



making sense of heritage

Unknown ('Cannon Site') Weymouth

Archaeological Services in Relation to Marine Protection
Undesignated Site Assessment



Ref: 108280.13
January 2016



Archaeological Services in Relation to Marine Protection

Unknown ('Cannon Site') Weymouth

Undesignated Site Assessment

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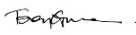
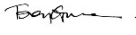
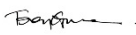
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Summary

Wessex Archaeology was commissioned by Historic England to undertake an undesignated site assessment of two unidentified wreck sites off Chesil Beach, Dorset, collectively known as the 'Cannon Site'.

Wessex Archaeology worked with the Shipwreck Project, a Weymouth-based community interest company, to carry out the assessment. The Shipwreck Project had originally reported the sites to Historic England and provided Wessex Archaeology with geophysical and other data, together with vessel services.

Three distinct sites were investigated. All are in a potentially hazardous location, just offshore of a high energy beach that has been responsible for the loss of many ships. Nevertheless, by careful planning a total of eight dives were undertaken with no weather down time.

Site 1 is very close inshore, on a gravel and cobble seabed just offshore of the toe of the beach slope. This is a very high energy environment and the beach and seabed is subject to modification by very large storm waves. The site is a wreck and comprises eight heavily concreted cast iron cannons, at least three of which have been tentatively identified with the assistance of independent ordnance expert Charles Trollope as English 24-32 pounders cast between the third quarter of the 17th century and the first quarter of the 18th century. In addition there is a scatter of cannon fragments, iron shot, at least one of which is for a 32 pounder, and other concretions, including several large conglomerates that include iron shot. There are also a number of small fragments of worn worked wood. Some of the cannons are mostly buried and it is possible that there is other buried wreck material, particularly immediately inshore. No evidence of ship structure has been found and the wreck remains unidentified. The most likely explanation is that the guns are outbound cargo, being carried on a merchant ship which was driven onto the beach and wrecked during the date range given for the guns.

Site 2 is also a wreck and lies approximately 220m to the south of Site 1 and further offshore, although it is still in a fairly high energy environment. The seabed is sandy gravel. The site consists of seven very heavily concreted cast iron cannon. At least one of the guns is probably a six pounder and they appear to be a dissimilar set to the guns on Site 1, which suggests that the sites represent two different wrecks. As with Site 1, the guns are not firmly dated because their features are obscured by concretion. Nevertheless, enough is known about them to suggest that they may also be English and cast in the second half of the 17th century. Otherwise no archaeological material has been found and the wreck is currently unidentified.

Site 3, further to the south-east is a small section of wooden ship hull, with carvel planking, probably oak. It is not known whether it is associated with either Site 1 or 2. Investigation here is at a very early stage.



Sites 1 and 2 have been risk assessed in accordance with Historic England recommended practice. Risk is assessed to be high. Although the principal vulnerability is natural, the Shipwreck Project report that their fieldwork has been observed and that subsequently some interference with Site 2 has occurred. Wessex Archaeology observed that some concretion had been removed from two of the guns.

Both sites have been assessed against the non-statutory criteria for designation under the *Protection of Wrecks Act 1973*. Although it is important to state that there is a lack of firm dating evidence and some of the criteria are difficult to assess at this early stage of investigation, it is nevertheless the opinion of Wessex Archaeology that Site 1 and probably Site 2 are likely to meet the criteria for designation. Should it be decided to designate, the small size of the sites means that only small areas within the Chesil Beach and Stennis Ledge Marine Conservation Zone will need to be designated.

Detailed site plans have been created of Sites 1 and 2 using photogrammetry supported by measured survey and diver descriptions. These form part of the site archive which is being shared with the Shipwreck Project. Co-operation between the Shipwreck Project and Wessex Archaeology is regarded by both organisations as having been highly successful.

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Acknowledgements

This investigation was commissioned by Historic England, and the assistance provided by Alison James, Mark Dunkley and Serena Cant is gratefully acknowledged.

Wessex Archaeology is particularly indebted to independent ordnance expert Charles Trollope. The provisional dating of the sites that are the subject of this report is based upon his advice on the likely dating of the guns present. Wessex Archaeology is also grateful to the following:

- *NRHE;*
- *Dorset County Council HER;*
- *UKHO; and*
- *authors mentioned in the bibliography.*

The assessment was carried out by a Wessex Archaeology and Shipwreck Project team comprising the following:

- *Richard Bright-Paul (Shipwreck Project), vessel master, diver and research;*
- *Grahame Knott (Shipwreck Project), vessel master and research;*
- *Oliver Penney (Royal Navy clearance diver and archaeology student), volunteer archaeological diving;*
- *Tom Harrison and Lowri Roberts (Bournemouth University archaeology students), volunteer tenders/archaeological recorders;*
- *Toby Gane, archaeological diving, project management, QA and editing;*
- *Graham Scott, project officer, diving supervision, archaeological diving, photogrammetry; research and reporting;*
- *Paolo Croce, diving supervision, archaeological diving; photogrammetry;*
- *Debra Shefi, archaeological diving;*
- *Michael Murray, archaeological diving;*
- *Peta Knott, archaeological diving;*
- *Louise Tizzard and David Howell, geophysical data processing;*
- *Richard Milwain, GIS and data searches;*
- *Karen Nicholls, illustrations; and*
- *Jane Edwards, administrative support.*

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1 INTRODUCTION

1.1 Assessment Background

- 1.1.1 Wessex Archaeology was commissioned by Historic England to undertake an undesignated site assessment of two unidentified wreck sites off Chesil Beach, Dorset, collectively known as the 'Cannon Site' (**Figure 1**).
- 1.1.2 The project was designed and carried out with the Shipwreck Project, a community interest company that undertakes maritime heritage research and fieldwork in the Dorset region. Site data generated both before and during the assessment has been shared.
- 1.1.3 The site was put forward to Historic England for investigation by the Shipwreck Project. They had investigated two groups of iron cannon located off Chesil Beach, Dorset and opposite East Fleet. These groups, known as the 'Inshore Site' and 'Offshore Site' became known collectively as the 'Cannon Site'.
- 1.1.4 The Shipwreck Project had discovered both sites in 2010 as sidescan sonar (SSS) anomalies. They subsequently groundtruthed both using divers. The guns on both sites were reported to be similar, although these investigations had only reached a very preliminary stage.
- 1.1.5 In addition, in 2014 the Shipwreck Project had discovered a section of wooden ship's structure to the south-east of the Inshore Site during a SSS survey (**Figure 1**). They considered it possible that all three sites were the result of a single wrecking event.

2 ASSESSMENT OBJECTIVES AND PRODUCTS

- 2.1.1 The overall aim of the project was undesignated site assessment (Historic England 2015). This required Wessex Archaeology to generate sufficient data to assess the site against the non-statutory criteria for designation under the *Protection of Wrecks Act* (1973) and to undertake a risk assessment in accordance with recognised guidelines (English Heritage 2008).
- 2.1.2 The following objectives were set out in the Client Brief (Historic England 2015). A number of other secondary objectives are not listed:
- *Contact the Shipwreck Project Team, finders of the site, to assist with the identification of the site's location and participate in the undesignated site assessment including the possibility of access to their geophysical data;*
 - *Undertake a data audit comprising documentary research on the site as appropriate, to inform designation assessment. Contact Serena Cant to ensure all information is gained from the NRHE;*

- *Contact the Receiver of Wreck and Historic England to gain a list of droits relating to the sites;*
- *Undertake an assessment of any finds held by the Shipwreck Project;*
- *Undertake a diver survey of the exposed remains. Confirm position, extent, stability and character;*
- *Locate and accurately position (plotted by tracked diver survey and probing where appropriate) any additional visual archaeological material;*
- *Undertake a diver survey to ground truth anomalies identified from the geophysical data provided by the Shipwreck Project team (using tracked diver survey, probing and augering as appropriate);*
- *Accurately position and recover samples suitable for dendrochronological analysis if suitable samples are exposed according to the brief protocols issued by the HE Scientific Dating Team (Annex A), and to deliver them to HE on completion of site visit for further analysis to be co-ordinated by the HE Scientific Dating Team;*
- *Produce a structured record of field observations; preferably including a photographic record of the site as free from fauna as possible and a basic site plan. Key artefacts are to be subject to detailed examination and recording (position by tracked diver survey, taped measurements, photographs and video and written database entries; and*
- *Review the two sites under the non-statutory criteria for designation under the Protection of Wrecks Act 1973.*

2.1.3 The following detailed fieldwork objectives were subsequently discussed and agreed by Historic England, Wessex Archaeology and the Shipwreck Project. They were designed to simultaneously generate sufficient data to carry out the assessment and assist the Shipwreck Project with their ongoing investigation of the site. Objectives were designed so that work carried out by the Shipwreck Project was not repeated unnecessarily; therefore Wessex Archaeology did not carry out a geophysical survey:

- *Reprocess Shipwreck Project SSS data to assist them in quality control, to identify anomalies and to provide geotiffs for subsequent groundtruthing by Wessex Archaeology;*
- *Obtain multibeam bathymetry from the UKHO and process;*
- *Locate and confirm the position of each site by diver groundtruthing and correct any layback error in the georeferencing of Shipwreck Project SSS data;*
- *Map the sites using USBL, photogrammetry and measured survey;*
- *Record wreck material found for the purpose of dating and identifying the wreck/s present;*
- *Recover any timber samples and small finds found that had the potential to provide dating or identification debris;*
- *Undertake supporting desk-based research; and*
- *Share data generated with the Shipwreck Project.*

2.1.4 The following products were specified in the Brief. This document is P2:

- *P1 - Archaeological Report (suitable for public release);*
- *P2 – Undesignated Site Assessment Report (confidential)*

- P3 - Project archive/s compiled in accordance with current accepted standards.

2.1.5 The recording level set in the Brief was Level 3a, detailed diagnostic recording of selected elements of the site. Selection of elements was left to the discretion of Wessex Archaeology.

