



Mounts Bay MCZ Seagrass Drop Down Video Survey 2018



Field Report for the Drop Down Video Survey
(20180522_CIFCA_MB_DDV)

Completed by: Cornwall Inshore Fisheries and Conservation Authority
(CIFCA)

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Contents

Contents	ii
List of Figures	iii
List of Tables	iii
1. Project Background	1
1.1.1 Aims and objectives	2
1.1.2 Aims	2
1.1.3 Objectives	2
2. Methodology	2
2.1 Survey Area	2
2.2 Vessel Specifications	3
2.3 Personnel	3
2.4 Personal Protective Equipment (PPE)	3
2.5 Drop Down Video (DDV) Survey	4
2.5.1 Equipment Specification	4
2.5.2 Methodology	5
2.5.3 Data handling	5
2.6 Data analysis	5
3. Results	6
4. Discussion	16
5. References	17
6. Appendices	18
Annex 1 – R/V Tiger Lily Deck Plan & Offsets	18
Annex 2 – Daily Log	20
Annex 3 – Video position data from the Mounts Bay MCZ DDV Survey	21
Annex 4 – Still image position data from the Mounts Bay MCZ DDV Survey	22

List of Figures

Figure 1: Mounts Bay Marine Conservation Zone (MCZ) and previous records of seagrass beds (Magic Map, 2018).....	2
Figure 2: Cornwall IFCA’s dedicated survey vessel, R/V Tiger Lily VI.....	3
Figure 3: SeaSpyder drop camera housed in a purpose built frame on the aft deck and in the deployment position onboard R/V Tiger Lily VI.	4
Figure 4: Location of drop down video (DDV) tows in Mounts Bay MCZ.	7
Figure 5: Representative still images and habitat classification for tow 1 within Mounts Bay MCZ.	8
Figure 6: Representative still images and habitat classification for tow 2 within Mounts Bay MCZ.	9
Figure 7: Representative still images and habitat classification for tow 3 within Mounts Bay MCZ.	10
Figure 8: Representative still images and habitat classification for tow 4 within Mounts Bay MCZ.	11
Figure 9: Representative still images and habitat classification for tow 5 within Mounts Bay MCZ.	12
Figure 10: Representative still images and habitat classification for tow 6 within Mounts Bay MCZ.	13
Figure 11: Representative still images and habitat classification for tow 7 within Mounts Bay MCZ.	14
Figure 12: Representative still images and habitat classification for tow 8 within Mounts Bay MCZ.	15

List of Tables

Table 1: The camera equipment specifications.....	4
Table 2: Daily log from survey carried on board R/V Tiger Lily on 22 nd May 2018.....	20
Table 3: Video position data from the Mounts Bay MCZ DDV Survey	21
Table 4: Still image position data from the Mounts Bay MCZ DDV Survey	22

1. Project Background

The Mounts Bay Marine Conservation Zone (MCZ) was designated in 2016 and lies within the Cornwall Inshore Fisheries and Conservation Authority (IFCA) district. The site protects a range of habitats including seagrass beds. Intertidal seagrass beds are located to the east of St Michael's Mount causeway and on the west side of Long Rock reef (Figure 1). A recent survey calculated the extent as 1 ha (Curtis, 2014). There are limited records of subtidal seagrass beds in the MCZ and those that have been recorded are to the west of St Michael's Mount (Figure 1) and around Greeb reef (ERCCIS, 2011). Within Mounts Bay MCZ the intertidal seagrass beds are located within sediments which vary between fine to coarse sands and gravel and were identified as biotope LS.LMp.LSgr.Znol and EUNIS habitat type code A2.611.

Under Section 154 of the Marine and Coastal Access Act (MACAA) 2009, Cornwall IFCA has a duty to further the conservation objectives of the features within the Mounts Bay MCZ. Cornwall IFCA is in the process of producing MCZ assessments for each site and feature in order to document and determine whether management measures for fishery activities are required to achieve the conservation objectives of each feature within the MCZ. In order to gather more information about the subtidal seagrass beds in the MCZ, Cornwall IFCA undertook a drop down video (DDV) survey to record the extent, distribution and density of seagrass.

1.1.1 Aims and objectives

1.1.2 Aims

- This survey aims to provide data on the subtidal seagrass (*Zostera marina*) beds within Mounts Bay MCZ.

1.1.3 Objectives

Complete a drop down video (DDV) survey, consisting of a series of transects across the area in which seagrass has been previously recorded or is predicted to occur, in order to confirm the:

- Extent;
- Distribution; and
- Density, of the subtidal seagrass beds.

2. Methodology

2.1 Survey Area

The survey area is shown in Figure 1.

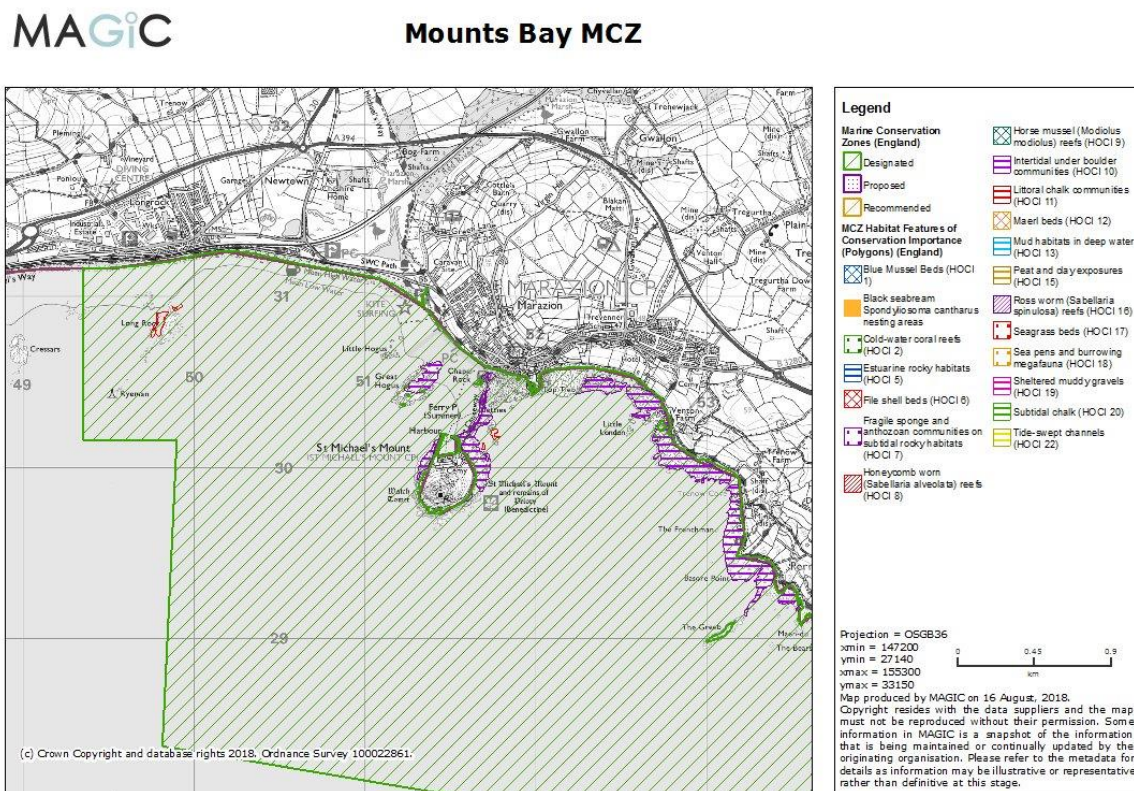


Figure 1: Mounts Bay Marine Conservation Zone (MCZ) and previous records of seagrass beds (Magic Map, 2018)

2.2 Vessel Specifications

The survey was undertaken from Cornwall IFCA's Research Vessel (R/V) Tiger Lily VI (Figure 2). This vessel has been refitted for survey work and includes a purpose built survey station within the wheelhouse (See Annex 1). R/V Tiger Lily VI has been fitted with an inverter and uninterruptable power supply (UPS) to provide stable 240 v power, NMEA outputs and a dedicated GPS with WAAS enabled. All position information was recorded in the Long/Lat WGS84 projection and taken from a single GPS (Furuno GP-32). All times are recorded as UTC and taken from the same source as the position data. The clocks on all of the data capture PCs were synched prior to departing the vessel's mooring.

Tiger Lily VI is an MCA coded Cat 2 vessel and is fitted with all necessary safety equipment including life rafts, first aid kits and fire suppression systems.



Figure 2: Cornwall IFCA's dedicated survey vessel, R/V Tiger Lily VI.

2.3 Personnel

The crew during the surveys consisted of the skipper and up to three scientific officers. The crew roles rotated during the surveys and roles included deploying and recovering the DDV unit, keeping a log and controlling the camera and video topside units.

2.4 Personal Protective Equipment (PPE)

Appropriate safety footwear and lifejackets with personal location beacons (PLBs) were worn at all times by members of the survey team whilst working on deck. Hard hats were worn during deployment and recovery of the DDV. There were no accidents or near misses reported.

2.5 Drop Down Video (DDV) Survey

2.5.1 Equipment Specification

The camera used for the DDV survey was an STR SeaSpyder drop camera system contained in a custom built frame, allowing high resolution stills of the seabed to be taken using a surface controlled digital SLR camera (Figure 3). Separate real time video, with user-programmable overlay, allows positional information, time, bearing and depth to be recorded on the video output. Details of the system are available online:

<http://www.str-subsea.com/sales/str-SeaSpyder-drop-camera-system>.



Figure 3: SeaSpyder drop camera housed in a purpose built frame on the aft deck and in the deployment position onboard R/V Tiger Lily VI.

The camera equipment specifications are shown in Table 1.

