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*FV Lady Nicola UL 584*

**REPORT of Survey: Drop-down video survey of seabed habitats and Priority Marine Features around the Shetland Isle**

**23 May - 1 June 2019**

**Loading:** Lerwick, 22 May 2019

**Boarding:** Lerwick, 23 May 2019

**Unloading:** Lerwick, 1 June 2019

In setting the survey programme and specific objectives, etc the Scientist-in-Charge needs to be aware of the restrictions on working hours and the need to build in adequate rest days and rest breaks as set out in Marine Scotland's Working Time Policy (Lab Notice 34/03). In addition, the Scientist-in-Charge must formally review the risk assessments for the survey with staff on-board before work is commenced.

In the interest of efficient data management it is now mandatory to return the survey report, to I Gibb and the Survey Summary Report (old ROSCOP form) to M Geldart, within four weeks of a survey ending. In the case of the Survey Summary Report a nil return is required, if appropriate.

**Personnel**

G. Pasco  
K. Dearing  
L. Kamphausen

**Organisation**

Seascope Fisheries Research  
Scottish Natural Heritage  
Scottish Natural Heritage

**Role**

SIC  
23 – 27 May 2019  
28 May – 1 June 2019

**Project:** 10 days

**Gear**

EMFF camera frame, umbilicals (300m + 100m), camera system (EMFF systems 1 and 2), lights and control unit.

SNH camera sledge (backup – not used), GoProTM Hero 4 camera in housing, lights, 80m umbilical, surface control unit, GPS

**Background and Objectives**

“Engaging Fishermen in Marine Environmental Monitoring” is a joint project between Marine Scotland (MS), Marine Scotland Science (MSS) and Scottish Natural Heritage (SNH), funded through the European Maritime and Fisheries Fund (EMFF). This survey is one of several planned for 2018 and 2019 working in collaboration with fishermen to collect information on seabed habitats within and adjacent to Scottish Marine Protected Areas (MPAs) <https://www2.gov.scot/Topics/marine/marine-environment/mpanetwork/MPAmonitoring/EMFFproject>

The objectives for this survey were:

- To engage fishermen in marine monitoring work through chartering of fishing vessels and training crew.
- To undertake a programme of targeted DDV sampling to enhance our understanding of the distribution and extent of Priority Marine Features (such as maerl beds and horse mussel beds) and other benthic habitats in and adjacent to MPAs in and around the Shetland Isles.

The focus of the sampling was to carry out targeted surveys of seabed habitats. DDV will be used to confirm habitat presence, extent and current status of such features. The survey builds upon work in previous years to refine the habitat maps for the area.

### **Survey procedure**

The initial plan was to deploy the DDV system from the fishing vessel at or near to pre-identified coordinates within the survey polygon in Figure 1. The planned survey positions were manually entered into the vessel navigation system each day as bulk loading of positions was not possible. During operation, the camera frame was lowered over the side of the vessel using the winch/haul and positioned just above the seabed. A live feed of the standard definition video signal was provided to the surface control unit (SCU) located in the wheelhouse, and red-line lasers enabled the field of view to be judged. The live video feed to the wheelhouse was visible to the skipper and winch operator, to help with locating the camera above the seabed and orientating the vessel during tows.

The vessel was allowed to drift in the direction of the prevailing current or wind for approximately 5 minutes. Longer or shorter runs were appropriate in some situations depending on the local conditions and habitats encountered. Vessel speed in general was approximately 0.5kn during tows. At intervals the camera frame was landed on the seabed to take 'Snapshot' still images of the seabed type and flora/fauna. The Surface Control Unit (SCU) displayed live Standard Definition (SD) video with time/date stamp, GPS location (when operating) and camera depth. LED lighting level was controlled from the SCU and was generally kept at maximum. High Definition (HD) video and still photos were stored in the camera for later downloading. SD video with overlay (including time/date stamp and position coordinates from its dedicated GPS) was recorded directly on the SCU.

Sample location (from the vessel's GPS) and other metadata were recorded on paper forms throughout the survey, with forms stored ashore at the end of each survey day and used to assist in quality control. Track and waypoints were recorded from a hand-held GPS as backup in case of problems with the camera or vessel positional data, but due to the problems with the SD overlay, post-survey these waypoint positions have been downloaded and used as principal sample location data, and are shown in Tables 1 and 2. Video files were downloaded from the camera at the end of each survey day, and data backed up according to the agreed protocols.

### **Narrative**

Scientists joined the vessel at either Lerwick, Scalloway, Mid Yell or Vidlin harbours each day. SNH staff changeover was on 27 May.

Weather over the survey period was fair to moderate, with predominantly westerly quarter winds throughout. A brief window of easterlies facilitated 2 days of sampling on the west side, working out of Scalloway. The remainder of sampling efforts focussed on suitably sheltered east coast locations, from Yell in the north down to Mousa in the south.

Sampling was conducted using EMFF system 2, with the exception of the camera itself, which was from EMFF system 1. The system performed well throughout the survey period, with no significant issues reported.

175 video samples and 2491 accompanying HD still images and 22 SD still images were collected. Table 1 provides the sample station locations (start and end waypoints) and Table 2 brief descriptions of the seabed at each sample station. Figure 2 shows an overview of all stations sampled on this Shetland survey in 2019, and Figures 3-11 show the video start waypoint locations and station numbers for more detailed areas.

Submitted: Guy Pasco & Charlotte Johnston 25 September 19

Approved: P Boulcott 03 February 2020

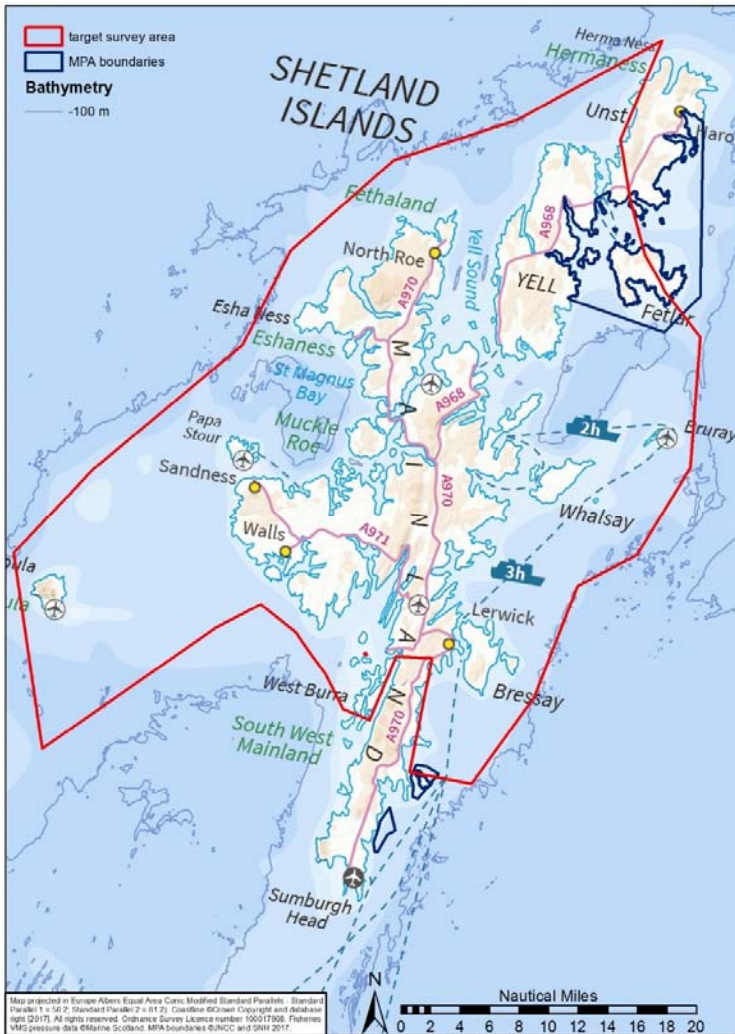
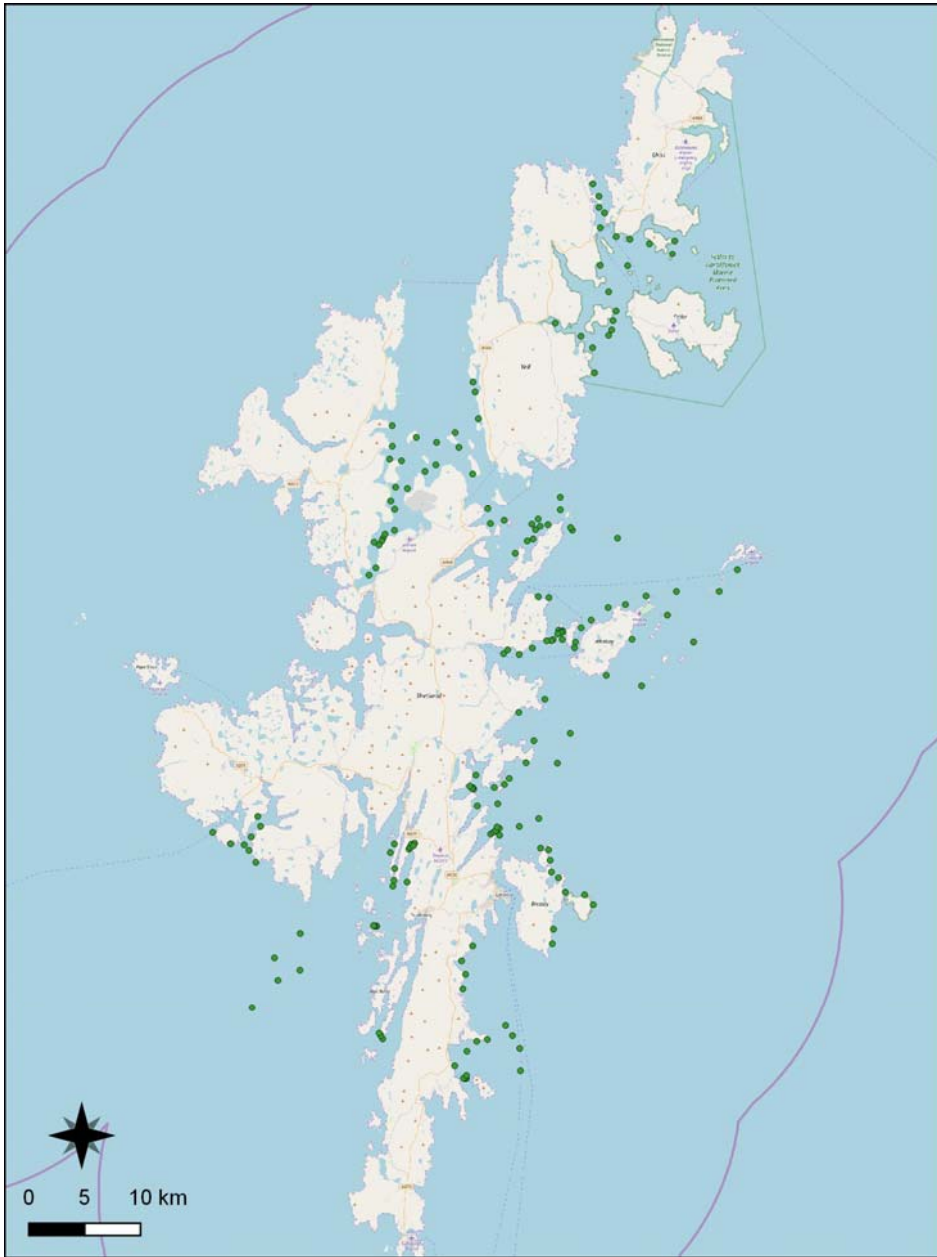
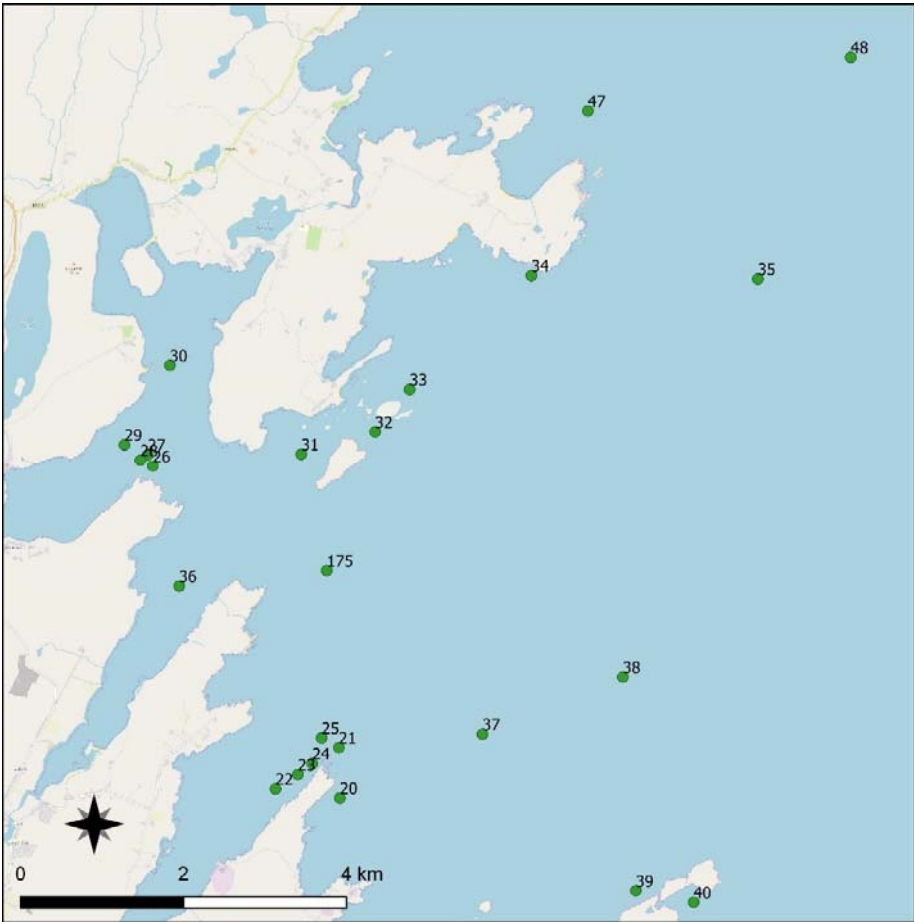


