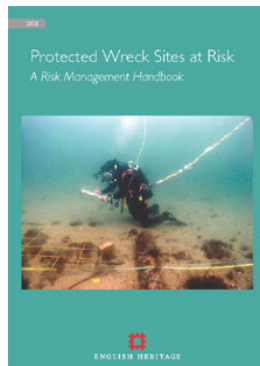




Historic England

Protected Wreck Sites At Risk: A Risk Management Handbook



On 1st April 2015 the Historic Buildings and Monuments Commission for England changed its common name from English Heritage to Historic England. We are now re-branding all our documents.

Although this document refers to English Heritage, it is still the Commission's current advice and guidance and will in due course be re-branded as Historic England.

[Please see our website](#) for up to date contact information, and further advice.

We welcome feedback to help improve this document, which will be periodically revised. Please email comments to guidance@HistoricEngland.org.uk

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2008

Protected Wreck Sites at Risk

A Risk Management Handbook



ENGLISH HERITAGE

Preface

The application of risk in relation to terrestrial archaeological sites has previously been addressed through English Heritage's *Monuments at Risk Survey* (Darvill and Fulton 1998). This followed the Department of the Environment (DoE) publication *A Guide to Risk Assessment and Risk Management for Environmental Protection* (DoE 1995), which took an important step in establishing basic guidelines for environmental risk management.

The *Monuments at Risk Survey* noted that a potential cause of harm to an archaeological site or monument is known as a hazard. The effects of a hazard upon archaeological deposits equate to a measure of risk. 'Risk' in this context therefore means uncertainty of outcome (English Heritage 2006). The unpredictable nature of the historic environment makes the identification and management of risk characteristically difficult to anticipate, particularly as risks to maritime archaeological sites have been identified as being derived from both environmental and human impacts (Grenier 2006, x). UNESCO, in particular, emphasises the risks posed by human intervention:

Today, shipwrecks and underwater ruins are coming under increasing threat. While professional equipment and a high-level of training are necessary to undertake underwater excavations, this heritage is no longer beyond the reach of treasure hunters. In addition to dispersal, recovered objects also face the risk of destruction owing to the lack of conservation.

(Source: <http://portal.unesco.org/culture/en/ev.php-URL_ID=34464&URL_DO=DO_TOPIC&URL_SECTION=201.html> (Accessed 13.05.2008))

Taking to the Water: English Heritage's Initial Policy for the Management of Maritime Archaeology in England is the published policy that frames English Heritage's management approach to the marine historic environment. The policy paper discusses the broad characteristics of the maritime archaeological resource in the English Territorial Sea and notes that maritime interests were excluded from the *Monuments at Risk Survey*.

English Heritage's specific responsibilities to maritime sites derive from the National Heritage Act 2002 which modified our 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 also enabled the Secretary of State to transfer administrative functions relating to the Protection of Wrecks Act 1973 to English Heritage.

As wreck sites may contain the remains of vessels, their fittings, armaments, cargo and other associated objects or deposits, they may merit legal protection if they contribute significantly to our understanding of our maritime past. The Protection of Wrecks Act 1973 empowers the appropriate Secretary of State to designate a restricted area around a vessel if he/she is satisfied that, on account of the historical, archaeological or artistic importance of the vessel, or its contents or former contents, the site ought to be protected from unauthorised interference. A 'Protected Wreck Site' is therefore one afforded statutory protection under the Protection of Wrecks Act 1973.

Where assessed, a Protected Wreck Site will be considered to be at high risk if there is a significant likelihood of loss or further loss of historical, archaeological or artistic significance from it within the foreseeable future.

('Significance', in this context, means *the sum of the cultural and natural heritage values of a place* (English Heritage 2008).) Assessment at medium risk indicates that there is a reasonable likelihood of loss of historical, archaeological or artistic significance in the future if no change in the management regime takes place. Low risk indicates that the site is being managed in a way that is sympathetic to its historical, archaeological or artistic significance.

Three broad factors have been considered when assessing the risk to the nation's Protected Wreck Sites:

- Condition: the current condition of the wreck, whether in optimal condition, generally satisfactory, generally unsatisfactory or having extensive problems;
- Vulnerability: an assessment of the natural and anthropogenic influences on the site, and;
- Trajectory: an assessment of the management regime and whether the monument condition is improving, remaining stable or experiencing unmanaged or inappropriate decline.

English Heritage recognises that natural processes, such as erosion, cannot always be prevented. Protected Wreck Sites that are subject to such forces will not be considered at risk if they are subject to a planned programme of managed change, recording and investigation.

England's historic environment is particularly rich and varied; it is our legacy to the future. If we are to pass on this fragile heritage to future generations, the current level of risk to Protected Wreck Sites must be reduced. English Heritage believes that no wreck site legally protected in the public interest should be at high risk.

This *Handbook* describes a methodology to be adopted by English Heritage, contract archaeologists, licensees and others engaged in the risk assessment and risk management of England's Protected Wreck Sites. It is anticipated that the methodology will be refined through application and eventually extended to the non-designated wreck resource.

The document also forms part of a wider initiative to assess the state of all designated historic assets and to understand their current management patterns, their likely future trajectory and how that can be influenced to ensure that their significance is maintained for both present and future generations.

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1 Introduction

1.1 What is Risk?

England’s protected wrecks, consisting of late Middle Bronze Age cargoes to early 20th-century submarines, survive in a range of environments and to varying degrees. Quantification of a wreck’s survival is a point-in-time measurement of the current state or condition of the wreck relative to some former state and reflects the cumulative effects of all the natural and human processes that have operated upon it.

If survival is taken to provide a measure of how a wreck site has fared to date, then risk must be regarded as the measure of how a wreck site is likely to fare in the future.

The concept of risk management in relation to archaeological remains has not been widely applied to wreck sites, although some coastal surveys have sought to grade sites according to archaeological potential and threat (see, for example, Northumberland County Council 2004). Impacts to archaeological remains in the inter-tidal zone were also identified in a survey of England’s coastal heritage (Fulford *et al* 1997). Some risk estimation and risk evaluation was included in the study. More recently, V Bain developed a practical risk assessment framework to help assess risks to the marine environment caused by the exploitation of marine minerals. In addressing wreck sites, Bain determined that the sensitivity of a ‘shipwreck site is assessed in terms of probability of damage or destruction [to] the...site’ (Bain *et al* 2007, 67).