Table 1: The camera equipment specifications

Equipment	Camera System
Manufacturer	SeaSpyder
Video	HD video 600 lines PAL
Stills	18 mega pixels
Trigger	Remote from deck
Height control	Video footage
Lighting	Four high density LED 20w lamps
Scale bar	4 Dual lasers for precise imagery scaling
Trigger	Remote from deck
Additional info	<ul style="list-style-type: none"> • Full remote control of camera functions including automatic and manual focus control • 'On-the-fly' image download • High speed digital telemetry link to camera and sensors • High power underwater flash

2.5.2 Methodology

The survey was carried out in line with; mapping European seabed habitats (MESH) recommended operating guidelines for underwater video and photographic imaging techniques (Coggan *et al.*, 20017).

Prior to the deployment of the SeaSpyder for each transect, the text overlay was checked and adjusted to display the survey name and transect number (e.g. "20180522_CIFCA_MB_DDV_T1") and the GPS, heading and depth overlays were checked to ensure they were updating correctly. The SeaSpyder camera was deployed from the starboard side davit of R/V Tiger Lily VI (see Annex 1) and lowered to the seabed. The video was set to record once the camera was on the seabed. A waypoint (mark) was created in OLEX to indicate the start of line (SOL) this was repeated at the end of line (EOL). The SeaSpyder was 'flown' with the frame legs just above the seabed and periodically landed on the seabed to allow a high quality still image to be taken. Still images were captured at a frequency of one every 60 seconds; images separation varied slightly to ensure that the stills taken were of good quality (e.g. taken when the frame was stable and the lens unobstructed) this sometimes led to a delay. Immediately upon having captured a stills image a waypoint (mark) was created in OLEX.

2.5.3 Data handling

OLEX navigation software was used to record the vessels track and waypoints/marks at the start and end of each transect and at the location of every stills image. However, Com Port A log files from the SeaSpyder were used in data processing to obtain image locations. Com Port A data was logged for the duration of each tow and saved in a .txt file format to the topside PC. All log files were transferred to a WD passport for transport after the completion of the tows. Once opened in Excel these files had the GGA strings extracted. Times and GPS locations were extracted from the GGA string and position data converted from degrees and decimal minutes to a decimal degree format. Appropriate headers were then added. The time of each still image was then matched to these log files and the correct location for the images extracted. SOL and EOL positions were recorded as the start and end of each tow video. Once completed the Excel file was transferred to the GI software and data points were created to show the position of each still image and SOL/EOL.

Stills images from the SeaSpyder camera were initially stored on the internal computer (sub-surface), then on completion of each transect, the still images were transferred to the SeaSpyder topside control unit using FileZilla and filed by transect number.

Video files were captured to the SeaSpyder topside unit data drive (D:/).

The stills and video files were transferred from the topside unit to a WD Passport for transport and storage.

2.6 Data analysis

Basic analysis of the video was completed using VLC media player. At one minute intervals the main habitat was recorded, as one of the following categories: seagrass <5%, seagrass 5-50%, seagrass >50%, sand, fine sediment/

mud, mixed sediment and rock; along with positional, time and depth data. Additional records were added more frequently if there was a change in habitat type. The positions were then plotted in MapInfo Professional (Version 17) overlaid onto charts of the area and thematically mapped for habitat.

3. Results

Video footage of eight transect sites were collected in Mounts Bay MCZ. However an issue with the GPS meant that the videos for the first two tows were not analysed, habitat descriptions were only made for the stills. Of the eight tows, a total of 128 stills were taken and an additional 36 records were made from the video footage. The location of the still images within the site is shown in Figure 4. The daily log for the survey operations is shown in Annex 2.

An overview of each tow, including representative still images and habitat classification is shown in Figure 7 to Figure 12. A summary of the video data collected during the DDV survey for Mounts Bay is shown in Annex 3 and the position information for the stills images is shown in Annex 4.

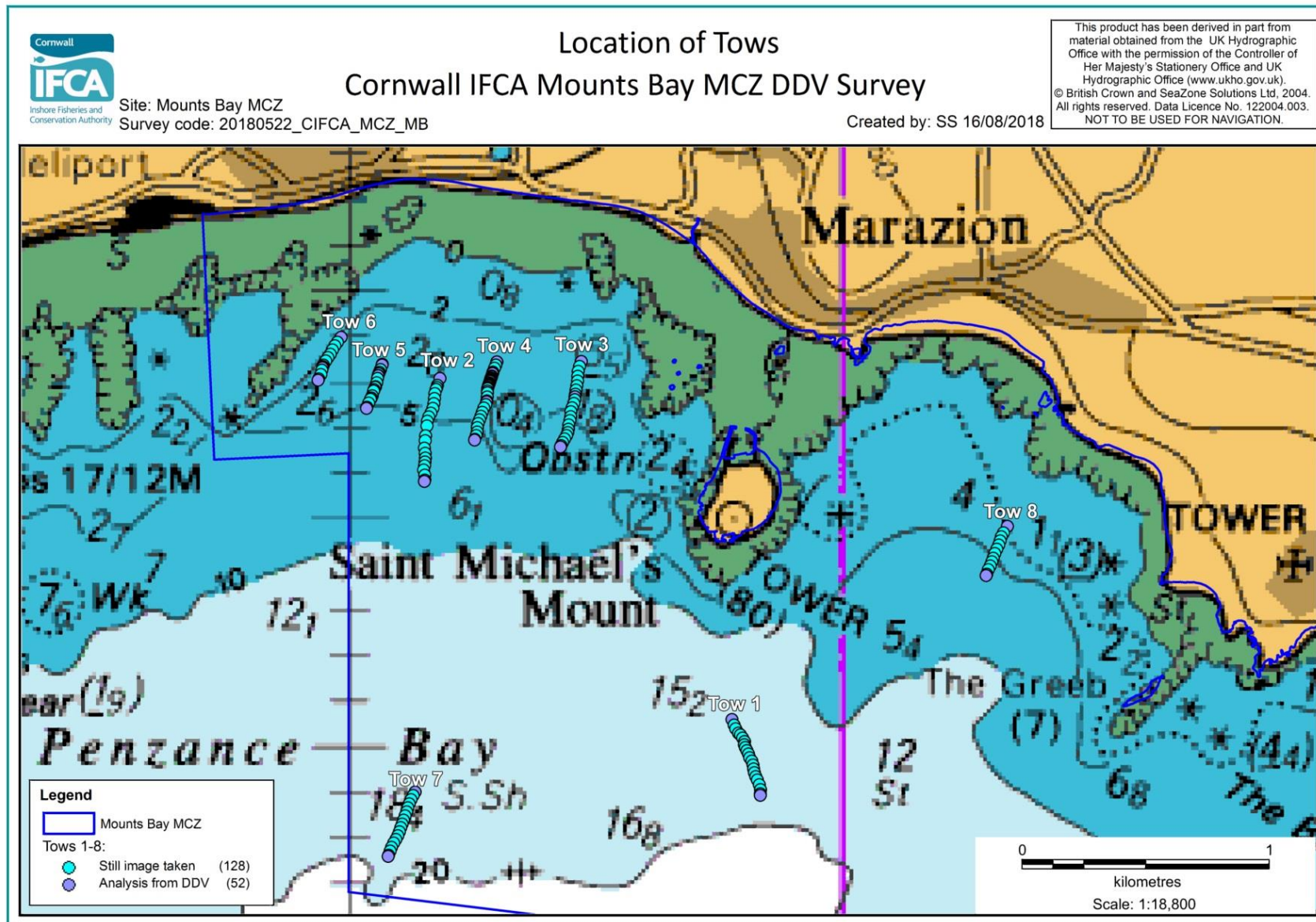


Figure 4: Location of drop down video (DDV) tows in Mounts Bay MCZ.

