



Historic England

HMS INVINCIBLE (1758)

HORSE TAIL, EASTERN SOLENT, OFF PORTSMOUTH

Conservation Statement and Management Plan

Daniel Pascoe and Carrie Cowan

Discovery, Innovation and Science in the Historic Environment

**HMS *INVINCIBLE* (1758)
HORSE TAIL, EASTERN SOLENT, OFF PORTSMOUTH**

CONSERVATION STATEMENT & MANAGEMENT PLAN

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EXECUTIVE SUMMARY

L'Invincible was launched by the French Navy in 1744. She was the second of three 74-gun warships, a new class conceived by the French that was to revolutionise French, British and Spanish warship design for the next sixty years. Captured by the British in 1747, she was commissioned into the Royal Navy as HMS *Invincible*, a Third Rate ship-of-the-line. In 1758 she ran aground and was wrecked on the Horse Tail sandbank in the Eastern Solent off Portsmouth.

The wreck was discovered in 1979 by a local fisherman, Arthur Mack. It was subsequently designated in 1980 under the Protection of Wrecks Act 1973. Extensive remains of the wreck are preserved on the sea bed. Archaeological excavations, led by Commander John Bingeman were carried out between 1980 and 1991 under the archaeological direction of Dr Margaret Rule; much of the hull was recorded and many artefacts recovered. The excavations were published in 2010.

In 2012, the *Invincible* was added to Historic England's Heritage at Risk Register due to a reduction in sediment levels resulting in the continued exposure of structure and artefacts. This was also evident in 2015 when *Invincible* was once again added to the Register.

This Conservation Statement and Management Plan has been produced to enable local, regional and national stakeholder involvement in Historic England's aspirations for the conservation management of *Invincible* to balance conservation with economic and social needs. The principal aim of the Plan is to identify a shared vision of how the values and features of *Invincible* can be conserved, maintained and enhanced.

The following management policies have therefore been developed:

Policy 1 We will continue to support and develop authorised access to the site as a mechanism to develop the instrumental value of the *Invincible*.

Policy 2 Through web-based initiatives and public displays, we will continue to improve the accessibility of related material and support appropriate links so as to develop effective public understanding.

Policy 3 Key gaps in understanding the significance of the component parts of the site are now being identified, prioritised and addressed so that these significances can contribute to informing the future conservation management of the site.

Policy 4 We are continuing a programme of environmental monitoring.

Policy 5 Once a clear framework is agreed excavation of targeted and at risk areas are recommended as the best way of preserving the archaeological value of the site.

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1 INTRODUCTION

1.1 Background

- 1.1.1 England's historic environment is particularly rich and varied; it is our legacy to the future and we owe it to future generations to make sure it is protected and enhanced.
- 1.1.2 Wreck sites may contain the remains of vessels, their fittings, armaments, cargo and other associated objects or deposits and they may merit legal protection if they contribute significantly to our understanding of our maritime past. The Protection of Wrecks Act 1973 (PWA) allows the UK Government to designate, in territorial waters, an important wreck site to prevent uncontrolled disturbance. Although the National Heritage Act 2002 enabled Historic England to assist with costs relating to works under the PWA, this opportunity must be balanced against strategic research priorities.¹
- 1.1.3 In addition, the UK Government has adopted the Annex to the UNESCO Convention on the Protection of the Underwater Cultural Heritage 2001 as best practice for archaeology. This Annex comprises a series of ethical *rules concerning activities directed at underwater cultural heritage* which provide objective standards by which to judge the appropriateness of actions in respect of archaeology underwater.²
- 1.1.4 The UK Marine Policy Statement, published in 2011, is the framework for preparing Marine Plans and taking decisions affecting the marine environment. It contributes to the achievement of sustainable development in the UK marine area. A high level marine objective for the promotion of good governance is that use of the marine environment recognises the protection and management needs of underwater cultural heritage. Accordingly, the view shared by the UK Administrations is that underwater cultural heritage should be enjoyed for the quality of life it brings to this and future generations, and it should be conserved through marine planning in a manner appropriate and proportionate to its significance.³

1.2 Purpose

- 1.2.1 This document seeks to set out a Conservation Statement and Management Plan for HMS *Invincible*, an archaeological site designated under the Protection of Wrecks Act 1973 lying within the Horse and Dean Sand in the Eastern Solent off Portsmouth.

¹ See <https://historicengland.org.uk/images-books/publications/he-action-plan-2015-18/>

² See: http://portal.unesco.org/culture/en/ev.php-URL_ID=33966&URL_DO=DO_TOPIC&URL_SECTION=201.html.

³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf

- 1.2.2 The *Invincible* is attributed the National Record of the Historic Environment monument number 1082111 and National Heritage List for England number 1000052.
- 1.2.3 Historic England (when English Heritage) published a set of *Conservation Principles, Policies and Guidance* for the sustainable management of the historic environment designed to strengthen our credibility and consistency of decisions taken and advice given (English Heritage 2008). These *Conservation Principles* are intended to support the quality of our decision-making, with the ultimate objective of creating a management regime for all aspects of the historic environment that is clear and transparent in its purpose and sustainable in its application. As such, *Conservation* is taken to be the process of managing change in ways that will best sustain the values of a place in its contexts, and which recognises opportunities to reveal and reinforce those values.
- 1.2.4 This Conservation Statement and Management Plan has therefore been produced to enable local, regional and national stakeholder involvement in identifying aspirations for the conservation management of the *Invincible*.

1.3 Aims and Objectives

- 1.3.1 The principal aim of this Conservation Statement and Management Plan is to identify a shared vision of how the values and features of the *Invincible* can be conserved, maintained and enhanced.
- 1.3.2 This will be achieved through the following objectives:
- Understanding the *Invincible*
 - Assessing the significance of the *Invincible*
 - Identifying where the significance of the *Invincible* is vulnerable
 - Identifying policies for conserving the significance of the *Invincible*
 - Realising the public value of conservation of the *Invincible*

1.4 Scope and Liaison

- 1.4.1 In 2007, Historic England (when English Heritage) sought to develop assessment methods to characterise 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 their significance is maintained for both present and future generations. For historic wreck sites, methodologies were developed to allow for the systematic quantification of the resource and to set benchmarks for the monitoring of future change. A major component of this process comprises the identification of risks to historic wreck sites so as to provide a measure of how a site is likely to fare in the future (see English Heritage 2008b).

- 1.4.2 Practical measures that can conserve, maintain and enhance the values and features of the *Invincible* identified as being at risk will be delivered through this Conservation Statement and Management Plan.
- 1.4.3 There are currently 52 wrecks designated in England under the Protection of Wrecks Act 1973. They are listed on the National Heritage List for England. Access to these sites is managed through a licensing scheme and is subject to authorisation by the Secretary of State for Culture, Media and Sport.
- 1.4.4 In addition, the stakeholders of the wreck and its contents was invited to provide comment in relation to management of the *Invincible* and contribute archaeological and historical information for integration within this Conservation Management Plan.

1.5 Authorship

- 1.5.1 This document was originally drafted by Carrie Cowan of English Heritage in February 2013 and has been updated by Daniel Pascoe of Pascoe Archaeology Services (PAS), contributions to this draft Conservation Statement and Management Plan are currently being sought through stakeholder involvement. Full acknowledgements of those who contributed to, or were consulted on, its preparation will be presented in the final version.
- 1.5.2 This document is based on the Historic England Conservation Principles, Policies and Guidance (EH 2008a) and draws on generic management plans for shipwreck sites (e.g. Cederlund 2004).

1.6 Status

- 1.6.1 The final version of this report was adopted in February 2017. Notes on its status (in terms of revision) will be maintained.