3 METHODOLOGY

3.1 Diving Survey

- 3.1.1 All Wessex Archaeology diving operations complied with the *Diving at Work Regulations* 1997 and the associated Scientific and Archaeological Approved Code of Practice (ACOP). Dive logs are summarised in **Appendix 1**.
- 3.1.2 Diving operations were conducted during daylight hours only on a single shift system by a four person team, assisted by a volunteer student Royal Navy diver and a non-diving student from Bournemouth University.
- 3.1.3 All diving was carried out from *Wey Chieftain IV*, a coded diving charter vessel. The crew, members of the Shipwreck Project, were familiar with the sites. They assisted in planning the work.
- 3.1.4 The crew did not consider it safe to anchor close to Chesil Beach. Diving was therefore carried out using untethered SCUBA equipment and the buddy diver system. Both divers were provided with through-water communications.
- 3.1.5 The site is subject to strong tidal currents. Diving is only possible on neaps from 3.5 hours after high water (HW) Portland to 5 hours after HW Portland and from 5 hours before HW Portland to 2.5 hours before HW Portland (Grahame Knott, Shipwreck Project, pers. comm.). In addition due to the proximity of Chesil Beach, diving is only possible when there is a smooth sea state and light winds. In practical terms this means that the site is rarely and fairly unpredictably diveable, with consecutive days only possible in settled periods of fine weather.
- 3.1.6 Underwater visibility is also variable. It can be excellent, 3m plus, but it can be very poor. On occasion there can be no effective visibility, as was the case during an inspection of Site 3.
- 3.1.7 Richard Bright-Paul of the Shipwreck Project took part in a single dive on Site 2. This was done in order to obviate the need for Wessex Archaeology divers to waste time searching for the cannons that had been found on the site.
- 3.1.8 Archaeological, environmental and observational data were recorded using Wessex Archaeology's proprietary DIVA MS Access recording system. This uses an 'observation point' system to record archaeological, environmental and operational observations made by the diver in real time.
- 3.1.9 The position of the divers and of observation points were generated in real time using a Sonardyne Scout Ultra Short Base Line (USBL) tracking system operating with internal instruments linked to a Hemisphere 101 dGPS system. Scout has a manufacturer estimated accuracy of 2.75% of slant range using internal instruments. Diver track and observation points were displayed in real time using a GIS interface (ArcGIS 10).
- 3.1.10 Photogrammetry was chosen as the principal survey tool because it is capable of producing a very detailed and accurate site plan in the course of a single dive. Industry-

standard Agisoft PhotoScan software was used. The 3D models created have been supported and tested by measured survey of individual site features. They are included in this report as 3D pdfs, which have been scaled using known distances. Due to the size of the models and the resultant file sizes, these have been included as appendices (**Appendix 4 and 5**).

- 3.1.11 Still and HD video recording was carried out using a housed Sony RX100 camera system. Additional video recording was carried out using a mask-mounted HD video camera. Artificial lighting was not required as sufficient natural light was available.

3.2 Site Plans

- 3.2.1 The site plans in this report have been prepared from high resolution photogrammetry models, supplemented where there is no photographic coverage by sidescan sonar data. The plans have been georeferenced using position data produced using the USBL system. Where tested against diver measurements and photographic scales, measurements taken from the models of feature dimensions have differed from direct measurements by a maximum of 25mm.

3.3 Geophysical Survey

- 3.3.1 Sidescan sonar data over Site 1 were provided by the Shipwreck Project. The data were acquired by the Shipwreck Project using a C-max sidescan sonar system in March 2015.
- 3.3.2 The data were provided as standard xtf file format and were processed by Wessex Archaeology using Coda GeoSurvey software. This allowed the data to be replayed with various gain settings in order to optimise the quality of the images. A mosaic of the sidescan sonar data was also produced. Anomalies relating to the site were interpreted and added into the project GIS to support diving activities.
- 3.3.3 The 2015 survey area did not include Site 2. Therefore a screen grab of an earlier Shipwreck Project SSS survey has been used (**Figure 3**). The raw data for that survey have become corrupted and are not therefore useable. A screen grab of the earlier survey has also been used in **Figure 2**.
- 3.3.4 In addition to the sidescan sonar data, multibeam bathymetry data were assessed (**Figure 1**). These data were acquired in 2009, through DORIS (Dorset Integrated Seabed Survey) and accessed through the United Kingdom Hydrographic Office (UKHO) INSPIRE portal. DORIS is a collaborative project involving Dorset Wildlife Trust, Maritime Coastguard Agency, Channel Coastal Observatory and the Royal Navy. Other partners include Natural England, Dorset Strategic Partnership, National Oceanographic Centre and the University of Southampton.
- 3.3.5 The data were recorded in WGS 84 and provided digitally in raw ungridded .gsf format. The files were then converted to WGS UTM 31N during processing. The data were gridded to a cell size of 1m and fully analysed using IVS Fledermaus software.

3.4 Dating

- 3.4.1 Dating in this report is very largely based upon an analysis of the design and size of the concreted iron cannon found on this site. However, the concretions could not, with one limited exception, be removed. As a result, the inspection and survey results and therefore the analysis is incomplete and potentially unreliable. The opinions and theories expressed concerning dating are therefore provisional and should be treated with a degree of caution.

4 RESULTS

4.1 Progress against Objectives

Table 1: Progress against objectives

Objectives	Progress
Contact the Shipwreck Project Team, finders of the site, to assist with the identification of the site's location and participate in the undesignated site assessment including the possibility of access to their geophysical data;	Achieved
Undertake a data audit comprising documentary research on the site as appropriate, to inform designation assessment. Contact Serena Cant to ensure all information is gained from the NRHE;	Achieved
Contact the Receiver of Wreck (RoW) and Historic England to gain a list of droits relating to the sites;	Achieved
Undertake an assessment of any finds held by the Shipwreck Project;	Not relevant to this assessment, although Wessex Archaeology has recommended to the Shipwreck Project that a small plank in their possession should be sent to Historic England for dendrochronological assessment.
Undertake a diver survey of the exposed remains. Confirm position, extent, stability and character;	Achieved
Locate and accurately position (plotted by tracked diver survey and probing where appropriate) any additional visual archaeological material;	Achieved
Undertake a diver survey to ground truth anomalies identified from the geophysical data provided by the Shipwreck Project team (using tracked diver survey, probing and augering as appropriate);	This did not form part of the final detailed objectives agreed by Historic England.
Accurately position and recover samples suitable for dendrochronological analysis if suitable samples are exposed according to the brief protocols issued by the HE Scientific Dating Team (Annex A), and to deliver them to HE on completion of site visit for further analysis to be co-ordinated by the HE Scientific Dating Team;	See above. This was not prioritised due to lack of time and a lack of obviously suitable samples on Sites 1 and 2. The Shipwreck Project has been advised to recover samples for future assessment by WA/Historic England.

Objectives	Progress
Produce a structured record of field observations; preferably including a photographic record of the site as free from fauna as possible and a basic site plan. Key artefacts are to be subject to detailed examination and recording (position by tracked diver survey, taped measurements, photographs and video and written database entries;	Achieved. Photogrammetry supported by measured survey has been used to create an accurate and very highly detailed site plan.
Review the two sites under the non-statutory criteria for designation under the Protection of Wrecks Act 1973.	Achieved

- 4.1.2 The co-operation between the Shipwreck Project and Wessex Archaeology is regarded by both organisations as having been highly successful. It is likely to form a useful model for similar projects in the future.

4.2 Site Position

- 4.2.1 The following positions for Sites 1 and 2 were recorded using the USBL system and have an estimated error budget of 1m. The Site 3 position is derived from a distance and bearing from a shot dropped from the Dive Support Vessel (DSV) and has an estimated error budget of 3-5m. These positions are shown in **Figure 1**.

Table 2: Site co-ordinates

Sub-site (Context)	Latitude (WGS 84)	Longitude (WGS84)
Site 1 (Inshore site; cascabel, 2001)	50° 36.758489' N	02° 32.070084' W
Site 2 (Offshore site; cascabel 2100)	50° 36.651607' N	02° 32.059267' W
Site 3 (ship structure)	50° 36.559935' N	02° 31.938911' W

4.3 Data Audit

- 4.3.1 For the undesignated site assessment, a number of sources were consulted, to determine whether there was any existing information on the site and to seek possible identifications of the wrecks. The following sources were consulted:

- *Dorset Historic Environment Record (HER) (obtained from HER 19/06/2015);*
- *NRHE (obtained from NRHE 28/08/2015);*
- *UKHO (obtained from UKHO 16/06/2015);*
- *Receiver of Wreck (obtained from RoW 11/09/2015);*
- *Sidescan sonar and multibeam bathymetry data from 2009 (Obtained from Dorset Integrated Seabed Survey);*
- *Geophysical data from The Shipwreck Project (received 10/08/2015);*
- *Photographs of the site supplied by The Shipwreck Project and Simon Brown;*
- *Personal communications with Grahame Knott and Richard Bright-Paul, throughout the project.*

- 4.3.2 A search of available loss records (NRHE, HER and selected secondary sources) was carried out as well as discussions with the Shipwreck Project in order to help identify further likely candidates (see **Appendix 6**). **Figure 1** shows HER and UKHO records in the vicinity of the sites. A number of these are potentially relevant. A single cannon is recorded as having been recovered from a site reportedly consisting of 18th century iron cannon and shot in 1973. The UKHO records this site as lying approximately 100 yards off Chesil Beach, although the obstruction position, stated to be approximate, lies about 720m north-west of the Inshore Site (UKHO 18809). There is a National Record of the Historic Environment (NRHE) monument report based upon the UKHO record (NRHE UID 1593646).
- 4.3.3 The Dorset HER has three potentially relevant records. The 'Chesil Cannon Site – Finds' site records a number of finds ascribed to the *De Hoop (Hope)*, a vessel lost on Chesil Bank in 1749 (HER MWX2479). A second related record is for the 'Chesil Beach: Cannon Site' and records a number of recovered small finds including shot and a brass barrel spigot (HER MWX2686). The site description quotes an entry in a regional dive guide, in which it is stated that:
- "The place off Chesil Beach where 26 large iron cannon lie is the wreck of the HOPE. In the late 1970s a group led by Nowell 'Chippy' Pierce recovered one of the cannon from the site using a Royal Navy helicopter. Trial excavations also led to the recovery of a number of items including a huge plug of tobacco, still preserved beneath the pile of cannon and crud. A number of Dutch silver coins were also recovered from the site but kept secret at the time. The main bulk of the remains are found in 11m, lying 120 yards offshore, where the pebbles start to fade into the sandier seabed. The site lies a mile to the north-west along the beach from the Fleet crossing point at Chickerell. The cannon, cannonballs and crud forming a mound are easy to see." (Hinchcliffe 1999: 96)
- 4.3.4 UKHO 18809 appears to be the same site. The recovery of the cannon was achieved by a helicopter lifting it straight from the seabed. It is currently on display outside the Shipwreck Project headquarters in Portland. A 3D photogrammetry model has been published on the web.¹
- 4.3.5 The position of the 'Fleet Cannon Site', consisting of a group of six cannons, corresponds with the position of the Offshore Site and is likely to be the same site (MWX5056). The HER states that this site was found during a survey for a 'Wreck Detectives' TV documentary and offers the opinion that it is probably unconnected with the 'Chesil Cannon site'.
- 4.3.6 HM Receiver of Wreck has provided details of four droits of potential relevance (**Appendix 3**). These appear to be related to the above sites.
- 4.3.7 The wreck sites and recorded losses in the vicinity of the site position are summarised in **Appendix 6**. Several of the wrecks and recorded losses are too recent for the artefactual evidence to correlate to the Cannon Site finds (MDO19862, MWX4901, MWX5103 and MWX5145). There are four recorded losses of vessels that did not carry any cannon and also have never been connected with any located seabed remains (MWX1862, MWX1955, MWX1959 and MWX4870). One final option is the troopship which may have been armed, however the recorded loss position for this vessel also rules out any correlation with the wreck site under investigation (MWX1847).

