



Sicar Rock, Dunbar, East Lothian

Undesignated Site Assessment Report





**ARCHAEOLOGICAL SERVICES IN RELATION TO THE MARINE SCOTLAND ACT
2010**

SICAR ROCK, DUNBAR, EAST LoTHIAN

UNDESIGNATED SITE ASSESSMENT REPORT

Prepared by:

WA Coastal & Marine
7-9 North St. David Street,
Edinburgh
EH2 1AW

Prepared for:

Historic Scotland
Longmore House
Salisbury Place
Edinburgh
EH9 1SH

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Principal Author (s)	John McCarthy
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Summary

WA Coastal & Marine was commissioned by Historic Scotland to undertake an Undesignated Site Assessment of the reported findspot of a number of pierced stone artefacts on the seabed off Dunbar Harbour in East Lothian. The site was first discovered by local divers in 1998. A total of six partial or complete pierced stones together with a metal fragment and a possibly natural stone fragment have been recovered by local divers. Local divers also report that at least one of the stones remains *in situ*. WA Coastal & Marine undertook a three-phase investigation of the site. The first of these was a programme of baseline data gathering followed by a dive survey and a final phase of data analysis.

The baseline research carried out for the project has helped to enhance our knowledge of this challenging site. The previously recovered stones are currently either in the East Lothian Museums Service collection in Haddington or in the Dunbar Town House Museum in Dunbar. Four of those in Haddington were made available by the museum staff and were resurveyed using photogrammetry. WA Coastal & Marine were also asked by Historic Scotland to undertake a programme of liaison with the members of BSAC21, the sub-aqua club that had discovered and investigated the site. This helped to establish as far as practical the location and nature of the remaining material on the seabed. The BSAC21 members generously provided a large quantity of background material including sketch plans and elevations of the site as well as depth profiles and correspondence relating to the discovery and publication of the artefacts. It had been several years since the main investigations of the site by the club but fortunately BSAC21 carried out a dive at the site several weeks in advance of the WA Coastal & Marine survey and confirmed that at least one of the anchors was still present.

Diving fieldwork was conducted at the site between 20th and 24th August 2012. Conditions were found to be problematic for diver survey but not insurmountable. Survey of the site was undertaken by pairs of divers and six dives were undertaken at the site. The depth profiles provided by the BSAC21 club members were used to build up a bathymetrical model of the site in ArcGIS. This was then used as background mapping to help guide the survey. The strength of the tide, the depth of the seabed and the high winds encountered on one of the surveys days meant that the amount of successful survey time on the bottom was insufficient to locate any archaeological material. The extent of the area surveyed was accurately recorded and will allow this area to be excluded from future surveys.

A review of parallels for the pierced stone artefacts has been made and the recovered artefacts are interpreted as stone anchors of unknown date. Stone anchors are a well-known artefact in maritime archaeology, particularly in the Mediterranean where they are often dated to the Graeco-Roman period. Although there are only a small number of published examples it has been demonstrated that a wide range of similar material has been recovered in British waters, a large proportion of which has only come to light in the last two decades. The great majority of pierced stones thought to be anchors in Britain or elsewhere in the world have either one hole or three holes, with very few demonstrating only an upper rope hole and a single lower fluke hole. For this reason this collection of stone anchors is relatively unusual. It has not been possible to date the material either through its context or through typological analysis.

A number of recommendations for further investigation of the site have been made. These include further diver survey and geophysical survey. All future works should be carried out in liaison with the local divers who discovered the site.

SICAR ROCK, DUNBAR, EAST LOTHIAN

Ref: 83800.13

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- The members of BSAC21, in particular Lorna Goudie, Graeme Govenlock, John Downs, Sara Robertson and Alastair Lyndon;
- Gary Lawson, skipper of the MV *Pegasus*;
- Dr. Claire Pannell of the East Lothian Museums Service;
- Martin Dean of ADUS.

John McCarthy, Graham Scott, Kevin Stratford and Jonathan Benjamin, carried out the fieldwork, with the able assistance of vessel skipper Gary Lawson. Graham Scott and Kevin Stratford supervised the diving and John McCarthy supervised the fieldwork and undertook photogrammetric recording of the previously recovered stone anchors.

The report was compiled by John McCarthy. QA was carried out by Toby Gane and Graham Scott. Kitty Brandon prepared the illustrations and Toby Gane managed the project for WA Coastal & Marine.

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SICAR ROCK, DUNBAR, EAST LOTHIAN

Ref: 83800.13

Contents

1. ASSESSMENT BACKGROUND.....	1
2. OBJECTIVES	1
3. METHODOLOGY	2
3.1. Diving.....	2
3.2. Photography/Photogrammetry	3
4. REVIEW OF EXISTING DATA AND PREVIOUS SITE INVESTIGATIONS	3
4.1. RCAHMS.....	3
4.2. Receiver Of Wreck.....	3
4.3. Previous site investigations	3
5. SITE DESCRIPTION AND INTERPRETATION	7
5.1. Site Location	7
5.2. Shallow/Surface Geology and Hydrodynamic Environment.....	7
5.3. Archaeological Investigations	7
Material thought to be on the seabed prior to the survey.....	7
Geophysical Data	8
Resurvey of Recovered Material	9
Dive Survey	9
5.4. Interpretation	9
Sicar Rock.....	9
Interpretation as Anchors.....	10
Dating.....	11
Function	12
6. INFORMATION RELEVANT TO THE SELECTION, DESIGNATION AND MANAGEMENT OF HISTORIC MARINE PROTECTED AREAS.....	13
6.1. Survival and Site Condition.....	13
7. RECOMMENDATIONS.....	14
8. ARCHIVE.....	15
9. REFERENCES.....	15
Published sources.....	15
Non-published and other written sources	17
APPENDIX 1: DIVE LOG	18
APPENDIX 2: RECORDING LEVELS	19

Figures

Figure 1	Site location map
Figure 2	Elevation and isometric view of 3D model of Sicar Rock provided by Graeme Govenlock of BSAC21.
Figure 3	Illustration of six of the recovered stone anchors by Colin Martin, included in Goudie's 2005 article on the site.
Figure 4	Bathymetrical map of Sicar Rock derived from depth profiles provided by Graeme Govenlock, overlaid with extent of 2012 diver survey (note that the accuracy of the bathymetry has not been confirmed).
Figure 5	Sketch elevation provided by BSAC21 members showing the outline of the ridge and the locations of <i>in situ</i> anchors. It is unclear whether some of these anchors have subsequently been lifted.
Figure 6	Orthographic projections from photogrammetric model of anchors 'B' - 'E'
Figure 7	Comparison of various types of stone anchor (Kapitän 1984, 34)

Plates

Plate 1	Scanned slide from the RCAHMS database showing anchors A, F and E (left to right)
Plate 2	Metal pulley recovered from the site in 1999
Plate 3	Article on the anchors from Dunbar local paper November 17 2000
Plate 4	Low resolution photograph of <i>in situ</i> anchor provided by BSAC21
Plate 5	Low resolution photograph of <i>in situ</i> anchor provided by BSAC21
Plate 6	Low resolution photograph of <i>in situ</i> anchor provided by BSAC21
Plate 7	Diver surveying at Sicar Rock.
Plate 8	Seabed conditions on south side of Sicar Rock
Plate 9	Thomas Philip's 1685 depiction of a large skin boat or coracle (currach) in Ireland. Stone anchors are clearly visible in both the upper and lower panels.

Tables

Table 1	Measurements (in cm) of stone anchors, after Goudie (2005)
Table 2	Stone anchors from Sicar Rock held by the East Lothian Museums Service

Front Cover Diver undertaking a search at Sicar Rock

Back cover Photogrammetric models of previously recovered stone anchors

SICAR ROCK, DUNBAR, EAST LOTHIAN

Ref: 83800.13

1. ASSESSMENT BACKGROUND

- 1.1.1. A group of pierced stones were first discovered on the seabed at Sicar Rock in August of 1998 when the late Richard Smith, a member of British Sub-Aqua Club 21 (BSAC21) spotted them on a recreational dive. Subsequently six of the stones were lifted and purchased by a local museum. An article on the stones was written for the *International Journal of Nautical Archaeology* (IJNA) by Lorna Goudie, a member of the club (Goudie 2005).
- 1.1.2. WA Coastal & Marine was commissioned by Historic Scotland under the Contract for Archaeological Services in relation to the Protection of Wrecks Act (1973) to carry out an undesignated site assessment at Sicar Rock, in liaison with the finder and Historic Scotland. This took the form of a five day SCUBA diving survey. The principle aim of this survey was to establish the nature and extent of any remaining archaeological material.
- 1.1.3. A programme of background research was also undertaken in support of the survey. This included recording of the recovered material, review of material provided by BSAC21 and a review of relevant literature.

2. OBJECTIVES

- 2.1.1. This work was commissioned in line with objectives defined in *The Marine Historic Environment Strategy for the Protection, Management and Promotion of Marine Heritage 2012-15* (Historic Scotland 2012). Historic Scotland is considering a small number of high priority undesignated sites as candidate Historic Marine Protected Areas in Scotland (under the Marine Scotland Act 2010) on the basis of national importance.
- 2.1.2. A Level 2a non-intrusive recording level (**Appendix 2**) was specified by Historic Scotland was defined using Wessex Archaeology's Specification for Levels of Recording. A Level 2a approach was requested (non-intrusive). It was felt that this would be sufficient to enable Historic Scotland, if appropriate, to develop a proposal to designate the site as a Historic Marine Protected Area.
- 2.1.3. WA Coastal & Marine was also asked to liaise with the discoverers of the site, the members of BSAC21, to facilitate the programme of works.
- 2.1.4. The minimum requirements of the work programme were defined as follows:
 - A structured record of field observations; preferably including a photographic record of the site and a basic site plan, delineating the location of any surviving remains within the area. Information should also be provided as to how

locations have been recorded and to what level of accuracy. Key artefacts on the seabed are to be subject to detailed examination and recording (for example, position by tracked diver survey, taped measurements, photographs and video and written database entries);

- An assessment of survival and site condition as per Historic Scotland's *Guidelines on the selection, designation and management of Historic Marine Protected Areas* (2012) with particular reference to Annex B;
- Information on socio-economic and environmental factors observed at the site and in the surrounding area which might pose significant risks to the survival of marine historic assets and site condition, if no change in the management regime takes place.

2.1.5. WA Coastal & Marine was not asked to undertake an assessment of cultural significance as this will be carried out by Historic Scotland. Information relating to the intrinsic, associative and contextual characteristics of the site that may assist in ascribing cultural significance was requested.

