ENGLISH HERITAGE

Management of Research Projects in the Historic Environment
MoRPHE Project Planning Note 1
Marine Archaeological Geophysical Survey

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Preface

MoRPHE Project Planning Notes form an integral part of the MoRPHE project management methodology. The Project Planning Notes provide specific guidance on the *management* of particular types of project, not guidelines on the techniques used.

They are intended to be presented together with, and read with '*The MoRPHE Project Managers Guide*' which gives generic guidance on project management.

1.0 Introduction

This Project Planning Note is intended to cover the archaeological and historical assessment, evaluation and recording of wreck sites through remote sensing and geophysical survey.

It is intended to be used in conjunction with draft guidelines on *Assessing, Evaluating and Recording Wreck Sites* (Wessex Archaeology 2005) prepared for English Heritage with support from the Aggregates Levy Sustainability Fund (ALSF).

2.0 Planning

2.1 Setting Objectives

Whether driven by development-led archaeology or research, a principle aim of an artefact-based (i.e. wreck) site investigation is to define the character and extent of the site which may lead to judgement-led decisions as to its 'importance'.

Here, a staged-approach is advocated as an appropriate means of investigation as different investigative approaches are required for vessels of different age, construction and exhibiting differing levels of survival.

A general progression from desk based research followed by geophysical and/or diver-based survey is advocated, with targeted ground-truthing (e.g. diver investigations) drawing heavily on the information gathered in the desk based and geophysical work.

2.2 Useful techniques for estimating time and budget

Although mobilisation and de-mobilisation will need to be built into the overall budget, consideration must be given to the charter of an appropriately-sized vessel and the nature of the targets and seabed to be surveyed.

It is also recommended that stand-by time is addressed within the project budget to provide for adverse weather conditions; winds greater than Force 4 or 5 on the Beaufort Wind Scale, causing moderate to rough sea states, can make the collection of geophysical data with equipment such as a side scan sonar or multibeam sonar problematic. Work undertaken in these conditions is likely to result in lower quality data.

Following fieldwork, the amount of geophysical data collected will determine the amount of post-processing required (to be undertaken by a suitably qualified marine archaeological geophysicist or overseen by an appropriately qualified archaeologist), while proprietary software may need to be purchased to enable this.

2.3 Risks and their management

For geophysical data collection, it might be appropriate to engage the services of a suitable marine sub-contractor employing the equipment to specifications pre-determined for optimum archaeological data collection and interpretation.

However, general risk issues for project management are as follows;

- Equipment reliability
- Skills of project team
- Unexpected discoveries
- Volume of data acquired (see section 6 below)

For survey vessels themselves, it should be noted that that Small Vessels operating commercially under the British Flag or in British waters must comply with the Merchant Shipping Regulations or an MCA Code of Practice.
In practice, this will ensure sea-worthiness of the survey vessel. Although the risk of down-time caused by strong winds has been addressed above, bad visibility due to fog can prevent such survey operations as the risk of collision at sea increases.

For project staff who are expected to periodically work on boats, the risk of severe personal injury at sea can be mitigated by undertaking sea survival training in accordance with the MCA's standards of training, certification and watch keeping (STCW95).

2.4 Likely list of products or outcomes

In addition to the technical report that will usually accompany geophysical data acquisition and interpretation, consideration will have to be given to the presentation of interpreted data. This might be in the form of flat images suitable for publication or datasets suitable for inclusion into 3D proprietary software.

2.5 Likely project stages

As a minimum, the following project execution stages are recommended;

- *Start-up and Initiation*
- *Desk-based Research*
- *Assessment / Evaluation*
- *Geophysical Survey Mobilisation*
- *Geophysical Survey Implementation*
- *Geophysical Survey De-mobilisation*
- *Geophysical Data Post-processing*
- *Assessment / Evaluation*
- *Dissemination and/or archive*
- *Closure*

3.0 Project execution

The following sections give more detailed guidance on execution stages of a project.

3.1 Desk-based Research

Desk-based assessments serve to determine the archaeological potential of a predefined study area or site using existing records and are defined in the IFA's Standard & Guidance Notes (1999). Broad specifications for marine DBA's (and geophysical survey) are given in the guidance note on *Marine Aggregate Dredging and the Historic Environment* (BMAPA & EH 2003). The assessment or evaluation of this data may provide contextual information for artefact-based sites.

3.2 Geophysical Survey

A geophysical survey can serve to:

- Detect previously unknown wreck sites or locate recorded losses of unknown position and can confirm the position of known sites;
- Gain more information on located, but unidentified anomalies or features, possibly identifying them without having to conduct a visual inspection;
- Provide more information on known archaeological sites to aid further evaluation (e.g. determine site extent, topography, areas of interest or diagnostic features).

There are many different types of geophysical survey tool available for use in the marine environment and it is not the purpose of this document to describe their relative applications. However, each of the techniques has their advantages and disadvantages with respect to the assessment and evaluation of wreck sites, so should be applied for a particular archaeological purpose to address specific questions. In determining the required geophysical survey tool, particular reference must be made to the guidance referred to in Sections 1.0 and 3.0.

It must be remembered that position fixing is central to all forms of archaeological investigation, but it is even more crucial at sea because the object of investigation cannot be seen from the surface, or related to visible landscape features. The majority of sea-users today use satellite derived positioning systems on their vessels, more commonly called Global Positioning Systems (GPS), to determine their position. All positions acquired with a GPS receiver are based on the terrestrial reference system or datum WGS 84 and for all practical purposes the WGS 84 datum is likely to be the definitive datum for many years to come with local transformations being used to maintain compatibility with other systems.

4.0 Review

The review or assessment of geophysical survey data must be undertaken by a suitable qualified marine geophysicist trained in archaeological interpretation to facilitate the correlation of archaeological base-line information with identified seabed anomalies, as well as identifying 'new' features of possible cultural interest.

This assessment is likely to inform a visual (Diver-based or ROV) inspection of identified features and/or anomalies.

5.0 Archive & Dissemination

While information on 'new' seabed anomalies contained within 'grey literature' may ultimately be provided to the NMRC, there is currently no suitable provision for the archiving of digital bathymetric data. Although English Heritage is addressing this, we currently recommend that the digital archive is maintained for five years following completion of the project. However, consideration should be given to the provision of meta-data to the Integrated Coastal Hydrography partnership. Also, English Heritage recommends that an OASIS record is completed.

6.0 Further Information

The Marine and Coastguard Agency website provides guidance on all maritime safety issues. See http://www.mcga.gov.uk

The Integrated Coastal Hydrography Partnership provides access to a range of hydrographic data and supporting information.
See http://www.coastalhydrography.com

7.0 Acknowledgement

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8.0 Contact details

This Project Planning Note was authored by Mark Dunkley, Marine Archaeologist, English Heritage. Email Mark.Dunkley@english-heritage.org.uk
Comments to assist future versions are welcome.