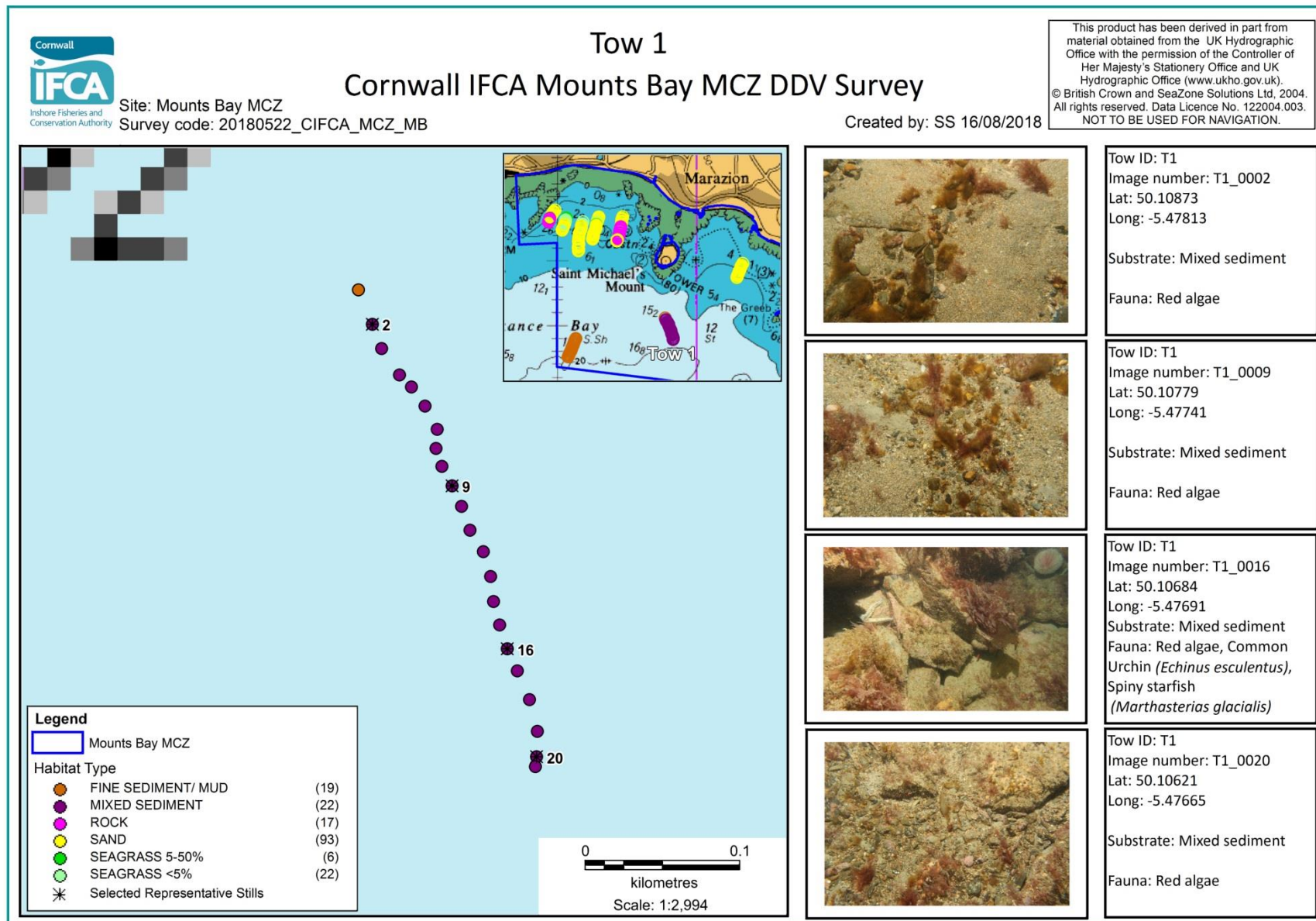


Figure 5: Representative still images and habitat classification for tow 1 within Mounts Bay MCZ.

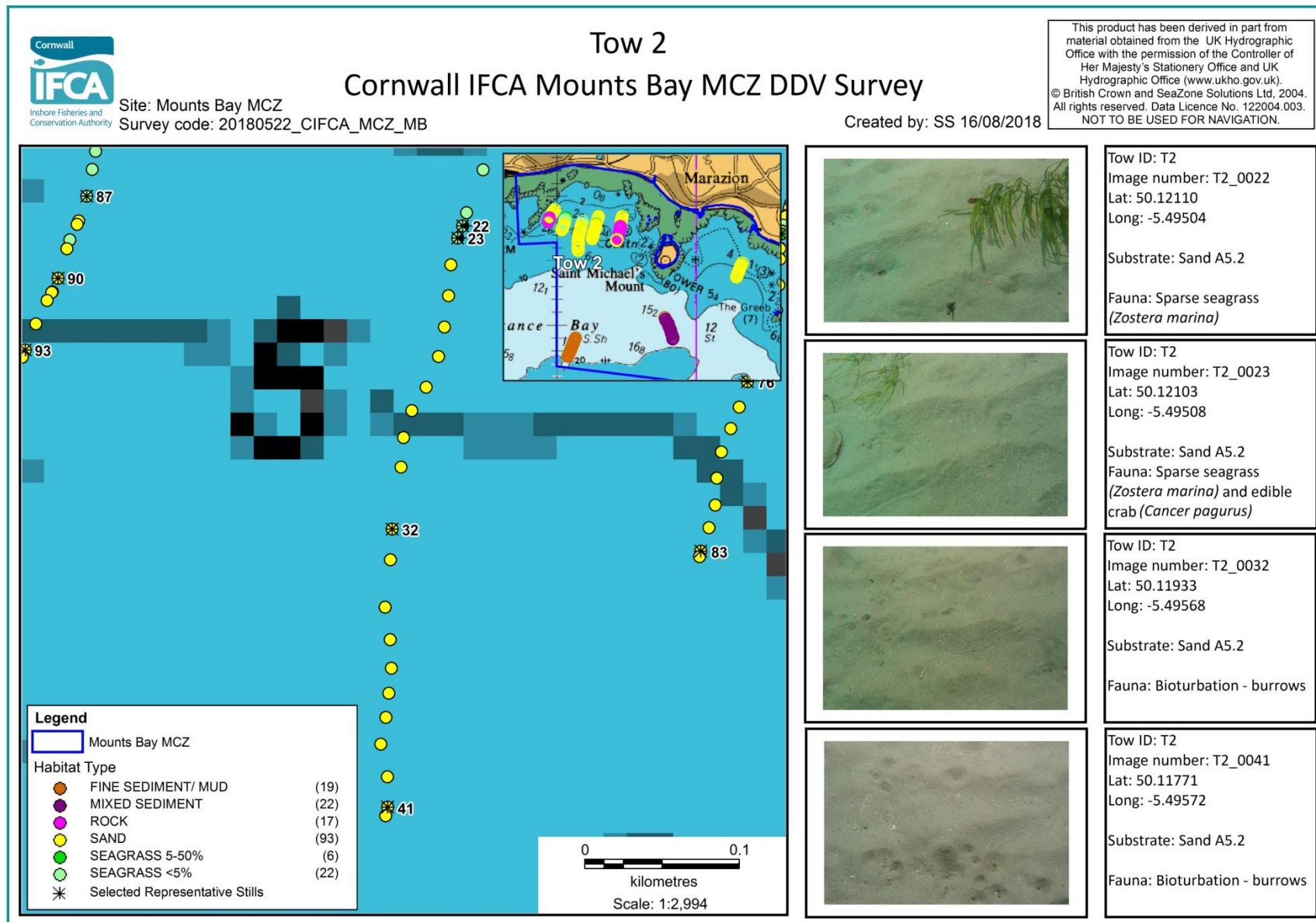


Figure 6: Representative still images and habitat classification for tow 2 within Mounts Bay MCZ.

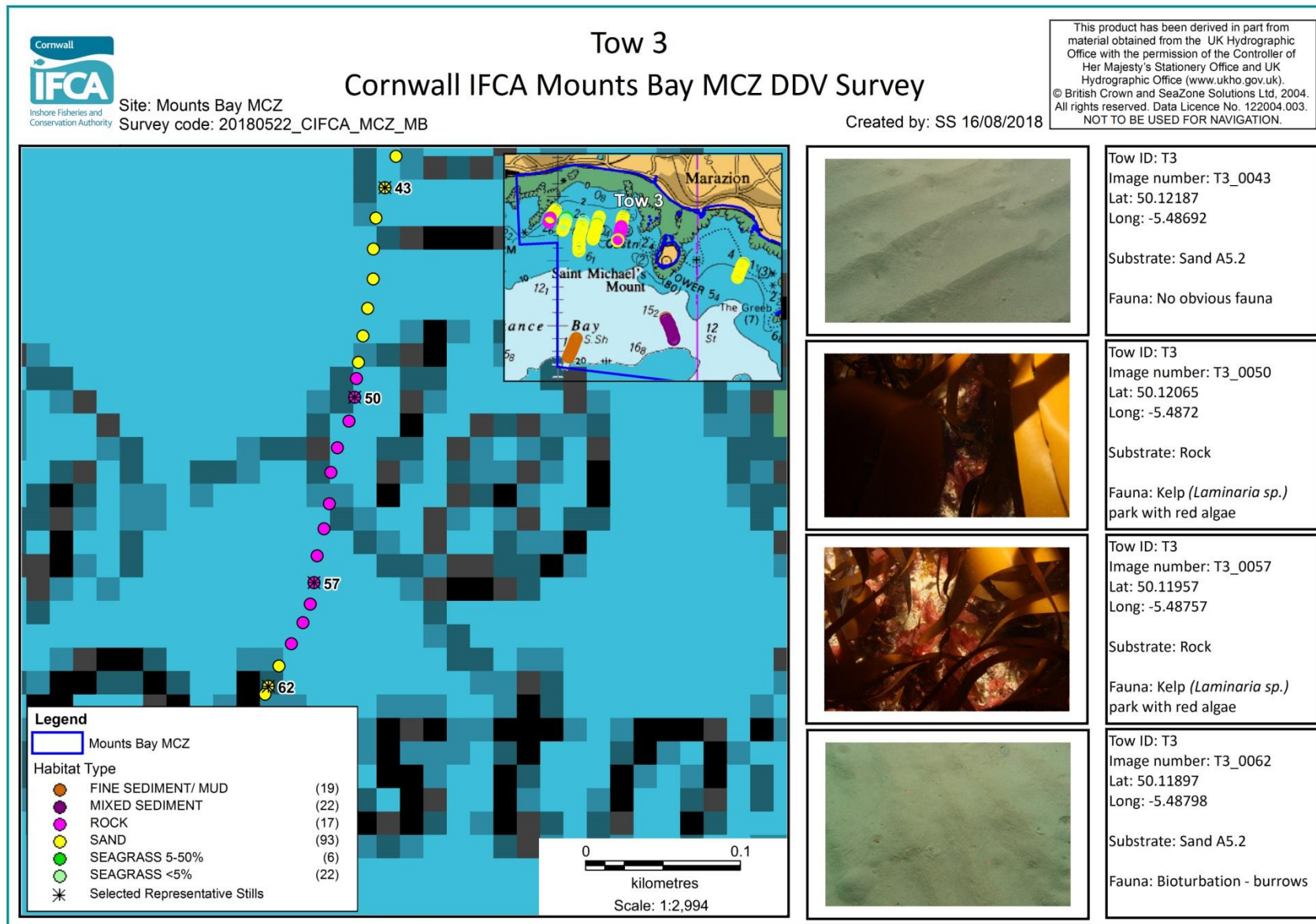


Figure 7: Representative still images and habitat classification for tow 3 within Mounts Bay MCZ.