2.1.6. Statements of national importance for designation of Historic MPAs differ from those applicable under the Protection of Wrecks Act 1973. Guidance on the determination of national importance for the designation of Historic MPAs is provided in Annex A of the Historic MPA guidelines.

3. METHODOLOGY

3.1. DIVING

3.1.1. Diving was carried out by a four person team using free-swimming SCUBA diving equipment, including through-water communications and full face masks. SCUBA equipment was chosen for operational and logistical reasons. Each dive was carried out by a buddy pair with a surface tender and diving supervisor.

3.1.2. The site was variously reported to be diveable approximately one hour or half an hour either side of slack tide. In the event it was found that the site did not appear to be completely slack at any time and that the slack did not correspond with the times predicted by Admiralty tables, presumably due to the local conditions. Visibility was limited to 3-4m due to the depth of water and sediment in the water column.

3.1.3. The diving operation complied with the Scientific and archaeological diving projects Diving at Work Regulations 1997 Approved Code of Practice. The diving operation was undertaken in daylight hours only.

3.1.4. MV *Pegasus*, a coded vessel adapted for diving was used as the diving support vessel. Loading and unloading took place in the harbour at Dunbar. Access and egress from the harbour was not possible for approximately one hour either side of Low Water and fieldwork had to be arranged to accommodate this.

- 3.1.5. Each diver was acoustically tracked using an Applied Acoustics Easytrack ultra short baseline (USBL) system, using a Hemisphere R100 receiver to provide dGPS. The USBL system was linked to WA's DIVA 'observation point' database recording system linked to a GIS interface. This enabled the search area to be accurately mapped by the diving supervisor. It is estimated that positions are recorded to an accuracy of one metre.
- 3.1.6. Data provided by BSAC21 members was used to guide the diver survey. This included use of a digital bathymetry map (**Figure 4**) which was loaded into the DIVA system as well as copies of the sketch plans.

3.2. PHOTOGRAPHY/PHOTOGRAMMETRY

- 3.2.1. A waterproof digital camera was taken on every dive conducted for the survey. Record shots were taken of all archaeological features using an appropriate scale. A Canon PowerShot S100 was used with a waterproof housing and fish eye lens. A white balance correction was made for all shots in the water. All shots were taken in both RAW and JPEG.
- 3.2.2. A Canon 550D DSLR was used to record the anchors held in the Haddington museum stores. These were processed photogrammetrically using Autodesk's 123D Catch. Orthographic projections were output and scaled using AutoCAD. An AVI digital video file fly-through of the 3D models was also created and provided to Historic Scotland.

4. REVIEW OF EXISTING DATA AND PREVIOUS SITE INVESTIGATIONS

4.1. RCAHMS

- 4.1.1. The site is recorded in the RCAHMS database under the Canmore ID number 151710. RCAHMS hold a variety of material relating to the site including the records of the Archaeological Diving Unit (ADU) dive survey carried out in 2000, a box of 36 colour slides and some of the BSAC21 correspondence.

4.2. RECEIVER OF WRECK

- 4.2.1. The first four anchors removed from the site in 1999/2000 were reported to the Receiver of Wreck (RoW) and recorded under the droit 197/99. In 2006 two more anchors were recorded under the droit 169/04 and 032/05.

4.3. PREVIOUS SITE INVESTIGATIONS

- 4.3.1. The discovery and reporting of the 'pierced stones' of Sicar Rock has been described briefly in an article published in the *International Journal of Nautical Archaeology* by Lorna Goudie (2005). Further details were added from consultation with the BSAC club members.
- 4.3.2. Sicar Rock is a relatively popular site for drift dives due to its strong current and abundance of marine life. It is often used as a second dive after a dive on another site

at slack water. The position first recorded for the stones lies 2.4nm north-east of Dunbar harbour, on the outer limit of the Bush of Blackstones ridge (**Figure 1**).

- 4.3.3. Four stone anchors were noticed at Sicar Rock in August of 1998 when the late Richard Smith, a member of BSAC 21, identified them on a recreational dive. In October 1999 these were recovered. By early 2000 a small and unusually shaped stone had also been raised from the same area which was interpreted as a possible partial anchor. A metal pulley (**Plate 1**) found around the same time. In June 2000 salvage was claimed on the four complete anchor stones which had been raised and they were sold to the Dunbar Town House Museum (operated by East Lothian Council) for a total of £800 (**Plate 2**). The 'partial anchor' seems to have been donated at the same time.
- 4.3.4. Lorna Goudie reported the recovered stones to the RoW who issued a droit number (197/99). Several letters were exchanged between Lorna and the RoW (dated 5/11/2009, 2/12/2009, 12/01/2000, 1/03/2000) and as a result various experts in maritime archaeology were notified and consulted, including Dr. Colin Martin, Dr. Robert Prescott and Honor Frost. Records of this correspondence were made available to WA Coastal & Marine by Lorna Goudie.
- 4.3.5. The five recovered stones were sent to the National Museum of Scotland where they were desalinated and eventually transferred to the East Lothian Council Museums Service. The metal pulley time was also reportedly sent to the National Museum of Scotland for conservation but its current whereabouts are unknown. Lorna Goudie stated that she believed the artefact was in the possession of a conservator, William Murray (formerly of the NMS and now of the Scottish Conservation Studio) but when contacted, Mr. Murray stated that although he had undertaken conservation on the stones he was unaware of any other related material (pers. comm., by phone 22/10/2012).
- 4.3.6. In July of 2000, the Archaeological Dive Unit (ADU) of St. Andrews University held the Protection of Wrecks Act contract with the Department for Culture Media and Sport and undertook a dive survey of the site. Three dives were carried out in total by Steve Liscoe, Martin Dean and Mark Lawrence. They reported finding only part of one anchor *in situ* but stated that one more complete anchor was reported to be present.
- 4.3.7. On the 13th August 2000 Graeme Govenlock, a member of BSAC21, conducted an echo sounder survey of the ridge. He took 480 depth readings while crossing north-south over the ridge in a RIB. He used this data to generate a 3D model of the site which was then further edited to show features such as the plateau on the southern side of the ridge and an overhang above it. The depth readings in Excel format and labelled screen grabs of the 3D model were provided to WA Coastal & Marine prior to the survey (**Figure 2**).
- 4.3.8. Between 2002 and 2004 at least three further stones were removed from the site (pers. comm., Graeme Govenlock, e-mail dated 17/08/2012). In 2004/2005 Lorna Goudie reported two further 'pierced stones' to the RoW and these were recorded under the droits 164/04 and 032/05. In 2006 these were received by the Dunbar

Town House Museum. Both of these reported stones appear to have been complete anchors. It is unclear whether one of the three pierced stones described by Greame Govenlock went missing at this point. In any case by the end of 2004 a total of six complete pierced stones, one possible partial stone and one pulley had been recovered from the site and placed into the hands of local museums.

- 4.3.9. In 2005 Ms. Goudie published a brief four page article on the site in the *International Journal of Nautical Archaeology* (Goudie 2005). Only the six complete pierced stones were discussed in the article. These were illustrated and assigned labels from A-F (**Figure 3**). A table of measurements of the stones was included with the article and is reproduced below. The weights of all the stones are reported as between 25 and 27 kg.

Stone	Height	Max width	Thickness	Apex Hole	Base hole
A	43	42	9	3.5	8x4
B	55	35	7	6	8x6
C	50	35	9	3	5.5x3
D	45	29	10	2.5	3.4
E	54	43	8	6.5x4	3x4
F	46	27	16	6.5x4	5x3

Table 1: Measurements (in cm) of stone anchors, after Goudie (2005)

- 4.3.10. The complete pierced stones all had two holes. In all cases there was a round hole in the narrower end of the stone, with a second hole in the wider part. In three of the six stones this second hole is clearly rectangular in shape. The stones vary between sub-triangular or wedge-like to sub-rectangular in shape. Stones A and B appears to be the most carefully worked, with a clear triangular shape and flat apexs, together with neatly cut rectangular second holes. Stone F is the most crudely made of the group, being an apparently naturally sub-rectangular stone modified only with a circular and oval hole.
- 4.3.11. At present only one of the stones is on display in the Dunbar Town House Museum. A visit was paid to the Town House on 22/10/2012 and it was found to be Goudie's Anchor 'A'. Four anchors were also found in the East Lothian stores in Haddington during the recent visit (Goudie's B-E). One complete pierced stone (Goudie's F) and the possible partial anchor could not be located at the time of the enquiry.
- 4.3.12. The following table lists the anchors held in the East Lothian Museums Service database (it is not clear exactly how Goudie's labelling system (A-F) corresponds with the East Lothian Accession numbers as the descriptions in the database are not detailed enough to identify the individual stones).

Type	East Lothian Accession No.	Description
Anchor	2000.460.1	Triangular in shape with a round hole through the depth of the stone at the top and a rectangular hole at the bottom of the stone. The stone is covered in barnacles.
Anchor	2000.460.2	Stone anchor, probably originally triangular in shape, this example is rectangular with a round hole through the depth of the stone at the top and a rectangular hole at the bottom of the stone. The stone is covered in barnacles.
Anchor	2000.460.3	Triangular with a round hole through the depth of the stone at the top and a rectangular hole at the bottom of the stone. The stone is covered in barnacles.
Anchor	2000.460.4	Stone anchor, triangular with a round hole through the depth of the stone at the top and a rectangular hole at the bottom of the stone. The stone has broken into two sections at the top through the round hole. The stone is covered in barnacles.
Anchor (part)	2000.460.5	Part of a stone anchor, triangular with a longer piece to one side forming an axe shape. The stone is covered in barnacles.
Anchor	2006.97	Triangular in shape with a round hole through the depth of the stone at the top and a rectangular hole at the bottom of the stone. The stone is covered in barnacles.
Anchor	2006.98	Triangular in shape with a round hole through the depth of the stone at the top and a rectangular hole at the bottom of the stone. The stone is covered in barnacles.

Table 2: Stone anchors from Sicar Rock held by the East Lothian Museums Service

- 4.3.13. In 2007 the BGS undertook a geological examination of the six complete pierced stones in the possession of East Lothian Council. At this time two of the stones (Goudie's B and D) were in storage and the other four were in Dunbar Townhouse Museum. A copy of this report (Hyslop 2007) has been archived with RCAHMS. This analysis was undertaken to try to identify the origin of the stone. The results of the analysis suggested that the stones were all of sandstone. Comparison with samples in the BGS collection showed they had similar characteristics with local Carboniferous and Devonian sandstones outcropping in the Dunbar area.
- 4.3.14. The archives relating to the project held by the RCAHMS were consulted during the baseline research. They included colour photos of Anchors A and E which were not found during the visit to the museum stores (**Plate 1**) and an image of the metal pulley (**Plate 2**).