Figure 1. Initially planned 2019 survey area around the Shetland Isles.



**Figure 2.** Drop down video stations surveyed in 2018 around the Shetland Islands (start waypoints).



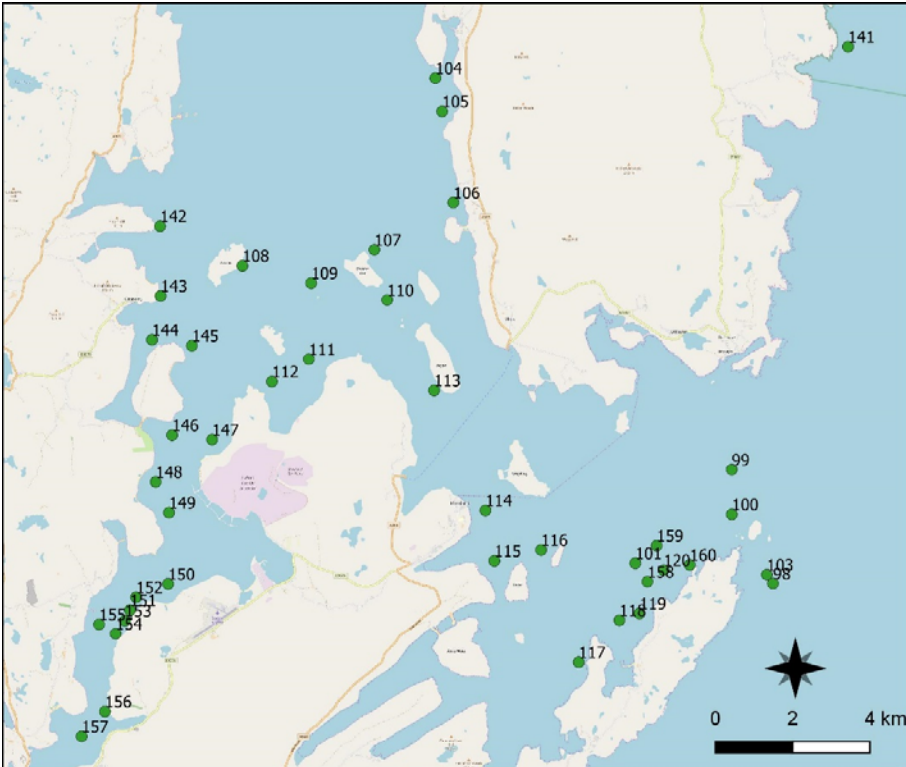
**Figure 3.** 2019 drop down video stations (with station numbers) east of Catfirth and Laxfirth, east Mainland.



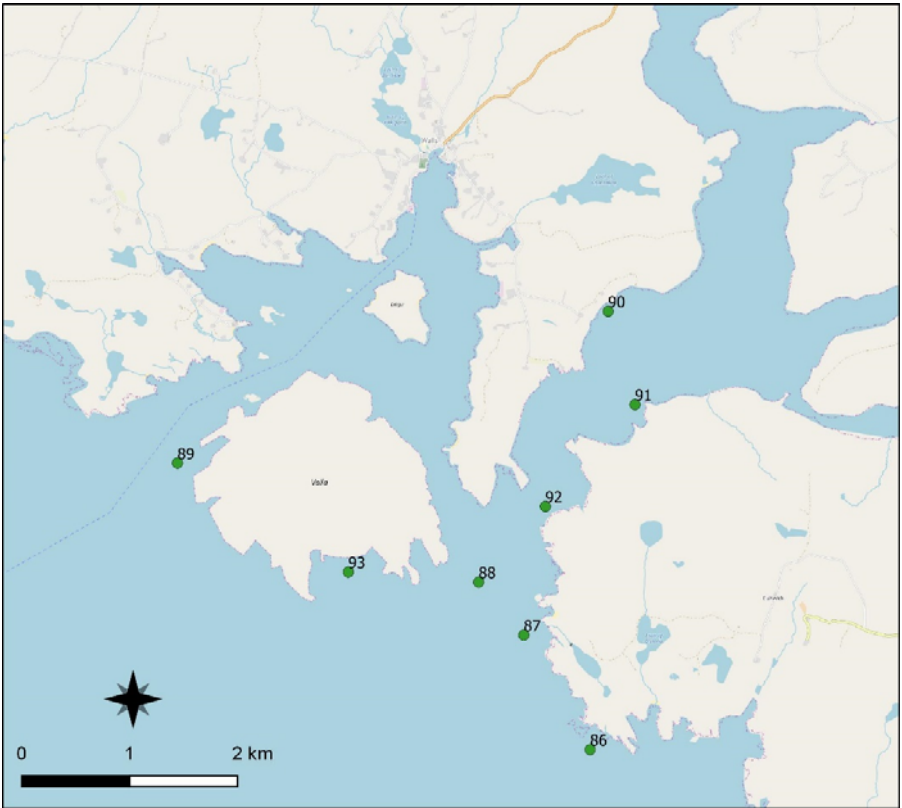
**Figure 4.** 2019 drop down video stations (with station numbers) around Whalsay.



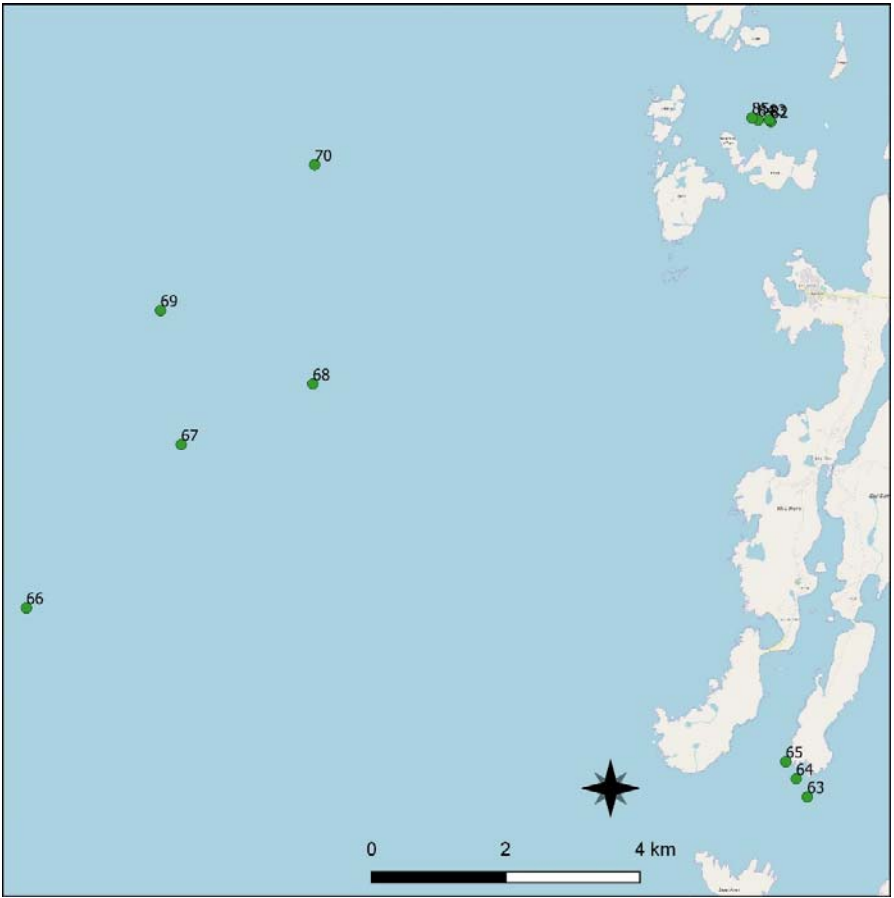
**Figure 5.** 2019 drop down video stations (with station numbers) around Yell.