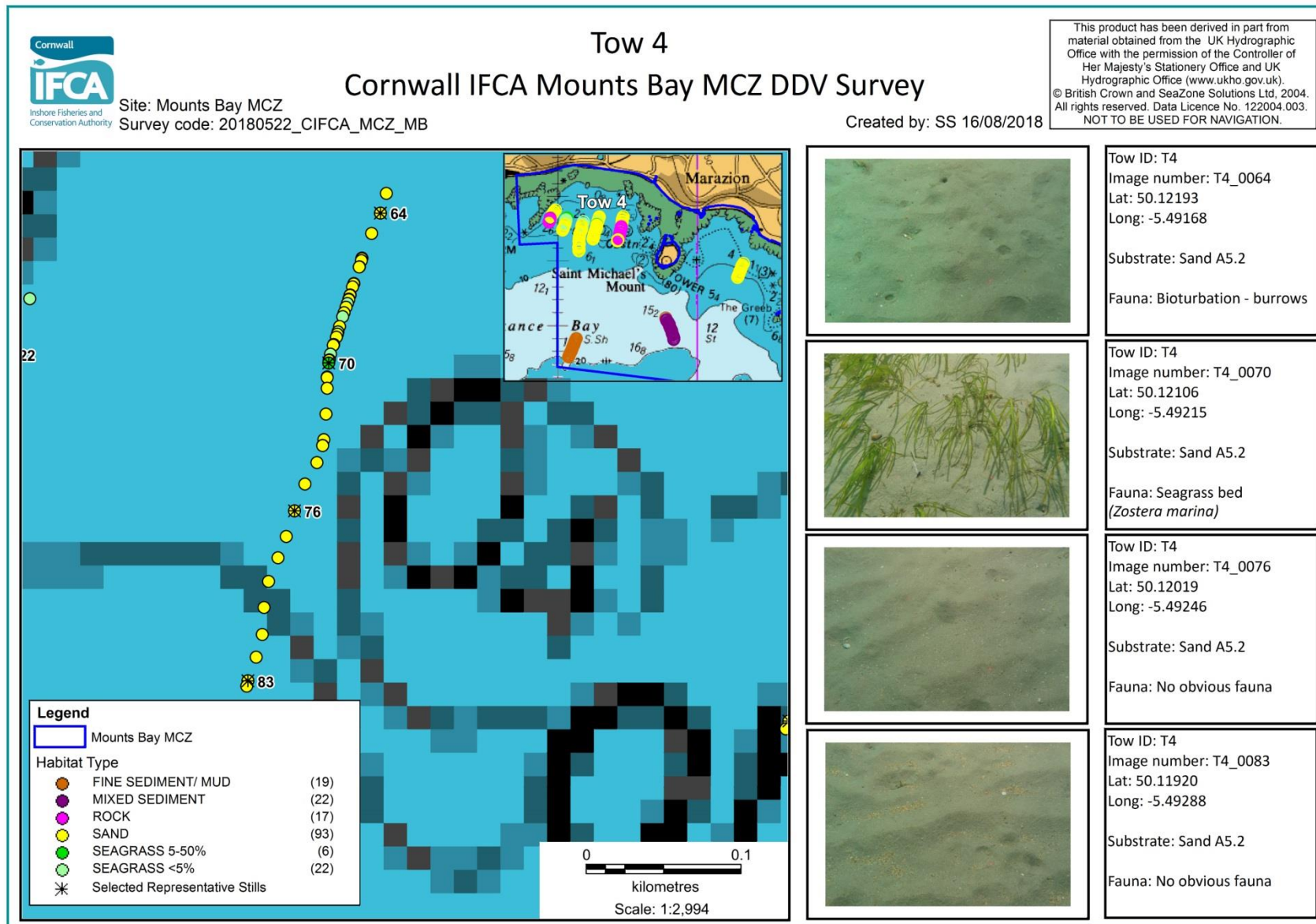


Figure 8: Representative still images and habitat classification for tow 4 within Mounts Bay MCZ.

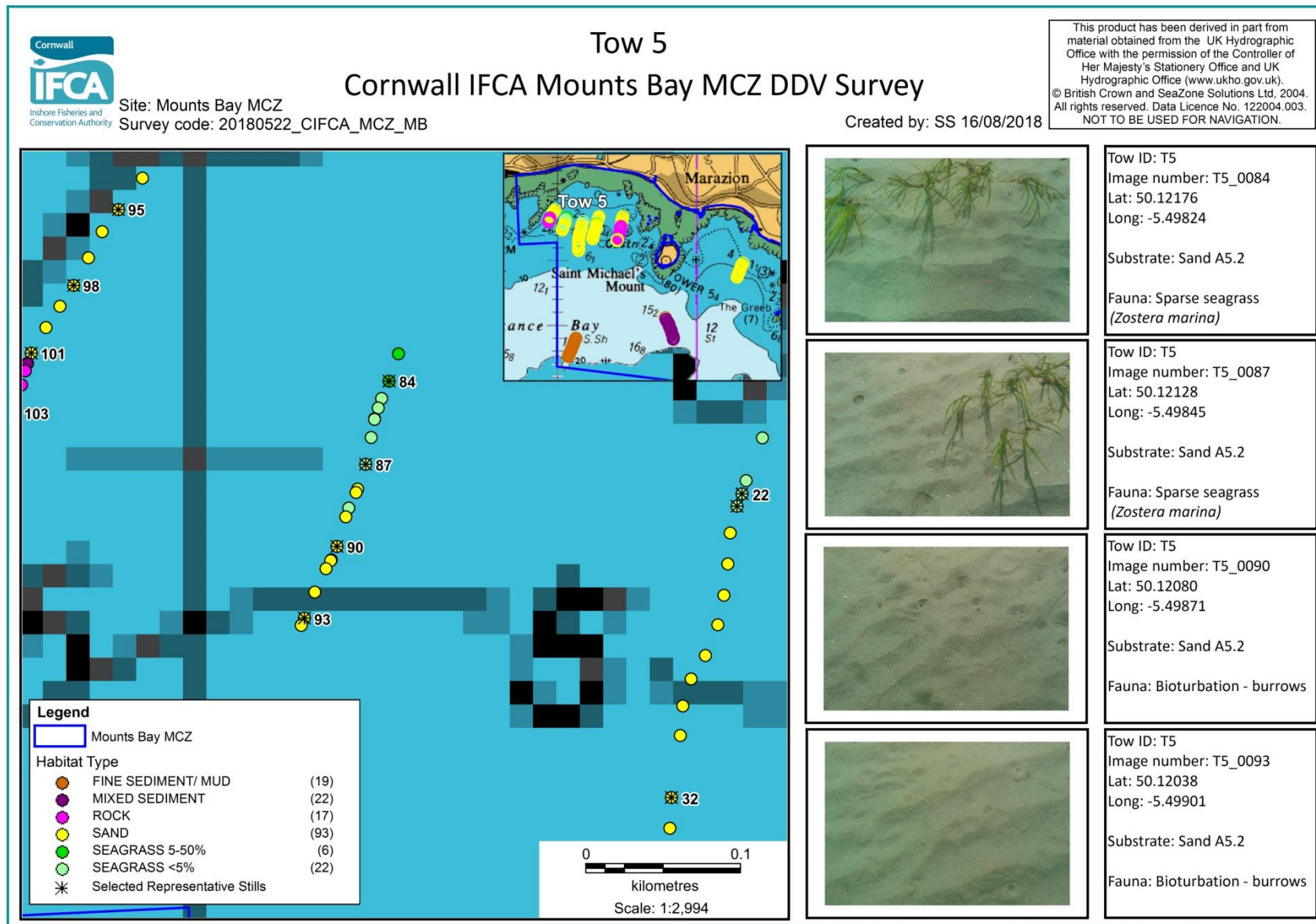


Figure 9: Representative still images and habitat classification for tow 5 within Mounts Bay MCZ.