- 4.3.15. BSCA21 members have stated that there had been a plan to complete a measured survey of the site several years ago. To this end a programme of archaeological training was undertaken for the BSAC21 club by the Nautical Archaeological Society around the time of the IJNA article (Goudie 2005). In the event, a detailed plan of the site was never made although a baseline was reportedly set up and two grid pegs were put in place on the site (and may still be there).

5. SITE DESCRIPTION AND INTERPRETATION

5.1. SITE LOCATION

WA Site Position

Lat.	-2°.477519
Long.	56°.013111
WGS 84	

- 5.1.1. The position given above is based on a comparison of sketches of the anchor locations provided by BSAC21 (**Figure 2, Figure 4, Figure 5**) in conjunction with the bathymetrical data provided by Graeme Govenlock.

- 5.1.2. The site is located approximately 2.4 kilometres east-north-east of Dunbar Harbour. The closest point of land is approximately 1.5 kilometres to the south. The site is variously known as *Siccar* Rock or *Sicar* Rock. The *North Sea Pilot* states that it is also known as ‘Sea Carr’ (Admiralty Hydrographic Department 2010, 208). ‘Sea Carr’ is listed by Jamieson (1867, 465) as a Scots word for mound or embankment. Alternatively *Sicar* might also be a corruption of the Gaelic *sgeir* (skerry). *Sicar* is used instead of *Siccar* throughout this report in order to be consistent with previous publications.

5.2. SHALLOW/SURFACE GEOLOGY AND HYDRODYNAMIC ENVIRONMENT

- 5.2.1. *Sicar* Rock is classified by the BGS as a protrusion of argillaceous rocks with subordinate sandstone and limestone. The seabed all around it is covered with marine sand. The general depth all around the rock varies from approximately 25-30 metres. The ridge itself is orientated east-west, and measures at least 500 metres in length by approximately 100 metres wide. It is characterised by a tall central irregular ridge with a least depth of approximately 8 metres which drops away sharply to the north and has a pronounced plateau to the south. The area has never been bathymetrically surveyed in great detail but the general bathymetry (consulted through Garmin Homeport) suggests that the ridge may have a total length of around 750 metres and a total area of up to 10 hectares.

5.3. ARCHAEOLOGICAL INVESTIGATIONS

Material thought to be on the seabed prior to the survey

- 5.3.1. In the weeks leading up to the survey, discussions took place with the BSAC21 members, in particular with the author of IJNA article, Lorna Goudie. Both Lorna

and the other members of BSAC21 suggested that there could be up to four anchors in position. If this were the case then it suggests that the site originally would have had a total of ten stone anchors and one partial anchor. A number of low-resolution photographs from 2006 (**Plates 4-6**) and a sketch of the site were provided (**Figure 5**). These showed up to four anchors in total on the seabed although it was unclear whether the sketches included stones which were subsequently lifted.

- 5.3.2. Two further objects on the seabed were also described, both lying on the north-east side of the ridge. One of these was described as a small metal object or canister, fused to the bedrock. Lorna stated that this was usually avoided in case it was unexploded ordnance (UXO). The second object was described as a small round stone with a hole in it, possibly a stone fishing weight. A report was received in September 2012, subsequent to completion of the dive survey and during the preparation of this report that an artefact had been raised from the site. The information was provided by Gary Lawson, skipper of the MV *Pegasus*, the same vessel used in the 2012 survey. He informed WA Coastal & Marine (who in turn informed Historic Scotland and BSAC21) that an artefact had been recovered from the site by a local diver who had been diving from his boat (the *Pegasus* is one of the main dive charters operating in this area). The artefact was described as a round stone with a hole in the centre, small enough to lift by hand. This description matches that of the object discovered previously by BSAC21 but left *in situ* by them. The description of the original location given by BSAC21 suggests that unlike the rest of the artefacts this lay on the north side of the ridge. Unfortunately the opportunity to record its exact location has now been lost and attempts are currently underway to ensure that the artefact is fully recorded and archived with the rest of the material recovered. The artefact is currently in the possession of Gary Lawson of Dive Safari Scotland, at his home in North Berwick. Mr. Lawson has been advised to place the object in fresh water to desalinate it.
- 5.3.3. BSAC21 members carried out a dive at the site several weeks in advance of the WA Coastal & Marine survey and reported that they had come across one of the anchors at the end of their dive on the 12th of August 2012 (pers. comm. Sara Robertson (BSAC21) email dated 15/08/2012). This anchor was noted at a depth of approximately 20 metres.

Geophysical Data

- 5.3.4. As discussed above, depth profiles taken in 2000 by Graeme Govenlock, a BSAC member were provided in Excel spreadsheet format to WA Coastal & Marine prior to the 2012 survey. As part of the 2012 programme of site investigation this data was processed into a bathymetrical model of the site by WA Coastal & Marine. A depth and time were provided with each for each depth reading together with latitude and longitude in WGS84 decimal degrees. The depths were tidally corrected using Admiralty Total Tide and were mapped out in ArcGIS 9.3. They were then used to generate a continuous surface topography using the Spatial Analyst Interpolation functions (**Figure 4**). Although the accuracy of this bathymetry is slightly inconsistent due to the irregular spacing of the sample points it was found to be a useful guide and is the most detailed depth survey ever taken of the area.

Resurvey of Recovered Material

- 5.3.5. A programme of review of the previously recovered material was carried out as part of the project. A visit was made to East Lothian Museums Service store at the Museums Service Headquarters in Haddington and a photographic record was made of the four anchors that could be located by the curators on the day. In addition a photogrammetric survey was made of the stones. The anchors were propped upright in the centre of a clear floor space and around 60 digital photographs were taken of each artefact. These were then processed into 3D models using Autodesk's 123D Catch. Four elevation and endview orthographic projections were generated for each stone (**Figure 6**). In addition fly-through videos of each anchor have also been provided to Historic Scotland. The Dunbar Townhouse Museum was also visited to try to record the stone held there (Lorna Goudie's 'A'). Unfortunately it was not possible to record the stone using photogrammetry as it was inside a glass case for which no key was available at the time of the visit.

Dive Survey

- 5.3.6. Fieldwork was conducted at the site between the 20th and 24th of August 2012 (**Plate 6**). Conditions were found to be problematic for diver survey, mainly due to strong tides, poor weather, relatively limited visibility (approximately 3-4 metres) and low light levels. However, six dives were completed. Survey was conducted from two shotline positions on the seabed during the course of the week, focusing on the southern side of the ridge where the main concentration of material was thought to be. No *in situ* material of archaeological interest was noted during the diver survey. The actual extent of the ridge at Sicar proved to be far greater than expected from diver descriptions and it was found that the bathymetry provided by Graeme Govenlock covered only one section of the ridge. It proved impossible to cover the entire area of interest (i.e. the discernible extent of the ridge) in the time available.
- 5.3.7. The seabed beyond the southern limit of the ridge was characterised by a relatively clear and level sand with occasional boulders at around 25m, surrounding an irregular ridge densely strewn with boulders and covered with yellow sponge anemones and sea urchins rising up to a general height of around 12-8 metres least depth (**Plate 8**). Anemone cover was much less on the deepest parts of the ridge. These deeper areas were also entirely covered with boulders of a similar size to the expected anchors, making discrimination of archaeological features difficult. An overhanging cliff and gully described by BSAC divers were not recognised during the survey.

5.4. INTERPRETATION

Sicar Rock

- 5.4.1. With one exception the stones have all come from the southern side of the ridge at Sicar Rock and according to information provided by the BSAC21 members were originally distributed in a line of approximately 30 – 50 metres length. The ridge is large and is likely to have been known to local sailors from an early date but with a least depth of around eight metres only presents a navigational hazard to very large modern ships. The ridge is an attractive location for marine life and may have been known as a fertile fishing ground from an early date.

- 5.4.2. The artefacts were all found lying on the surface of the ridge and no material was recovered from a secure dateable context. As a result any interpretation of their date must be closely tied to an interpretation of their function and both aspects are discussed together here.

Interpretation as Anchors

- 5.4.3. Although most of the artefacts recovered from Sicar Rock have been referred to here as anchors, the purpose of these objects has been the subject of some debate. Goudie's 2005 article in the *IJNA* used the term 'pierced stone' in its title and did not explicitly refer to them as anchors although it was noted that 'the stones are of significantly greater weight than known fishing nets or basket weights' (Goudie 2005, 355).
- 5.4.4. The design of the stones gives some clues. In the six 'pierced stones' from the site, the upper hole shows clear signs of abrasion from attachment to a rope. The lower fluke holes vary between a round or oval shape and a rectangular shape. It is likely that this took the form of a single timber (or possibly a metal bar in the case of the lower circular holes) whose ends acted as flukes or bills. Although some of the recovered examples appear to be relatively crude, others are very carefully shaped and appear to have been in use for some time. Given the amount of effort required to shape the stones (particularly A and B) it is clear that they were not a 'disposable' item.
- 5.4.5. Comparison with artefacts from other sites lends weight to the interpretation as composite anchors. Kapitän (1984) has produced an illustration comparing the main categories of stone anchors outside Britain (**Figure 7**). There are numerous examples of similar artefacts in the wider archaeological records with parallels in India, Syria, Sri Lanka, Saudi Arabia, Turkey and Israel. The Israeli examples are known as 'Syrian type' and date to the Late Bronze Age or earlier. They tend to be of similar dimensions and weight but have a single hole at their apex (Frost 1970; Galili 1984; Galili, Gale and Rosen 2012; Galili and Sharvit 1994). The Indian and Sri Lankan anchors come in two distinct types, grapnel and triangular. The 'triangular' type (not all of which are triangular) are similar in size and design to the Sicar anchors but only a few examples have a single upper and lower hole while the majority have an apex hole and two holes at the base (Souter 1998; Sundaresh *et al* 1999; Gaur *et al* 2001). A single relatively large three-holed example thought to be of pre-Islamic date has been found in Saudi Arabia in 2012 (Cooper and Zazzaro 2012). Numerous stone anchors have been found along the Anatolian coast of Turkey and these are similar to the Israeli examples including the occasional example of a two-holed stone (Evrin *et al.* 2002). Frost (1970, 394) also mentions examples from Sicily, the Italian mainland, France, Greece, Spain and North Africa. Lorna Goudie was able to provide records of correspondence received after the publication of her article in *IJNA* showing parallels from Spain and America as well as several published examples from France.
- 5.4.6. There are numerous examples of stone objects interpreted as anchors from around Britain. Several sources were consulted for parallels. These included the Big Anchors

Project¹ website, the online database of the Shipwrecks and History in Plymouth Sound (SHIPS) project², the records of English³ and Scottish⁴ Historic Environment Records and published sources such as the *IJNA*. A total of 41 separate examples were found (plus one site with over a hundred objects described as anchors) and there are likely to be many more. The distribution of the examples found during the literature review is strongly biased towards the south coast of England around Dorset, Devon and Cornwall with numerous examples in Plymouth Sound. The majority of these examples were found by divers and it is likely that the distribution is partially a reflection of popular diving areas. Within Scotland there appears to be only one known example of a stone anchor, at the Easdale Island Folk Museum. This is described as a pear-shaped and 40 cm long, with a single round hole of about 7 cm diameter. A series of 'cappies' were also noted by Goudie (2005) but are much smaller and thought to be fishing weights.