2 UNDERSTANDING HMS *INVINCIBLE* (1758)

2.1 Historical Development of the Designated Site

- 2.1.1 HMS *Invincible*, was built at Rochefort for the French Navy and originally called *L'Invincible*. Designed by Pierre Morineau in 1744, she was one of the first three 74-gun warships conceived by the French and she had a brief career in the French Navy with a deployment to the West Indies. With 74 guns arrayed over two and a half decks, and a weight of shot that could outmatch all but the largest though more lumbering three-deckers, this great new potential was not lost on the British who first encountered *L'Invincible* between the Caribbean Islands of St Dominque and Cuba in 1745. Here the *Invincible* was much more heavily armed and was able to fend off three British attackers the *Plymouth* (60), *Strafford* (50) and *Lyme* (24) (Lavery 1988, 14).
- 2.1.2 *L'Invincible* was supporting an East India convoy when she was captured by the British Vice-Admiral Lord George Anson at the first Battle of Finisterre, off north-west Spain, in 1747 and taken into the Royal Navy. She was brought back to Portsmouth and surveyed. She was difficult to 'Rate' as no similar class of ship existed previously and so she was rated a Third Rate ship-of-the-line and kept her *Invincible* name. The Admiralty were impressed with her qualities and ordered her to be commissioned as a flagship (Bingeman 2010, 5). Anson's appreciation of her superior build and sailing qualities were eventually incorporated into ship's designs of the Royal Navy and she revolutionised British warship design (Bingeman 2010, 7, 11).
- 2.1.3 In September 1757, she was part of a fleet under Vice-Admiral Edward Boscawen and commanded by Captain John Bentley to oust the French from the fortress of Louisbourg, Nova Scotia, Canada. The ships were caught in a hurricane and the *Invincible* was damaged off Cape Breton. After a brief time for repair in Portsmouth she was once again ordered as part of a fleet departing St Helens Roads, Isle of Wight, 19 February 1758, to fulfil the Louisbourg mission.
- 2.1.4 The order to raise anchor was given but her anchor stuck and then her rudder jammed and *Invincible* ran aground on Horse Tail, Eastern Solent off Portsmouth, rolling over onto her port side. Her hold soon flooded and stores and guns were transferred to sailing barges to lighten her. In deteriorating weather, she rolled over onto her port beam ends and was completely wrecked on the 22 February 1758. Stores and rigging were removed over the following weeks and into the summer. Her weakened hull from the hurricane the year before would explain why she succumbed so quickly to the grounding on the sands (Bingeman 2010, 19).
- 2.1.5 No lives were lost and the ensuing Court Martial absolved all those involved of blame. A full account of the wrecking is recorded in the Court Martial proceedings. Over the next seven months the wreck was heavily salvaged, with all of the guns being recovered as well as the remaining masts and spars.

- 2.1.6 A local fisherman, Arthur Mack, discovered the wreck in 1979 when he fouled his fishing gear and brought up timber. The site was investigated by divers who discovered the remains of a large wooden warship. Commander John Bingeman, naval officer and archaeologist, became involved in the wreck which he identified as the *Invincible*. This was later confirmed by the discovery of a wooden tally attached to a spare sail with the words *Invincible, Flying jib 26x26 No6*. This artefact is now held by Chatham Historic Dockyard Trust.
- 2.1.7 The site was designated on 01 September 1980 under the Protection of Wrecks Act 1973. This designation came into force 30 September 1980 (SI 1980/1307).
- 2.1.8 The extensive remains of this large warship were found, part of which lay up to 1m above the seabed, but dredging in the 1980s nearby was threatening the stability of the site (Bingeman 2010, 47). John Bingeman was licensed to carry out archaeological investigations and a series of surveys and excavations took place from 1980-1991 with Margaret Rule acting as the nominated archaeologist. Much of the hull was recorded and objects recovered but parts of the starboard side remain unexcavated.
- 2.1.9 In 1983, John Bingeman and his associates set up *Invincible Conservation 1744-1758 Ltd* to raise capital for further work. A wide range of objects had been recovered and some 680 artefact entries are held by Chatham Historic Dockyard Trust (CHDT). CHDT selected at least one of every type of artefact to form the basis of a representative collection. Duplicate artefacts not required by CHDT were sold at auction. (Bingeman 2010).
- 2.1.10 In 1991 a sewage outfall was constructed 370m from the site which brought excavation work to a halt.
- 2.1.11 The known information and particulars of the *Invincible* may be presented as a summary *Ship Biography* which draws together the main attributes of the site and provides a statement of the site's archaeological interest:

Build	1741-4, designed by Pierre Morineau at Rochefort. Owned by the French Navy.
Use	Captured by the Royal Navy 1747 and refitted as a Third Rate, Ship of the Line 1752-6 at Portsmouth.
Loss	1758 ran aground and was wrecked on Horse Tail Sand, Eastern Solent off Portsmouth.
Survival	HMS <i>Invincible</i> lies on the Horse Tail Sand (part of the larger Horse and Dean Sand) at a depth of 6-8m. The remains are extensive and all exposed structure now lies up to 1m above the seabed. The lower part of the hull is extensively preserved and measures 50m long and 40m wide. The wreck lies on the port side at an angle of 45 degrees, bow to the north-west and stern to the south-east. The starboard structure is largely detached and lost, though significant coherent sections are probably distributed to the north-east. Surveys have identified a rectangular concretion of composite wood and iron to the south-east. Several objects

have been found scattered around on the seabed during monitoring.

Investigation Excavations carried out 1980-1991 were published in 2010. A large collection of the finds are now at Chatham Historic Dockyard with smaller collections in private ownership. Since 1991 the site has been surveyed and monitored only. 2010 saw a new licensee and a new programme of monitoring and recovery of high risk mobile artefacts.

2.2 Description of Surviving Features

- 2.2.1 The wreck lies on the relatively flat, featureless sank bank known as the Horse Tail at a depth of 7-9m. The remains are extensive and all exposed structure now lies no more than 1m above the seabed.
- 2.2.2 In 2003 Wessex Archaeology was commissioned by Historic England (when English Heritage) to carry out a Designated Site Assessment of the site. They reported that the main part of the *Invincible* wreck site covered an area approximately 50m long and (at the northern end) 40m wide. The wreck lay on the port side at an angle of 45 degrees, bow to the north-west and stern to the south-east. The vessel's back was apparently broken at the 64/65th frame. The starboard structure was largely detached and lost, though significant coherent sections are probably distributed to the north-east.
- 2.2.3 Damage had been caused on the 19th November 1996 by the grounding of a merchantman MV *Amer Ved* and the timbers at the stern of the *Invincible* were reported in 1996 as truncated (ADU 1996). The stern post which once stood 1.5m proud of the seabed, was noted to be missing and 25m of visible timbers were damaged (Bingeman 2010, 62).
- 2.2.4 The University of Southampton conducted two geophysical surveys in 1995 and 1997. The purpose of the surveys was to investigate the processes of site formation, changes in the site over a two-year period and to examine the effectiveness of marine geophysical surveying for site monitoring (Quinn *et al* 1998, 128). High resolution Sub-bottom and sidescan sonar was used to conduct the surveys. The surveys identified fragmented buried and exposed wreck structure to the north and north-east of the *in-situ* portside.
- 2.2.5 A 1998 magnetometer survey centred on an area 400m to the south of the main site in an attempt to locate the upper deck guns which were jettisoned when the vessel stranded (ADU 1998).
- 2.2.6 A subsequent multibeam survey identified a rectangular concretion of composite wood and iron measuring an area approximately 4m by 1.5m (ADU 2002). This 'South-Eastern Anomaly' was further investigated in 2003 along with a number of outlying concretions. It represents more wreck remains but perhaps it may be part of a separate shipwreck (WA 2003, 1).
- 2.2.7 In 2009 a survey of the site was undertaken by the Hampshire & Wight Trust for Maritime Archaeology as part of the Solent Marine Heritage Assets project (HWTMA 2010). They discovered exposed artefacts scattered around the area such as cable/cordage on the seabed. Further objects including a

powder barrel were discovered during monitoring in 2011 (Pascoe 2011). In 2012 a barrel lid inscribed with the letters PGC was found on the seabed during monitoring and recovered via an emergency recovery licence. (<http://www.nasac.org.uk/InvincibleGallery.html>). A 10mx5m section of the starboard side structure of the lower hull to the north-east was also recorded in 2012 as well as further timbers which could be related to the forward mast step (Pascoe 2012, 3-4).