¹ See <https://sketchfab.com/models/98060c6ec64f478494dcf14428da507d>.

4.4 Site Description

Inshore site (Site 1)

- 4.4.1 Site 1 lies immediately offshore of the bottom of the Chesil Beach slope. It consists of seven cast iron muzzle loading cannon, one of which is outlying, together with other archaeological material (**Figure 2; Plate 1**). In addition, the presence of at least two more guns just inshore of the site has been reported by the Shipwreck Project since the fieldwork (**Plate 2**; Richard Bright-Paul, pers. comm.).
- 4.4.2 Discounting the outlying gun (**WA2007**) which lies approximately 11m to the west (**Plate 3**), the observed archaeological material covers an area of about 12m by 12m, roughly 144 square metres. Seabed within the site is gravel with occasional cobbles. Depth established from multibeam survey is approximately 11m below Lowest Astronomical Tide (LAT).
- 4.4.3 Three of the guns in the main part of the site (**WA2001 - WA2003**) and the outlying gun are lying on the seabed surface and their full length is exposed. They are very heavily concreted. Dimensions measured by hand are as follows:

Table 3: Site 1 Gun dimensions

Measurement	mm	inches
WA2001		
Muzzle Face to Base-ring	2700	106.3
Diameter of base-ring	600	23.6
Muzzle Face diameter	300	11.8
Muzzle bore diameter (concreted)	100	3.94
WA2002		
Muzzle Face to Base-ring	3100	122
Base-ring to centre of trunnions	1330	52.4
Muzzle Face diameter	350	13.8
Muzzle bore diameter (concreted)	100	3.9
Trunnion diameter	250	9.8
WA2003		
Muzzle Face to Base-ring	2200 (incomplete)	86.6
Diameter of base-ring	550	21.6
Base-ring to centre of trunnions	1220	48
Muzzle Face diameter	310	12.2
Muzzle bore diameter (concreted)	90	3.54
Trunnion length	220	8.7
Trunnion diameter	220	8.7
WA2007		
Muzzle Face to Base-ring	2750 (incomplete?)	108.3
Base-ring to centre of trunnions	1150	45.3

- 4.4.4 These guns are very large and the measurements suggest that they are likely to be 24 to 32 pounders. The first reinforces are long and there is no sign of vent fields. On that basis they are likely to have been cast in the period from the third quarter of the 17th century to the first quarter of the 18th century and they are likely to be of English manufacture (Charles Trollope, pers. comm.).

- 4.4.5 Only one of the guns, **WA2002**, is undamaged. The remainder have damage to their muzzles, most noticeably **WA2003** which has lost its muzzle. **WA2007** was observed to have a modern rope stop twisted around both trunnions (**Plate 3**). This may or may not represent an attempt to move it.
- 4.4.6 Approximately 4m east of **WA2001-3** is another group of cast iron muzzle loading guns. These are very largely buried, with only the tops of their breeches exposed. All it is possible to say about these guns is that they also appear to be large.
- 4.4.7 In addition to the complete guns there are at least five cannon barrel fragments scattered within a small area of the centre of the site. These have not been surveyed in detail and it is not known whether they are from the same gun.
- 4.4.8 A number of more lightly concreted cast iron shot (**WA2021-5**) are scattered around the site. **WA2021** was measured as having an approximately 170mm diameter, which equates to 32 pounder size. **WA2022**, is reported by the Shipwreck Project to be even larger, and could conceivably be a mortar bomb (Richard Bright-Paul & Grahame Knott, pers. comm.).
- 4.4.9 A prominent feature of the site is a number of conglomerate concretions, the largest of which is 4m long by more than 1.5m wide. Bulbous cylindrical shapes are incorporated into the surfaces of these objects and it seems highly probable that they are at least partly masses of cast iron shot that has become concreted together. Some of these shot are clearly of large size and are probably consistent with 24 to 32 pounders. One of the smaller conglomerates, **WA2020**, may contain bar shot.
- 4.4.10 There are a number of small, worn fragments of worked wood scattered around the site (**WA2026-31**). They are generally lodged under concretions, although it does not appear that they are attached to them. The presence of a small amount of clearly modern debris, including plastic, suggests that most of this wood is likely to be modern and intrusive. However, there are two complex objects (**WA2029** and **WA2031**) that could be unidentified rigging fittings.
- 4.4.11 Post- Wessex Archaeology fieldwork, two more cannon have been discovered by the Shipwreck Project just inshore of the site. The tops of their barrels are reported to be only just exposed and they are flush with the seabed (Richard Bright-Paul, pers. comm.). It is likely that they are only periodically exposed due to the mobility of the material forming the slope of the beach.

Offshore site (Site 2)

- 4.4.12 Site 2 lies approximately 200m south of Site 1 and approximately 150m from the bottom of the beach slope. It consists of seven iron guns (**WA2100 - WA2107**), six of which were located during fieldwork (**Figure 3**). A seventh lies approximately 5 metres to the north-west of **WA2102**. Discovered by the Shipwreck Project during SSS survey, subsequent groundtruthing has confirmed it to be similar (**Figure 3**; Richard Bright-Paul, pers. comm.).
- 4.4.13 Altogether the guns cover an area of about 30m by 12m, roughly 360 square metres and with the long axis roughly parallel to Chesil Beach. The site is situated within an area of flat sandy gravel seabed that shelves almost imperceptibly offshore (**Figure 1**). Depth is approximately 15.3m below LAT.
- 4.4.14 The guns are lying on and partly in the seabed. Otherwise, no archaeological material has been observed on the seabed surface. Although no intrusive investigations of the seabed have been carried out, there is no obvious wreck mound or other visual indication that

buried archaeological material is present. Whilst the seabed around the site has not been thoroughly searched, a wider spread of wreck material is not indicated by the SSS data.

- 4.4.15 The distribution of the guns does not suggest any obvious pre-loss use or disposition. It is therefore likely to be the result of a wrecking event or of subsequent site formation or modification processes.
- 4.4.16 It is possible that the guns may have been jettisoned, this was normally a tactic reserved for getting vessels that had run aground refloated and the guns were then usually hoisted out and buoyed for later recovery. However, heavy guns such as these were in any event extremely difficult to jettison in anything but flat calm. It is considered more probably that Site 2 is the remains of a wrecked vessel.
- 4.4.17 Although the six inspected are all extremely heavily concreted and their shape and features are largely obscured, it is clear that they are all cast iron muzzle loading cannon. Dimensions measured by hand are as follows:

Table 4: Site 2 Gun dimensions

Measurement	mm	inches
WA2100		
Overall Length	2750	108.3
Muzzle Face to Base-ring	2600	102.4
Length of cascabel (button)	150	5.9
Diameter of base-ring	370	14.6
Muzzle Face diameter	270	10.6
WA2101		
Muzzle Face to Base-ring	2150 (uncertain)	84.6 (uncertain)
Diameter of base-ring	330	13
Muzzle Face diameter	230	9
WA2102		
Overall Length	2450	96.5
WA2103		
Overall Length	2150	84.6
Diameter of base-ring	480	18.9
Muzzle Face diameter	260	10.2
Muzzle bore diameter	95	3.74
WA2104		
Overall Length	2400	94.5
Muzzle Face to Base-ring	2250	88.6
Diameter of base-ring	350	13.8
Muzzle Face diameter	250	9.8
WA2105		
Overall Length	2100	82.7
Diameter of base-ring	350	13.8
Muzzle Face diameter	260	10.2

- 4.4.18 Concretion appears to have been recently and deliberately removed from the muzzles of **WA2103** and **WA2106**, exposing the bare metal surface. In both cases the metal is corroding and concretion is starting to re-establish itself. **WA2106** appears to have muzzle rings and a swell. **WA2103** was subject to close visual inspection after the removal of a

small amount of additional concretion to expose the diameter of the bore. This was subsequently made good.

- 4.4.19 The muzzle of **WA2103**, which has a swell, has muzzle rings (**Plate 4**). The bore diameter is 95mm (3.74 inches), although a rounding of the edges and the presence of a hard and spherical object in the mouth of the bore, possibly an iron shot, renders this measurement uncertain. Nevertheless, it does indicate that the gun is a six pounder.
- 4.4.20 **WA2103** is also one of three seven foot guns on the site (**WA2101** and **WA2105**). This length of gun is typically English and this and their shape, including the apparently short and round buttons, are suggestive of a casting date in the second half of the 17th century. **WA2104** appears to have a remarkably short Second Reinforce and appears to be a cut (Charles Trollope, pers. comm.). Guns of this type were cast in the 1650's and 1660's.

Isolated ship structure (Site 3)

- 4.4.21 Site 3 is situated approximately 220m south-east of Site 2, in a similar water depth (**Figure 1**). It was discovered as a SSS anomaly by the Shipwreck Project and subsequently groundtruthed. It was located and inspected by Wessex Archaeology, although a lack of visibility meant that inspection was difficult.
- 4.4.22 The site consists of a single section of ship structure comprised of what appears to be flush, edge to edge laid planking with wooden treenail fasteners and traces of fittings. At least three strakes can be seen in **Plate 5**, a photograph taken following its initial discovery, with the lower plank having a width of approximately 0.5m and a curved lower edge. The structure is approximately 1.5m by 1.5m. The timber is dark and clearly old and its surface and edges are eroded. The timber is probably oak.
- 4.4.23 When discovered the Shipwreck Project dug a small hole at the side of the structure. They report having found what appeared to be a frame below the planking and below that a further layer of planking, which may have a small opening cut into it (**Plate 6**; Grahame Knott, pers. comm.).

