Natural England Commissioned Report NECR352

Studland to Portland SAC 2017 Survey Report

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Foreword

Natural England commission a range of reports from external contractors to provide evidence and advice to assist us in delivering our duties. The views in this report are those of the authors and do not necessarily represent those of Natural England.

Background

Following designation, Natural England started a baseline monitoring programme across all marine protected areas.

This report was commissioned as part of an inshore benthic marine survey of the Studland to Portland SAC.

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Further information
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Studland to Portland SAC

2017 Survey Report

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P Cooper	15/12/2017	First draft report submitted to Cefas.	V0.1
P Cooper	13/09/2018	Submitted to MPAG review.	V1
P Cooper	01/05/2019	Submitted to Defra for sign-off following application of MPAG comments.	V2

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1 Introduction

1.1 Site description

The Studland to Portland Special Area of Conservation (SAC) is located on the Dorset coast and is comprised of two sections (Figure 1), the Studland Bay to Ringstead Bay reefs and the Portland Reefs. The site contains a diverse range of reef habitats, which exhibit a large amount of geological variety and biological diversity. The site contains an area of Annex I Reef habitat of approximately 19194 ha, which covers approximately 58% of the site (Natural England, 2018).

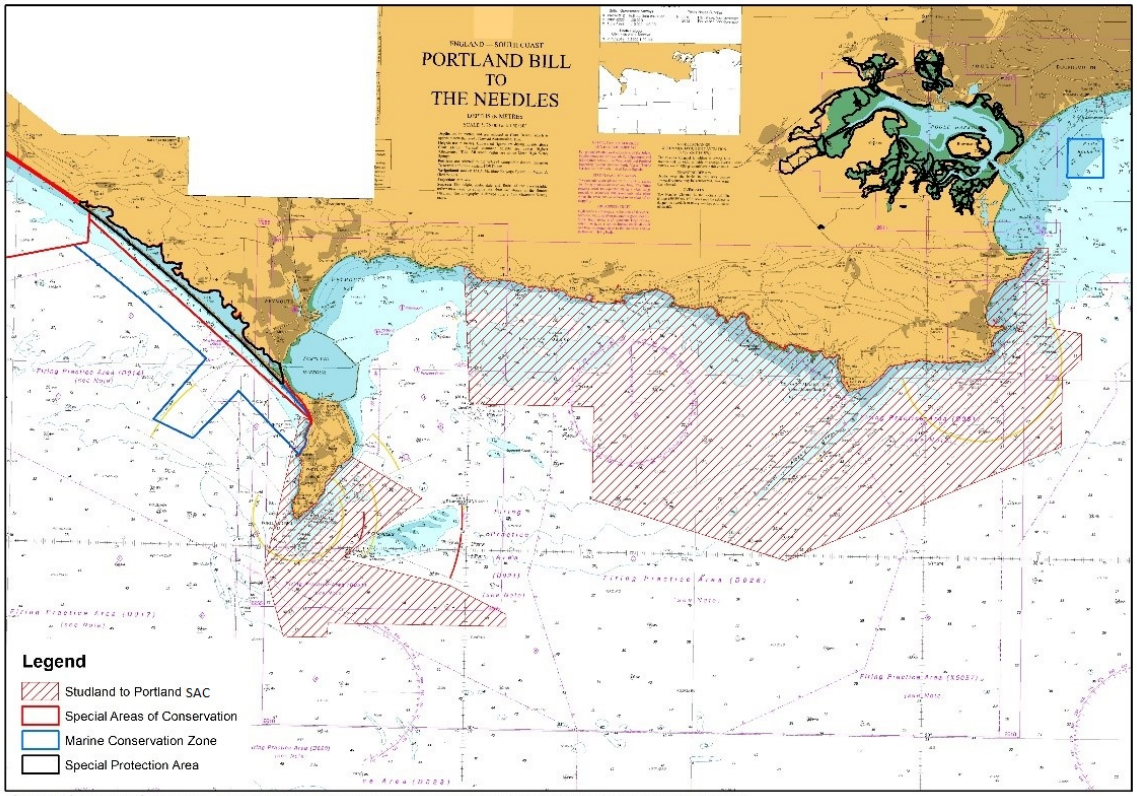

Figure 1. Location of Studland to Portland SAC and surrounding MPAs

The site contains numerous geological features of interest, including exposed chalk bedrock, limestone ledges, large boulder and cobble reefs, flat bedrock, shelly gravel, shale reefs and seabed caves. The diverse geology is coupled with important biological features including seagrass beds, maerl beds, *Ampelisca* mats and *Sabellaria* reefs (Cork et al., 2008; Dewey et al., 2011; Natural England, 2009). The site is designated for Annex I Reef, made up of several different types of lithic substrate; a description is provided for each in Table 1.

Table 1. Designated feature and constituent sub-features present with the Studland to Portland SAC (Cork et al., 2008, Dewey et al., 2011, Powell et al, 2011, Natural England, 2009).

Feature	Subfeature habitat	Description
Annex I Reef	Circalittoral rock	Circalittoral rock, characterised by faunal dominated communities that include rare species and species of national importance, is the dominant feature throughout the site.
	Infralittoral rock	Infralittoral rock occurs along the coastal fringe throughout the majority of the site. The seabed is a mixture of horizontal ledges, vertical faces and boulder slopes. In the shallower portion the habitat is characterised by upward facing rock dominated by kelp and turfs of red algae. Both high and moderate energy infralittoral rock can be found within the site. The geology varies in the infralittoral with limestone and chalk occurring in different areas.
	Subtidal stony reef	Stony reef consisting of stable boulders and cobbles overlying a matrix of smaller sized material, i.e. sediment. The reefs harbour a rich variety of species similar to those found on circalittoral rock, although the interstitial spaces provide shelter for some species.

1.2 Existing data and information utilised to inform survey planning

The Studland to Portland SAC has been thoroughly surveyed to varying levels in recent years. The DORset Integrated Seabed study (DORIS), completed in 2011, combined a number of surveys undertaken by the MCA, Channel Coastal Observatory and the Royal Navy. This provided swath bathymetry and co-registered backscattered data for the site (Dewey et al., 2011; Figure 2). This data was used for pre-survey consideration and copies of maps were taken onboard the vessel to inform surveyors on site.