- 2.2.8 In 2012, the *Invincible* was added to the Heritage at Risk Register. The site became at risk due to the continued exposure of unrecorded timbers and delicate small organic finds. Her condition was described as generally unsatisfactory with major localised problems, high vulnerability and a declining trend.
- 2.2.9 Since 1995 the National Oceanography Centre, University of Southampton have undertaken several geophysical surveys, including Sub-bottom, sidescan sonar and multibeam bathymetry. The results from the 1995-1997 surveys has been published in the International Journal of Nautical Archaeology (Quinn *et al* 1998) and subsequent surveys have been studied by students from the Maritime Archaeology Masters programme.
- 2.2.10 In 2013 a surface recovery licence to allow the recovery of high risk mobile artefacts was issued and was intended to replace the need for an emergency licence. In addition, an NHPP project (ref 6650) was set up to carry out the assessment, recording and monitoring of the wreck site (Pascoe 2013). Areas of the site had become exposed due to sediment levels reducing. Chatham Historic Dockyard stated their continued support for the project and guaranteed long term curation of artefacts recovered from the site.
- 2.2.11 Project 6650 undertaken by PAS also carried out a study of the hydrology and sediment movement local to the site (PAS 2014, 7-8). It revealed two distinct topographic trends. The sand bank as a whole has moved south but with the top layers of extremely mobile deposits moving north-east or south-west, depending on energy levels. The latter has more localised and seasonal effect, covering and uncovering different parts of the site at different times. The former has a general and long term effect with the prognosis that if the trend continues the site will become more exposed.
- 2.2.12 During the 2013 project sediment monitoring points (SMP) were installed around the site to monitor the changes in sediment levels. The SMPs were 1.5m long 1/2" galvanised water barrel (tube) which were hammered into the seabed by 0.6m so 0.9m was protruding from the sand. To monitor the level of the seabed around the site divers simply measured from the top of the tube down to the seabed. Monitoring since then has identified a considerable loss of sediments especially in the north areas of the site exposing structure and artefacts (PAS 2014 & 2015).
- 2.2.13 The location of the site on the northern edge of Horse Tail highlighted its susceptibility to further exposure during high energy storm events. This was recorded in 2014 following an extension to the previous project 6650 (PAS

2015). The winter storms of late 2013 and early 2014 had resulted in considerable new exposure of wreck material across the whole site with a loss of seabed sediments across the site ranging from 0.05-1m (PAS 2015 10 & 11). Greatest loss of sediments was observed in the north and north-east areas of the site. This part of the site is closest to the northern edge of Horse Tail.

2.2.14 In July 2014 WA were commissioned by Historic England to collect high resolution magnetometer, sidescan sonar and multibeam bathymetry data in order to establish the extent, stability and character of the site. The results from the surveys were compared with data collected in 2003. The 2014 results identified that a large amount of sediment had been removed from the site exposing archaeological material which is now at risk (WA 2015, 9).

2.2.15 Project 6650 conducted by PAS identified and recorded substantial sections of exposed starboard side remains extending from the main site up to 30m to the north-east. A section of hull furthest to the north-east labelled Area 2 was recorded to be 14m long by 10m wide and represents a piece of the hull between the orlop deck and the hold (PAS 2015,7). Another section found between Area 2 and the main site was labelled Area 3 and consisted of another large section of the lower hull, 14m long by 8m wide (PAS 2015, 8-9). The remains were recorded and added to the existing plans of the site (PAS, 2014 & 2015) (Figure 1). The recording of this structure identified that substantial parts of the starboard side of the ship survives with the potential for more to be buried. The main site which consists of the port side was also significantly exposed especially in the north where the remains of the bow is located. As well as the main structure of the port side being exposed, artefacts and internal structures of cabins or storerooms were also evident (PAS 2015, 6).

2.2.16 A section of the bow and the remains of the starboard side were not excavated during the 1980s due to the level of sand covering these parts. The loss of seabed sediments in these areas is now exposing previously undisturbed archaeological deposits which are now under threat.

2.2.17 In 2015 the site was put back onto the Heritage at Risk Register because of further exposure of structure and artefacts
<https://content.historicengland.org.uk/images-books/publications/har-2015-registers/se-har-register2015.pdf/>

2.3 Ownership, Management and Current Use

2.3.1 The *Invincible* is owned by the Ministry of Defence and lies in Portsmouth Harbour Administrative Area.

2.3.2 Following the 2003 Site Assessment, action to commence conservation management of the site was commissioned by Historic England (when English Heritage) in 2009 which sought to undertake a condition survey of the site and determine the site's vulnerability (HWTMA 2010).

- 2.3.3 During 2009 HWTMA monitored the *Invincible* site as part of the Solent Heritage Assets project which involved investigating, monitoring and reporting on a range of marine heritage assets in the Solent and Sea Wight area. <http://www.maritimearchaeologytrust.org/invincible>
- 2.3.4 Physical access to the *Invincible* is restricted to licensed divers and further recovery of artefactual material has been managed through the current licensing system. Since 2011 monitoring has been undertaken by licensee Daniel Pascoe of PAS who has recovered more exposed artefacts. The monitoring revealed differences in sediment cover in several areas of the site, with areas of the site recently exposed due to sediment levels reducing (Pascoe 2011,2012, 2013,2014 and 2015).
- 2.3.5 PAS was funded by Historic England (when English Heritage) in 2013 to undertake a recording and monitoring project which was extended in 2014 because of further exposure of the wreck. Exposure of the wreck has continued leading to further funding by Historic England allowing PAS to continue recording the most vulnerable parts of the site in May 2016.
- 2.3.6 Since 2014 the Licensee has been organising visitor days to the site through the Nautical Archaeology Society (NAS). This allows members of the NAS or dive clubs to come and dive the site of *Invincible* and experience diving on a protected wreck.

2.4 Gaps in Existing Knowledge

- 2.4.1 Parts of the bow of the port side and the remains of the starboard side were not excavated. This represents significant portions of the ship that are not fully understood. These areas are now under threat through reduction in seabed sediments and there is inevitable loss of information occurring as these areas remain exposed.
- 2.4.2 The quality of the surviving buried remains of the *Invincible* have significant potential for further understanding of 18th century shipbuilding technology and practice. There is still more to learn from the structural remains of the ship in the understanding of the original design and construction of the hull; building and re-building sequences; and the internal layout of cabins and compartments.
- 2.4.3 More archival research is needed to study the designs of subsequent British 74s to enable comparisons with the remains of *Invincible*. This will help understand which characteristics were copied and developed and which ones were rejected.
- 2.4.4 A dendrochronological study of the hull timbers should identify the date and perhaps also sources and types of timber employed. Therefore, identifying which parts of the ship originate from the original French construction and which parts were replaced during British refits and repairs.

- 2.4.5 The dockyard progress reports for the repairing of the *Invincible* (1753-1756) did not survive (Lavery 1988:65). Therefore, investigating the surviving hull structure is the only way of identifying the repairs that were made.
- 2.4.6 During the wrecking of *Invincible* six upper deck guns were jettisoned from the ship. The guns were a new type of light weight 24-pounder issued to the ship in March 1756. They were to be carried on the upper deck, instead of 18-pounders. The *Invincible* was one the first ships to trial these new guns (Lavery 1988, 69 & Bingeman 2010, 14). As yet, these guns have never been found but their discovery and subsequent study would add to the significance of the site.
- 2.4.7 Together, the archaeological and historical information forms a sound basis to develop an understanding of the *Invincible*. However, the wreck site clearly has the potential to yield more information with parts unexcavated with further areas both to the south-east and to the north and east (see Section 4.3) are not fully understood.

3 ASSESSMENT OF SIGNIFICANCE

3.1 Basis for Assessment of Significance

- 3.1.1 Significance means the sum of the cultural and natural heritage values of a place (English Heritage 2008). Cultural heritage value has many aspects, including the potential of a place to yield primary information about past human activity (evidential value, which includes archaeological value), the ways in which it can provide direct links to past people, events and aspects of life (historical value), the ways in which people respond to a place through sensory and intellectual experience of it (aesthetic value, which includes architectural value) and the meanings of a place for the people who identify with it, and communities for whom it is part of their collective memory (communal value).
- 3.1.2 In addition, the historic environment is a cultural and natural heritage resource shared by communities characterised not just by geographical location but also by common interests and values. As such, emphasis may be placed upon important consequential (technically, 'instrumental') benefits or potential, for example as an educational, recreational, or economic resource, which the historic environment provides. The seamless cultural and natural strands of the historic environment are a vital part of everyone's heritage, held in stewardship for the benefit of future generations.
- 3.1.3 The basis for assessing significance therefore enables consideration of the varying degrees of significance of different elements of the site. By identifying those elements which are vital to its significance and so must not be lost or compromised, we can identify elements which are of lesser value, and elements which have little value or detract from the significance of the site.

