the relevant issue is that all such political debate ignores maritime matters on an *a priori* basis. (However, the Newport ship may be the exception proving the rule, just like the polder-area may be in the Netherlands).

This tendency to defer decisions on specific priorities to local level goes hand in hand with another, sociological, tendency affecting archaeology and the heritage discipline. Creating and reinforcing local identities of people who risk becoming 'root-less' as a

result of globalisation, has become one of the political justifications for heritage endeavours.<sup>2</sup> The specificity of landscapes and their biography is the archaeological theoretical basis through which that function is served, that gives people a background with time-depth of the area in which they live (Ingold 2000; Bloemers 2003). There is nothing wrong with that, although perhaps it should not be the only way in which archaeology develops. It certainly reinforces archaeology's social role. But again, what of maritime matters? Instead of including them, the new tendencies have the potential to reinforce the traditional biases of mainstream archaeology and agenda setting in archaeological heritage management. Maritime matters simply do not seem to matter.

Moreover, how can a local community decide on the importance of local heritage where no local community exists? Nobody lives where most maritime management matters crop up – the large stretches of hazardous waters (Fig 6.3). Maritime heritage matters are never to be weighed against local welfare or schooling. Are they more important for that reason? No. Are they less important because there is no local community backing them up? Not intrinsically. Corollary to the tendencies outlined, there are problems with regard to the generally accepted professional evaluation of sites. If one looks at the matter with regard to the intricate balance between local, regional, and national responsibilities in government, it is quite convenient that the importance of individual sites is generally assessed as of local, regional, or national significance, with world heritage representing the highest level.

What, however, is the local importance of a wreck site? There may be a local link in a coastal site, but basically the importance of a wreck always transcends its location. By their very nature ships are trans-national and trans-cultural, a great asset to identity in present day multi-cultural society, by the way, but not recognised in the accepted systems of allotting significance. The local importance of prehistoric habitation sites on submerged continental shelves is another issue not dealt with on a local or regional scale. But does that make each and every wreck site or submerged site of national or supra-national importance? No, perhaps not, but the scale local – regional – national is utterly inappropriate and other scales of significance should be developed and accepted.

Accepted by whom? In what role? What this all stresses is that the only way in which maritime heritage can be managed is if the national government

takes responsibility or continues to take responsibility, whether it likes it or not. It is essential that maritime matters are specifically dealt with by curators who are well informed. It is not only the circumstances of finds and the often exceptional quality of the heritage resource, but also the different administration and different ways of decision making that set maritime matters apart. This is not to say that maritime heritage management as such should be disconnected from general heritage policies. On the contrary, even if that were at all feasible, it would be self-defeating. It is within the heritage continuum that maritime sites have their very specific, fine-grained quality, but in the absence of local stakeholders they need a public defender.

Unfortunately, curatorial practice deals with particulars and that is not what national government wants

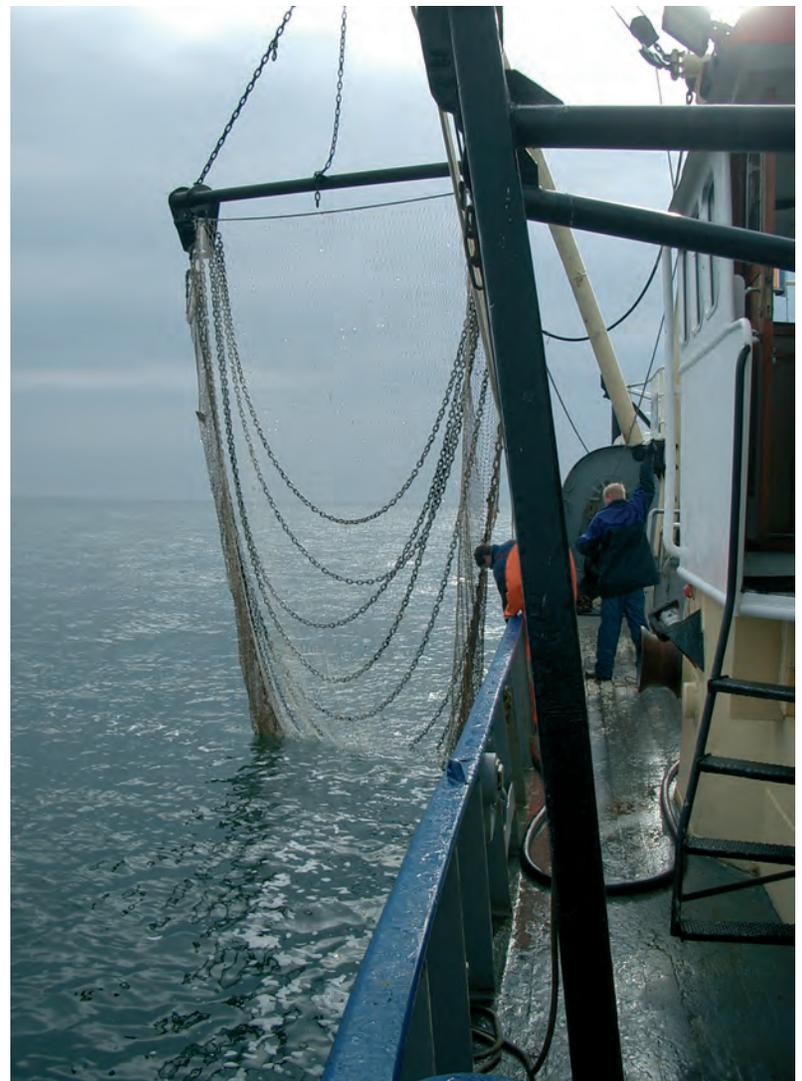


Figure 6.3 Fishing for Pleistocene fossils and fresh fish in the North Sea in May 2003. Is maritime heritage an exception to the rule that the local community should decide on the importance of local heritage? (Photo: T. Maarleveld)

to be bothered with, unless they are of utmost importance and politically sensitive. The political sensitivity of maritime matters is not in the local political arena, not in the local dialogue between stakeholders in

which civil society takes decisions (as demonstrated by the recent Goodwin Sands or *Rooswijk* case; Duivenvoorde 2006, Maarleveld 2006). The stakeholders are simply spread too wide and far apart over the globe.

### The challenges ahead

There are political sensitivities, though. Too lenient an approach to activities directed at the UCH (to use the phrase from the 2001 UNESCO convention) risks a situation which could become disastrous, not only for the heritage in question, but also for the credibility of government's other policies regarding the heritage continuum. Actually it is perhaps only through international obligations and international friction that governments are prepared wholeheartedly to take responsibility (Dromgoole 2004) – isn't the HMS *Sussex* affair sparking discourse in Britain, the Mediterranean countries, Spain, and the US alike? All maritime practitioners should be aware that even in the absence of ratification and entry into force, the UNESCO convention serves an important purpose, perhaps a more important one than the local stakeholders and pressure groups considered above. On 2 November 2001, a range of governments, including the governments of the UK, Germany, Norway, France, the Netherlands, and even Russia and the United States, committed themselves to unilateral adherence to the operational rules of the annex of the convention, as adopted. That is a political fact. Governments or politicians that deliberately decide to act otherwise can seriously be embarrassed in the international and national arena, especially if some of the international stakeholders criticise their good governance and duty of care.

There are other international agreements, too, that can make maritime matters politically sensitive. In preventive or development-led archaeology (or the organisation of mitigation in activities incidentally affecting the UCH) there is no reason why maritime archaeology should not take the lead or at least be in the forefront. The Valletta Convention includes them and the obligations for impact studies are quite clear.<sup>3</sup> Ways of quantifying the resource are dealt with elsewhere in this volume (see Kelleher, Dix, and Staniforth, all in this volume). In the Netherlands trends are now monitored by four-yearly surveys addressing intrinsic matters as well as the effects of policies and changes in policies (Lauwerier and Lotte 2002).

A third level of attention is presently perhaps even more problematic in the European context. This is the

often headache-inducing dynamic management of the resource in dynamic environments. At the start of my career, when I was enlisted as a specialist to decide what was most important, it was such dynamic environments that presented themselves to me as the most important asset for maritime archaeology to look into. The case of the Waddenzee presented itself as of global importance. Now, after several decades, as an expert with a longer track record, I still say the same thing: in dynamic environments good research results can be achieved with relatively small investments. Such dedicated research provides a good example. It prevents total loss of the heritage by natural agents and it provides justification for policies discouraging exploitation for collection and sale. Best results, for fewest problems, what more does one want? However, current developments in archaeology and society do seriously distract from any management of dynamic environments. Development-led archaeology is the main focus. Through the funding system it is also a milk cow. Curatorial efforts concentrate on attending to planning. They concentrate on being present at stakeholder debates at a local or regional level. They concentrate on interference with these debates in making heritage and archaeology an issue. Dynamic environments, such as in estuaries and tidal basins, do not organise stakeholder debates before continuing their impact. Stakeholders do not live there, but are spread far and wide. Who will discuss and who will pay for the monitoring, safeguarding and, if necessary, intrusive research of the extremely important sites in such areas like the Waddenzee? The credibility of restrictive protective policies is at stake, as restrictions are at least partly outranged by natural processes. Who will take responsibility in a complicated web of non-local stakeholders? The heritage in dynamic environments is in need of a public defender. How do we convince government of this, despite its changing orientation? The solution may lie with international legal instruments and co-operation. The Valletta Convention specifically mentions the obligation to define archaeological reserves and manage them.

In conclusion one could say that maritime heritage should not perhaps be treated differently from other

types of heritage, though the organisation of its management unavoidably needs to be different. The checks and balances of stakeholder interests and government guidance cannot be resolved in the 'local' political arena. Which 'local' arena would that be? Interests in maritime matters are simply too much divorced from their local setting. Stakeholders are never local, they are dispersed far and wide. Nor can the significance of maritime heritage be measured on a local, regional, or national scale. Other, international, criteria need to be developed. Specific curatorial expertise, versed both in archaeology and in maritime matters and decision-making, needs to be deployed to warrant the public interest. For reasons of scale, this curatorial role should probably be effectuated at the national level.

The challenges ahead include planning issues, but perhaps even more importantly they include control

over initiatives and activities directly targeted at underwater sites. A better understanding of the resource, both in numbers and individual sites, and in 'landscapes' and preservation contexts, needs to be complemented by the preferential management of highly sensitive areas. Such management should perhaps take least interference as its starting point, but should nevertheless ensure that good use is made of the resource, in terms of both accessibility and research. In the maritime arena it is unacceptable and self-defeating if all interference is development-led. Comprehensive and considerate maritime management matters. It can only be catered for at the national level, as it includes international management of heritage with different links and differential significance for international groups as well as active management of specific high-value areas. It will not be easy, but it is evident that such maritime management matters.

## Notes

- 1 In what way have the biases changed that affect the translation of reported field-observations and evaluations into new insights into history as compared to other ways of organising archaeological fieldwork? Interesting questions, certainly. And it needs only very superficial knowledge of the history of sciences to realise that there is a relationship between the organisation of a discipline and its biases. Present changes may induce positive effects of differentiation, whereas the efforts at standardisation should not evolve into an uncreative straightjacket.
- 2 Likewise, in the process of unification of Europe, strengthening of local identities is a route to reduce nationalist sentiments.
- 3 For instance through the Convention on Environmental Impact Assessment in a trans-boundary context (Espoo 1991).



# *IN SITU* PRESERVATION VERSUS ACTIVE CONSERVATION: ARE WE PREPARED FOR THE DELUGE?

*By Ian Panter*

## Introduction

Following the introduction of the National Heritage Act in 2002, English Heritage assumed responsibility for maritime archaeology in English territorial waters (see Oxley, this volume). This, coupled with well-established ongoing initiatives, has helped raise the profile of underwater archaeology and highlight the existence of a potentially rich resource including shipwrecks and relic prehistoric landscapes, structures, and artefacts. Whilst the preferred management strategy remains one of *in situ* preservation, it has to be recognised that the marine environment is simply more dynamic than that on land, and therefore that long-term preservation for selected 'sites' may only be achievable through recovery and active conservation.

The seabed is also facing unprecedented pressures from development, with proposals for wind farms, gas and oil pipelines, and updated harbour infrastructures all potentially impacting on and exposing previously buried remains.

Scuba diving as a hobby continues to increase in popularity and whilst schemes such as the 'Adopt a Wreck' programme initiated by the Nautical Archaeology Society aim to educate the recreational diver in 'good practice' on underwater wrecks, including non-recovery of artefacts, fixtures, and fittings, the potential for material to be legitimately retrieved from the seabed still exists.

A recent initiative undertaken by the North-East branch of the Nautical Archaeology Society (funded by the English Heritage regional capacity building scheme) has provided an insight into the nature and quantity of material being retrieved from wrecks off

the coast of Yorkshire and the North-East. A number of diving clubs were visited in order to record recovered items, and approximately 300 items were looked at. Most of these were relatively 'modern' and in the main comprised brass scuttles and other ships' fittings. A number of possible ancient boat timbers had, however, been collected from a beach location and now require conservation treatment.

Although 'modern', the material does still require specialist conservation advice as the application of inappropriate techniques may result in the inadvertent loss of information as well as other more fragile components. This pilot project, whilst providing a snapshot for one part of the coast, serves to demonstrate the enormous potential for material requiring professional conservation advice (Green *et al* 2005).

Another initiative, again commissioned by English Heritage, may well add further to the recovery of material from the seabed. Protocols for the reporting of artefacts from aggregate dredging operations (Wessex Archaeology 2005) have recently been adopted by the British Marine Aggregates Producers Association and the impact of this will be closely studied.

The potential for the retrieval of artefacts and other objects is high and therefore the need for access to professional conservation advice and services has never been greater. Is the conservation profession ready to meet this challenge? Are there sufficient resources, in terms of skilled personnel, laboratory facilities, and funds, to cope with growing demands? This paper attempts to bring the issues to a much wider audience and concludes with a number of suggestions for redressing the problem.

## The issues

The capability of the profession to meet these increasing demands depends upon:

1. Having sufficient numbers of trained and experienced maritime conservators.
2. Having well-equipped laboratories capable of handling large and heavy artefacts and structures.
3. Adequate financial resources in place.

## Personnel

There is a widely held view within the profession that the provision of archaeological conservation within the UK is in decline, and this is certainly supported by the results of a number of surveys that have been carried out over the last two decades by the then United Kingdom Institute of Conservation (now reformed as the Institute of Conservation). An initial survey of 1987 (Cameron *et al* 1988) was undertaken in order to assess the then current level of provision for archaeological conservation within England and Wales, establishing where the majority of conservators were employed and how many were actually employed as practising conservators. The data suggested that there were in the order of 50 'full-time equivalent' posts, the majority of these being employed in either national or local authority operated museums. A small percentage of conservators were also employed within universities, independent units, and government bodies, or were self-employed. The wider archaeological community was included in the survey in order that UKIC could assess the future requirements for conservation provision, and nearly 50% of the respondents implied that conservation provision was inadequate for their needs. Conservation appeared to be on the verge of a new dawn, with demand outstripping supply.