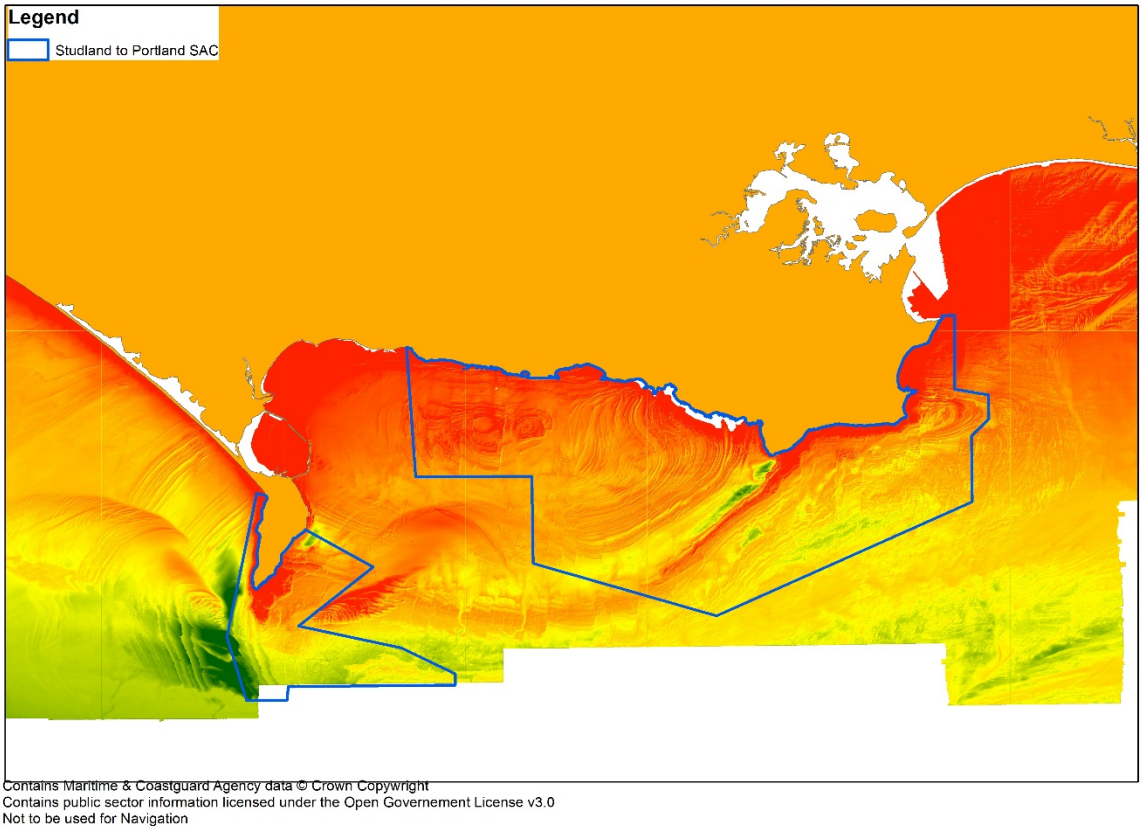

Figure 2. Bathymetry collected and compiled as part of the Dorset Integrated Seabed Study overlaid with the Studland to Portland SAC.

The DORIS project also compiled drop-camera work, grab samples and dive surveys to provide more detail on the epifauna and infauna across the site. These, particularly the video work, were used by Natural England to inform the survey design.

1.3 Aim and objectives

The survey aim was to sample a range of sub-feature habitats classified under the broad designation of Annex I Reef. Sampling locations were spatially distributed to provide wide spatial coverage in addition to covering the range of sub-feature habitats.

The Studland to Portland SAC covers a large area, therefore the specific survey objectives developed by Natural England and the Southern IFCA were:

(1) Revisit a selection of stations surveyed as part of the 2009 Dorset Integrated Seabed (DORIS) study (Axelsson et al., 2011), with a drop-down camera. These were stations confirmed to be infralittoral, circalittoral and stony reef (23 areas, figures 3 & 4). This will enable temporal comparison between the DORIS study and this survey.

(2) Characterise previously un-surveyed areas of the SAC predicted to be reef feature (7 areas) with a drop-down camera, based on the outputs of full coverage acoustic surveys undertaken in 2008 by the DORIS study, and follow-up dive surveys.

1.4 Survey project team

The 2017 Studland to Portland SAC survey took place aboard Southern IFCA Fisheries Patrol Vessel *Tenacity* during August and September 2017. Due to local tidal conditions, the size of the vessel and staffing, shifts were limited to days, no night shifts were undertaken, and these were spaced across the two months to take advantage of optimum weather and tides.

Table 2. Southern IFCA survey personnel

Simon Pengelly	OIC, Camera operator, Hauler Operator, Project Management
Patrick Cooper	OIC, Camera Operator, Pot Hauler, Reporting, Planning
Vicki Gravestock	Camera operator, Crew
Sarah Birchenough	Camera Operator, Crew
Neil Richardson	Vessel Skipper
David Mayne	Vessel Skipper
Sam Dell	Vessel Skipper

Due to experience using the SeaSpyder gear previously and training in the use of the hauler, Simon Pengelly and Patrick Cooper were designated officers in charge for the period of the survey. All other crew were trained on gear during survey operations.

2 Survey design and methods

2.1 Survey design

At each of the 30 sampling areas, three separate drop-down camera tows were planned. The distribution of numbered sampling locations is displayed in Figure 3 and Figure 4, overlain onto the DORIS data, which were used to inform the sampling design. The DORIS tows varied in length and density in each area, so a standardised approach was used. The tow direction was planned to repeat the 2009 DORIS study, but was dependent on local tidal conditions. The number of drops on each tow was to be approximately 1 per minute for 15 minutes, but this varied based on conditions and the ability to land the frame. The location and codes for each station, corresponding to the maps below, have been included in Section 7.5.

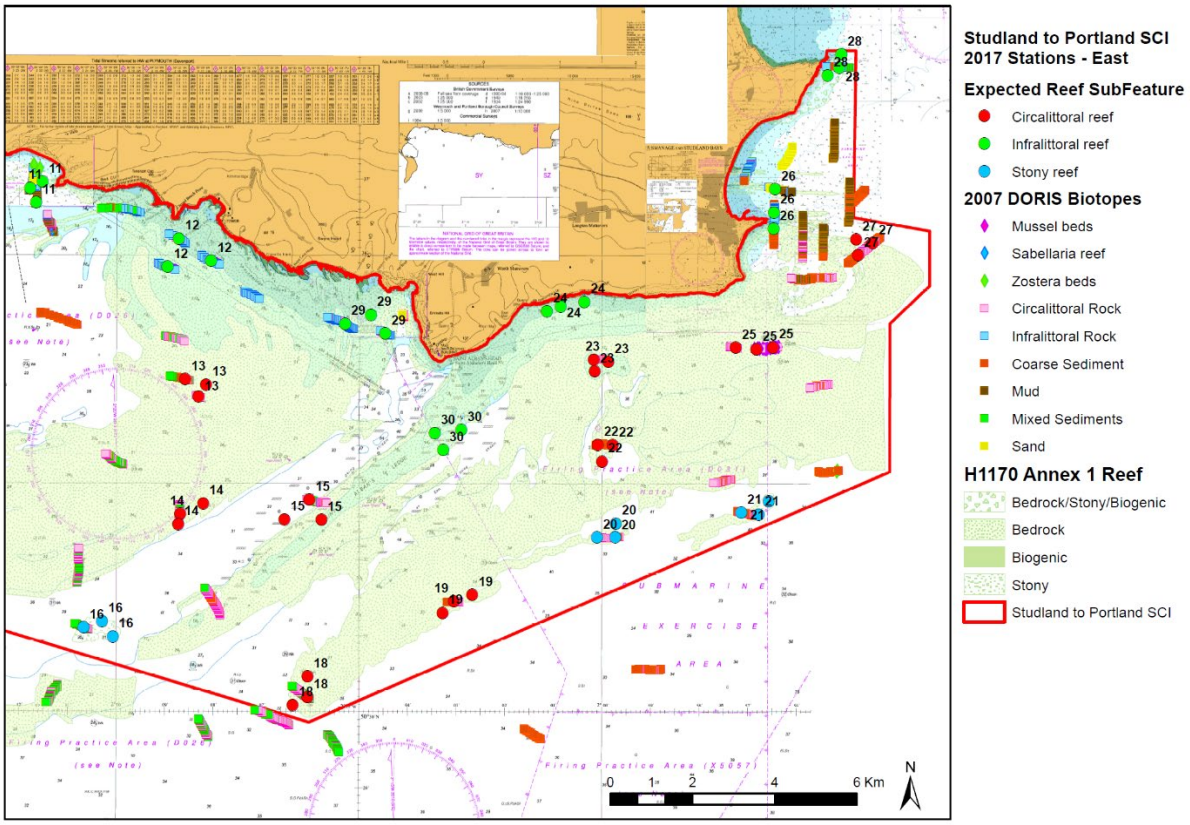

Figure 3. 2017 sampling locations (coloured by expected reef sub-feature) overlain on DORIS biotope data: Eastern portion of the Studland to Portland SAC.