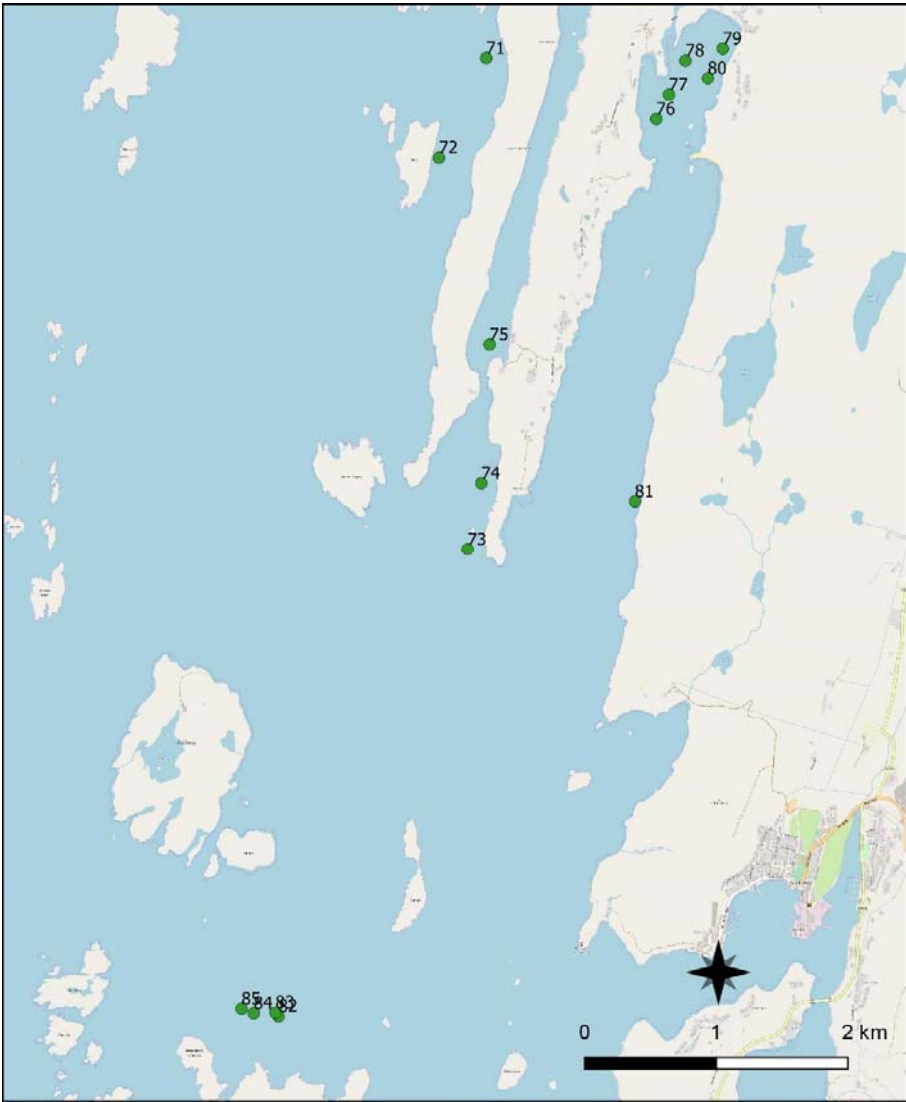
**Figure 6.** 2019 drop down video stations (with station numbers) around Sullom Voe.