Therefore, the principle that risk concerns the chance or possibility of future danger, loss or other adverse consequences as a result of natural processes or the intentional or unintentional actions of individuals or groups applies (Darvill and Fulton 1998, 28). Expressed as a simple formula, risk can be defined as ‘probability x consequence’.

1.2 Managing and Assessing Risk

For English Heritage, managing risk involves foreseeing areas of uncertainty and planning appropriate countermeasures consistent with our intention to study and assess the risks to historic assets and to devise appropriate responses (English Heritage 2005, Research Theme D). By quantifying and analysing the condition of the Protected Wreck Sites we will be able to identify elements that are at risk and determine priorities for future actions.

Risk assessment and management are systematically used to identify and assess risks,

to understand the impacts and importance of risks, and, most importantly, to manage the risks as appropriate (Meadowcroft and Cruickshank 2001, 39). Accordingly, Fig 1 shows a general and highly simplistic model of risk management to provide a background for the risk assessment methodology proposed within this document.

It is also worth noting the concept of ‘risk’ as adopted by the National Historic Ships committee. National Historic Ships is a non-departmental public body advising the Secretary of State for Culture, Media and Sport on national historic ship preservation and funding priorities.

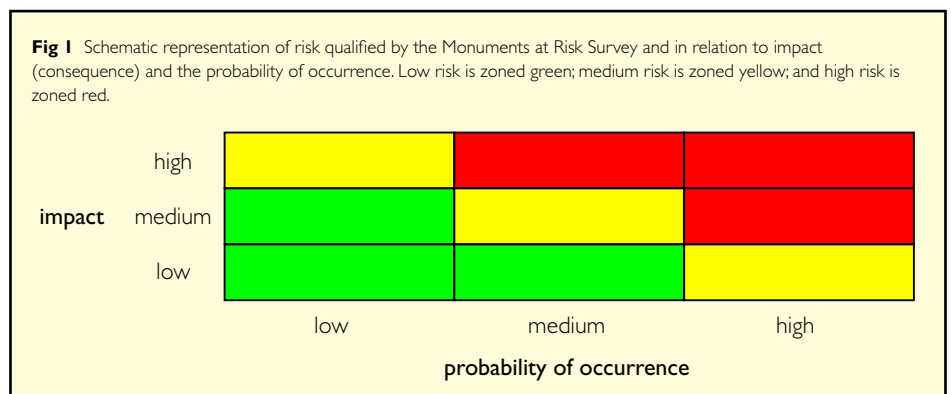
The committee also acts as a focus for advice on aspects of the preservation of historic vessels and maintains the *National Register of Historic Vessels*, which includes the *Vessels at Risk List*. This identifies any registered vessel that is thought to be under threat, although the vessel’s condition is the key issue used to determine that it is ‘at risk’ (for further information, see <http://www.nationalhistoricships.org.uk>).

1.3 Condition Assessment

However, the assessment of risk to wreck sites (as interpreted here) is based primarily on current fabric condition and on change over time (observed and anticipated ‘condition trend’). Such assessment is achieved using two criteria: a ‘decision-tree’ approach and a ‘sieve’ method, which uses factorisation of the recorded attributes (see section 4). The ‘decision-tree’ method is illustrated in section 4. The ‘sieve’ method may be generated from data entered onto a risk assessment recording form (most likely created in MS Access).

For each wreck site, information is gauged against a set of standard terms within 34 data fields. This enables assessment within a necessarily subjective process in a systematic and supportable manner.

Each wreck record can be displayed through a series of eight tabs, which group the fields together under the following headings (as defined in section 2):



- location;
- type;
- local factors;
- condition (fabric);
- condition (amenity value);
- management;
- risk assessment, and;
- notes.

The recording fields are listed in Table 1, in section 2 in the order in which they should appear on a recording database; and the category band definitions and coding scheme for each attribute are provided in section 3, with explanatory text as appropriate. Examples of the application of category band definitions and types of vulnerability are illustrated by three case studies in section 5.

The assessment of risk to a Protected Wreck Site is also reflected by an assessment of its percentage survival (relative to its former state). Ideally, survival should be measured with reference to the original characteristics of a vessel prior to its loss, but in practical archaeological terms this is usually impossible to determine in all but a few cases: For example the galley frigate *Royal Anne* foundered in a storm in 1721 in route from Spithead to Barbados (Camidge *et al* 2006, 38). It may reasonably be assumed that she was fully armed and laden for such a voyage and yet none of the vessel's hull survives; rather the site only comprises a general distribution of artefacts. Contemporary salvage of the *Royal Anne* and modern recovery of objects means that there

has been a high percentage of material loss from the site. The site is therefore at risk because further loss of material cannot be sustained.

This is to be contrasted with the Holland No. 5 submarine, which lies off East Sussex. Here, the submarine foundered while under tow in 1912 and diver survey indicates that the vessel is virtually complete and sealed (McCartney and Beattie-Edwards 2007). It is therefore likely that all internal fittings are in place and in a good condition. The percentage material loss to the Holland No. 5 is therefore very low because 80% of the vessel survives.

Our heritage is valuable but vulnerable and all archaeological sites and monuments are at risk from a wide range of agencies, both natural and human. To a certain extent the degree of risk to individual wreck sites can be predicted or modelled. The *Monuments at Risk Survey* concluded that 'risk can broadly be equated with the concept of "vulnerability" included in the criteria for the selection of nationally important monuments for scheduling' (Darvill and Fulton 1998, 218). For the purposes of this document vulnerability is defined as a damaging process either already at work or likely to occur.

1.4 Measuring Vulnerability

The principal vulnerability (ie the principal damaging process) is recorded for each wreck site using a coding system adapted from English Heritage's existing Monument Protection Programme system (see www.eng-h.gov.uk/mpp/

[mppa.htm](http://www.eng-h.gov.uk/mpp/)). These codes are grouped into the following five generic categories (see also section 3):

- inshore fisheries;
- natural processes;
- socio-economic activity;
- other causes of damage, and;
- no known threat.