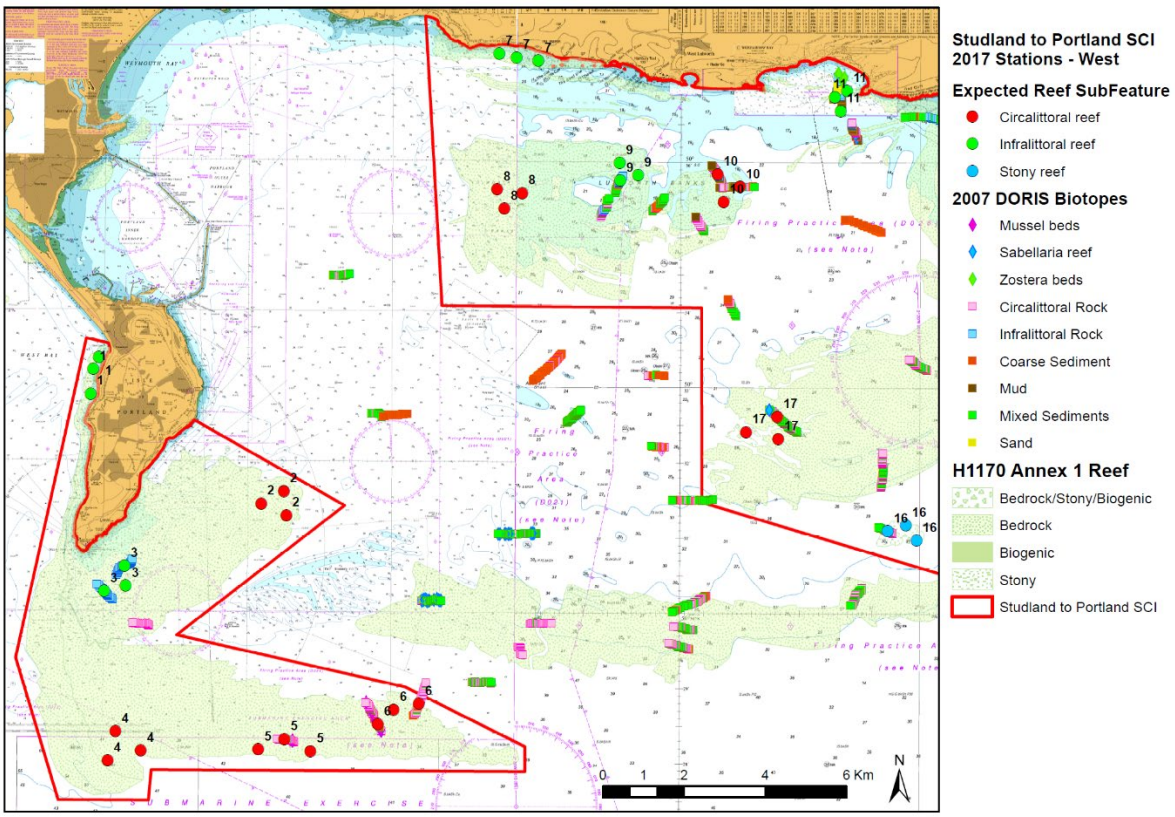

Figure 4. 2017 sampling locations (coloured by expected reef sub-feature) overlain on DORIS biotope data: Western portion of the Studland to Portland SAC.

2.2 Survey equipment and sample processing

Ground truth sampling was achieved using an underwater video and stills camera (Figure 5), as described below.

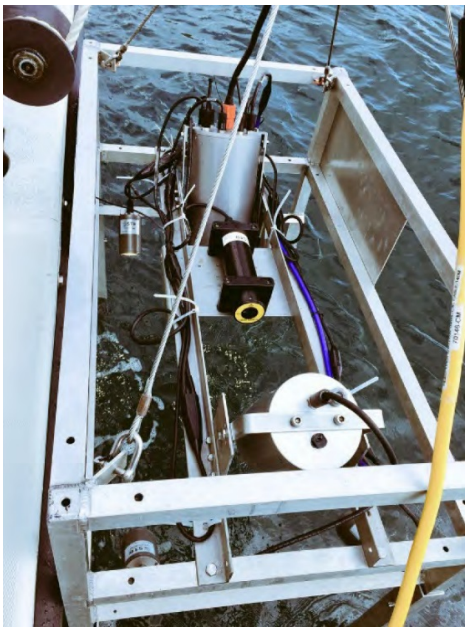

Figure 5. STR SeaSpyder drop camera video and still imaging system.

The camera system used for the survey was an STR SeaSpyder system mounted on a drop-down frame, deployed from the FPV *Tenacity*. The system is ideally suited to operation in shallow-medium water depths. The system is fitted with a new generation digital SLR camera offering 18.0 mega pixel resolution and both manual and automatic focus. The system also includes a dedicated real-time video, overlaid with data from the dGPS and depth sensor. A high-powered flash is used for the stills as well as an array of four LED lamps. Dual scaling laser pointers provide accurate imagery scaling.

The system was controlled onboard with the topside processer allowing full remote control of the camera and immediate on-site review. The Standard Operating Procedure (SOP) for the survey was to deploy from the starboard of the vessel and let the vessel drift whilst collecting continuous video. Approximately once every minute, the frame would be dropped on the seabed and a still image collected. The aim was to collect one still image every minute, however, due to the uneven nature of the seabed in certain places, still image capture was delayed in some cases until a successful drop could be undertaken. Each tow continued for 15 minutes, although where failed drops or difficulty landing were experienced, assuming the stills were not collected, the tow would last for longer unless seabed conditions required recovery.

The system was not brought back on board in between survey stations. Due to the nature of the vessel (high gunnels and short hauler) and time taken for a complete haul in for the camera rig, the system was tied off on the deployment side of the vessel to secure between stations. Because of this, the first still image taken upon reaching the seabed is also the start of line position for the video tow. The times/positions included in the Stills and Video Log reflect this.

At regular points throughout the survey, the lasers were calibrated to ensure an accurate measure of the features could be made during analysis. Calibration of the lasers proved difficult due to the design of the laser mounting not allowing for calibration beyond a 5 mm accuracy, and each day there were slight variations that could not be resolved, but all laser measurements fell within the following range:

- 185 (+/-5 mm) in the horizontal axis
- 225 (+/-5 mm) in the vertical axis

For each day, the lasers were checked and remeasured/adjusted to ensure they were parallel. The measurements for each tow can be found in the video and stills logs for each tow.