**Figure 7.** 2019 drop down video stations (with station numbers) around Gruting Voe, west Mainland.

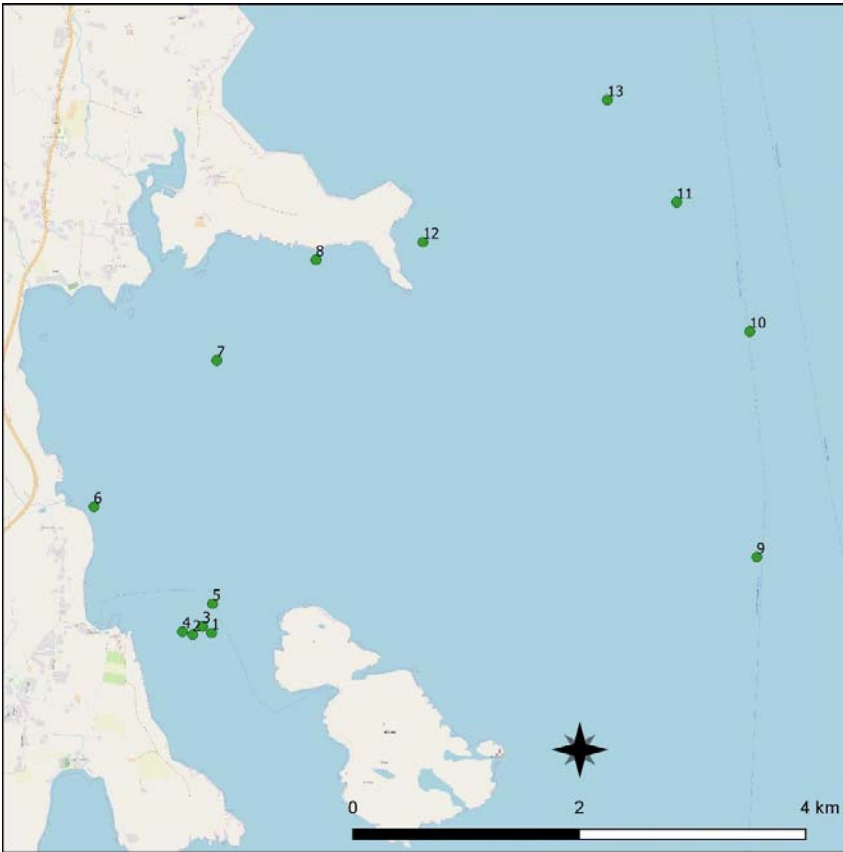


**Figure 8.** 2019 drop down video stations (with station numbers) north of Papa and south west of Mainland.

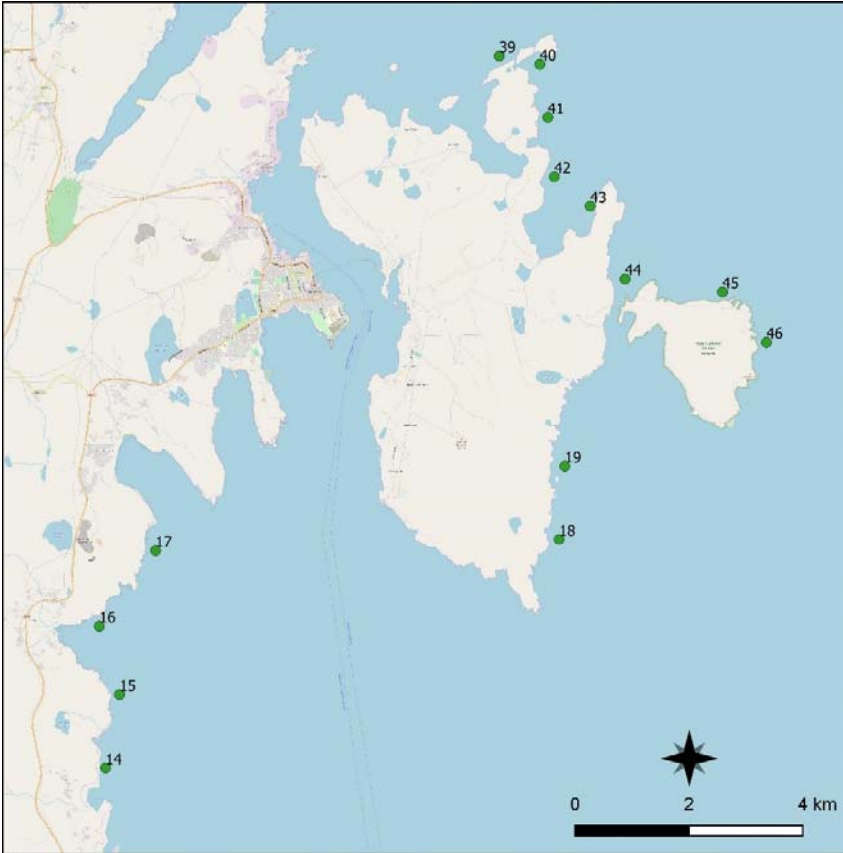


**Figure 9.** 2019 drop down video stations (with station numbers) around Whiteness and north of Papa.





**Figure 10.** 2019 drop down video stations (with station numbers) around Mousa, south east Mainland.



**Figure 11.** 2019 drop down video stations (with station numbers) around Bressay and south of Lerwick.

**Table 1 Shetland sampling station locations, May 2019**

Project code	Survey area	Station ref.	Site name	Camera gear code	Date	Start time (UTC)	Start Lat.	Start Long.	End time (UTC)	End Lat.	End Long.
MS EMFF	Shetland	1	Mainland East	MS C-Tecnic 1	23/05/2019	08:45:12	60.006391	-1.203280	09:05:45	60.010648	-1.200947
MS EMFF	Shetland	2	Mainland East	MS C-Tecnic 1	23/05/2019	09:14:43	60.006260	-1.206276	09:37:38	60.011276	-1.205444
MS EMFF	Shetland	3	Mainland East	MS C-Tecnic 1	23/05/2019	09:48:33	60.006914	-1.204719	10:07:14	60.011672	-1.204089
MS EMFF	Shetland	4	Mainland East	MS C-Tecnic 1	23/05/2019	10:16:35	60.006499	-1.207889	10:45:12	60.011353	-1.206747
MS EMFF	Shetland	5	Mainland East	MS C-Tecnic 1	23/05/2019	10:53:37	60.008704	-1.203138	11:13:31	60.010915	-1.202403
MS EMFF	Shetland	6	Mainland East	MS C-Tecnic 1	23/05/2019	11:39:19	60.016384	-1.221922	11:46:08	60.015664	-1.220344
MS EMFF	Shetland	7	Mainland East	MS C-Tecnic 1	23/05/2019	11:59:52	60.027969	-1.202455	12:05:26	60.027760	-1.202214
MS EMFF	Shetland	8	Mainland East	MS C-Tecnic 1	23/05/2019	12:17:25	60.035922	-1.186744	12:23:29	60.035403	-1.187570
MS EMFF	Shetland	9	Mainland East	MS C-Tecnic 1	23/05/2019	12:51:53	60.012404	-1.116939	12:57:45	60.011703	-1.117959
MS EMFF	Shetland	10	Mainland East	MS C-Tecnic 1	23/05/2019	13:17:18	60.030250	-1.118050	13:26:34	60.030434	-1.118803
MS EMFF	Shetland	11	Mainland East	MS C-Tecnic 1	23/05/2019	13:40:11	60.040485	-1.129615	13:45:25	60.039883	-1.130075
MS EMFF	Shetland	12	Mainland East	MS C-Tecnic 1	23/05/2019	13:58:51	60.037321	-1.169814	14:04:56	60.036989	-1.170543
MS EMFF	Shetland	13	Mainland East	MS C-Tecnic 1	23/05/2019	14:18:59	60.048575	-1.140601	14:24:29	60.047953	-1.141053
MS EMFF	Shetland	14	Mainland East	MS C-Tecnic 1	23/05/2019	14:50:45	60.078231	-1.208962	14:56:06	60.077916	-1.208775
MS EMFF	Shetland	15	Mainland East	MS C-Tecnic 1	23/05/2019	15:06:02	60.089801	-1.204571	15:11:40	60.089337	-1.204066
MS EMFF	Shetland	16	Mainland East	MS C-Tecnic 1	23/05/2019	15:21:24	60.100527	-1.210941	15:27:03	60.100122	-1.211550
MS EMFF	Shetland	17	Mainland East	MS C-Tecnic 1	23/05/2019	15:39:40	60.112416	-1.193195	15:44:44	60.112474	-1.194161
MS EMFF	Shetland	18	Mainland East	MS C-Tecnic 1	23/05/2019	16:25:52	60.114163	-1.065988	16:31:28	60.114827	-1.065636
MS EMFF	Shetland	19	Mainland East	MS C-Tecnic 1	23/05/2019	16:41:37	60.125687	-1.064169	16:47:32	60.125523	-1.063253
MS EMFF	Shetland	20	Kebister Ness	MS C-Tecnic 1	24/05/2019	07:44:53	60.200218	-1.150312	07:52:31	60.201032	-1.149215
MS EMFF	Shetland	21	Kebister Ness	MS C-Tecnic 1	24/05/2019	08:00:01	60.205765	-1.150543	08:07:05	60.206375	-1.150650
MS EMFF	Shetland	22	Kebister Ness	MS C-Tecnic 1	24/05/2019	08:18:04	60.201203	-1.164545	08:26:19	60.201467	-1.166333
MS EMFF	Shetland	23	Kebister Ness	MS C-Tecnic 1	24/05/2019	08:34:39	60.202782	-1.159603	08:42:26	60.202256	-1.160909
MS EMFF	Shetland	24	Kebister Ness	MS C-Tecnic 1	24/05/2019	08:46:56	60.204005	-1.156431	08:55:22	60.204003	-1.157662
MS EMFF	Shetland	25	Kebister Ness	MS C-Tecnic 1	24/05/2019	09:01:31	60.206823	-1.154349	09:14:16	60.206383	-1.154210
MS EMFF	Shetland	26	Wadbister Voe	MS C-Tecnic 1	24/05/2019	09:38:08	60.236764	-1.191692	09:46:10	60.237458	-1.192452
MS EMFF	Shetland	27	Wadbister Voe	MS C-Tecnic 1	24/05/2019	09:50:04	60.238033	-1.192805	09:51:59	60.238188	-1.192872
MS EMFF	Shetland	28	Wadbister Voe	MS C-Tecnic 1	24/05/2019	09:55:39	60.237409	-1.194462	10:01:17	60.238103	-1.195221
MS EMFF	Shetland	29	Wadbister Voe	MS C-Tecnic 1	24/05/2019	10:05:29	60.239130	-1.197961	10:25:24	60.240425	-1.194205
MS EMFF	Shetland	30	Mainland East	MS C-Tecnic 1	24/05/2019	10:34:42	60.247848	-1.187927	10:40:12	60.248399	-1.187086
MS EMFF	Shetland	31	Mainland East	MS C-Tecnic 1	24/05/2019	10:54:45	60.238087	-1.158858	11:00:05	60.238255	-1.157693
MS EMFF	Shetland	32	Mainland East	MS C-Tecnic 1	24/05/2019	11:13:07	60.240566	-1.142523	11:18:34	60.240845	-1.141789

Project code	Survey area	Station ref.	Site name	Camera gear code	Date	Start time (UTC)	Start Lat.	Start Long.	End time (UTC)	End Lat.	End Long.
MS EMFF	Shetland	33	Colsie	MS C-Tecnic 1	24/05/2019	11:28:49	60.245209	-1.134886	11:33:31	60.244907	-1.133573
MS EMFF	Shetland	34	Mainland East	MS C-Tecnic 1	24/05/2019	11:51:30	60.257707	-1.107944	11:54:28	60.257920	-1.107693
MS EMFF	Shetland	35	Mainland East	MS C-Tecnic 1	24/05/2019	12:14:56	60.257336	-1.057841	12:20:42	60.257057	-1.058036
MS EMFF	Shetland	36	Mainland East	MS C-Tecnic 1	24/05/2019	13:04:05	60.223518	-1.185880	13:09:36	60.224063	-1.185032
MS EMFF	Shetland	37	Mainland East	MS C-Tecnic 1	24/05/2019	13:33:26	60.207232	-1.118775	13:40:30	60.207249	-1.117467
MS EMFF	Shetland	38	Mainland East	MS C-Tecnic 1	24/05/2019	13:52:40	60.213528	-1.087709	13:58:04	60.213434	-1.086493
MS EMFF	Shetland	39	Mainland East	MS C-Tecnic 1	24/05/2019	14:16:14	60.190020	-1.084827	14:21:25	60.190121	-1.083650
MS EMFF	Shetland	40	Mainland East	MS C-Tecnic 1	24/05/2019	14:38:40	60.188730	-1.072055	14:44:05	60.188747	-1.071034
MS EMFF	Shetland	41	Mainland East	MS C-Tecnic 1	24/05/2019	14:53:34	60.180414	-1.069511	15:02:40	60.180568	-1.067471
MS EMFF	Shetland	42	Mainland East	MS C-Tecnic 1	24/05/2019	15:13:39	60.171086	-1.067461	15:21:53	60.171044	-1.065935
MS EMFF	Shetland	43	Mainland East	MS C-Tecnic 1	24/05/2019	15:28:51	60.166475	-1.056171	15:34:16	60.166687	-1.056324
MS EMFF	Shetland	44	Mainland East	MS C-Tecnic 1	24/05/2019	15:50:38	60.155048	-1.045181	15:55:38	60.155075	-1.044405
MS EMFF	Shetland	45	Mainland East	MS C-Tecnic 1	24/05/2019	16:08:14	60.153032	-1.014461	16:14:25	60.153155	-1.012900
MS EMFF	Shetland	46	Mainland East	MS C-Tecnic 1	24/05/2019	16:27:44	60.145124	-1.000586	16:34:52	60.145661	-0.999596
MS EMFF	Shetland	47	Mainland East	MS C-Tecnic 1	25/05/2019	08:10:42	60.275719	-1.095441	08:16:08	60.276309	-1.095464
MS EMFF	Shetland	48	Mainland East	MS C-Tecnic 1	25/05/2019	08:35:15	60.281591	-1.037299	08:41:25	60.282299	-1.037520
MS EMFF	Shetland	49	Mainland East	MS C-Tecnic 1	25/05/2019	09:09:57	60.298112	-1.119605	09:15:02	60.298361	-1.118691
MS EMFF	Shetland	50	Mainland East	MS C-Tecnic 1	25/05/2019	09:36:00	60.308484	-1.077953	09:41:18	60.308133	-1.076331
MS EMFF	Shetland	51	Dury Voe	MS C-Tecnic 1	25/05/2019	10:15:15	60.347516	-1.137246	10:23:03	60.346729	-1.136077
MS EMFF	Shetland	52	Lunning Sound	MS C-Tecnic 1	25/05/2019	10:50:32	60.355593	-1.064639	10:58:49	60.354896	-1.064147
MS EMFF	Shetland	53	Lunning Sound	MS C-Tecnic 1	25/05/2019	11:08:21	60.354745	-1.068038	11:17:03	60.353587	-1.067176
MS EMFF	Shetland	54	Lunning Sound	MS C-Tecnic 1	25/05/2019	11:31:50	60.362892	-1.055951	11:39:15	60.362262	-1.055407
MS EMFF	Shetland	55	Lunning Sound	MS C-Tecnic 1	25/05/2019	11:44:41	60.362535	-1.049995	11:53:25	60.360525	-1.050663
MS EMFF	Shetland	56	Lunning Sound	MS C-Tecnic 1	25/05/2019	11:59:13	60.361717	-1.048933	12:16:54	60.358309	-1.048210
MS EMFF	Shetland	57	Lunning Sound	MS C-Tecnic 1	25/05/2019	12:24:09	60.361010	-1.052375	12:32:42	60.359933	-1.053617
MS EMFF	Shetland	58	Lunning Sound	MS C-Tecnic 1	25/05/2019	12:37:25	60.360062	-1.057259	12:43:20	60.359153	-1.057544
MS EMFF	Shetland	59	Whalsay	MS C-Tecnic 1	25/05/2019	13:33:41	60.327375	-0.979810	13:38:41	60.326565	-0.979318
MS EMFF	Shetland	60	Whalsay	MS C-Tecnic 1	25/05/2019	14:09:08	60.355826	-0.938773	14:16:14	60.354362	-0.938408
MS EMFF	Shetland	61	Whalsay	MS C-Tecnic 1	25/05/2019	14:40:15	60.374889	-0.882238	14:45:31	60.373055	-0.882747
MS EMFF	Shetland	62	Whalsay	MS C-Tecnic 1	25/05/2019	15:04:42	60.393501	-0.867811	15:09:48	60.392472	-0.867050
MS EMFF	Shetland	63	West-East Burra	MS C-Tecnic 1	26/05/2019	08:42:39	60.037859	-1.336921	08:47:47	60.037272	-1.338353
MS EMFF	Shetland	64	West-East Burra	MS C-Tecnic 1	26/05/2019	08:55:07	60.040277	-1.339903	09:00:26	60.039808	-1.340793
MS EMFF	Shetland	65	West-East Burra	MS C-Tecnic 1	26/05/2019	09:07:02	60.042552	-1.342673	09:14:31	60.042514	-1.343817
MS EMFF	Shetland	66	Burra Haaf	MS C-Tecnic 1	26/05/2019	10:14:09	60.063088	-1.545683	10:23:19	60.063330	-1.547937
MS EMFF	Shetland	67	West of west Burra	MS C-Tecnic 1	26/05/2019	10:52:08	60.085000	-1.504299	11:02:13	60.085183	-1.506405

