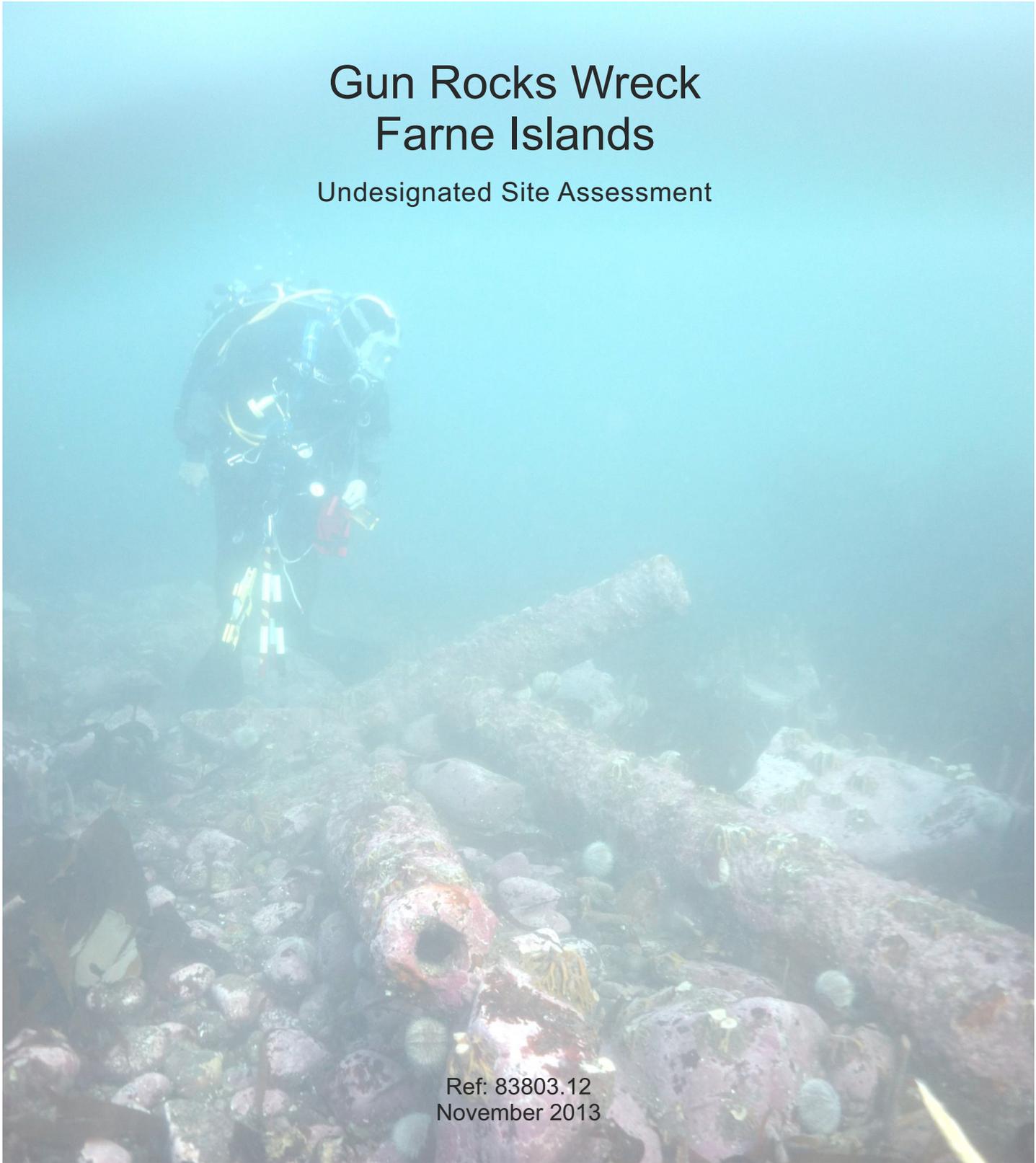




making sense of heritage

Gun Rocks Wreck Farne Islands

Undesignated Site Assessment



Ref: 83803.12
November 2013



ARCHAEOLOGICAL SERVICES IN RELATION TO MARINE DESIGNATION

Gun Rocks, Farne Islands

UNDESIGNATED SITE ASSESSMENT

CONFIDENTIAL REPORT

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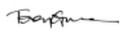
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Gun Rocks, Farne Islands

UNDESIGNATED SITE ASSESSMENT

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Gun Rocks, Farne Islands

UNDESIGNATED SITE ASSESSMENT

Summary

Wessex Archaeology was commissioned by English Heritage (EH) to undertake an Undesignated Site Assessment of the wreck site located at Gun Rocks, Outer Farne Islands. The work was completed as part of the Heritage at Risk (HAR) contract for archaeological services in relation to marine designation.

WA was asked to liaise with the local BSAC branch (Tyneside 114), and to conduct a photographic, acoustic and measured survey of the site to confirm the nature and extent of *in situ* artefacts at Gun Rocks, off Staple Island. Fieldwork was conducted at the site between the 28th August and 5th of September 2013.

Initial survey of the site recorded thirteen concreted iron cannons lying in a scattered formation off the south west side of Gun Rocks. Several cannon balls and a section of lead sheet were also located in this area. The site was surveyed and a section was recorded by photomosaic and three cannons were captured through photogrammetry. A second, previously undiscovered area of cannons was located 30m to the west and consisted of 6 cannons. This site was also recorded.

Several other anomalies identified by the earlier geophysical survey were investigated and these revealed an anchor and wooden object with cuprous bolts and a modern metal box or section of ducting.

A number of finds previously recovered from the site were described to WA by Tyneside 114 whose predecessors had surveyed the site in 1970. One of the sword hilts that were raised was made available to the WA team for examination and recording.

Initial analysis of the archaeological evidence suggests that this is a wreck of a Dutch merchant vessel from the early 18th century.

In addition to measured survey and diver tracking, the relatively new technique of automated photogrammetry was applied to the cannons and the results are presented below.

A number of recommendations for further investigation of the site have been made. These include documentary research in the Netherlands and diver survey and monitoring, all of which should include liaison with the local divers who discovered the site.



Gun Rocks, Farne Islands

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This investigation was commissioned by English Heritage, and the assistance provided by Mark Dunkley, Alison James, Terence Newman and Serena Cant is gratefully acknowledged.

Wessex Archaeology would also like to thank the following people and organisations (alphabetical order):

- BSAC Tyneside 114, current and previous investigators of the site;
- Nico Brinck, ordnance expert;
- Selby Brown, former BSAC Tyneside 114 diver;
- Charles Trollope, ordnance expert;
- William Shiel, Michael Craig and James Rhee, owner, master and deck hand of *Glad Tidings VII*;
- Paul Ternent, Northumberland Archives Service;
- Lisa Waters, Collections and Conservation Manager, Bamburgh Castle;
- Paul Wilcock, Director, Arms and Armour Research Institute; and
- Ron Young, dive guide author.

A Wessex Archaeology dive team worked with divers from Tyneside 114 BSAC to carry out the Stage 3 diving operations. The Wessex Archaeology team consisted of project officer Peta Knott, Paolo Croce, John McCarthy, Drew Roberts and Graham Scott, together with Mark Dunkley and volunteer Royal Navy diver Oliver Penney. The Tyneside 114 BSAC team included Andy Hunt, Kevin Thompson, Liz McKernan, Andy Moss, Brian Dinsdale, David Mitchell, Hubert Desgranges, Michael Hunt, Tony Horsfall and Ethan Lisk.

Peta Knott supervised the Stage 3 fieldwork. Graham Scott and Paolo Croce supervised the Wessex Archaeology diving operations. Tyneside 114 BSAC diving operations were led by Andy Hunt and Kevin Thompson

The report was compiled by Peta Knott with contributions by Graham Scott. John McCarthy carried out the photogrammetric modelling and Ken Lymer prepared the illustrations. Toby Gane and Graham Scott carried out QA. The project was managed for Wessex Archaeology by Toby Gane.



Gun Rocks, Farne Islands

UNDESIGNATED SITE ASSESSMENT

1 INTRODUCTION

1.1 Assessment Background

- 1.1.1 Wessex Archaeology (WA) was commissioned by English Heritage (EH) to undertake an Undesignated Site Assessment of the wreck of the Gun Rocks wreck (the Site; **Figure 1**);. The work was undertaken as part of the Heritage at Risk - Designated Wrecks at Risk (Dive Contract) 2013/15 contract for archaeological services (HAR). The UDS application number is 476490.
- 1.1.2 The work was conducted in accordance with a written brief and agreed scope of work (EH 2013). This was modified on site with the agreement of the client representative Mark Dunkley.
- 1.1.3 The fieldwork was part of a staged investigation of a number of wreck sites in the Farne Islands, beginning in March 2013. Stage 1 and 2 were geophysical surveys (WA 2013b); Stage 3 was a diving investigation, mainly of selected geophysical anomalies identified as having archaeological potential. The diving project took place between 28th August and 5th September 2013 and included 14 dives connected with the investigation of the Gun Rocks wreck site.
- 1.1.4 The text of this report should be understood strictly as read and contains no implied meanings or judgements. Reporting of third party actions, statements and intentions is based upon the information available to WA at the time of drafting. Use of the phrase "It is reported that..." means that WA has received a report from a third party that appears to be credible but which cannot be confirmed as fact from the available evidence.

1.2 Existing Data

- 1.2.1 Data received from EH with the brief included UDS records and attachments for the Gun Rocks site, including the National Record of the Historic Environment (NRHE) monument report. In addition, United Kingdom Hydrographic Office (UKHO) records were obtained for Stage 2 and HM Receiver of Wreck (RoW) records have been requested but not yet received. Information about previous fieldwork came in the form of two reports from Tyneside BSAC 114 and a video and short report from the Archaeological Diving Unit.
- 1.2.2 Data from Stages 1 and 2 was available for the Stage 3 fieldwork (in WA 2013b).
- 1.2.3 A report was written as a result of a summer's worth of diving by the British Sub Aqua Club (BSAC) Tyneside 114 branch in 1970 (Smith 1970). A team of 12 recreational divers surveyed the site and recorded artefacts some of which were later raised, researched and reported to the Receiver of Wrecks. Many photographs of the site and individual artefacts were taken at the time and it is understood that some, if not all are in the possession of the current Tyneside 114 members. Tyne Tees Television was also involved with making

several documentaries about the site and the activity of the divers however this footage has since been lost.

- 1.2.4 There is an Archaeological Diving Unit (ADU) tape recording of a single dive held by the NRHE that is labelled *Gun Rocks* and dated 1st September 1995. A mask-mounted video camera shows the progress of a single diver on surface supply across the Gun Rocks site. Several of the cannon appearing in the footage have been correlated with cannon recorded in Stage 3. The short report about this monitoring dive recorded that eight cannons were seen along with concreted iron shot, one which had been detached. The report concluded that despite periodic removal of small artefacts, the site is quite stable (ADU 1995). WA has transferred the tape to DVD and a copy has been supplied to the NRHE.
- 1.2.5 To commemorate 40 years since the first survey of Gun Rocks, Tyneside 114 completed a brief investigation of the area in June 2010. They created a rough sketch locating 13 of the cannon from the 1970 survey and they also found a previously unknown cannon to the north of Gun Rocks (Hunt 2010).
- 1.2.6 The UKHO records in 1976 that a wreck was lying in 25ft on east side of Gun Rocks. According to local knowledge it is a 16th century wreck consisting of three cannon and a large number of cannon balls.
- 1.2.7 The Receiver of Wreck has details of artefacts removed from the site on Gun Rocks. The only detailed information about these droits seen by WA comes from secondary sources (Smith 1970 and NHRE) as records from the Receiver of Wreck have not yet been received.
- 1.2.8 The Northumberland Historic Environment Record (HER) and English Heritage NRHE contain records for the remains of wreck that grounded on the eastern side of Gun Rocks, originally thought to be a 16th century warship and later believed to be the remains of a cargo vessel, probably Dutch, with dating evidence of around 1650 to 1715 (HER 25554 and NRHE 907656) .

2 ASSESSMENT AIMS AND OBJECTIVES

- 2.1.1 The overall aim of the project was an undesignated site assessment. This was broken down into the following primary and secondary objectives (EH 2013):

Primary Objectives

- Contact the Receiver of Wreck to gain a list of droits relating to the site;
- Undertake a diver survey of the exposed remains. Confirm position, extent, stability and character (plotted by tracked diver survey) of the site;
- Locate and accurately position (plotted by tracked diver survey and probing as appropriate) any additional archaeological material;
- Produce a structured record of field observations; preferably including a photographic record of the site 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);
- Review the site against the non-statutory criteria for scheduling under the Ancient Monuments and Archaeological Areas Act 1979.

Secondary Objectives

- If possible (and without excavation) assess the likely depth of deposit on the site, estimated by reference to the angle of any frames and the height of any ballast/cargo/artefact mound material;
- Supplement the recording of the core of the site by recording profiles across the main axis of the site;
- Establish links with local divers, dive groups and skippers to enable future site management options.

2.1.2 Following discussions with the onsite EH representative it was agreed that diver survey should consist of ground-truthing selected sidescan sonar anomalies identified during Stage 2 (Wessex Archaeology, 2013b). A1 (anthropogenic origin of archaeological interest) and A2 (uncertain origin of possible archaeological interest) sidescan sonar anomalies were given priority as were those described as elongated anomalies of cannon-like length in the geophysics report (Wessex Archaeology, 2013b). **7139** and **7140** to the north-east of Gun Rocks, **7012-3**, **7131** and **7044** to the north-west and the cluster of anomalies around **7125-7128**, **7023** to the east and **7075** to the south of Gun Rocks were investigated.

2.1.3 Prior to Stage 2-3 fieldwork, it was agreed that the secondary objective to establish links with local divers and to involve them in Stage 3 was to be treated as a priority objective. These were specifically listed as the BSAC Tyneside 114 branch and Ron Young.

2.1.4 The level of site investigation required by English Heritage was defined using WA's proprietary Level of Recording system. A Level 3a approach was requested (diagnostic). All archaeological material located was recorded using still photography and video, together with selected measurements. Positions were to be recorded using either a USBL system or a GPS buoy and/or by distance and bearing to a shot position. It was felt that the full measured site sketch and database of surface artefacts would be sufficient to enable English Heritage, if appropriate, to develop a proposal to designate the site as a Historic Marine Protected Area.

3 METHODOLOGY

3.1 Stage 1 and 2 Geophysical Survey

3.1.1 In early 2013 multibeam swath bathymetry data was acquired by EGS as part of the stage 1 investigations. This data was assessed during both Stages 1 and 2 (WA 2013b). The survey vessel was already mobilised for CEFAS MCZ bathymetric survey.