The settings for each image can be found in the metadata, however, for almost all stills the following settings were used:

F stop – f/8
1/200 secs
ISO- AUTO (typically 400)

2.2.1 Camera clock synchronisations

The video includes UTC overlay. Each image collected included a time stamp in the name. The clocks between the GPS (displayed in the overlay) and the stills camera were synchronized at the beginning of each day, to ensure accurate positioning of the stills from the camera and ensure that the seconds and minutes were the same. The timing for the stills has been used with the GPS details to determine their exact location. This has also been cross checked with the video file and stills, to ensure stills and video line up. The timings and locations were determined in advance of renaming the stills, in order to collect the information for geo-referencing and the timing of the stills (raw files are retained). These positions and timings have been included in the stills log. A calibration was required post collection due to a system reset. The second and minute adjustments remained, but the hours reverted back to BST. This was noticed part way through the survey, but it was felt that it would be easier to apply a constant calibration (-1 hour on video and stills) to the data. These times were calibrated back to UTC and checked against the video footage to ensure that the stills and video lined up (possible due to the requirement to land the frame and the varying nature of the seabed with clear markers in both the stills and the video footage). Those times detailed within the logs have been calibrated and match the footage UTC timings and locations observed in the overlay.

2.2.2 GPS positions and corrections.

The GPS positioning was collected using the onboard Furuno GP32 WAAS enabled DGPS system. This was fed and overlaid onto the video data and the clocks synchronised so that exact position could be verified (see above for necessary calibration). The image filenames included the time stamp, these were used to take the position of each still (included in video and stills log spreadsheet), in advance of being renamed with the correct file naming conventions. Originals of all versions have been retained. Position logging was also undertaken from the acquisition software and NMEA text files are available for almost all survey days (although for one day this is not available). Where this was the case, the video overlay has been used to ascertain location of the stills.

The offset for the vessel is highlighted in Section 7.3. Cable layback was measured for each camera drop, as well as depth and any significant alterations. In most instances, due to the weight of the camera gear and the requirement to work in calm conditions with a very limited drift, the cable layback was minimal throughout.

The table in Section 7.3 indicates the layback and total offset of each tow based on the location of the vessels GPS and the depth. In most instances this remains around 9-15 m, however, in some circumstances this increased (although some of these were those where tows required a re-run) due to the higher drift speed, or in some unavoidable cases, deeper water. With the direction of the vessels drift, and the fact that in all instances the vessel was towing the frame from the starboard, using an inverse of the heading, estimated offset positions have been provided for the start and end of each tow. These have been applied and an updated location for the stills has been calculated.

3 Survey narrative

Survey operations began once the survey plan had been finalised and a procedure agreed with CEFAS, Natural England and Southern IFCA. The mobilisation onboard the vessel and dry tests took place on the 14th of August and the first survey day scheduled was the 15th of August, however, the conditions of an offshore breeze did not allow for acceptable data collection. This was also followed by issues surrounding the pot hauler and a planned survey day for the 18th and 19th August had to be delayed into the following week. The two initially failed attempts allowed for more detailed testing of the equipment and led to a number of minor alterations of the kit, the main one being a shortening of the legs to reduce the high of the camera frame and improve its performance in the local conditions.

Following a period of poor weather and suboptimal tidal conditions, the next available days were the 30th of August and the 1st of September. During this period good weather and small tides meant that 27 stations were surveyed successfully. However, surveying did not commence on the 30th of August until 11:24 UTC due to a software issue and a full system reset required on both video and stills systems.

A survey was also attempted on the 4th of September, but due to strong tides only one station was successful. This highlighted the difficulty of surveying the sites around Portland Bill and the significant tidal currents. Other successful survey days included the 18th, 27th and 28th of September, when conditions were calmer and more suitable for surveying. On the

28th September, two tows were agreed to be moved slightly due to their placement right in the tidal race; this was at station 3 (STN code 08 and STN09), following a number of attempts to survey at different states of the tide.

In October it was agreed that the weather was becoming more inclement and the faunal composition was likely to become incomparable to the stations already sampled. As a result, the survey was put on hold until the following year for completion. Stations at the races and those that were tidally dominated/exposed to the South-West proved to be difficult to survey in the conditions which meant that the survey did not extend to the Eastern end of the proposed survey area.

4 Sample acquisition

In total 42 camera tows were successfully completed with still and video collected at each (Figure 6). A further 12 unsuccessful attempts have been logged and the data included in the evidence package, although the quality, particularly of the video, is not acceptable in some places (often due to high drift speeds). Some of the stills could be used if further attempts to resurvey failed or to inform future planning (Figure 7).

Data quality varied throughout and was typically influenced by the weather conditions and/or tides more than anticipated. They led to greater drift speeds, unstable drops to collect stills and poor visibility due to suspended matter. The experience gained from these initial surveys, however, may prove useful when planning the rest of the survey.

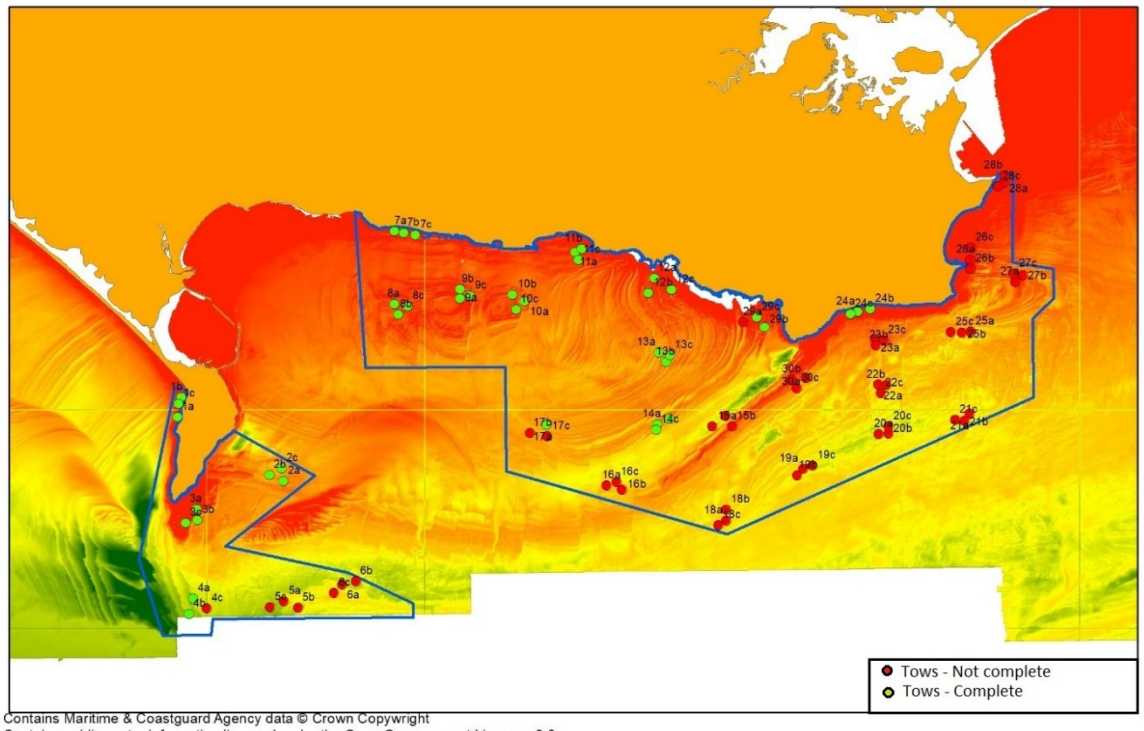

Figure 6. Location of video acquired at STPO on the TEN0817 cruise.