3.2 Statement of Significance

- 3.2.1 The *Invincible* has an important place in naval history in the development of warships as a new type of warship conceived by the French but which subsequently revolutionised British warship design.
- 3.2.3 *L'Invincible* was one of three new vessels that emerged from a school of naval architecture, employing a scientific, as opposed to a commonly conservative, basis for their design. At a time when colonial expansion was at the fore, the ability to protect convoys travelling afar with fast and manoeuvrable all-purpose naval warships gave the French a sudden tactical advantage (Lavery 1988). She was a new design of a 74-gun warship. She had a better shaped hull for speed than British counterparts being capable of 13 knots while the British ships could only manage 11 knots (Bingeman 2010, 11).
- 3.2.4 The gun decks of the *Invincible* and the other new 74s were not only longer allowing for extra gun ports but the main gun deck was six feet above the waterline, as opposed to the British first and second rates, which were only three to four feet above the waterline. The result of this was that the British three deckers were restricted to the use of two gun decks instead of three, in all but the calmest of seas (Bingeman 2010, 12). They would also be without the use of their heaviest guns and were thus at a significant disadvantage against the French 74s.
- 3.2.5 As well as being designed as a powerful fighting ship the *Invincible* was also designed for speed and manoeuvrability. This was accomplished by having a fuller bow and much finer lines to the ship's stern with a near vertical stern post and rudder. Angled rudders when turned causes the stern to be pulled more deeply into the sea and therefore slowing the vessel down. Having a near vertical rudder doesn't have the same pulling down affect and therefore doesn't slow the vessel as much when manoeuvring (Bingeman 2010, 13).
- 3.2.6 The ship is not only significant because of her revolutionary design but also because of the new technologies used in her construction. Ships from this period were almost entirely constructed from wood, however, the French had started to experiment more with the use of wrought iron. As a result, *Invincible* was constructed with 200 iron knees (Lavery 1988, 9).
- 3.2.7 The combination of talented designers with a creative freedom and the necessity to build a ship that could meet all the maritime needs led to creation of this new revolutionary 74. This was the complete opposite in Britain where the growth of the largest navy in Europe had led to a need to create standardization in the design and construction; arming and fitting out. This led to a system of 'Establishments' aimed at achieving uniformity within each class of vessel (Baugh 1977:199). This became progressively rigid through the second quarter of the 18th Century. The lack of creative freedom brought on through the system of 'Establishments' combined with the lack of action during this period led Britain to produce a fleet that was superior in numbers but was inferior in terms of designs and ability. The inadequacies would not be realised until the advent of war with Spain and France and the subsequent capture of French and Spanish vessels, such as *Invincible* in 1747.

- 3.2.8 Anson and other officers who served on her were convinced ships like *Invincible* were the future of warship design (Bingeman 1998, 168). However, changes did not occur until the mid-1750s, with the advent of a new generation of administrators and designers (Lavery 2010, 7).
- 3.2.9 By 1748 the British had captured four of the French new 74s, *Monarque* (renamed *Monarch*), *Terrible*, *Magnanime* and *Invincible*. This meant the British had the finest French ships serving in the British Navy. The effects were detrimental for French maritime commerce as there were not enough French ships to escort their merchant ships (Lavery 1988, 43).
- 3.2.10 The utilising of these new revolutionary French ships in the British Navy made up for the early reluctance to design and build the subsequent British warships to the French specifications.
- 3.2.11 Anson's appreciation of her superior build was eventually incorporated into British ship designs. An Admiralty Office letter dated 21 May 1757 instructing the building of the *Valiant* and the *Triumph* to the *Invincible*'s exact scantlings saying '*Invincible is in every respect the very best Ship of her Class and answers all purposes that can be desired of a Ship of War*' (Bingeman 2010, 176).
- 3.2.12 The *Invincible*'s legacy lay in her influence on the design of future British warships of the late 18th and early 19th centuries. The success of the 74-gun warship was such that more than half the ships present at the Battle of Trafalgar 1805 were of this type (PAS 2014).
- 3.2.13 It was not only in her fundamental design but also in the technologies employed that made the *Invincible* so successful including early use of copper nail studding, pre-dating copper sheathing, as an early method to protect against shipworm. Also, an iron hearth replacing the brick-built galley, iron knees, rudder position indicators and flint-lock firing mechanisms fitted to the great guns. Many of these were being tried here before becoming standard issue in the Royal Navy (Bingeman 2010).
- 3.2.14 In the service of the Royal Navy *Invincible* mainly served as a flagship or a guardship. These roles were only reserved for the best ships in the fleet and this demonstrates her high status within the Navy. The *Invincible* served briefly as a flagship during the end of the War of the Austrian Succession (1740-1748) but then at the advent of peace served as a flagship for Court martials in 1749 and later a guardship in Portsmouth. In 1752 she was given a foreign voyage to Gibraltar to relieve a battalion of infantry (Lavery 1988, 61). It was during this voyage when the Captain Bentley of *Invincible* reported the ship's fine sailing qualities. '*Her speed was excellent – has gone 13 knots large and 8 by the wind, and would have went more could I have made a proper sail*' (TNA ADM/95/25, f67).
- 3.2.15 For two and half years between 1753 and 1756 *Invincible* remained in dock for repairs. In 1753 shipwright William Bateley and Thomas Slade surveyed the ship and found her in a poor state but serviceable (Lavery 1988, 65). It

was decided to repair the ship as opposed to a complete re-build. What is significant about this is that parts of the *Invincible*'s original French construction will still exist.

3.2.16 In 1756 *Invincible* was reinstated as a flagship, this time for the Western Squadron under the command of Admiral Boscawen (Lavery 1988, 69). The Western Squadron had the responsibility of patrolling the western approaches to the English Channel. This included keeping guard over the French coast of Brest. Brest was important as a base for any invading fleet of England or reinforcing the colonies of the Caribbean, North America or India. Therefore, this was arguably the most important command in the Navy (Lavery:1988, 70).

3.2.17 In 1756 *Invincible* was sent to North America to reinforce Vice-Admiral Sir Francis Holburne's squadron with the attention of attacking the French at Louisbourg. It was not a successful mission for either Holburne or *Invincible*. The fleet was caught out in a hurricane and *Invincible* amongst others were badly damaged. Holburne decided to send back the ships which were seriously damaged, including *Invincible* (Lavery 1988, 92).

3.2.18 *Invincible* arrived back in Portsmouth on the 9th November 1757. There was extensive damage to the hull, rigging and rudder and these were carried out quickly and mainly while she was still afloat (Lavery 1988, 95). This is a significant point in the ships history as the speed at which the ship was repaired may be one of the factors leading to the ships loss on the 19th February 1758.

3.2.19 The wreck of *Invincible* is the best-preserved remains of a ship of the line from the mid-18th century in UK waters. The ship is one of the earliest designs of the 74-gunship that went onto become the back bone of all of the most powerful navies. She is unique in that she represents the earliest of this type for both the French and British. The remains of the wreck hold invaluable clues to French and British ship design, ship-board life and technologies (PAS 2014, 4).

3.2.19 The NRHE lists only nine records of British ships of the line lost in the two decades either side of 1758 (1738-1778). Of these, three are Third Rate ships of which the *Invincible* is one and the other two are:

Vessel	Location	Monument no.	Date of loss
<i>Conqueror</i>	Drake's Island, S Devon	876524	1760
<i>Nottingham</i>	Sheerness, Thames Estuary	895125	1773

Of the designated wreck sites for the same period, only four others, apart from the *Invincible*, are known:

Vessel	Location	NHLE no.	Date of loss
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HMS *Invincible*: Conservation Statement & Management Plan

<i>Amsterdam</i>	Bulverhythe, Hastings, East Sussex	1000055	1745
<i>Hanover</i>	Hanover Cove, Near Cligga, Perranzabuloe, Cornwall	1000072	1763
<i>Rooswijk</i>	Kellett Gut, Goodwin Sands off Kent	1000085	1739
<i>Assurance</i>	The Needles, Totland, Isle of Wight	1000087	1753