3.1.2 During Stage 2, both sidescan sonar and magnetic survey data were acquired in various survey areas over the course of three days in May and June 2013. A lower resolution sidescan survey was first conducted. Additional higher resolution data was then acquired over areas of significant archaeological potential identified during the survey.

3.1.3 The uneven, rocky nature of the seabed affected the ability to distinguish between natural geological features and small anthropogenic features of archaeological interest in both the bathymetry and sidescan sonar data. This was a particular problem around Gun Rocks with the geophysical team unable to locate the original, known cannon site. Furthermore; the strong magnetic field caused by the geological background resulted in anthropogenic features being extremely difficult to distinguish against the background data (WA 2013b).



3.1.4 A1 (anthropogenic origin of archaeological interest) and A2 (uncertain origin of possible archaeological interest) sidescan sonar anomalies identified during this survey are shown in **Figure 5**.

3.2 Stage 3 Diving Survey

3.2.1 The diving technique selected was free-swimming buddy-pair SCUBA with through-water communications and twinsets, although lightweight surface supplied diving equipment was also mobilised. Depth did not necessitate the use of gas mixtures other than air and all diving was carried out within no-decompression limits.

3.2.2 The diving operation complied with the Diving at Work Regulations 1997 and the HSE Scientific and Archaeological Diving Projects Approved Code of Practice. The diving operation was undertaken in daylight hours only.

3.2.3 Strong tidal currents running along an approximately north-south axis are experienced around Gun Rocks during most of the tidal cycle. However, significantly longer localised slack water periods are experienced in the immediate vicinity of the site known to Tyneside 114 and what is believed to be the site investigated in the 1970s (Site 1; marked by the buoy on the back cover). This and the availability of nearby dive targets with different slack water times minimised the time lost due to strong tidal currents. Gun Rocks is however an exposed location from the south, north and west and winds of Force 4-5 and above quickly render the location undiveable.

3.2.4 The diving support vessel (DSV) was *Glad Tidings VII*, a local dive charter vessel operated by William Shiel. Shore base, Seahouses Harbour, was approximately 30 minutes away from the Site. Use of a local charter vessel enabled the nearest shore base to be used and proved to be a significant advantage in terms of local knowledge, the location of Site 1 and its tides and shallows being well known to the crew. The vessel operators also provided logistical support in the form of air fills and temporary storage and delivery facilities.

3.2.5 Survey concentrated on re-recording Site 1 (**Figure 3**), together with ground-truthing A1 and A2 anomalies identified during the Stage 1 and 2 geophysical surveys (**Figure 5**). Andy Hunt provided WA with a rough sketch plan of the location of the guns that had already been located.

3.2.6 In order to structure the survey and facilitate diver navigation, ground-truthing was generally carried out by circular searches. The shot was generally dropped as close as possible to each anomaly position to minimise the risk of failing to locate it due to layback errors. Visibility generally exceeded five metres and the primary search technique was therefore visual search.

3.2.7 Exposed artefacts were subject to measured and still photographic recording using a housed Sony RX100 camera and a housed mask-mounted GoPro Hero 3 HD video camera. Extensive still photography was also undertaken on Site 1 for 3D photogrammetric modelling and creation of a photo-mosaic. Soft marine growth was removed from objects and the surrounding seabed in order to facilitate this. Still photographs were taken in both RAW and JPEG, digital video files in MP4 format.

3.2.8 Diver and surface descriptions of archaeological features, operational actions and environmental features were recorded using a proprietary MS Access database called 'DIVA', linked to ArcView 9.3 GIS. DIVA uses a system of 'observation points' to record survey data. Some data was added in real time, other data such as cannon

measurements was generally added post-dive. The DIVA system was also used to generate daily operational logs, which were sent to EH.

- 3.2.9 Positions for all environmental and archaeological features and dive events recorded during the survey and navigational information for the divers were generated using an Applied Acoustics Easytrak Nexus USBL acoustic positioning system (internal instruments) and a Hemisphere R101 dGPS system, linked to the DIVA database. An omni-directional transponder beacon was attached to one of the buddy-pair divers. The Nexus system was selected because it is optimised for shallow water conditions. The position of the diver generated by NEXUS was displayed against GIS layers of the bathymetric and sidescan sonar data and the anomaly positions, enabling the dive supervisor to provide navigational corrections and ensuring that anomaly positions were fully searched. Diver orientation and navigation were also assisted by use of compasses and ground lines.
- 3.2.10 In addition to USBL positions, data derived from a measured offset survey, individual recording of the cannons and from still and video photography was used to compile the Site 1 plan (**Figure 3**). The plan of Site 2, a second group of cannon, was derived from triangulation and cannon measurements, as well as USBL and sidescan sonar data (**Figure 4**).
- 3.2.11 Although geophysical survey suggested that Sites 1 and 2 were not contiguous, a linear search was carried out between them to confirm this.
- 3.2.12 Members of Tyneside 114 were asked to ground-truth anomalies identified during the Stage 1 and 2 geophysical surveys. Targets were discussed with the divers concerned and they adopted a similar ground-truthing methodology as outlined above. As they were not tracked, any archaeological features located were positioned using range and bearing from a shot dropped in the immediate vicinity. Located features were generally recorded using photography. With the exception of the anchor (**6019**), features located by club members were subject to further recording by WA divers. Club members dived as a separate team under their own diving procedures.
- 3.2.13 Other than the removal of marine growth, the work was non-intrusive and no finds were recovered.
- 3.2.14 The possibility of local tourist boat traffic curtailing WA diving operations had been anticipated. However, no problems were encountered and this was at least partly due to the fact that the DSV was chartered from the main local commercial vessel operator.

3.3 Post-fieldwork Processing

- 3.3.1 Photogrammetric modelling was undertaken following fieldwork by a WA specialist. Up to 70 photographs of each cannon on the seabed were processed in Agisoft Photoscan. The resulting models were output as scaled orthographic plans and also as 3D models in interactive PDF format.
- 3.3.2 A photomosaic survey was carried out of cannons **6003**, **6005**, **6006**, **6007**, **6008** and **6009** (**Plate 2**). The final processing of photo-mosaic images was undertaken using Coreldraw by WA drawing office staff. Measurements of parts of the cannon were confirmed using the models and they were also used to aid in the production of site plans.

3.3.3 Information recorded about the guns found on site were compiled and researched by WA staff. This initial investigation was then sent to external Naval Ordnance expert Charles Trollope for further analysis.

4 RESULTS

Results are reported here for Stage 3. Stage 1 and 2 results are incorporated, but are reported upon separately (WA 2013b).

4.1 Summary of Progress Against Objectives

Primary Objectives	Progress
Contact the Receiver of Wreck to gain a list of droits relating to the site.	Awaiting response. The Receiver of Wreck was contacted post fieldwork however no droits have yet been received.
Undertake a diver survey of the site	Achieved. The areas of interest surrounding Gun Rocks were located and searched. Two distinct sites of cannon were surveyed. See Figures 3 and 4 .
Locate any additional material	Achieved. Several other anomalies of archaeological interest were examined and surveyed. See Figures 2 and 5 .
Produce a structured record of field observations	Achieved, using the DIVA recording system and still and video photography and photogrammetry. See archive, images and appendices.
Review the site against the non-statutory criteria for scheduling under the Ancient Monuments and Archaeological Areas Act 1979.	Achieved. See section 7.
Secondary Objectives	Progress
Assess the likely depth of deposit	Not applicable. No ship structure or other coherent archaeological deposits were located.
Record profiles across the site	Not applicable. The site appears to be dispersed and no coherent archaeological deposits were located.
Liaise with BSAC 114 and Ron Young and offer them participation in Stage 3.	Achieved. See below generally.

Table 1: Progress Against Objectives

4.1.2 Tyneside 114 divers participated actively in the Stage 3 fieldwork. They have been provided with both Stage 1 and 2 geophysical survey data in the form of anomaly positions and descriptions and have been attempting to ground-truth further anomalies following the conclusion of fieldwork (email Andy Hunt, Tyneside 114). A very strong level of satisfaction with this participation has been expressed by the club chair and by individual club members (various, pers. comm.).

4.1.3 The author Ron Young was kept updated with regard to the progress of fieldwork and it is suggested that he should be provided with a copy of this report by EH. He was invited to visit diving operations but was unable to do so because he no longer has sufficient mobility to board a vessel safely.

4.2 Data Audit

4.2.1 A limited audit of existing primary and secondary sources has been undertaken in order to inform BULSI (Build; Use; Loss; Survival; Investigation) characterisation (see **section 5.4**) and interpretation generally. Local knowledge has perpetuated the memory of the wreck, although accurate details of the event or the vessel in question have not been well recorded. Nonetheless, it is necessary to examine the available documentary evidence from the perspective of BULSI, as this is directly relevant to the identification and interpretation of archaeological material.

4.2.2 The first written record of the wreck site is a map from 1778 that was created as part of Bamburgh Castle's lifesaving movement (**Plate 1**). Mr Robert Sutherland was commissioned, by Bamburgh trustee John Sharp, to draw a map of the area noting all of the navigational hazards including Gun Rocks. The connection between the wreck and the castle was further strengthened when one of the cannons from the wreck was installed in the castle as part of the shipwreck rescue service (Sharp 1778-1791).

4.2.3 The UKHO records and Northumberland HER both list the wreck site as being on the eastern side of Gun Rocks and while at least one cannon and several artefacts (see **Appendix 3**) have been located on that side, the majority of artefacts have been discovered on the south and western sides of Gun Rocks.

4.2.4 In 1970, Tyneside 114 completed a survey of the Gun Rocks wreck site and produced a quality report. The site was surveyed using trilateration based on 3 pitons embedded in Gun Rocks. During this process 20 cannon and numerous small artefacts were located, surveyed, and in the case of small items and one cannon, raised and drawn to scale. All artefacts raised were reported to the Receiver of Wreck and some artefacts handed over (Smith 1970). For reasons unknown, only 15 of the 20 cannon appear on the site plan. Several of the raised artefacts were examined by experts from the local museums and the National Maritime Museum who concluded that they were from a wreck from the late 16th and early 17th centuries (Smith 1970).

4.2.5 Analysis of the video footage taken by the ADU in 1995 has allowed for five of the eight cannon to be conclusively correlated with cannons recorded in Stage 3. There is also the strong possibility that one cannon in the ADU video has since been removed from the site.

4.2.6 While the Tyneside 114 expedition to Gun Rocks in 2010 did not achieve their aim of a comparative survey to that completed in 1970, they did succeed in locating a previously unknown cannon to the north of Gun Rocks located at 55 39 551N, 001 37 760W (Hunt 2010: 8).

4.3 Site Survey

4.3.1 Diving operations were scheduled to coincide with neap tides. A total of 14 dives were undertaken, with a total in-water time of 758 minutes. When 2 of the 14 dives were aborted due to strong tides, the diving operations were moved to a more sheltered location and therefore no time was lost to weather.

4.3.2 The extent of the area searched is indicated in **Figure 5**. This incorporates the points generated by the USBL system for the diver being tracked (isolated points generally



represent false positions occasionally generated by the USBL system) and uses a 5 metre buffer which accounts for the average underwater visibility.

Site Position

- 4.3.3 The site investigated is the area around Gun Rocks, which is off the south-west coast of Staple Island in the Outer Farnes. The main areas of interest were to the south (anomaly **7075**) and west (**7023** and **7125-8**) of Gun Rocks with several discrete A1 and A2 anomalies investigated to the north (**7131**), north-east (**7012-3**) and east (**7139-40**).
- 4.3.4 The position given below is based on the centre point of Site 1.

Location	N	W
	55° 37.882935'	01° 37.747011'
WGS 84		

Table 2: Site co-ordinates

Seabed

- 4.3.5 The Farne Islands area is a glaciated offshore extension of the igneous Great Whin Sill. The site investigated surrounded the two rocks of Gun Rocks 150m from the western shore of Staple Island. These two rocks are totally submerged at high tide and visible to 3.6m above sea level at low tide.
- 4.3.6 The seabed on the north and west of Gun Rocks drops away at a fairly steep angle to a plateau at approximately 15m below sea level. To the east and south of Gun Rocks, the seabed has a more gradual gradient. Between Gun Rocks and Staple Island the seabed remains at approximately 5-6m below sea level while an area of approximately 50m² to the south is 6-8m below sea level. Beyond this area to the south, the seabed swiftly drops away to a depth of 16m.
- 4.3.7 Site 1 is located off the south side of Gun Rocks on the section of seabed at 6-7m below sea level (**Figure 2**). This area is characterised by undulating bathymetry with sections of large boulders interspersed with cobbled and pebbly areas.
- 4.3.8 Site 2 is situated on the plateau to the west of Gun Rocks where the seabed is very flat with a predominance of cobbles and the occasional boulder and 16m below sea level. This environment type continues to the north and is characteristic of the seabed surrounding anomaly **7044**.
- 4.3.9 As the area surrounding Site 1 is on the lee side of Gun Rocks during a flood tide, it is fairly sheltered during this period. However the current is very strong beyond the protection of the rocks.

Ecology

- 4.3.10 Ecological assessment was not set as an objective and therefore no survey was carried out. However, limited comment can be made based upon general observations during diving, supplemented by available literature.

- 4.3.11 The area surrounding Gun Rocks provides a variety of different environments for flora and fauna to inhabit. The steep slope of the north and west side of Gun Rocks is covered in a variety of different anemones (Young, 2000). The hard rocky seabed to the south is an entirely different environment that is heavily colonised by large kelp that impeded visual searches by divers. Beneath the kelp, urchins and anemones can be found. The deeper areas to the south and west of Gun Rocks are characterised by a flat cobbled seabed with fairly dense coverings of sponges, urchins and anemones. The occasional crab was also seen in this area.
- 4.3.12 The Site lies within the Berwickshire and North Northumberland Coast European Marine Site (EMS). Both kelp forest and faunal turf environments are typical of the EMS generally (Lancaster 2006: 16 & 18).