Project code	Survey area	Station ref.	Site name	Camera gear code	Date	Start time (UTC)	Start Lat.	Start Long.	End time (UTC)	End Lat.	End Long.
MS EMFF	Shetland	68	West of west Burra	MS C-Tecnic 1	26/05/2019	11:24:51	60.093101	-1.469120	11:34:57	60.093348	-1.471418
MS EMFF	Shetland	69	West of west Burra	MS C-Tecnic 1	26/05/2019	11:55:58	60.102895	-1.509813	12:01:33	60.102949	-1.510940
MS EMFF	Shetland	70	West of west Burra	MS C-Tecnic 1	26/05/2019	12:37:51	60.122305	-1.468608	12:43:09	60.122350	-1.470101
MS EMFF	Shetland	71	Weisdale Voe	MS C-Tecnic 1	26/05/2019	13:41:04	60.193318	-1.318283	13:46:32	60.193171	-1.319113
MS EMFF	Shetland	72	Weisdale Voe	MS C-Tecnic 1	26/05/2019	13:54:49	60.186543	-1.324739	14:03:11	60.186028	-1.325241
MS EMFF	Shetland	73	Whiteness Voe	MS C-Tecnic 1	26/05/2019	14:24:44	60.159887	-1.320825	14:30:17	60.159629	-1.321632
MS EMFF	Shetland	74	Whiteness Voe	MS C-Tecnic 1	26/05/2019	14:37:13	60.164400	-1.318952	14:43:42	60.164066	-1.320042
MS EMFF	Shetland	75	Stromness Voe	MS C-Tecnic 1	26/05/2019	14:56:49	60.173834	-1.317818	15:07:24	60.173314	-1.318570
MS EMFF	Shetland	76	Whiteness Voe	MS C-Tecnic 1	26/05/2019	15:43:06	60.189195	-1.295029	15:51:14	60.188368	-1.295274
MS EMFF	Shetland	77	Whiteness Voe	MS C-Tecnic 1	26/05/2019	15:56:29	60.190820	-1.293311	16:01:36	60.190596	-1.294037
MS EMFF	Shetland	78	Whiteness Voe	MS C-Tecnic 1	26/05/2019	16:09:08	60.193143	-1.291051	16:14:13	60.192759	-1.291361
MS EMFF	Shetland	79	Whiteness Voe	MS C-Tecnic 1	26/05/2019	16:20:30	60.193957	-1.285948	16:25:33	60.193746	-1.286460
MS EMFF	Shetland	80	Whiteness Voe	MS C-Tecnic 1	26/05/2019	16:30:38	60.191944	-1.287993	16:39:41	60.191590	-1.289459
MS EMFF	Shetland	81	Whiteness Voe	MS C-Tecnic 1	26/05/2019	16:59:03	60.163168	-1.297949	17:05:15	60.162763	-1.298384
MS EMFF	Shetland	82	Papa (North)	MS C-Tecnic 1	27/05/2019	08:21:31	60.128070	-1.346650	08:27:34	60.127317	-1.347170
MS EMFF	Shetland	83	Papa (North)	MS C-Tecnic 1	27/05/2019	08:33:39	60.128312	-1.347069	08:59:14	60.126190	-1.352432
MS EMFF	Shetland	84	Papa (North)	MS C-Tecnic 1	27/05/2019	09:06:28	60.128277	-1.350047	09:26:25	60.126396	-1.353385
MS EMFF	Shetland	85	Papa (North)	MS C-Tecnic 1	27/05/2019	09:36:05	60.128572	-1.351708	09:45:13	60.127607	-1.352981
MS EMFF	Shetland	86	Gruting Voe	MS C-Tecnic 1	27/05/2019	10:47:11	60.178778	-1.539532	10:55:08	60.178545	-1.538846
MS EMFF	Shetland	87	Gruting Voe	MS C-Tecnic 1	27/05/2019	11:06:16	60.188270	-1.550613	11:13:27	60.186975	-1.550103
MS EMFF	Shetland	88	Gruting Voe	MS C-Tecnic 1	27/05/2019	11:23:08	60.192676	-1.558143	11:28:18	60.192047	-1.557560
MS EMFF	Shetland	89	Vaila Sound	MS C-Tecnic 1	27/05/2019	11:49:38	60.202537	-1.608446	11:55:18	60.201546	-1.607718
MS EMFF	Shetland	90	Gruting Voe	MS C-Tecnic 1	27/05/2019	12:37:36	60.215128	-1.536526	12:42:50	60.214596	-1.536712
MS EMFF	Shetland	91	Gruting Voe	MS C-Tecnic 1	27/05/2019	12:53:29	60.207389	-1.532042	12:59:05	60.206687	-1.532217
MS EMFF	Shetland	92	Gruting Voe	MS C-Tecnic 1	27/05/2019	13:10:35	60.198941	-1.547010	13:17:33	60.197573	-1.548364
MS EMFF	Shetland	93	Vaila Sound?	MS C-Tecnic 1	27/05/2019	13:31:34	60.193504	-1.579916	13:38:18	60.192131	-1.579912
MS EMFF	Shetland	94	Whalsay/Out Skerries/Hamnavoe	MS C-Tecnic 1	28/05/2019	10:21:33	60.319054	-0.923430	10:27:11	60.318788	-0.924050
MS EMFF	Shetland	95	Whalsay/Out Skerries/Hamnavoe	MS C-Tecnic 1	28/05/2019	11:00:55	60.353653	-0.840403	11:07:26	60.352773	-0.839942
MS EMFF	Shetland	96	Whalsay/Out Skerries/Hamnavoe	MS C-Tecnic 1	28/05/2019	11:36:54	60.393588	-0.799320	11:44:10	60.392816	-0.798499
MS EMFF	Shetland	97	Whalsay/Out Skerries/Hamnavoe	MS C-Tecnic 1	28/05/2019	12:08:58	60.410658	-0.770460	12:15:11	60.410263	-0.768707
MS EMFF	Shetland	98	Whalsay/Out Skerries/Hamnavoe	MS C-Tecnic 1	28/05/2019	13:59:42	60.441779	-1.033931	14:05:45	60.441538	-1.030935

Project code	Survey area	Station ref.	Site name	Camera gear code	Date	Start time (UTC)	Start Lat.	Start Long.	End time (UTC)	End Lat.	End Long.
MS EMFF	Shetland	99	Whalsay/Out Skerries/Hamnavoe	MS C-Tecnic 1	28/05/2019	14:29:03	60.468184	-1.053313	14:34:33	60.468404	-1.051986
MS EMFF	Shetland	100	Whalsay/Out Skerries/Hamnavoe	MS C-Tecnic 1	28/05/2019	14:48:17	60.457857	-1.053294	14:54:02	60.458372	-1.051052
MS EMFF	Shetland	101	Whalsay/Out Skerries/Hamnavoe	MS C-Tecnic 1	28/05/2019	15:14:44	60.446536	-1.098629	15:33:35	60.444495	-1.094277
MS EMFF	Shetland	102	Whalsay	MS C-Tecnic 1	29/05/2019	08:05:34	60.435473	-0.961845	08:12:45	60.435383	-0.960932
MS EMFF	Shetland	103	Lunna Ness	MS C-Tecnic 1	29/05/2019	08:42:03	60.443851	-1.036836	08:48:46	60.444797	-1.035832
MS EMFF	Shetland	104	Yell West	MS C-Tecnic 1	29/05/2019	10:34:25	60.558756	-1.192586	10:40:02	60.559222	-1.191445
MS EMFF	Shetland	105	Yell West	MS C-Tecnic 1	29/05/2019	10:51:05	60.551024	-1.189423	10:56:18	60.550357	-1.189701
MS EMFF	Shetland	106	Yell West	MS C-Tecnic 1	29/05/2019	11:15:04	60.529945	-1.184146	11:20:17	60.529421	-1.183223
MS EMFF	Shetland	107	Yell Sound	MS C-Tecnic 1	29/05/2019	11:36:27	60.519068	-1.221249	11:42:57	60.519947	-1.219730
MS EMFF	Shetland	108	Yell Sound	MS C-Tecnic 1	29/05/2019	12:05:42	60.515334	-1.283242	12:11:02	60.515652	-1.281776
MS EMFF	Shetland	109	Yell Sound	MS C-Tecnic 1	29/05/2019	12:27:19	60.511366	-1.250936	12:33:21	60.511123	-1.250596
MS EMFF	Shetland	110	Yell Sound	MS C-Tecnic 1	29/05/2019	12:49:50	60.507455	-1.215243	12:55:12	60.507541	-1.214073
MS EMFF	Shetland	111	Yell Sound	MS C-Tecnic 1	29/05/2019	13:13:38	60.493743	-1.252050	13:20:26	60.493284	-1.249988
MS EMFF	Shetland	112	Yell Sound	MS C-Tecnic 1	29/05/2019	13:30:28	60.488565	-1.269378	13:38:03	60.488530	-1.266519
MS EMFF	Shetland	113	Yell Sound	MS C-Tecnic 1	29/05/2019	14:06:52	60.486543	-1.193200	14:12:30	60.486255	-1.190793
MS EMFF	Shetland	114	Yell Sound	MS C-Tecnic 1	29/05/2019	14:31:26	60.458762	-1.169054	14:36:40	60.457968	-1.167542
MS EMFF	Shetland	115	Yell Sound	MS C-Tecnic 1	29/05/2019	14:46:28	60.447064	-1.164874	14:51:40	60.447068	-1.162709
MS EMFF	Shetland	116	Yell Sound	MS C-Tecnic 1	29/05/2019	15:03:21	60.449597	-1.142899	15:08:44	60.449054	-1.141524
MS EMFF	Shetland	117	Yell Sound Coast	MS C-Tecnic 1	29/05/2019	15:34:04	60.423575	-1.125221	15:39:26	60.423967	-1.124229
MS EMFF	Shetland	118	Yell Sound Coast	MS C-Tecnic 1	29/05/2019	15:52:00	60.433318	-1.106101	15:57:04	60.433261	-1.104301
MS EMFF	Shetland	119	Yell Sound Coast	MS C-Tecnic 1	29/05/2019	16:02:50	60.434867	-1.096683	16:07:01	60.434736	-1.095135
MS EMFF	Shetland	120	Yell Sound Coast	MS C-Tecnic 1	29/05/2019	16:17:30	60.444933	-1.085311	16:32:42	60.444595	-1.079179
MS EMFF	Shetland	121	Yell	MS C-Tecnic 1	30/05/2019	07:50:15	60.604861	-1.061386	07:55:20	60.604866	-1.059885
MS EMFF	Shetland	122	Yell	MS C-Tecnic 1	30/05/2019	08:11:29	60.594570	-1.020233	08:16:50	60.593834	-1.018910
MS EMFF	Shetland	123	Yell	MS C-Tecnic 1	30/05/2019	09:33:01	60.680109	-0.989433	09:38:48	60.681398	-0.989175
MS EMFF	Shetland	124	Yell	MS C-Tecnic 1	30/05/2019	09:48:49	60.695930	-0.991522	09:54:44	60.696639	-0.989694
MS EMFF	Shetland	125	Yell	MS C-Tecnic 1	30/05/2019	10:05:00	60.704597	-0.991606	10:10:24	60.704127	-0.988860
MS EMFF	Shetland	126	Yell	MS C-Tecnic 1	30/05/2019	10:23:19	60.714268	-1.001300	10:28:57	60.713637	-1.000245
MS EMFF	Shetland	127	Yell	MS C-Tecnic 1	30/05/2019	10:47:00	60.691687	-0.982524	10:52:24	60.692599	-0.981226
MS EMFF	Shetland	128	Yell	MS C-Tecnic 1	30/05/2019	11:13:56	60.673087	-0.964011	11:22:08	60.673518	-0.961394
MS EMFF	Shetland	129	Yell	MS C-Tecnic 1	30/05/2019	11:34:04	60.671024	-0.942140	11:40:12	60.670566	-0.940832
MS EMFF	Shetland	130	Yell	MS C-Tecnic 1	30/05/2019	11:52:15	60.667502	-0.910875	11:55:10	60.666995	-0.909835