- 3.2.20 Although, not from the immediate period there is one Designated Wreck of the same type as *Invincible* and that is the 74-gunship, HMS *Colossus* (NHLE 1000078). *Colossus* was built in 1787 at Gravesend and wrecked in the Isles of Scilly in 1798 (Camidge 2014, 8). At 51m (170 ft) in length she is very similar in size to *Invincible* and so far, *Colossus* is the most significant comparison there is in UK waters. The quality of the surviving structure from both these sites makes comparable studies between the two very significant.
- 3.2.21 Although, not of the same class, HMS *Victory* was ordered in the same year as *Invincible* was wrecked. HMS *Victory*, therefore represents the only surviving vessel from the period and will no doubt have many features in common with *Invincible*.
- 3.2.22 A substantial artefact assemblage survives from the *Invincible* which is now held at Chatham Historic Dockyard Trust and was published in Bingeman 2010. Further finds are being washed out from the wreck site area indicating that the wreck site clearly has the potential to yield more information. The silts in the hull may preserve and cover significant environmental information relating to life aboard.
- 3.2.23 The *Invincible* is associated with leading personalities: Lord Anson (1697–1762) was First Lord of the Admiralty from 1751 to 1756 and 1757 to 1762; Vice-Admiral The Hon. Edward Boscawen (1711–1761), naval officer and politician; Captain John Bentley (Vice-Admiral Sir John - *bap.* 1703, *d.* 1772), all of whom have entries in the Oxford Dictionary of National Biography.
- 3.2.24 The *Invincible* took part in naval campaigns which played a key role in England's national history. Lord Anson's victory off Cape Finisterre, 3 May 1747, is depicted in a painting at the National Maritime Museum.
- 3.2.25 Many contemporary documents survive (see Section 2.4.1); the archaeological and historical archive currently housed at the Chatham Historic Dockyard Trust; the full publication of the excavations in 2010 aids our understanding and adds significance to the surviving remains, and the digitised excavation archive which is available on line <http://www.maritimearchaeologytrust.org/mapguide/maps/invincible/main.php> However, there are still extensive areas of the site which have not been investigated. There therefore, much more to learn from the remaining structures of the hull regarding the construction of the ship.

3.2.26 The following table seeks to summarise these values as a whole, by noting how those values relate to the surviving fabric and its constituent parts:

Evidential	Relating to the potential of the <i>Invincible</i> to yield primary information about past human activity; excavation has shown substantial survival of the hull structure with potential for further archaeological deposits inside and artefacts still being washed out from the wreck site area.
Historical	Relating to the ways in which the <i>Invincible</i> can provide direct links to past people, events and aspects of life; the wreck is identified with leading personalities and naval campaigns. Documentary evidence together with archaeological recording allows for an understanding of her superior design, refitting and subsequent legacy while artefacts provide insights into 18 th century shipboard life.
Aesthetic	Relating to the ways in which people respond to the <i>Invincible</i> through sensory and intellectual experience; the wreck's strength lies in her being an 18 th century Third Rate ship-of-the-line.
Communal	Relating to the meanings of the <i>Invincible</i> for the people who identify with it, and whose collective memory it holds; from the original project team members who have a long history of association with the wreck, to the more recent investigation and survey by HWTMA and NASAC.
Instrumental	Economic, educational, recreational and other benefits which exist as a consequence of the cultural or natural heritage values of the <i>Invincible</i> may be identified in her value as a visited site and co-location close to other wrecks in the area.

3.3 Gaps in Understanding Significance

3.3.1 With the identification of unexcavated areas in section 2.4 and 5.4 there are gaps in our understanding of the significance of these component parts of the site. These will need to be filled so these significances can contribute to informing its future conservation management.

3.3.2 Since 2013 PAS has been trying to establish the extent and significance of structural material remaining. This work is on-going but it has already added significant parts of previously unrecorded starboard side remains to the existing site plans. It has also identified the potential for more to be buried and although exposure of the wreck is increasing, to gain an even better understanding of what could potentially survive, high resolution sub-bottom data should be collected or existing data looked at to determine the extent of buried remains again (for newer processing software now exists allowing better results for interpretation).

3.3.3 The undertaking of a high resolution sub-bottom survey could potentially identify whether the 'South-Eastern Anomaly' is linked to *Invincible* or in fact another wreck.

3.3.4 During the 2014 geophysical survey of the site WA identify magnetic and sidescan sonar anomalies outside the protected area (WA 2015). WA recommended that these anomalies were diver ground-truthed to determine whether they are associated with the wreck of *Invincible* (WA 2015:10). If they

are, then the Statutory Instrument boundary will need to be extended to include the new parts of the wreck. This is important in order to offer new features of the wreck the same protection (see also section 5.4.3 below). These anomalies have the potential to be the 24-pounder guns that were jettisoned to “in order to bring her on an even keel”. The *Invincible* was the first ship to trial these new light-weight guns (Bingeman 2010:14, Lavery 1988:67) and therefore are both historically and archaeologically very significant.

- 3.3.5 It has been well established from historical research that *Invincible* had a great influence on British warship design during the 18th century. However, no-one has specifically studied the archaeological remains of subsequent British warships in such a way as to identify the design influences that were adopted or discarded by British ship designers. The remains of *Invincible* on their own are significant but studied in relation with other sites, such as the 74-gun *Colossus*, (then?) they become even more important and informative (see also section 5.4.3 below).

3.4 Statutory and Other Designations

- 3.4.1 Statutory Instrument 1980/1307 affords protection to a circular area of seabed (radius 100m) around position 50°44.34'N, 01°02.23'W under the Protection of Wrecks Act 1973. The National Grid Reference is SZ 67933 93771.
- 3.4.2 Archaeological interventions that impact the seabed may require a marine licence issued by the Marine Management Organisation under the Marine and Coastal Access Act 2009 and a licence from the Crown Estate.
- 3.4.3 The *Invincible* lies between, but not within, the Solent Maritime and South Wight Maritime Special Areas of Conservation.
- 3.4.4 In addition, Section 40 of the Natural Environment and Rural Communities Act (2006) places a duty on all public bodies to have regard to the conservation of biodiversity. Guidance for this duty has been published by DEFRA 2007 *Guidance for Public Authorities on implementing the Biodiversity Duty*
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69311/pb12585-pa-guid-english-070516.pdf to be published by DEFRA.

4 ISSUES AND VULNERABILITY

4.1 Introduction

- 4.1.1 This section summarises the main conservation and management issues that specifically affect, or may affect, the significance of the *Invincible* and its component parts and elements. The ways in which the significance of the site may be vulnerable will also be identified.
- 4.1.2 Vulnerability (and therefore risk) may be assessed against environmental factors (such as natural processes) and human impacts on the site, including the setting (see English Heritage 2008b). Commissioned research has been undertaken to assess site specific marine environments to provide a better understanding of the level of risk to assets or whether a site is in a stable condition. The current assessment indicated that the *Invincible* site is at high risk because of significant reductions in seabed levels exposing large areas of structure and artefacts (PAS 2014 and 2015) unless they are completely buried below bed level during successive tidal cycles.
- 4.1.3 It is accepted that all wreck sites are vulnerable simply because of the nature of their environment, though sites will be considered to be at risk when there is a threat of damage, decay or loss of the monument. However, damage, deterioration or loss of the monument through natural or other impacts will not necessarily be considered to put the monument at risk if there is a programme of positive management.
- 4.1.4 Practical measures that affect site stability, preservation *in situ* and increased visitor access will be addressed here, while the necessity to address the paucity of publication in relation to previous interventions on the site is recognised (see also Section 4.7).
- 4.1.5 Issues relate specifically to the values identified in Section 3.2 above and are presented here thematically rather than in order of severity or priority for remedial action. Relevant issues cover a wide range, including - but not restricted to

- The physical condition of the site and its setting;
- Conservation and presentation philosophy;
- Ownership and other legal requirements (including visitation);
- The existence (or lack) of appropriate uses;
- Resources, including financial constraints and availability of skills;
- Lack of information or understanding about aspects of the site, and;
- Conflicts between different types of significance.

4.2 The Physical Condition of the Site and its Setting

- 4.2.1 The site lies on the northern edge of Horse Tail, a relatively flat featureless sand bank and the free running seawater leads to mobile sand and regular reductions in seabed level. In 1992 the ADU reported evidence of scouring of sediment around upstanding structures and regular fluctuations in seabed

level were noted over the site in 1996 (ADU 1996). In the northern area of the site, comparison between the 1990 site plan and a multibeam survey carried out by Wessex Archaeology in 2003 suggests alterations to the level of exposure within this area. In 2003 Wessex Archaeology observed that the wreck site was exposing in the north but appeared to have infilled in the southern areas (WA 2003, 8).