Archaeological Features

- 4.3.13 The Geophysical Survey in Stages 1 and 2 covered a considerable area around Gun Rocks and revealed a number of potential archaeological remains. High potential A1 and A2 anomalies were focused on directly around Gun Rocks to establish the extent of the wreck site. The main features of the site were two distinct areas of cannons, Site 1 (**Figure 3**) and 30m to the west, Site 2 (**Figure 4**). Several other anomalies were investigated (**7012-3, 7023, 7044, 7075, 7125-8, 7131-2, 7139** and **7140**), and some were found to be archaeological remains (see **Figure 5**).
- 4.3.14 The thirteen cast iron smooth bore muzzle loading (SBML) artillery pieces (cannons) at Site 1 (**Figure 3**) are scattered on a rocky seabed of varying depths in an area approximately 20m by 20m to the southwest of Gun Rocks. These cannon are located in the vicinity of anomaly **7075**. The site is covered by sturdy kelp, with abundant sponges and urchins. There appears to be no pattern to how the cannons are arranged that might reflect their position on board the wrecked vessel. In fact, it is known that at least one of them, **6012**, has been moved from its original deposition as the ropes from the raising attempt are wrapped underneath the cannon. Using a site sketch created by Tyneside 114 divers, the cannons were assigned numbers approximately from north to south starting with **6000** and going through to **6012**. All thirteen cast iron cannon were heavily concreted but the general shape of each, as well as features such as trunnions and cascabels were easily discernible and occasionally it was possible to see reinforcing rings as well.
- 4.3.15 The dimensions of the cannons are recorded below in millimetres and converted to feet and inches in brackets.

No.	Muzzle to base ring	Muzzle face	Bore	Muzzle to trunnion	Trunnion diameter	Trunnion to base ring	Base ring diameter
6000							
6001	2300 (7'6)	200(7 7/8")	100 (3 15/16")	1280 (4'2)	100 (3 15/16")	950 (3'1)	420 (1'5)
6002	2310 (7'6)	200(7 7/8")	100 (3 15/16")	1360 (4'5)	100 (3 15/16")	950 (3'1)	420 (1'4)
6003	2420 (7'11)		110 (4")	1290 (4'2)	110 (4")	1130 (3'8)	450(1'5)
6004	2833 (9'3)						
6005	2630 (8'7)	210 (8")	110 (4")		110 (4")		580 (1'10)
6006	2630 (8'7)	230(9")	100 (3 15/16")				



No.	Muzzle to base ring	Muzzle face	Bore	Muzzle to trunnion	Trunnion diameter	Trunnion to base ring	Base ring diameter
6007	2400 (7'10) (visible)	210 (8")	110 (4")		130 (5")		
6008	2320 (7'7) (visible)	210 (8")	110 (4")				
6009	2400 (7'10)	230 (9")	110 (4")	1400 (4'7)	115 (4 ½")	1000 (3'3)	
6010	2570 (8'5)	250 (10")	100 (3 15/16")	1670 (5'5)		900 (2'11)	450 (1'5)
6011	2500 (8'2)	300 (12")	100 (3 15/16")	1400 (4'7)	140 (6")	1100 (3'7)	550 (1'9)
6012	2650 (8'8)	250 (10")		1450 (4'9)		1000 (3'3)	

Table 3: Measurements of cannon from Site 1

- 4.3.16 Cannon **6000** was not examined by WA divers but its presence was noted by the volunteer Tyneside divers and its rough location noted by them. The Tyneside club has been tasked with recording this cannon as part of their future work on the site.
- 4.3.17 Cannon **6001** is orientated almost directly facing north and is 2230mm from muzzle to breech. Despite the concretion layer, the divisions of the first and second reinforcements are easily discernable.
- 4.3.18 Slightly south of **6001** is cannon **6002** which is located on a bed of large rocks and is pointing northwest. The 2310mm cannon is fairly intact and lying on its right side with the left trunnion facing up. The cascabel and muzzle are intact but a chunk has been taken out of the top face in the middle of the section from trunnion to muzzle. Reinforcing rings are visible along the length of the cannon and their lengths are: first reinforcement 700mm, second reinforcement 350mm, vent field is 190mm and cascabel and button 400mm. The situation of cannon **6002** in a relatively open space, made this artefact an excellent candidate for photogrammetry, the results of which can be seen in **Appendix 5**.
- 4.3.19 Cannon **6003**, **6004** and **6005** are all located at the base of a steep drop off from Gun Rocks. This area is predominantly covered with kelp and the cannon were not clearly visible during initial inspections. Clearing of kelp throughout the fieldwork made these cannons more discernible. Cannon **6005** is one of the longer cannons in this area measuring 2630mm from muzzle to base ring. It is orientated in a north to north-east direction with its trunnions and cascabel still intact. Cannon **6004** is the largest of all cannon in the Gun Rocks area measuring 2833mm from muzzle to breech. It is located slightly to the east of **6005** and oriented in a south west position. Cannon **6003** is positioned south of **6004** and **6005** and not in very good condition. It is lying on its back with the right trunnion almost broken off and the left one damaged slightly. The muzzle is much worn and some of it has been broken off so the extant length of the cannon is 2420mm.
- 4.3.20 The cluster of cannons **6006-8** were often used by divers as a reference point for the site, particularly **6008**, which projects beyond the rocks and kelp and is visible for some distance. This cluster is to the west of cannons **6003-5**. Cannon **6006** is lying on a bed of small stones with muzzle pointed slightly up and north. It is lying on its left side and has a slightly broken muzzle and an overall length of 2630mm. Very slightly to the west is **6007** which is lying upright and in fairly good condition, with an overall visible length of 2400mm



with muzzle up against **6008**. Cannon **6008** is in very good condition with an overall length of 2320mm. This cannon has a very intact muzzle which is pointing almost 45 degrees from vertical.

- 4.3.21 To the south of the cluster is cannon **6009** which is located in a clearing on a bed of small rocks which made it ideal for photogrammetry (**Plate 2**). The cannon measures 2400mm from muzzle to breech and is lying on its left side with right trunnion pointing up. The muzzle is quite deformed and it is possible that a blowout has occurred. This is a very worn and concreted cannon which means there are no rings visible and no evidence of a cascabel. Cannon **6010** is nearby and oriented in a south west position. The overall length of the cannon is 2570mm including a 220mm section of the muzzle where only half remains with the rest sheared off. This cannon does not have a cascabel anymore but both trunnions are intact.
- 4.3.22 To the south lies cannon **6011** in an area of cobbled rocks. This 2500mm long cannon is lying on its back with both trunnions intact and cascabel partially intact but much worn. Faint rings are visible at the breech. The muzzle is quite broken, with over half the barrel missing for a small portion and pushing up against a large rock.
- 4.3.23 The final cannon at this site, **6012**, is located within a gully of Gun Rocks. There is evidence of an attempt to lift this cannon out of the water in the form of ropes trapped beneath the artefact. This 2650mm long gun is one of the largest cannon at this site and is lying on its side in the gully.
- 4.3.24 A small section of lead sheet (**6022**) was identified to the northeast of cannon **6009** in Site 1. It is curved which suggests that it may be a gun apron, originally designed to be placed over the cannon's vent field to keep the powder dry.
- 4.3.25 Two concreted iron shot (**6021**) were found south of cannon **6003**. They are 100mm in diameter including concretions and appear to be part of a formerly larger group of iron shot. There is evidence for at least one other iron shot that has been forcibly removed from the seabed.
- 4.3.26 Site 2 (**Figure 4**) is 30m west of Site 1 and consists of six cast iron SBML artillery pieces on a cobbled flat seabed with sponges and a few urchins as the predominant sea life. These cannon are located in the vicinity of anomalies **7023** and **7125-8**. No evidence of these cannons has been found in earlier surveys and it is presumed that they have not previously been recorded. The six cannon were clearly identified on the sidescan sonar images of the area, as the elongated shapes were distinctly visible on the very flat seabed. This was in contrast to the cannon at Site 1 which were not discernible amongst the rocky seabed. All six cannons were recorded through measurements of the discerning features and through photographs. The nature of the flat seabed allowed for divers to measure between the cannon and these measurements, when combined with compass bearings, allowed for a site plan to be created. The accuracy of the site plan was then confirmed against the sidescan sonar anomalies that indicated the positions of the cannon.
- 4.3.27 The dimensions of the cannons are recorded below in millimetres and converted to feet and inches in brackets.

No.	Muzzle to base ring	Muzzle face	Bore	Muzzle to trunnion	Trunnion diameter	Trunnion to base ring	Base ring dia.



6013	2000 (6'6)	220 (8")	70 (2 ¾")	1195 (3'11)	70 (2 ¾")	805 (2'7)	
6014	2200 (7'2)	250 (9")	80 (3")	1150 (32'9)	100 (3 15/16")	1050 (3'5)	
No.	Muzzle to base ring	Muzzle face	Bore	Muzzle to trunnion	Trunnion diameter	Trunnion to base ring	Base ring dia.
6015	2400 (7'10)	270 (10")	100 (3 15/16")	1150 (3' 9)	100 (3 15/16")	1250 (4'1)	
6016	2650 (8'8)		145 (6")	1500 (4ft'11)	150 (6")	1150 (3'9)	500 (1'7)
6017	2300 (7'6)		100 (4")	1350 (4'5)	100 (3 15/16")	950 (3'1)	
6018	2450 (8')	280 (11")	110 (4")	1400 (4'7)	110 (4")	1050 (3'5)	540 (1'9)

Table 4: Measurements of cannon from Site 2

- 4.3.28 At 2000mm from muzzle to base ring, Cannon **6013** is the smallest in the Gun Rocks area. It has a much worn surface with large pitting holes and is lying almost on its back on its left side.
- 4.3.29 Cannons **6014** and **6015** are lying very close together. **6014** is another relatively small cannon at 2200mm in length. It is lying right way up and has a much concreted surface with large pitting. Cannon **6015** is 2400mm long and has its muzzle up against cannon **6014**. Lying upside down and leaning slightly to the left, it has an intact muzzle and cascabel with rings around the breech area faintly visible.
- 4.3.30 Cannon **6016** is 2650mm long and lying upside down and leaning slightly to the left. Once again, the surface of the cannon has distinct pitting and is noticeably worn. The muzzle is intact and is situated almost right up against a large rock while the cascabel is present but quite worn.
- 4.3.31 Cannon **6017** is lying on its back leaning slightly to the right (see **Plate 6**). The 2300mm long cannon has an intact but fairly worn cascabel with some details of the button still visible. Several rings are visible and are the following lengths: chase 850mm, second reinforce 450mm, first reinforce 500mm and vent field 200mm.
- 4.3.32 The final cannon at Site 2 is 16m away from the other five. Cannon **6018** is 2450mm long and has a much pitted surface. The muzzle is chipped around the bore which may be the result of a blowout during firing.
- 4.3.33 Anomaly **7139** was classified as an A2 in the geophysics report (Wessex Archaeology 2013b) and described as a distinct elongated anomaly with a thin rectangular shadow visible. Its long shape and length of 13.5m suggested it could be a cannon or cannons. Upon inspection, divers identified this anomaly as a cylindrical wooden object (**6020**), possibly part of a ship. The artefact is 1350mm long with a diameter of 240mm throughout the majority of its length but tapers off at either end due to environmental erosion. The wooden object has clearly been purposely worked into a cylindrical shape (**Plate 8**). Further investigation revealed there were one inch diameter cuprous bolts driven through the timber at semi regular intervals. The bolts were located at the following measurements from the southeast end: 2.9m, 3.9m, 4.55m, 5.2m, 6.55m (bolt missing), 7.2m, 7.92m, 8.5m, 9.14m, 9.82m, 10.5m, 11.2m, 11.78m, 12.5m, 13.2m. Some of these bolts were slightly rounded at the ends through weathering whilst others had jagged broken ends.

While the proximity to the wreck site suggests it is part of ship construction, no parallels have been identified in other vessel designs. The length and cylindrical shape of the object suggests that it could be a spar, yard or bowsprit however there is no precedent for cuprous bolts in such elements of ship construction. Usually any ship fittings, such as cleats, attached to rigging members were made of iron. Further investigation is required to identify whether this artefact is connected to the Gun Rocks wreck.

- 4.3.34 Volunteer divers from Tyneside 114 were sent to investigate anomaly **7044** that had been identified in the Stages 1 and 2 Report (Wessex Archaeology 2013b), as a linear piece of debris with a hooked shadow. The divers proved that the geophysicists had been correct in identifying this anomaly as an anchor, seen in **Plate 7**. The anchor **6019** has a 2500mm shank of square cross section which is 40mm high and 90mm wide when lying on the seabed with one arm raised. The ring attached at one end has an internal diameter of 230mm and the ring itself is 50mm thick. At the opposite end of the shank, the crown has a single hole going through it where the shank joins the arm. The divers reported that the arm appeared to have no distinct fluke although it may be possible that a small fluke is present underneath marine growth. The divers also could not ascertain whether there was a matching arm buried in the seabed although the positioning of the anchor does suggest that an arm is buried in the sediment which is keeping the opposite arm upright.

Anomaly **7131** was investigated on the last dive of the fieldwork. It was 80m from the northern tip of Gun Rocks and was described in the geophysics report (Wessex Archaeology 2013b) as having characteristics that suggest it could be a cannon. Upon investigation it was found to be a modern metal locker or section of ducting measuring 1600mm by 450mm by 300mm.

Anomalies **7131-2**, **7012-3** and **7139** were examined by divers and found not to be archaeological remains.

5 DISCUSSION

5.1 Type and Size of Site

- 5.1.1 While the archaeological remains of cannons, cannon balls, and a possible lead apron suggest that there is likely to be a wreck site at Gun Rocks, the lack of any vessel structure makes it difficult to discern the exact nature of the site. As there are no vessel remains and no order to the cannon distribution on the seabed, it can only be conjectured as to the circumstances of the wrecking event.
- 5.1.2 The site is located on a rocky and cobbled seabed in a periodically high energy environment. There are two clear areas of archaeological remains (Site 1 and Site 2) with the possibility of at least one or two more areas as shown by the cannon reported by Tyneside 114 to the north-east of Gun Rocks and the unidentified wooden object (**6020**) to the east. WA divers completed several swim searches in the 30m area separating Site 1 from Site 2 and did not find any cultural material. Although there currently appears to be two distinct areas of cannon on the seabed over an area of 80m east-west and 40m north-south, they are most likely to be from the same shipwreck as the cannon design is similar on both sites. This assertion is strengthened by the similarity in the typology of the cannon assemblage as a whole.
- 5.1.3 Further evidence to connect the two areas of cannon can be found in the investigations into the wrecks of the *Sacramento* (1647) and *Mauritius* (1609). Both these vessels were laden with cannon and analysis of the wrecking event proved that there was an initial

spillage of cargo while the hull and remaining contents drifted for a time before sinking, hence the two areas of cannon (Charles Trollope pers. comm.).