Project code	Survey area	Station ref.	Site name	Camera gear code	Date	Start time (UTC)	Start Lat.	Start Long.	End time (UTC)	End Lat.	End Long.
MS EMFF	Shetland	131	Yell	MS C-Tecnic 1	30/05/2019	12:12:24	60.659285	-0.874127	12:31:16	60.657139	-0.867962
MS EMFF	Shetland	132	Yell	MS C-Tecnic 1	30/05/2019	12:42:35	60.669628	-0.870465	13:01:23	60.668580	-0.862424
MS EMFF	Shetland	133	Yell	MS C-Tecnic 1	30/05/2019	13:30:23	60.649870	-0.945650	13:35:53	60.649561	-0.944492
MS EMFF	Shetland	134	Yell	MS C-Tecnic 1	30/05/2019	13:52:31	60.650089	-0.989556	13:57:43	60.649480	-0.987894
MS EMFF	Shetland	135	Yell	MS C-Tecnic 1	30/05/2019	14:13:10	60.629392	-0.976138	14:19:21	60.629605	-0.972975
MS EMFF	Shetland	136	Yell	MS C-Tecnic 1	30/05/2019	14:32:29	60.614349	-0.964052	14:39:46	60.614653	-0.961234
MS EMFF	Shetland	137	Yell	MS C-Tecnic 1	30/05/2019	14:49:44	60.606907	-0.968988	14:55:44	60.606756	-0.966615
MS EMFF	Shetland	138	Yell	MS C-Tecnic 1	30/05/2019	15:04:07	60.599640	-0.971100	15:13:26	60.598789	-0.967050
MS EMFF	Shetland	139	Yell	MS C-Tecnic 1	30/05/2019	15:21:54	60.595306	-0.976103	15:32:00	60.594692	-0.972147
MS EMFF	Shetland	140	Yell	MS C-Tecnic 1	30/05/2019	15:46:00	60.585606	-1.001690	15:53:03	60.584804	-0.999683
MS EMFF	Shetland	141	Yell	MS C-Tecnic 1	30/05/2019	16:08:04	60.565957	-0.998657	16:13:17	60.565731	-0.996835
MS EMFF	Shetland	142	Sullom Voe	MS C-Tecnic 1	31/05/2019	09:28:54	60.524509	-1.321945	09:38:11	60.525582	-1.321430
MS EMFF	Shetland	143	Sullom Voe	MS C-Tecnic 1	31/05/2019	09:51:14	60.508397	-1.321688	09:57:22	60.509171	-1.321892
MS EMFF	Shetland	144	Sullom Voe	MS C-Tecnic 1	31/05/2019	10:07:11	60.498259	-1.325738	10:12:22	60.498558	-1.326633
MS EMFF	Shetland	145	Sullom Voe	MS C-Tecnic 1	31/05/2019	10:22:09	60.496905	-1.306988	10:27:25	60.497061	-1.308208
MS EMFF	Shetland	146	Sullom Voe	MS C-Tecnic 1	31/05/2019	10:50:32	60.476186	-1.316289	10:56:22	60.476689	-1.317155
MS EMFF	Shetland	147	Sullom Voe	MS C-Tecnic 1	31/05/2019	11:04:52	60.475129	-1.297502	11:10:14	60.475903	-1.297768
MS EMFF	Shetland	148	Sullom Voe	MS C-Tecnic 1	31/05/2019	11:23:04	60.465323	-1.323995	11:28:11	60.465668	-1.325093
MS EMFF	Shetland	149	Sullom Voe	MS C-Tecnic 1	31/05/2019	11:36:44	60.458259	-1.317746	11:41:49	60.458785	-1.318970
MS EMFF	Shetland	150	Sullom Voe	MS C-Tecnic 1	31/05/2019	12:01:00	60.441680	-1.318162	12:10:07	60.442403	-1.320610
MS EMFF	Shetland	151	Sullom Voe	MS C-Tecnic 1	31/05/2019	12:32:49	60.435644	-1.336112	12:42:02	60.436663	-1.337345
MS EMFF	Shetland	152	Sullom Voe	MS C-Tecnic 1	31/05/2019	12:17:19	60.438608	-1.333205	12:26:30	60.439250	-1.335499
MS EMFF	Shetland	153	Sullom Voe	MS C-Tecnic 1	31/05/2019	12:59:01	60.433193	-1.338476	13:04:54	60.433649	-1.339309
MS EMFF	Shetland	154	Sullom Voe	MS C-Tecnic 1	31/05/2019	13:12:39	60.430156	-1.342829	13:20:40	60.430741	-1.344003
MS EMFF	Shetland	155	Sullom Voe	MS C-Tecnic 1	31/05/2019	13:28:20	60.432340	-1.350597	13:34:36	60.432962	-1.351690
MS EMFF	Shetland	156	Sullom Voe	MS C-Tecnic 1	31/05/2019	13:49:21	60.412115	-1.347837	13:57:48	60.412813	-1.349629
MS EMFF	Shetland	157	Sullom Voe	MS C-Tecnic 1	31/05/2019	14:06:48	60.406391	-1.358811	14:13:41	60.407050	-1.360308
MS EMFF	Shetland	158	Yell Sound	MS C-Tecnic 1	31/05/2019	16:05:32	60.442209	-1.092937	16:11:34	60.442545	-1.094743
MS EMFF	Shetland	159	Yell Sound	MS C-Tecnic 1	31/05/2019	16:26:53	60.450569	-1.088604	16:33:09	60.451034	-1.085990
MS EMFF	Shetland	160	Yell Sound	MS C-Tecnic 1	31/05/2019	16:45:27	60.446138	-1.073051	16:50:37	60.447294	-1.072319
MS EMFF	Shetland	161	East Mainland	MS C-Tecnic 1	01/06/2019	7:50:33	60.389491	-1.088543	7:55:41	60.389793	-1.087404
MS EMFF	Shetland	162	East Mainland	MS C-Tecnic 1	01/06/2019	8:06:14	60.388660	-1.071448	8:11:33	60.388513	-1.069981
MS EMFF	Shetland	163	East Mainland	MS C-Tecnic 1	01/06/2019	8:36:52	60.370975	-1.004012	8:43:09	60.370701	-1.005762
MS EMFF	Shetland	164	East Mainland	MS C-Tecnic 1	01/06/2019	9:00:37	60.380847	-0.976851	9:06:24	60.381272	-0.977415
MS EMFF	Shetland	165	East Mainland	MS C-Tecnic 1	01/06/2019	9:19:51	60.383231	-0.949200	9:25:23	60.383910	-0.949671

Project code	Survey area	Station ref.	Site name	Camera gear code	Date	Start time (UTC)	Start Lat.	Start Long.	End time (UTC)	End Lat.	End Long.
MS EMFF	Shetland	166	East Mainland	MS C-Tecnicos 1	01/06/2019	9:40:50	60.389941	-0.916221	9:46:43	60.390505	-0.916628
MS EMFF	Shetland	167	East Mainland	MS C-Tecnicos 1	01/06/2019	0:19:40	60.364884	-1.019775	0:24:59	60.365501	-1.019209
MS EMFF	Shetland	168	East Mainland	MS C-Tecnicos 1	01/06/2019	0:34:33	60.353621	-1.029008	0:39:59	60.353732	-1.030271
MS EMFF	Shetland	169	East Mainland	MS C-Tecnicos 1	01/06/2019	0:46:15	60.349133	-1.030625	0:53:59	60.349679	-1.029715
MS EMFF	Shetland	170	East Mainland	MS C-Tecnicos 1	01/06/2019	1:07:42	60.355606	-1.050041	1:13:03	60.356630	-1.050006
MS EMFF	Shetland	171	East Mainland	MS C-Tecnicos 1	01/06/2019	1:25:51	60.354635	-1.074912	1:32:16	60.355533	-1.072647
MS EMFF	Shetland	172	East Mainland	MS C-Tecnicos 1	01/06/2019	1:45:26	60.348875	-1.097775	1:50:38	60.349823	-1.097322
MS EMFF	Shetland	173	East Mainland	MS C-Tecnicos 1	01/06/2019	2:02:32	60.343842	-1.118966	2:08:13	60.344157	-1.117185
MS EMFF	Shetland	174	East Mainland	MS C-Tecnicos 1	01/06/2019	2:23:49	60.344470	-1.143899	2:27:07	60.344802	-1.142914
MS EMFF	Shetland	175	East Mainland	MS C-Tecnicos 1	01/06/2019	3:47:33	60.225213	-1.153213	3:52:42	60.225845	-1.151894