These categories provide some compatibility with the approach adopted by the *Monuments at Risk Survey* by providing a systematic quantification of the historic and archaeological resource, and by setting benchmarks for the monitoring of future change.

It is also important to note that research has indicated that recorded benthic species and biological habitats act as proxies to provide information on prevailing abiotic environmental conditions at wreck sites. The recording of such data is encouraged so as to compliment archaeological information and to inform risk management.

This handbook is therefore designed to assist the user in achieving a consistent approach to the risk assessment of wreck-based archaeological sites, whether designated or not.



Repeatable and accurate assessment is essential for risk management (image courtesy of Wessex Archaeology).

2 Recording fields

The following Recording fields are intended to assist an assessor into making objective judgements relating to the condition of a wreck site. This procedure will enable an impartial

assessment of the risk of loss or further loss of the special historic, archaeological, architectural or artistic interest of the site.

* See http://thesaurus.english-heritage.org.uk/thesaurus.asp?thes_no=143.

Table 1 Recording fields

<i>field number</i>	<i>location</i>	<i>field name</i>	<i>comment</i>
1		wreck (or site) name	default: unknown
2		SI number	text (where applicable)
3		NMR or UKHO UID	number
4		EH region	Select from List 1
5		latitude (WGS84)	number
6		longitude (WGS84)	number
7		restricted area (size)	number
8		principal land use	select from List 2
<i>type</i>			
9		class listing	use NMR Maritime Craft Thesaurus*
10		period	select from List 3
11		status	select from List 4
<i>setting</i>			
12		licensee	text
13		nominated archaeologist	text
14		principal ownership category	select from List 5
15		seabed owner	select from List 6
16		navigational administrative responsibility	default: Nil
17		environmental Designations	select from List 7
18		seabed Sediment	select from List 8
19		energy	high, medium or low (H, M or L)
<i>condition (fabric)</i>			
20		survival	select from List 9
21		fabric (overall condition)	select from List 10
22		fabric (condition trend)	select from List 11
23		fabric (principal vulnerability)	select from List 12
<i>condition (amenity value)</i>			
24		amenity value quality: visibility	select from List 13
25		amenity value quality: physical accessibility	select from List 14
26		amenity value quality: intellectual accessibility	select from List 15
<i>management</i>			
27		management action	select from List 16
28		management prescription	select from List 17
<i>risk assessment</i>			
29		data source	select from List 18
30		date of last visit	dd/mm/yyyy
31		risk assessment date	dd/mm/yyyy
32		compiler	text
33		risk: field assessment	high, medium or low (H, M or L)
<i>notes</i>			
34		notes	text

3 Category band definitions and codes

List 1 English Heritage region

Select **one** of the following codes:

- East Midlands
- East of England
- London
- North East
- North West
- South East
- West Midlands
- Yorkshire & the Humber



EH regional boundaries map.

List 2 Principal land use

Select **one** of the following codes:

- Coastland 1 marine
- Coastland 2 inter-tidal
- Coastland 3 above high water
- Coastland 4 saltmarsh
- Coastland 5 cliff and related features
- Coastland 6 other

Source: <http://ads.ahds.ac.uk/oasis/lists/wordlists.cfm#landuse>

List 3 Period

The National Monuments Record is currently reviewing the recording of dates and periods, with a view to updating the way these are expressed. Please contact the Data Standards Unit (dсу.info@english-heritage.org.uk) for updates on this project, or to participate.

Select **one** of the following to reflect the principal period of use **or** period of loss, where known:

<i>period</i>	<i>minimum date</i>	<i>maximum date</i>
uncertain	-	-
early prehistoric	-500000	-4000
late prehistoric	-4000	43
roman	43	410
early medieval	410	1066
medieval	1066	1540
post-medieval	1540	1901
Tudor	1540	1603
Stuart	1603	1714
Hanover	1714	1837
Victorian	1837	1901
modern	1901	3000
pre-WWI	1901	1913
WWI	1914	1918
inter-war	1919	1938
WWII	1939	1945
post-WWII	1945	3000

List 4 Status

Select **one** of the following to reflect the status of the wreck site:

- A Protection of Wrecks Act 1973
- B Ancient Monuments & Archaeological Areas Act 1979
- C Protection of Military Remains Act 1986
- D non-designated wreck site
- E unknown

List 5 Principal ownership category

Select **one** of the following to reflect the principal ownership of the wreck:

- A private (individual)
- B private (trust or company)
- C Crown / MoD
- D Government or agency
- E other (select this if you do not know or qualify nature of ownership in notes field)

List 6 Seabed owner

Select **one** of the following to reflect the ownership of the seabed or to identify an organisation with powers to control local seabed activities:

- A Crown Estate
- B other (qualify in notes field)
- C unknown

List 7 Environmental designations

Select **one** of the following to reflect the co-location of the site:

- A RAMSAR wetlands of international importance designated under the Ramsar Convention
- B SAC areas that have been given special protection under the European Union's Habitats Directive
- C SPA strictly protected sites classified in accordance with Article 4 of the EC Directive on the conservation of wild birds
- D SSSI the country's very best wildlife and geological sites
- E MNR Marine Nature Reserve
- F OTHER (qualify in notes field)
- G NONE no environmental designation



The Dutch Indiaman *Amsterdam* is subject to the high energy forces within the intertidal zone (English Heritage).



Additional risk management is afforded to the *Iona II* as it lies within Lundy's Marine Nature Reserve (Wessex Archaeology).