- 5.1.4 Another hypothesis to connect the two areas of cannon relates to the number of artefacts removed from the seabed, mainly over the last few decades. It is known that at least nine cannons have been raised in the recent past (see **Appendix 3**) although, on the whole it is not known from where they were removed. It is conceivable that cannon and other shipwreck related artefacts may have been raised from the area between the two sites and that it used to be a more continuous area of artefact deposition.
- 5.1.5 So far, there have been no conclusively identified vessel remains from the Gun Rock wreck. There is the possibility that the cylindrical wooden object (**6020**) was part of the vessel. **6020** has been purposely formed into a cylindrical shape which is common on spars and yards of ships. Another typical feature of wooden vessels is cuprous bolts such as those found irregularly spaced on **6020**. However, as yet, no comparative ship design can account for the cuprous bolts in a cylindrical ship timber. Cuprous bolts usually have the purpose of securing hull features together which are rarely cylindrical and most commonly of a rectangular cross section. Conversely, it is common to find metal fastenings in elements of a ship's superstructure, however these are usually iron rigging fittings and not of a cuprous nature. As the only remaining artefact in the area that could possibly part of a vessel structure, further investigation is required to establish what component of a vessel it might be, and also to establish whether it is from the cannon wreck at Gun Rocks or from one of the other wrecks in the Farnes.
- 5.1.6 As there are no confirmed vessel remains, it can only be hypothesised as to how the wreck occurred. A suggested scenario is that the vessel grounded at high water, when the Gun Rocks were not visible. The cannon were then haphazardly distributed around the offending rocks through the force of the water and currents. This high energy environment would most likely have also resulted in the disintegration of the wooden remains of the vessel as the rocky seabed is not conducive to vessel preservation through lack of protective sediments.
- 5.1.7 While it is unlikely that any substantial remains of the vessel will be found on the rocky seabed surrounding Gun Rocks. There is the possibility of small artefacts to be located between the rocks and in gullies and some of them may provide further information into the nature of the vessel itself. The site used to have a greater variety of finds on the seabed; however over the years many have been raised by divers, such as during the 1970 survey by Tyneside 114. All known artefacts that have been removed from the Gun Rocks site have been recorded to give background information on the former diversity of the site (**Appendix 3**).
- 5.1.8 Other objects identified during the survey of the Gun Rocks included an anchor and a metal locker or piece of ducting. Due to the distance from the main sites and the nature of construction, it is concluded that the anchor **6019** is probably not associated with the early 18th century wreck site. The metal locker/section of ducting **7131** is also considered to not be associated with the wreck as it is modern.

5.2 Date of Loss

- 5.2.1 Although it is not possible to calculate an exact date for the loss of this vessel, there are several pieces of evidence that can provide an approximate time period in which the shipwreck occurred.

- 5.2.2 Using the physical evidence of the remaining cannon on the seabed, the style and design of the cannon suggests a late 17th-early 18th century date. Naval ordnance experts Charles Trollope and Nico Brinck both agree that the cannon from this wreck can be dated to the end of the 17th and early 18th centuries. Brinck likens the cannons at Gun Rocks to one at Fort Nelson of similar dimensions and even goes as far to specify the dates of 1670-1710 (pers. comm. 28.09.13).
- 5.2.3 Whilst not securely tied to the wreck site, the sword hilt **6023** was dated to the early 18th century by Paul Wilcock of the Arms and Armour Research Institute (pers. comm. 8.10.13). Many other small artefacts raised during the 1970 survey were examined by relevant experts with the overall conclusion that the items dated the wreck to the late 17th and early 18th centuries (Smith 1970).
- 5.2.4 There are no contemporary documents recording the loss of the vessel on Gun Rocks, however there are several written sources from within a generation or two of the wrecking event that can provide further details. In a document dated 1778-1791, John Sharp trustee of Bamburgh Castle, records that the wreck occurred “probably in 1704” (Sharp 1778-1791). While this document was written at least 70 years after the fact, it can still be considered as a relevant guide. There is also another contemporaneous written source that confirms this early 18th century date. Thomas Pennant wrote his “A Tour in Scotland” in 1769 and mentions that a Dutch frigate of 40 guns was wrecked approximately 60 years earlier (Pennant 1769).
- 5.2.5 It can therefore be surmised that a ship was wrecked on Gun Rocks in the early 18th century with archaeological evidence and written sources to support this date.

5.3 Identification

- 5.3.1 At this point in the investigation, it has not been possible to find the identity of the vessel wrecked on Gun Rocks. Using a combination of documentary and archaeological evidence it is possible to narrow down the options for the type of vessel.
- 5.3.2 Documents written within one or two generations of the wrecking event report that a Dutch merchant vessel had run onto the rocks with loss of all life (Pennant 1769; Sharp 1778-1791). As there are no recorded eyewitness accounts or contemporary documents recording the event, it is difficult to ascertain how accurate the reports of Pennant and Sharp it might be. The lack of eyewitness accounts can partially be explained by the second-hand report that all crew were lost from the vessel (Pennant 1769).
- 5.3.3 For some reason by the late 19th century, the identity of the wreck had changed from being of Dutch origin to being associated with the Spanish Armada (Bates 1894). This story was incorporated into the interpretation of the Bamburgh Cannon (**6024**) and has only recently been refuted by further research. The Spanish Armada was also the main course of research during the Tyneside 114 survey in 1970 until artefact analysis proved a later date (Smith 1970).
- 5.3.4 Current examination of the archaeological remains, focussing on the cannon, has caused the nationality of the wreck to be brought back to the Netherlands and to draw some possible conclusions about the purpose of the vessel. After initial analysis by WA staff, an assemblage of information, including measurements and photographs, was sent to naval ordnance expert Charles Trollope for verification of the identity of the cannons on the Gun Rocks site.

- 5.3.5 As can be seen in **Tables 3** and **4**, there was no uniformity of dimensions amongst the cannons around Gun Rocks. There were not even matching pairs of cannon revealed in the measurements. Cannon lengths ranged from 2000mm (6'6) to 2833mm (9'3) with bores similarly varying from 70mm (2 ¾") to 145mm (6"). Charles Trollope concluded that the varying dimensions of the cannons on board meant that these artillery pieces were being used for trade rather than protection (pers. comm. 29.09.13). While all armed vessels had a range of calibre weapons on board at any one time, it was usual to have different groups of matching calibre weapons to serve varying purposes rather than the mismatch assemblage displayed on the Gun Rocks site.
- 5.3.6 There was a range of cannon to be found on site but mostly of the small to medium calibre. The smallest cannon in size and calibre was **6013** which is a 2 pounder. **6014** was tentatively identified as a 6 pounder. Eight other cannons have been confirmed as 6 pounders (**6001**, **6006**, **6002**, **6010**, **6011**, **6012**, **6015** and **6017**), six from Site 1 and two from Site 2. Another six cannons were identified as 8 pounders (**6003**, **6005**, **6007**, **6008**, **6009**, and **6018**), five from Site 1 and one from Site 2. Cannon **6004** from Site 1 was identified as an 18 pounder and **6016** from Site 2 was identified as either an 18 or 24 pounder. While no patterns can be discerned from the distribution of cannon across the two sites it should be noted that the smaller assemblage at Site 2 contained both the smallest calibre and the largest calibre cannon at Gun Rocks.
- 5.3.7 Another example of an 8 pounder from the Gun Rocks site is the Bamburgh cannon (**6024**). As this cannon was no longer covered in concretion it was easier to see the finer detail of the weapon although unfortunately no maker marks were visible. While the Bamburgh cannon was referred to as a nine pounder in Sharp's account (Sharp, 1778-1791), it has been identified by Nico Brinck as an 8 pounder. This variation can be attributed to cultural differences in classification with Dutch 8 pounders being equivalent to English 9 pounders (Nico Brinck pers. comm.).
- 5.3.8 Although concretions currently cover the production marks of the underwater cannons, it is known that they had 'F' and 'S' marked on their trunnions. The divers in the 1970 survey removed the concretion and recorded these marks and there are photographs of the marks in the report (Smith 1970). This associates the cannons with the production centre at Finspong, Ostergotland in Sweden (Kennard 1986). Cannon founding was a major industry in Sweden and was first established by the Dutch de Greer family and went on to supply most of the Dutch requirements for iron guns from the 1620s onwards (Martin 2005; Charles Trollope pers. comm. 23.11.13). Other examples of Dutch wrecks in UK waters with Finspong artillery include the *Kennemerland* (1664) and *Adelaar* (1727) (Martin 2005). Nico Brinck also confirmed the Swedish origins of the Gun Rocks cannon (Nico Brinck pers. comm. 28.09.13).
- 5.3.9 It should be noted that several of the cannon show signs of damage. While it is not possible to conclusively state whether this occurred before or after the wreck event it likely that at least some of the damage occurred before the wreck event. Many of the cannons show damage to the cascabels and trunnions. As these are the more fragile protruding aspects of the artefact, it is difficult to ascertain whether this damage was sustained before the wreck, during the wrecking process or as a result of the underwater environment. **6002** has a chunk taken out of the barrel but it is not possible at this stage to determine whether this happened before the wreck or not. The damage caused to the muzzles of three of the cannon more obviously occurred pre-wrecking. The muzzles of cannons **6006**, **6009** and **6018** show evidence of a possible blow out during firing and **6010** and **6011** are missing the top halves of an approximately 200mm section of muzzle which could also have been a pre-wreck event. The fact that five out of nineteen cannons were damaged is not enough to conclude that these were scrap artillery being used as



ballast, however it must remain a strong possibility. There is evidence of this practice taking place on East Indiamen and on Danish vessels (Brown 1990; Auer 2013).

- 5.3.10 From local stories in the 18th century and reported anecdotes in the 20th and 21st centuries it can be concluded that there used to be more than the current 19 cannon in the Gun Rocks area. A document written within two or three generations of the wrecking event reported that it was thought to be a 40 gun vessel that sank in the 18th century (Pennant 1769). In 2013, a member of the initial Tyneside survey crew recalled that there were 40 or 42 cannon on site in 1970 (pers. comm. Selby Brown 05.09.13) however only 25 cannon are mentioned in the report and only 15 actually appear on the site plan and these are all to the west of Gun Rocks (Smith 1970). A popular dive guide also reports that there used to be 25 guns onsite (Young 2000).
- 5.3.11 There are reports of several cannon being legally and illegally removed from the site which has contributed to their diminishing numbers. One cannon was raised with the knowledge of RoW by the Tyneside club in 1970. There is also anecdotal evidence of between two and nine cannon being raised from the site, as some reports may overlap with another (Diver 1996; Northumberland County Council 1996 and Selby Brown pers. comm.). Unfortunately it is not possible to reconcile the site plans of the 1970 survey with that of the current survey and therefore decipher which cannons have been recorded by Tyneside 114 and subsequently removed.
- 5.3.12 No records or site plans have yet been discovered from the ADU monitoring survey in 1995 beyond the video footage. Therefore, it has not been possible to track which cannons were still on site at that time. However, careful observation of the video did allow for cannons **6002, 6006, 6007, 6008** and **6011** to be identified. It was also noted that an extra cannon used to be located near **6002** but has since been moved or removed.
- 5.3.13 Taking all the reports of differing numbers of cannon into account, it is difficult to definitively prove how many cannons there originally were at Gun Rocks. It is also difficult at this point to prove how many cannons still remain onsite. While 19 cannons were recorded by WA, one other cannon was reported by Tyneside 114 to the northeast of Gun Rocks, and there are also still several A1 and A2 anomalies that could be potential candidates for more cannons. These will be investigated by Tyneside 114 in due course.
- 5.3.14 Taking the changing numbers of possible cannons into account, along with their carrying calibres and sizes, Nico Brinck has concluded that the most likely scenario for the wreck at Gun Rocks is a merchant ship with a cargo of cannons. The vessel was probably a Dutch vessel transporting Swedish made cannons from Sweden to the Netherlands when it was blown off course and wrecked on Gun Rocks. The early 18th century was at the height of the Dutch trading boom and therefore this vessel would have been one of many hundreds of trading vessels on the sea at that time. It would therefore be challenging to locate any records of this vessel (Nico Brinck pers. comm. 28.09.13).

5.4 Overall Characterisation

- 5.4.1 The overall character of the exposed material on the seabed can be summarised as follows, using the Build/Use/Loss/Survival/Investigation (BULSI) method of 'shipwreck biography'. For the purposes of the analysis it is assumed that only one shipwreck is present and that Site 1 and Site 2 are from the same wreck.

Build	No archaeological remains have yet been identified that are definitely
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	<p>part of the ship construction. It can be assumed that the vessel was a wooden construction as was typical of the time in early 18th century. It is possible that the cylindrical wooden object, 6020 located to the east of Gun Rocks, may be part of the vessel but this has not been proved as yet. Due to the highly turbulent waters around Gun Rocks and the hard substrate, it is unlikely that any ship remains will be found beyond small pieces that may be located in the gullies and gaps between the rocks.</p>
Use	<p>There is no firm archaeological evidence to suggest what type of vessel was wrecked on Gun Rocks however analysis of the cannon combined with written sources and local knowledge may provide a solution. The first written account of the wreck is by Thomas Pennant who records in 1769 that a Dutch frigate of 40 guns was lost opposite to Bamburgh Castle. Sharp also supports the theory that the vessel was a Dutch 40 gun ship. However by the late 19th century, the wreck had become associated with the Armada (Bates 1894) and this still prevailed through to the late 20th century with members of the Tyneside 114 club investigating this avenue of research (Smith 1970).</p> <p>Rather than being an armed warship of Dutch or Spanish origins, current analysis of the cannon designs and sizes suggests that the vessel is more likely to be a Dutch merchantman carrying a cargo of guns. Armed vessels would have carried a range of different calibre guns to serve different purposes on board. However, within each calibre type, the cannons would have been uniform in length. While the majority of cannon on the Gun Rocks site are 6 and 8 pounders, they are all of varying lengths which suggests that they are a cargo of cannon rather than armaments for the vessel (pers. comm. Charles Trollope). Damage to some of the cannon may prove that some or all of the cannon were being used as ballast rather than as future defence enforcers.</p>
Loss	<p>There are no primary records of the ship sinking/loss and the archaeological remains on the seabed do not provide enough detail to reconstruct the wrecking event. As yet, no primary documents recording the wrecking event have been located and as Pennant records that all crew were lost during the wreck (Pennant 1769) it is unlikely that any such documents exist. There are no confirmed remains of the vessel on the seabed, and the arrangement of the cannons is haphazard and reveals no information as to how the vessel may have come to grief. It is deduced that the ship ran into the Gun Rocks at high tide or in the dark when the navigation hazard could not be seen.</p>
Survival	<p>The first account of the wreck was in Pennant's guidebook of 1769. By 1778, it was common local knowledge that a vessel with many guns had been wrecked off Staple Island, thus giving rise to the name of 'Gun Rocks' (Plate 1). John Sharp also gave an account of the wreck in his document dated from 1778-91. Early local knowledge of the wreck has perpetuated the story of the cannon wreck even if the details of the nationality, design, type and period of vessel have changed over the years.</p> <p>The UKHO has details of a wreck to the east side of Gun Rocks and reports that local knowledge states it is a 16th century wreck. The NRHE also lists the vessel being wrecked on the eastern side of Gun Rocks. It reports that the vessel appears to have grounded on the eastern side of Gun Rocks although it does report artefacts being located, and some retrieved from the south side of the rocks. It is now clear that the majority of wreck material is to the west of Gun Rocks (Figure 5). It is possible that the vessel was stranded on Gun Rocks with some material falling to</p>