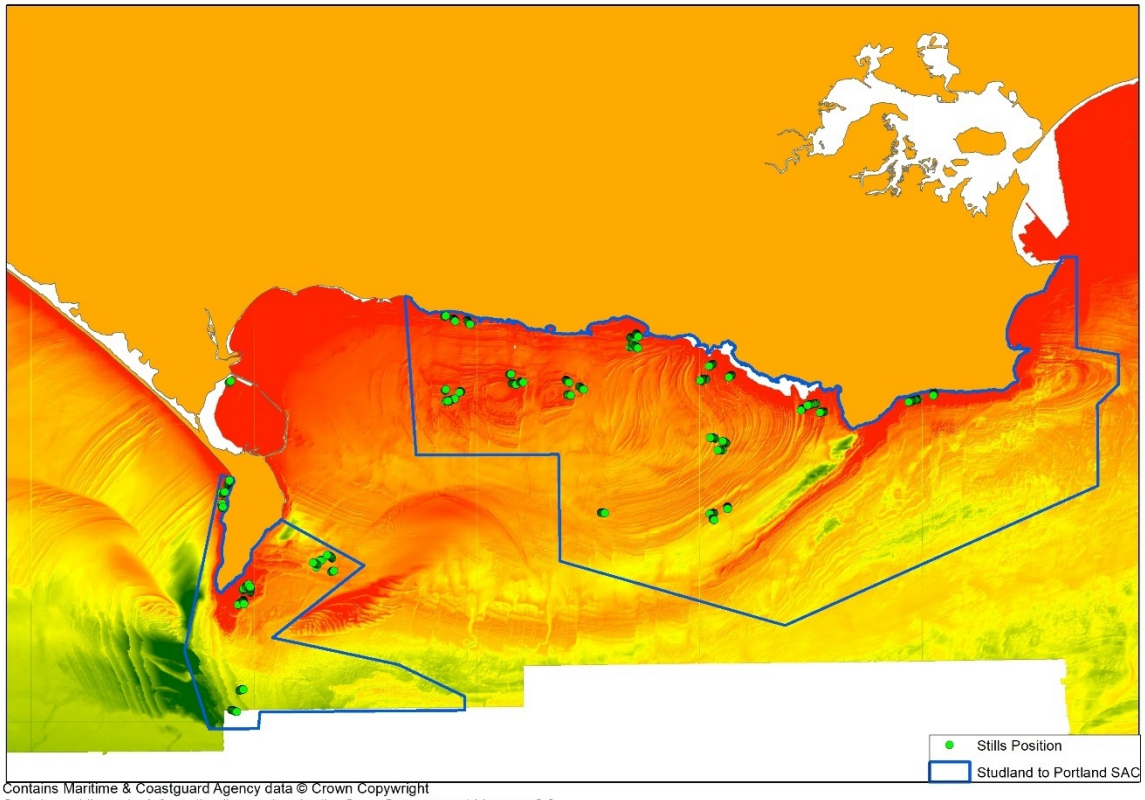

Figure 7. Location of stills acquired at STPO on the TEN0817 cruise'.

5 Evidence of anthropogenic impacts.

No significant anthropogenic activities were identified during the survey. Occasional lost fishing gear was encountered, but surveying tended to avoid strings of actively fished pots. A wreck was noted at station 11C (STN33).

6 References

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7 Annexes

7.1 FPV *Tenacity*

FPV Tenacity**: the vessel used for the survey**

Home Port	Southampton
Length OA	9.2m
Breadth (MLD)	3.5m
Builder	Cheetah Catamaran
Commissioned	2000
Communications	VHF radio, dual frequency.

Endurance	1 day
Complement	Coded for 6 onboard, minimum requirements 1 skipper 1 crew (2 for surveying)
Propulsion System	Twin outboard motors, 130bhp Honda.

Call sign	VQWY2
Hauler	Portside, Spencer Carter, Hydraulic powered.

7.2 Drop Camera

The specifications of the drop frame camera are detailed below:

- Video – PAL format, 600 TV lines, 50 FPS
- 18 Mega Pixels Digital Stills Camera
- Separate high-powered flash
- Up to 4 high Intensity LED Lights

- 2x Dual Scaling Lasers
- Combined Compass & Depth Sensor

7.3 Position Logging/GPS Offset

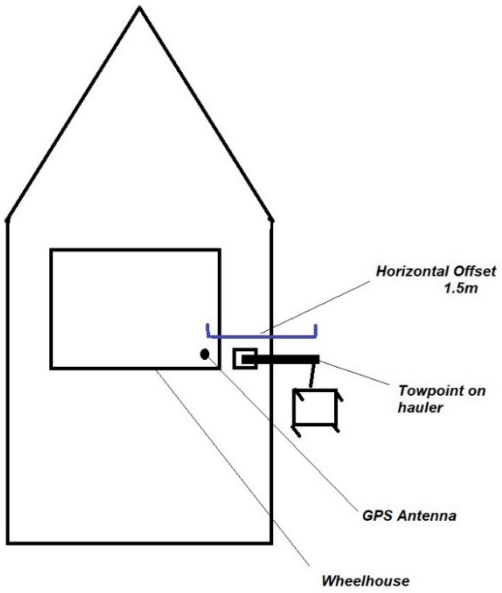
The GPS Position on the overlay is provided by the vessels Furuno GP32 WAAS enabled dGPS. This information has been used to provide the still locations (Video and Stills Spreadsheet) provided with the survey information

FPV *Tenacity* deploys scientific gear from the starboard side of the vessel. The basic vessel diagram is included below in Figure 9, but the hauler is offset horizontally from the GPS antenna. It is offset by 1.5 m and this has been included within the calculations for estimated offsets. The offsets have been calculated below, based on using the layback (+ the height of the frame and cradle it is hoisted from (1.5 m)) and the depth. Based on the way the vessel drifts and the requirement not to drift over the camera (and essentially tow from the starboard), it is assumed that this can be added to the existing 1.5m offset as the direction of the camera also out to starboard. The calculated offsets are included in table 3. Also calculated is the estimated location of these offsets assuming the inverse (+/- 180°) of the heading. Using this, distance and start location to determine end location along a great circle arc, these have been included in an updated video and stills log (but the original remains). Those in red were subject to re-runs. Most remain closer to 10 m, however, at the deeper sites, unsurprisingly, the offset increases, reaching close to 25 m at the deepest site.