List 8 Seabed sediment*

Select **one or more** of the following to reflect the **principal** seabed sediment:

- S sand
- cS clayey sand
- mS muddy sand
- zS silty sand
- sC sandy clay
- sM sandy mud
- sZ sandy silt
- C clay
- M mud
- Z silt
- G gravel
- mG muddy gravel
- msG muddy sandy gravel
- sG sandy gravel
- gM gravelly mud
- gmS gravelly muddy sand
- gS gravelly sand
- (g)M slightly gravelly mud
- (g)sM slightly gravelly sandy mud
- (g)mS slightly gravelly muddy sand
- (g)S slightly gravelly sand
- OT other (qualify in notes field)

* Sediment particle size analysis (PSA) may be used to objectively determine sediment type

List 9 Survival

Select **one** of the following codes to reflect the percentage material loss (PML), and therefore survival, of the wreck site:

- | | | |
|-----------|------------|-------------------|
| very good | PML <20% | (survival >80%) |
| good | PML 21-40% | (survival 61-80%) |
| medium | PML 41-60% | (survival 41-60%) |
| poor | PML 61-80% | (survival 21-40%) |
| very poor | PML >80% | (survival <20%) |
| unknown | - | - |

List 10 Fabric (overall condition)

Select **one** of the following codes:

- A Optimal ie the best we can realistically expect to achieve: there is very little or no erosion, deterioration or other damage
- B Generally satisfactory but with minor localised problems: there may be some localised erosion or deterioration, typically affecting up to 15% of the monument. It does not constitute serious damage and is an acceptable feature of the monument. No management action is required provided it does not greatly exceed its current extent
- C Generally satisfactory but with significant localised problems: more significant damage is apparent. The damage is localised but may affect up to 25% of the monument
- D Generally unsatisfactory with major localised problems: severe localised damage, such as part collapse of a structure, erosion, deterioration and/or unauthorised activity
- E Extensive significant problems: there is widespread damage which may affect 50% or more of the monument. The damage could be caused by one or more factors, such as erosion and deterioration affecting structures, leading to severe structural problems and/or collapse
- F Unknown. This code might apply in cases where it has not yet been possible to visit the site to ascertain condition, or when the site has been buried by sediment, or when assessment has been made using geophysical survey or other evidence requiring field verification

List 11 Fabric (condition trend)

Condition trend is an assessment of the frequency, duration and scale of damage factors noted in the previous section. Note: select D if selected F for 'Fabric: overall condition' in previous section (if condition is unknown, you cannot assess condition trend). Select **one** of the following codes:

Note: If Condition is unknown (F), you cannot assess Trend, so select D

- A Improving: there is a visible improvement in the condition of the monument since the last inspection, typically as a result of ongoing management intervention
- B Declining: the condition of the monument is deteriorating as a result of ongoing damage, causing loss of fabric which might be gradual or rapid
- C Stable: the monument shows no sign of active deterioration either recent or midterm. The condition of a monument is stable, provided the damage remains constant
- D Unknown: it is not possible to assess the trend in condition of the fabric as a field assessment has not been made recently or is not known. More detailed evaluation may be required to make an assessment on condition trend



Wheel Wreck, Isles of Scilly. A stable site on a dynamic seabed (Wessex Archaeology).



Reducing threats through the simple provision of buoyage (English Heritage).

List 12 Fabric (principal vulnerability)

Select **one or more** of the following codes that apply, to reflect the principal threat(s) to the site:

inshore fisheries

- ANGL** recreational angling
BAIT bait-digging (may have potentially damaging impacts on historic environment interests)
FISH fishing ground
POT potting (is a selective fishing method. A lobster pot and a crab pot are the same, but for the bait)
SHELL an area of seabed for which shellfishery rights are granted by a Sea Fisheries Committee (SFC) to a particular body/co-operative
TRAWL trawling

Natural Processes

- BIO** biological decay
C_ERO coastal erosion
ECOL benthic ecology
MECH mechanical degradation
S_ERO seabed erosion
NAT natural decline

Socio-Economic Activity

- ACC** authorised access
ANCH anchorage
DEV development (e.g. offshore renewable power generation infrastructure)
DIVE unlicensed diving
DUMP dumping ground
LICE licensed aggregate extraction area
LINE pipeline/cable route
MIL military practice area
TRANS transportation route

NKT no known threat
OTH other (qualify in notes field)

List 13 Amenity value quality (visibility)

Select **one** of the following codes:

- A** substantial above bed structural remains that are highly visible and 'legible' without further information
B limited above bed structural remains and finds scatter with limited visibility and only 'legible' with further interpretative information
C not visible. Only buried remains survive
D unknown

List 14 Amenity value quality (physical accessibility)

Select **one** of the following codes:

- A** Full: no restrictions on access and no impediments to appreciation of the wreck
B Restricted: access permitted but interference and entry prohibited
C Restricted: access subject to licence or other authorization
D Nil: access prohibited
E unknown

List 15 Amenity value quality (intellectual accessibility)

Select **one** of the following codes:

- A** Developed interpretative scheme on, or close to, site comprising at least two or more of following elements: interpretation / information board, leaflet, display / exhibition, guided tour, audio tour, guidebook and reconstruction.
B Limited interpretation on or close to site with only one element: eg interpretation/information board, leaflet, display/exhibition, guided tour, audio tour, guidebook and reconstruction
C no interpretation
D unknown

List 16 Management action

Select **one** of the following codes:

- A** no action required (routine monitoring by the licensee / archaeological contractor)
B action implemented
C action identified / agreed but not implemented
D action to be identified / agreed



Intellectual accessibility achieved through the provision of information panels Cornwall and Isles of Scilly Maritime Archaeology Society (CISMAS).

List 17 Management prescription

Select **one or more** of the following codes that apply:

- A** formal management agreement
B Marine Heritage Partnership Agreement
C EH Grant Assistance / Commission.
D Local Heritage Initiative
E management agreement / grant funded by Local Authority or other body e.g. Natural England (qualify in notes field)
F other grant scheme (eg HLF / partnership funding) or development proposal with explicit consideration of (and beneficial to) historic environment of the wreck site (qualify in notes field)
G EH to influence local plan policies/liaise with local authority planners
H EH to liaise with owner/other stakeholders concerned to improve management regime
I refer to DCMS to review/consider de-designation
J refer to DCMS to review/consider extension or reduction of restricted area
K condition survey required.
L more regular condition monitoring e.g. increase inspections and monitoring (qualify in notes field)
M no management prescription required
N other (qualify in notes field)

List 18 Glossary for data source field:

Select **one** of the following codes:

- AS** aerial survey
CA County Archaeologist
CON contractor (archaeological)
GEO geophysical survey
HEFA Historic Environment Field Advisor
IAM Inspector of Ancient Monuments
LAC Local authority curator
LIC licensee
MCA Maritime and Coastguard Agency (Civil Hydrography Programme)
MPPA Monument Protection Programme Archaeologist / Designations
NOM nominated archaeologist
OT other (qualify in notes field)



Discarded cable on *Holland No. 5*, causing abrasion to the outer casing (Wessex Archaeology).