	<p>the east but the majority of the wreck disintegrating to the west as is shown by Site 1 and Site 2. Further investigation of the area to the north-east around the reported cannon is required to confirm this theory.</p> <p>No confirmed vessel structure remains have been located. A combination of high energy environment and rocky seabed with minimal sediment were contributing factors in the lack of vessel structure preservation. Fortunately, numerous gullies and places between rocks ensured the survival of small artefacts on the site. Many such artefacts were located and raised during the 1970 survey and at that time it was noted that many were well worn from the underwater environment. This can be extended to the cannons remaining on the seabed. As sturdy metal objects it is to be expected that they have survived underwater for several centuries. However, there is some evidence of the harsh turbulent marine environment shown in the wearing of cascabels, muzzles and trunnions and the pitting on the surfaces of some cannon, particularly at Site 2.</p> <p>While no evidence of vessel structure exists, there are still considerable archaeological remains on the seabed. 19 cannons, a lead apron and several iron shot are confirmed remains of the wrecked vessel on Gun Rocks. However in the past, a greater diversity of artefact types could be found on the seabed and many artefacts have been raised over the years.</p> <p>The first item known to be retrieved from the wreck site is the cannon 6024 that now resides at Bamburgh Castle (Plate 10). It was raised in 1744 along with a bronze cannon. Since then, up to nine other cannon have been raised both legally and illegally. Numerous small artefacts were raised from the seabed during the 1970s survey and a few other items have been raised and reported to the RoW. A complete list of known artefacts removed from the Gun Rocks site is found in Appendix 3.</p>
Investigation	<p>Several surveys of the Gun Rocks site have taken place over the past 40 years. Unfortunately none have provided comprehensive coverage of all the site and archaeological remains.</p> <p>BSAC Tyneside 114 were the first group to survey the site in 1970. For a group of recreational divers they produced a high standard report (Smith 1970) after completing a trilateration survey of the remains to the west of Gun Rocks corresponding with the current Stage 3 Site 1. The recreational divers were in a position to record many small finds from the Gun Rocks site, many of which were raised and reported to RoW.</p> <p>The ADU in 1995 completed a measured and video survey of part of the Gun Rocks site, once again corresponding with part of the current Site 1.</p> <p>In 2010, a new generation of recreational divers from Tyneside 114 returned to the site unfortunately they were not able to complete a comprehensive survey to match the one done in 1970. However, the divers did locate a previously undiscovered cannon to the north of Gun Rocks.</p> <p>The most recent survey completed by WA in 2013 is the most comprehensive to date. However even then, the whole site was not surveyed in its entirety. While a new group of cannons were located and surveyed at Site 2 in addition to the well documented assemblage at Site 1, the divers were unable to investigate all the potentially archaeological anomalies or locate the cannon to the east of Gun Rocks.</p> <p>Further investigation is required of the Gun Rocks site to ensure that a</p>

	complete survey of the area is completed and all archaeological remains are documented.
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Table 5: Characterisation Using BULSI

6 RISK ASSESSMENT

- 6.1.1 Using available information, the Site has been risk assessed for the purposes of site management using the EH Risk Management Handbook (EH 2008). The results are set out in **Appendix 4**.
- 6.1.2 Risk is assessed as medium risk. The principal vulnerability identified is the risk of a resumption of finds recoveries without adequate archaeological controls, however this is relatively minor.

7 ASSESSMENT AGAINST THE NON-STATUTORY CRITERIA FOR SCHEDULING

7.1 Assessment Scale

- 7.1.1 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;
 - Extremely Valuable – this category makes the site exceptionally important. The site could be designated on the grounds of this category alone.

7.2 Non-Statutory Criteria Assessment

- 7.2.1 The Gun Rocks site has been assessed against the *Ancient Monuments and Archaeological Areas Act 1979* using the assessment scale outlined above. Should further evidence be found relating to the site, this assessment should be updated appropriately.

Period

- 7.2.2 Highly Valuable. The wreck at Gun Rocks has been identified as being from the early 18th century. This falls into the Stuart period (1603-1714) for wrecked and lost vessels databases (NHRE and WA Early Boats and Ships). While there are a large number of vessel losses recorded during this period (over 1200) there are only 38 undesignated wrecks and 23 designated wrecks in English waters for this era (WA 2013a). While this is a considerable number of known wrecks, it is still a small amount compared to post 1840

wrecks. Known wrecks of the Stuart period also tend to be in poor condition due to the effects of the environment or removal of artefacts. Therefore, as was stated in the Early Boats and Ships study, sites of the Stuart period should be considered of special interest (WA 2013a).

Rarity

- 7.2.3 Highly valuable. In the post-medieval period (1501-1901), there are 392 NRHE loss records for Dutch cargo vessels wrecked in UK waters. Very few of these correspond to actual known wreck sites of Dutch vessels. Amongst these post-medieval known Dutch merchant vessel wrecks, there are none that share the identifying characteristics of the Gun Rocks wreck, namely, the remains of a Dutch merchant vessel carrying cannons.

Documentation

- 7.2.4 Moderately valuable. There are no known contemporary documents relating to the wreck on Gun Rocks and it is unlikely that any will be located. However there are several secondary sources written within 70 years of the wrecking event that can reveal some relevant information. The 1778 map drawn by Sutherland is a significant document that records the location of Gun Rocks in space and time. While not contemporary, the documents of Pennant and Sharp, most likely have some element of truth in the details that they recorded about the wreck (Pennant 1769; Sharp 1778-91).

Group Value

- 7.2.5 Moderately valuable. The wreck at Gun Rocks does not easily fall into a group of vessels by design, purpose or period however it does add to the diversity of wrecks in the Farne Islands. Of the 176 wrecks listed by English Heritage Monument Reports as being in the Farnes, none display similar characteristics to that of Gun Rocks wreck. The group value of the Gun Rocks wreck is that it adds to the diversity of wrecks in the Farne Islands and contributes to the significant diving industry of the area.

Survival / Condition

- 7.2.6 Variable. While there are no known surviving remains of the vessel itself, and many smaller artefacts have been removed from the site, the cannons themselves are remarkably preserved and are a distinguishing feature of the site. The site's state of preservation is typical of wrecks of the Stuart era, the Early Boats and Ships study recommends that any wreck of this era should be considered of special interest no matter how poor the condition (WA 2013a).

Potential

- 7.2.7 Moderately valuable. This wreck site has a small amount of archaeological potential that will be revealed by investigating the remaining target A1 and A2 anomalies. This will determine whether there are any further archaeological remains in the vicinity. One final survey, as is outlined below, will exhaust the potential of the site archaeologically. However, there are other areas in which this site might excel. There is considerable scope for public engagement with the site with minimal damage to the archaeological remains.

7.3 Summary

The Gun Rocks wreck site demonstrates high value in the categories of Period and Rarity, moderate value in Documentation, Group Value and Potential and is variable in the category of Survival/Condition. Therefore, according to the non-statutory criteria assessment and the recommendation that sites demonstrating high value in two criteria (English Heritage 2012), the Gun Rocks wreck site is a strong candidate for scheduling under the *Ancient Monuments and Archaeological Areas Act 1979*.

8 CONCLUSIONS

8.1.1 The site as defined by the results of the geophysical and diver surveys consists of two main sites which together contain 19 cannons a lead apron and iron shot. No vessel remains were conclusively identified. The design and type of the cannons have been identified as being produced in Finspong, Sweden in the late 17th or early 18th centuries. The majority of cannons are 6 or 8 pounders with one 2 pounder, one 18 pounder and an 18 or 24 pounder also found off Gun Rocks. The considerable variation in sizes within the calibre types has led to the conclusion that the cannons were cargo rather than artillery. Damage noted on several of the cannons also leads to the possibility that the cannon were being used as ballast rather than transported for later armament use. The overall conclusion is that a Dutch cargo vessel was transporting cannons from Sweden to the Netherlands when it was blown off course and wrecked on Gun Rocks in the early 18th century.

8.1.2 Wessex Archaeology recommends that the following avenues are pursued to come to a more complete understanding of the Gun Rocks wreck site.

Additional Survey

8.1.3 The baseline survey of this site is incomplete and therefore it is recommended that the following additional work should be undertaken:

- Full measured survey and photographic recording of all known cannons, including the cannon reported to be to the east of Gun Rocks, followed by further specialist analysis to identify them;
- Further searches on the east side of Gun Rocks to investigate historic reports of wreck material associated with Site 1;
- Searches around Sites 1 and 2 to define their full extent;
- Further groundtruthing of A1 and A2 cannon-like geophysical anomalies;
- Further investigation of wooden ship timber **6020** and its vicinity.

8.1.4 Tyneside 114 is entirely capable of completing these tasks under the direction of English Heritage and with assistance from Wessex Archaeology. They are clearly motivated to continue working on the site and have already ground-truthed further geophysical anomalies in the Gun Rocks area. They have also show interest in using photogrammetry as a recording method for the site. Combining their ability to acquire the basic photographic data with WA's specialist capabilities in this respect has the potential to provide EH with another effective, low cost model for an avocational-professional partnership.

Documentary Research

8.1.5 As Nico Brinck is sceptical as to whether research in Swedish or Dutch archives will lead to the identification of the wreck (pers. comm. 29.09.13), WA recommends that opinion should be sought from additional experts as to whether such research is likely to be productive. If the collective opinion is positive, then this avenue of enquiry should be considered by EH. However, such research is likely to be expensive unless carried out by appropriately skilled volunteers.

Site monitoring

- 8.1.6 The site appears to be fairly robust and there is no obvious short or medium term environmental threat to this site. There have been no reported recoveries of cannon in recent years, although it is possible that shot or other small items have been taken. Whilst it is acknowledged that the recent publicity given to the site creates an unquantifiable risk of uncontrolled disturbance, it is unlikely that this will occur without it coming to the attention of Tyneside 114 BSAC or the local charter boat community. WA therefore recommends that monitoring should be confined to periodic informal liaison between EH and these stakeholders.

Dive Trail

- 8.1.7 Fieldwork participants including divers and vessel crew were informally questioned as to whether they thought that the site would make a good subject for a dive trail. The response was universally positive and indicated that they would see it as either being a 'second dive' or an interesting training dive for novices. The Farne Islands are one of the most popular dive attractions in the UK and there appears to be an opportunity for EH to actively promote the value and understanding of marine heritage assets there through the establishment of a dive trail. Provided that Tyneside 114 and local charter boat operators were actively involved, the costs incurred would probably be modest and the prospects of a successful and sustainable launch high.

Diver Liaison

- 8.1.8 It is recommended that all future work carried out at the site should be done in conjunction with the local divers from Tyneside 114 wherever possible. If the site is protected, there would also be value in promoting protected status by placing an information board at Seahouses from where all vessels to the Farne Islands depart.

9 ARCHIVE

- 9.1.1 The project archive consists of a hard copy file and computer records and is currently stored at WA under project code 83803. The project will be transferred to an accredited repository to be agreed upon in the future.
- 9.1.2 Shapefiles generated for the project comply with Marine Environment Data and Information Network (MEDIN) standards for metadata.

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11 APPENDICES

Appendix 1: Dive Log

Dive	Date	Start Time	Duration*	Max Depth (m)	Divers	Task
01	28/08/2013	10:34	58	6	Croce, Penney	Site familiarisation and kelp removal
02	28/08/2013	14:13	82	7.5	Croce, Dunkley	Photomosaic of part of Site 1
03	28/08/2013	16:34	53	7.5	Knott, Roberts	Cannon measurement at Site 1
04	29/08/2013	11:13	54	16.2	Penney, Roberts	Cannon measurement at Site 2
05	29/08/2013	16:31	62	8.7	Dunkley, Knott	Record wooden object NE of Gun Rock
06	30/08/2013	-	-	-	Penney, Scott	Void dive
07	31/08/2013	15:12	57	15.2	Knott, Penney	Survey of Site 2
08	02/09/2013	10:09	67	8	Penney, Scott	Cannon measurement
09	03/09/2013	11:20	4	8	Penney, Scott	Abort dive
10	03/09/2013	16:31	60	8	Croce, McCarthy	Photogrammetry
11	04/09/2013	11:37	71	7.7	McCarthy, Scott	Photogrammetry
12	04/09/2013	16:36	52	16	Croce, Penney	Search between Sites 1 and 2
13	05/09/2013	8:35	100	7	Croce, Penney	Baseline offset
14	05/09/2013	11:09	38	13.9	Scott, McCarthy	Survey

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



Appendix 2: List of archaeological features located

WA ID	Description	Anomaly	Easting*	Northing*
6000	Cast iron cannon of unknown calibre	7075	586309	6165803
6001	Cast iron 6 pounder cannon	7075	586305	6165795
6002	Cast iron 6 pounder cannon	7075	586306	6165793
6003	Cast iron 8 pounder cannon	7075	586315	6165782
6004	Cast iron 18 pounder cannon	7075	586317	6165786
6005	Cast iron 8 pounder cannon	7075	586314	6165787
6006	Cast iron 6 pounder cannon	7075	586308	6165785
6007	Cast iron 8 pounder cannon	7075	586306	6165785
6008	Cast iron 8 pounder cannon	7075	586305	6165784
6009	Cast iron 8 pounder cannon	7075	586307	6165782
6010	Cast iron 6 pounder cannon	7075	586305	6165780
6011	Cast iron 6 pounder cannon	7075	586311	6165775
6012	Cast iron 6 pounder cannon	7075	586318	6165774
6013	Cast iron 2 pounder cannon	7125,7126,7128	586241	6165781
6014	Cast iron possibly 6 pounder cannon	7125,7126,7128	586240	6165783
6015	Cast iron 6 pounder cannon	7125,7126,7128	586239	6165784
6016	Cast iron 18 or 24 pounder cannon	7023	586248	6165791
6017	Cast iron 6 pounder cannon	7023	586244	6165793
6018	Cast iron 8 pounder cannon	7127	586260	6165790
6019	Anchor	7044	585924	6165981
6020	Cylindrical wooden object	7139	586401	6165844
6021	Cannon balls		586313	6165780
6022	Lead Sheet		586308	6165784
6023	Sword Hilt		-	-
6024	Bamburgh Castle cannon		-	-