GPS offsets for each camera tow

Stn/towNo	StnCode	Water Depth (m)	Rep+Attempt	Cable Out	Horizontal offset (m)
01A	1	19.2	A1	20	11.18
01A	1	19.5	A2	20	10.56
01B	2	11	B2	11.5	8.43
01C	3	18.7	C1	20	12.11
01C	3	14	C2	15	10.23
2A	4	26.2	A1	28	15.06
2B	5	29.2	B1	31	15.77
2B	5	29.5	B2	33	19.39
2B	5	30	B3	32	16.41
2B	5	29.2	B4	30	13.32
02C	6	30.5	C1	34	19.67
3A	7	17	A1	17.5	9.99
3A	7	18.3	A2	20	12.79

03B	8	11.5	B1	12	8.57
03C	9	14	C1	13	5.27
04A	10	43.2	A1	46	21.25
4B	11	46.2	B1	50	24.26
07A	19	9.5	A1	10	7.98
07B	20	11	B1	11.4	8.24
07C	21	7.9	C1	9	8.42
08A	22	19.5	A1	20	10.56
08B	23	22	B1	22	9.76
08B	23	19.4	B2	20	10.77
08C	24	18.4	C1	20	12.62
09A	25	13.3	A1	14	9.46
09b	26	16.7	B1	17.5	10.56
09C	27	19.4	C1	20	10.77
10A	28	21	A1	22	12.05
10B	29	18	B1	18.8	10.89
10C	30	19.5	C1	20	10.56
11A	31	10.5	A1	11	8.28
11B	32	14.9	B1	15.5	9.68
11C	33	19	C1	21	13.55
11C	33	20	C2	21	11.81
12A	34	10	A1	12	10.57
12B	35	20	B1	21	11.81
12C	36	11	C1	12	9.33
13A	37	29	A1	31	16.17
13B	38	23.3	B1	25	14.12
13C	39	26	C1	27	13.17
14A	40	26.5	A1	28	14.46
14B	41	27.7	B1	30	16.50
14C	42	28	C1	29	13.59
17A	49	29	A1	31	16.17
24A	70	11	A1	12	9.33
24B	71	9	B1	10	8.66
24B	71	12	B2	12	7.68
24C	72	12	C1	12	7.68
29A	85	16.5	A1	17	9.87
29B	86	15	B2	16	10.51
29C	87	4.9	C1	4	4.00
TEST01	Test01	7	1	8	7.92



FPV *Tenacity* offset diagram

7.4 Station metadata

Station metadata for the STPO DDV and Stills survey is provided in Table 3 below. All stations were sampled on Cruise TEN0817. Station Code is used to identify the location of the sampling station. Station Number is a sequential event number for the cruise, so changes each time a new gear is used or a new location is sampled. All positions in decimal degrees, Lat/Long WGS84. Key: HG=Ham Grab, DC=Drop Camera, CTD = Conductivity, Temperature and Depth, OBS = Optical Back Scatter, SOL = Start Of Line, EOL = End Of Line. A more detailed spreadsheet including the latitude and longitude, and time of collection from each still has been provided in the supplementary files.

More details including the latitude and longitude of each of the stills, georeferenced based on the time stamp, can be found in the video/stills log provided with the data. This also includes information on drift speed, depth and layback.

Table 3. Station metadata for TEN0817 – STPO DDV and stills survey

Date	Stn/ tow No.	StnCode	Gear Code	Water Depth (m)	Rep & Attempt	SOL Time (UTC)	EOL Time (UTC)	SOL Latitude	SOL Longitude	EOL Latitude	EOL Longitude	Comment
15/08/2017	11C	33	DC	19	C1	10:59:34	11:02:42	50.6103017	-2.19645	50.57369	-2.19446	Not successful, vessel moving too quick.
15/08/2017	08B	23	DC	22	B1	11:05:53	11:18:19	50.5892867	-2.31379	50.55072	-2.30766	Not successful, vessel moving too quick.
15/08/2017	TEST 01	Test01	DC	7	1	13:04:42	13:09:49	50.5974783	-2.45085	50.55663	-2.44958	Test in calm conditions to optimise data collection.
30/08/2017	07A	19	DC	9.5	A1	11:24:39	11:41:26	50.6234033	-2.31397	50.58484	-2.3129	Successful. Macrocalgae makes use of lasers difficult, speed sometimes drops as low as 0.1.
30/08/2017	07B	20	DC	11.4	A2	11:55:48	12:10:51	50.622455	-2.30801	50.58399	-2.3069	Successful. Overlay details off slightly, details in log.
30/08/2017	07C	21	DC	7.9	C1	12:21:59	12:36:02	50.6219317	-2.29935	50.58361	-2.29745	Successful. Depth increases over site
30/08/2017	11A	31	DC	10.5	A1	13:12:22	13:27:19	50.6142617	-2.19619	50.57766	-2.19329	Successful.
30/08/2017	11B	32	DC	14.9	B1	13:38:04	13:53:05	50.615885	-2.19231	50.57935	-2.19092	Successful. Depth shallows across tow slightly.
30/08/2017	11C	33	DC	19	C2	14:00:31	14:15:32	50.6113567	-2.19441	50.57478	-2.1912	Successful. Shipwreck at 14:01, camera partially hauled until past.

30/08/2017	10A	28	DC	21	A1	14:40:47	14:55:49	50.5946233	-2.22869	50.55748	-2.22592	Successful. Static gear observed.
30/08/2017	10B	29	DC	18	B1	15:08:27	15:23:03	50.5973983	-2.23715	50.56011	-2.23521	Successful.
30/08/2017	10C	30	DC	19.5	C1	15:31:34	15:43:22	50.5915567	-2.23627	50.55429	-2.234	Successful. Needs to be checked, 13 stills instead of 15 due to adverse conditions, may be candidate for re-run in spring.
30/08/2017	09A	25	DC	13.3	A1	16:05:54	16:21:55	50.5962317	-2.27156	50.55837	-2.26852	Successful.
30/08/2017	09C	27	DC	19.4	C1	16:29:20	16:43:42	50.5967633	-2.2664	50.55899	-2.26407	Successful. Overlay incorrect, 09C not B.
30/08/2017	09b	26	DC	16.7	B1	16:53:35	17:07:27	50.599715	-2.27296	50.56183	-2.27165	Successful.
30/08/2017	08A	22	DC	19.5	A1	17:25:37	17:40:24	50.5935383	-2.31401	50.55497	-2.31333	Successful. Observations of old fishing gear.
30/08/2017	08B	23	DC	20	B2	17:48:09	18:01:55	50.5892883	-2.31152	50.55076	-2.31184	Successful. Slight shift in direction of drift part of the way through.
30/08/2017	08C	24	DC	18.5	C1	18:10:13	18:23:58	50.593005	-2.30373	50.55461	-2.30468	Successful. Heading alters slightly part of the way through after still G.
01/09/2017	12A	34	DC	10	A1	08:13:44	08:27:58	50.6031367	-2.14377	50.56741	-2.14621	Successful. Site split, speed too quick at times so video extended.
01/09/2017	12B	35	DC	20	B1	08:39:53	09:02:08	50.5971167	-2.14809	50.56132	-2.15211	Successful. Lands initially but failed still so start of tow approximately 10 minutes later.