CONCLUSIONS AND DISCUSSION

4.5 Interpretation

Site 1 (Inshore)

- 4.5.1 The 24-32 pounder guns found on Site 1 are larger than would be expected for merchant ships or privateers. This suggests that they are naval or land guns. It is possible that they are the armament of a large and previously unknown naval vessel that has gone ashore on Chesil Beach and been wrecked. In this context it is noticeable that guns **WA2001** – **WA2003** and guns **WA2004** - **WA2006** are disposed parallel to each other, about 4m apart and in a way that could reflect the on board disposition of armament. However, this arrangement could be entirely coincidental. More importantly the guns are of different lengths, so this is less likely than the explanation that they are cargo. Consignments of large guns being sent out to colonies were not unusual cargoes and Barbados alone received more than 400 between 1660 and 1815 (Charles Trollope, pers. comm.). If the guns are English and were outbound cargo, then it is probably more likely than not that the ship sailed from an English port.
- 4.5.2 As there are numerous iron concretions that appear to be gun fragments and three of the four exposed guns have damaged muzzles, it could be argued that it was a cargo of broken or scrap guns or ballast. However, the presence of what appears to be a large

quantity of shot, at least some of which are of compatible size, would be hard to explain in that context.

- 4.5.3 Although the damage to the guns and in particular the presence of gun fragments are not supportive of them being an outward bound cargo of serviceable guns, there is some reason to consider them likely to be the result of wrecking event or post-loss processes. The site is at the base of an extremely dynamic and high energy gravel beach slope and it is plausible that the relatively vulnerable muzzles of guns would sustain damage in that environment, particularly if the wrecked vessel had gone ashore higher up the slope. The presence of additional guns inshore of the site lends support to this explanation.
- 4.5.4 Furthermore, the Shipwreck Project believe that it is very possible that explosives have been used by divers on this site previously, although local recollection of where explosives have been used is not sufficiently precise to confirm this (Grahame Knott, pers. comm.). The use of explosives, perhaps to break apart or move a large concretion could have resulted in the gun fragments that are present on the site today.

Site 2 (Offshore)

- 4.5.5 Site 2 is almost certainly the wreck or part of the wreck of a wooden post-medieval sailing ship. The seven foot guns and the cut suggest a date for the loss of the ship in the second half of the 17th century.
- 4.5.6 It is not clear whether the guns were being carried as defensive armament or as cargo/ballast. The seven foot guns in particular could be defensive armament and the presence of a possible iron shot in the mouth of the bore of **WA2103** suggests that the gun was loaded. Guns carried as armament would often be kept in a loaded state.
- 4.5.7 It is not clear at the present time whether there is any association between the sites other than by proximity. Examples of vessels going ashore on Chesil Beach that have broken in two with the after part floating off and sinking further out are known and it is conceivable that this has resulted in the formation of all three sites from a single vessel. However, firm dating evidence for all sites is lacking and the guns on Sites 1 and 2 are dissimilar. On a balance of probability basis the evidence suggests that Sites 1 and 2 are different wrecks.

Site 3

- 4.5.8 The structure present appears to be from a ship. The buried structure reported by the Shipwreck Project suggests that it is a section of wooden ship hull, with carvel planking. It is therefore likely to be post-medieval in date. However, the evidence will not currently allow us to interpret this further or to evaluate the possibility that it could be associated with Sites 1 or 2.

4.6 Identification

- 4.6.1 The wrecks at Site 1 and 2 are currently unidentified. A search of available loss records (NRHE, HER and selected secondary sources) and discussions with the Shipwreck Project have failed to identify likely candidates, although there are a number of HER and NRHE records of sites with cannons whose locations are not well defined. If the theory that they were ships carrying outward bound cargoes of guns is correct, it is possible that records of exported ordnance may hold the key to identifying candidate losses.
- 4.6.2 Due to positional uncertainties and the density of loss records along Chesil Beach, it is not possible to say with certainty whether or not Site 1 has been recorded as a HER, NRHE or UKHO record. The size of the guns appear to be too large for this to be the wreck of *De Hoop*, the Dutch privateer and smuggler lost in 1748 whose wreck and its aftermath are

described in a contemporary account and is much searched for (Anonymous, 1749). HER MWX2686, described as the wreck of the *De Hoop* and the findspot of the gun recovered in the 1970s (see 4.4.9), one of 26 reported to be on the site, is about 585m to the north-west. Even taking into account the uncertainties of 1970s positioning, the distance between them is significant. Furthermore, although part of Site 1 may be buried, there is no indication that over twenty guns are present. Like the HER record, UKHO 18809 lies about the right distance offshore but over 700m to the north-west. MWX2479, a record for finds associated by the HER with the *De Hoop* lies well to the south-south-east of the sites and over one kilometre from MWX2686. Although its position corresponds with the local dive guide position, that position contradicts the site description contained in the guide and is likely to be unreliable (see 4.3.2).

- 4.6.3 HER record MWX5056 ('Fleet Cannon Site') is a group of six cannons found in 2004. The site is recorded as being 50m to the north of Site 2. However there is nothing evident at that location in the SSS data acquired by the Shipwreck Project in 2015 and it may be that the group of guns are Site 2 and they have been positioned incorrectly.
- 4.6.4 The wreck material at Site 3 is also currently unidentified. However, approximately 260m inshore of Site 3 is HER record MWX1859, the supposed wreck of the wooden barque *Cassibelaunus* that may have been driven onto the beach in 1872. During filming for a television documentary in 2004, a wreck appears to have been found that is associated with this record and this position. It is conceivable, although highly speculative, that Site 3 is part of the *Cassibelaunus*.

4.7 Miscellaneous

- 4.7.1 A cast iron cannon lifted from the seabed off Chesil Beach by a naval helicopter in the 1970s is currently on display outside of the Underwater Explorers dive shop at Portland. Enquiries of some of those involved have failed to establish the location of the site (Grahame Knott, pers. comm.). A photograph showing the direction of flight of the helicopter towards the former naval air station at Portland suggests that the site could not have been south of the Fleet.
- 4.7.2 A Shipwreck Project photogrammetry model of the gun is currently available on the Sketchfab website.² The surface of the gun is in poor condition and there are no markings. Long thought to be Swedish, the gun can be identified as English and was probably cast in 1620-35 (Charles Trollope, e-mail). This is sufficiently earlier than the guns on Sites 1 and 2 to make it unlikely that it was recovered from either of those two sites.
- 4.7.3 The gun is reported by the HER as having been recovered from the wreck recorded as MWX2686, to the north-west of Site 1. This is reported to be the *De Hoop*, but the apparent date of the gun appears to preclude this, as does the reported presence of cuprous sheathing, which would preclude it from being earlier than the late 18th century.
- 4.7.4 A conglomerate of concretion containing what appears to be an old anchor and a rudder stock has recently been reported to Wessex Archaeology by the Shipwreck Project (Grahame Knott, e-mail). This lies to the north-west of Sites 1 and 2. It is not known whether there is an association.

4.8 Site Description

- 4.8.1 The overall character of the exposed material on the seabed can be summarised as follows (after Watson & Gale 1990):

² See <https://sketchfab.com/models/98060c6ec64f478494dcf14428da507d>.

Table 5: Site description

Area and distribution of surviving ship structure
Site 1: No ship structure has been found. Site 2: No ship structure has been found, although an association with Site 3 cannot be ruled out. Site 3: Small section of ship structure measuring approximately 1.5m by 1.5m.
Character of ship structure
Site 1: Not applicable, although the guns found on site are likely to have been carried on board a wooden sailing ship. Site 2: Ditto Site 1. Site 3: The evidence suggests that the site consists of a small section from the carvel planked hull of a wooden ship.
Depth and character of stratigraphy
Site 1: Although there is no obvious stratigraphy, some of the guns are buried and there is potential for there to be buried material, both within the area surveyed and particularly inshore to the north-east. Site 2: There is potential for buried artefacts and deposits to be preserved, particularly under the guns. However, although intrusive investigations have not taken place, there is no obvious stratigraphy. Site 3: Framing and a second layer of planking is currently buried.
Volume and quality of artefactual evidence
Site 1: Considering the archaeologically hostile environment, there is a fairly diverse assemblage, comprising eight cast iron muzzle loading cannon, broken guns, large quantities of shot, unidentified concretions and wooden objects. Site 2: There is a very limited assemblage consisting of seven cast iron muzzle loading cannon, apparently scattered by wrecking event and site formation/reworking processes. No other artefactual material has been found. Site 3: No artefactual assemblage other than the structure.
Apparent date of ship's construction and/or loss
Site 1: Post-medieval, possibly second half of the 17 th century or the first quarter of the 18 th . Site 2: Post-medieval, possibly second half of the 17 th century. Site 3: Post-medieval.
Apparent function
Site 1: Uncertain, but the evidence currently favours the theory that it was a merchant ship with an outward bound cargo of iron guns. Site 2: Uncertain. The guns could have been carried as either defensive armament or cargo/ballast. Site 3: Unknown.
Apparent origin
Site 1: Uncertain. The guns may be English and an outbound cargo, which suggests that the vessel may have sailed from an English port Site 2: Uncertain. There is no evidence to suggest an origin, although the guns may be English. Site 3: Unknown.

4.9 Characterisation

- 4.9.1 The results have been used to inform the following Build/Use/Loss/Survival/Investigation (BULSI) characterisation.

Table 6: Characterisation using BULSI

Build
<p>Site 1: The vessel has not been identified and there is no evidence concerning the design or size of the vessel, other than it can be inferred that it was a wooden sailing ship. Size is unknown, although its size can be inferred as not being very small due to the quantity and weight of archaeological material on the seabed.</p> <p>Site 2: As Site 1.</p> <p>Site 3: The evidence suggests that the vessel was a wooden sailing ship of unknown size.</p>
Use
<p>Site 1: The available evidence suggests that the vessel may have been a cargo vessel, carrying an outbound cargo of heavy cannon and shot at the time of loss.</p> <p>Site 2: There is no evidence concerning the use of the vessel.</p> <p>Site 3: There is no evidence concerning the use of the vessel.</p>
Loss
<p>Site 1: The vessel is likely to have been trapped on a lee shore by a south-westerly or similar gale and to have gone ashore, in which case the ship probably broke up. The beach is mobile and it is possible that the site is where the vessel struck or that wreck material has migrated downslope during the wrecking or thereafter.</p> <p>Site 2: The vessel is likely to have either foundered a short distance offshore or the site represents a section of wreck that has broken off a vessel on the beach and come to rest further offshore.</p> <p>Site 3: There is no evidence concerning the loss of the vessel, other than that it can be inferred that it went ashore or foundered close in, probably as a result of a gale or navigational error.</p>
Survival
<p>Site 1: There is a fairly diverse archaeological assemblage, including eight cast iron cannon, broken guns, large quantities of shot and concretions and some small wooden objects, although no evidence of the wooden ship structure of the ship itself. There is some evidence that part of the site may lie buried under the base of the beach to the north-east. The environment is highly dynamic, with strong currents and regular and very large storm waves and some destructive reworking of the assemblage is likely to have taken place by natural forces.</p> <p>Site 2: The only archaeological material present appears to be seven cast iron cannon. Whilst investigation is still at an early stage, there is no indication of buried material or a wider distribution. Although further offshore, the environment is still dynamic, with strong currents and regular and very large storm waves and it is very possible that the guns represent the surviving elements of a larger wreck assemblage. There is evidence of some of the guns being partially deconcreted, probably by divers.</p> <p>Site 3: The site shares the dynamic environment of Site 2 and it is likely that exposure on the seabed surface is a relatively recent occurrence.</p>
Investigation
<p>Site 1: No convincing evidence has been found to suggest that this site has been recorded previously, although the site may have been explored and disturbed in the 1970s or 80s. Investigations by the Shipwreck Project and Wessex Archaeology on all three sites appear to be the first investigations carried out to current archaeological standards.</p> <p>Site 2: The site appears to have been discovered by the Shipwreck Project in 2010 during a geophysical survey. It may have been located previously in 2004 for a television documentary and the removal of some concretion suggests that it may have been dived recently by non-Shipwreck Project divers.</p> <p>Site 3: The site appears to have been discovered recently by the Shipwreck Project.</p>