So what is the situation today? Well the new dawn appears to have been a false dawn as the data from the latest survey conducted in 2001 highlights (Stevenson and Suenson-Taylor *in press*). Whilst employment opportunities remain static (again the majority of conservators are employed in national and local museums), the actual number of 'full-time equivalent' posts has fallen to only 35 throughout England and Wales. Whilst a drop of fifteen might, at first sight, appear as rather insignificant, it does in fact represent a serious loss in both numbers and skills to the profession. If such a decline continues over the next couple of decades then one has to question whether the UK will have the capacity for the long-term preservation of existing cultural heritage, let alone the ability to deal with new challenges presented

by the increased awareness and potential of maritime archaeology.

The current skills base of the profession is also of concern, especially as material from a maritime context presents a wholly different set of conservation problems that are generally not encountered in the more typical terrestrially derived material. This issue was the focus of a more recent survey undertaken by the Archaeology Section of UKIC in 2004 (Panter and Sutherland *in press*). Unlike previous surveys that had consisted of direct mail shots to the wider archaeological community, this one was conducted as a web-based questionnaire aimed at UKIC members only in order to gain information on a number of issues relating to maritime archaeology and conservation, including provision of training, perceptions of the problems of maritime conservation, and whether members felt in a position to undertake treatment of marine artefacts.

Response was low, with approximately 15% of the potential membership returning questionnaires. Of these though, 71% asserted that they had sufficient skills and knowledge of maritime conservation and felt confident about carrying out treatment on such material. However, it is interesting that almost all stated that their contracts of employment precluded their working on material that was not part of their collection or fell outside the remit of the collecting policy of the employing institution. This is not surprising given that the majority of conservators are employed either in national or local authority organisations that have clear and precisely defined areas of operations. Independently employed conservators are few and far between – a recent article suggested that there are currently only two independent archaeological units in a position to employ conservators (Spriggs and Narkiss 2005), so the future does not bode well for the capacity to undertake maritime work.

Training was identified as crucial, both at degree level and as continuing professional development. Whilst it is clear that the conservation of maritime material forms an element of more general conserva-

tion training programmes, it was felt that there was the need for further courses covering such issues as maritime law and salvage rights as well as the general maritime archaeology elements. Integrating conservation training with maritime archaeology was considered highly desirable and the way forward.

Following the recent closure of the conservation programme at the University of Durham there is now a pressing need to reassess the provision of primary conservation training within the UK. There is the

demand for an integrated maritime archaeology and conservation course as a number of recent initiatives including University College London, Nottingham, and Southampton attest. However, problems with access to suitable artefacts and materials needs to be looked at further, and none of the current courses have the capability of handling large and heavy structures or artefacts, such as iron cannons, which is a situation that needs to be addressed if students are to benefit from the experience.

## Facilities

Awareness-raising initiatives such as the archaeological wood survey (Nayling 1989) served to highlight the problems confronting the archaeological profession and the treatment of waterlogged wood. Inadequate facilities were identified as one of the reasons why a large percentage of recovered waterlogged wood had not been conserved, and why the oft-followed route was one of record and discard. To counteract the imbalance between what had been conserved and what needed to be conserved a number of initiatives were proposed, and this led to the establishment of improved wood conservation facilities in York (Fig 7.1). This facility in York, together with the commercial facilities operated by the Mary Rose Trust in Portsmouth, as well as the National Museum of Scotland, means that the UK is now better placed than it was for the conservation of waterlogged wood.

All these facilities have access to equipment including large-scale treatment tanks, freeze-driers and heavy

lifting gear; these represent not only substantial capital outlay but are also prerequisites for well-resourced organic conservation facilities. Such equipment would also be essential items for a well-equipped maritime laboratory, but this does not mean that the UK is well catered for in this respect. On the contrary, as Spriggs and Narkiss (2005) point out in reference to possible conservation required for the *Stirling Castle* (a designated historic wreck site) or HMS *Sussex*, 'there are no facilities in the UK with the capability to undertake such projects without considerable extra expenditure or new lab space, facilities, and staff'. Surely it is better to prepare now than to be caught unawares. It is inevitable that a large-scale maritime project is around the corner – the regulatory authorities may pursue *in situ* preservation as the preferred management strategy but a scenario whereby the environment is simply too dynamic is likely to develop, and then preservation by record becomes the only option. It is simply a question of time.

## Funding

Adequate resources are, without doubt, the crux of the matter, and key to reversing the decline in conservation provision. Finding a solution is difficult though, given problems with current funding levels of the majority of public institutions and government bodies where changing priorities have seen a shift of emphasis towards what could be considered 'front of house' activities and away from the more traditional, conservation-oriented, collection care activities.

This shift has contributed to the decline in conservation provision with staff losing jobs and laboratories being closed, epitomised by the decline in the regional facilities offered by the old Area Museums Councils. The void created has yet to be filled.

The change in funding of rescue archaeology, brought about by the introduction of Planning Policy

Guidance Note 16 (DoE 1990), has had significant impact upon the archaeological profession, including conservation. The majority of independent archaeological units now have to operate on a strictly commercial basis where operational costs and profit margins are of paramount importance to their survival. The employment of 'in house' specialist staff becomes hard to justify and is not viewed as a high priority if services can be bought in from external sources. However, as we have already seen, such external services are now at risk either through changing museum priorities or an inability of museum staff to work on maritime material due to contractual obligations.

It has been suggested that something in the order of £50 million is spent annually on developer-funded



Figure 7.1 York Archaeological Trust Laboratory

archaeology, which is a significant leap forward from the days when the majority of rescue archaeology was funded from central government. Given such a buoyant market one would expect all archaeological science professions to be riding the crest of the wave, not to be subject to declining resources. Whilst this maybe a naïve view, the figures certainly suggest that there are resources available, which could be used to reverse the over-all trend of declining provision.

PPG16 is founded on the principle of ‘the polluter pays’ and it is unlikely that there will be any significant shift away from this over the coming

years. Coupled with current funding priorities for the UK government, any initiative will be dependent upon partnership funding, which is going to include commercial input. However, whatever monies are made available from commercial activity will never be sufficient to maintain a long-term conservation facility – those commercial facilities operated in York and Portsmouth are unlikely to make enough money to cover annual salary costs from commercial activity alone. Therefore some central funding is necessary to maintain conservation laboratories.

## The way forward?

There are a number of initiatives that could be employed to ensure that the conservation profession has the capability to meet the ever-increasing demands that maritime archaeology presents, both now and in the future.

1. Increased training opportunities through higher education programmes that integrate archaeology and conservation, providing fully resourced facilities with the potential for conserving large-scale artefacts and structures. Training to degree level is essential, and courses for continuing professional development are desirable.

2. Setting up of a number of well-resourced regional maritime conservation facilities that can offer a commercial service but with partnership funding from a number of sources to ensure appropriate levels of funding and long-term viability of operation. A strong

research agenda is also essential that will investigate improved conservation techniques as well as *in situ* preservation issues. Such a facility may serve as a regional resource centre (or regional store?).

There is no reason why a regional conservation facility could not be linked to a local university and therefore offer training programmes to degree level at the same time as offering a commercial service.

Whilst *in situ* preservation will remain as the preferred management strategy for some time to come, there is a high probability that material will be retrieved requiring specialist conservation advice and assistance. Active conservation intervention must be viewed as an integral element of any management strategy or plan and hence it is essential that there exists both the personnel and facilities to deal with all eventualities.



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## SECTION THREE

# ACCESSING THE MARINE CULTURAL HERITAGE

The ever-increasing discovery of submerged sites and structures provides both challenges and opportunities for access, presentation, and promotion. When dealing with the marine cultural resource an important aspect to take into consideration, together with the definition, quantification, and management, is accessibility to stakeholders, professionals, and to a wider audience – particularly the general public. This developing aspect of marine heritage management demands the provision of opportunities for new involvement and new participation, in addition to a reconsideration of traditional approaches to presentation.

Familiar methods of presentation such as museum displays and static exhibitions are being re-examined to help develop innovative approaches to attract the public and stimulate curiosity about the human past. The ability to interact with heritage is vital in order to awaken wonder in the viewer or visitor. Such engagement and sharing of information on the story of our past promotes interest and enthusiasm which, in turn, generates increased popularity and attention.

The process of providing access to marine cultural heritage begins in the hands of professionals through management approaches. The sharing of results and achievements, employing new technological approaches, supporting new research and involvement, and utilising new ideas and tools are all required to promote understanding of the past for a diverse public audience. This is achieved through advanced outreach and research programmes.

Four cases are presented in this section, all four with different backgrounds, experiences, approaches, and achievements. Two contributors have a museum background – Keith Wijkander, General Director of the National Maritime Museum in Sweden, and Christopher Dobbs from The Mary Rose Trust in Portsmouth – and two work within government organisations – Jeremy Weirich from NOAA Office of Ocean Exploration and Ian Oxley, Head of Maritime Archaeology, English Heritage. They provide four different views of national and international experiences.

The American experience demonstrates that collaborative projects, advanced technologies, financial support, and innovative use of the internet play a key role in successful and effective education and outreach. The English experience is focused on assuming new roles and taking on new challenges and responsibilities for the understanding, management, accessibility, and enjoyment of the cultural heritage. It is recognised that marine archaeological remains often require specialist and technical skills to be deployed for their investigation and presentation. Sites can be situated in hazardous environments, others are managed through *in situ* preservation; these factors can limit the potential for wider public participation on a practical level and require new approaches to access.

The remote aspect of submerged heritage presents extra challenges for museums: the need to recreate for the general public what diving archaeologists have experienced and investigated at first hand requires considered and innovative solutions. This seems to be the experience of the Mary Rose Museum in Portsmouth, whose role in the United Kingdom has been a pioneering one. Drawing on twenty years experience of presenting the *Mary Rose* and maritime archaeology, it is possible to compare results and approaches with those of other museums such as the Swedish experience where the *Vasa* (and associated museum) can be considered as the national marine archaeological icon. Another inspirational example is provided by the Viking Ship Museum in Denmark, which is commended for the experience it provides visitors through the variety of ways in which it promotes access to maritime archaeology.

The development and delivery of successful access and education programmes is intrinsic to the long-term management of the marine archaeological resource. Such approaches are the building blocks on which public understanding and appreciation is fostered. The papers in this section explore problems, issues, and a variety of solutions, which are helping to open up the exciting world of submerged heritage.





# THE ROLE OF THE TRADITIONAL MUSEUM

*By Keith Wijkander*

## Introduction

This paper is titled ‘The role of the traditional museum’ and concentrates on the role of museums in curating or managing the marine cultural heritage.

To try to reach some conclusions on the role of the traditional museum it is useful to reflect on some of the most common terms of reference used for heritage, such as ‘cultural history’, ‘cultural heritage’, and ‘marine’ or ‘maritime’, and those for individuals and organisations such as ‘academics’, ‘heritage administrators’, and ‘museums’. Through contrasting these terms with each other it is possible to distinguish

different approaches to the management of marine cultural heritage.

This paper is written from the perspective of a professional who has studied medieval history before working in the Swedish Ministry of Culture, and now fulfilling the role of the director of the Swedish Maritime Museums. This background within the academic and political spheres has provided experience of differing approaches to heritage, which are drawn on within the text.

## Cultural interest, cultural history, and cultural heritage

It can be unusual for individuals to change course within their professional careers, but it can be common for people working within heritage to change between university, museums, and heritage administration posts. This may be reflected in the fact that ‘cultural heritage’ is recognised as an official term, and has a political, administrative, and organisational use and meaning. This use of this terminology within Sweden has developed over the years; similar development and use of the term ‘cultural heritage’ may also be seen in other European countries.

A brief review of the etymology of the term ‘cultural heritage’ demonstrates that it was widely used during the 19th century to describe the idea of society growing from its roots into the future (Smith 2004). This idea is not only seen in political conservative ideas, but also in ideas surviving from the romantic era, being found in powerful movements as for example arts and crafts. The idea of a cultural heritage at that time was very much linked to the idea of the nation, acting as a bridge between the old society and the developing society of industrialisation. In this situation ‘cultural heritage’ has been given a transformative context.

It is not appropriate to take an in-depth look at the history of ideas and mentalities over the last 100 years. However, it is possible to conclude that the experiences of World War I led to a mental shift from the end of the 1920s onwards. The result is a concentration on the intellectual side of the human mentality and the idea of rationalism becomes the dominant philosophy. This is partly an Anglo-Saxon phenomenon which is influential in the ideas of Marxism. Conversely there is the example of national socialism in Germany which in many ways takes up and builds on (perhaps perverting) the older ideas with their roots in the romantic era. The Nazi ideology is full of dim and unclear references to *blut und boden*, *heimatsfuhlungen*, and so on. The result is that even the idea of the cultural heritage becomes affected with associations of the dangerous and cloudy world that brought so much terror to Europe (Evans 1999; Fawcett and Kohl 1995; Diaz-Andreu and Champion 1996).

In Sweden the term ‘cultural heritage’ became contaminated during the years following World War II. The cultural heritage became the cultural history, and cultural values tended to become items of cultural

interest. This reflects a movement towards the intellectualisation of the human mind, an attempt to understand rational reasoning as the grounds for human action and the corresponding surprises of the world of thought. All individuals are humans with feelings and thoughts, but when a new and modern society is built on the fundamentals of capitalism or the ideas of Marx and Lenin, too much concentration on thinking can be a dangerous process.

The return of cultural heritage marks the end of the era of 20th-century modernism, as well as the era of the bipolar political world. Now within the post-modernist period it is also the post-cold war era.

Within Sweden the idea of the country's cultural heritage became reaccepted during the 1980s. This was partly as a result of the use of common language, partly as a result of international influences. For

example, the Council of Europe formed its special committee on cultural heritage during these years.

For museums and heritage administration as well as for arts and humanities in the academic sphere, this marks a fundamental shift – from a defensive position, trying to defend the heritage against dominant social trends, to a rather responsible position of responding to public demand in relation to history.

So, what is the public asking for today? Perhaps we can say that cultural demands in our time stress the future as well as the past, reason as well as feeling, intellect as well as intuition. This is the standpoint which one takes when dealing with cultural affairs in general as well as when dealing with the marine cultural heritage (for further discussion of the construction of cultural heritage and its social meaning see Edson 2004).

### The character of the marine cultural heritage

Moving now to consider marine culture heritage, is this heritage something special? And if so, why is it so special?