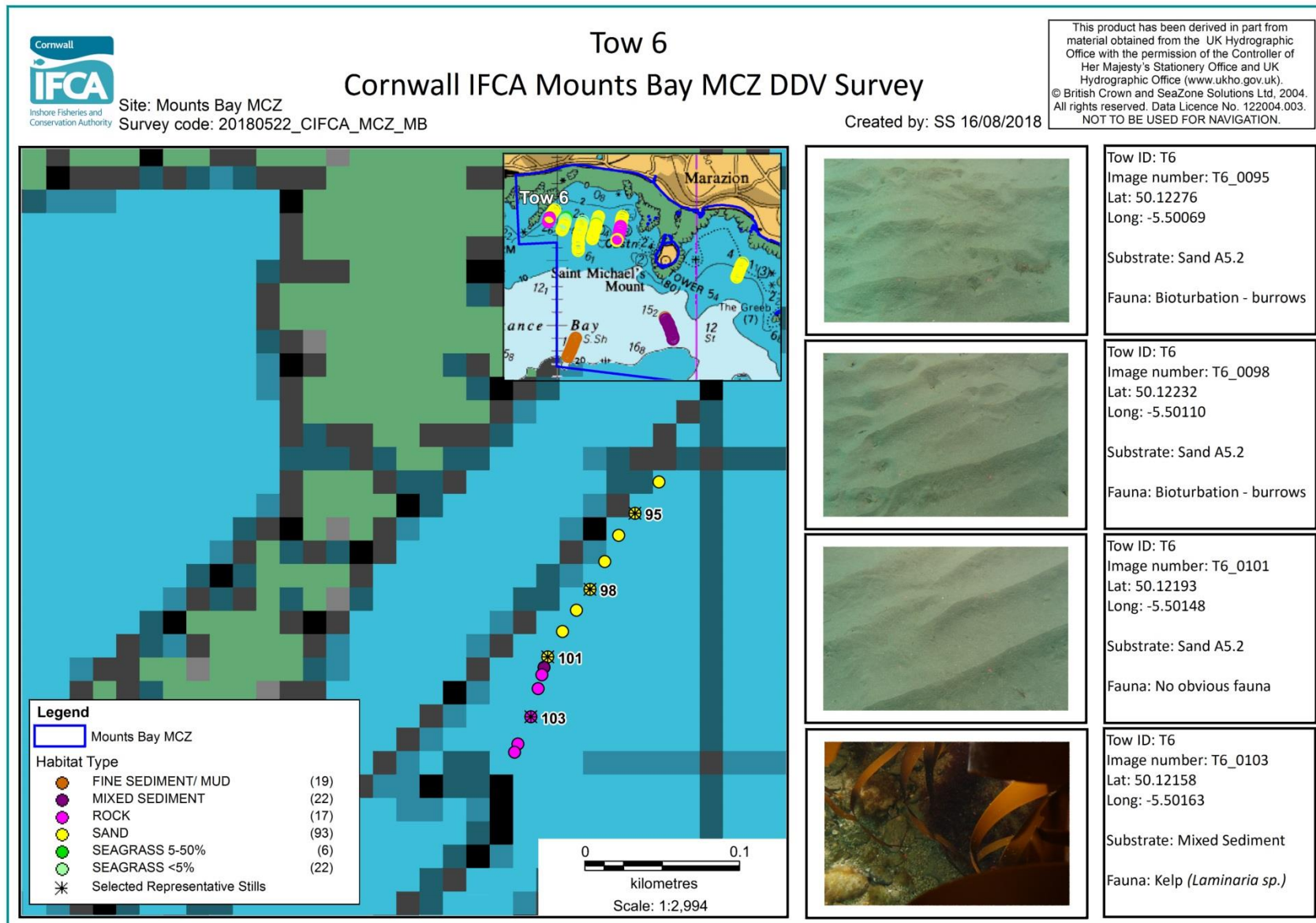


Figure 10: Representative still images and habitat classification for tow 6 within Mounts Bay MCZ.

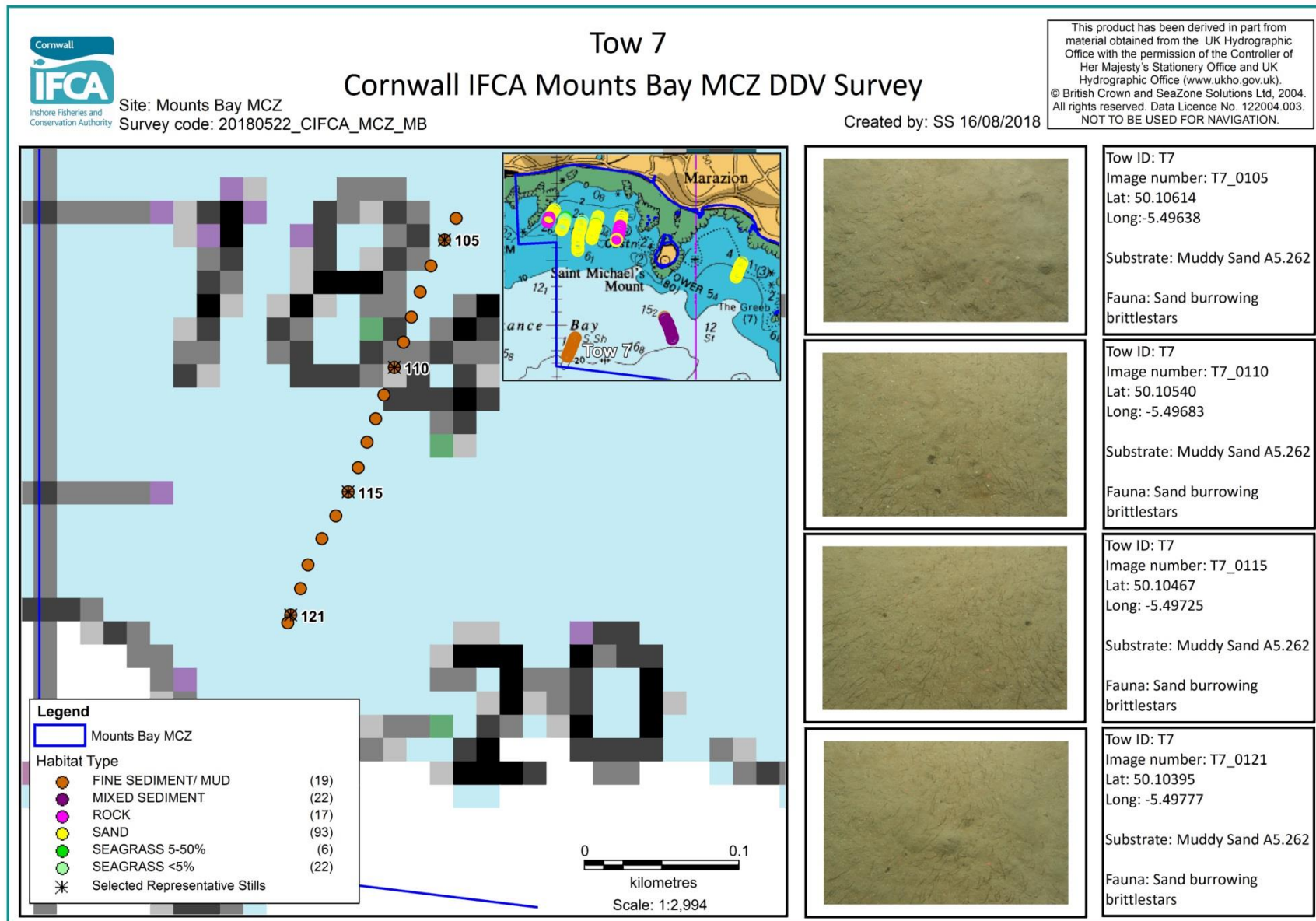


Figure 11: Representative still images and habitat classification for tow 7 within Mounts Bay MCZ.

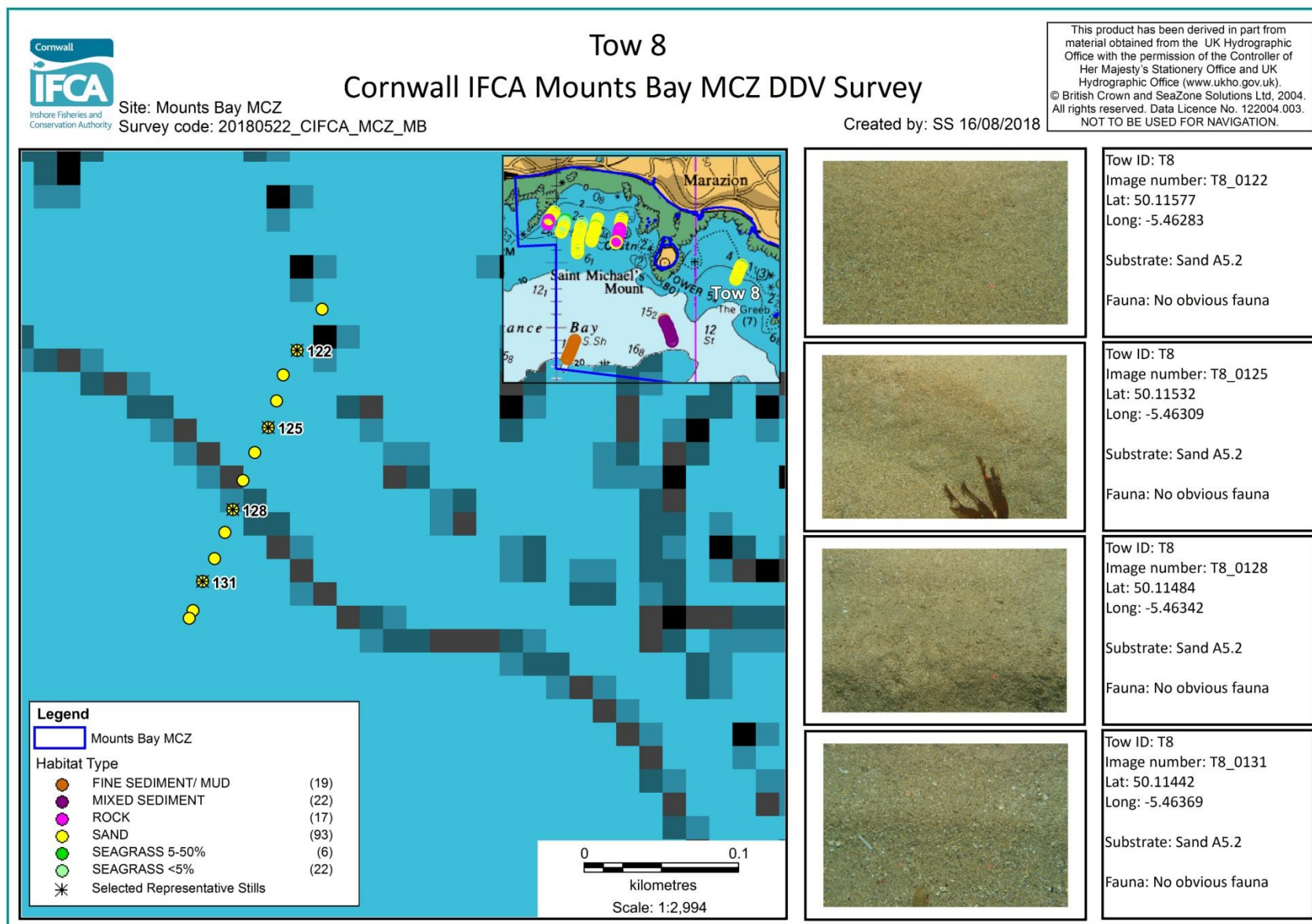


Figure 12: Representative still images and habitat classification for tow 8 within Mounts Bay MCZ.