01/09/2017	12C	36	DC	11	C1	09:16:05	09:31:00	50.5986367	-2.13202	50.5631	-2.13384	Successful. Boulders make landing sled on the minute difficult, some taken out of sequence.
01/09/2017	29A	85	DC	16.5	A1	10:00:33	10:15:58	50.5847467	-2.08698	50.54996	-2.08838	Successful.
01/09/2017	13A	37	DC	29	A1	10:42:57	10:58:00	50.573095	-2.14289	50.53738	-2.14613	Successful.
01/09/2017	13B	38	DC	23	B1	11:09:15	11:25:03	50.5683533	-2.13815	50.53272	-2.14142	Successful.
01/09/2017	13C	39	DC	26	C1	11:36:53	11:51:02	50.571295	-2.13596	50.5357	-2.13825	Successful.
01/09/2017	14A	40	DC	27	A1	12:12:19	12:27:26	50.5430783	-2.14419	50.50734	-2.14685	Successful. First still after initial landing (approx. 20 secs) as skipper slows vessel movement.
01/09/2017	14B	41	DC	27.5	B1	13:03:48	13:18:48	50.545655	-2.13556	50.51006	-2.13548	Successful.
01/09/2017	14C	42	DC	28	C1	13:27:36	13:41	50.5409217	-2.14519	50.50517	-2.144	Successful.
01/09/2017	17A	49	DC	29	A1	14:06:52	14:20:43	50.5437267	-2.21582	50.5068	-2.21333	Successful.
04/09/2017	2A	4	DC	26.5	A1	07:48:21	08:03:06	50.5875483	-2.38673	50.54777	-2.38529	Successful. Lows speeds at times make some stills geographically close.
04/09/2017	2B	5	DC	29.2	B1	08:20:25	08:25:21	50.5239183	-2.39583	50.48399	-2.39631	Unsuccessful. Speed too fast.
04/09/2017	3A	7	DC	17	A1	08:55:58	09:10:32	50.5097667	-2.44267	50.46906	-2.44592	Unsuccessful. Speed too fast.
04/09/2017	01A	1	DC	19.2	A1	09:44:17	09:52:09	50.5481267	-2.45652	50.50718	-2.4555	Unsuccessful. Speed too fast.
04/09/2017	01C	3	DC	18.7	C1	10:03:05	10:05:29	50.5530517	-2.4563	50.51211	-2.45601	Unsuccessful. Poor conditions and visibility poor, (wrong label on footage).

18/09/2017	2B	5	DC	29.5	B2	07:42:00	07:48:00	50.5234983	-2.39448	50.48359	-2.39631	Unsuccessful. Speed too quick
18/09/2017	2B	5	DC	30	B3	07:58:38	07:59:44	50.52566	-2.39391	50.48576	-2.39382	Unsuccessful. Poor visibility.
18/09/2017	29B	86	DC	15	B2	09:05:40	09:20:43	50.5833567	-2.07356	50.5488	-2.0762	Successful. Some extra stills taken out of sequence in attempt to land on flatter substrate.
18/09/2017	29C	87	DC	4	C1	09:29:40	09:45:02	50.5867533	-2.07871	50.55211	-2.08406	Successful.
18/09/2017	24A	70	DC	11	A1	10:36:51	10:50:50	50.58788	-2.01395	50.55431	-2.01633	Successful.
18/09/2017	24C	72	DC	12	C1	10:54:51	11:08:43	50.5898783	-2.00396	50.55648	-2.01993	Successful.
18/09/2017	24B	71	DC	10.5	B1	11:17:11	11:17:36	50.5898783	-2.00396	50.55648	-2.00399	Unsuccessful. Smear on lens and lasers out of calibration. Brought inboard to fix.
18/09/2017	24B	71	DC	9	B2	11:29:09	11:43:04	50.590135	-2.00389	50.55674	-2.39382	Successful. Drift direction changes part of the way through.
27/09/2017	04A	10	DC	43.2	A1	08:46:48	09:00:51	50.4733	-2.4455	50.43254	-2.44308	Successful.
27/09/2017	4B	11	DC	46.2	B1	09:12:56	09:28:52	50.4654717	-2.45084	50.42462	-2.44717	Successful.
27/09/2017	3A	7	DC	18.3	A2	10:13:07	10:24:28	50.5097883	-2.44303	50.46907	-2.44216	Successful. Speed picks up near end but most of tow within operational limits. A number of extra stills taken due to attempts to land on flat surface.

27/09/2017	01A	1	DC	19.5	A2	11:03:01	11:17:59	50.5471383	-2.45584	50.50621	-2.45515	Successful. Boulders on ground, in some instances stills taken at more opportune moments.
27/09/2017	01C	3	DC	14	C2	11:25:51	11:41:45	50.5528017	-2.45475	50.51189	-2.45388	Successful. Boulders on ground, in some instances stills taken at more opportune moments.
27/09/2017	01B	2	DC	11	B2	11:51:34	12:07:33	50.5560733	-2.45206	50.51521	-2.45088	Successful. Lasers again recalibrated at beginning of tow, ground boulder in some instance stills taken at more opportune moments.
27/09/2017	2B	5	DC	29.2	B4	13:09:46	13:23:47	50.523875	-2.39573	50.48395	-2.39843	Successful. Although a few speed peaks above optimal levels, skipper able to reduce drift.
27/09/2017	02C	6	DC	30.5	C1	13:35:12	13:52:11	50.5263033	-2.3863	50.48653	-2.38946	Successful.
28/09/2017	03B	8	DC	11	B1	09:05:23	09:22:39	50.5138617	-2.44301	50.47314	-2.4392	Successful. Station moved due to tidal currents. Variable speed, gap between stills 6 and 7 where speed increased above 0.9 knots.

28/09/2017	03C	9	DC	14	C1	09:37:55	09:55:02	50.51278	-2.43834	50.47214	-2.43818	Successful. Station moved due to tidal currents. Light conditions make lasers difficult to view.

7.4 Daily Progress Reports

1. Vessel & Project Information

Project	STPO
Survey Contractor	SIFCA
Survey Vessel	FPV Tenacity
Daily Progress Report No.	1
Location at 2400 UTC	Portland
Date	30/08/2017

2. Safety Statistics

	1.1.1.1.1 Today	**To Date**
Accidents / Incidents	None	
Near Misses	None	
Safety Drills / Induction	Initial Health and Safety Brief for those new to vessel. Run through of deployment procedure to ensure all crew were familiar with use of the seaspider.	
Additional comments	None	

3. Summary of Operations (0000 – 2400 UTC)

Day 1 – 30/09/2017		
Event	**Times**	**Remarks**
Operational - MOB	09:00 -11:00	Initial setup of equipment following prior to transit, measure lasers and test cameras/lights.
Operational – Transit	11:00 - 12:15	Transit to first site
Operational – Survey	12:15 - 18:00	First tow at 12:24 UTC. Vis acceptable and able to drift within workable range. Where speeds increased significantly above 0.5 knots a sea anchor was deployed and the skipper used the engines to slow the drift. In these instances the speed was successfully reduced, where it has exceeded the 0.5 it has been logged and measures taken to reduce the speed have proven to be