- 5.4.7. In all six of the Sicar stones, there was only a single rope hole and a single fluke hole. This is relatively unusual in the context of both Mediterranean and British discoveries. Only one example of a stone anchor found in Britain had two holes. This example from Langstone Harbour, is similar to the Sicar examples in having two holes and was found in the 1970s. This is around half the size of the Sicar examples at only 13.6 kg.⁵

Dating

- 5.4.8. As mentioned above the presence of two holes is relatively unusual. The discovery of a group of anchors at the same site and of a similar design might be taken to suggest that they are related and from a single archaeological period. Although the majority of Mediterranean parallels appear to be prehistoric, the evidence from Britain is less certain. Few of the British stone anchors have any dating evidence associated with them. A single-holed example from Lulworth Cove (Farrar 1970; Farrar 1971) was found close to a fragment of pottery of Mediterranean origin dated to 100BC-100AD. An example found at a light house on the Scilly Isles may be post-Roman as one side was carved with a cross although the cross is not exclusively a Christian symbol (Ratcliffe and Thorpe 1988). A symbol was also found on a stone anchor recovered from St Alban's Head in Dorset (Markey 1997) although the mark has not been identified. At North Killingholme, in North Lincolnshire, a large sandstone object was found during the excavation of an Iron Age/Romano-British enclosure and identified as a possible anchor for a small vessel (Jordan 2006). In 2000 a large cluster of anchor stones was found in an excavation of a medieval breakwater at an inland site in Leicestershire. Over 100 anchor stones were recovered. These weighed between 10 and 80 kg, with the majority between 20 and 50 kg. These were different in form to the Sicar Anchors, having a groove cut around the centre of a stone. Some also had a 'tie hole' cut perpendicular to the groove. The withy band from one of the

¹ <http://www.biganchorproject.com>

² <http://www.promare.co.uk/ships/index.htm>

³ Consulted through <http://www.heritagegateway.org.uk/>

⁴ Consulted through <http://www.rcahms.gov.uk/canmore.html>

⁵ http://www.biganchorproject.com/_cnk/members/anchor.php?anchor_id=556
(registration required)

Accessed 30/10/2012

anchors gave a radiocarbon date within the same 8th/9th century period as the adjacent fish weirs while bands from other stones gave 13th/14th century dates.

- 5.4.9. It is not clear at present how the Sicar stones relate to other examples from other sites in Britain and beyond. In the Mediterranean the stone anchor seems to have gone out of use after the Bronze Age in the Mediterranean. There are very few published examples from the British Isles but there are indications that it may have been in use until quite recently.
- 5.4.10. It is interesting to note that the use of stones as anchors continued until recently in the British Isles. A type of anchor known as a *cailleach*, 'kellick' or 'killock' is mentioned in Scottish and Cornish 19th century dictionaries as describing a stone anchor (Jamieson 1867, 308; Couch 1865, 18) and these appear to have been in use all over the British Isles prior to the widespread adoption of iron anchors. Many of the historical references to killocks suggest they were un-pierced and as a result may be all but impossible to trace archaeologically. However the possibility that some of the anchor stones recovered at Sicar were part of a killock-type composite anchor must also be considered and this raises the possibility of a relatively recent date for them. Corlett (2007) has discussed the use of killocks in an Irish context. He demonstrates that this type of anchor was in use in Ireland as late as the 1920s and includes several black and white photographs of examples from the early 20th century. These appear to be quite different to the Sicar Rock examples, consisting of a single unpierced long stone lashed to a timber frame, close to Kapitän's type 8. An illustration of killock anchors in use was made in 1685 by Captain Thomas Philips (Plate 9).
- 5.4.11. The late use of killocks in Britain was probably mainly due to the cost of metal anchors but there may have been other advantages. There is some evidence that even where metal anchors were available stone anchors were sometimes preferred for certain fishing sites. In a 19th century fishing manual, it is suggested that 'on a rocky bottom a sling-stone or kellick should always be used in lieu of an anchor, which frequently gets irrecoverably hooked in some projection or crack in the rock' (Wilcocks 1868, 7). The seabed at Sicar is rocky. This might go some way to explaining why numerous anchors have been found at the rocky ridge at Sicar compared to the dearth of similar material elsewhere in Scotland and it should also be noted that there are several other examples of anchors finds at rock reefs around Britain, including Middle Patch Point and Chapman's Pool.

Function

- 5.4.12. If the stones are anchors then the question of what type or size of the vessel they were for arises. The relationship between the size of the anchors and the vessels is not clear. A larger vessel may simply have used more rather than larger anchors. The advantage of using multiple smaller stones meant that anchors could be retrieved by a single person without the aid of pulleys or cranes (Ehud Gallili pers. comm. 24/9/2011). Weighing between 25 and 27 kg, all of the stones from Sicar can be comfortably lifted by a robust person. The anchors may have been deployed singly from very small/light vessels or in large groups from a larger vessel. In the former case the Sicar Rock assemblage would to represent multiple losses of anchors (this interpretation was favoured by the ADU - Martin Dean pers. comm. 17/07/2012).

The variation in shape between the anchors, particularly in the differences in fluke holes might be taken to support this. A vessel small enough to be held by one of the Sicar Anchors would be quite small and probably only capable of journeys to and from the shore. The analysis of the stones by the BGS (Hyslop 2007) showed that the stones were probably local in origin and would suggest the anchors were lost by locally-based fishermen.

- 5.4.13. The alternative theory that all the anchors might have come from a single vessel was favoured by Goudie 2005. Unfortunately our current knowledge of the distribution of the artefacts along the ridge does not allow us to eliminate either theory.
- 5.4.14. There is also the possibility that the stones are not anchors, in the sense that they were not used to hold boats or ships in place. The ADU divers who visited the site in 2000 suggested that they might be anchors from drift nets or other fishing equipment (Martin Dean pers. comm. 17/07/2012). An interesting possibility is raised by an illustration on the SHIPS website which shows stone anchors strung out along a rope to hold smuggled barrels below the surface for later collection.⁶ However the presence of carefully shaped fluke holes on some of the stones makes this interpretation unlikely.
- 5.4.15. The unconfirmed description of the smaller round stone suggests it is unlikely to be an anchor and may instead be a small fishing weight, similar to the cappies of Shetland (Goudie 2005, 335).
- 5.4.16. As discussed above, two metal objects have been reported at the site. One of these was recovered and appears to be a heavily corroded pulley of some kind. The second is a small metal object or canister, fused to the bedrock on the north side of the ridge. No more detailed description or photographs of this object have been encountered during the research for this project. The ADU survey in 2000 described finding the scattered remains of a fishing vessel lost near the site in the 1990s and it is possible that these objects are related to that vessel rather than the stone artefacts.

6. INFORMATION RELEVANT TO THE SELECTION, DESIGNATION AND MANAGEMENT OF HISTORIC MARINE PROTECTED AREAS

6.1. SURVIVAL AND SITE CONDITION

- 6.1.1. At least eight stones have already been recovered from the site. Although the WA team did not succeed in locating any pierced stones on the seabed, confirmation by BSAC 21 and Mr Lawson of further seabed material would suggest that we are yet to determine the full extent of survival on this site. Given this situation and the uncertainty over interpreting the origins of this site, the extent of survival in-situ can best be described using the classifications established in Annex B of *Guidelines on the selection, designation and management of Historic Marine Protected Areas* (Historic Scotland, 2012) as ‘unknown’.

⁶ http://www.promare.co.uk/ships/Finds/Fd_10A11StoneAnchor.html Accessed 30/10/2012

- 6.1.2. The most significant risk to the site from manmade operations is through selective recovery or disturbance of material by recreational divers, as evidenced by the recent recovery of a small round stone. Unfortunately both removing and moving the objects without an accurate record of their original locations means that this information is lost and achieving a definitive interpretation of the site becomes less likely (in particular distinguishing whether the material might relate to a single wreck). Fortunately, at Sicar Rock, the impact of previous recoveries has to a certain extent been mitigated by recording and publication by the finders, and through curation of recovered finds by the East Lothian Museum Service.
- 6.1.3. Given the relatively robust nature of stone artefacts, there is no evidence that remaining stone finds on the seabed are likely to be vulnerable to damage or deterioration due to natural processes occurring at Sicar Rock. However, one of the artefacts previously recovered was a metal ring of unknown function. If there are further remains of a similar nature in situ and they are associated with the stone anchors, they will be slowly degrading due to natural chemical interaction with seawater. Taking into account both the history of investigation on this site and factors relating to condition of artefacts, site condition is best described as ‘generally unsatisfactory with major localised problems’.

7. RECOMMENDATIONS

- 7.1.1. Sicar Rock proved a particularly difficult site to survey due to the wide area over which material may be scattered, and the limitations on diving imposed by tidal conditions and depth.
- 7.1.2. Further work is desirable to establish the full extent of survival on this interesting site. Any future survey of the site would benefit from the participation of divers familiar with the site. Alternatively local divers might be encouraged to place temporary shotlines on any anchors they find in the months and weeks leading up to a survey. This was not possible in the case of the 2012 survey mainly due to the work commitments of the BSAC21 members. Finally, although depth profiles were available prior to the survey they were found to be of limited use during field survey due to problems with positioning of the data. Any future survey at the site would benefit greatly from a geophysical survey of the site, perhaps using survey quality single beam, which could then be georeferenced and used as base mapping for diver tracking.
- 7.1.3. Consideration should be given to the possibility of conducting a community-based recording project at the site. There are several local organisations with an interest in the site, including BSAC 21, the East Lothian Museum Service and the Dunbar and District History Society. Such a project could be undertaken with professional archaeological (non-diving) advice and direction, with a professional dive team of archaeologists working alongside (but not within) the avocational teams. The Nautical Archaeology Society has had some involvement with the site in the past and might also play a role, perhaps as a part of the Big Anchor project.