Natural decline of a wreck is acceptable, as long as there is provision for a programme of managing change (HWTMA).

4 Risk assessment methods for Protected Wreck Sites

The degree of risk to the surviving fabric of a Protected Wreck Site can be assessed using one of two decision support methods. The first method is the 'sieve' method which has been developed for scoring risk and is based on familiarisation and completion of the category band definitions and codes presented in Section 3 above. The method entails computer-based factorisation and analysis of four principal attributes: visibility, fabric condition, fabric condition trend and fabric vulnerability. Provided the relevant data for each of the scored fields in Section 3 is entered on a digital Risk Assessment Recording Form, computer generation of the risk assessment can be automated by requesting the relevant Report.

A second approach, the 'decision-tree' (see Fig 2), is based on the known circumstances

of the site at the time of the last assessment, knowledge of case-history and predictions for the foreseeable future. By working through the stages in the decision-tree, wreck sites are assessed as being in one of three risk bands: high, medium or low. This outcome is then entered in the relevant field on the Risk Assessment Recording Form.

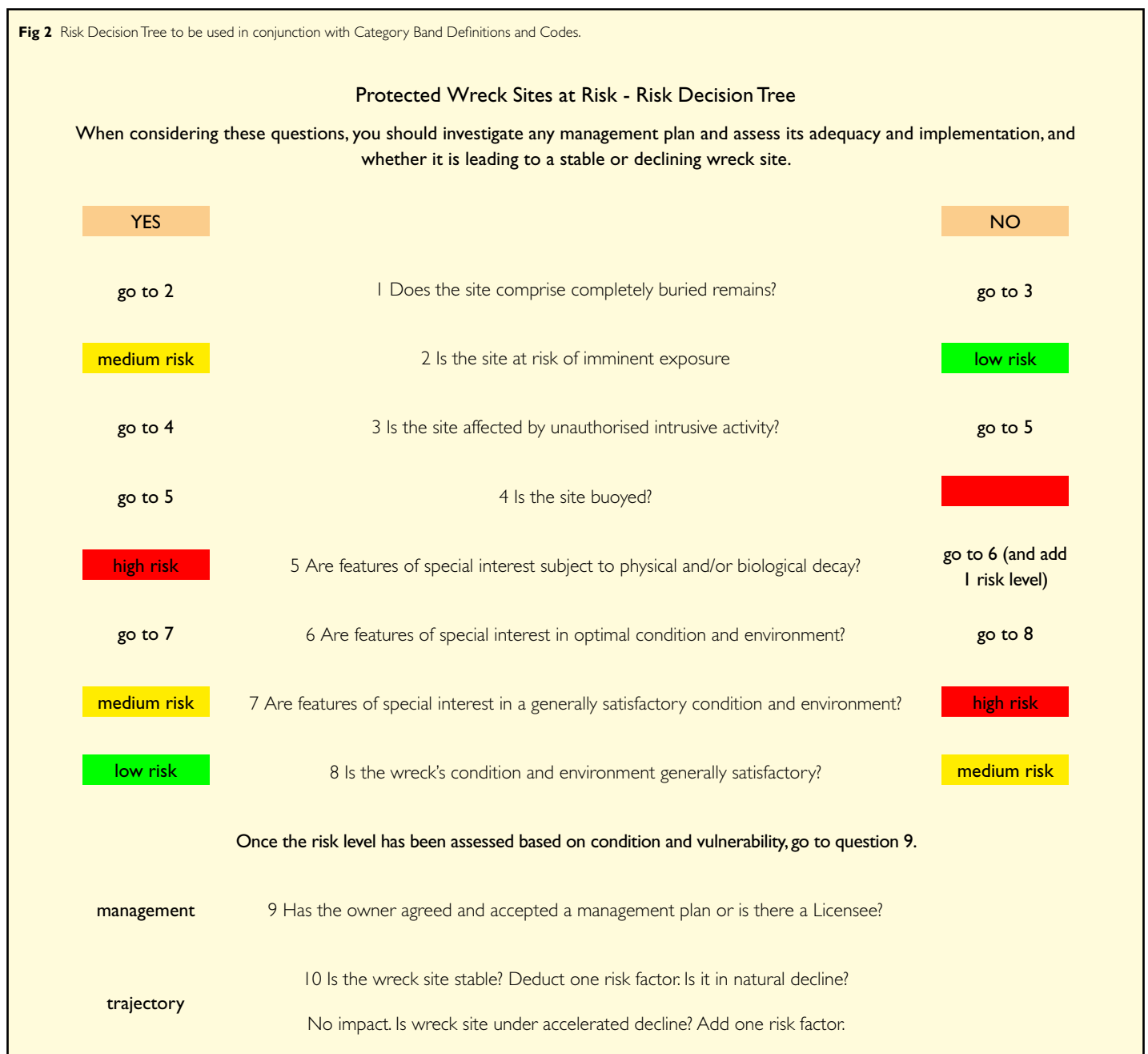
This approach to risk assessment is dependant on a series of broad assumptions about the relationship between the site's current use and risk, as defined within the decision-tree. Its principal purpose is to act as an aid to professional judgement and to ensure uniformity of decision making amongst assessors. The method is, however, considered to be as objective as possible within the constraints of the reliability of readily accessible information and forecasting. It can be used for either field-based or desk-based assessments. In

particular, the method is quick to use and the user rapidly becomes familiar with the questions in the decision-tree to the point where almost immediate and reliable ascription to a risk-band becomes possible.

Finally, once a wreck's risk band has been determined from either the 'sieve' or 'decision-tree' method, attention will be given (in the first instance) to those Protected Wreck Sites deemed to be at high risk. The target will be to reduce these on a year by year basis.

The medium risk category will also be monitored since it is at this point that action can be taken to prevent future damage, decay or loss. This is a more desirable strategy than taking remedial action once the damage, decay or loss has already occurred.