4. Discussion

The majority of the habitat recorded in the eight tows consisted of sand. Seagrass was found in Tow 2 (Figure 6), Tow 4 (Figure 8) and Tow 5 (Figure 9) which were between Great Hogus and Long Rock, north west of St Michael's Mount. When recorded seagrass was found to be patchy and the density of seagrass was low, with no records of dense beds (>50% cover).

5. References

Curtis, L. 2014. Mounts Bay rMCZ Intertidal Rock and Sediment Verification Survey 2013/2014: Ecospan Environmental.

Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS). 2011. ERCCIS Maerl Eelgrass and Seahorse records 2011: Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS).

Magic Map. 2018. Mounts Bay MCZ. Available from: <http://magic.defra.gov.uk/MagicMap.aspx> [Accessed 16/08/2018]

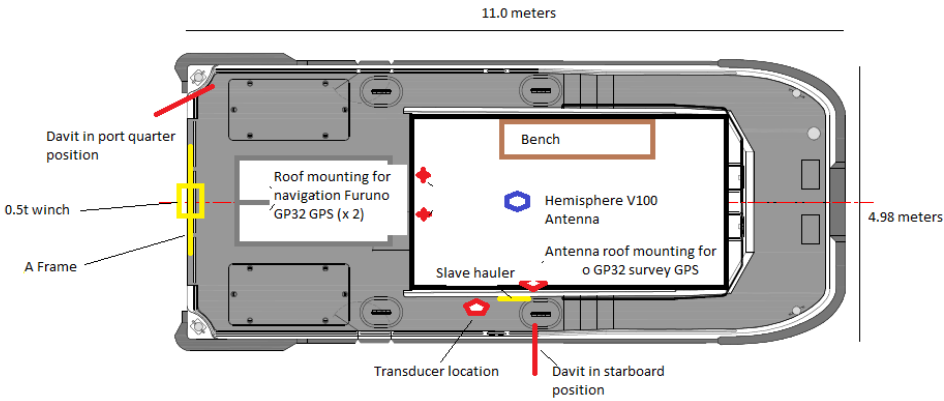
6. Appendices

Annex 1 – R/V Tiger Lily Deck Plan & Offsets



Builder	South Boats Ltd
Model	Island MkII
Built	2007
LOA	11.0m
Beam	4.98m
Draught	1.1m (aft)
Tonnage	c.10 tonnes
Area of operation	MCA Category 2
Call sign	MRWR7
MMSI Number	235054954
MECAL Certification number	M07WB0111059
Complement	14 (including min 2 crew)
Propulsion	2 x 450hp Iveco NEF series
Speed	Cruising: 16 – 18 knots Top: 24 – 26 knots
Range	c. 400 nautical miles
240v AC supply	Victron 3Kw power inverter 5KvA Volvo-Perkins generator (All 240 AC power is accessed via APC Smart UPS C1500)
Stern Gantry	500kg SWL
Winch (on stern gantry)	Spencer Carter 0.5t with scrolling level wind
Slave hauler	Sea Winch 200m dia.
Electric line hauler	12v Spencer Carter Bandit
Positioning	Hemisphere V100 GNSS 3 x Furuno GP32
NMEA data outputs	4 x USB 4 x Serial 4 x banjo
Navigation	Olex with data export Knockle Hypack Max

Tiger Lily VI General Layout - Plan view



			Offset (m)		
NMEA Device	Make/Model	Offset Name	X (f'wd)	Y (port)	Z (+/-)
Sounder	Furuno Navnet	Transducer	7.0	4.2	-0.5
GPS	Furuno GP32	GPS 1	4.8	3.48	+2.2
GNSS	Hemisphere V100	GNSS 1	5.0	2.5	+2.35

[Annex 2 – Daily Log](#)

The daily log for the survey carried out on 22nd May is shown in Table 2.

Survey code: 20180522_CIFCA_MB_DDV

Staff: Colin Trundle (Principle Scientific Officer, Cornwall IFCA), Hilary Naylor (Scientific Officer), Kate Owen (Scientific Officer) and Dan McIntyre (Skipper).

Vessel: Tiger Lily VI

All times are UTC

Table 2: Daily log from survey carried on board R/V Tiger Lily on 22nd May 2018

Time	Activity
07:55:00	Depart Newlyn
09:06:24	Camera deployed
09:11:51	T1 SOL
09:32:29	T1 EOL
09:44:25	T2 SOL
10:07:19	T2 EOL
10:22:27	T3 SOL
10:43:14	T3 EOL
11:01:15	T4 SOL
11:21:30	T4 EOL
11:32:51	Reduced number of camera stills from 20 to 10
11:32:51	T5 SOL
11:43:35	T5 EOL
11:50:03	T6 SOL
12:01:06	T6 EOL
12:04:18	Stopped for lunch
12:37:30	T7 SOL
12:53:53	T7 EOL
13:07:05	T8 SOL
13:19:15	T8 EOL
13:30:00	Arrive Newlyn

Annex 3 – Video position data from the Mounts Bay MCZ DDV Survey

Table 3: Video position data from the Mounts Bay MCZ DDV Survey

Cornwall IFCA		Video Positioning Summary								
Area	Mounts Bay MCZ	Project name		20180522 Mounts Bay MCZ DDV Field Report						
Vessel	Tiger Lily	Sampling position		Starboard davit						
Sample type	Image_ID	Date	Time SOL	Time EOL	SOL Latitude (decimal degrees)	SOL Longitude (decimal degrees)	EOL Latitude (decimal degrees)	EOL Longitude (decimal degrees)	Video length	Number of stills
Camera	CIFCA_MB_TOW_1_20180522	22/05/2018	09:11:51	09:32:29	50.10893	-5.4782597	50.10615	-5.4766558	00:20:38	20
Camera	CIFCA_MB_TOW_2_20180522	22/05/2018	09:44:25	10:07:19	50.121431	-5.4948543	50.117659	-5.4957373	00:22:54	23
Camera	CIFCA_MB_TOW_3_20180522	22/05/2018	10:22:27	10:43:14	50.122057	-5.4868216	50.118923	-5.4880082	00:20:47	20
Camera	CIFCA_MB_TOW_4_20180522	22/05/2018	11:01:15	11:21:30	50.122044	-5.4916249	50.119172	-5.4928895	00:20:15	20
Camera	CIFCA_MB_TOW_5_20180522	22/05/2018	11:32:51	11:43:35	50.121954	-5.4981366	50.120337	-5.4990333	00:10:44	10
Camera	CIFCA_MB_TOW_6_20180522	22/05/2018	11:50:03	12:01:06	50.122946	-5.5004717	50.121369	-5.5017804	00:11:03	10
Camera	CIFCA_MB_TOW_7_20180522	22/05/2018	12:37:30	12:53:53	50.106267	-5.4962722	50.103906	-5.4978003	00:16:23	16
Camera	CIFCA_MB_TOW_8_20180522	22/05/2018	13:07:05	13:19:15	50.116014	-5.4626041	50.11421	-5.4638114	00:12:10	11