- 7.1.4. As regards protection of this significant site, it may prove difficult for Historic Scotland to justify designation of a Historic Marine Protected while there is remaining uncertainty both in relation to the origins of the site and the full extent of survival of material on the seabed. At the current time, the Scottish Government may wish to consider how the marine licensing requirements set out in Part 4 of the Marine (Scotland) Act 2010 provide a mechanism to ensure that planned recovery of objects from the seabed at Sicar Rock is carried out in accordance with archaeological best practice.

8. ARCHIVE

- 8.1.1. The project archive consisting of the digital records of the dive survey and the digital records of the anchors in the Haddington Museum Collections building is currently stored by WA under project code 83800. A hard copy of the report will be provided to Historic Scotland and RCAHMS. Digital and paper archives of material gathered for the project will be archived with RCAHMS.

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APPENDIX 1: DIVE LOG

Dive	Date	Divers	Start time*	Max. Depth (m)	Bottom Time (min.)	Work undertaken	Tide times
1	20/08/2012	McCarthy, Stratford	16:35	20.3	10	Divers descended to bottom but aborted dive due to strong tide	11:00 LW 17:20 HW
2	21/09/2012	McCarthy, Stratford	11:20	25.2	20	Descended near spine of ridge to west of summit on shallow north-facing slope. Numerous boulders noted, covered in yellow sponge coral. Most boulders in the same expected size range as the anchors, or slightly larger. Also covered in white worm cast material similar to that on the recovered anchors. No archaeological features noted.	11:35 LW
3	21/09/2012	Scott, Benjamin	17:28	22	8	Conducted linear search SE from shot position about 10-15 metres. Dive aborted due to strong currents. No archaeological features noted.	18:00 HW
-	22/09/2012	-	-	-	-	Went out to attempt a dive at low slack. High winds forced cancellation of all diving for the day.	12:10 LW
4	23/09/2012	Scott, Benjamin	11:58	25.3	21	Made bottom at base of shot at bottom of boulder slope. Carried out 5m and 10m circular searches. Started linear search to the west of shot. No archaeological features noted. Completed echo sounder outline survey of ridge.	07:00 HW 13:00 LW
5	24/09/2012	Scott, Benjamin	11:54	24	22	Moved shot line to circa 100m east. Excellent weather and slack low tide. No archaeological features noted.	07:50 HW 13:50 LW
6	24/09/2012	McCarthy, Stratford	12:48	25	20	Excellent weather and slack low tide. No archaeological features noted.	07:50 HW 13:50 LW

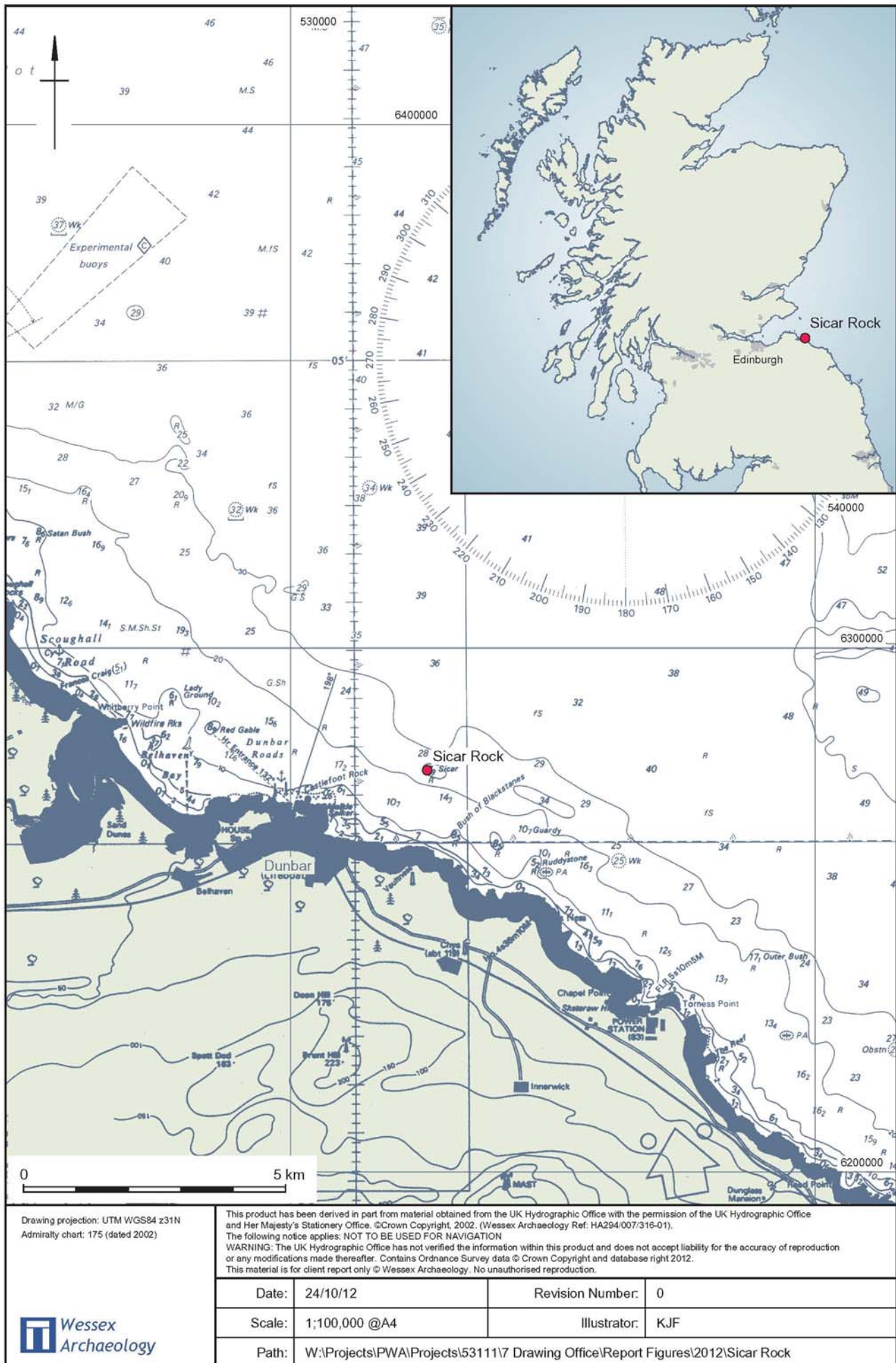
*All times BST

APPENDIX 2: RECORDING LEVELS

Level	Type	Objective	Sub-level	Character	Scope	Description
1	Assessment	A record sufficient to establish the presence, position and type of site.	1a	Indirect (desk-based)	A basic record based on documentary, cartographic or graphic sources, including photographic (incl. AP), geotechnical and geophysical surveys commissioned for purposes other than archaeology.	Documentary assessment / inventory of a site, compiled at the start of work on a site, and updated as work progresses.
			1b	Direct (field)	A basic record based on field observation, walkover survey, diving inspection etc., including surveys commissioned specifically for archaeological purposes.	Typically a 1-2 dive visit to the site (to assess a geophysical anomaly, etc.).
2	Evaluation	A record that provides sufficient data to establish the extent, character, date and importance of the site.	2a	Non-intrusive	A limited record based on investigations that might include light cleaning, probing and spot sampling, but without bulk removal of plant growth, soil, debris etc.	Typically a 2-4 dive visit to assess the site's archaeological potential, backed up by a sketch plan of the site with some key measurements included.
			2b	Intrusive	A limited record based on investigations including vigorous cleaning, test pits and/or trenches. May also include recovery (following recording) of elements at immediate risk, or disturbed by investigation.	Either an assessment of the buried remains present on a site; the recovery of surface artefacts; or cleaning to inform for example a 2a investigation.
3	In situ	A record that enables an Archaeologist who has not seen the site to comprehend its components, layout and sequences.	3a	Diagnostic	A detailed record of selected elements of the site.	The first stage of a full record of the site. This would include a full measured sketch of the site and a database (or equivalent) entry for all surface artefacts.
			3b	Unexcavated	A detailed record of all elements of the site visible without excavation.	Full site plan (i.e. planning frame or equivalent accuracy) with individual object drawings, and full photo record (possibly including a mosaic).
			3c	Excavated	A detailed record of all elements of the site exposed by open excavation of part or whole of the site.	This may take the form of full or partial excavation of a site.
4	Removal	A record sufficient to enable analytical reconstruction and/or reinterpretation of the site, its components and its matrix.			A complete record of all elements of the site in the course of dismantling and/or excavation.	

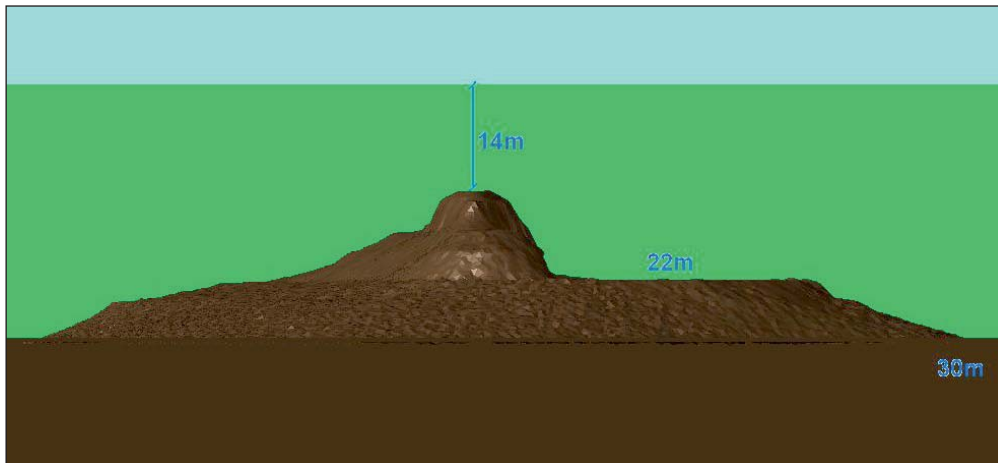
Level	Type	Objective	Sub-level	Character	Scope	Description
5	Intra-site	A record that places the site in the context of its landscape and other comparable sites.			A complete record of all elements of the site, combined with selective recording of comparable sites and investigation of the surrounding area.	

Note: these levels represent guidance formulated by Wessex Archaeology for use during the archaeological investigation of wreck sites. They are currently used by curators, but have not been formally accepted as a standard means of grading archaeological work.