The answer to this question is, yes, it is special. This quality does not lie in what maritime cultural heritage can tell us intellectually, but in how it can reveal a new side to human nature. It may be controversial to say that marine archaeology has not been very successful in providing new knowledge about the past. This is not to say that it has not been successful in other areas, and it would seem that marine archaeology is a discipline with a bright future ahead of it. Marine archaeology is special in terms of excavation techniques, but not in terms of formulating models and posing questions to help look at history from new angles. In these terms marine archaeology is a complement to ordinary archaeology, not an alternative.

The marine cultural heritage does not affect the general public because of the intellectual knowledge that it can provide about the history of the past. It affects people merely as it stimulates new thoughts and feelings.

Many historic remains within our environment tend to be either still in use, which is the case with many old houses, or they are abandoned and are ruins or relics, which means that they are in existence but they are not functional. Historic remains become characterised as archaeological when they have been destroyed and are buried under the ground. In effect, as long as items are not referred to as 'artefacts' or 'pieces of art' they will be in general use and

will eventually be abandoned, ruined, or mostly destroyed; this is when they become archaeological remains.

#### In use, abandoned or destroyed

On the other hand the marine cultural heritage signifies the word 'lost'. The archetype of marine archaeological remains is, of course, the sunken ship. And this signifies 'the lost item', implying that it could be found again. Marine heritage and marine archaeology is therefore the idea or the hope of finding again what once was lost.

The sunken ship has much in common with the ruin. But while the ruin is abandoned, the sunken ship is lost; this is a fundamental difference, according to the signals from the human mind or psychology. However, while the abandoned and sunken ship is common in the marine sphere, the lost or abandoned is the exception in the world of ruins.

But what is it that sparks interest in Indiana Jones, this archetype of the adventurer in the past? It is surely not the ordinary ruins, such as old churches or castles. It is surely not archaeological remains, such as the cultural layers of medieval towns or burial fields of the Iron Age. No, it is the ruins, the exceptional lost and found-again ruins. So, Indiana Jones is an atypical archaeologist as long as we regard him as a land-based archaeologist. But if we regard him as a marine archaeologist, he will be a typical archaeologist, searching for the intact structure from the past, lost

and found again. This is what inspires public fascination with the marine heritage.

Another element of marine heritage is that which is usually called 'maritime heritage' and is related to the general maritime sector, whether sunken or not. This maritime sphere provokes special interest, in much the same way as the lost item which has the

potential to be found again. There is something in ships that captures interest in a very specific way. The maritime world, which is heavily associated with the world of marine cultural heritage, raises public interest in a way that could be characterised as intellectual. However, this interest goes beyond the intellectual sphere.

### Academics, heritage administrators, and museums

The majority of contributors to this volume would be defined as academics or heritage administrators, and this is interesting when considering the wider relationship between university academics, the heritage administrations, and museums.

Viewing this situation from a distance, it could be said that these three groups of professionals reflect the growing specialisation within the heritage or cultural sector over the past hundred years or so. They stand for the promotion of knowledge, the promotion of preservation, and the promotion of public information respectively. During the 20th century these three aspects were not closely aligned, but within Sweden over the past ten to fifteen years there has been a very clear movement to bring these aspects together into a single concept.

Closer co-operation between these aspects – knowledge, preservation, and public information – is vital for the future. The cultural sector, in common with every other sector, has to be aware of the risks of marginalisation. This goes for the whole cultural sector in general, and also for the specialised branches within the cultural sector, such as marine and maritime culture.

The field of museums and their presentation of the past is an interesting area of study. Museums can be viewed as institutional attempts to present the heritage phenomena of the present day, through reflecting traces of the past in the context of history. Hence,

there are museums which reflect the heritage of the nation, in addition to museums that reflect the greatness and importance of special branches or affairs. This includes maritime museums, which present the greatness of shipping and mariners, and the overwhelming importance of shipping companies and their fleets to the history of the nation.

But times have changed and the era of the traditional maritime museum has almost passed. This does not mean that there is no longer a place for maritime museums, just not in their traditional form – that type of museum that Tintin used to visit. Part of the concept for the 'new' maritime museum is an awareness of the wider world. The concept of owning a collection will be of much less importance compared with its potential to demonstrate aspects of the past in relation to the wider environment.

When considering the marine cultural heritage it is clear that this heritage is very hard to reach *in situ* for anyone other than trained divers. It is likely that this will change in the future due to advancing technology and techniques, but marine sites will never be as easy to reach as those found on land.

In conclusion, museums and museum displays are vital in order to present the marine cultural heritage to the wider public. This is not a surprising conclusion, but it does demonstrate why maritime museums have an exciting future ahead of them.



## VISITORS, FUNDING, AND MUSEUMS – REFLECTIONS ON THE MARY ROSE EXPERIENCE

*By Christopher Dobbs*

### Abstract

The theme of this publication is ‘managing the marine cultural heritage’ and the roles of archaeological projects and museums are central to this theme. Over seven million people have now visited the *Mary Rose* since the ship hall opened in 1983. Does this success imply that the investigation of the marine cultural heritage can be funded by visitor income to maritime museums? This paper looks at the funding of the *Mary Rose* project since its inception, outlines the patterns

of visitor attendance, and compares these data with those from other attractions. It then considers potential audiences and methods that could be used to attract them. It concludes with the author’s view on whether the marine cultural heritage can be funded by visitor income and proposes a funding model for regions or nations which may contemplate building a maritime museum or centre in the future, based on an important example of their cultural heritage.

### Introduction

The *Mary Rose* operation from 1979 to 1982, the period of excavation and salvage, is shown in annual reports and accounts as costing £2.8 million. However, this does not include the extensive gifts of equipment, time, and expertise so generously given by many companies. For instance *Tog Mor*, the enormous sea-borne crane that raised the hull, would have cost at least £700,000 to hire for the duration of the salvage programme but this expense was met by the owners, Howard Doris Marine. Much more sponsorship in kind was given by companies in this way and this explains why the cash cost was not much greater. Although critics have occasionally maintained that the *Mary Rose* project diverted funds that would have been available for other work, the validity of this view can be challenged. There was, after all, no funding for maritime archaeology before the *Mary Rose* project was born; in fact the *Mary Rose* project was inspira-

tional in bringing new money into this field. There is also no doubt that the *Mary Rose* raised the public profile of maritime archaeology both in the UK and abroad.

Sixty million people worldwide saw the raising of the hull, which included the first live outside broadcast from underwater. Subsequently there has been an enormous range of live broadcasts from underwater for nature programmes as well as many documentary series dealing with the underwater heritage. Furthermore, over seven million people have paid to see the *Mary Rose* (and no doubt the total number of visitors is higher). This paper will now look at visitor figures and compare them with other attractions. Since managing the marine cultural heritage also involves managing how it is presented and made available to the public, it is useful to consider some examples of interpretation.

### Visitor numbers at major maritime heritage attractions

Figure 9.1 shows comparative visitor numbers for the *Mary Rose* and HMS *Victory* from 1986 when *Victory* started to charge for entry. The ship hall first opened to the public in October 1983 but at that time HMS

*Victory* was a free attraction supported by the taxpayer through the Navy. Whilst it has been a great achievement for the *Mary Rose* Trust to average over 300,000 visitors over a 20-year period, the general pattern of



Figure 9.1 *Mary Rose* and *HMS Victory*, Portsmouth: visitor numbers 1986–2005

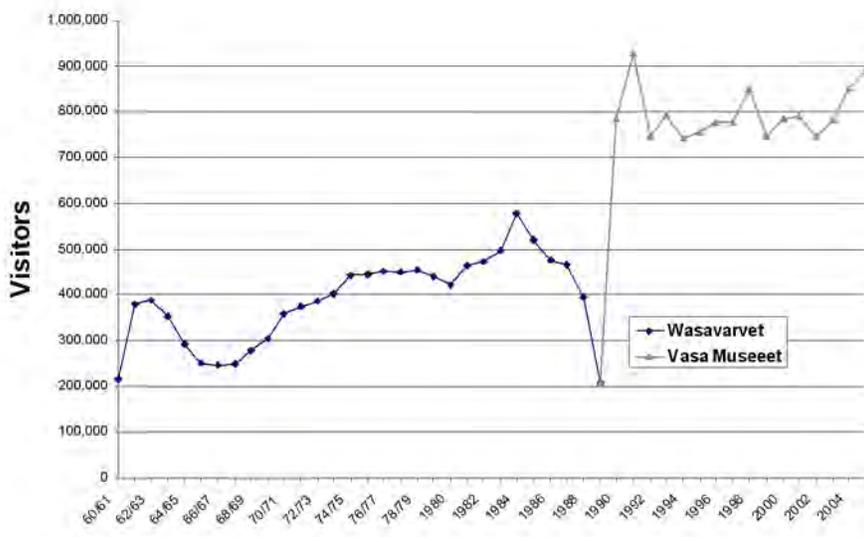


Figure 9.2 Vasa Museum, Stockholm: visitor numbers 1961–2005. Data source: Vasa Museum

diminishing sales for a maturing product can be seen in the figures. In marketing terms, the important point to note is the need to reinvent or remarket a product periodically to maintain sales. Particularly important therefore on this graph are the increases managed in 1995 and 1996, and again in 2002 and 2003. These can be interpreted as being due to the change in ticketing at the Historic Dockyard, as two and three ship tickets were introduced in 1995 and an all-site ticket in 2002. Although these changes substantially increased visitors, the income from each ticket was then less, so visitor income was maintained rather than substantially increased. The poor performance in 1994 was partly caused by a period of difficult customer access, as the views of the ship were badly affected by

the building work on the new viewing galleries needed for the change in the conservation programme. By contrast, *HMS Victory* did not suffer a drop in visitors that year and subsequent to the MAG conference had a huge increase for 2005 – the 200th anniversary of Trafalgar. Also of note is that from 1986 to 1990, the *Mary Rose* surpassed *HMS Victory* in visitor numbers, but *HMS Victory* was able to overtake the *Mary Rose* when a timed entry system was introduced in 1990. This allowed visitors to be spread over the whole day, with specific timed tours, rather than having the queue system that both attractions had been using up until that year.

The most obvious international maritime heritage attraction to compare with the *Mary Rose* is the *Vasa*

in Stockholm, although the Vasa Museum has the advantage of being the main jewel in the crown for tourism in Sweden. Visitor numbers for the *Vasa* are shown in Figure 9.2 and the early years reflect the usual euphoria of opening followed by a decline as the novelty factor wears off. However, numbers then built up steadily again; this is likely to have been through attracting the international tourist market of the whole region rather than just the local area. There was then a major new product to launch in 1990 with the new Vasa Museum. This was preceded by the low figures of 1988–89 due to closure of the museum, as the ship was floated around to the new location and installed. The Vasa Museum has been able to prevent the usual decline in visitor numbers, perhaps through being the major tourist attraction of the region – the equivalent of the Tower of London. However, it has also ensured that there is a steady stream of new displays and exhibits in the museum and this will have helped to maintain visitor interest and satisfaction amongst repeat visitors. Individual peaks in the data can often be attributable to special years such as 1998 when Stockholm was the European Union Cultural Heritage Capital. The fall in 2002 is attributed by the museum to the decline in international travel following the September 11 attacks in 2001, while the ensuing rise coincides with a general increase in international tourism to Stockholm – in particular by cruise ships.

Another international maritime heritage attraction worth comparing with the *Mary Rose* and *Vasa* is the Viking Ship Museum at Roskilde in Denmark (Fig 9.3). Although the visitor numbers are lower than the previous examples, the museum has managed to maintain a remarkable consistency through the years. Much of this will again have been achieved by reinventing itself. The major attraction of the Viking Boatyard is immediately next to the museum where an extraordinary range of activities for visitors to observe or take part in are organised. These include rope making and sailing or rowing in the unique collection of replica craft, based on archaeological discoveries (Fig 9.4). The Boatyard is open free of charge and gets 500,000 visitors per year, ensuring a large market of interested visitors available for the museum next door to convert into paying customers.

The excellent visitor figures enjoyed by these museums suggests that a healthy income can be achieved from the maritime heritage, but certainly in the case of the *Mary Rose* Trust, the income does not nearly approach what is required to keep the operation going. Even maintaining the museum is an expensive operation, let alone the tremendous cost of conserving the ship and all the objects discovered during the archaeological excavations. As a result of this, all aspects of potential funding have to be explored and continually reassessed.

Figure 9.3 Viking Ship Museum, Roskilde: visitor numbers 1969–2005.  
Data source: Viking Ship Museum, Roskilde

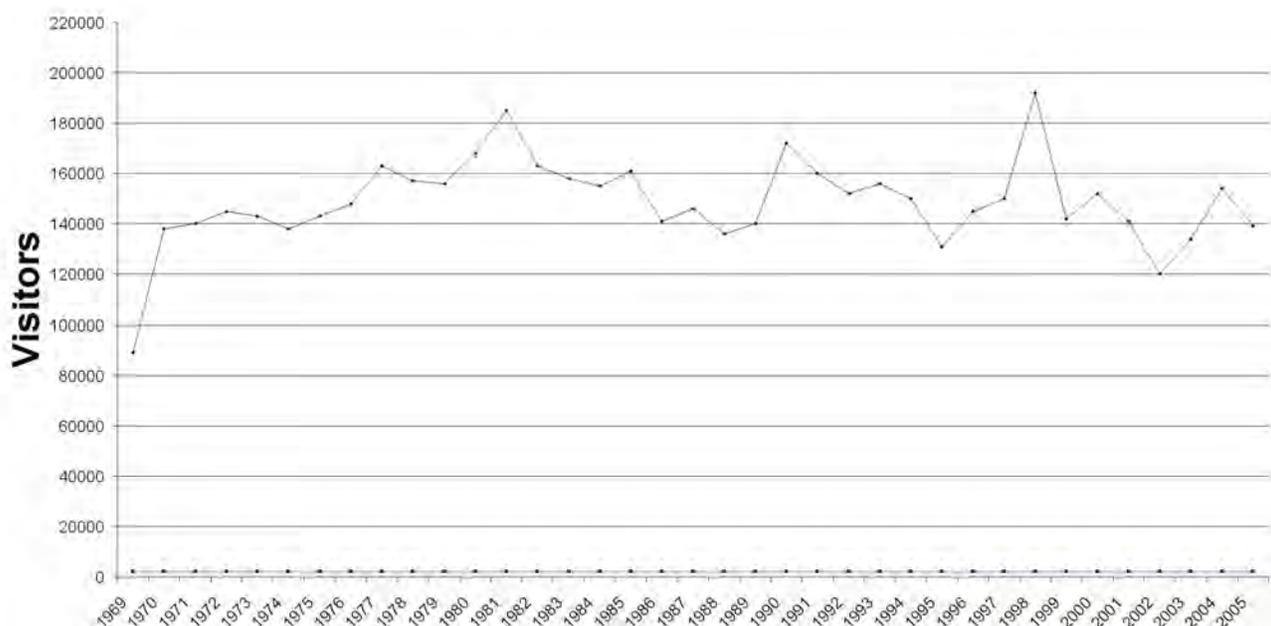




Figure 9.4 Hands-on activity: pupils rowing a replica boat at Roskilde

### Income sources for the Mary Rose Trust

The varied sources of income for the Mary Rose Trust are illustrated in the summary of income from 1983 to 2001 shown in the pie chart of Figure 9.5 (Mary Rose Trust Annual Reports, 1983–2001). Whilst over half of the income (56%) has been from museum entry tickets, a further 7% has come from shop sales, giving a total of 63% attributable to visitors. The remainder has come from a variety of sources, interestingly not dominated by any individual source. Although the Mary Rose Museum has achieved ‘Designated Status’ that acknowledges it has a pre-eminent collection of national importance, it is not eligible for statutory government funding such as that received by national museums. Hence it does not receive taxpayers’ money, although in the early years it benefited from the National Heritage Memorial Fund. Lately the Trust has relied on grants from the Heritage Lottery Fund to assist towards a number of expensive obligations such as conserving the hull and preparing the five-volume publication on the archaeological work. Local government sources have included both Hampshire County Council and Port-

smouth City Council, whose support is extremely important and reflects a recognition that the *Mary Rose* is an attraction that draws many tourists into the region. Income from fundraising is fairly evenly split over the years between the three main areas of charitable trusts, corporate company sponsorship, and donations from individuals. The latter have been approached through a variety of initiatives including friends’ schemes, lectures, dinners, events, ‘preserve-a-plank’, and lately through Gift Aid schemes. The pie chart hints at how hard the Mary Rose Trust has to work to achieve the income required to cover all its charitable objectives which include conserving the hull and objects, maintaining the museum, education, outreach, the publication of the archaeological report, and further research.