7.5 Planned Survey Stations

AREACODE	STNCODE	STNNO	Latitude_Degree	Latitude_DecMin	Latitude	Longitude_Degree	Longitude_DecMin	Longitude	EUNISSUB
1	1a	1	50	-32.874	50.547907	2	27.291	-2.454857	Infra
1	1b	2	50	-33.362	50.556038	2	27.126	-2.4521	Infra
1	1c	3	50	-33.205	50.553417	2	27.240	-2.453995	Infra
2	2a	4	50	-31.276	50.521259	2	23.197	-2.38662	Circa
2	2b	5	50	-31.429	50.523821	2	23.721	-2.395356	Circa
2	2c	6	50	-31.595	50.526575	2	23.252	-2.387537	Circa
3	3a	7	50	-30.592	50.509863	2	26.562	-2.442706	Infra
3	3c	9	50	-30.256	50.50426	2	26.986	-2.449761	Infra
3	3b	8	50	-30.329	50.50548	2	26.541	-2.442349	Infra
4	4a	10	50	-28.396	50.473265	2	26.732	-2.445532	Circa
4	4b	11	50	-28.007	50.466778	2	26.894	-2.448235	Circa
4	4c	12	50	-28.138	50.468959	2	26.203	-2.436713	Circa
5	5a	13	50	-28.300	50.471667	2	23.214	-2.3869	Circa
5	5b	14	50	-28.141	50.469009	2	22.668	-2.377802	Circa
5	5c	15	50	-28.163	50.469384	2	23.758	-2.395974	Circa
6	6b	16	50	-28.779	50.479655	2	20.416	-2.340262	Circa
6	6a	17	50	-28.697	50.478286	2	20.944	-2.349074	Circa
6	6c	18	50	-28.506	50.4751	2	21.269	-2.354483	Circa
7	7a	19	50	-37.419	50.623649	2	18.797	-2.313289	Infra
7	7b	20	50	-37.371	50.622845	2	18.435	-2.307258	Infra
7	7c	21	50	-37.326	50.622101	2	17.981	-2.299689	Infra
8	8a	22	50	-35.616	50.593603	2	18.830	-2.313836	Circa
8	8b	23	50	-35.359	50.589324	2	18.676	-2.311263	Circa
8	8c	24	50	-35.567	50.592782	2	18.304	-2.305065	Circa
9	9a	25	50	-35.738	50.59563	2	16.262	-2.271041	Infra
9	9b	26	50	-35.974	50.599564	2	16.274	-2.271234	Infra
9	9c	27	50	-35.812	50.596867	2	15.888	-2.264798	Infra
10	10a	28	50	-35.663	50.594381	2	13.761	-2.229357	Circa
10	10b	29	50	-35.827	50.597117	2	14.229	-2.237148	Circa

10	10c	30	50	-35.457	50.590945	2	14.102	-2.23503	Circa
11	11a	31	50	-36.858	50.614294	2	11.783	-2.196387	Infra
11	11b	32	50	-36.941	50.615676	2	11.529	-2.192142	Infra
11	11c	33	50	-36.669	50.611148	2	11.661	-2.194344	Infra
12	12a	34	50	-36.198	50.603294	2	8.714	-2.145236	Infra
12	12b	35	50	-35.826	50.597104	2	8.945	-2.149091	Infra
12	12c	36	50	-35.906	50.598438	2	8.046	-2.134099	Infra
13	13a	37	50	-34.352	50.572531	2	8.578	-2.142975	Circa
13	13b	38	50	-34.123	50.568723	2	8.304	-2.138397	Circa
13	13c	39	50	-34.280	50.571341	2	8.148	-2.135795	Circa
14	14a	40	50	-32.580	50.543002	2	8.674	-2.144563	Circa
14	14b	41	50	-32.717	50.54528	2	8.203	-2.13671	Circa
15	15c	45	50	-32.771	50.546179	2	6.015	-2.100258	Circa
15	15a	43	50	-32.511	50.541855	2	6.528	-2.108807	Circa
15	15b	44	50	-32.505	50.541757	2	5.765	-2.096088	Circa
14	14c	42	50	-32.445	50.540746	2	8.716	-2.145275	Circa
16	16a	46	50	-31.090	50.518162	2	10.662	-2.177698	Stony
16	16b	47	50	-30.969	50.516146	2	10.060	-2.167668	Stony
16	16c	48	50	-31.171	50.519509	2	10.282	-2.171372	Stony
17	17a	49	50	-32.608	50.543466	2	12.969	-2.216152	Circa
17	17b	50	50	-32.401	50.540019	2	13.618	-2.226972	Circa
17	17c	51	50	-32.314	50.538565	2	12.948	-2.2158	Circa
18	18a	52	50	-30.177	50.50295	2	6.049	-2.100817	Circa
18	18b	53	50	-30.452	50.507532	2	6.047	-2.100791	Circa
18	18c	54	50	-30.072	50.501197	2	6.353	-2.105888	Circa
19	19a	55	50	-31.436	50.52394	2	3.037	-2.050614	Circa
19	19b	56	50	-31.283	50.521389	2	3.270	-2.054493	Circa
19	19c	57	50	-31.521	50.525356	2	2.655	-2.044245	Circa
20	20a	58	50	-32.275	50.537916	2	0.087	-2.001456	Stony
20	20b	59	50	-32.281	50.538023	1	59.710	-1.995169	Stony
20	20c	60	50	-32.458	50.540966	1	59.701	-1.99501	Stony
21	21a	61	50	-32.749	50.545813	1	56.552	-1.94253	Stony
21	21b	62	50	-32.576	50.54293	1	56.755	-1.945916	Stony
21	21c	63	50	-32.601	50.543344	1	57.115	-1.951919	Stony

22	22a	64	50	-33.493	50.55822	2	0.070	-2.001162	Circa
22	22b	65	50	-33.488	50.558133	1	59.760	-1.996004	Circa
22	22c	66	50	-33.274	50.554564	1	59.985	-1.999757	Circa
23	23a	67	50	-34.611	50.576848	2	0.154	-2.00257	Circa
23	23b	68	50	-34.460	50.574338	2	0.135	-2.002257	Circa
23	23c	69	50	-34.582	50.576369	1	59.853	-1.997549	Circa
24	24a	70	50	-35.309	50.588482	2	0.839	-2.013978	Infra
24	24b	71	50	-35.370	50.589493	2	0.345	-2.005755	Infra
24	24c	72	50	-35.246	50.587441	2	1.120	-2.018666	Infra
25	25a	73	50	-34.771	50.579517	1	56.460	-1.941003	Circa
25	25b	74	50	-34.747	50.579116	1	56.799	-1.946651	Circa
25	25c	75	50	-34.767	50.579451	1	57.226	-1.953769	Circa
26	26a	76	50	-36.542	50.60904	1	56.434	-1.940572	Infra
26	26b	77	50	-36.327	50.605456	1	56.441	-1.940684	Infra
26	26c	78	50	-36.847	50.614121	1	56.413	-1.940223	Infra
27	27a	79	50	-35.981	50.599691	1	54.704	-1.911726	Circa
27	27b	80	50	-36.140	50.602336	1	54.402	-1.906699	Circa
27	27c	81	50	-36.188	50.603134	1	54.739	-1.912317	Circa
28	28a	82	50	-38.444	50.640728	1	55.086	-1.918104	Infra
28	28b	83	50	-38.616	50.643602	1	55.040	-1.91733	Infra
28	28c	84	50	-38.343	50.639055	1	55.326	-1.922106	Infra
29	29a	85	50	-35.078	50.584639	2	5.283	-2.088053	Infra
29	29b	86	50	-34.955	50.582587	2	4.456	-2.074264	Infra
29	29c	87	50	-35.198	50.586638	2	4.748	-2.079135	Infra
30	30a	88	50	-33.688	50.561462	2	2.883	-2.048051	Infra
30	30b	89	50	-33.646	50.560771	2	3.433	-2.057209	Infra
30	30c	90	50	-33.424	50.557068	2	3.257	-2.054275	Infra