- 4.2.2 In 2009 the site appeared relatively stable at medium risk (HWTMA 2010, 4). The wreck was subject to seabed erosion and biological decay but there appeared to be limited alteration from season to season. They noted, however, that other objects recorded on the seabed were at higher risk, with vulnerable elements of cable/cordage observed deteriorating as they were uncovered by erosion. Smaller artefacts were at risk of removal through swell or tide. They concluded that the gradual degradation of the seabed archive over time is resulting in the loss of information from the wreck (HWTMA 2010, 19).
- 4.2.3 Since 2011 Daniel Pascoe has been the licensee of *Invincible* in which time he and the licenced team have spent a total of 49 days on site, undertaking 509 individual dives amounting to 27,734 minutes underwater. These dives have been conducted during the months of March through to December. The frequency of site inspections has enabled the present team to build up a more reliable understanding of the environmental and physical changes occurring on the site over a sustained period of time and over different periods of the year.
- 4.2.4 In 2011 it was reported by the Licensee that localised areas of surface sediment loss revealing fragile organic objects and structure (see Section 2.2.7) had been identified. Some of the sediment loss was occurring in areas previously unrecorded outside the main site to the north and east. Upstanding structure within the site at the bow was also causing localised scouring revealing fragile objects. (Pascoe 2011, 6).
- 4.2.5 As a result of these observations Historic England commissioned PAS in 2013 and 2014 to conduct an archaeological assessment of the site. This included the recording of new exposed features and setting up of a system to monitor the environmental changes occurring over and around the site. In addition, limited desk-based research was undertaken in order to understand environmental factors affecting the site. Historic England, also commissioned WA to conduct a high resolution geophysical survey of the site in 2014.
- 4.2.6 The study of georeferenced cartographic data alongside multibeam bathymetry data of the area identified that Horse Tail sand had moved over the site leaving it on the northern edge. The most northerly part of the site is now only 15m away from the northern edge of the sand bank (PAS 2014,7). The present position of the site means it is vulnerable from the progression of Horse Tail Sand southwards but also the shallow nature of the site means it is vulnerable to high energy storms events (PAS 2014,25).

- 4.2.7 The PAS 2013 and 2014 underwater investigations along with the results of the WA geophysics revealed that there had been a loss of seabed sediments throughout the site but most significantly in the northern areas. This extended from the bow of the main site up to 30 metres north.
- 4.2.8 In the bow, structures relating to all three surviving decks were exposed and within that a high concentration of artefacts. Artefacts include gun powder barrels, ship's cable, leather shoes and rammer heads (Pascoe 2015). Extending from this point 30m north there are large sections of exposed starboard side structure. These artefacts and structures are extremely vulnerable when exposed to biological and physical decay. The biological decay of timbers is illustrated in Pascoe 2012 and PAS 2014 reports.
- 4.2.9 In May 2016 Kim Knight, a masters' student from Bournemouth University provided sacrificial wood samples to be placed on the site. These were recovered in October. Three types of wood were used, pine, elm and oak. So far only the pine samples have been analysed. Analysis of the pine samples has identified a very active site with breeding and spawning occurring late into the year. The dominant species infesting the wood are *Lyrodus pedicellatus* and *Limnoria quadripunctata*. The latter has caused 27% of the surface area of the samples to be lost in just 5 months. This places the samples within the severe damage category according to the BS EN275 (1992) standards. Considering parts of the orlop and gun decks are clad with pine and significant parts are now exposed the rapid colonisation by wood borers is a huge threat to exposed parts of the site. Full results of the study will be forthcoming on completion of Kim Knight's Master's degree.

4.3 Conservation and Presentation Philosophy

- 4.3.1 To the south of the main site the 'South-Eastern Anomaly' was surveyed in 2003 along with several outlying concretions. Although it clearly represents the partial remains of a wooden shipwreck further work is required in order to establish the extent and significance of this debris as it may be part of a separate shipwreck (WA 2003, 1). However, this has remained buried since Daniel Pascoe has been licensee. Due to the distance, it is from the main site of the *Invincible* regular geophysical surveys around the site are recommended to identify exposure of this wreck material and any changes in the topography of the seabed.
- 4.3.2 To the north and east of the main site there are large sections of exposed starboard side structure. Newly exposed structures and the recording of the sediment monitoring points have demonstrated reductions in seabed levels. A significant proportion of the recently exposed structures has now been recorded and added to the existing site plan but due to the extent of exposure in recent years this is not complete (PAS 2014 & 2015). At present the rate of exposure is faster than the divers can record the site using traditional recording methods. These structures have now been exposed for several years and timber surfaces are deteriorating. The loss of seabed sediments is threatening the stability of the site.

- 4.3.3 Part of the hull is extensively preserved. However, this has not been fully quantified and it is necessary to quantify the extent of structural material remaining on the seabed and in what condition. This is work in progress and PAS has recorded large areas of starboard side structure which is increasing our understanding of the extent of structure that survives.
- 4.3.4 However, the site is vulnerable to physical destruction through the processes of sediment movement around the wreck and biological decay through marine borers. Observations made from similar site environments such as the Swash Channel Wreck has identified that the exposed surfaces of timbers can quickly deteriorate with the loss of important diagnostic information, such as tool and carpenter marks. Recent analysis of sacrificial wood samples from *Invincible* have identified that exposed timbers become quickly colonised by marine borers causing severe surface and sub-surface damage to the wood (Knight forthcoming Masters dissertation).
- 4.3.5 Despite evidential and aesthetic value of the *Invincible* being of vital significance to the site, *in situ* management may not be appropriate for the site as a whole. Rather selective archaeological excavation of the most vulnerable areas should be considered as management options for the site.
- 4.3.6 At present the most vulnerable parts of the site are in the northern areas. This includes the bow to amidships of the coherent portside and the detached remains of the starboard side. These areas are experiencing the more significant loss of seabed sediments. The bow section of the portside is rich in artefacts and fragile internal structures of the ship. These areas as well as the starboard side remains have been undisturbed by the previous excavations and therefore there is no record of the surviving buried structures or content from these parts of the ship. The continuing exposure of the wreck in these areas means the structure and content of the ship could be lost in a few years. Therefore, selective excavation in these areas should to be considered as a management option to record and rescue archaeological material before it is lost.
- 4.3.7 The *Invincible* is situated on a mobile sand bank with highly mobile surface sediments. The monitoring of these sediments in 2014 revealed up to a loss of 1m covering significant areas of the site (PAS 2015,11). This demonstrates how mobile these deposits are and the quantity of material that can be lost. The shallow nature of the site combined with highly dynamic seas during storm events means any stabilising material put down would also be effected by these forces. Therefore, any stabilising measure would have to be maintained and repaired on an annual basis.

4.4 Visitor and other Occupancy Requirements

- 4.4.1 There are plans to develop underwater interpretative materials and we encourage and support responsible visitor access through the licensing system. Any persons wishing to visit the *Invincible* are directed to the Licensee and encouraged to participate in the existing licensed survey initiative.

4.4.2 'Virtual access' to the site has been enabled through the website <http://www.maritimearchaeologytrust.org/mapguide/invincible/main.php> and the archaeological publication: Bingeman 2010. In addition, PAS has been commissioned by Historic England to undertake a project in 2016 (Project 7235) which includes the creation of a virtual and interactive dive trail. This will also increase 'virtual access' to the site for both the non-diving community but also divers who will be able to familiarise themselves with the wreck before they dive it.

4.4.3 Physical access to the site has been increased by the Licensee by organising visitor days to the site for divers through the NAS. The day includes a presentation by the Licensee followed by a dive on the wreck.

4.5 The Existence (or lack) of Appropriate Uses

4.5.1 Regular, consistent and reliable information relating to the condition of the *Invincible* will be necessary to monitor the existence (or lack) of appropriate uses of the site.

4.5.2 Enforcement of the Protection of Wrecks Act 1973 is the responsibility of the appropriate County Constabulary as it is a criminal offence to any of the following in a designated area without a license granted by the appropriate Secretary of State:

- Tamper with, damage or remove any part of a vessel lying wrecked on or in the seabed or any object formerly contained in such a vessel.
- Carry out diving or salvage operations directed to the exploration of any wreck or to removing objects from it or from the seabed, or uses equipment constructed or adapted for any purpose of diving or salvage operations. This is likely to include deployment of remotely operated vehicles.
- Deposit anything including anchors and fishing gear which, if it were to fall on the site, would obliterate, obstruct access to, or damage any part of the site.

4.5.3 It is also an offence to cause or permit any of the above activities to be carried out by others, without a license, in a restricted area.