Whilst the additional income outlined above is vital, it is the visitor income that is likely to remain the main source of funding, and ways have to be found continually to increase it. To attract enough visitors it is necessary to appeal to a very wide range of people. The Mary Rose project is too expensive

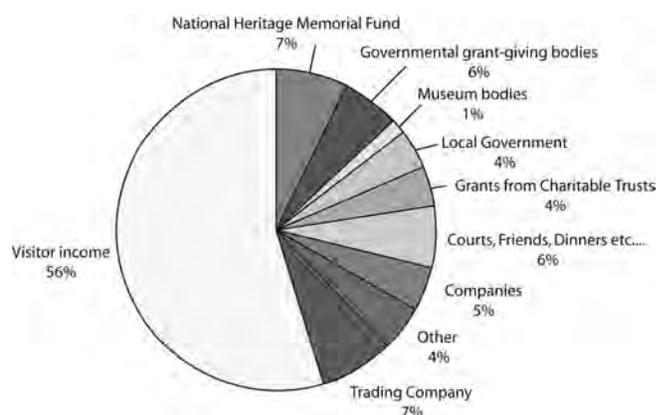


Figure 9.5 Mary Rose Trust, funding sources  
1983–2001

## New markets and new products

There is a need to attract the following groups in greater numbers:

- non-museum goers
- families
- local and regional non-visitors
- repeat visitors.

To do this we have to bring the objects to life, to bring the museum to life, and hence to bring history to life. We need to reinvent ourselves and create new products. We need to create a programme of events and activities and market them effectively so that the groups listed above know that if they come to the dockyard on a half-term or holiday weekend, there will be an engaging and informative activity taking place. Indeed, this ideal should be available every day of the year. There is an educational proverb attributed to Confucius that is particularly apt, namely: 'I hear and I forget, I see and I remember, I do and I understand'. We have to reduce the emphasis (or perceived emphasis) on showcases and text, and increase the opportunities for our visitors to feel, touch, smell, and experience the collection.

However, there is a conflict here between the need to bring the collection out of the showcases and the requirement of museums to safeguard their collections for the future. This is particularly important in the case of the *Mary Rose* museum where a core value of the collection is that it has an abundance of organic objects that have not survived elsewhere. It is these everyday items of wood and leather that give us a glimpse of the objects used by Tudor people as opposed to the pewter, silver, or gold of the nobility. Yet these objects are also the ones that will perish the fastest if handled or even stored outside the carefully controlled environmental conditions of the showcase or the store-room. High-quality replicas have a role here, but as archaeologists working in museums we also need to

an operation to only have a 'product' that appeals to the small percentage of the public that regularly visits museums. Although the museum operates in the heritage industry, it also has to appeal to the visitor attraction market. It is necessary to tap new markets – both to gain additional income and to widen our charitable aims of working 'for the education and benefit of the nation'.

interpret the past in a way that ordinary people can connect with, adding a human element to the story we are trying to tell, or using human interaction to enable that connection.

Two major projects that have drawn on experimental archaeology to help visitors experience the past are the Tudor Shipwright Project and the *Mary Rose* Galley Reconstruction. In the first, carried out initially over a one-month period and subsequently at festival weekends both in Portsmouth and at exhibitions elsewhere, a team of archaeologists was assembled to demonstrate the tools and techniques that were available to the Tudor shipwright (Figure 9.6). Different methods of converting an oak tree were demonstrated in an outdoor arena, including sawing, hewing, and cleaving. For each technique, copies were made of original timbers in the hull that had been created using the same techniques almost 500 years ago. Main deck planks and half-beams were made using a pitsaw, v-shaped floor timbers from the forward end of the hold were hewn (shaped by axe and adze) from crooks of oak trees, whilst the public found the most unusual technique to be cleaving. This involves the controlled splitting of wood – taking a massive oak trunk, and splitting it lengthways to form the cleft, weather-board planks that were discovered in the castle areas of the *Mary Rose*. Replicating timbers in this way helped give first-hand knowledge about the tool marks that can still be seen on *Mary Rose* timbers, and has helped to build up these early skills of shipwrightry in a group of people that have gone on to demonstrate the techniques elsewhere. Above all however, it brought alive some sights and sounds of the Tudor dockyard for visitors and even an authentic smell of fresh oak chippings. Museum learning was achieved, both formally through regular presentations and informally through questions, through watching and through hands-on experience when safety guidelines allowed.



Figure 9.6 Activities and reconstructions: the Tudor Shipwright Project at a festival



Figure 9.7 Activities and reconstructions: cooking at the galley

A second large project was the Mary Rose Galley Reconstruction that initially started as a research exercise using experimental archaeology to reconstruct the brick cooking range. Complete with a 600-litre cauldron, this had been discovered as a heap of rubble during the *Mary Rose* excavations (Dobbs forthcoming). The methodology adopted for the galley project, broadly following those proposed by Sean McGrail for replicas of complete boats (McGrail 1997, 347–53), was one of record the evidence, reconstruct as found, reconstruct hypothetically based on that evidence, and then build a full-scale reconstruction and evaluate it in trials. Whilst the recording of the brickwork was carried out underwater in 1982 and the hypothetical reconstructions on paper took place in the archives and drawing office, the full-scale reconstruction and trials were carried out in public. Although an archaeological exercise, this could also be a museum and educational activity. Further trials and demonstrations of the cooking take place approximately twice each year when resources allow. The extent of visitor interaction during the building was surprisingly high and it was amazing to discover how many experts there are in lime mortar, keen to check that everything was being done properly! When cooking started on the replica, the crowds came in even greater numbers (Fig 9.7) and showed the power of using experimental archaeology and costumed interpretation to help deliver learning experiences to the public.

However, large projects like the above require resources that cannot be available all the time and less ambitious activities were required to ensure coverage on more weekends and eventually throughout the year. The Mary Rose Museum started to build up these events during 1999 and 2000, so that by 2001 activities were in place during every spring and summer weekend. Independent enthusiasts and re-enactors were used for many of these events, but it was vital to ensure that the activities were based on the Mary Rose collections. Costumed demonstrations included those by barber-surgeons, apothecaries, pole-lathe turners, musical instrument makers, archers, fletchers, cutlers, and so on. In parallel with this, costumed interpreters were recruited onto the staff to ensure that visitors on every day of the year could benefit from this method of story telling. Funding was initially provided by a grant from the Designated Challenge Fund, but soon the concept of costumed interpretation became engrained in the culture of the museum and is now supported from core income.

The above describes some of the initiatives carried out within the museum, but what can we do for non-visitors, especially as our charitable objectives are not meant to be just for visitors but are inscribed as being ‘for the education and benefit of the nation’?

Three of the methods being used are outreach boxes, the website, and documentary films. The outreach boxes are a set of wooden chests containing well-made replicas of specially selected artefacts from the Mary Rose collection. These are distributed around the country away from the southern region, usually at Local Education Authorities. They are loaned to schools and enable access to the collection for pupils who are not able to travel to Portsmouth due to distance or disability. A number of workshops can be run using the objects and two additional chests are kept in Portsmouth by the Trust, again for use in schools by pupils with either physical or learning disabilities.

The Mary Rose was one of the first UK museums to establish its own website, which has won a number of awards since it was launched in 1995. It receives over half a million visitors (session users) every year and a remarkably high number of downloads. It has become a very powerful tool for increasing access, albeit virtual, and spreading our educational net wider both nationally and internationally.

Documentary films are a further way of reaching a new and large audience and it is very fortunate that the *Mary Rose* story has so many facets that filmmakers continue to explore new themes. Two recent full-length documentaries have included the Channel 4 Darlow-Smithson film ‘What Sank the *Mary Rose*’ and a BBC Timewatch ‘Secrets of the *Mary Rose*’. Programme notes for the latter said the film ‘... tells the story not only of the artefacts discovered on board – cooking utensils, prayer books, weapons – but also reveals the stories of the sailors themselves. Dramatic reconstructions and detailed graphics provide a glimpse into a lost world: what emerges is a detailed picture of what life would have been like on a Tudor warship’. Museums need now to adopt many of the methods of the filmmakers – to tell human stories, to use graphics and computer animations.

However, the point has to be made that any replicas, reconstructions, story telling, or interpretation in the museum context has to be done with integrity. Museums must not perpetuate the ‘disneyfied’ approach to maritime archaeology that seems to interpret shipwrecks merely as sources of treasure, with pirates often complete with eye-patch, parrot, and peg-



Figure 9.8 Re-enactors with the product of the galley experiments during filming for the BBC *Timewatch* documentary  
Photo: Ben Lawrie, BBC *Timewatch*

leg. Learning a few tricks from theme parks, from filmmakers, from experts outside our sphere, is needed – but we need to beat them at their own game and bring the past to life through integrity and not through make-believe. The resulting new products will open up new markets to help achieve our charitable objectives. Our greatest asset is having the real thing. The task is to balance the visitors' interest in seeing the genuine articles with an appropriate way of showing how they were used and thus bring back to life the objects and the people who made or owned them (Fig 9.8).

Maritime archaeology, or more specifically the aspects of this field that involve sunken shipwrecks, can be an expensive discipline. However, it also gives great value as it can reveal so many aspects of the past that are not available from other sources. Museums need to appeal to the widest audience, both to spread the word and to generate increasing income. New ways of getting the story across can be devised and ideas for how to do this can be gleaned from other fields. But how would funding be provided for a maritime attraction in an ideal world?

### A funding model for future centres of maritime archaeology

The funding difficulties hinted at earlier illustrate the author's view that the marine cultural heritage cannot be funded either in the short or long term simply by visitor income – even by visitors to an internationally renowned attraction. As advice is sometimes sought by international colleagues on how to fund a potential project based on the excavation or raising of a historically important ship or submerged remains, a hypo-

thetical funding model is given here. This should act as a cautionary note for any regions or nations contemplating such an ambitious venture, as the long-term needs and funding have to be considered at the earliest stage. Such ventures are often the result of a region having a vision of a flagship attraction that will increase tourism, but it should be borne in mind that the realities of limited funding mean that only one

flagship project is likely to be possible in any individual region and therefore the cultural heritage at the heart of it will need to be of the highest significance in terms of its historical, cultural, or regional importance. Although every situation will be different, it is worth having a starting point that can be challenged or adjusted as local circumstances dictate.

Excavation or raising a historic ship or submerged remains might just be able to be funded by short-term sources of income such as sponsorship, local fundraising, or grants born out of the flush of enthusiasm generated by the exciting new nature of the project. But it is the long-term needs that have to be addressed before the project becomes unstoppable. In the case of the *Mary Rose* excavation, this principle was enshrined in a series of cut off points that were identified, when the site could be backfilled if it became impossible to complete the excavation through lack of funds (Rule 1982, 73). Alternative options had also been considered, including leaving the hull *in situ*, or raising it complete with silt and contents and excavating in more controlled circumstances.

Long-term needs include ensuring funds are available for the long-term conservation, the long-term research, and the long-term building and capital requirements. Whilst a great deal could be achieved by a major benefactor with very deep pockets, in the author's opinion these items require funding or underwriting by national or local governments or institutions. Conservation, both during the initial and maintenance stages needs major heritage, lottery, or government backing (see Panter, this volume). Build-

ings and major capital developments could come from central or local government – perhaps in return leading to the regeneration of a brownfield site or a run-down industrial area. Finally, continuing research will be vital, not just for the academic and archaeological objectives of the project but also to build in the ability continually to come up with new research results – with the new stories that will refresh the product and maintain visitor interest and repeat attendance. This would best be ensured by having a permanent partnership or even joint ownership of the project with a university, preferably with an established Department of Archaeology.

If all the above long-term costs are met by the external sources, it may then be possible for visitor income to cover running costs, but only if the attraction is located close to a high-density population or in a major tourist area. However, there will still be a need for special projects, relaunches, and reinventing the product to be paid for by additional fundraising, grants, or extra sources of income. With the current emphasis in the archaeological world of preservation *in situ* rather than excavation, and funding limitations that preclude multiple examples of the same type of heritage being actively conserved, such a project is likely to be justifiable only in the case of unavoidable threat and/or if it is of supreme importance to national or regional identity, history, or tourism. As the justification is not on archaeological grounds but of wider concern, so too must the funding come from a wider pot rather than from routine archaeological or heritage sources.



# CONNECTING WITH THE PAST: USING ONLINE TOOLS, TECHNIQUES AND PARTNERSHIPS TO EXPLORE OUR MARITIME HERITAGE

*By Jeremy Weirich*

## Introduction

Historic shipwrecks acquaint us with the maritime cultures of the past: the builders, sailors, mariners, and traders who were the lifeblood of early shipping industries and naval conflicts of mighty sea powers. Their accounts are often missing from the written record, but archaeology can give them a voice.