4.10 Risk Assessment – Sites 1 & 2

- 4.10.1 Risk is assessed for Sites 1 and 2 as being high (**Appendix 2**). Principal vulnerability is the high energy location, although there is evidence of recent intrusive activity on Site 2 by persons unknown following its initial investigation by the Shipwreck Project. Guns 2103 and 2106 have clearly had concretion deliberately removed from their muzzles in the recent past.
- 4.10.2 It is unclear whether and to what extent commercial fishing represents a significant threat at the present time. Trawling is rumoured to occur occasionally (Grahame Knott, pers. comm.). Messages and photographs posted on social media also suggest that trawling may be carried out within 500m of the beach and within the Marine Conservation Zone (MCZ).

4.11 Assessment against the non-statutory criteria for designation

- 4.11.1 Sites 1 and 2 have been assessed against the key non-statutory criteria for designation under the Protection of Wrecks Act 1973, as set out in the relevant English Heritage Designation Selection Guide (English Heritage 2012: 9-10). The wording used and given below in italics is derived from the Guide and reference to the word scheduling should be read as equivalent to designation in this respect. The sites have been treated for this purpose as separate wrecks.

Assessment Scale

- 4.11.2 For each criterion, one of the following grades has been selected. This has been done in order to help assess the relative importance of the criteria as they apply to the site. The 'scoring' system is as follows:
- *Uncertain – insufficient evidence to comment;*
 - *Variable – the importance of the wreck may change, subject to the context in which it is viewed;*
 - *Not Valuable – this category does not give the site any special importance;*
 - *Moderately Valuable – this category makes the site more important than the average wreck site;*
 - *Highly Valuable – this category gives the site a high degree of importance. A site that is designated is likely to have at least two criteria graded as highly valuable; and*
 - *Extremely Valuable – this category makes the site exceptionally important. The site could be designated on the grounds of this category alone.*

Assessment

- 4.11.3 **Period** – *Vessels from all periods are important in reflecting technological advances in boat construction and materials, and providing evidence of trade networks, industry, and transport. Those vessels which best illustrate or epitomise this development can have strong claims to national importance.*
- 4.11.4 Site 1 – Highly Valuable. Although investigation of both sites is at an early stage and in respect of characterisation is producing working theories rather than confirmed facts, the evidence currently suggests that Site 1 may have been an outbound merchant ship or transport carrying a cargo of cast iron English guns. As such it would preserve evidence of an important aspect of English trade and in a period in which worldwide British trading networks were becoming established.

- 4.11.5 Site 2 - Uncertain. No remains of the vessel have been found. Archaeological investigation is at an early stage and it is conceivable that the site extends further than is currently understood or that there are buried deposits.
- 4.11.6 **Rarity** – *The remains of vessels for periods before 1700 are so rare that any firmly dated vessels from this period are likely to be of national importance and may merit scheduling. For vessels of later date, particularly those types for which examples survive today, scheduling will always be exceptional.*
- 4.11.7 Sites 1 & 2 - Highly Valuable. Although the dating of these sites is provisional and depends upon the potentially misleading examination of concreted guns, the evidence currently suggests that both Sites 1 and 2 are the remains of vessels lost in the second half of the 17th century or the first quarter of the 18th. Most designated vessels of this period are naval vessels, which would make Site 1 even rarer.
- 4.11.8 **Documentation** – *Our understanding of shipbuilding, transport, trade and industry can be greatly enhanced by the survival of historical documentation relating to particular vessels and their service. Where modern analytic documentation can provide evidence for especially strong historical claims, for example confirming a ship to be the last of its type, this may be a key factor in establishing its importance.*
- 4.11.9 Sites 1 & 2 – Uncertain. The lost vessels are as yet unidentified and therefore no documentation has been traced.
- 4.11.10 **Group Value** – *In some instances, a vessel's importance may be strengthened by an association with other vessels of a similar type, for example the Scottish fishing boats at Kilspindie or the group of gunpowder boats at Waltham Abbey Gunpowder works, which allows for comparative study. Association within a wider context which reflects their use can also be a consideration. In the case of hulks, as well as having intrinsic interest, they can contribute to the story of a landscape, and its long-term evolution and management.*
- 4.11.11 Sites 1 & 2 – Highly Valuable. On a local and regional level these sites can be seen as an important and very early part of a very large group of wrecks and recorded losses associated with Chesil Beach, one of England's most important and notorious navigational hazards, which also includes the designated wreck at West Bay. On a thematic level, these sites form part of a small group of 17th and early 18th century wrecks, including the *London* and a number of Goodwin Sands wrecks, that have traditionally been regarded as having outstanding archaeological interest
- 4.11.12 **Survival/Condition** – *Given the range of materials used in boat-building, survival of vessels can be highly varied, from the sand-imprint of the ship at Sutton Hoo or fragment of the log boat at Shardlow (Derbyshire) to the concrete boats of Second World War date at Purton. Given the rarity of surviving vessels of pre-1700 date, even fragmentary survivals are likely to be of national importance although a judgment must be reached as to the degree of survival and intactness. For vessels of later date, increasingly complete survival, allied to strong archaeological and historical importance, will be expected before scheduling would be considered.*
- 4.11.13 Sites 1 & 2 – Moderately Valuable. Although the known remains are fragmentary and mainly limited to materials that are resistant to mechanical degradation caused by the environment, these are potentially pre-1700 vessels. As such they are likely to be regarded as very important survivals.

- 4.11.14 **Potential** – *England's maritime past is one of its most defining characteristics throughout all periods. Evidence for the construction and use of vessels gives us great insight into not only the exploitation of our immediate marine environment, but also into the development of wider trade and transport networks. This is especially true of earlier periods which are lacking in the rich literature and documentation of later times. Surviving vessels may also provide evidence of their use and construction, reflecting technological developments which in some instances may be all but lost. For the prehistoric period, in particular, the remains of vessels may be some of the largest artefacts discovered which demonstrate the technology of woodworking and management of woodland resources. Similarly, where vessels are found in situ, associated deposits may be rich in palaeoenvironmental remains. The potential which a vessel has for answering questions about our maritime past will be a consideration in establishing its importance. If remains of a cargo survive it is likely to add very considerably to the vessel's significance, for its evidence of trade and material culture at a particular point in time.*
- 4.11.15 Sites 1 and 2 - Uncertain. Archaeological investigations are at an early stage and there is some indication that the site may extend inshore beyond the toe of the beach slope. No intrusive investigations have been undertaken within the site. Given the survival of hull structure at Site 3, there must be potential for buried deposits both within and inshore of the visible site extent and this may include vessel structure and a more deeply buried and varied assemblage, together with material preserved inside the large concretions. Further archaeological and historical investigation, particularly of the guns may result in closer dating and the identification of the vessel. Iron guns of this period are relatively rare and have the potential to add to our knowledge of gun founding and design, as well as guns exported for both trade and the arming of fortifications.
- 4.11.16 As with Site 1, the iron guns on Site 2 may have potential for study, not least because their intrusive investigation may enable the site to be dated more closely and identified. An association with Site 1 remains a possibility. Both sites have the potential to add to our knowledge of wrecking processes along this important beach.
- 4.11.17 **Fragility/Vulnerability** - *Highly important archaeological evidence from some wrecks can be destroyed by the selective or uncontrolled removal of material by unsympathetic treatment, works, development, or by natural processes. Some vessel types are likely to be more fragile than others and the presence of commercially valuable objects within a wreck may make it particularly vulnerable. Vulnerable sites of this type would particularly benefit from protective designation.*
- 4.11.18 Sites 1 & 2 – Moderately Valuable. Whilst protecting these sites from the principal and long-term vulnerability, the natural environment, is unlikely to be either cost-effective or even practical, designation would go some way to protecting the sites from diver interference. Given that evidence has been seen on Site 2 to suggest that this has occurred subsequent to Shipwreck Project investigations, the potential for this activity to be repeated must be considerable, particularly if the unknown persons responsible become aware of Shipwreck Project investigations of Site 1.
- 4.11.19 **Diversity** - *The importance of wrecked vessels can reflect the interest in their architectural design, decoration and craftsmanship, or their technological innovation or virtuosity, as well as their representativeness. Consideration should be given both to the diversity of forms in which a particular vessel type may survive and to the diversity of surviving features. Some vessel types may be represented in the surviving record by a wide variety of building types and techniques which may be chronologically, regionally, or culturally conditioned. The sample of protected wreck sites should reflect this wide variety of forms. In addition, some wrecks may be identified as being of national importance because they*

possess a combination of high quality surviving features or, occasionally, because they preserve a single important attribute.

- 4.11.20 Sites 1 & 2 – Uncertain. Insufficient is known about the wrecked vessels to assess this criterion.

Summary

- 4.11.21 Although it is important to state that neither site can be firmly dated, the available evidence suggests that both sites and particularly Site 1 are likely to meet the criteria for designation under the Protection of Wrecks Act (PWA) 1973. There also appears to be a degree of vulnerability that would render designation of practical value in protecting both sites.
- 4.11.22 Should the sites be designated, Wessex Archaeology would recommend that two small areas should be utilised in the same manner that the *London* in the Thames Estuary was protected. It is not necessary for these areas to extend much beyond the site extents as currently known, as they could be extended as required.
- 4.11.23 It is strongly recommended that the above assessment against the criteria should be reviewed at a later stage in the site investigations, particularly if more secure dating evidence becomes available.