* UTM zone 30N



Appendix 3: List of recovered finds

Find	Description	Location on wreck	Date recovered	Reference
Iron cannon	9 pounder cannon raised and given to Bamburgh Castle		1744	Sharp, 1778-1791
Brass cannon	Brass 6 pounder sold for scrap		1744	Sharp, 1778-1791
Bottle	Black 'onion' type bottle with neck missing and identified as from 1600s	On rock face approximately 55 37N 001 38W	2008	Receiver of Wreck Droit 179/08
2 cannon	2 cannon raised and then confiscated by the police and matter decided by receiver of wreck	East side of rocks	1996	Diver November 1996, No.11 41:10
3 cannon and iron shot			1996	Northumberland County Council 1996
2 sword hilts			Unknown	
Small bronze cannon			Unknown	
Pulley blocks			Unknown	
Pewter candlesticks			Unknown	ADU, 1995
Bronze wheel well	bronze wheel well, very corroded, lying in 30-35ft water	north east of rock	1970	Smith, 1970
Metal pulley wheel			1970	Smith, 1970
3 rapier handles	Made of bronze or brass. Drawings in report. Hancocks Museum and Laing Art Gallery have dated the handles to 1500-1620 and 1720	Northwest of Gun Rocks	1970	Smith, 1970
Metal tube	Cuprous tube with a small bore (11/16") at one end and larger (1.5/16") at the		1970	Smith, 1970



	other			
Scabbards			1970	Smith, 1970
Parts of blades			1970	Smith, 1970
Cannon	Raised, used on TV program, conserved by museum in Newcastle.	West of Gun Rocks	1970	Smith, 1970
2 sounding weights		Cave entrance	1970	Smith, 1970
3 assorted cannon balls			1970	Smith, 1970
Cannon balls	7 inch cannon ball weighing 35 lbs	North of Gun Rocks	1970	Smith, 1970
Wrought iron piece	21 3/8" piece of wrought iron with 2 square slots and a pivot piece at one end		1970	Smith, 1970
Piece of copper with square nail holes on edge	Identified by P. Annis of National Maritime Museum as a hatch cover rather than copper hull sheathing	Northwest of Gun Rocks	1970	Smith, 1970
Small knuckle guard			1970	Smith, 1970
Pottery and glass	one piece of pottery has a coat of arms or design on it	At northwest base of Gun Rocks	1970	Smith, 1970
2 eroded sword handles		West of Gun Rocks	1970	Smith, 1970
Pieces of copper and lead		West of Gun Rocks	1970	Smith, 1970
Piece of lead		West of Gun Rocks	1970	Smith, 1970
Piece of pottery		West of Gun Rocks	1970	Smith, 1970
Large sounding lead			1970	Smith, 1970
Musket balls	two 3/4 inch di lead	between the rock and the reef	1970	Smith, 1970
Tin box with inscribed lid	Raised by university divers		Before 2000	Young, 2000



Appendix 4: Site Risk Assessment

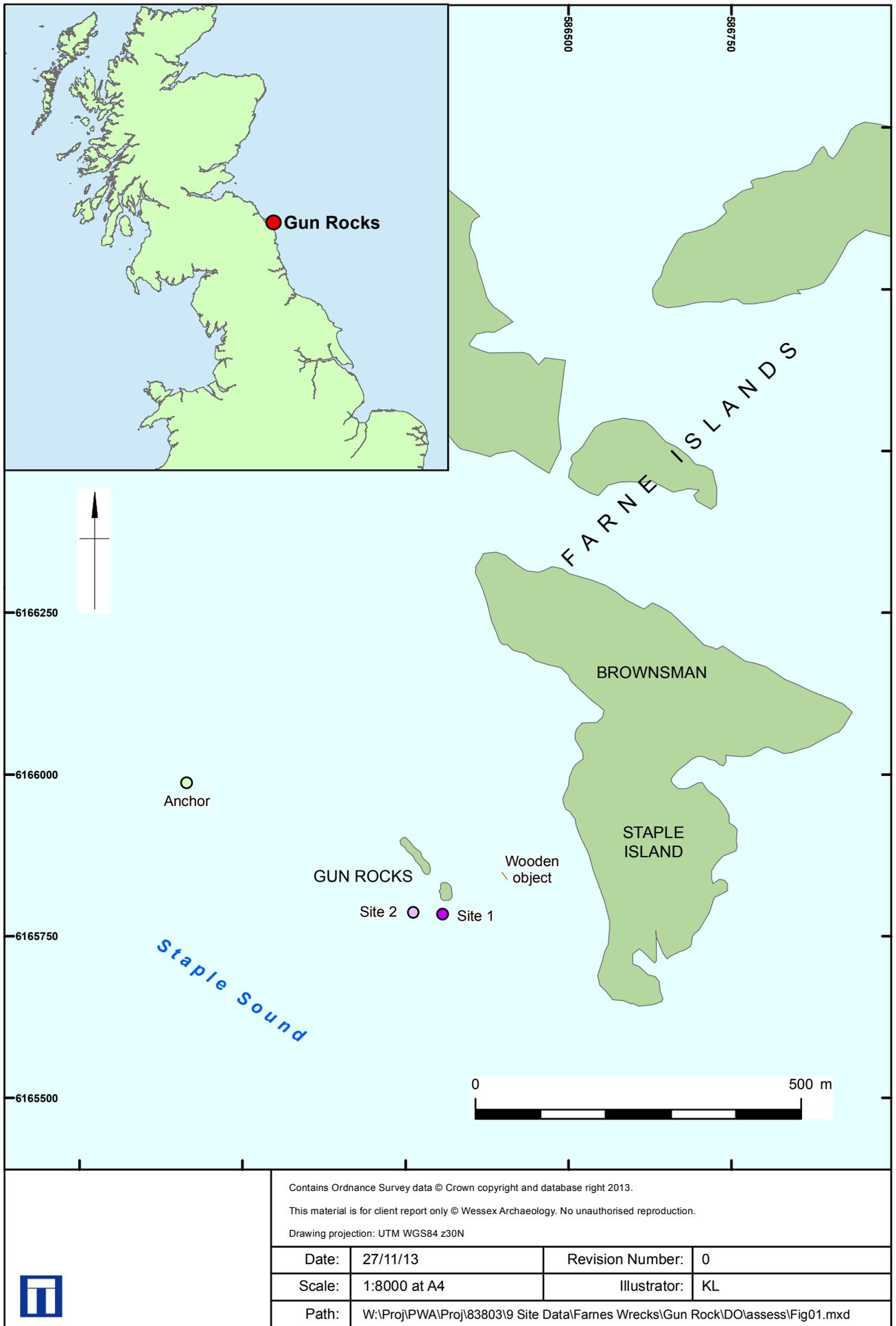
Wreck/Site Name	Gun Rocks, Farne Islands.		
HRHE / UKHO No.	EH Region	Restricted Area	Principal Land Use
NRHE 907656	North East	N/A	Coastland 1: Marine
Latitude (WGS84)	55° 37.882935'N		
Longitude (WGS84)	01° 37.747011' W		
Class Listing	Period	Status	
Unknown (Possible Wreck)	post-medieval	Non-designated site	
Licensee	Nominated Archaeologist	Principal Ownership Category	
N/A	N/A	N/A	
Seabed Owner	Navigational Administrative Responsibility		
Crown Estate	North Sunderland Harbour Commission		
Environmental Designations			
Berwickshire and North Northumberland Coast European Marine Site			
Seabed Sediment	Energy		
Sandy gravel, with cobbles and medium rock outcrops	High		
Survival			
Medium			
Overall Condition	Condition Trend	Principal Vulnerability	
E: Dispersed site	C: Stable, no active deterioration of remaining artefacts detectable.	NKT: no known threat	
Amenity Value: visibility			
B: Very limited above bed finds scatter with limited visibility. Only 'legible' with further interpretive information			
Amenity Value: physical accessibility			Amenity Value: intellectual accessibility
A: No restrictions to access.			C: No interpretation on site or on shore but knowledge of the site in the local diving community and in publications (Young, 2000).
Management Action	D		



Management Prescription	H; N		
Notes:	South western side of Gun Rocks, Farne Islands. Wreck of possible Dutch merchantman from early 18 th century. No wreck structure has been found and is unlikely to exist. The remains of 19 cast iron smooth bore muzzle loading artillery of different calibres and sizes prove that a wreck occurred on the navigation hazard of Gun Rocks. 13 cannon are located on a rocky seabed with dense kelp coverage to the southwest of Gun Rocks with a further 6 cannon located on a flat and open seabed 30 m to the north east. The site used to comprise of a diversity of artefacts including more cannon, sword hilts, sounding leads and iron shot. In the last few decades, many of the smaller items have been removed from the seabed as well as several cannon. As there are probably only large cannons remaining on the seabed (unless contexts containing smaller artefacts are subsequently discovered), it seems unlikely that any more artefacts will be removed from the site. The cannon are also known to be in a relatively stable condition so there is limited risk of them deteriorating in their current state. The Farne Islands is a popular recreational diving location and it is known that the Gun Rocks wreck is often used a 'second dive' for groups visiting the islands. It is therefore recommended that EH commission an interpretive trail to be created of the site to encourage diver engagement with the site. The trail would help divers find the 13 cannon to the southwest of Gun Rocks that are often hard to locate amongst the kelp. The trail would also help to connect the two groups of cannon that are separated by only 30 m. As was outlined in the Non-Statutory Criteria Assessment, the Gun Rocks wreck site is a strong candidate for scheduling under the <i>Ancient Monuments and Archaeological Areas Act 1979</i> .		
Risk is assessed as:	Low to Medium		
Data Source	CON	Date & Initials	Wessex Archaeology, November 2013