**Table 2 Shetland sampling station descriptions, May 2019**

Station ref.	Site name	Date	Depth Start (mBSL)	Depth End (mBSL)	Vessel speed (knots)	Video notes Main substrate type	Video notes Flora and/or fauna
1	Mainland East	23/05/2019	26.1	29.7	1	Sandy with rocky outcrops	Brittle star, turf on rock, patches of maerl, urchins, dead mens fingers
2	Mainland East	23/05/2019	27.5	28.2	0.8	Sandy with patches of maerl	Maerl, deadmans fingers, urchins, scallops, fish, horse mussels
3	Mainland East	23/05/2019	26.2	27.8	1	Sandy with patches of maerl	Maerl, rocky outcrops with deadmans fingers, urchins, brittlestars, fish
4	Mainland East	23/05/2019	26.9	28.4	0.6	Rocky boulders on sand	Deadman's fingers on boulders, fish, brittlestar, urchin, horse mussel, individual twigs of maerl.
5	Mainland East	23/05/2019	25.8	29.7	0.3	Rocky outcrops on sandy bottom	Deadman's fingers on rock, urchins, brittlestar, cushion star, turf on cobbles, fish, scallop
6	Mainland East	23/05/2019	13.4	23.2	0.4	Rocky reef	Algae encrusted rock, urchin, kelp, brittlestars, mussels
7	Mainland East	23/05/2019	38.9	39.4	0.2	Sandy	Nothing seen
8	Mainland East	23/05/2019	27.9	34.8	0.4	Rocky reef	Urchins, algal turf, starfish, fish
9	Mainland East	23/05/2019	72.1	71.9	0.4	Rocky reef	squat lobster, urchin, starfish sp. algal turf, anemone
10	Mainland East	23/05/2019	82.6	84.6	0.4	Sandy	seapens, starfish, urchin
11	Mainland East	23/05/2019	37.9	36.5	0.4	Rocky reef	brittlestar bed, urchin, other starfish sp
12	Mainland East	23/05/2019	18.9	18.7	0.4	Rocky reef	Kelp patches ( <i>L. digitalis</i> ), urchin,
13	Mainland East	23/05/2019	45.5	37.1	0.4	Rocky reef	Urchin, fish (ling?)
14	Mainland East	23/05/2019	20	22.6	0.3	Rocky cobbles and pebbles	some turf, red seaweed, brittlestars
15	Mainland East	23/05/2019	19.1	26.9	0.3	Rocky reef	Kelp, urchin, starfish sp., fish
16	Mainland East	23/05/2019	20.8	26.8	0.4	Rock reef	urchin, starfish sp.,
17	Mainland East	23/05/2019	17	10.1	0.4	Rocky reef	urchin, patches of turf, patches of kelp, starfish
18	Mainland East	23/05/2019	24.9	26.2	0.5	Rocky boulders	urchin, deadman's fingers, kelp, wrasse
19	Mainland East	23/05/2019	20	27	0.3	Rocky reef	kelp, urchin, plumose anemone.
20	Kebister Ness	24/05/2019	33.2	36.1	0.6	Sand	Brittlestar, urchin
21	Kebister Ness	24/05/2019	40.6	39.8	0.5	Course Sand	Brittlestar, urchin
22	Kebister Ness	24/05/2019	21.5	26.5	0.5	Sand and Gravel	Urchin, brittlestar,
23	Kebister Ness	24/05/2019	21.5	20	0.8	Gravel and pebbles	Kelp, scallop



Station ref.	Site name	Date	Depth Start (mBSL)	Depth End (mBSL)	Vessel speed (knots)	Video notes Main substrate type	Video notes Flora and/or fauna
24	Kebister Ness	24/05/2019	20.7	23	0.5	Pebble and cobbles	brittlestar, urchin, other star sp., scallop, horse mussel
25	Kebister Ness	24/05/2019	29.7	28.2	0.6	Sandy with stones	urchin, starfish sp., horse mussel?, deadman's fingers
26	Wadbister Voe	24/05/2019	15.7	10.2	0.4	Sandy with pebbles	urchin deadman's fingers, starfish sp., horse mussel?
27	Wadbister Voe	24/05/2019	12.7	9.94	0.4	Sandy and gravel	maerl, kelp, urchin
28	Wadbister Voe	24/05/2019	15.2	12.8	0.6	Sand	maerl, kelp, urchin
29	Wadbister Voe	24/05/2019	26.4	23.1	0.4	Sand	cone shell, urchin, slender seapen, starfish, hermit crab
30	Mainland East	24/05/2019	20.5	15.9	0.5	Gravel	Scallop, kelp, starfish, urchin
31	Mainland East	24/05/2019	25.3	16.5	0.4	Sand	algal mat, starfish, casts (A. marina), tube building worms, razor shells
32	Mainland East	24/05/2019	27.1	26.7	0.4	Pebble & cobble	brittlestar, urchin, scallop, encrusting worm
33	Colsie	24/05/2019	14.2	9.4	0.3	Rocky	kelp, urchin
34	Mainland East	24/05/2019	15.1	17.3	0.3	Pebble and cobbles	urchin, algal turf patches
35	Mainland East	24/05/2019	38	40	0.5	Rock	brittlestar, urchin
36	Mainland East	24/05/2019	20.2	18.4	0.5	sandy	urchin, starfish
37	Mainland East	24/05/2019	28.9	26.2	0.5	Sand, pebbles and cobbles	shells, brittlestar, horse mussel
38	Mainland East	24/05/2019	47.9	44.2	0.4	Rock, sand, boulders	urchins, encrusting algae, anemones at end
39	Mainland East	24/05/2019	40.3	36.1	0.4	Sand	brittlestar
40	Mainland East	24/05/2019	14.2	13.1	0.4	Boulders	Kelp on boulders, urchins
41	Mainland East	24/05/2019	27.6	36.7	0.4	Rock with sand filled gullies	urchin, horse mussel, brittlestars
42	Mainland East	24/05/2019	22.7	31.4	0.4	Rock with sand in gullies	horse mussels, scallops, maerl? Urchin, starfish
43	Mainland East	24/05/2019	13.3	14.4	0.4	Rocky bed with sandy pockets	urchin ,kelp
44	Mainland East	24/05/2019	13.1	14.1	0.4	Sand - rippled	None recorded
45	Mainland East	24/05/2019	27.4	31.5	0.4	Rock	Deadman's fingers, urchins, fish, starfish
46	Mainland East	24/05/2019	20.8	28.8	0.4	Rock and boulders	urchin,
47	Mainland East	25/05/2019	15.3	18.5	0.4	Rock	Kelp, urchin
48	Mainland East	25/05/2019	25.6	34.9	0.3	Cobbles and boulders	urchin, deadman's fingers, horse mussels, starfish, brittlestar
49	Mainland East	25/05/2019	27.8	29.5	0.5	Sand	razor clam shells, algal fluff in troughs, seaweed detritus, brittlestar, hermit crab.

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50	Mainland East	25/05/2019	48.2	51.9	0.7	sand	urchin, seaweed debris, algal fluff in trough, common star, scallop, burrows.
51	Dury Voe	25/05/2019	19.7	28.1	0.6	sand	urchin, seaweed debris, algal fluff in trough, urchin, empty shells
52	Lunning Sound	25/05/2019	38.4	42.4	0.4	sand with pebbles	deadman's fingers, brittlestar, urchin, sun star, blue mussel, horse mussel?
53	Lunning Sound	25/05/2019	17	35.2	0.6	Bed rock and boulders	Kelp, other seaweed, urchin, deadman's fingers, common star, sun star
54	Lunning Sound	25/05/2019	25.2	28	0.5	Sand and pebbles	brittle star, kelp ( <i>L. digitata</i> & <i>L. saccharina</i> )
55	Lunning Sound	25/05/2019	23.7	17.7	0.8	bed rock with sand in gullies	deadman's fingers, common star, sun star, filamentous green algae, kelp, urchin, maerl
56	Lunning Sound	25/05/2019	20.8	26.5	0.7	pebble and cobbles in sand	common star, clumps of red algae, kelp, fucus?, deadman's fingers, urchin
57	Lunning Sound	25/05/2019	22	13.8	0.6	bed rock with sand in gullies	kelp, urchin, filamentous green algae, maerl, common star, pink encrusting algae
58	Lunning Sound	25/05/2019	26.1	16.5	0.6	sand with pebbles	kelp, pink encrusting algae, maerl, urchin, broken shells
59	Whalsay	25/05/2019	52	53.4	0.6	gravel and sand with shells	brittlestar, common star
60	Whalsay	25/05/2019	21.9	30	0.7	bedrock with sand in gullies	urchin, deadman's fingers, mussels, brittlestar, common star, sun star
61	Whalsay	25/05/2019	22	30.5	1.1	bedrock	kelp ( <i>L. digitata</i> ), deadmans fingers, green filamentous algae, urchin, anemone, fish
62	Whalsay	25/05/2019	47.7	54	0.7	sand with pebbles and stones	deadman's fingers, urchins, brittlestar, edible crab, fish, common starfish, sun star
63	West-East Burra	26/05/2019	25.9	25.8	0.6	Sand with razor clam shells	razor clam shells
64	West-East Burra	26/05/2019	22.2	26	0.4	Rock with sand in gullies	Kelp, urchin, horse mussel, red algae, cushion star, anemone, pink encrusting algae
65	West-East Burra	26/05/2019	16.3	24.2	0.6	Rock with sand and pabbles	Kelp urchin crab red seaweed, star fish, brittlestar, feather star, sun star.
66	Burra Haaf	26/05/2019	117	115	0.5	Muddy sand	burrows, fish, starfish
67	West of west Burra	26/05/2019	92.4	91.8	0.4	sand with pebbles and stones	star, anglerfish, cushion star, urchin, squat lobster, featherstar, fan mussel?
68	West of west Burra	26/05/2019	81.1	82.2	0.5	pebbles on sand	scallop, urchin, brittlestar, lobster, starfish, octopus?, worm cases?

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69	West of west Burra	26/05/2019	92.6	90.3	0.4	Rock cobbles and boulders	squat lobster, urchin, cushion star, spider crab?, whelk (buckie)
70	West of west Burra	26/05/2019	64.2	56.2	0.5	Rock	brittlestar, urchin, squat lobster, featherstar, common starfish, sun star, cushion star
71	Weisdale Voe	26/05/2019	29.8	34.3	0.3	Gravel	starfish, brittlestar, crab, scallop, burrows.
72	Weisdale Voe	26/05/2019	26.7	21.1	0.4	Sand with pebbles and shells	urchin, common starfish, sun star, horse mussel shells, scallop shell, 1 horse mussel alive
73	Whiteness Voe	26/05/2019	13.4	31.4	0.4	sand and gravel	filamentous green algae, urchin, common star, razor shells, burrows
74	Whiteness Voe	26/05/2019	29.6	42.1	0.3	Gravel and shells with overlying silt	Crab, urchin, burrows
75	Stromness Voe	26/05/2019	12.8	13.7	0.2	sand and gravel with shells	crab, razors? Urchin, horse mussel shells, encrusting worms, shore crab, scallop
76	Whiteness Voe	26/05/2019	11.9	11.2	0.2	fine sand	diatom mat, worm cast and burrows, tracks in mud
77	Whiteness Voe	26/05/2019	10.3	12.7	0.5	fine sand	star fish, cast, diatom mat, tracks in the mud, A. marina cast, crab
78	Whiteness Voe	26/05/2019	9.56	8.68	0.3	fine sand	tracks in mud, queenie? A. marina casts, sea squirts on green algae, diatom mat, hermit crab
79	Whiteness Voe	26/05/2019	8.86	9.6	0.3	fine sand	A. marina casts, diatom mat, tracks in mud, sea squirts
80	Whiteness Voe	26/05/2019	9.4	8	0.3	fine sand	A. marina casts, diatom mat, tracks in mud, sea squirts, kelp
81	Whiteness Voe	26/05/2019	13.2	17.9	0.4	sand and some shells	filamentous green algae, urchin, razor shells, fish
82	Papa (North)	27/05/2019	31	21.2	0.4	sand with silt on top. Shell debris	dead maerl, scallop, urchins, kelp debris
83	Papa (North)	27/05/2019	27	15.7	0.7	course sand with silt on top.	urchin, dead maerl, maerl, kelp on rock outcrops., encrusting pink algae, fish, starfish
84	Papa (North)	27/05/2019	16.4	13.9	0.7	sand, shell debris	Maerl, sugar kelp, green filamentous algae, fish, starfish
85	Papa (North)	27/05/2019	18.9	11.9	0.6	Sand, some rock/boulders. Shell debris	Maerl, dead maerl, common starfish, urchins, green filamentous algae, kelp
86	Gruting Voe	27/05/2019	23	29.9	0.2	Rock.	Dead mans fingers, brittlestars, urchins, crab, pink encrusting algae, common starfish