5 FUTURE INVESTIGATION

- 5.1.1 The following discussion concerning further investigations is pursuant to discussions with the Shipwreck Project:

Site 1

- 5.1.2 Site 1 lacks firm dating evidence to confirm its apparent importance. Whilst more detailed examination of each of the guns and of the gun fragments could provide further information, resolving this issue may ultimately require the intrusive investigation of one or more of the guns to look for a casting date and other markings, as well as better evidence with regard to the gun size and proportions. As this may destabilise the gun selected, a method of making good will be required to minimize the damage caused if the gun is not to be recovered. Due to the high energy location, the use of anodes is unlikely to be practical.
- 5.1.3 Only very limited research has been undertaken with regard to candidate vessel losses in the context of this assessment and none have been identified. Research aimed at identifying missing shipments of guns would be appropriate.
- 5.1.4 The full extent of Site 1 is also uncertain and therefore further survey work is required, particularly on the inshore side where two additional cannon have recently been found. Due to the gravel and cobble seabed, probing is likely to be ineffective. For the same reason, the use of parametric or 3D CHIRP sonar is also unlikely to be effective. Subject to local conditions, a very detailed towed magnetometer or magnetometer/gradiometer may be worthwhile, as might a diver metal detector or gradiometer survey, provided that the latter has good positional control. Ultimately, however, establishing site extent both horizontally and vertically is likely to require some form of test pitting.

Site 2

- 5.1.5 Site 2 also lacks firm dating evidence and similar intrusive investigation may be required, although closer non-intrusive examination and recording of each gun would be warranted as a preliminary step. The additional gun not examined in 2015 requires recording.

Site 3

- 5.1.6 The ship structure requires detailed recording in order to more firmly understand it. The fact that it is partially buried is a complicating factor, although it may be possible through examination of Shipwreck Project video to avoid the requirement for excavation. Dating is likely to be crucial to understanding its significance and, assuming that it cannot be stylistically dated, the structure should be examined for its dendrochronological potential.
- 5.1.7 It is not known whether this structure is an isolated find or part of a larger wreck site or debris field. A wider search is therefore clearly merited, particularly towards the beach.

6 ARCHIVE

- 6.1.1 The project archive consists of a hard copy file and computer records and is currently stored at Wessex Archaeology under project code 108280. The archive will be transferred to the National Record of the Historic Environment.
- 6.1.2 Shapefiles generated for the project comply with Marine Environment Data and Information Network (MEDIN) standards for metadata.
- 6.1.3 There is currently no agreed standard for the archiving of photogrammetry models. Therefore these will be archived as PhotoScan .psz and orthophoto files and as 3D pdfs.

7 REFERENCES

7.1 Bibliography

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7.2 Other Sources

English Heritage, 2008, *Protected Wreck Sites at Risk. A Risk Management Handbook*, Historic England.

English Heritage, 2012, *Designation Selection Guide: Ships and Boats: Prehistory to Present*, Historic England.

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Dorset County Council HER Monument Full Reports

UKHO Wreck and Obstruction Records

7.3 Admiralty and Other Charts

Admiralty Chart 2615ac



8

APPENDICES

Appendix 1: Dive Log (Wessex Archaeology divers only)

DIVA 1112 Dive No.	Date	Start Time	Duration*	Max Depth (m)	Divers	Work
02	22/08/2015	07:51	52	13	Knott & Penney	Initial site inspection (Site 1)
03	22/08/2015	09:53	67	13	Croce & Murray	Close inspection, photography and measured survey (Site 1)
04	03/09/2015	14:18	33	11.7	Croce & Shefi	Photogrammetry survey (Site 1)
05	03/09/2015	16:24	26	11.9	Hamel & Scott	Location and photogrammetry survey of outlying gun (Site 1)
06	04/09/2015	14:53	55	16	Croce, Shefi & Bright-Paul	Photogrammetry survey (Site 2)
07	04/09/2015	16:25	37	15.8	Hamel & Scott	Intrusive investigation of gun 2103 (Site 2)
08	09/10/2015	09:32	16	16.9	Gane & Knott	Locating and inspecting site (Site 3)
09	09/10/2015	14:07	54	13.6	Gane & Shefi	Identifying individual site features in photogrammetry model (Site 1)

* Bottom time in minutes (time from diver left surface to diver left bottom; actual working time will be shorter)



Appendix 2: Site 1 & 2 Risk Assessment

Wreck/Site Name	Unknown ('Cannon site'), Weymouth – Sites 1 and 2 (Inshore and Offshore)		
NRHE /UKHO No.	EH Region	Restricted Area	Principal Land Use
TBC	South-West	None	Coastland 1
	Site 1		Site 2
Latitude (WGS84)	50° 36.758489' N		50° 36.651607' N
Longitude (WGS84)	02° 32.070084' W		02° 32.059267' W
Class Listing	Period	Status	
Sailing Vessel	Stuart (?)	Non-designated wreck site	
Licensee	Nominated Archaeologist	Principal Ownership Category	
N/A	N/A	Other	
Seabed Owner	Navigational Administrative Responsibility		
Crown Estate	Nil		
Environmental Designations			
Other			
Seabed Sediment		Energy	
Site 1: Gravel and cobble Site 2: Sandy gravel		High	
Survival			
Very poor			
Overall Condition	Condition Trend	Principal Vulnerability	
Extensive significant problems	Declining	Mechanical degradation; seabed erosion; natural decline; unlicensed diving	
Amenity Value: visibility			
Limited			
Amenity Value: physical accessibility		Amenity Value: intellectual accessibility	
Full		No interpretation	
Management Action	Action to be identified/agreed		
Management Prescription	H; I		
Notes:			
<p>Two post-medieval wreck sites close to Chesil Beach, Dorset and within the Chesil Beach and Stennis Ledges MCZ. Investigation is at an early stage but currently it is thought likely that both sites are different unidentified vessels wrecked in the second half of the 17th century or the first quarter of the 18th.</p> <p>Site 1 (also known as the Inshore Site) is shallow and close inshore and may extend inshore of the toe of the beach slope. Principal vulnerability is undoubtedly very large storm waves that are common at this location and the movement of beach gravel. Further to recent investigations, the site may receive more diver visits and it is possible that intrusive investigation and removal of artefacts such as iron shot will result.</p> <p>Site 2 (also known as the Offshore Site) is located further offshore in slightly deeper water. Nevertheless the principal vulnerability is very large storm waves and sediment movements, although there are clear indications of damage caused by intrusive investigation by divers following recent archaeological investigations.</p> <p>There is also some indication from social media sites that small commercial fishing vessels have been spotted trawling along Chesil Beach and within 500m of the shore.</p>			
Risk is assessed as:	High		
Data Source	Undesignated Site Assessment, 2015	Date & Initials	Wessex Archaeology, June 2015



Appendix 3: Results of RoW Droit Search

Droit No.	Location	Wreck Name	Description	Remarks
A/2266	Off Chesil Beach, Nr Fleet Village	Unknown	2 x Bar shot. 3 x Cannonballs. 1 x Spiked cannonball. 3 x Cannonballs in canvas bag. 1 x Expanding bar shot.	Donated to Weymouth Museum.
A/2625	Chesil Bank, Portland	De Hoop (Hope)	2 x Rivets. 1 x Branding iron. 1 x Canvas needle. 1 x Silver coin.	
A/0812	Off Chesil Beach	Hope (1740)	1 x Cannon (on loan from Weymouth Museum).	Cannon on loan from Weymouth Museum to Nothe Fort.
079/03		Unknown	1 x Half bar shot. 1 x Small iron concreted clump, 6" x 5", probably a small cannonball about 2lbs size.	

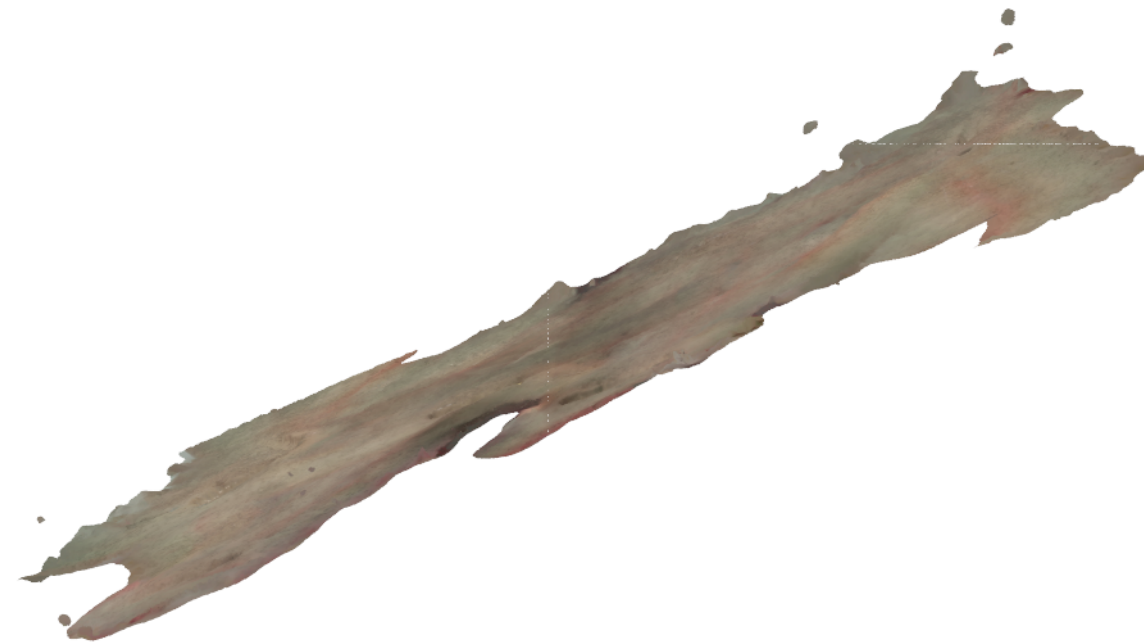
Appendix 4: Low resolution 3D pdf of Site 1 photogrammetry model

Appendix 5: Low resolution 3D pdf of Site 2 photogrammetry model

Due to file size constraints, these appendices have been produced as separate documents. A recent version of Adobe Acrobat Reader freeware is required in order to view and manipulate them.