Using these stories to engage and inform the public is a critical component of our overall maritime heritage. It promotes active and responsible stewardship, and generates interest for future or advanced research. It also connects people to the past, giving them a sense of place, time, and context. Conveying that message today, in the form of education and public outreach, can be challenging. However, one American agency is using advanced technology not only to research the people of the past but also to reach out to the people of the present.

The National Oceanographic and Atmospheric Association (NOAA) Office of Ocean Exploration (OE) is a component of a proposed larger National Ocean Exploration Programme (National Research Council 2003). It investigates the oceans for the purpose of discovery and the advancement of knowledge of the marine physical, chemical, biological, and archaeological environments by means of interdisciplinary expeditions to unknown, or poorly known, regions of the world's oceans. OE's maritime archaeology programme addresses the exploration potential of submerged cultural resources, and supports programmes that seek to understand better our maritime past. This is achieved through collaborative projects that discover new submerged cultural resources and those that help to share knowledge about our maritime heritage (Weirich and Gray 2005).

Recognising shipwrecks and inundated landscapes as valuable marine resources, NOAA equips maritime heritage researchers with vessel time, advanced technologies, and financial support to a degree not readily available a few years ago. The goal is to expand our knowledge of shipwreck science and maritime heritage. Through website offerings, news releases, and other means, NOAA brings the public onboard the ships to share new discoveries as they happen.

This paper highlights a few recent exploratory projects sponsored by NOAA, and describes how different media have been used to reach all ranges of the public. Along the way, researchers – archaeologists and scientists alike – have discovered effective avenues for illustrating the relevance and importance of their research. Using several NOAA-sponsored expeditions as backdrops for illustrating effective education and outreach, discussions will emphasise: satellite communications; website summaries and daily logs; educational lesson plans; professional documentaries; and press releases. This paper will conclude with examples of 'lessons learned', highlighting areas of improvement on past expeditions, and will discuss advanced technology that will make it possible to reach the public in new ways.

In the absence of discussing the many agency-sponsored maritime archaeology projects, this paper will highlight selected expeditions that involve exceptional education and outreach components. They open the door to our imaginations and expand the limits of technology, but also deliver new, unexpected experiences. Sometimes when we explore the past, we discover new ways to look at the future.

## Taking advantage of new technologies

For the 2003 Black Sea Expedition, Dr Robert Ballard's Institute for Exploration (IFE), along with chief archaeologists Dr Cheryl Ward and Prof Fred Hiebert, explored the stagnant depths of the Black Sea to locate and document ancient shipwrecks and to search for indications of human settlements.

The Black Sea is a unique basin in that there is little or no oxygen below a few hundred metres. Although there is plenty of fresh water entering from rivers, the only area where water drains from the Black Sea is the relatively shallow opening of the Bosphorus Strait. This poor circulation is limited mostly to surface currents, and creates a torpid bottom layer of cold, anoxic water (Bearman 1995). Aside from anaerobic bacteria, the bottom is barren of life. There are no wood-boring worms, common in the open ocean, so this environment is ideal for preserving organic matter, such as ancient wooden shipwrecks.

Using information from previous expeditions, researchers in 2003 decided to explore four possible shipwreck sites located off the coast of Sinop, Turkey. Sailing aboard the science ship *RV Knorr*, the team used a new remotely operated vehicle (ROV), *Hercules*, to acquire archaeological data. *Hercules* was specially designed by marine engineers and maritime archaeologists to conduct underwater archaeological surveys. Its equipment includes advanced high-definition cameras, sonar mapping instruments, and a combination vacuum/water jet system for removing surface sediments. It also has two manipulators, or robotic arms, one with force-feed back capabilities, meaning

that when using the arm to grab something at the site, the ROV pilot feels the sensation of pressure in the controls as if the object is being held directly in the pilot's hand.

*Hercules* is connected to the vessel with fibre-optic cables that not only send down commands, but also send back amazing high-definition video footage. For this expedition, the IFE and the Immersion Institute used an innovative telecommunications system to transmit these video images via satellite to the United States. They were then distributed live throughout the world on Internet and Internet II networks (Ocean Exploration 2003a). This allowed scientists and archaeologists to answer questions directly from children and adults from all over the country, even though the research ship was working thousands of miles away (Fig 10.1).

One of the shipwrecks, located deep in the anoxic layer, dated back to the 5th century AD, yet it was so well preserved it had the appearance of a ship that sank only a few years ago. This site provided a rare, intimate glimpse into ancient ship construction, and, together with its cargo and other artefacts, told archaeologists about the people who once sailed, traded, and lived during this time period. More importantly, the ability to share these images live with the public all over the world was a powerful way to send a message. This expedition was a successful test of new underwater robotic technology, coupled with innovative satellite communications. The result was a new approach, which was mimicked on future OE-sponsored missions.

## Making information accessible through various media

Maritime heritage projects can provide a telepresence, linking researchers directly to public venues. At times, this can be as basic as making a phone call to a school using a special satellite phone from the research vessel to shore. Other telepresence projects, such as the 2004 Return to RMS *Titanic*, are more involved. Using the same technology as the 2003 Black Sea Expedition, researchers onboard the NOAA Ship *Ronald H Brown*, led by Dr Robert Ballard, designed more sophisticated broadcasts and tackled an unprecedented number of live, at-sea media requests – all the while, using RMS *Titanic* as a springboard for engaging the public on many other maritime heritage issues.

While on site, the team broadcast four live shows a day through the Immersion Institute to various public facilities around the US. Unlike the Black Sea expedition, each show lasted about half an hour and included a 'canned', or pre-recorded, documentary followed by a live interview with a particular researcher on board the ship. The shows' host, Jay Schadler, and the interviewee were connected to the broadcast via headsets. Mr Schadler would begin with a few general questions, then open it up to the audience located around the country for additional discussion (Fig 10.2). People from places like Michigan and California were asking questions as if they were on site with the research team.

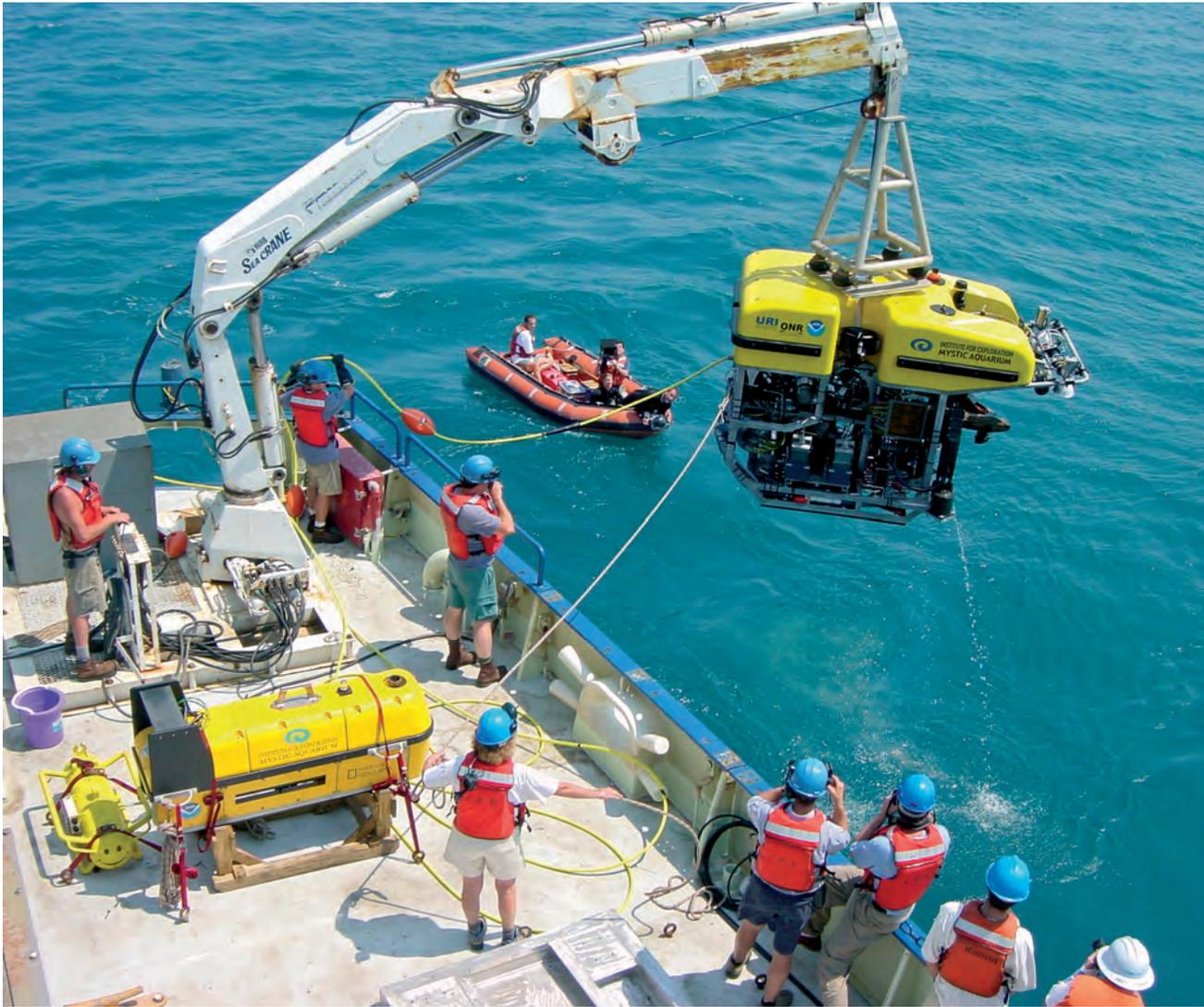


Figure 10.1 The ROV *Hercules* is recovered on the back deck of the RV *Knorr* during the Institute for Exploration's 2003 Black Sea Expedition

The shows' topics varied, and included: advanced technology, deep-sea environments, and *in situ* preservation *versus* salvage. RMS *Titanic* may have been the reason the audience tuned in, but now that the researchers had their attention, they were free to expand the idea of *Titanic* onto other maritime heritage issues, such as the importance of resource protection and the need to explore further our oceans. Arguably, RMS *Titanic*'s allure and significance is more social than archaeological. This engaging and interactive broadcast capitalised on the pop culture appeal of this single deep-sea wreck to discuss the investigation and preservation of others.

In addition to the daily broadcasts, there were two television documentaries and a magazine article produced by the National Geographic Society (NGS). In addition, several websites were launched, including

one hosted by NOAA's Ocean Explorer and the Jason Foundation, both of which provided education material for school groups (Return to *Titanic* Expedition 2004). Before, during, and after the expedition, media events were co-ordinated by NGS and NOAA involving television and radio shows, and newspaper and magazine articles. At one point while on site, over twenty interviews were given in the course of two hours by various researchers.

This expedition was clearly the exception when considering the media blitz, and it is doubtful that many researchers will be involved in such a high-profile project generating so much attention and staffed by a dedicated public relations team. However, this extreme experience offered many outreach opportunities and challenges, leaving the researchers evaluating new ways to deal with this advanced communications technology.

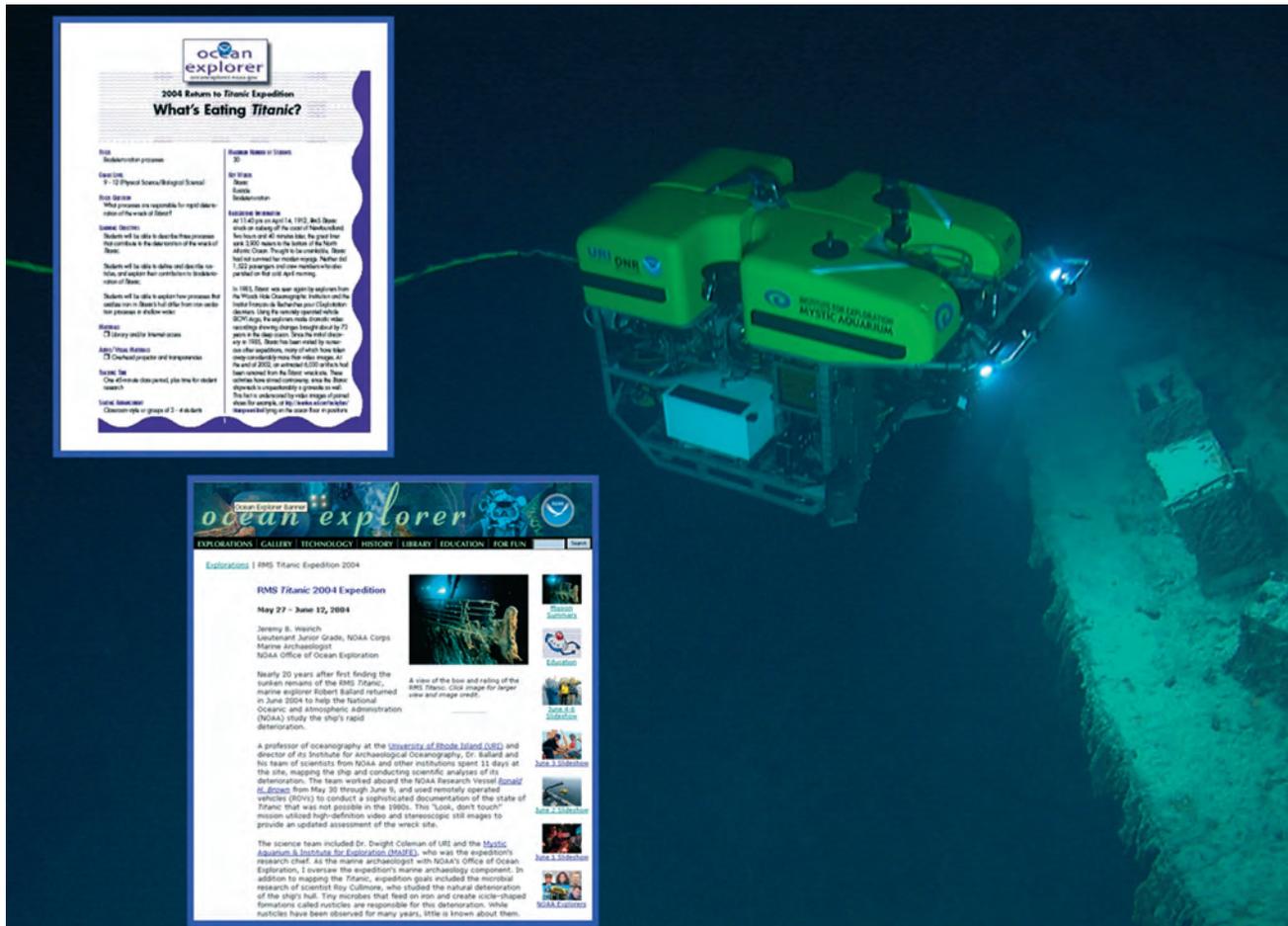


Figure 10.2 Institute for Exploration's ROV *Hercules* examining the stern of RMS *Titanic* (courtesy of NOAA/IFE/URI), with one of the expedition's lesson plans and one of many partner websites

### Maximising partnerships

OE encourages partnerships nationally and internationally, drawing upon unique technologies, talented researchers, and innovative marine programmes. In order to fulfil the shared goal of protecting historically important maritime sites, and given the relatively small maritime heritage community in the US, the programme collaborates regularly with federal partners on resource issues, specifically the National Park Service, the Minerals Management Service (MMS), and the Naval Historical Centre.