Annex 4 – Still image position data from the Mounts Bay MCZ DDV Survey

Table 4: Still image position data from the Mounts Bay MCZ DDV Survey

Cornwall IFCA						Camera Positioning Summary		
Area	Mounts Bay MCZ	Project name		20180522 Mounts Bay MCZ DDV Field Report				
Vessel	Tiger Lily	Sampling position		Starboard davit				
Sample type	Image_ID	Date	Time	Latitude (decimal degrees)	Longitude (decimal degrees)	Depth (m)	Substrate	Comments
Camera	MB_TOW_1_20180522__09_13_15__0001.JPG	22/05/2018	09:13:07	50.1087278	-5.4781338	-	MIXED SEDIMENT	Sand with cobbles and pebbles, red algae
Camera	MB_TOW_1_20180522__09_14_18__0002.JPG	22/05/2018	09:14:07	50.1085868	-5.4780497	-	MIXED SEDIMENT	Sand with cobbles and pebbles, red algae
Camera	MB_TOW_1_20180522__09_15_32__0003.JPG	22/05/2018	09:15:25	50.1084325	-5.4778878	-	MIXED SEDIMENT	Coarse sediment with cobbles and pebbles
Camera	MB_TOW_1_20180522__09_16_18__0004.JPG	22/05/2018	09:16:09	50.1083632	-5.4777788	-	MIXED SEDIMENT	Cobbles and pebbles, red algae
Camera	MB_TOW_1_20180522__09_17_17__0005.JPG	22/05/2018	09:17:07	50.1082517	-5.4776565	-	MIXED SEDIMENT	Cobbles and pebbles, red algae
Camera	MB_TOW_1_20180522__09_18_17__0006.JPG	22/05/2018	09:18:07	50.1081163	-5.4775455	-	MIXED SEDIMENT	Cobbles and pebbles, red algae
Camera	MB_TOW_1_20180522__09_19_15__0007.JPG	22/05/2018	09:19:06	50.108005	-5.4775583	-	MIXED SEDIMENT	Cobbles and pebbles, red algae
Camera	MB_TOW_1_20180522__09_20_15__0008.JPG	22/05/2018	09:20:05	50.1078998	-5.4775028	-	MIXED SEDIMENT	Cobbles and pebbles, red algae
Camera	MB_TOW_1_20180522__09_21_16__0009.JPG	22/05/2018	09:21:07	50.1077868	-5.4774108	-	MIXED SEDIMENT	Coarse sediment with cobbles and pebbles, red algae
Camera	MB_TOW_1_20180522__09_22_16__0010.JPG	22/05/2018	09:22:06	50.1076667	-5.477325	-	MIXED SEDIMENT	Coarse sediment with cobbles and pebbles, red algae
Camera	MB_TOW_1_20180522__09_23_15__0011.JPG	22/05/2018	09:23:06	50.1075283	-5.4772495	-	MIXED SEDIMENT	Mixed sediment with cobbles and pebbles, red algae
Camera	MB_TOW_1_20180522__09_24_16__0012.JPG	22/05/2018	09:24:06	50.1074027	-5.477128	-	MIXED SEDIMENT	Mixed sediment, red algae
Camera	MB_TOW_1_20180522__09_25_16__0013.JPG	22/05/2018	09:25:07	50.107258	-5.4770627	-	MIXED SEDIMENT	Boulder, cobbles, pebbles, red algae and orange sponge
Camera	MB_TOW_1_20180522__09_26_19__0014.JPG	22/05/2018	09:26:09	50.1071115	-5.4770355	-	MIXED SEDIMENT	Boulders on mixed sediment, red algae
Camera	MB_TOW_1_20180522__09_27_17__0015.JPG	22/05/2018	09:27:07	50.106976	-5.476981	-	MIXED SEDIMENT	Boulder, cobbles, pebbles, red algae
Camera	MB_TOW_1_20180522__09_28_20__0016.JPG	22/05/2018	09:28:09	50.1068357	-5.4769113	-	MIXED SEDIMENT	Boulders on mixed sediment, red algae, urchin and starfish
Camera	MB_TOW_1_20180522__09_29_17__0017.JPG	22/05/2018	09:29:08	50.106708	-5.4768202	-	MIXED SEDIMENT	Coarse sediment with cobbles and pebbles, hydroids
Camera	MB_TOW_1_20180522__09_30_17__0018.JPG	22/05/2018	09:30:07	50.1065397	-5.47671	-	MIXED SEDIMENT	Cobbles and pebbles, hydroids
Camera	MB_TOW_1_20180522__09_31_18__0019.JPG	22/05/2018	09:31:09	50.1063548	-5.4766383	-	MIXED SEDIMENT	Boulders on mixed sediment, red algae
Camera	MB_TOW_1_20180522__09_32_16__0020.JPG	22/05/2018	09:32:06	50.1062067	-5.476645	-	MIXED SEDIMENT	Cobbles and pebbles, red algae
Camera	MB_TOW_2_20180522__09_45_27__0021.JPG	22/05/2018	09:45:04	50.1211805	-5.4950032	-	SEAGRASS <5%	Sand with very sparse seagrass

20180522_CIFCA_MB_DDV

Camera	MB_TOW_2_20180522__09_46_39__0022.JPG	22/05/2018	09:46:34	50.1211037	-5.4950393	-	SEAGRASS <5%	Sand with very sparse seagrass, burrow
Camera	MB_TOW_2_20180522__09_47_10__0023.JPG	22/05/2018	09:47:02	50.1210322	-5.495084	-	SEAGRASS <5%	Sand with very sparse seagrass, edible crab
Camera	MB_TOW_2_20180522__09_48_09__0024.JPG	22/05/2018	09:48:00	50.1208758	-5.4951462	-	SAND	Sand with shell fragments and burrows
Camera	MB_TOW_2_20180522__09_49_10__0025.JPG	22/05/2018	09:49:01	50.1206957	-5.4951673	-	SAND	Sand and burrows
Camera	MB_TOW_2_20180522__09_50_12__0026.JPG	22/05/2018	09:50:03	50.1205127	-5.4952043	-	SAND	Sand and burrows
Camera	MB_TOW_2_20180522__09_51_12__0027.JPG	22/05/2018	09:51:02	50.12034	-5.4952575	-	SAND	Sand and burrows
Camera	MB_TOW_2_20180522__09_52_12__0028.JPG	22/05/2018	09:52:02	50.1201607	-5.49537	-	SAND	Sand and burrows
Camera	MB_TOW_2_20180522__09_53_11__0029.JPG	22/05/2018	09:53:02	50.1200237	-5.4955013	-	SAND	Sand
Camera	MB_TOW_2_20180522__09_54_11__0030.JPG	22/05/2018	09:54:00	50.1198667	-5.4955763	-	SAND	Sand and burrows
Camera	MB_TOW_2_20180522__09_55_11__0031.JPG	22/05/2018	09:55:00	50.1196945	-5.4955987	-	SAND	Sand, bioturbation, netted dog whelk
Camera	MB_TOW_2_20180522__09_57_09__0032.JPG	22/05/2018	09:57:03	50.1193325	-5.4956793	-	SAND	Sand, bioturbation and burrows
Camera	MB_TOW_2_20180522__09_58_12__0033.JPG	22/05/2018	09:58:03	50.1191535	-5.4956943	-	SAND	Sand, bioturbation and burrows
Camera	MB_TOW_2_20180522__10_00_09__0034.JPG	22/05/2018	09:59:59	50.1188772	-5.4957433	-	SAND	Sand, bioturbation
Camera	MB_TOW_2_20180522__10_01_10__0035.JPG	22/05/2018	10:00:59	50.118687	-5.4956957	-	SAND	Sand, bioturbation and burrows
Camera	MB_TOW_2_20180522__10_02_09__0036.JPG	22/05/2018	10:02:01	50.11852	-5.495685	-	SAND	Sand and burrows
Camera	MB_TOW_2_20180522__10_03_09__0037.JPG	22/05/2018	10:03:01	50.1183738	-5.4957075	-	SAND	Sand and burrows
Camera	MB_TOW_2_20180522__10_04_09__0038.JPG	22/05/2018	10:04:00	50.1182333	-5.4957353	-	SAND	Sand with shell fragments and burrows
Camera	MB_TOW_2_20180522__10_05_10__0039.JPG	22/05/2018	10:05:01	50.1180772	-5.4957805	-	SAND	Sand with shell fragments and burrows
Camera	MB_TOW_2_20180522__10_06_10__0040.JPG	22/05/2018	10:06:00	50.1178857	-5.4957217	-	SAND	Sand, bioturbation and burrows
Camera	MB_TOW_2_20180522__10_07_10__0041.JPG	22/05/2018	10:07:01	50.1177092	-5.4957185	-	SAND	Sand with shell fragments and burrows
Camera	MB_TOW_3_20180522__10_23_57__0043.JPG	22/05/2018	10:23:46	50.1218745	-5.4869231	-	SAND	Sand waves
Camera	MB_TOW_3_20180522__10_24_59__0044.JPG	22/05/2018	10:24:49	50.1216968	-5.4870045	-	SAND	Sand waves
Camera	MB_TOW_3_20180522__10_25_57__0045.JPG	22/05/2018	10:25:47	50.1215172	-5.4870268	-	SAND	Sand waves
Camera	MB_TOW_3_20180522__10_26_58__0046.JPG	22/05/2018	10:26:47	50.1213426	-5.4870301	-	SAND	Sand waves
Camera	MB_TOW_3_20180522__10_27_58__0047.JPG	22/05/2018	10:27:51	50.1211713	-5.4870795	-	SAND	Sand waves
Camera	MB_TOW_3_20180522__10_29_00__0048.JPG	22/05/2018	10:28:50	50.1210105	-5.4871211	-	SAND	Sand waves
Camera	MB_TOW_3_20180522__10_29_58__0049.JPG	22/05/2018	10:29:47	50.1208561	-5.4871629	-	SAND	Sand waves
Camera	MB_TOW_3_20180522__10_31_00__0050.JPG	22/05/2018	10:30:58	50.1206529	-5.487197	-	ROCK	Kelp (Laminaria sp.) park with red algae
Camera	MB_TOW_3_20180522__10_32_04__0051.JPG	22/05/2018	10:31:55	50.1205144	-5.4872476	-	ROCK	Kelp (Laminaria sp.) park with red algae
Camera	MB_TOW_3_20180522__10_33_07__0052.JPG	22/05/2018	10:32:58	50.1203588	-5.4873529	-	ROCK	Kelp (Laminaria sp.) park with red algae