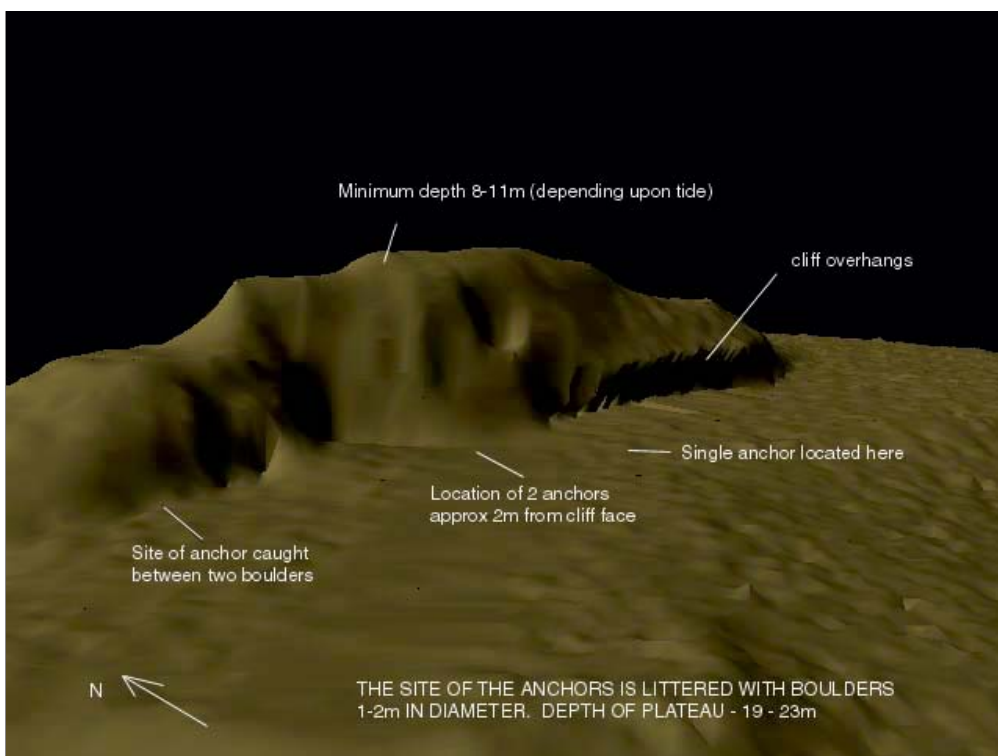


Site location

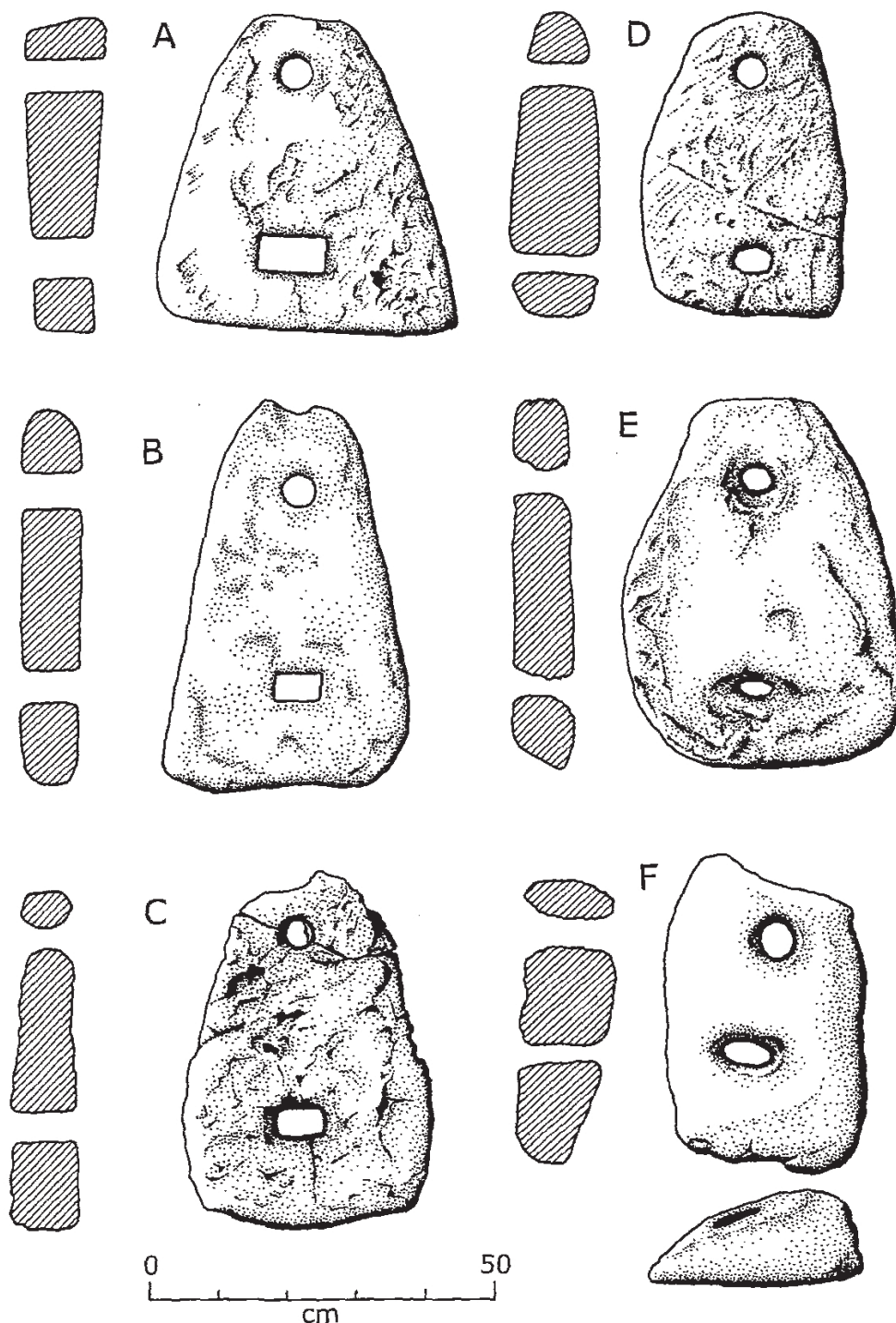
Figure 1



A. Elevation of 3D model of Sicar Rock provided by Graeme Govenlock of BSAC21



B. Isometric view of 3D model of Sicar Rock provided by Graeme Govenlock of BSAC21, including estimates of anchor locations



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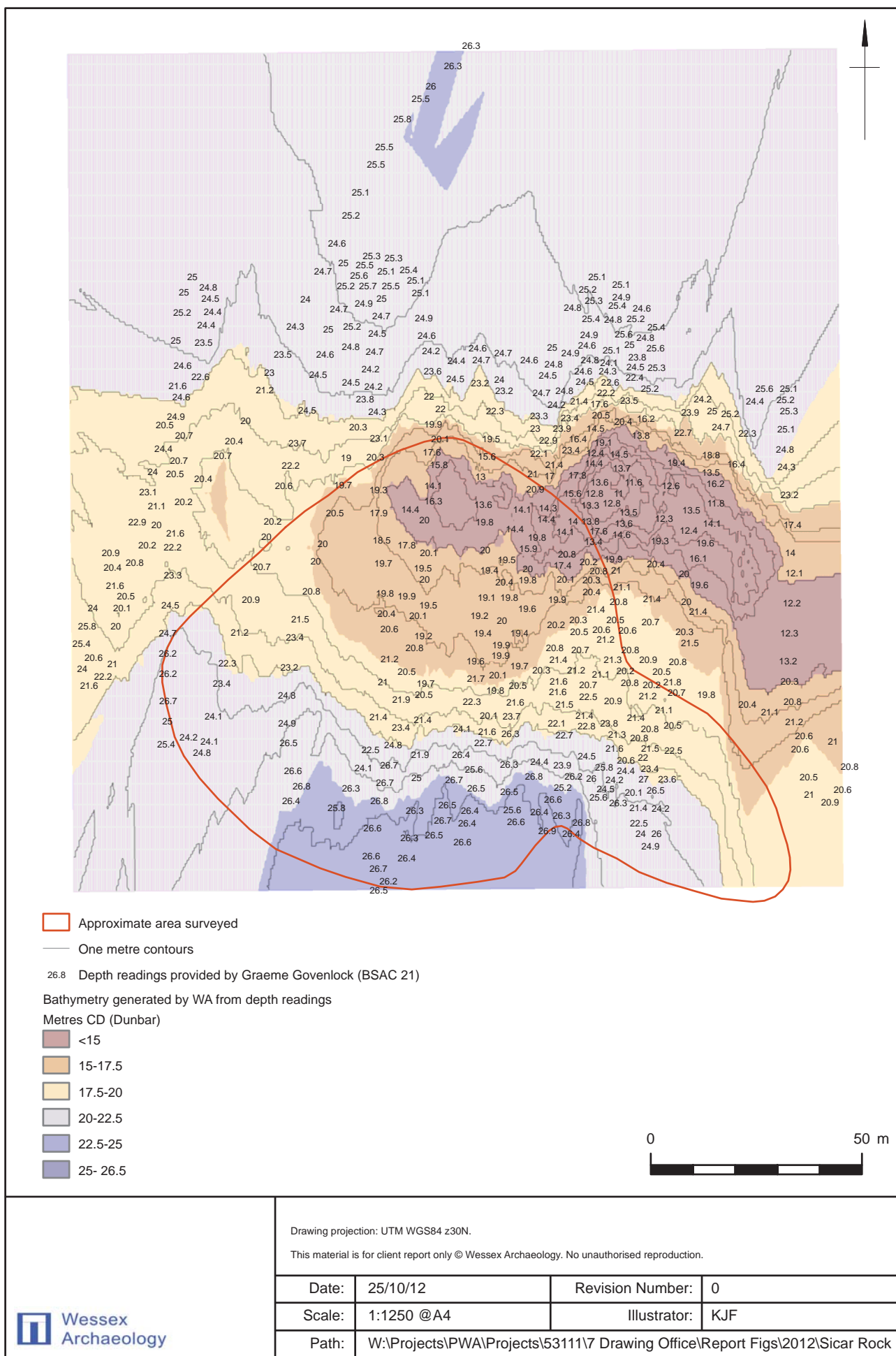
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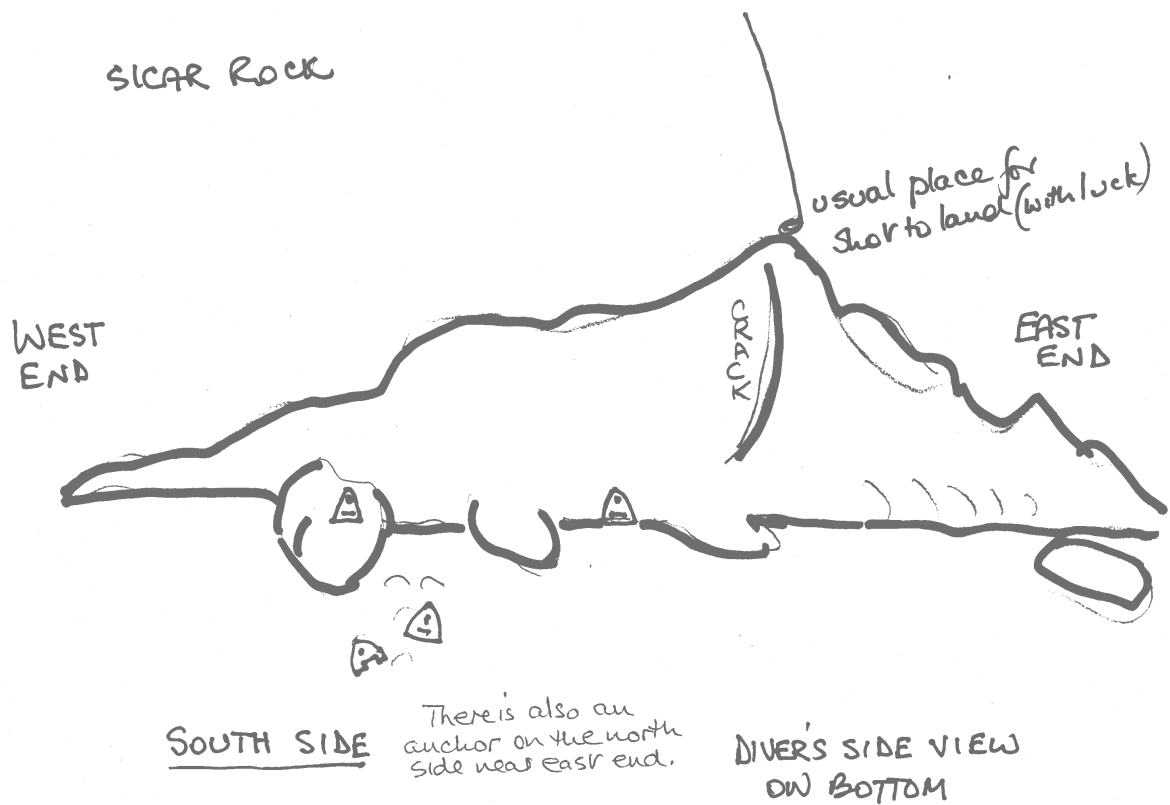
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Bathymetrical map of Sicar Rock derived from depth profiles provided by Graeme Govenlock, overlaid with extent of 2012 diver survey (note that the accuracy of the bathymetry has not been confirmed)