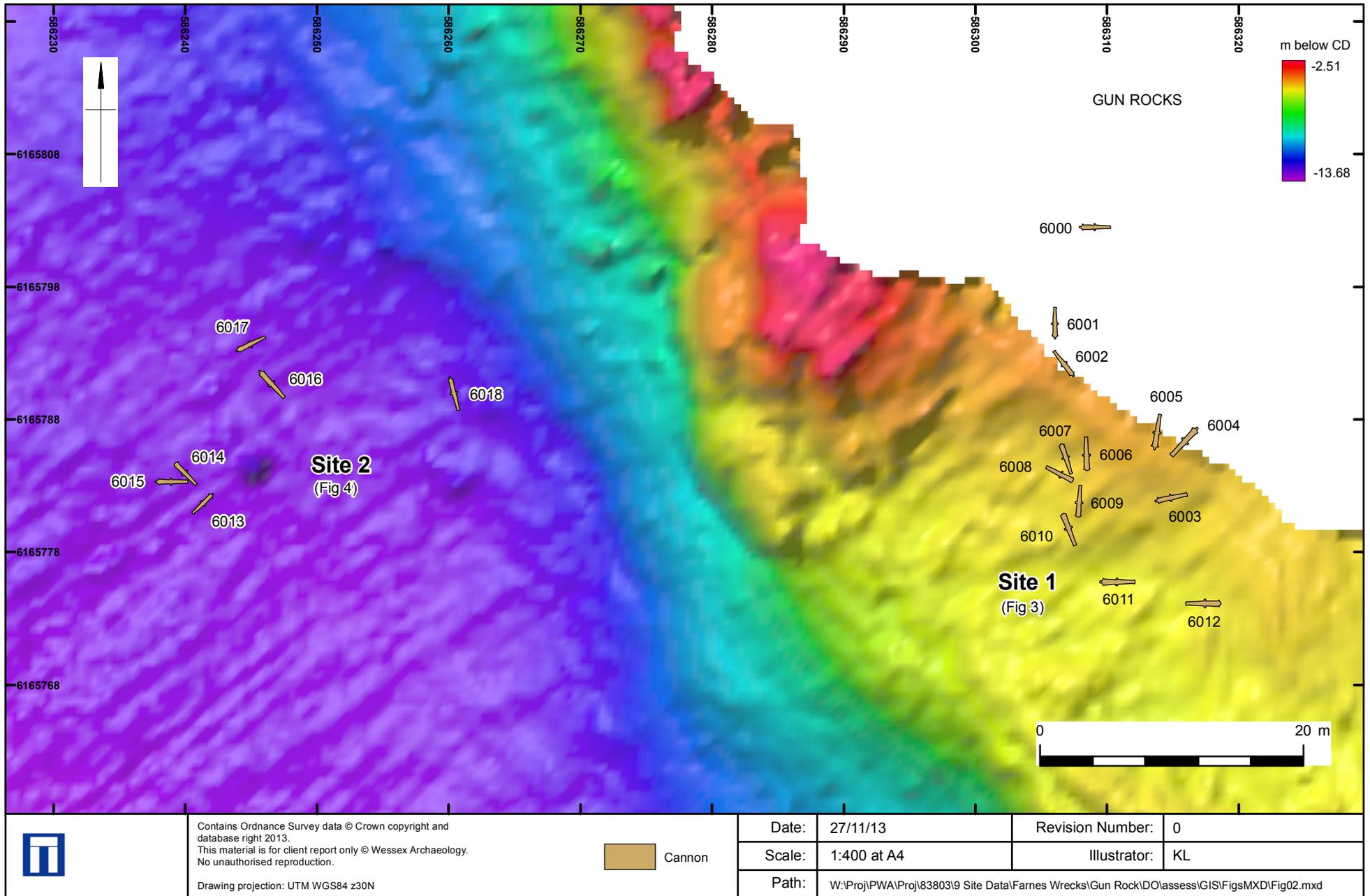


Appendix 5: Photogrammetry 3D model in interactive PDF format



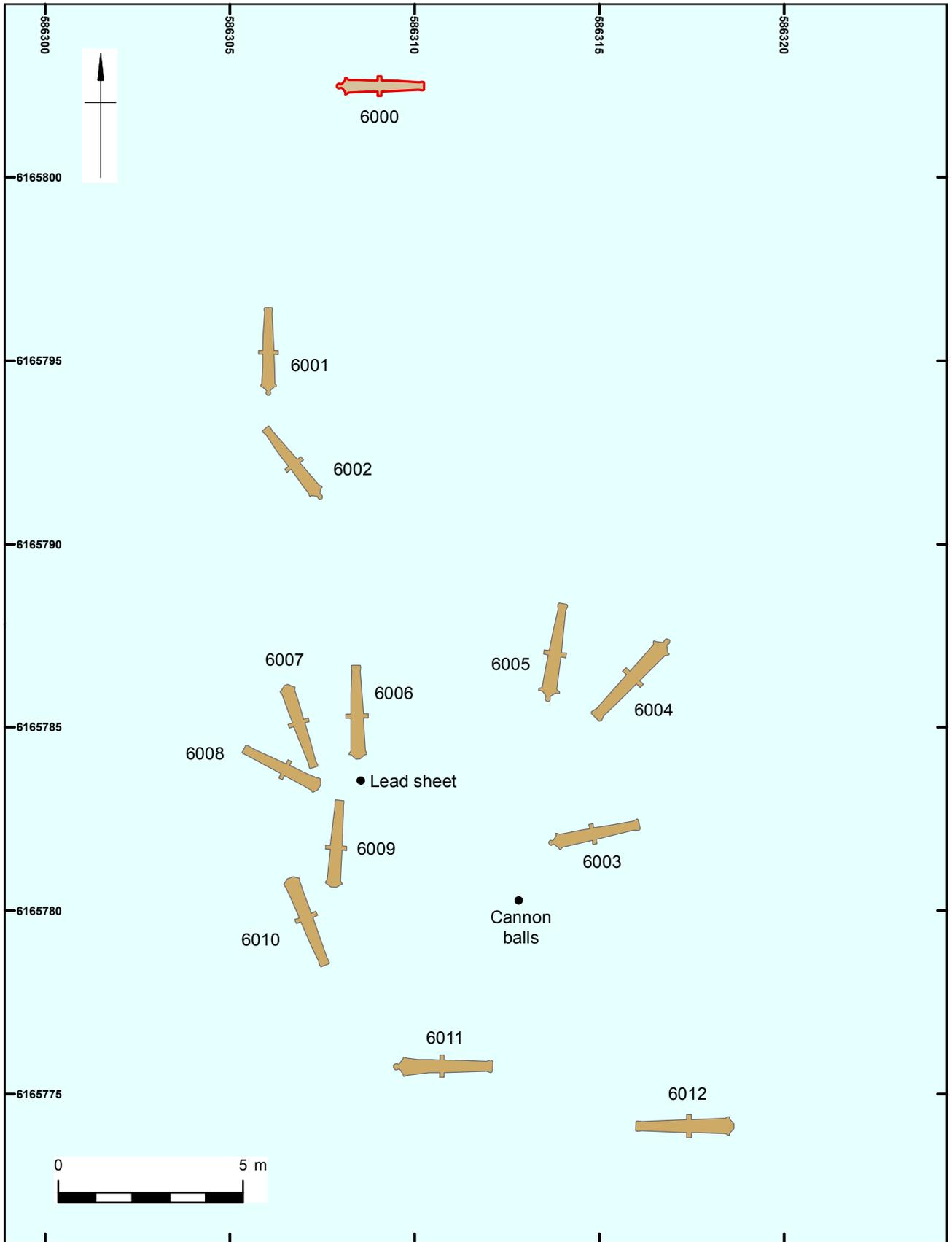
Gun Rocks location

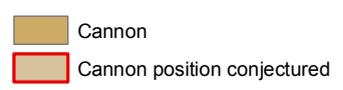
Figure 1



Overall Gun Rocks site plan

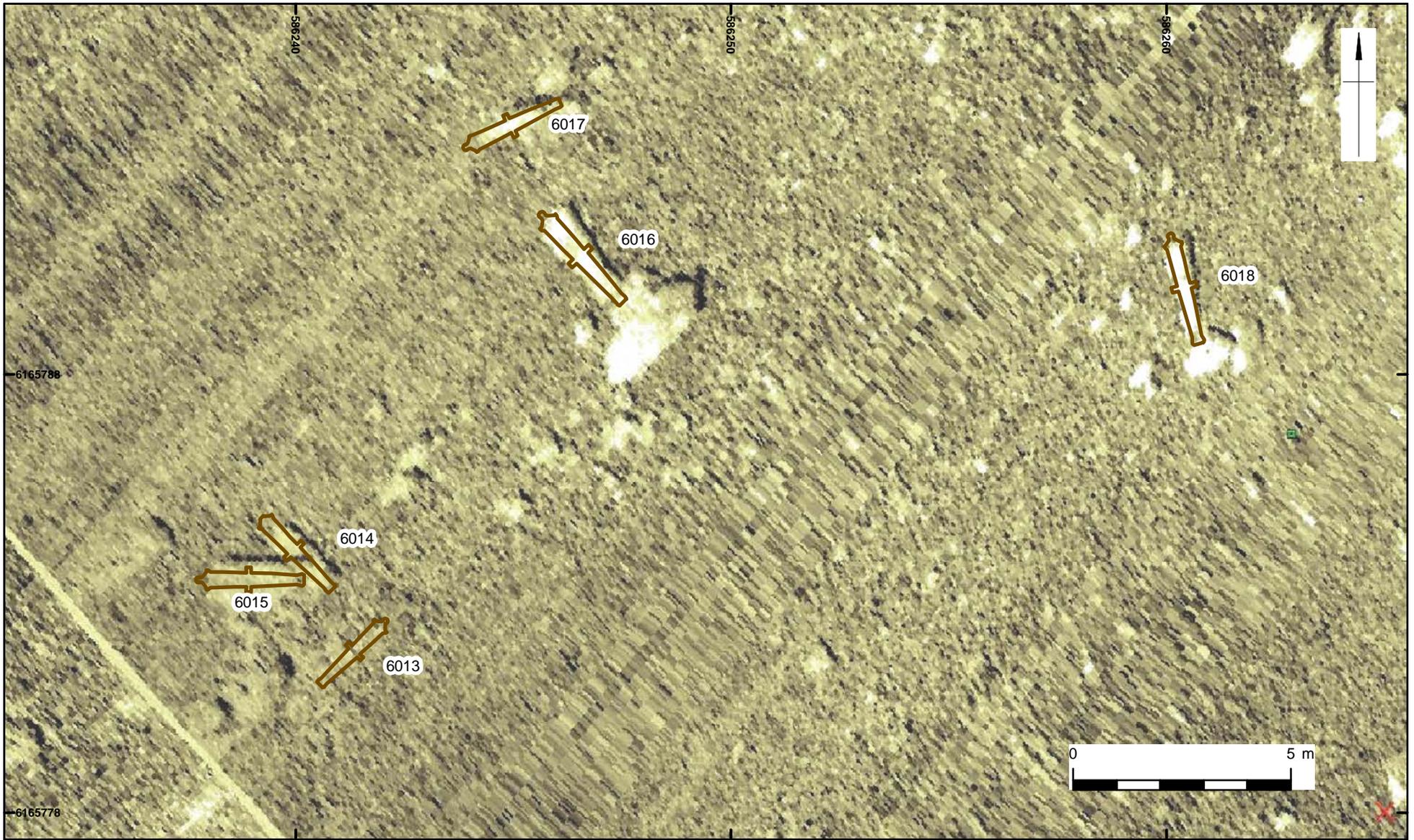
Figure 2



 	This material is for client report only © Wessex Archaeology. No unauthorised reproduction.			
	Drawing projection: UTM WGS84 z30N			
	Date:	27/11/13	Revision Number:	0
	Scale:	1:125 at A4	Illustrator:	KL
Path:		W:\Proj\PWA\Proj\83803\9 Site Data\Fames Wrecks\Gun Rock\DO\assess\Fig03.mxd		

Site 1 plan

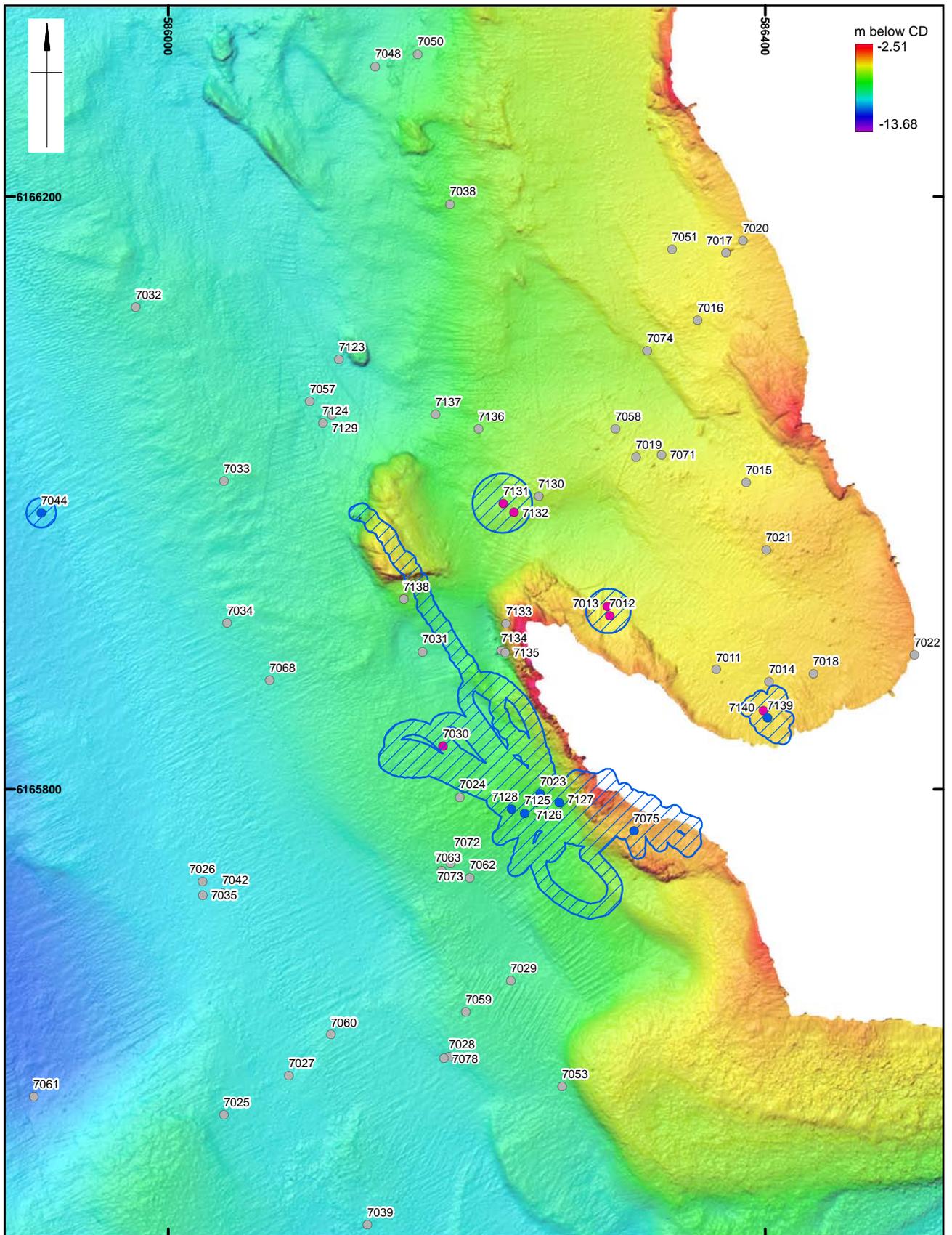
Figure 3



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Site 2 plan

Figure 4



 <ul style="list-style-type: none">  Diver search area  Positive anomaly  Negative anomaly  Unchecked anomaly 	This material is for client report only © Wessex Archaeology. No unauthorised reproduction. Drawing projection: UTM WGS84 z30N			
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Gun Rocks diver search areas and anomalies of archaeological interest

Figure 5

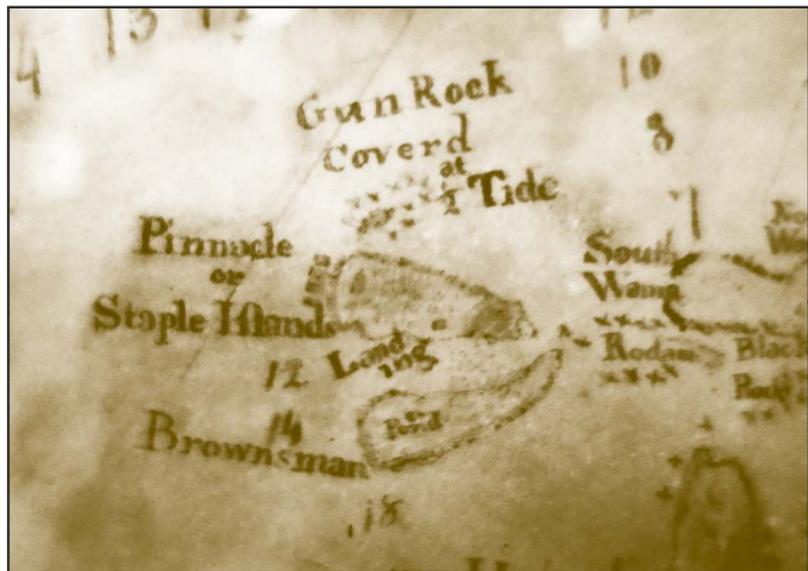


Chart from Sunderland Point by Robert Sutherland, 1778.
 Courtesy of Bamburgh Castle.