Government and industry partnerships also make it possible to lever and pool resources not afforded to just one entity. A recent example highlighting this type of partnership was the 2003 expedition conducted aboard the NOAA Ship *Ronald H Brown* to document the wreck of the German submarine *U-166* located in the Gulf of Mexico.

First discovered in 2001 by C&C Technologies Inc during a pipeline survey, the remains of the then unknown U-boat were initially a mystery to C&C

archaeologists Dan Warren and Rob Church, the project's principal investigators. According to historical records, there was not supposed to be a wreck in that area, especially a target that looked very much like a submarine.

During World War II, 24 German U-boats operated in the Gulf of Mexico, sinking 56 merchant vessels in one year with only one U-boat lost: the *U-166*. The submarine was assigned to the Gulf in July of 1942 to lay mines near the mouth of the Mississippi River and to patrol shipping lanes to hunt merchant shipping. On 30 July, the passenger freighter *Robert E Lee* and a naval escort *PC-566* were transiting across the Gulf en route to New Orleans. That afternoon, the *Robert E Lee* came into the sights of the *U-166*, and was struck by a torpedo on the starboard side.

As the *Robert E Lee* began to sink, *PC-566* rushed in and began depth charging the area where the U-boat was located. Although the crew was confident they sank the submarine, the ship was not



Figure 10.3 Image of the *U-166*'s forward deck gun (courtesy of C&C Technologies) and the Sonsub ROV team, who effortlessly adapted their industry ROV to conduct intricate scientific work. Logos of project partners are provided

given official credit for the sinking. Adding to the confusion was a historical document indicating that a US Coastguard seaplane, which reported bombing a U-boat two days later, 140 miles further west, was given credit for sinking the *U-166* (Church *et al* 2003).

The true account of what happened to the *U-166* would not be written for nearly 60 years, not until the 2003 expedition to explore the site led by Warren and Church. Partners from OE, MMS, Sonsub International, Sonardyne, Droycon Bioconcepts Inc, and the PAST Foundation joined to offer a variety of expertise and technology to investigate the mysterious wreck site. Using an industry ROV and special positioning equipment to survey the area accurately, the expedition team located the broken *U-166* lying upright at a depth of around 1700m. The bow was separated from the rest of the boat by several hundred metres, with a debris field between the two sections. Little growth and no fishing nets allowed a pristine view of the submarine's many features such as its deck guns (Fig 10.3).

This expedition led to a more comprehensive, 18-day research expedition in 2004 to investigate several other World War II casualties of U-boats in the Gulf of Mexico. OE and MMS sponsored C&C Technologies Inc to assess archaeologically and ecologically seven vessels sunk by U-boats. Since these sites ranged in depth from around 95 to 2150m, biologists had a unique opportunity to study the artificial reef effect in differing ecological niches.

In both instances, the PAST Foundation provided web coverage with material from the researchers on site (Ocean Exploration 2004; PAST Foundation). Their interactive website provided daily text and ROV still photos, and two to three minute streaming video pieces offered every other day. Award-winning filmmaker Dr Dennis Aig, professor of media and theatre arts at Montana State University, Bozeman, was also on hand to produce a documentary of the second expedition. This is in addition to an episode produced by the History Channel's *Deep Sea Detectives* in which their team was invited to participate in the expedition.

### Participating in the education curriculum

A minimum of 10% of OE’s annual budget supports education and outreach. Formal lesson plans are developed in compliance with national science education standards to help bring a number of expeditions into the classroom. Several maritime archaeology focused projects have corresponding lesson plans such as the 2004 Return to *Titanic* Expedition highlighted earlier, and the 2003 Steamship *Portland* Project.

In 2003, researchers from NOAA’s Stellwagen Bank National Marine Sanctuary and the National Undersea Research Centre at the University of Connecticut, in partnership with filmmakers from The Science Channel, returned to the newly discovered wreck site of the side-wheel steamer lost in 1898 during a famous November gale. Their goal was to use an advanced ROV to document the site as well as a few other wrecks recently located in the Sanctuary (Ocean Exploration 2003b).

Daily logs and images were provided on the NOAA Ocean Explorer website, and science lesson plans were added to correspond with the research activities. Created by professional educators in cooperation with the *Portland*’s researchers, eight lessons were designed for children in US grades 5–12 (roughly 10 to 17 years old), to allow teachers and students to learn actively from the project, not just read about it. Topics ranged from sonar equipment to extreme storms to vessel navigation (Fig 10.4).

Not only are these lesson plans available on the website, but they were also compiled in *Learning Ocean Science through Ocean Exploration*, a curriculum for teachers that was developed for NOAA Voyages of Discovery and the Ocean Explorer (Chase 2003). This compilation provides teachers



Figure 10.4 Images from the 2003 Steamship *Portland* Project. Clockwise from upper left: a lesson plan from the *Portland* project with the Ocean Exploration curriculum in the background; a side scan image of the *Portland* wreck site (courtesy of Stellwagen Bank National Marine Sanctuary); logos of project partners; a section of an advertisement for the Science Channel’s documentary on the *Portland* legacy

with a variety of exercises covering all aspects of marine exploration, and is one tool in a suite of educational components offered by the programme. In addition to the lesson plans and curriculum,

professional development seminars and workshops are organised throughout the country, designed to encourage teachers' participation in ocean exploration activities.

## Lessons learned

OE has largely been pleased with the results of the education and outreach components of its projects. However, OE programme leads and its sponsored researchers have experienced a few challenges when it comes to disseminating its message. The following recommendations are offered to maritime heritage researchers and archaeologists planning future projects.

### Design and understand your message points early

No one knows your research better than you, but conveying that message to others in a way that they understand can be difficult. Sometimes when an archaeologist is asked about his or her project, they provide so much detail in a string of long tangents that the simple, general message of their research is lost. Even though the archaeologist is enthusiastic, the listener may become lost or disinterested.

Before public meetings, media interviews, or live broadcasts, it is important for the principal investigator to set aside some time with the staff to formalise concise message points which address the root of the project, the goals of the research, and their importance to the public. Usually, three to four one-sentence message points are ideal, with perhaps more specific supporting statements listed for each. Work with your team to craft these points and make sure everyone is on the same wavelength.

### Designate someone to handle communications and press relations

Many project duties can consume maritime heritage researchers without adding education and outreach components. Directly handling public relations, especially when one is already multi-tasking, may create more problems than opportunities. It is a good idea to incorporate someone into the project who can handle public affairs. Ideally, this is someone who is familiar with the project, has been briefed on the message points, and who can effectively co-ordinate requests from the press or outside groups.

Some researchers for OE-sponsored projects have involved communication directors from their universities or parent organisations, while others have simply let OE's public affairs officer manage media relations, which is a service the programme offers. This allows qualified, experienced personnel to handle simple requests for information, and to co-ordinate media events or interviews for the research team.

### Co-ordinate live material with shore receiver stations

Whether a research team is using a state-of-the-art, high-resolution satellite link up, or a simple ship-to-shore radio, it is important to co-ordinate any broadcasts or interviews with a land crew, giving as much prior notice as possible. Inevitably, equipment malfunctions or information is crossed, so testing the process first before going 'live' is in everyone's best interest.

### Create media agreements with documentary teams

Often as the subjects of formal documentaries, and not the creators, maritime heritage researchers have limited editorial control over final productions. Working with producers to outline your projects goals and emphasise your message points in advance will help avoid any misinterpretations. In addition, following up with formal agreements is also helpful.

Previous agreements for OE-sponsored projects have included such items as: not disclosing sensitive wreck site locations and co-ordinates; requesting copies of any final media products; prohibiting the broadcast of human remains; and providing accurate credit to project partners. Producers often come back with their own amendments to the agreement, providing their own feedback. By resolving any ambiguities, both groups walk away with a better understating of each other's expectations, leaving little room for major misunderstandings.

### Draft joint project agreements with science partners regarding data and images

As a government programme, public funds support OE expeditions though a formal grant process and taxpayers deserve feedback on the results of such projects. However, we also respect the intellectual property rights of the researchers, understanding that they have the right to publish their results first within an appropriate period of time. Thus, the two groups, OE and our sponsored scientists, have found the need to agree formally on which data is releasable to the public and under which timeframe. This pertains primarily to images and information posted on partners' websites or provided to the media.

### Design lesson plans that meet educational standards

Professional educators who have an understating of the national science curriculum write all of the lesson plans created for OE-sponsored projects. They rely on maritime heritage researchers and archaeologists to provide accurate content, but not for the overall design and format. Thus, if researchers wish to add an education component to their project, they should not feel intimidated by the prospect of having to create lesson plans on their own. Various education groups, interested in all aspects of marine research, are willing to assist in this task. Likewise, a researcher should not feel compelled to create lesson plans on their own accord. Without a familiarity with appropriate educational standards, these efforts may result in wasted time and materials.

## Conclusion

Maritime heritage researchers and archaeologists have an amazing advantage over colleagues in other disciplines. Their subject matter easily lends itself to a human connection, generating exciting expeditions, interesting investigations, and captivating stories. Yet, many researchers fail to maximise this potential through effective outreach tools, doing themselves a great disservice. By failing to generate interest in their current project, they neglect to garner support for the next phase of their research.

More importantly, the seabed resources themselves warrant further protection and preservation, which can only be gained by interacting with people of all ages. Education and outreach are essential mechanisms to engage the public about the cultural and

ecological significance of our heritage. With that knowledge, and the realisation that when these wreck sites are gone, they are gone forever, local communities take on a more preservationist point of view, opting to take pictures rather than artefacts from these sites.

Promoting active and responsible stewardship, engaging and informing the public on maritime heritage issues, and generating interest for future or advanced research are all valid reasons for supporting and incorporating effective education and outreach activities into project designs. These tasks can be accomplished by taking advantage of new technologies and maximising industry partners willing to contribute resources.

# MAKING THE SUBMERGED HISTORIC ENVIRONMENT ACCESSIBLE – BEYOND THE NATIONAL HERITAGE ACT (2002)

*By Ian Oxley*

## Introduction

English Heritage, as a national Heritage Agency, has only had responsibility for the seabed of England and the historic environment resource that it contains from 2002. Since its inception in 1983, the role of the organisation has not changed essentially but it has matured into a new context – one of a holistic approach that values the historic environment not just for its archaeological, historic, or architectural significance, but also for its wider contribution to a sense of place and to social and economic regeneration. There is also a new acceptance of the need to manage change rather than to oppose it, and to recognise the right of stakeholders to appropriate treatment and levels of service from English Heritage itself.

Therefore, English Heritage assumed new duties and responsibilities for a little-understood marine burial environment and the heritage it contains at a period when the whole organisation was undergoing radical realignment. This situation has posed a variety of challenges in understanding and managing the non-renewable maritime archaeological resource, not least in trying to ensure that the submerged historic environment is made accessible to the widest community. This paper describes this background of context and organisational change, and the work English Heritage has underway to continue to raise the awareness of all stakeholders about the marine historic environment, from other sea users to the public at large.

## What's new?

### Extension to English Heritage's remit

The expansion of English Heritage's remit to include the seabed off the coast of England to the 12 nautical mile territorial limit, through the passing of the National Heritage Act 2002, has represented one of the most significant challenges the organisation has faced since its establishment. In spatial terms the increase approximates to three-quarters as much again as the land area of England but, more importantly, the seabed contains an immense wealth of archaeological sites and remains, potentially without equal elsewhere in the world in terms of their number and diversity, including extensive inundated prehistoric landscapes as well as evidence of the exploitation of the sea in more recent times.

English Heritage was given these new responsibilities at the same time as the interests of the wider

public, and specific stakeholders in the marine and underwater heritage, have risen to unprecedented heights – evidenced by the popularity of television programmes and the interest shown by the media generally (eg Time Team, and the Battle of Trafalgar Bicentenary in 2005). This enhanced role offered a unique opportunity for making a very significant element of the nation's historic and archaeological resource accessible to the wider community of our historically 'maritime' nation. In response, *Taking to the Water: English Heritage's initial policy for the management of maritime archaeology in England* (Roberts and Trow 2002) was published and, twenty days after the passing of the National Heritage Act 2002, a Head of Maritime Archaeology was appointed. In the last three years, due to increasing recognition of the scale of the challenge, English Heritage has been able to expand the Maritime Archaeology Team

to include two more archaeologists, a marine planner, a coastal archaeology specialist, and an Administrative Assistant.

### English Heritage's new responsibilities

The National Heritage Act 2002 harmonised the roles of the UK heritage agencies by extending English Heritage's remit into the marine zone below the low-water line, modifying the organisation's functions to include:

- securing the preservation of ancient monuments in, on, or under the seabed; and
- promoting the public's enjoyment of, and advancing their knowledge of, ancient monuments in, on, or under the seabed.

The 2002 Act amended the definition of 'ancient

monuments' in the National Heritage Act (1983) and the Ancient Monuments and Archaeological Areas Act (1979) to include sites in, on, or under the seabed (including those comprising the remains of vehicles, vessels, aircraft, or movable structures) within the seaward limits of the UK territorial waters adjacent to England.

Another significant change allowed administrative responsibilities in support of the Protection of Wrecks Act 1973, on a UK-wide basis, to be transferred from the Department of Culture, Media and Sport (DCMS) to English Heritage. English Heritage now administers the DCMS Advisory Committee on Historic Wreck Sites (ACHWS) and manages the UK government's contract for archaeological services in support of the 1973 Protection of Wrecks Act, currently held by Wessex Archaeology.

## Issues

In terms of their historical significance, their information potential, and their contribution to our cultural identity, it is clear that marine archaeological sites should enjoy parity of esteem and treatment with their terrestrial counterparts. However, the marine historic environment does not currently enjoy that parity and it remains essentially inaccessible and hidden to most of the population. Many issues and barriers to progress need to be addressed as indicated below.

### The complex character of the submerged historic environment

Despite their radically different environmental circumstances, marine and terrestrial archaeological remains provide a seamless physical and intellectual continuum. As a result of coastal change, some originally terrestrial sites are now submerged and some marine sites are now on land; some sites have ambivalent settings, being situated in the intertidal zone and enjoying marine and dry land environments sequentially; and others extend from dry land into the sea. Even wholly submerged and discrete sites, such as shipwrecks, can be considered to be part of wider maritime cultural landscapes that also embrace the yards where they were constructed, the ports they served, and the defences erected against them.