Figure 4



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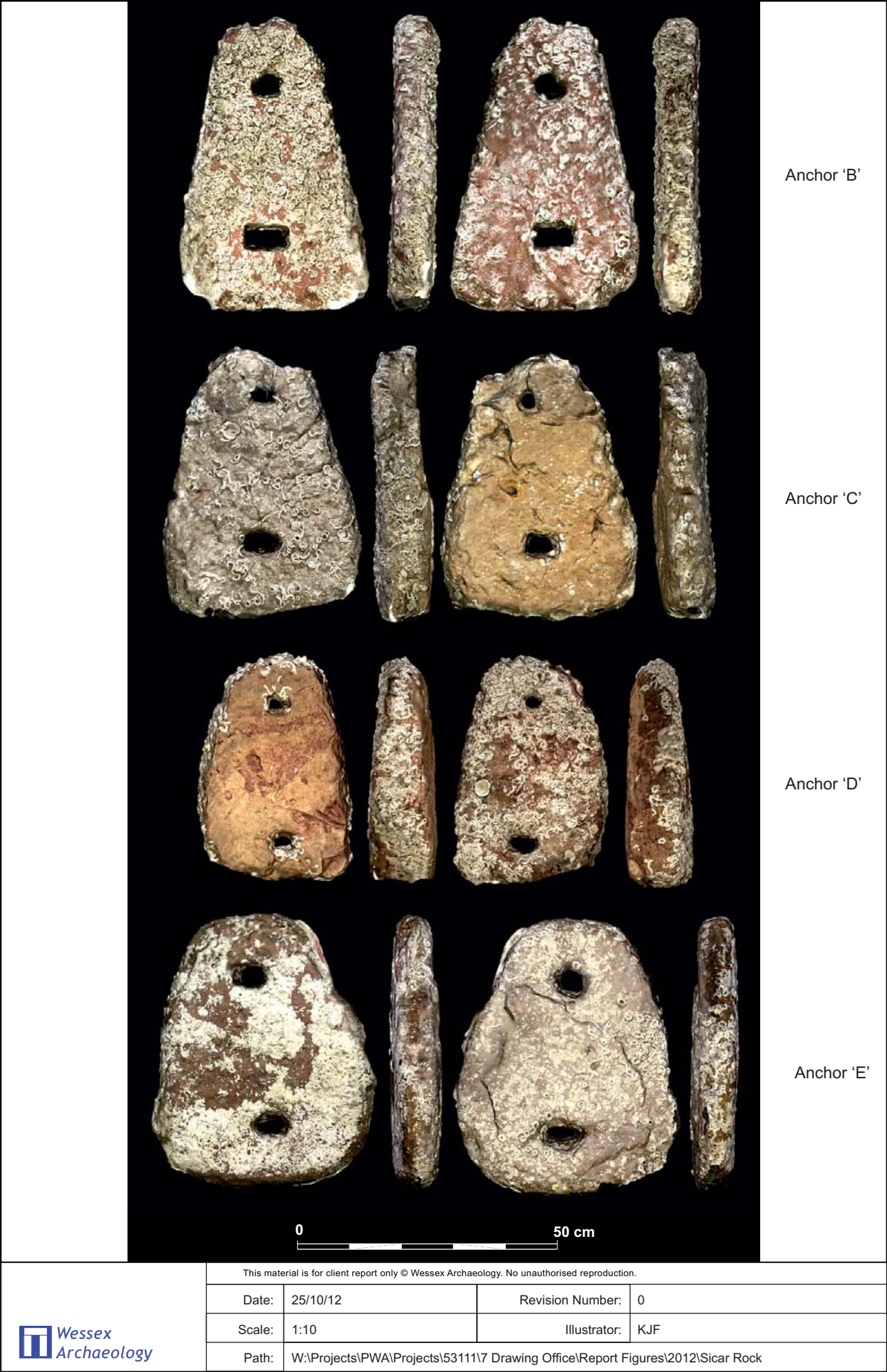
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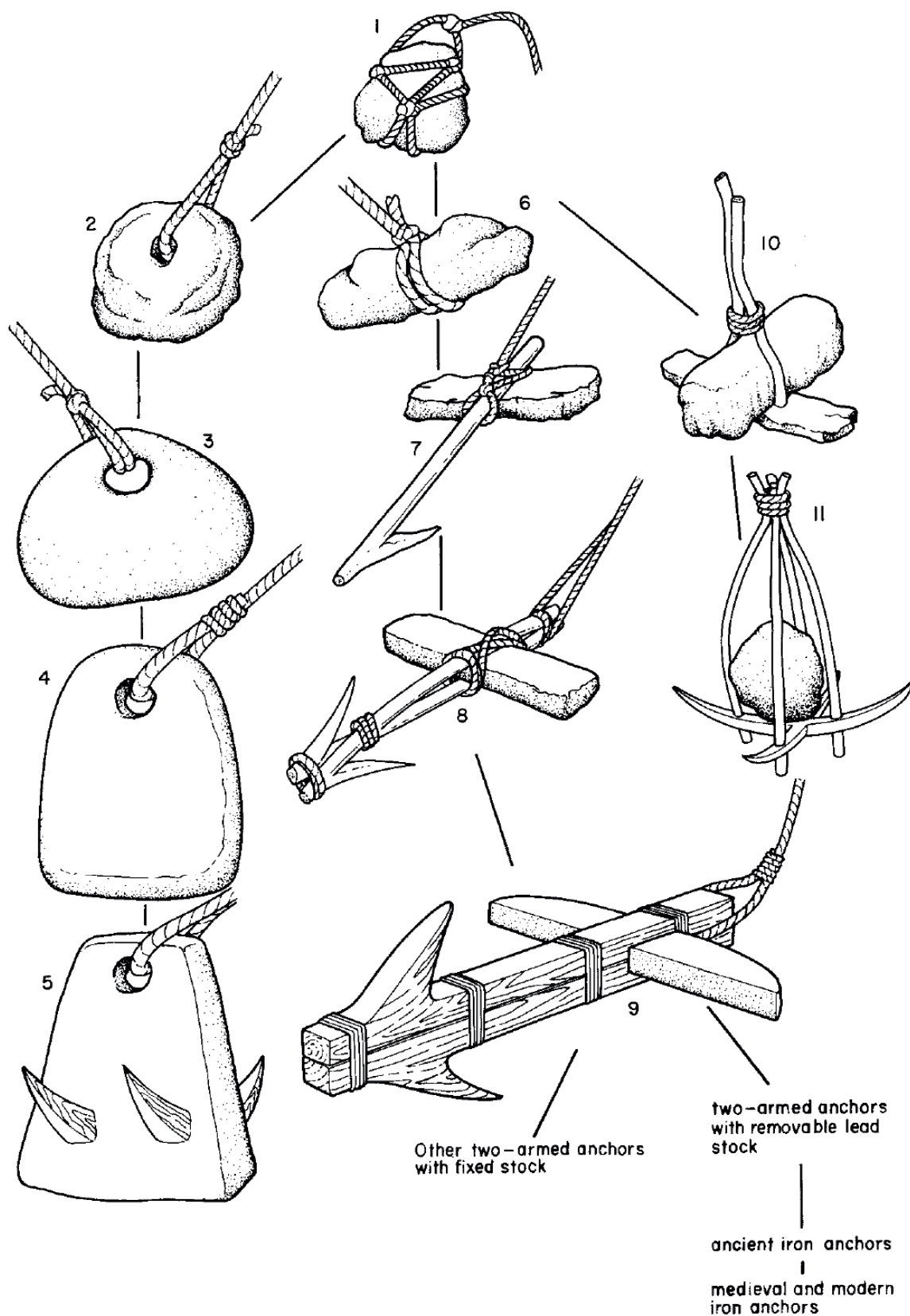
Sketch elevation provided by BSAC21 members showing the outline of the ridge and the locations of in situ anchors. It is unclear whether some of these anchors have subsequently been lifted.