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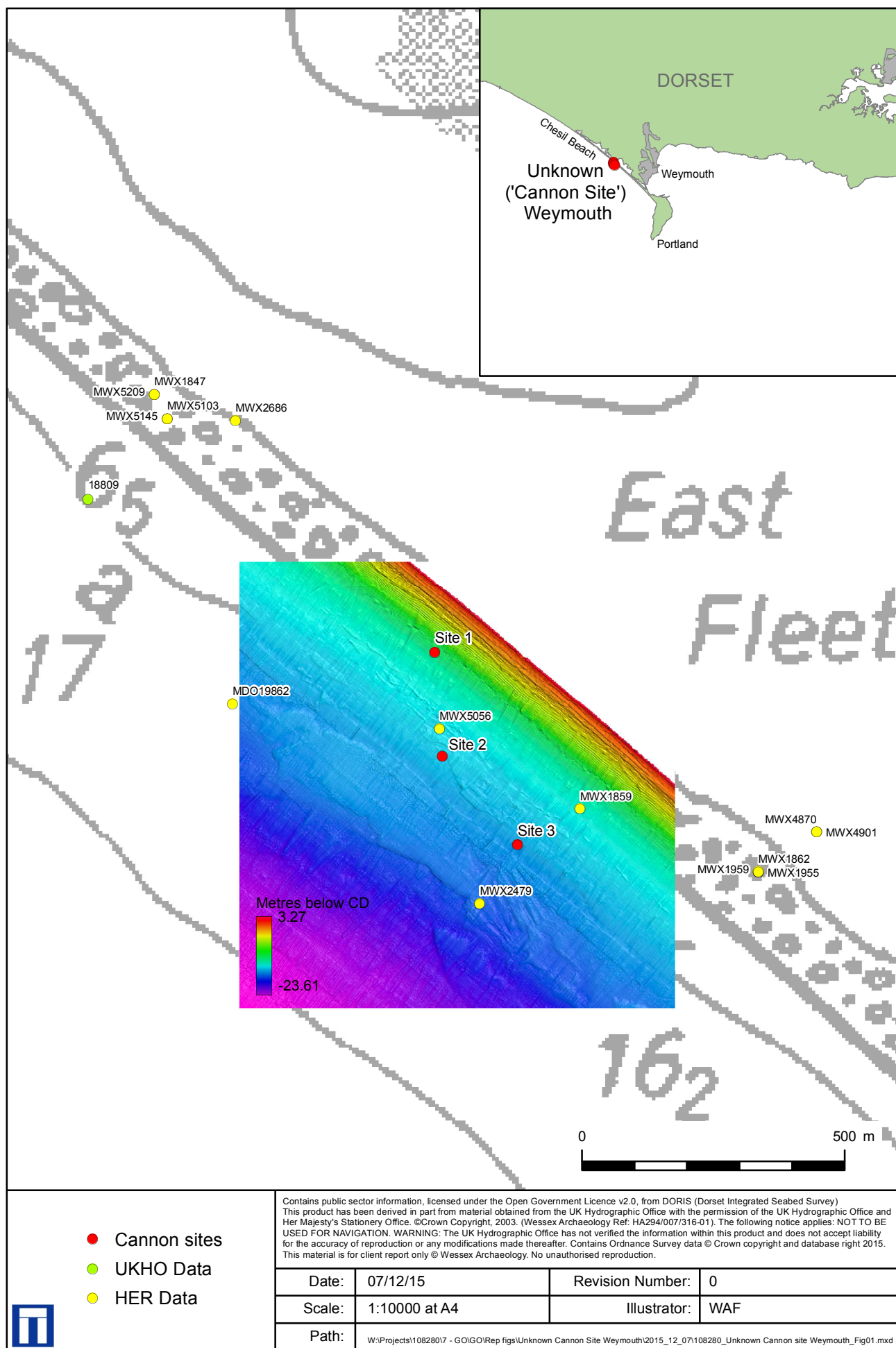
Appendix 6: Wrecks and recorded losses

Coordinates in UTM 30N

ID	Name	Date	Loss	Loss location	Description	Possible candidate	Easting	Northing
MDO19862	P40 Tomahawk	1941	Ditched	Chesil beach	A Curtis P40 Tomahawk was ditched by the pilot during a severe hailstorm that took place during formation flying training. Cockpit raised and put in museum		532549	5606756
MWX1847	<i>Venus</i>	1795	Recorded loss	Off Fleet	A wooden sailing ship carrying troops from Isle of Wight to the West Indies wrecked off Fleet in a gale.		532400	5607345
MWX1859	<i>Cassibelaunus</i>	1872	Wrecked	Chesil beach	Scattered vessel structure located in 2004 during filming of Wreck Detectives	Possibly associated with Site 3	533211	5606556
MWX1862 NRHE 1145522	<i>Vriendschap Heike</i>	1851	Recorded loss	West Bay	A Dutch galliot carrying grain cargo ran ashore due to severe damage to the ship. Crew survived. Unknown whether salvage took place.		533551	5606435
MWX1955 NRHE 900940	<i>Arethusa</i>	1838	Recorded wreck	Chesil beach	Wooden passenger vessel wrecked during a storm. No located seabed remains		533551	5606435
MWX1959 NRHE 901195	<i>Lanoma</i>	1888	Recording stranding	Fleet	Wooden barque cargo vessel ran aground in poor visibility. Wreck material has been found from this cargo vessel.		533551	5606435
MWX2479	Chesil Cannon Site	Post-medieval	Unknown	Chesil bank	A range of finds ascribed to <i>De Hoop</i> wreck. Finds include: rivets, branding iron, canvas needle, silver coin, bar shot and a cannon that is on loan from Weymouth Museum		533021	5606375