4.6 Resources, including Financial Constraints and availability of Skills

4.6.1 There is no doubt that extensive recovery of archaeological material, including hull structure, indicates the evidential value of the *Invincible* and that interaction with archaeological material relates to both aesthetic and historical value. The cost of dealing with recovery, storage and conservation is also high and this may exceed the professional and funding capacity of Historic England. In which case, external funding and professional skills such as in conservation of material recovered would need to be sourced externally (see section 6.2.5).

4.6.2 In accordance with the Diving at Work Regulations 1997, archaeological interventions underwater commissioned by Historic England can only be undertaken by a registered Diving Contractor, and then only by such a Contractor with appropriate archaeological experience.

4.7 Lack of Information or Understanding about aspects of the Site

4.7.1 *Taking to the Water* (English Heritage's Initial Policy for the Management of Maritime Archaeology in England) addressed the protected wreck site post-excavation backlog. Here, it is recognised that over the last 25 years many licenses have been issued for survey and excavation work within areas designated under the Protection of Wrecks Act 1973. Few of the licenses issued required the academic reporting of fieldwork results and, as the vast majority of this work took place on a voluntary basis, lacking adequate financial support for subsequent analysis and dissemination of the results, very little of this work has been formally published (Roberts & Trow 2002, 25). However, in the case of the *Invincible* the archaeological excavations have been published (Bingeman 2010, Lavery 1988 and Bingeman's annual reports to the ACHWS) and four archaeological assessment reports (WA 2003, HWTMA 2010 and PAS 2014 & 2015).

4.7.2 There are several main areas that hinder public understanding of the *Invincible*:

- More information is needed on the extant and significance of structural and artefact material remaining, particularly in the bow and the lower parts of the coherent portside (see Bingeman's 1998 site plan showing unexcavated areas); and the collapsed starboard side structures.
- More information is needed on the degradation of the structure.
- Existing plans need further updating especially in the northern areas.
- Lack of information on the extent and significance of the 'South-Eastern Anomaly'.

4.7.3 It is the intention of this Conservation Management Plan to provide a mechanism to reconcile the lack of information/understanding about the site to assist in its management for all.

5 CONSERVATION MANAGEMENT POLICIES

5.1 Introduction

5.1.1 This section of the Conservation Statement and Management Plan builds on the Assessment of Significance and the issues identified in Issues and Vulnerability to develop conservation policies which will retain or reveal the site's significance, and which provide a framework for decision-making in the future management and development of the site or reveal the site's significance and also:

- Meet statutory requirements;
- Comply with Historic England's standards and guidance.

5.1.2 It is intended that the policies will create a framework for managing change on the *Invincible* that is clear in purpose, and transparent and sustainable in its application. Our aim is to achieve implementation through the principles of shared ownership and partnership working so as to balance protection with economic and social needs.

5.1.3 Policies are also compatible with, and reflect, Historic England's *Conservation Principles for the Sustainable Management of the Historic Environment* (English Heritage 2008a) and its published policies and guidelines, as well as the wider statutory and policy framework.

5.2 The *Invincible* is a Shared Resource

5.2.1 The *Invincible* forms a unique record of past human activity which reflects the aspirations, ingenuity and investment of resources of previous generations. Through the future display of material at the National Museum of the Royal Navy (see section 6.2.5), *Invincible* may be an economic asset as a generator of tourism or inward economic investment.

5.2.2 The *Invincible* is a social asset as a resource for learning and enjoyment. It should be used and enjoyed without compromising the ability of future generations to do the same.

5.2.3 In addition, the conflict between the desire for access to the site and the restrictions imposed by conservation needs and legislative limitations will be reconciled through visitor management.

5.2.4 Learning is central to sustaining the historic environment. It raises people's awareness and understanding of their heritage, including the varied ways in which its values are perceived by different generations and communities. It encourages informed and active participation in caring for the historic environment.

5.2.5 Education at all stages should help to raise awareness and understanding of the site's values, including the varied ways in which these values are perceived by different generations and communities.

Management Policy 1 We will continue to support and develop authorised access to the site as a mechanism to develop the instrumental value of the Invincible

5.3 Everyone should be able to participate in sustaining the *Invincible*

- 5.3.1 Local, regional and national stakeholders have the opportunity to contribute to understanding and sustaining the *Invincible*. Judgements about its values and decisions about its future will be made in ways that are accessible, inclusive and informed.
- 5.3.2 Practitioners should use their knowledge, skills and experience to help and encourage others to understand, value and care for the *Invincible*. They play a crucial role in communicating and sustaining the established values of the wreck, and in helping people to refine and articulate the values they attach to it.
- 5.3.3 CHDT has recently opened a new exhibition, *Command of the Seas*, which features 130 artefacts from *Invincible* with interactive interpretations. The rest of the collection has been or is in the process of being digitally photographed and recorded into a digital archive.
- 5.3.4 'Virtual access' to the site has been created through the MAT website. In addition to this PAS will be creating a virtual and interactive dive trail to be hosted on Historic England's website (project ref 7235).

Management Policy 2 Through web-based initiatives, we will continue to improve the accessibility of related material and support appropriate links so as to develop effective public understanding.

5.4 Understanding the significance of the *Invincible* is vital

- 5.4.1 The significance of the *Invincible* embraces all the cultural and natural heritage values that are associated with it. To identify and appreciate those values, it is essential first to understand the structure and ecology of the site, how and why that has changed over time, and its present character.
- 5.4.2 The purpose of understanding and articulating the significance of the *Invincible* is to inform decisions about its future.
- 5.4.3 We acknowledge that there are gaps in our understanding of significance as set out in Section 4.7:
- More information is needed on the extent and significance of structural and artefact material remaining, particularly in the bow and lower parts of the coherent portside and the collapsed starboard side structures.
 - More information is needed on the extent and significance of the 'South-Eastern Anomaly'.
 - Lack of information on the extent and significance of the anomalies outside the protected area.
 - More information is needed on recently exposed structure to the north and east which have not been investigated or recorded.

- Lack of comparable studies between the archaeological remains of *Invincible* and subsequent British warships to identify the influences that shaped British warship designs.
- 5.4.4 A formal programme of assessment and recording started in 2013 and is continuing in 2016. It will assess the site establishing the areas that are most at risk and that have not been fully recorded. Anomalies outside the protected area will be diver ground-truthed to determine whether they relate to the site.
- 5.4.5 A collaboration has been instigated between Daniel Pascoe and the Licensee of the protected wreck of HMS *Colossus*, Kevin Camidge. *Colossus* was a British 74 wrecked on the Isles of Scilly in 1798. The idea of collaboration is to exchange information between teams working on the two sites. A collaboration has also begun with The National Museum of the Royal Navy which will potentially in the future enable comparative studies between the remains of HMS *Invincible* and HMS *Victory*.

Management Policy 3 Key gaps in understanding the significance of the component parts of the site are now being identified, prioritised and addressed so that these significances can contribute to informing the future conservation management of the site.

5.5 The *Invincible* should be managed to sustain its values

- 5.5.1 Changes to the *Invincible* are inevitable and it is acknowledged that all wreck sites are vulnerable simply because of the nature of their environment.
- 5.5.2 Action taken to understand natural changes will be proportionate to the identified risks and sustainable in the long term.
- 5.5.3 Intervention that causes limited harm to the values of a place may be justified if it increases understanding of the past, reveals or reinforces particular heritage values, or is necessary to sustain those values for future generations, so long as any harm is decisively outweighed by the benefits.
- 5.5.4 Sediment monitoring, geophysical surveys and diver observations have all identified significant areas of sediment loss on the site. This has been exposing new material, which is vulnerable and at risk from biological and physical decay. Recent trends show the site continues to be under threat from sediment loss (PAS 2014, 2015 and WA 2015) and therefore the future prognosis is that unless there is some form of intervention then material will continue to deteriorate and eventually lost.
- 5.5.5 Highly dynamic seas (predominantly in the winter) in the shallow waters of the site cause drastic movement of seabed sediments. These physical conditions will have the same effect on any stabilising measures put on the seabed. This would require regular maintenance to make repairs or replenish. This may not be economically viable. Instead, focused excavations should be considered in areas at risk and where new information can be gained.