Fig 2 Risk Decision Tree to be used in conjunction with Category Band Definitions and Codes.



5 Case studies



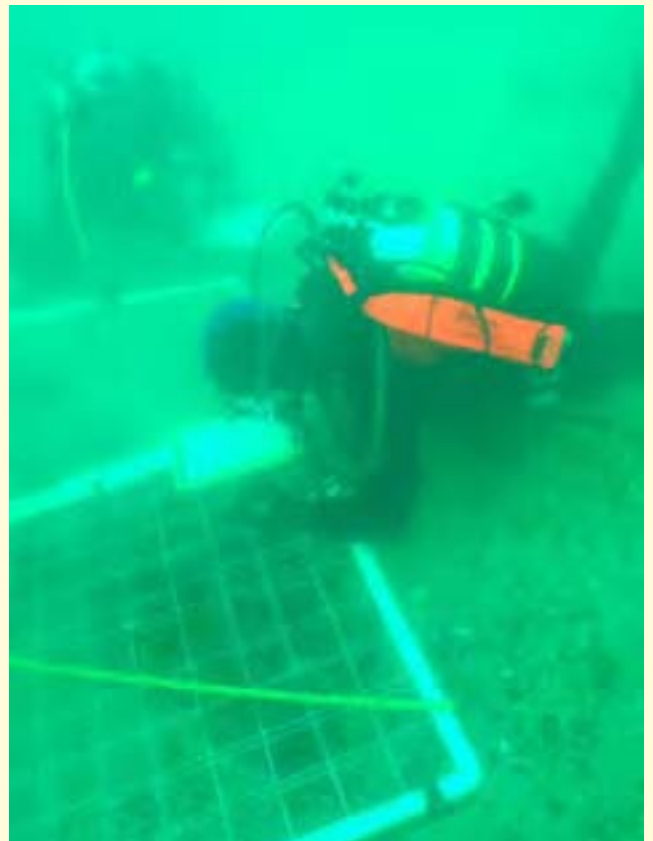
1 Stirling Castle, Goodwin Sands, off Kent.



2 Seaton Carew, Hartlepool.



3 Loe Bar, Cornwall.



4 Swash Channel, Poole Bay.



Sieve adjacent to structural timber, *Stirling Castle* (Seadive).

Case Study I Mechanical degradation	
name	SI number
Stirling Castle	2004/2395

NMR number	EH region	restricted area	principle land use
1082115	South East	300	Coastland I

SI latitude	51 16.4561 N
SI longitude	01 30.4121 E

class listing	period	status
Third Rate Ship of the Line	post-medieval	Protection of Wrecks Act 1973

licensee	nominated archaeologist	principal ownership category
yes	yes	private (trust / company)
seabed owner	navigational administrative responsibility	
Crown Estate	nil	
environmental designations		
nil		
seabed sediment	energy	
slightly gravelly sand	high	

survival
very good

overall condition	condition trend	principal vulnerability
extensive significant problems	declining	mechanical degradation

amenity value: visibility
Substantial above bed structural remains which are highly visible and 'legible' without further information

amenity value: physical accessibility	amenity value: intellectual accessibility
restricted (C)	developed interpretative scheme

management action	action identified/agreed but not implemented													
management prescription	A	B	C	D	E	F	G	H	I	J	K	L	M	N
			✓			✓		✓			✓			
notes	<p>Sand-wave migration in the northern area of the Goodwins is evidenced by a sandbank on the starboard side of the wreck that appeared to have moved to the northeast by c.200 metres between 1999 and 2000 causing a significant reduction in seabed levels over the whole site, particularly at the port quarter. This area of the hull and the stern has been subject to very significant scouring which has further removed sand that was supporting the outboard side of the hull, with the result that the port quarter and part of the stern have collapsed outwards. The site is therefore unstable and the structure of the vessel has been gradually collapsing over a number of years.</p> <p>The site has benefited from the application of research generated by external grant schemes (ALSF & MACHU).</p> <p>A Management Plan has been drafted but has yet to be agreed and implemented.</p> <p>Risk is assessed as HIGH.</p>													



Wreck viewed from seaward, February 2005 (Tees Archaeology).

Case Study 2 Coastal erosion	
<i>name</i>	<i>SI number</i>
Seaton Carew	1997/1717

<i>NMR number</i>	<i>EH region</i>	<i>restricted area</i>	<i>principle land use</i>
1312495	North East	100	Coastland 2

<i>SI latitude</i>	54 39.5084 N
<i>SI longitude</i>	01 10.8060 W

<i>class listing</i>	<i>period</i>	<i>status</i>
collier brig	post-medieval	Protection of Wrecks Act 1973

<i>licensee</i>	<i>nominated archaeologist</i>	<i>principal ownership category</i>
yes	yes	other
<i>seabed owner</i>		<i>navigational administrative responsibility</i>
Crown Estate		Hartlepool Borough Council
<i>environmental designations</i>		
nil		
<i>seabed sediment</i>		<i>energy</i>
sand		high

<i>survival</i>
medium

<i>overall condition</i>	<i>condition trend</i>	<i>principal vulnerability</i>
generally satisfactory but with minor localised problems	declining	coastal erosion

<i>amenity value: visibility</i>
Limited above bed structural remains and finds scatter with limited visibility and only 'legible' with further interpretative information.

<i>amenity value: physical accessibility</i>	<i>amenity value: intellectual accessibility</i>
restricted (C)	developed interpretative scheme on, or close to, site

<i>management action</i>	action identified/agreed but not implemented													
<i>management prescription</i>	A	B	C	D	E	F	G	H	I	J	K	L	M	N
<i>notes</i>		✓					✓	✓			✓			
	<p>Fluctuating levels of beach loss from the Seaton Carew Wreck site throughout 2005/06 leave the vessel exposed to greater or lesser degrees throughout the year. The reasons for this trend are still not clear though local opinion suggests that extended periods of south-easterly winds does result in significant sand loss from the area. Regular monitoring by the Licensee</p> <p>Hartlepool BC recently issued proposals to create a Personal Watercraft Launching Area across the designated area. EH required that the proposals be revised.</p> <p>Risk is assessed as LOW.</p>													



Loe Bar, near Porthleven, in 2004 (Wessex Archaeology).