The character of the maritime archaeological resource is complex and diverse, incorporating sites and landscapes that were submerged by sea-level rise; the remains of vessels (ships and aircraft); scattered

material relating to ships and shipping (eg lost cargoes, anchors, and debris); remains related to coastal activity (eg projectiles from coastal batteries and dumped rubbish); the subtidal elements of coastal features (usually relating to exploitation of, or defence from, the sea); and seabed emplacements (such as trans-oceanic communication cables and pipelines) (Roberts and Trow 2002).

### Practical challenges

However, it must also be recognised that due to the physical environment in which marine archaeological remains are situated, dealing with them poses significant practical challenges that cannot be ignored. In particular, marine archaeological sites have the following characteristics:

- they are not easily accessed and managed without specialist skills, techniques, and equipment, and consequently, access to the resource is comparatively expensive
- they are situated in a generally hazardous environment, subject to continuous and sometimes rapid change
- in general terms they are poorly understood
- the density of shipwreck remains in English territorial waters is likely to be amongst the highest in the world
- the professional framework for maritime archaeology is very poorly developed and supported – amateur archaeologists have a

more central role than they do in terrestrial archaeology

- the number of sports dives is probably among the highest in the world; and
- the management of marine archaeological remains and the dispersal of portable antiquities takes place within a wholly different legislative framework.

### Lack of understanding of the resource

Our collective understanding of the nature of the marine archaeological resource is relatively poor. In the National Monuments Record of England (NMR) there are over 42,500 maritime records comprising around 33,000 wrecks, of which only 5200 have reasonable positions. There are over 1100 records of crashed British aircraft and up to 7400 further references to fishermen's net snags of which nothing else is known as to their importance, vulnerability, or potential for research, amenity, or education.

This summary only provides an indication of the nature of the existing resource, and it should be

qualified by a critical appraisal of the nature of the origin, completeness, and accuracy of the source data of the records. In addition, opportunities for developing the linkages between the NMR and those local Historic Environment Records (normally based in Local Authorities) that record maritime sites have yet to be developed. It is likely that estimates of how many maritime sites of all types exist could be in the region of many hundreds of thousands.

As a further example of disparity, England's existing statutorily protected submerged sites relate only to historic shipwrecks. In 2002, English Heritage assumed responsibility for the physical management of the 39 (now 42) historic wreck sites in England's waters designated under the Protection of Wrecks Act 1973 prior to the passing of the National Heritage Act 2002. In relation to these sites, a plan-based approach will be developed to take forward management objectives, taking into account the interests of a broad range of stakeholders, and including a competent assessment of the marine environmental processes that cause change.

## Barriers, pressures, and drivers

### Developments in the UK marine sector

Resource exploitation in the marine zone is becoming a significant driver for change. Recent developments in marine industry in the UK show that a requirement of great importance to be able to achieve effective marine historic environment management is engagement with the marine development sector. Multiple use and exploitation of the sea is the norm, with a wide range of activities frequently taking place in the sea or on the seabed. New activities, notably, most recently, the development of offshore wind energy, are constantly being proposed and encouraged. There is a widespread recognition that the current management of the marine and coastal environment is complex and fragmented, and that there is currently no holistic, plan-led approach to look at the wider picture.

The future protection of the marine historic environment resource must involve central and local government, industry, and all the other stakeholders ranging out to the wider public, so a considerable amount of effort over the last three years has been invested in building the required frameworks and relationships with other government departments and

agencies. Development control and wider consultation duties are steadily increasing in parallel with the government's promotion of broader Marine Stewardship initiatives. The English Heritage Maritime Archaeology Team receives, and comments on, approximately 25 consultations per month relating to all areas of the English marine zone ranging from large-scale marine aggregate extraction, offshore wind farm installations, gas pipelines, electric cables, coastal defence, to port and coast edge constructions.

Andrews (2004) summarises the present difficulties of implementing the spirit of Planning Policy Guidance 16 in the marine zone, in particular the necessity for reasonableness. Developers expect clarity on the importance of remains and precise definition of their obligations. The difficulties of interpreting fragmentary data, the likelihood of requiring the acquisition of more data that does not necessarily increase knowledge, and a poor understanding of the nature of non-wreck sites, are all barriers to maritime archaeology benefiting from the contribution of private sector funding in the form of development-led archaeology.

## Marine spatial planning

Current trends strongly favour improving the compatibility of datasets collected and held by various sectors, with clear emphasis on map-based data retrieval to inform the rapidly increasing role of spatial planning in the marine environment. It is thought that marine spatial planning can:

- offer a means of managing potentially conflicting uses of the sea and cumulative effects of human activities
- provide an opportunity to deliver greater integration, better management, and regulation (ie proportionate, accountable, consistent, transparent, targeted).

It is vitally important that the marine historic resource is adequately represented as these initiatives develop.

## Promoting considered use of seabed resources

A few, but significant, advances have been made in engaging with marine industries. Since 2002, English Heritage has sought to develop appropriate guidance for developers on how to incorporate best practice in ensuring that historic environment issues are given proper attention in the regulation of marine development. English Heritage and the British Marine Aggregates Producers Association jointly produced *Marine Aggregate Dredging and the Historic Environment: assessing, evaluating, mitigating and monitoring the archaeological effects of marine aggregate dredging* (BMAPA and English Heritage 2003) which is designed to provide all stakeholders including developers, regulators, consultants, and heritage professionals with a well-defined approach and clear statement of policy with respect to marine archaeology and marine aggregate extraction. This guidance has been further enhanced by a protocol for the proper reporting of finds of archaeological interest generated by aggregates extraction.

## Maritime archaeology capacity building

Increased development control highlights one area where there is a shortage of competent maritime archaeological capacity in the UK. In 2003, English Heritage commissioned the Institute of Field Archaeologists to survey all those involved in maritime archaeology in the UK, focusing on skills, experience, and training. The

report, *Identifying Skills and Needs in Maritime Archaeology* (Edwards and Aitchison 2004), listed the following general and strategic conclusions:

- a consistent management and research policy is needed from the heritage bodies
- formal structures are needed to focus effort
- a research agenda is needed, to allow priorities to be established and maintained
- European partnerships and cross-border research and co-operation would be a significant contribution
- improved protection of underwater cultural heritage is needed
- there should be greater integration with archaeology on land
- over-regulation of the recreational diving sector should be avoided
- core funding is needed
- more professional maritime archaeologists are needed
- there are too few employers
- career and employment prospects are poor
- the avocational sector is important, and needs more assistance
- opportunities, training, and encouragement are needed for professional non-divers in maritime specialisms
- formal standards for underwater work are needed to improve quality of training and practices
- assessment of currency of knowledge and competency in skills is difficult, but this can be addressed by IFA membership and through continuing professional development
- responsible fieldwork should be encouraged and results published, in order to enhance the core database, and establish a firm basis for future research and development
- long-term core-funded projects are needed, to provide training and career development opportunities
- overall publication backlog needs addressing
- need to encourage use of basic survey skills and reduce reliance on technological tools.

To begin to address these issues, English Heritage has focused on developing internal linkages and lines of communication to raise awareness amongst the organisation's staff about the maritime historical environment and English Heritage's role and responsibilities. A significant effort has been made to raise the awareness and capacity of all the Groups and teams of

English Heritage by: strengthening links with officers with coastal responsibilities in the Regional Offices and the centre; providing training, desk instructions, information, and a source of specialist advice; and factoring the marine historic environment and maritime heritage generally in major English Heritage strategic and policy initiatives (eg *State of the Historic Environment Report* and the *Modern Military Framework Strategy*).

In the external sector, English Heritage has supported continuing professional development initiatives through University extra-mural courses, and joint seminars with organisations such as the Institute of Field Archaeologists Maritime Affairs Group and the Association of Local Government Archaeological Officers.

### The lack of existing maritime archaeological research frameworks

There is a clear requirement for the development of robust research frameworks so that a broader understanding of the marine historic environment can be achieved, leading to curators being able to take informed decisions on value, for developers to control risk, and for the maritime resource to receive the protection, interpretation, and presentation to the wider community, that it deserves (Andrews 2004).

Many questions need to be addressed before appropriate maritime archaeological research frameworks can be developed. Should they be assessed chronologically, thematically, or geographically? What is the optimum integration with existing and planned terrestrial research framework initiatives?

In March 1995 a report was produced by the Institute of Field Archaeologists' Maritime Affairs Group (Firth 1995b), intended as a starting point for a discussion about maritime archaeology research frameworks, prompted by English Heritage's review, *Frameworks for Our Past* (Olivier 1996). It is notable that of the 121 national and 268 regional research framework documents submitted to English Heritage, fewer than 1% were specifically dedicated to maritime archaeology and reference to maritime archaeology was omitted from virtually all of the remainder.

The Maritime Affairs Group report intimated that many of the difficulties affecting research within maritime archaeology stemmed from the separation of maritime/underwater from terrestrial archaeology – the former being institutionalised from 1973 onwards by the Protection of Wrecks Act 1973. This legislation

cut off maritime/underwater from the important developments that took place in terrestrial archaeology through the 1970s and 1980s. This led to:

- most investigations of maritime/underwater sites being directed towards shipwrecks, and particularly post-medieval warships that constitute the bulk of the wrecks designated under POW
- archaeologists' interests have been limited to those sites
- fieldwork carried out in other periods or themes (eg earlier boats and ships, submerged prehistoric land surfaces, maritime industries) have been carried out on land or on intertidal areas within the framework of terrestrial archaeology
- maritime/underwater work was characterised by official disinterest in results, and an accompanying lack of support for research
- controls placed on investigations were not sufficient to ensure that results were properly disseminated, or that fieldwork was to an adequate standard
- this resulted in little post-excavation analysis, failure to publish substantive reports, inadequate provision for duplicating and curating archives, dispersal of excavated and recovered material (often by sale), and a difficulty in maintaining and developing investigation teams.

Maritime/underwater archaeology has developed slowly against a culture of dispute that ancient material could survive beneath the sea, and the suspicion that investigations underwater could not be carried out to the same standard as on land. These structural problems led to a concentration of research into site formation studies and work on technical aspects of methodology (eg geophysics for site location and characterisation).

The research infrastructure for maritime/underwater archaeology was regarded as being severely underdeveloped despite the existence of many museums with maritime/underwater holdings and an increasing number of universities with interests in the area. There was no form of overall collaboration.

The key objective for the production of an agreed research framework for maritime archaeology remains, and English Heritage has included a requirement into its Strategic Plan (2005–10) to ensure that the marine historic environment is addressed in the ongoing development of a national strategy for archaeology.

## Opportunities for raising awareness and improving accessibility

English Heritage now participates in various local and regional organisations with interests in the marine historic environment such as the Dorset Coastal Forum, the North-East Forum on Maritime Archaeology, and the Hampshire and Wight Trust for Maritime Archaeology.

### Submerged prehistory

English Heritage has specifically targeted commissioned research, according to strategic priorities, on under-studied or vulnerable areas. For example, basic site evaluation work has been commissioned on the Bouldnor Cliff site, off the Isle of Wight, on a submerged prehistoric landscape that includes worked flints dating to approximately 7000 years before present. Secondly, in 2003 a workshop on the Submerged Prehistory of the North Sea was held, designed to bring together people with an interest in North Sea environmental management, North Sea archaeology, and submarine prehistory in other parts of the world, to discuss their mutual interests and share their experience (Flemming 2004).

### Aggregates Levy Sustainability Fund

The introduction of the Aggregates Levy Sustainability Fund (ALSF) by the Department for Environment, Food and Rural Affairs (Defra), essentially a levy on minerals extraction, including marine aggregates, provided the opportunity for a timely boost to English Heritage's ability to fund essential research into the marine historic environment affected by aggregate extraction. Projects, totalling around £1.5 million over the financial years 2002/3 and 2003/4, supported by the ALSF included:

- surveys of archaeological finds from the southern North Sea and the eastern English Channel with particular emphasis on enhancing understanding and characterisation of Palaeolithic and Mesolithic archaeology at risk from marine aggregate extraction
- characterisation of the historic environment resource under threat from marine aggregate extraction: enhancement of available records of wrecks, hazards, and casualties to improve understanding of likely maritime remains on the seabed

- research into innovative, assessment protocols (such as multi-beam sonar) on historic wrecks
- understanding depositional processes of marine aggregate deposits
- determining the geomorphology of submerged and buried landscapes on the northern English Channel shelf to assess the archaeological significance of offshore fluvial systems in their palaeoenvironmental contexts prior to aggregate extraction.

Defra announced an extension of the two-year ALSF pilot for a further three years. Marine projects are now segregated from terrestrial, and discretionary funds are shared between English Nature, English Heritage, and the Defra Centre for Fisheries, Environmental and Aquaculture Science agency. English Heritage has disbursed £800,000 in 2004/5 and can expect to disburse £1 million in 2005/6 and £1 million in 2006/7.

An example of a completed initiative is the Re-assessment of the Archaeological Potential of Continental Shelves project undertaken by the University of Southampton. This project reviewed the archaeological potential of the UK continental shelf to enable a greater understanding of the relationship between marine aggregate deposits and past-landforms. This project highlighted the realisation that the approaches necessary to locate, identify, and understand the distribution of archaeological remains in particular offshore areas must take into account past landforms. Literature from research disciplines relating to the reconstruction of submerged landscapes and pre-submerged archaeological deposits was reviewed, which will assist in offshore regulation and licensing.

The following summaries show ALSF projects that are currently underway.

#### *England's Historic Seascapes*

The Historic Seascapes project aims to adapt the methodology of Historic Landscape Characterisation (HLC) to England's intertidal and marine zone. Anticipating a key role in framing responses to aggregates extraction, the adaptation will be trialled through an initial pilot in North-West England.

Effective and co-ordinated management of the marine historic environment requires the ability to take a strategic level overview, whether the concern is

to plan the future direction of conservation activity and funding, to provide sustainable responses to development and other pressures for change, or to prioritise research funding.

Wessex Archaeology has been commissioned to trial the project methodology in Liverpool Bay, drawing together a range of marine cultural and natural environment datasets to understand and map the historic dimension of the wider environment, beyond the unevenly distributed and variable data from previous archaeological work. This project's GIS database will enable the marine historic environment to participate fully in partnership with our fellow agencies for the natural environment in the government's development of an integrated marine spatial planning system.

This will inform four further, separate, pilots to confirm the method's validity in other main types of coastal context, ensuring a robust characterisation methodology to inform the assessment of aggregates extraction licence applications. Seascapes will complement the current national programme of county-based HLC projects, which, through desk-based GIS mapping and analysis, seek an archaeological understanding of the historical and cultural development of the present landscape.