20180522_CIFCA_MB_DDV

Camera	MB_TOW_3_20180522__10_34_01__0053.JPG	22/05/2018	10:33:52	50.1202147	-5.4874118	-	ROCK	Kelp (Laminaria sp.) park with red algae
Camera	MB_TOW_3_20180522__10_35_02__0054.JPG	22/05/2018	10:34:54	50.1200318	-5.4874259	-	ROCK	Kelp (Laminaria sp.) park with red algae
Camera	MB_TOW_3_20180522__10_36_01__0055.JPG	22/05/2018	10:35:53	50.1198868	-5.4874736	-	ROCK	Kelp (Laminaria sp.) park with red algae
Camera	MB_TOW_3_20180522__10_37_03__0056.JPG	22/05/2018	10:36:57	50.1197293	-5.4875371	-	ROCK	Kelp (Laminaria sp.) park with red algae
Camera	MB_TOW_3_20180522__10_38_04__0057.JPG	22/05/2018	10:37:56	50.1195727	-5.4875655	-	ROCK	Kelp (Laminaria sp.) park with red algae
Camera	MB_TOW_3_20180522__10_39_02__0058.JPG	22/05/2018	10:38:54	50.1194479	-5.4875986	-	ROCK	Kelp (Laminaria sp.) park with red algae
Camera	MB_TOW_3_20180522__10_40_01__0059.JPG	22/05/2018	10:39:51	50.1193395	-5.4876647	-	ROCK	Kelp (Laminaria sp.) park with red algae
Camera	MB_TOW_3_20180522__10_41_01__0060.JPG	22/05/2018	10:40:52	50.1192166	-5.48777	-	ROCK	Kelp (Laminaria sp.) park with red algae
Camera	MB_TOW_3_20180522__10_41_59__0061.JPG	22/05/2018	10:41:52	50.1190867	-5.4878826	-	SAND	Sand with some rock. Kelp, hydroids, red algae
Camera	MB_TOW_3_20180522__10_42_59__0062.JPG	22/05/2018	10:42:50	50.1189687	-5.4879789	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_02_28__0064.JPG	22/05/2018	11:02:18	50.1219286	-5.4916793	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_03_27__0065.JPG	22/05/2018	11:03:17	50.1218109	-5.4917593	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_04_30__0066.JPG	22/05/2018	11:04:21	50.1216524	-5.4918517	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_05_28__0067.JPG	22/05/2018	11:05:20	50.1214987	-5.4919312	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_06_31__0068.JPG	22/05/2018	11:06:18	50.1213487	-5.4920074	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_07_29__0069.JPG	22/05/2018	11:07:17	50.1212062	-5.4920783	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_08_27__0070.JPG	22/05/2018	11:08:20	50.1210556	-5.4921471	-	SEAGRASS 5-50%	Sand with very sparse seagrass
Camera	MB_TOW_4_20180522__11_09_29__0071.JPG	22/05/2018	11:09:20	50.1209085	-5.4921611	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_10_28__0072.JPG	22/05/2018	11:10:19	50.120758	-5.4921709	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_11_27__0073.JPG	22/05/2018	11:11:19	50.1206089	-5.4921911	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_12_30__0074.JPG	22/05/2018	11:12:20	50.1204763	-5.4922536	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_13_29__0075.JPG	22/05/2018	11:13:20	50.12035	-5.4923626	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_14_29__0076.JPG	22/05/2018	11:14:19	50.1201941	-5.4924555	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_15_29__0077.JPG	22/05/2018	11:15:20	50.1200454	-5.4925312	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_16_28__0078.JPG	22/05/2018	11:16:19	50.1199201	-5.4926061	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_17_26__0079.JPG	22/05/2018	11:17:17	50.1197825	-5.4926917	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_18_28__0080.JPG	22/05/2018	11:18:16	50.1196313	-5.4927331	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_19_27__0081.JPG	22/05/2018	11:19:17	50.1194733	-5.4927478	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_20_28__0082.JPG	22/05/2018	11:20:18	50.1193411	-5.4928043	-	SAND	Sand waves
Camera	MB_TOW_4_20180522__11_21_28__0083.JPG	22/05/2018	11:21:18	50.1192037	-5.4928787	-	SAND	Sand waves

20180522_CIFCA_MB_DDV

Camera	MB_TOW_5_20180522__11_34_32__0084.JPG	22/05/2018	11:34:22	50.1217619	-5.4982372	-	SEAGRASS 5-50%	Sand with sparse seagrass
Camera	MB_TOW_5_20180522__11_35_27__0085.JPG	22/05/2018	11:35:19	50.121606	-5.4983351	-	SEAGRASS <5%	Sand with very sparse seagrass
Camera	MB_TOW_5_20180522__11_36_30__0086.JPG	22/05/2018	11:36:20	50.1214334	-5.4984005	-	SEAGRASS <5%	Sand with very sparse seagrass
Camera	MB_TOW_5_20180522__11_37_25__0087.JPG	22/05/2018	11:37:15	50.121277	-5.4984495	-	SEAGRASS <5%	Sand with sparse seagrass
Camera	MB_TOW_5_20180522__11_38_30__0088.JPG	22/05/2018	11:38:19	50.1211127	-5.4985372	-	Sand	Sand with single stem of seagrass
Camera	MB_TOW_5_20180522__11_39_25__0089.JPG	22/05/2018	11:39:16	50.1209701	-5.4986293	-	SAND	Sand waves
Camera	MB_TOW_5_20180522__11_40_26__0090.JPG	22/05/2018	11:40:16	50.120798	-5.4987092	-	SAND	Sand waves
Camera	MB_TOW_5_20180522__11_41_29__0091.JPG	22/05/2018	11:41:18	50.1206677	-5.4988095	-	SAND	Sand waves
Camera	MB_TOW_5_20180522__11_42_26__0092.JPG	22/05/2018	11:42:16	50.1205309	-5.4989105	-	SAND	Sand waves
Camera	MB_TOW_5_20180522__11_43_27__0093.JPG	22/05/2018	11:43:16	50.120379	-5.4990057	-	SAND	Sand waves
Camera	MB_TOW_6_20180522__11_51_44__0095.JPG	22/05/2018	11:51:34	50.1227632	-5.5006886	-	SAND	Sand waves
Camera	MB_TOW_6_20180522__11_52_44__0096.JPG	22/05/2018	11:52:34	50.1226339	-5.500837	-	SAND	Sand waves
Camera	MB_TOW_6_20180522__11_53_45__0097.JPG	22/05/2018	11:53:35	50.122481	-5.5009632	-	SAND	Sand waves
Camera	MB_TOW_6_20180522__11_54_47__0098.JPG	22/05/2018	11:54:36	50.12232	-5.5010962	-	SAND	Sand waves
Camera	MB_TOW_6_20180522__11_55_45__0099.JPG	22/05/2018	11:55:35	50.1221984	-5.50122	-	SAND	Sand waves
Camera	MB_TOW_6_20180522__11_56_44__0100.JPG	22/05/2018	11:56:31	50.1220741	-5.5013472	-	SAND	Sand waves
Camera	MB_TOW_6_20180522__11_57_45__0101.JPG	22/05/2018	11:57:35	50.1219252	-5.5014804	-	SAND	Sand waves
Camera	MB_TOW_6_20180522__11_58_51__0102.JPG	22/05/2018	11:58:41	50.1217403	-5.501567	-	ROCK	Kelp
Camera	MB_TOW_6_20180522__11_59_50__0103.JPG	22/05/2018	11:59:42	50.1215761	-5.5016321	-	ROCK	Kelp
Camera	MB_TOW_6_20180522__12_00_56__0104.JPG	22/05/2018	12:00:48	50.1214175	-5.5017506	-	ROCK	Kelp
Camera	MB_TOW_7_20180522__12_38_39__0105.JPG	22/05/2018	12:38:30	50.1061411	-5.4963775	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_39_39__0106.JPG	22/05/2018	12:39:33	50.1059888	-5.4965006	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_40_41__0107.JPG	22/05/2018	12:40:32	50.1058373	-5.4965981	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_41_40__0108.JPG	22/05/2018	12:41:33	50.1056896	-5.496678	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_42_39__0109.JPG	22/05/2018	12:42:31	50.1055428	-5.4967493	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_43_39__0110.JPG	22/05/2018	12:43:30	50.1053961	-5.4968335	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_44_41__0111.JPG	22/05/2018	12:44:31	50.1052364	-5.4969265	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars

20180522_CIFCA_MB_DDV

Camera	MB_TOW_7_20180522__12_45_40__0112.JPG	22/05/2018	12:45:29	50.1050966	-5.4970022	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_46_39__0113.JPG	22/05/2018	12:46:28	50.1049604	-5.4970803	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_47_40__0114.JPG	22/05/2018	12:47:29	50.1048119	-5.4971604	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_48_41__0115.JPG	22/05/2018	12:48:31	50.1046699	-5.4972509	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_49_40__0116.JPG	22/05/2018	12:49:31	50.1045303	-5.4973641	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_50_39__0117.JPG	22/05/2018	12:50:30	50.1043969	-5.4974904	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_51_42__0118.JPG	22/05/2018	12:51:32	50.1042443	-5.4976158	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_52_39__0119.JPG	22/05/2018	12:52:28	50.1041052	-5.4976835	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_7_20180522__12_53_45__0121.JPG	22/05/2018	12:53:34	50.1039505	-5.497773	-	FINE SEDIMENT/ MUD	Sand burrowing brittlestars
Camera	MB_TOW_8_20180522__13_09_09__0122.JPG	22/05/2018	13:09:00	50.115773	-5.4628307	-	SAND	Barren sand
Camera	MB_TOW_8_20180522__13_10_11__0123.JPG	22/05/2018	13:10:01	50.1156301	-5.4629569	-	SAND	Barren sand
Camera	MB_TOW_8_20180522__13_11_08__0124.JPG	22/05/2018	13:10:58	50.1154776	-5.4630179	-	SAND	Barren sand
Camera	MB_TOW_8_20180522__13_12_08__0125.JPG	22/05/2018	13:12:00	50.1153229	-5.4630933	-	SAND	Barren sand
Camera	MB_TOW_8_20180522__13_13_08__0126.JPG	22/05/2018	13:13:00	50.1151772	-5.4632164	-	SAND	Barren sand
Camera	MB_TOW_8_20180522__13_14_08__0127.JPG	22/05/2018	13:13:59	50.1150142	-5.4633225	-	SAND	Barren sand
Camera	MB_TOW_8_20180522__13_15_10__0128.JPG	22/05/2018	13:15:03	50.1148439	-5.4634154	-	SAND	Barren sand
Camera	MB_TOW_8_20180522__13_16_07__0129.JPG	22/05/2018	13:15:57	50.1147107	-5.4634872	-	SAND	Barren sand
Camera	MB_TOW_8_20180522__13_17_07__0130.JPG	22/05/2018	13:16:58	50.1145582	-5.4635796	-	SAND	Barren sand
Camera	MB_TOW_8_20180522__13_18_07__0131.JPG	22/05/2018	13:17:55	50.1144235	-5.4636888	-	SAND	Barren sand
Camera	MB_TOW_8_20180522__13_19_07__0132.JPG	22/05/2018	13:18:57	50.1142535	-5.4637759	-	SAND	Barren sand