Figure 5



Orthographic projections from photogrammetric model of anchors 'B' - 'E'

Figure 6



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Plate 1: Scanned slide from the RCAHMS database showing anchors A, F and E (left to right)

It's anchors aweigh for Town House

A RARE find of four stone anchors uncovered by a team of Edinburgh divers off the coast of Dunbar have been purchased by East Lothian Museums Service for display in Dunbar Town House.

Councillor Maureen Talac, vice-convener of education and community services, said: "This is a very exciting and rare find as stone anchors are very rare. Only one other such

anchor has been discovered in Britain and that was down in Dorset.

"Stone anchors have mainly been found in the Mediterranean so this local find is very important and the anchors will remain in Dunbar, close to their resting place."

It is difficult to age stone anchors accurately. The Dunbar anchors found in the Mediterranean area have three

holes whereas the Dunbar anchors are similar to the earlier Dorset find and only have two holes.

One hole was for the rope that raised and dropped the anchor. The second hole is rectangular and is thought to have had a wooden stick inserted through it to bed the anchor into the ground.

The anchors were part of a group of seven which is

believed to be an anchorage or a Four of the group by the divers; — Sub Aqua Club reported to the Wrecks.

The four were chased for £66 Museums Service £300 grant from Fund for Acquisition National Museum Scotland.

Plate 3: Article on the anchors from Dunbar local paper November 17 2000



Plate 4: Low resolution photograph of *in situ* anchor provided by BSAC21

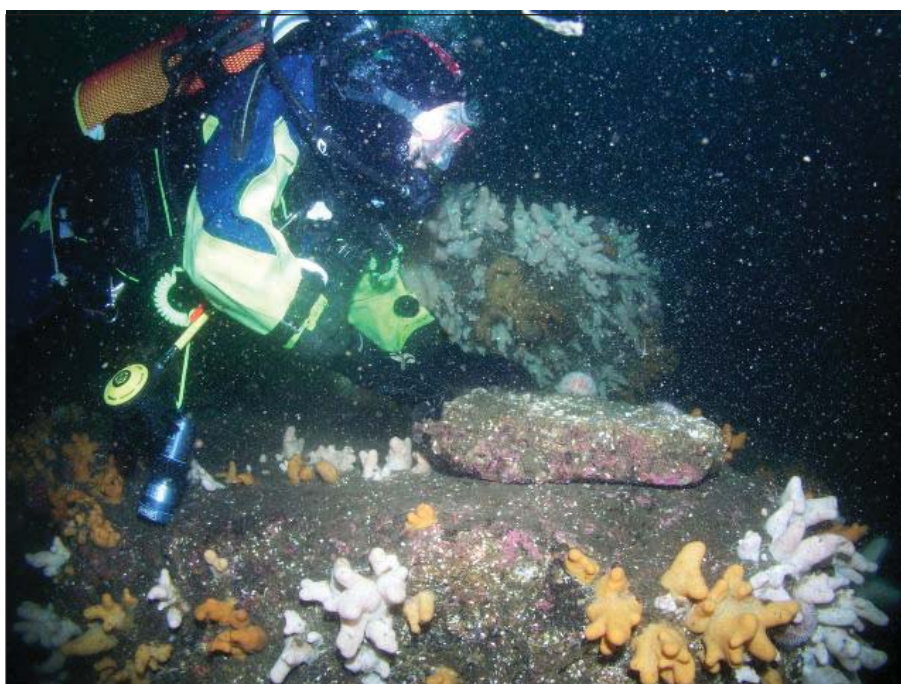


Plate 5: Low resolution photograph of *in situ* anchor provided by BSAC21


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Plate 6: Low resolution photograph of *in situ* anchor provided by BSAC21

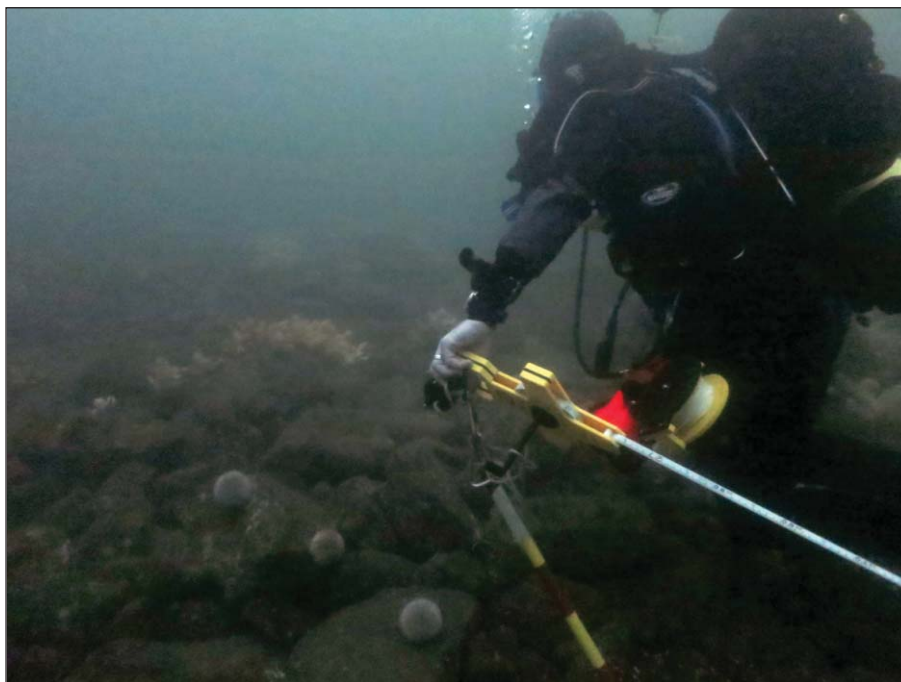



Plate 7: Photograph of diver surveying at Sicar Rock

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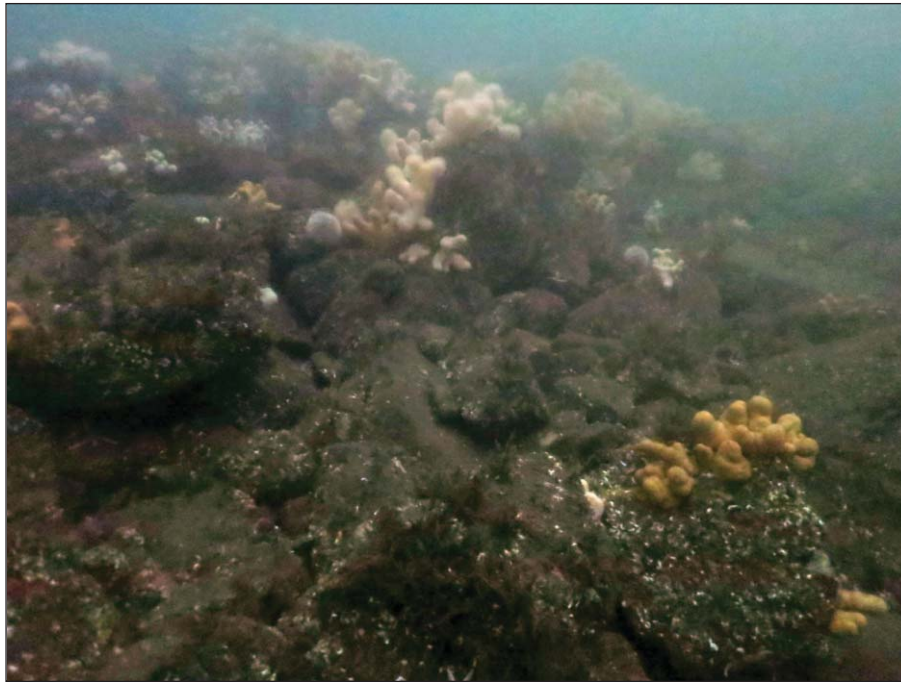


Plate 8: Photograph of seabed conditions on south side of Sicar Rock

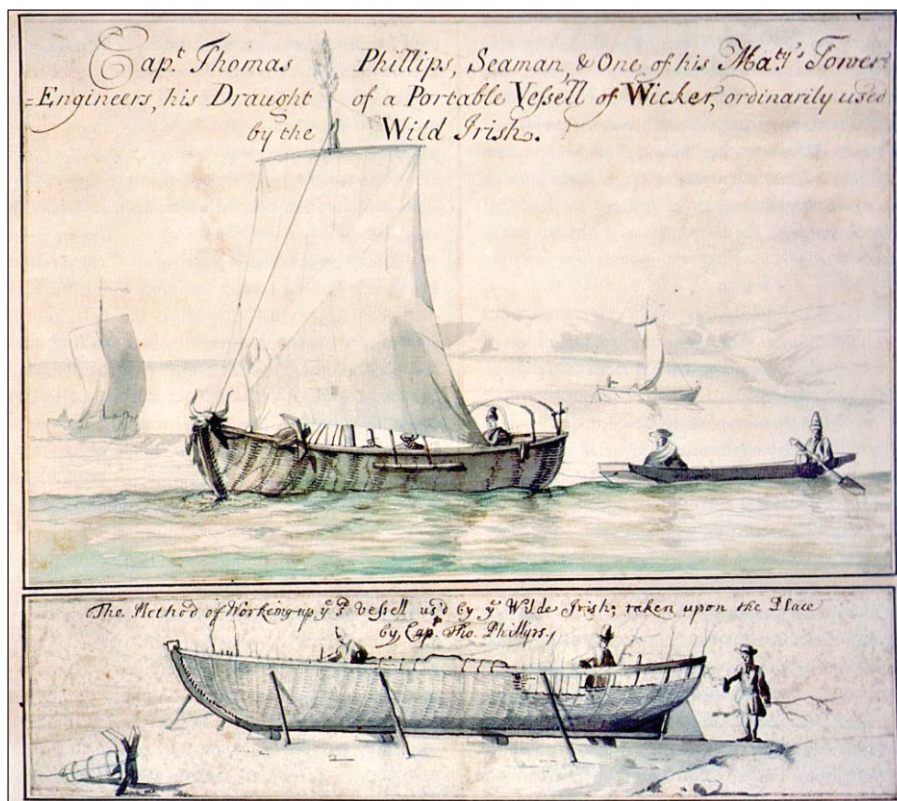


Plate 9: Thomas Philip's 1685 depiction of a large skin boat or coracle (currach) in Ireland. Stone anchors are clearly visible in both the upper and lower panels.

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WESSEX ARCHAEOLOGY LIMITED.

Registered Head Office: Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB.

Tel: 01722 326867 Fax: 01722 337562 info@wessexarch.co.uk

Regional offices in **Edinburgh, Rochester and Sheffield**

For more information visit www.wessexarch.co.uk



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