5.5.6 However, until a research agenda is agreed for excavation work should continue to record the changes in *Invincible*'s environmental setting as set out in Section 4.7:

- There is a need to continue recording the environmental changes on the site to establish potentially new areas of risk;
- There is a need to understand the biological decay occurring on the exposed parts of the wreck and the rate at which this is happening. This could be understood through wood sampling and installation of sacrificial wood samples,
- Continued updating of plans of the site, especially the northern area, which would provide the basis for future monitoring of sand levels on the site;
- Regular geophysical surveys should continue to record changes in sedimentation on the site and to track the movement of localised sand waves over the Horse Tail. This will build up a picture of environmental changes occurring over time and determine which areas will be most at risk.

5.5.6 A formal programme of assessment and monitoring is now underway. It will continue to assess and plan the site and record seabed levels from the sediment monitoring points.

Management Policy 4 We are continuing a programme of environmental monitoring of the Invincible.

Management Policy 5 Once a clear framework is agreed excavation of targeted and at risk areas are recommended as the best way of preserving the archaeological value of the site.

6 FORWARD PLAN

6.1 Introduction

6.1.1 In order to commence the implementation of the proposed Management Policies outlined in Section 5, Historic England is seeking to support projects that will increase our understanding of the value and setting of the *Invincible*. The projects are outlined in Section 6.2 below.

6.2 Commissioned Projects in relation to the *Invincible*

6.2.1 *The Invincible Project* (Ref 7235). The project will continue from Project 6650 and seeks to monitor the site and formulate a strategy for future investigations.

6.2.3 This project will continue with a formal programme of survey and fieldwork to contribute towards a fuller understanding of the site as set out in Section 5.4.3. In addition, further environmental monitoring as set out in Section 5.5.5 will continue in the short-medium term.

6.2.4 The project will ground-truth anomalies outside the designated area to establish whether the Statutory Instrument boundary will need to be extended to include the new parts of the wreck.

6.2.5 This project will assist the planning of future conservation strategies for the long-term survival of the wreck.

6.2.6 This project will create a virtual and interactive dive trail increasing public access to the site to a wider audience.

6.2.7 This project will increase opportunities for learning and developing skills in underwater archaeology for volunteers and students.

6.2.5 The proposed timescale for the implementation of the project is summarised below:

Project Title	Project Summary	Management Policy	Timetable
The <i>Invincible</i> Project (Ref 7235)	Environmental monitoring	MP1, 4 & 6	Summer 2016-ongoing
	Undertake a formal programme of assessment and recording	MP1, 2, 3 & 5	2016-ongoing
	Creation of a virtual and interactive dive trail	MP 2	Summer 2016-winter 2016

6.3 Proposed Projects in relation to *Invincible*

6.3.1 The HMS *Invincible* 1744 project. This project received £2 million of funding in July 2016 from the LIBOR funds fund. It is a partnership between the Licensee, the National Museum of the Royal Navy (NMRN), Bournemouth University (BU) and the Maritime Archaeology Sea Trust (MAST). The key goals of the proposed project are as follows

- Archaeologically excavate and record those areas of the site at imminent risk and poorly understood as highlighted in sections 4.7.2 and 5.4.3 and 6.4.6.
- Increase opportunities for learning and raising awareness of heritage through involvement of volunteers from fieldwork through to conservation and display of the recovered material. This will create a shared resource and allow people to participate in sustaining *Invincible* and thus fulfilling section 5.2 and 5.3.
- Conserve recovered artefacts.
- Provide a public display of the collection at the NMRN. Again, this will fulfil sections 5.2 and 5.3.
- The archive produced from this project will feed into the digital archives of the Chatham Historic Dockyard and the Maritime Archaeology Trust. Therefore, keeping the archives together, digitally. This will enable researchers to easily access all information gathered from site over the various stages of investigation. The original archive such as dive logs and drawings from the excavation will be deposited with the NMRN. This will fulfil section 5.2.
- Publish the project's results and leave a legacy involving an underwater diver trail for divers and input and update the virtual trail created during project 7235. The legacy will ensure public access and enjoyment of the site long after the project is complete. This will fulfil section 5.3

6.3.2 In summary the Project aims to meet some Key Outcomes that include the following:

- Outcomes for Heritage: an internationally significant site is saved by raising and recording those parts that would otherwise be destroyed. This will fill the gaps in the understanding of the site and its significance as highlighted in sections 4.7.2 and 5.4.3.
- Outcomes for people: Volunteers, students and professionals acquire new, transferrable skills which can be used on other archaeological sites. This will allow *Invincible* to be a shared resource as expressed in section 5.2
- Outcome for communities: The ongoing digital interpretation of the site during excavation and conservation and eventual display at the NMRN will ensure a wide range of communities will have a chance to engage with the internally significant heritage. Thus, fulfilling the points made in section 5.3.

6.2.5 The proposed timescale for the implementation of the project is summarised below:

Project Title	Project Summary	Management Policy	Timetable
The <i>Invincible</i>	Undertake a formal	MP1, 3, 4	Summer

1744 Project	programme of excavation and recording	and 5	2017-2018
	Adding to the virtual and interactive dive trail	MP2	2018 - ongoing
	Conservation and display	MP2	2017 - ongoing

6.4 Recommendations for further work

- 6.4.1 High resolution geophysical surveys should be conducted regularly to monitor and record the environmental changes occurring to the site and the surrounding seabed. This will identify which areas of the site are most at risk. Also, by recording the movement of localised sand waves and the northern edge of Horse Tail it may be possible to determine which parts of the site will expose or cover up. This will assist Management Policy 4.
- 6.4.2 A high resolution sub-bottom survey should be conducted from the southern end of the site (stern) towards the 'South-Eastern Anomaly, so to identify buried wreck material. This will help to determine whether the 'South-Eastern Anomaly' is potentially part of *Invincible* or possibly another wreck site. This will assist management Policies 3.
- 6.4.3 Undertake a dendrochronological study of the hull timbers to identify the date and perhaps also sources and types of timber employed. This would also determine, which parts of the ship originate from the original French construction and which parts were replaced during British refits and repairs. This would assist Management Policy 3.
- 6.4.4 Environmental sampling of timbers and seabed sediments is recommended to identify types of species causing biological decay to the archaeological material. It would also be recommended to continue installing sacrificial wood samples on the site but for different time periods to understand fully the rate at which biological decay is occurring. This would assist management Policy 4.
- 6.4.7 As the site is located in a dynamic environment and changes are constantly being recorded the CSMP needs to be regularly updated and revaluated in order to closely monitor and react to these changes. This will assist Management Policy 4.
- 6.4.5 It is well established that *Invincible* was extremely influential in the designs of future British warships. To identify these influences comparable studies should be conducted between *Invincible* and other sites of subsequent British warships, such as *Colossus*. The quality of surviving hull structure from both these sites allows for great potential in comparing design and structural features. It would also be beneficial to carry out further archival

research to identify information on other vessels and identification of other wreck sites. This would assist Management Policy 3.

- 6.4.6 Following a clear and agreed research framework and funding has been sourced excavation should be conducted in areas poorly understood and at risk, as highlighted in sections 4.7.2 and 5.4.3. This is necessary as recent work by PAS (PAS 2014 and 2015) has identified an alarming loss of seabed sediments over the site as a whole but particularly in the northern areas. The study into local sediment transportation and the tracking of the movement southwards of Horse Tail sands has demonstrated that the risk to site will continue. This will assist Management Policy 1, 3, and 5.

7 IMPLEMENTATION

7.1 Consultation

- 7.1.1 This document has been internally reviewed by Historic England.
- 7.1.2 The *Conservation and Management Plan* for the *Invincible* was circulated for a four-week stakeholder consultation to refine how the values and features of the *Invincible* can be conserved, maintained and enhanced. Responses to the consultation were considered and the *Plan* revised as appropriate.

7.2 Adoption of Policies

- 7.2.1 Following consultation, the *Plan* was adopted on 24th February 2017.
- 7.2.2 A programme that identifies a realistic timescale for implementing the *Plan*, taking into account those areas which need immediate action, those which can be implemented in the medium or long term, and those which are ongoing will be devised.
- 7.2.3 Responsibilities for implementation lie with Historic England, though consultation with stakeholders will be maintained throughout. In addition, provision will be made for periodic review and updating the *Plan*.

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9 AUTHORSHIP AND CONSULTATION

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Natural England
Nautical Archaeology Society
Ministry of Defence (owner)
The Crown Estate
Portsmouth City Council
Receiver of Wreck



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