Case Study 3 No known threat	
<i>name</i>	<i>SI number</i>
Loe Bar	1999/1438

<i>NMR number</i>	<i>EH region</i>	<i>restricted area</i>	<i>principle land use</i>
1181945	South West	250	Coastland I

<i>SI latitude</i>	50 3.8101 N
<i>SI longitude</i>	05 17.4377 W

<i>class listing</i>	<i>period</i>	<i>status</i>
East Indiaman	post-medieval	Protection of Wrecks Act 1973

<i>licensee</i>	<i>nominated archaeologist</i>	<i>principal ownership category</i>
nil	nil	other
<i>seabed owner</i>	<i>navigational administrative responsibility</i>	
Crown Estate	nil	
<i>environmental designations</i>		
Loe Pool SSSI		
<i>seabed sediment</i>	<i>energy</i>	
sand	high	

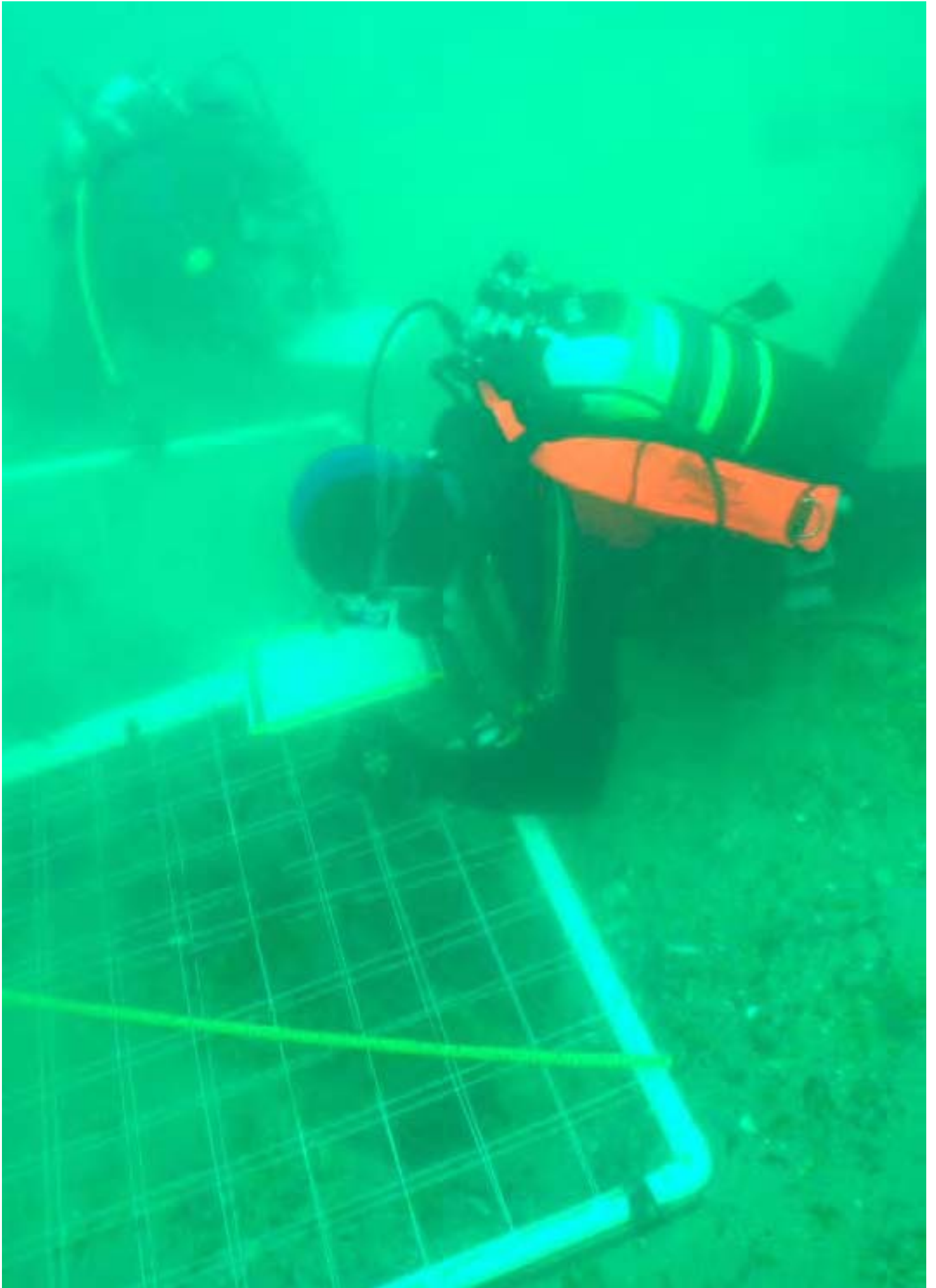
<i>survival</i>
very poor

<i>overall condition</i>	<i>condition trend</i>	<i>principal vulnerability</i>
unknown	unknown	no known threat

<i>amenity value: visibility</i>
not visible, only buried remains survive

<i>amenity value: physical accessibility</i>	<i>amenity value: intellectual accessibility</i>
restricted (C)	no interpretation

<i>management action</i>	action identified/agreed but not implemented													
<i>management prescription</i>	A	B	C	D	E	F	G	H	I	J	K	L	M	N
											✓	✓	✓	
<i>notes</i>	<p>The site lies at a depth of up to about 10-11m. It is a rocky area with variable sand cover; lying only a few meters out from the low water mark. While iron objects are scattered over the site, smaller items may be covered by pockets of sand in the uneven rock. The surge from offshore swell is very apparent on the seabed and easily moves loose material, it is a very dynamic site which is a problem for preservation, and means objects can be moved, or covered; as much as 3-4m of shingle overburden can cover the site.</p> <p>Research suggests it may be the EIC President. The site may attract attention because of treasure stories associated with the President.</p> <p>Risk is assessed as LOW.</p>													



Swash Channel Protected Wreck Site, Poole Bay (Bournemouth University).