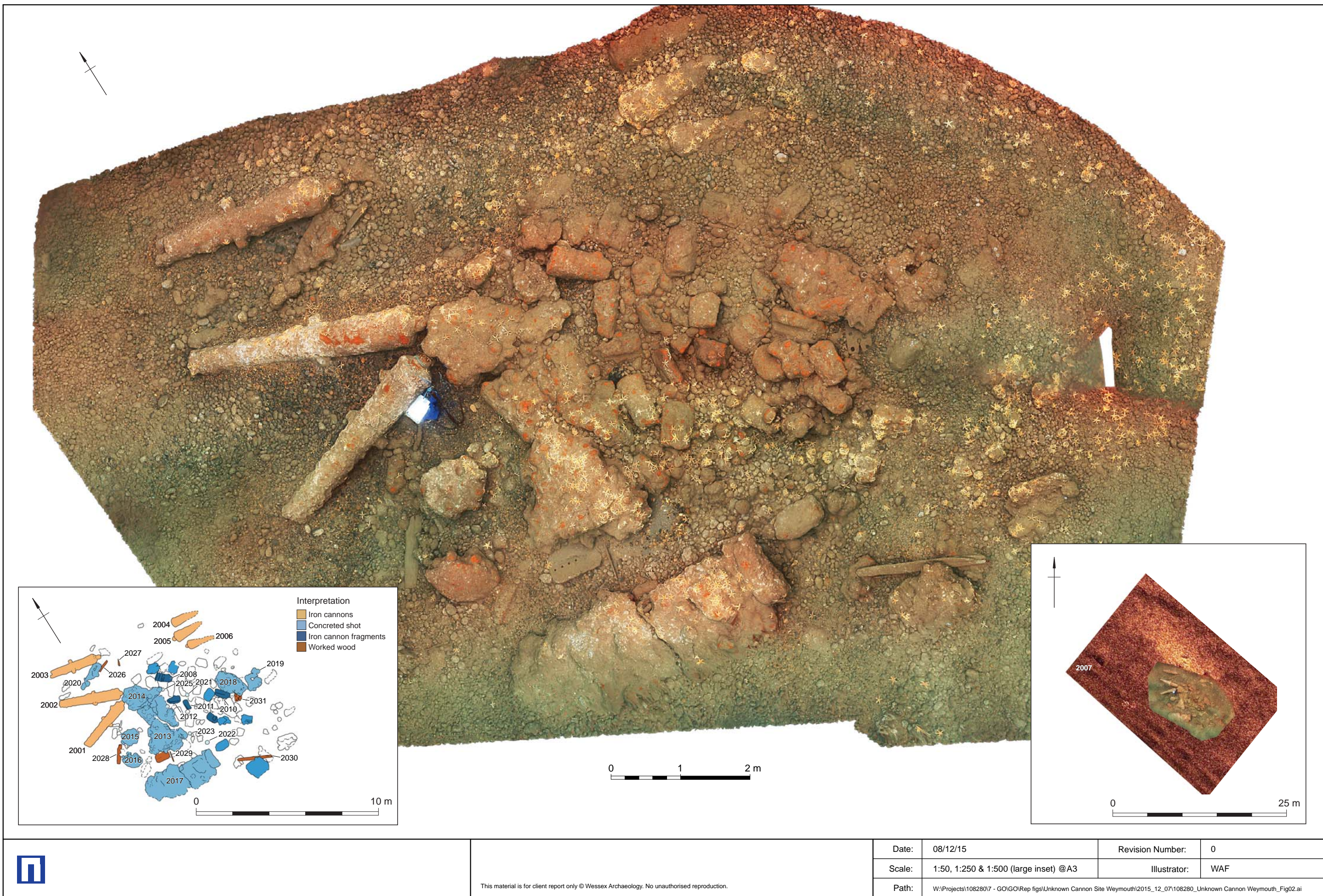


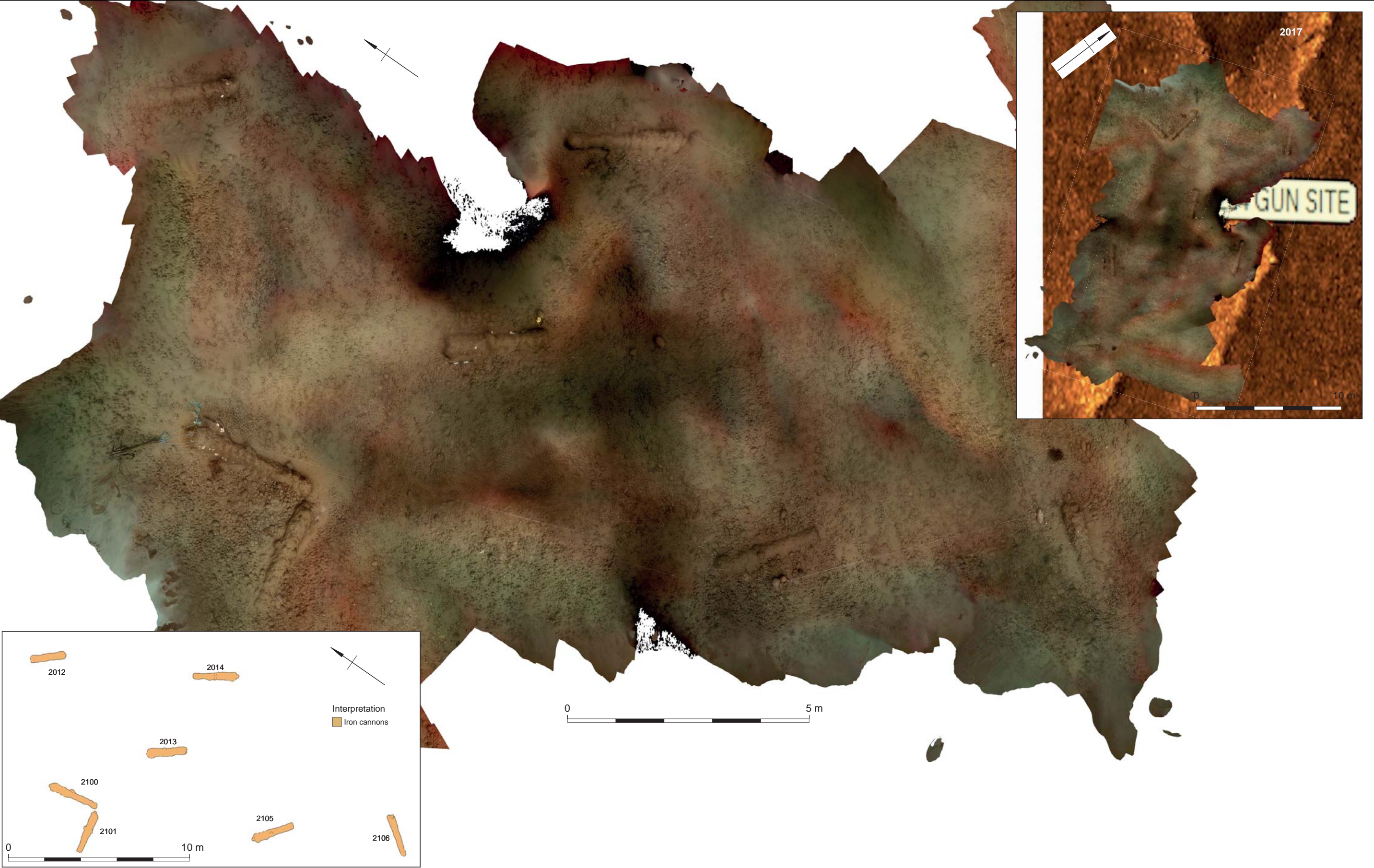
ID	Name	Date	Loss	Loss location	Description	Possible candidate	Easting	Northing
MWX2686	Chesil Beach wreck	Post-medieval	Unknown	Chesil beach	An assemblage of shot and cannonballs found off Chesil beach and ascribed to <i>De Hoop</i> wreck however the copper alloy pins and hull sheathing do not correspond with that wreck		532555	5607295
MWX4870	<i>Naiad</i>	1852	Recorded stranding	Chesil beach below Chickerell	Vessel stranded on Chesil beach and possibly refloated. No located seabed remains		533662	5606512
MWX4901	<i>Noreg</i>	1914	Recorded stranding	Chesil beach near Fleet	Norwegian steamer reported stranded on Chesil beach. No located seabed remains.		533662	5606512
MWX5056	Fleet Cannon Site	Post-medieval	Unknown	Chesil beach	Six cannons		532944	5606708
MWX5103	<i>Kentbrook</i>	1930	Recorded sinking	Off Fleet	Steam vessel reportedly sank off Fleet. No located seabed remains		532425	5607298
MWX5145	MFV No. 1089	1953	Recorded stranding	Chesil beach	Wooden motor fishing vessel that sank off Chesil beach and may have been salvaged		532425	5607298
UKHO 18809 NRHE 1593646	Cannon Site	Post-medieval	Unknown	Chesil beach	A number of 18 th century iron cannon, cannon balls and shot were found at this location in 1973. One cannon was raised and put on display at the Weymouth museum. Seabed remains not visible in 2009		532275	5607144




Site locations

Figure 1





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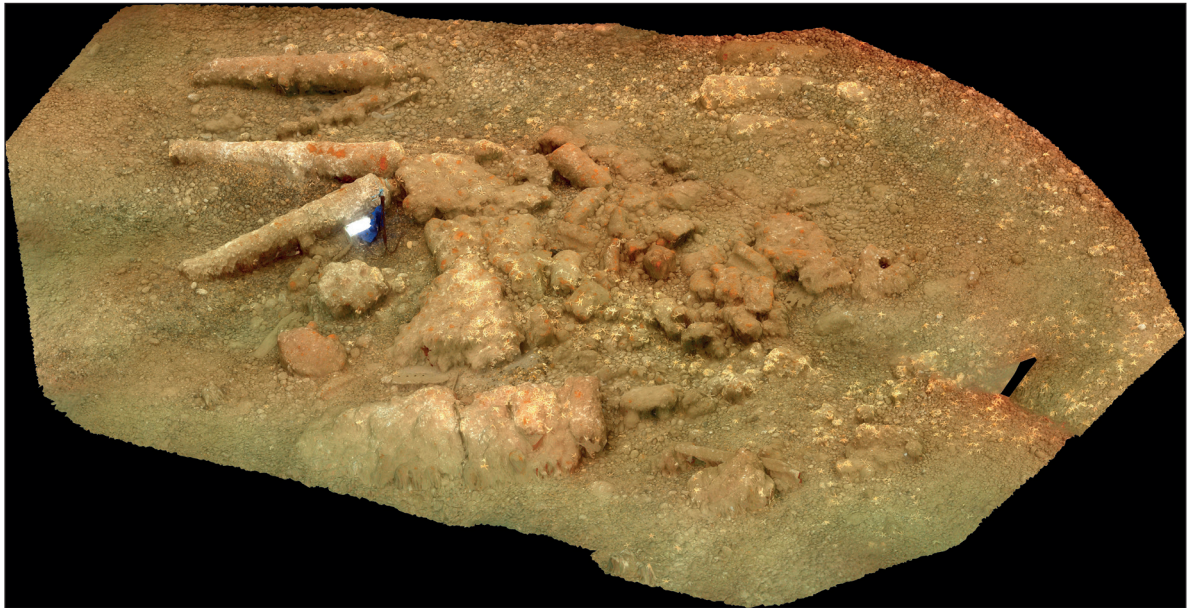



Plate 1: Site 1, looking inshore (2D orthophoto of photogrammetry model)



Plate 2: One of two guns found post-fieldwork inshore of Site 1 (© The Shipwreck Project)

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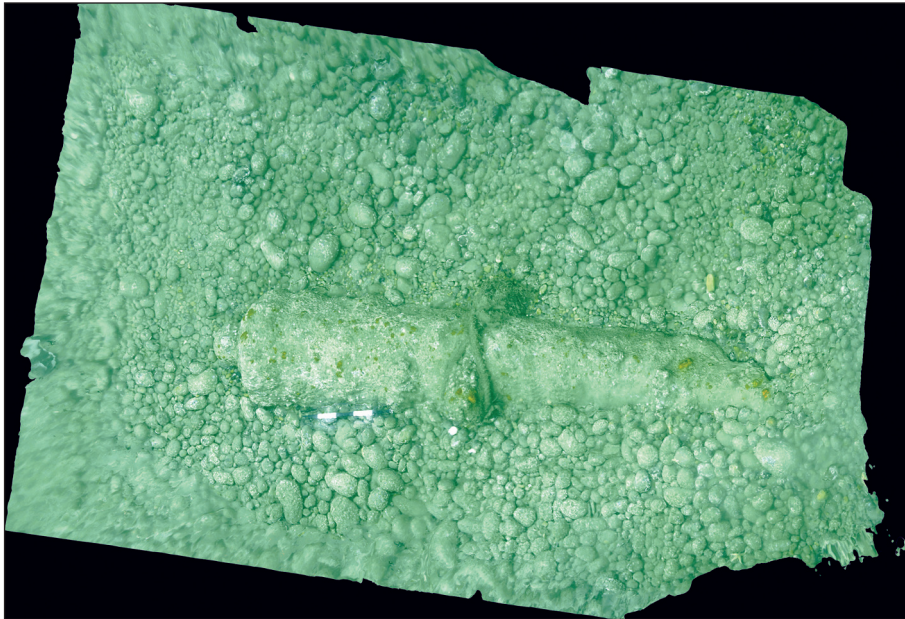



Plate 3: Cannon 2007 (2D orthophoto of photogrammetry model)



Plate 4: Gun 2103, muzzle

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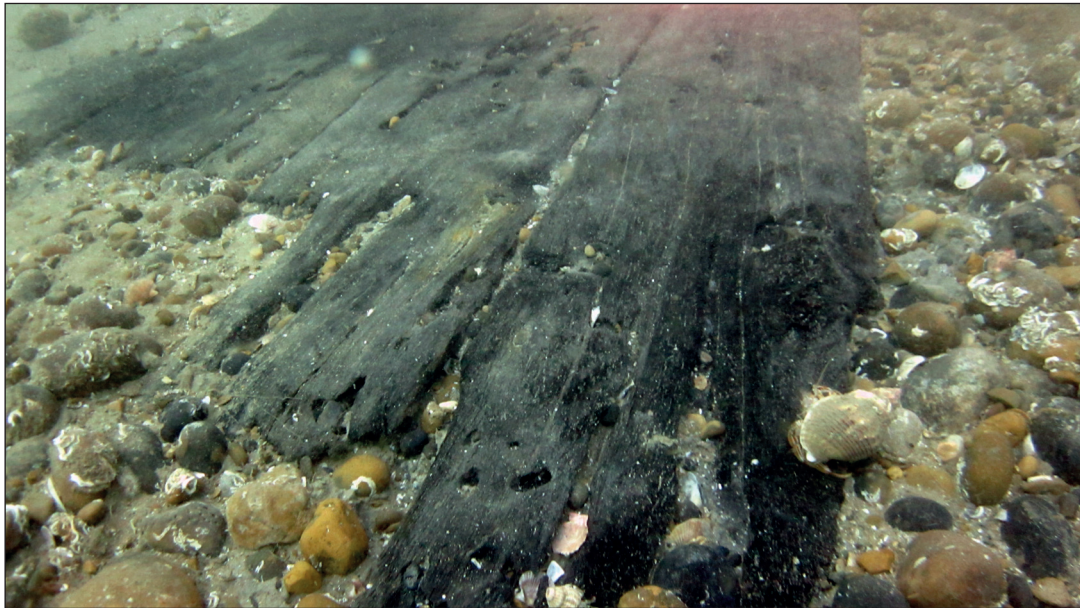



Plate 5: Ship structure, Site 3 (© The Shipwreck Project)



Plate 6: Ship structure, Site 3 (side view) © The Shipwreck Project

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