The intention is to provide overviews of the historic dimension of environment, giving understanding at a scale capable of effectively informing strategic level conservation planning and research prioritisation. Scale and full coverage within their project areas and themes enables them to give context to the presently, point-based, individual site records, and provide predictive assessments of areas outside those records.

#### ***'The Importance Of Shipwrecks' and 'Enhancing Our Understanding: Shipwreck Importance'***

These two linked projects, undertaken by Wessex Archaeology and Bournemouth University respectively, address the fundamental issue of the absence of adequate tools to assess the value of shipwreck sites. Managing change, for example ensuring that the impact of marine aggregate extraction is minimised, requires that decisions are informed and that they are driven by an understanding of what is valued and as full a knowledge of the archaeological resource as possible.

There are trans-national issues involved in estimating importance and value as submerged heritage assets can be located outside the territory of their state of origin or beyond the territory of any nation state

(ie in international waters), and can be unattributable to any single state (ie built, flagged, crewed, victualled, or cargoed by more than one country).

The aim of these projects is to develop and trial a framework for ascribing importance to shipwrecks suitable for use in the environmental assessment of marine aggregate dredging proposals.

#### ***Wrecks On The Seabed***

This Wessex Archaeology project comprises the refinement and development of methodologies related to area survey methods and the survey of ephemeral sites through the acquisition of substantial and purposely collected geophysical datasets that represent relevant and independent 'compare and contrast' scenarios for side-scan sonar surveys. Such scenarios will enable clear 'demonstrable' guidance on the most appropriate geophysical survey specification to meet archaeological objectives. Specifically, the module is intended to standardise the approach to reviewing typical geophysical datasets and defining whether an acoustic signal is anomalous or not.

#### ***Enhancing Our Understanding: Navigational Hazards***

Bournemouth University is undertaking this project to assess the suitability of historical and scientific data relating to specific aspects of the marine historic environment surrounding navigational hazards for use in the environmental assessment of marine aggregate dredging proposals. Source analysis is likely to assist in the greater understanding and detection of hitherto unknown sites. The project will also test the creation of an indicative predictive map of proactive management strategies through linkages formed with other ALSF projects.

#### ***England's Shipping***

Through the England's Shipping project, Wessex Archaeology seeks to improve the conservation, understanding, and wider appreciation of the marine historic environment affected by dredging. Specifically, the project seeks to collate documentary information about shipping patterns to facilitate the assessment of maritime archaeological potential in the course of preparing marine aggregate environmental statements. The collation and GIS presentation of historical data used during this project will assist the effective assess-

ment of archaeological potential within areas of proposed aggregate extraction.

### *Modelling Exclusion Zones for Marine Aggregate Dredging*

Southampton University has been commissioned to undertake this project to make a preliminary assessment of dredging on archaeological materials, focusing particularly on wreck material. The work will bring together expertise across archaeology, oceanography, and marine engineering, with the potential to impact on not only archaeological science but also marine science.

### *Rapid Archaeological Site Surveying and Evaluation in the Marine Environment and Transitional Zones*

The principal aim of this project, with the University of St Andrews, is to exploit the potential of geophysical, remote survey equipment to allow rapid detailed investigation of submerged archaeological sites and their immediate surroundings. A secondary aim is to establish the optimum configuration of acoustic instruments to obtain the maximum resolution necessary for high-quality archaeological work.

### *Seabed in Prehistory*

Wessex Archaeology has been commissioned to undertake the Seabed in Prehistory project with the aim of informing best practice for the assessment and evaluation of prehistoric deposits, on or beneath the seabed, in the course of the aggregate dredging licence application process, and to provide baseline data on the prehistoric archaeological potential of dredging areas around the coast of England. The intention is to carry out two fieldwork elements: geophysical survey off Great Yarmouth; and extensive grab sampling in the palaeo-Arun off the coast of Sussex.

### **Reform of historic environment heritage protection**

In November 2002, Tessa Jowell (Secretary of State, DCMS) announced the need for 'a designation system that sustains the historic environment as a whole rather than relating in a piece-meal way to its constituent parts', adding that 'we all know about the problems which can arise from some of

the current procedures ... We need to reform these, make them work better for everyone, while maintaining the same level of protection for the historic environment'.

As a result the DCMS Review of Heritage Protection was developed to address issues of the protection of heritage 'assets' of any age or type, including those which currently lie in terrestrial or marine burial environments.

At the same time English Heritage commissioned a research project to review in depth the genesis and the nature of the present legal framework relating to maritime archaeology in England and Wales (School of Legal Studies 2003).

On 26 March in Ramsgate Maritime Museum, David Miles, then Chief Archaeologist for English Heritage, launched the DCMS marine consultation entitled *Protecting our Marine Historic Environment: Making the System Work Better* (DCMS 2004). The paper set out the key issues and questions in relation to marine historic environment designation:

- seek the closest practical integration of marine and terrestrial historic environment protection
- define the term 'marine historic asset'
- create a new unified designation for marine heritage assets
- establish appropriate criteria for designating marine sites
- debate the proper management and control for marine protected historic assets
- propose the development and publication of statements of significance
- debate the determination of site boundaries
- discuss the appropriate levels of openness and interim protection for marine historic sites.

It also sought to provide:

- a positive approach to managing the marine historic environment, which will be transparent, inclusive, effective, and sustainable and central to social, environmental, and economic agendas at a local as well as national level; and
- a legislative framework that protects the marine historic environment but enables appropriate management techniques to be applied and to evolve.

English Heritage commissioned the drafting of the consultation document and organised stakeholder seminars around England. The consultation period ended on 31 July 2004 and DCMS has recently

published its analysis of the responses and its proposals for the way forward, acknowledging the considerable

work already underway by English Heritage and others (DCMS 2005).

## Conclusions

Subsequent to the passing of the National Heritage Act 2002, English Heritage has begun to address the wider issues related to maritime archaeology in England, including the development of appropriate research agendas. In this paper a number of related initiatives have been described, including those being taken forward under the Aggregates Levy Sustainability Fund, that are beginning to address serious deficiencies in maritime historic environment engagement at the level of a national heritage agency, particularly in the areas of providing statutory advice. Many other areas still require attention including:

- clarification of what actually comprises the maritime archaeological resource and its relationship to other assets such as historic ships, maritime museums, and coastal properties
- issues of jurisdiction, management, and administration (national, regional, and local) which cross the environmental divide of the low-water mark
- raising the capacity of the maritime archaeological sector whether in academia, contract archaeology, or Local Authorities
- the promotion of best practice in the existing maritime archaeology sector
- increasing our understanding of the nature of the maritime historic environment and relative preservation in different marine burial environments
- understanding the numbers, potential, and nature of, and threats to, existing sites, particularly drowned prehistoric landscapes.

English Heritage has a five-year plan, *Making the Past Part of our Future* (English Heritage 2005) to take us into the future with its real and tough challenges. The organisation will continue to work in new ways, relying on more partnership and strategic engagement, speed and flexibility, clarity and consistency of advice, commercial awareness and customer service.

The aim is to promote a 'heritage cycle' where an increasing understanding of the historic environment

leads to people valuing it more, and as a consequence caring for it better. An environment cared for will be enjoyed, and enjoyment normally brings a thirst to learn more, thus completing the cycle. For each element high-level strategic aims have been adopted to:

- help people develop their understanding of the historic environment
- get the historic environment on to other people's agenda
- enable and promote sustainable change to England's historic environment
- help local communities to care for their historic environment
- stimulate and harness enthusiasm for England's historic environment
- make the most effective use of the assets in our care.

For English Heritage as a whole, and for the Maritime Archaeology Team in particular, the challenge over the next five years is to achieve these aims in relation to the maritime historic environment of England. At present English Heritage is constrained by resource limitations but recent restructuring of the former Archaeology and Historic Buildings Departments within English Heritage has offered the opportunity of enabling a more strategic approach to be taken to addressing marine historic environment and maritime heritage objectives and the sharing of tasks with teams other than that of Maritime Archaeology so that the organisation can continue to:

- gradually build internal capacity to fulfil its role as national curator/statutory advisor
- commission key projects from external partners to raise awareness, enable access, develop and promote standards
- promote the debate about frameworks to underpin future research directions
- identify gaps in participation, ownership, and support for the submerged historic environment.



## SECTION 4

# DISCUSSION AND FUTURE CHALLENGES

From the issues, approaches, and challenges raised in this collection of papers it is clear that the management of the marine archaeological resource across the globe is a diverse, expanding, and exciting field. These international case studies have highlighted some of the main areas of concern for present and future practitioners, managers, and curators. The task of balancing research, conservation, and outreach against increasing pressures from human

and natural forces has never been more evident.

The multiplicity of the issues raised within these papers reflects the lively discussion and debate that was held during the Managing the Marine Cultural Heritage Conference. This section attempts to summarise the key areas which require the attention of the marine heritage management community, subjects which will, no doubt, be stimulating debate and developments for many years to come.

### Legislative frameworks

The development of legislative frameworks within which the marine cultural heritage is protected and conserved has been undertaken by individual nations in reaction to specific circumstances. A number of case studies presented here mention national legislative developments and approaches (Staniforth, Alves, Kelleher, Oxley, and Maarleveld). These examples show a diverse approach to protection regimes. However, it must not be forgotten that many nations have no legal protection for marine cultural heritage, and some regularly face long and bitter battles with treasure hunters.

The UNESCO Convention on Underwater Cultural Heritage has been discussed in a number of papers. Although the convention has not yet received enough ratifications to come into full force, it is a fundamentally important document which, through the annex, provides a set of guiding principles for protecting and investigating marine cultural heritage.

With increasing pressures on the marine environment, it is likely that the legislative frameworks within which maritime heritage is managed will evolve. This is clearly an area of concern to heritage practitioners, managers, and governments, for whom balancing conservation with social and economic development is certainly a challenge.

Key challenges for legislative frameworks include:

- balancing heritage protection with long-established principles of private ownership
- ensuring parity of protection for all submerged heritage remains, moving away from a focus on shipwrecks
- maintaining comparable standards and approaches between nations which may regulate adjacent sea areas
- promoting the ratification of the UNESCO convention
- reflecting issues of significance, potential, and fragility within legislative approaches.

### Management frameworks and research agendas

The legislative frameworks discussed above are often intrinsically linked to management frameworks, but there are a wide range of issues tied up within the 'triangle' of legislation, management and research. Each of these strands is based on a range of values which include significance, rarity, fragility, amenity, and poten-

tial. While these can be subjective topics, research agendas and management frameworks are evolving to provide a basis on which to assess, compare, and evaluate these factors in relation to marine cultural heritage.

Papers within this volume provide a range of examples of how management frameworks are devel-

oping. This area of the discipline is rapidly expanding, and can be linked to wider social trends of increasing accountability on many levels – from government to the wider public. Heritage frameworks must be used to reinforce the importance of cultural remains and human development. This is a tall order for archaeology in general, let alone for maritime archaeology.

Within the broad topic of management frameworks and research agendas a number of key challenges are evident:

- maritime archaeology must develop new research agendas and feed into established agendas, which often include terrestrial remains
- managing heritage in the dynamic marine environment requires innovative approaches
- the international nature of shipwrecks make them a unique management challenge
- methods for determining significance in the marine heritage must be developed
- a balance between *in situ* preservation, development, and investigative research must be reached.

### Archives, collections, and disposal

When the investigation of the marine cultural heritage has resulted in the production of significant archives and collections, the nature of management challenges changes. Within the museums, archives, and display sectors there are obstacles to overcome of lack of resources, particularly funding, but also skilled staff for conservation and display. The lack of provision of facilities and archives to accession, conserve, and curate maritime assemblages is evident.

International approaches to marine heritage collections are largely based around classic shipwreck sites and assemblages which represent the ‘time-capsule’ phenomenon. This situation can create huge potential for popular and effective museums and display, but it can also create a fear of the scale and long-term responsibility involved with marine collections. Issues of the retention of entire collections are yet to be fully addressed through the development of considered

disposal policies (see Panter, this volume). However, this is an area that will inevitably require attention, given the expansion of the investigation of the marine heritage and the resulting archives.

In summary, the principal areas of concern are:

- a lack of clear responsibility for marine cultural heritage through local, regional, and national collection policies
- a lack of provision for the active collection, conservation, and display of marine cultural assemblages
- a lack of skilled marine conservation professionals and conservation facilities
- no disposal policies for marine finds, based on considered research and significance priorities
- continuing debate over the ‘ownership’ of marine collections, particularly those from shipwrecks.

### Professional development, standards, and guidance

The development of marine archaeology as a profession has taken a variety of courses within different countries. Some nations have a long history of the consideration of submerged heritage and recognition of the need for practitioners in this specialist field; others have had to respond rapidly to urgent situations; others still are struggling to maintain any marine archaeologists. The role of the ‘practitioner’ can range from avocational weekend divers to full-time employed marine archaeologists; all play their part in heritage investigation and management.

Allied to the development and maintenance of a core body of marine archaeologists is the need for a framework of standards and guidance through which

their work can be assessed and regulated. This role requires the existence of institutes, organisations, and groups that can bring individuals together to develop standards and guidance to act as benchmarks for the detailed and consistent investigation of marine archaeological remains. The setting, promotion, and maintenance of such standards for archaeological work requires the provision of specialist training; this is relevant across the board from volunteer field worker to project manager.

Expanding the ‘pool’ of marine archaeological practitioners will be key to the long-term sustainability of the discipline. Issues include:

- a lack of underwater excavation opportunities



- to maintain a skill base
- low number of full-time professional marine archaeologists
- lack of availability of continuing professional development and training opportunities.

### A challenging future

Awareness of conservation issues within the marine environment is a rapidly expanding area of concern. This is reflected in international examples of the development of approaches for integrated management of the marine zone, particularly the use of space, regulation of activities, and exploitation of a range of resources. It is within this context that more strategic approaches to managing marine cultural heritage must be developed, applied, and refined.

The above sections outline issues of particular urgency for marine heritage management. Inevitably with a volume such as this, which touches on many aspects of marine heritage management, it has not been possible to explore fully all of the challenges faced. It is hoped that this volume will serve to promote further international discussion, debate, and collaboration which will help drive important aspects of development in the exciting and demanding field of marine cultural heritage.





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# Managing the Marine Cultural Heritage

## Defining, accessing and managing the resource

Recent decades have witnessed an expansion of archaeological activity under water and in the coastal zone. There has also been a realisation of the threats to this material from human and natural action. This period of relatively rapid change has increased pressure on governments, heritage groups and agencies, coastal-zone managers, and sea users to formulate approaches to managing the maritime cultural heritage.

This volume presents a range of international initiatives that include examples of management responses to regional, national, and international situations. It also discusses the principal challenges facing maritime archaeology, which have relevance not just in the UK but across the globe.

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