Case Study 4 Biological decay															
name		SI number													
Swash Channel		2004/3243													
NMR number		EH region			restricted area				principle land use						
I408546		South West			100m x 200m				Coastland I						
SI latitude		50 39.7994 N													
SI longitude		01 55.5182 E													
class listing			period				status								
armed cargo vessel			post-medieval				Protection of Wrecks Act 1973								
licensee		nominated archaeologist					principal ownership category								
yes		yes					other								
seabed owner					navigational administrative responsibility										
Crown Estate					Poole Harbour Commissioners										
environmental designations															
none															
seabed sediment					energy										
slightly gravelly sand					high										
survival															
good															
overall condition			condition trend				principal vulnerability								
generally unsatisfactory with major localised problems.			declining				biological decay								
amenity value: visibility															
substantial above bed structural remains which are highly visible and 'legible' without further information															
amenity value: physical accessibility							amenity value: intellectual accessibility								
restricted (C)							no interpretation								
management action		action identified/agreed but not implemented													
management prescription		A	B	C	D	E	F	G	H	I	J	K	L	M	N
				✓			✓		✓			✓	✓		
notes		<p>Following designation, Poole Harbour Commissioners (PHC) has appointed Bournemouth University (BU) as archaeological advisors/contractor to undertake a five-year research project on this site, with EH support.</p> <p>Action for conservation management of the site was commissioned by Poole Harbour Commissioners in 2005 when the extent of the site was first planned by Wessex Archaeology. In October 2007, BU reported that as well as observing deterioration of exposed wood, large areas of hull structure had been uncovered owing to extreme water movements and net sediment loss, indicating a greater survival of material than previously thought. BU has also reported the extensive presence of two types of woodborers on the site: crustacean (gribble) and shipworm.</p> <p>The current depth of burial is therefore insufficient for site stability and the condition of the material remains has been noted to have deteriorated. Accordingly, the priority requirement for continuing baseline survey, monitoring and stabilisation trials has commenced; all projects are being undertaken by BU supported by PHC and EH.</p> <p>A Management Plan has been drafted but has yet to be fully implemented.</p> <p>Risk is assessed as MEDUIM.</p>													

6 Glossary

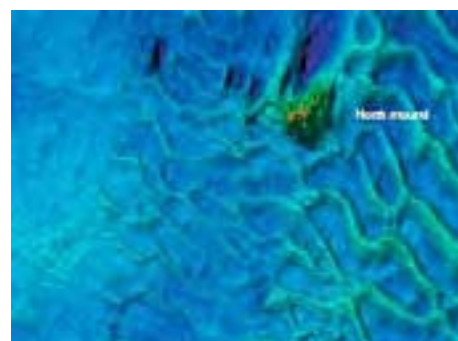
amenity value	The non-monetary, aesthetic value of an archaeological site or place.
ALSF	Aggregates Levy Sustainability Fund.
class listing	In this context, the list of maritime craft within the National Monuments Record Maritime Craft Type Thesaurus.
condition	A measure of the current state of a wreck site relative to some former state.
countermeasure	A planned response to an anticipated risk (qv) to a project, setting out what will be done to reduce the probability that it will happen, or the impact that it would have.
decision tree	A decision support tool that uses a graph or model of decisions and their possible consequences, including chance event outcomes, resource costs, and utility. A decision tree is used to identify the strategy most likely to reach a goal.
fabric	The physical material of an archaeological site or place, including components, fixtures, contents and objects.
licensee	An individual, licensed by the Secretary of State for Culture, Media & Sport to access a site designated under the Protection of Wrecks Act 1973.
MACHU	Managing Cultural Heritage Underwater; a collaborative research project developed with the support of the Culture 2000 Programme of the European Union.
risk	The combination of the probability or frequency of occurrence of a recognised hazard in relation to the magnitude of the consequences.
significance	The sum of the cultural and natural heritage values of a place.
trajectory	Assessed through the management regime and whether the monument condition is improving, remaining stable or experiencing unmanaged or inappropriate decline and / or unauthorised interference.
vulnerability	A damaging process either already at work or likely to occur:



High quality artefacts remain attractive to unauthorised dives (English Heritage).



With unmanaged decline, portable artefacts become dispersed (Hazardous Project).



Repeatable bathymetric survey enables effective site monitoring (University of St. Andrews and Wessex Archaeology).

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Without recovery and conservation, *in situ* stabilisation becomes the first option for management (Bournemouth University).

9 Notes

Annex to the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage

The UK Government has adopted the Annex (Rules Concerning Activities Directed at Underwater Cultural Heritage) to the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage as being best practice for archaeology. The Annex to the 2001 Convention provides objective standards by which to judge the appropriateness of actions in respect of the underwater cultural heritage and is available from: http://www.unesco.org/culture/laws/underwater/html_eng/conven3.shtml.

Advice and support

Practical advice on assessing and managing risk in relation to historic wreck sites and the conservation management of such sites is available from English Heritage (contact: www.english-heritage.org.uk/maritime) and, where applicable, the Historic Environment Local Management (HELM) website at www.helm.org.uk or the appropriate English Heritage Regional Office (see the Contact pages of English Heritage's website).

Further information and guidance on Maritime Archaeology and Protected Wreck Sites is available from: www.english-heritage.org.uk/maritime.

Benthic ecological survey

It is recommended that an ecological survey of a wreck site is undertaken to complement and inform risk management. See <http://www.seasearch.org.uk/> for guidance.

Downloadable data

The Statutory Instruments for current designations are available from the Office of Public Sector Information (www.opsi.org).

The location of all England's Protected Wreck Sites is available to download as a spatial dataset from the English Heritage website. See <http://services.english-heritage.org.uk/NMRDataDownload/>.

Spatial information related to statutory rural designations, including Protected Wreck Sites is available from the Government's Multi-Agency Geographic Information system for the Countryside website (www.magic.gov.uk).

Contributors

Ian Oxley, Peter Murphy and Chris Pater.

Acknowledgements

This document has been prepared by:

Mark Dunkley
Maritime Archaeologist
English Heritage
Fort Cumberland
Eastney
Portsmouth
PO4 9LD
United Kingdom

Tel +44 (0)23 9285 6768
Fax +44 (0)23 9285 6701

mark.dunkley@english-heritage.org.uk

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