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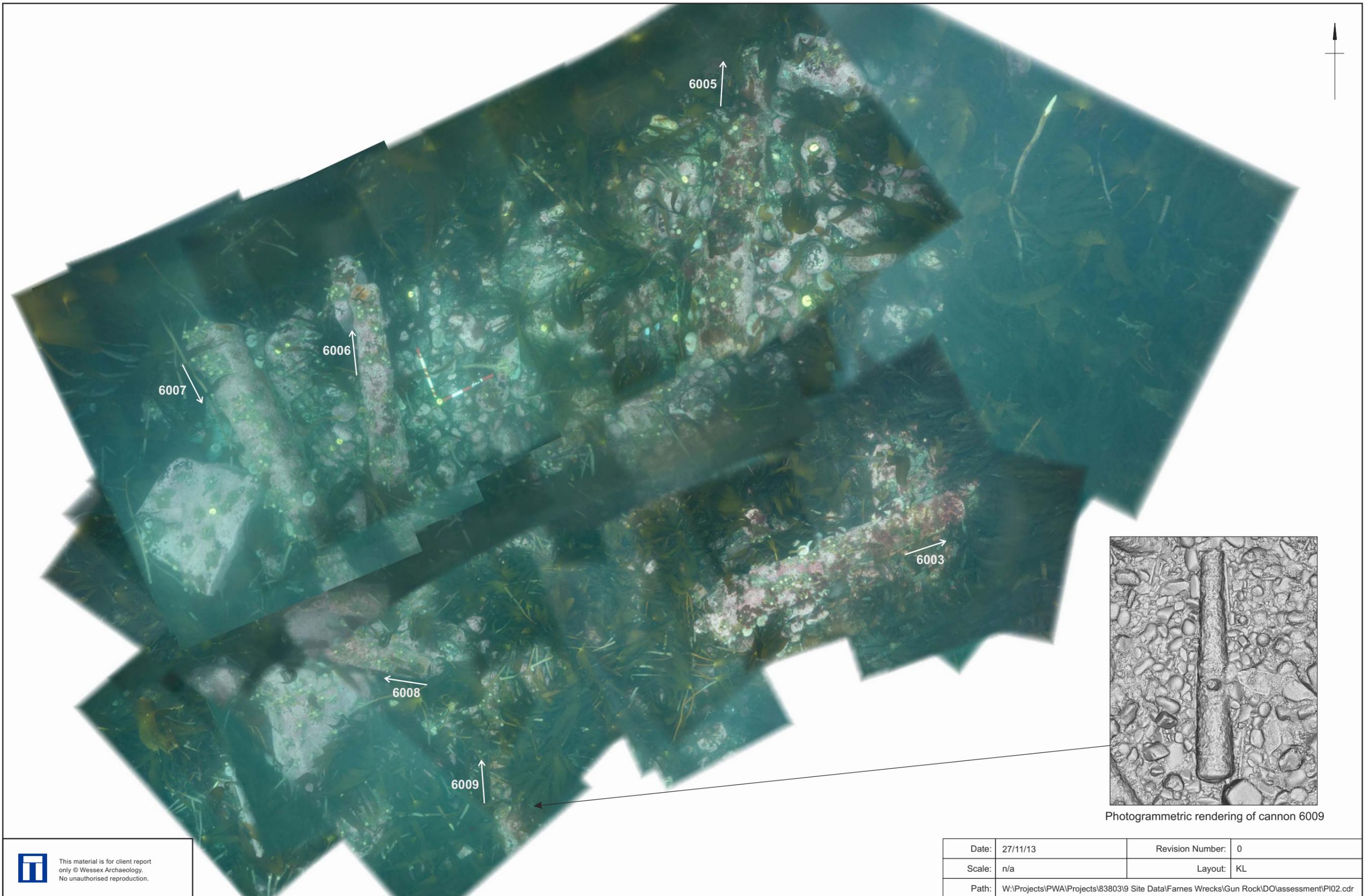
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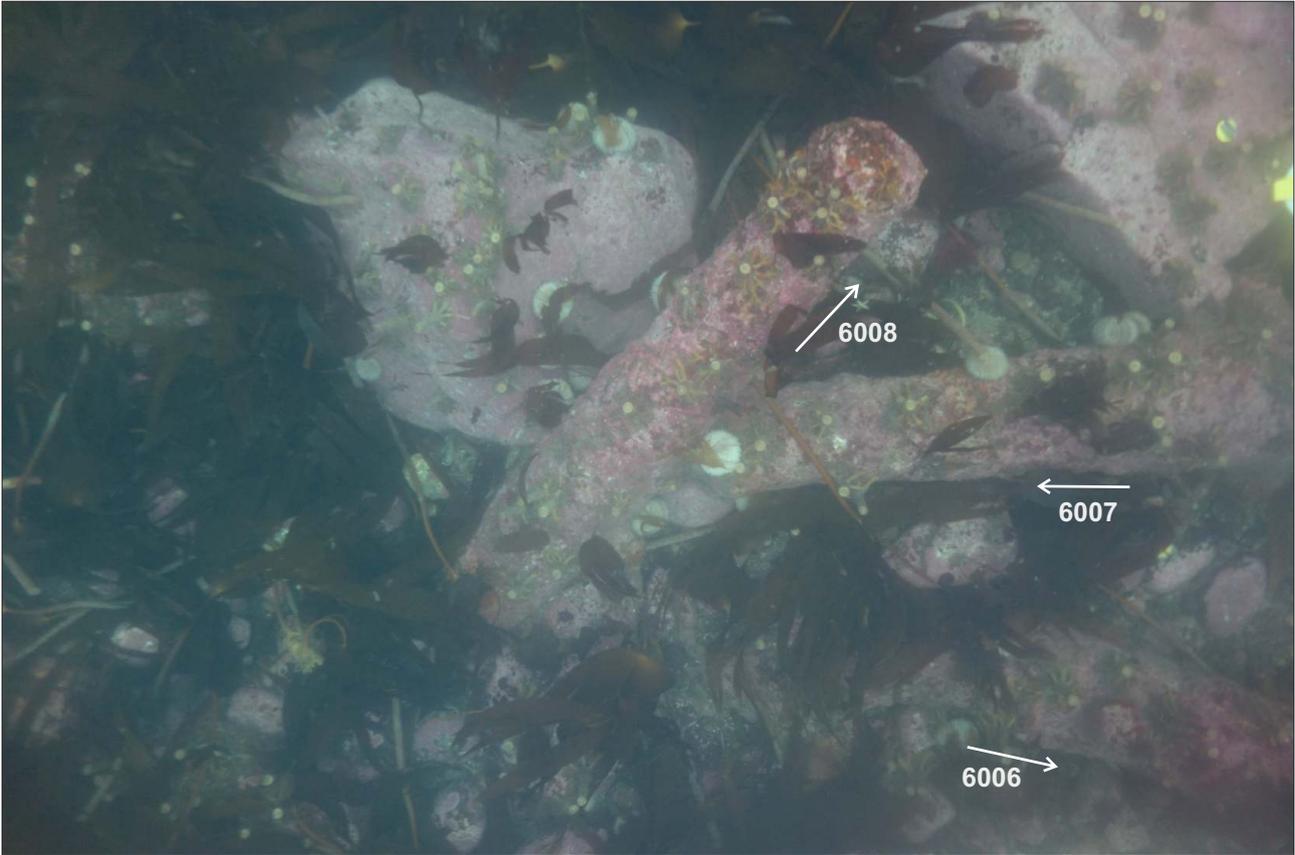
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Photomosaic of the main part of the original cannon site



Canons 6006, 6007 and 6008

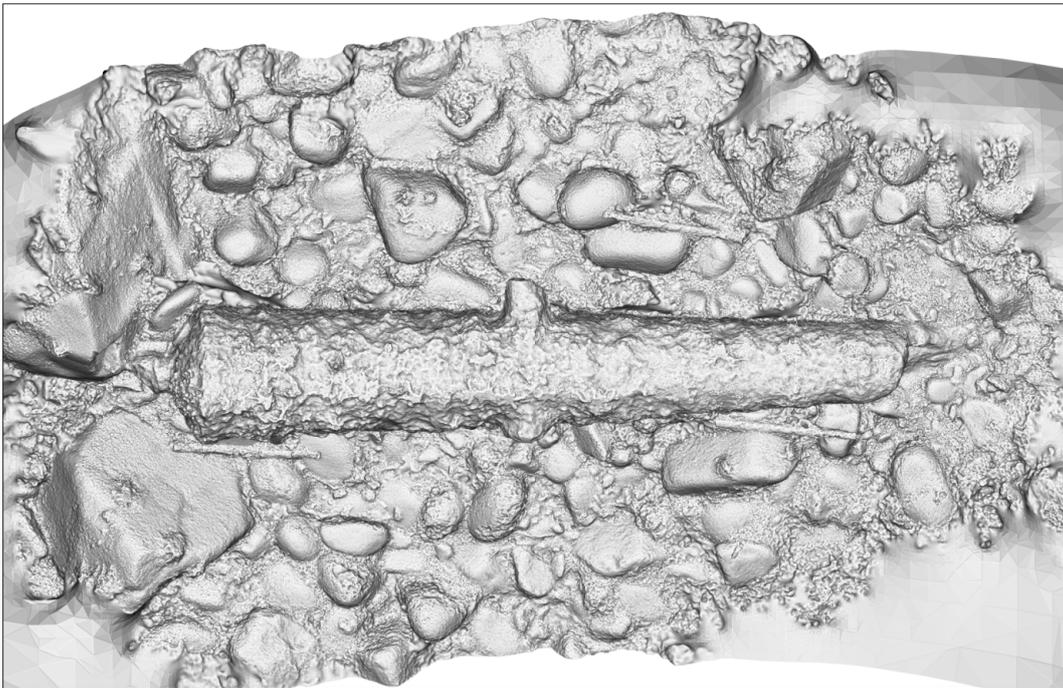


Canon 6008

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Photograph of cannon 6011



Photogrammetric greyscale rendering of cannon 6011

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Cannon 6012 showing rope from raising attempt



Cannon 6014 in foreground and 6015 in background at Site 2

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Canon 6017



Trunnion of cannon 6017



Cascabel of cannon 6017

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Lead sheet 6022 from Site 1



Volunteer diver inspecting the anchor 6019 north west of Gun Rocks

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One of the cuprous bolts in the cylindrical wooden object



Cylindrical wooden object

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View from top



View of top of hilt



View of underside of hilt

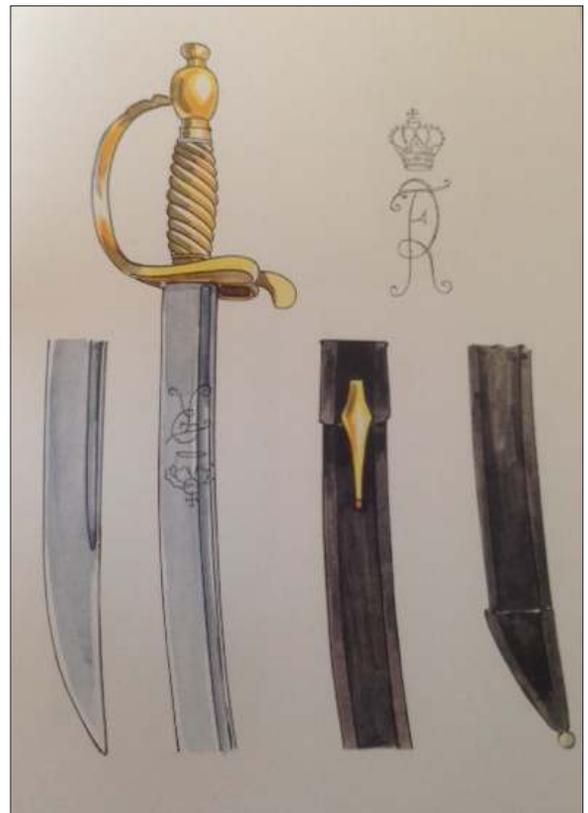
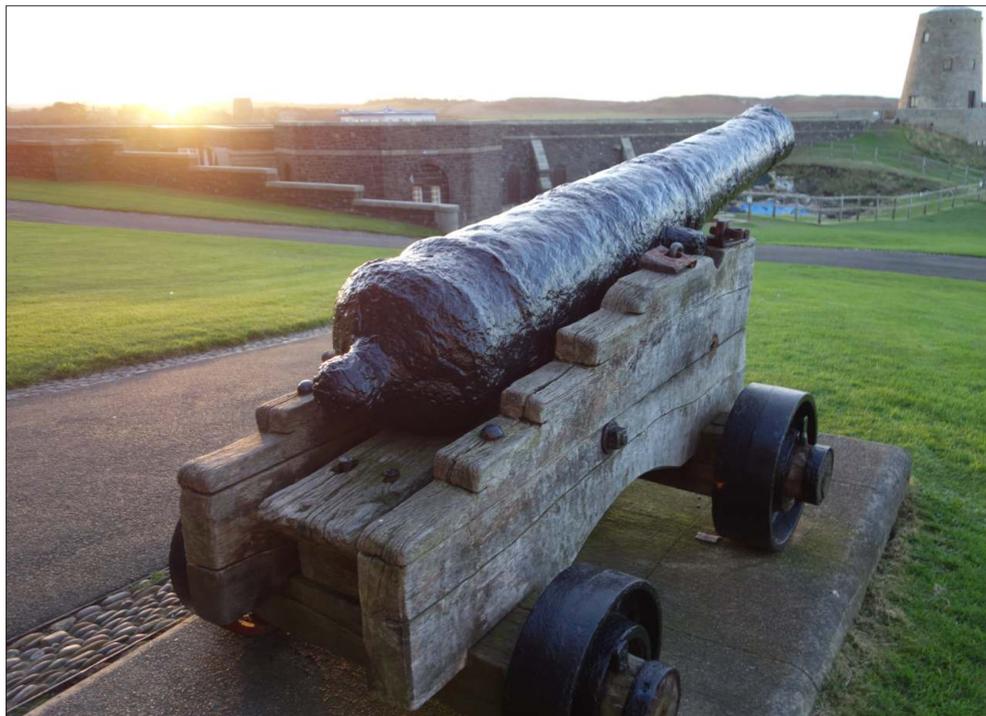
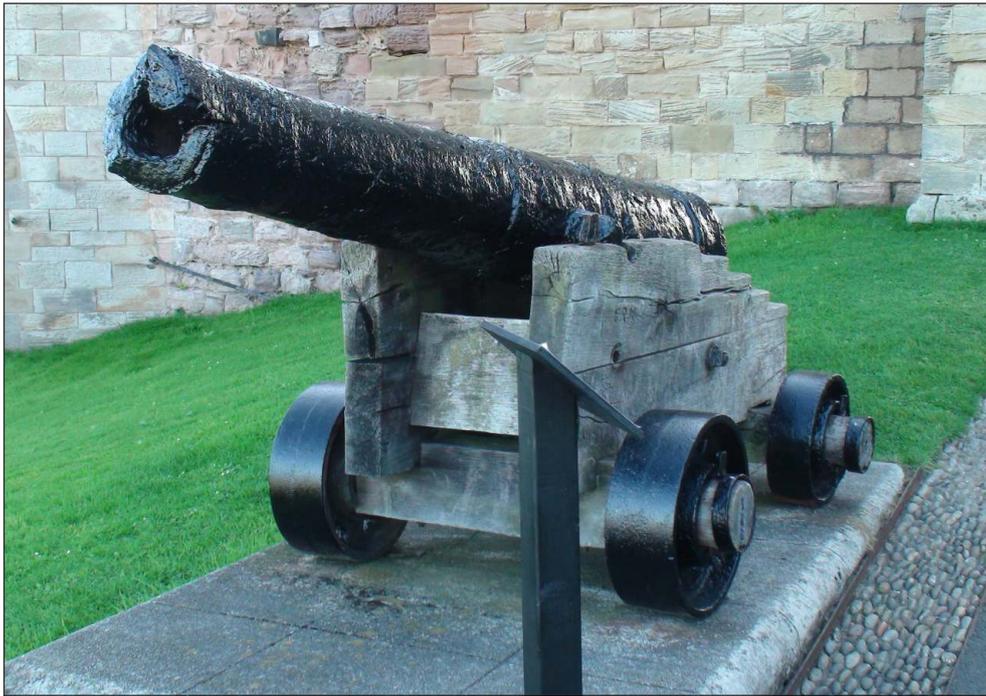


Illustration of late 17th century –18th century sword (Wagner, 1967)

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