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87	Gruting Voe	27/05/2019	28.6	33.8	0.6	Boulders in sand/gravel	Urchins, common starfish, brittlestars, sunstar, pink encrusting algae
88	Gruting Voe	27/05/2019	30.7	32.8	0.5	Sand	Starfish
89	Vaila Sound	27/05/2019	38.7	36.6	0.7	Course sand, moves into cobble	Brittlestars, urchin, common starfish, dead mans fingers, sunstar, tube building worms on cobble, squat lobster?
90	Gruting Voe	27/05/2019	9	14.7	0.4	Gravel with fine silt covering	Starfish, hermit crab, green fluff/covering, algal detritus, mussel?sea squirt, cone shells
91	Gruting Voe	27/05/2019	13.5	11.6	0.6	Gravel and pebbles.	Kelp, urchin, green fluff, cone shells, algal debris, crab, starfish
92	Gruting Voe	27/05/2019	25.2	23.2	0.7	Sand. Some rocky outcrops	Brittlestars, kelp and algae debris. Urchins on rock. Maerl? Fish, common starfish
93	Vaila Sound?	27/05/2019	15.4	29.1	0.9	Rock, big boulders.	Kelp ( <i>L. digitata</i> ) urchins, dead mans finger, common starfish, fish, brittlestars, jellyfish, sunstar
94	Whalsay/Out Skerries/Hamnavoe	28/05/2019	37.8	38.4	0.4	Bedrock and boulders, shell gravel	pink encrusting algae and <i>Alcyonium digitatum</i> and <i>Echinus</i> . 1 Octopus
95	Whalsay/Out Skerries/Hamnavoe	28/05/2019	34.5	36	0.5	Bedrock and boulders, shell gravel	pink encrusting algae and <i>Alcyonium digitatum</i> and <i>Echinus</i> .
96	Whalsay/Out Skerries/Hamnavoe	28/05/2019	38	43.9	0.5	Bedrock and boulders, shell gravel, patches of cobbles on shell gravel, later 100% cobbles, then bedrock	pink encrusting algae and encrusting sponges and <i>Echinus</i> .
97	Whalsay/Out Skerries/Hamnavoe	28/05/2019	46.6	46.7	0.6	sand, cobbles, shell gravel. Later boulders	sand with brown diatom film, rock bare apart from pink encrusting algae, <i>Alcyonium digitatum</i> , <i>Echinus</i> , brittlestars, cushion and sunstars.
98	Whalsay/Out Skerries/Hamnavoe	28/05/2019	10	54	0.9	bedrock/boulders, shell gravel	Kelp forest ( <i>L. hyperborea</i> ). Dropping off onto jagged bedrock/boulders with urchins, onto boulders with pink encrusting algae and urchins on shell gravel. Lots of wrasses and dogfish, and possible patches of maerl gravel
99	Whalsay/Out Skerries/Hamnavoe	28/05/2019	51.1	49.1	0.7	shell gravel / sand with pebbles, cobbles, <i>Modiolus</i> shells	possibly a few live <i>Modiolus</i> ?
100	Whalsay/Out Skerries/Hamnavoe	28/05/2019	42.3	46.3	1	cobbels and pebbles on shelly sand	<i>Alcyonium digitatum</i> , <i>Echinus</i> , <i>Flustra</i> , brittlestars, pink encrusting algae. Very colourful

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101	Whalsay/Out Skerries/Hamnavoe	28/05/2019	31.1	25.2	0.6	boulders, cobbles and pebbles on shelly sand, then maerl bed with bedrock outcrops / boulders	Maerl bed patches 80% live, Flustra, brittlestars, S lat & L hyp on rocks
102	Whalsay	29/05/2019	128	127	0.3	shelly sand, empty shells	queenies and scallps, seaweed detritus, brittlestars
103	Lunna Ness	29/05/2019	21.7	32.2	0.2	coarse shell gravel with pebbles and cobbles, boulders, megaripples	L.hyp, Alaria, Echinus, pink enc algae,
104	Yell West	29/05/2019	30.6	22.1	0.7	coarse shell gravel with muddy sand	Ensis, seaweed detritus, scallops
105	Yell West	29/05/2019	24.2	21.9	0.3	coarse shell gravel with muddy sand	Ensis, seaweed detritus
106	Yell West	29/05/2019	19.3	9.1	0.6	sand and shell gravel	Ensis, diatom film, seaweed detritus, queenies
107	Yell Sound	29/05/2019	16.6	29.5	0.7	bedrock with patches of shell gravel in crevices, later cobbles	Horse mussel bed. Alcyonium, starfish, Alaria, pink enc algae, brittlestars, dense Horse mussels in patches
108	Yell Sound	29/05/2019	18.7	24.7	0.2	coarse shell gravel with cobbles and pebbles	L hyp and S lat, Modiolus shells, Ensis shells
109	Yell Sound	29/05/2019	15	10	0.2	boulders / bedrock, shell gravel	L hyp, red algae, Echinus, Alaria
110	Yell Sound	29/05/2019	19.1	22.2	0.2	cobbles and boulders on shelly sand	L hyp, pink enc algae, red seaweeds, Echinus, brittlestars
111	Yell Sound	29/05/2019	39.9	25.5	0.8	pebbles and cobbles on sand, broken shell, Modiolus shell	Horse mussel bed. Brittle stars
112	Yell Sound	29/05/2019	19.8	22.3	0.8	shelly sand, horse mussel bed	Horse mussel bed. Red seaweeds
113	Yell Sound	29/05/2019	26.5	19	0.7	cobbles and boulders on shelly sand	few Modiolus, pink enc algae, Echinus
114	Yell Sound	29/05/2019	27.9	34.1	0.7	Boulders on shell gravel	Alcyonium, pink enc, Echinus, sponges
115	Yell Sound	29/05/2019	31.9	32	0.7	pebbles and empty shell and shell gravel	brittlestars (patches of S), pink enc
116	Yell Sound	29/05/2019	25.9	24.3	0.5	cobbles/boulders on shelly gravel	Brittlestars (S), octopus (near the end)
117	Yell Sound Coast	29/05/2019	25	20.8	0.5	shelly sand	Brittlestars, Ensis shells, some L hyp, possible maerl gravel?
118	Yell Sound Coast	29/05/2019	26.5	23.9	0.6	cobbles and pebbles on shelly sand	Banks of drift-kelp, Ensis, starfish, empty shells, sand with Ensis
119	Yell Sound Coast	29/05/2019	15.1	13	0.6	sand waves, shell in troughs	Banks of drift-kelp, Ensis, Echinus (caught too much kelp onto frame to see well)

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120	Yell Sound Coast	29/05/2019	29.3	25.7	0.9	maerl bed on sand and maerl gravel, patches of pebbles and boulders at very end	maerl bed, Ensis, sunstars, maerl gravel,
121	Yell	30/05/2019	11.7	11.9	0.7	mud	algal turf, some seaweed, Echinus, queenies
122	Yell	30/05/2019	22.8	23.6	0.9	pebbles on shelly sand, some boulders	pink enc algae, Ensis, Echinus, patches of S brittlestars
123	Yell	30/05/2019	35.8	37.5	1	small boulders and cobbles	dense Alcyonium, pink enc algae, Echinus, sunstars
124	Yell	30/05/2019	15.2	20.2	0.7	shelly sand, some pebbles, few boulders	pink enc algae, Alaria, L hyp, Echinus, green and brown algae
125	Yell	30/05/2019	23	30.9	0.8	cobbles and boulders, later bedrock	pink enc algae, patches of S brittlestars, L hyp, Echinus, on bedrock Alcyonium and S brittlestars
126	Yell	30/05/2019	20.5	24.8	0.9	boulders on shelly sand	Alcyonium, L hyp, pink enc algae, brittlestars, Alaria, Echinus, Luidia, scallops
127	Yell	30/05/2019	31	31.2	0.9	boulders / bedrock	Alcyonium, pink enc algae, sponges, Echinus
128	Yell	30/05/2019	22	18.9	0.9	maerl bed on shelly sand and maerl gravel with pebbles, later cobbles.	maerl bed. Ensis. Alaria on cobbles. 2 dogfish eggs
129	Yell	30/05/2019	12	14.8	0.6	boulders with patches of shelly sand	L. hyp, urchins, Ensis
130	Yell	30/05/2019	20.5	21.5	0.8	shelly sand with cobbles and boulders, onto sandflat	L. hyp with Echinus, Modiolus?
131	Yell	30/05/2019	25.6	31.8	0.6	maerl bed. Chunky maerl with empty shells on maerl gravel (waves).	maerl bed. Chunky maerl with empty shells on maerl gravel (waves). Some filamentous brown/red algae.
132	Yell	30/05/2019	23.1	25.1	0.7	initially sand, later maerl bed (waves, maerl and shell in troughs)	Ensis. Maerl bed started at about 4 min, 25m depth
133	Yell	30/05/2019	24.5	24.4	0.5	pebbles and cobbles	S brittlestars, pink encr. alga, urchins
134	Yell	30/05/2019	14.7	12.2	0.7	sand and shell, maerl gravel, maerl bed (waves)	maerl bed. Ensis, brittlestars
135	Yell	30/05/2019	28.3	22.1	1	maerl bed. Sand and shell gravel	maerl bed. Ensis, empty shells
136	Yell	30/05/2019	34.7	35.9	0.6	pebbles on shelly sand, patches of maerl bed and horse mussel bed	pink encr. algae, patches of S brittlestars, maerl bed, horse mussel bed, Alcyonium
137	Yell	30/05/2019	24.8	29.2	0.7	horse mussel bed. Boulders and cobbles	horse mussel bed. Alcyonium, S brittlestars, Echinus, pink enc algae
138	Yell	30/05/2019	30.7	36.4	1.1	maerl bed. Waves. On maerl gravel	maerl bed. Waves. On maerl gravel

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139	Yell	30/05/2019	34.8	39	0.7	sand, some maerl twiglets. Later maerl bed.	maerl bed. Maerl gravel and maerl in troughs
140	Yell	30/05/2019	33.3	37	0.6	megaripples of shelly sand with shell in troughs	Ensis, scallops
141	Yell	30/05/2019	45	47.8	0.6	cobbles on shelly sand, pebbles, later sand.	pink enc algae
142	Sullom Voe	31/05/2019	26.6	30.5	0.4	pebbles and cobbles on sand	Pink enc algae, Modiolus shells, kelp O, empty shells, Luidia, Ensis
143	Sullom Voe	31/05/2019	34.4	28.6	0.3	pebbles and cobbles on muddy shelly sand, lot of empty shells	Modiolus bed, seaweed detritus, S lat, brittlestars
144	Sullom Voe	31/05/2019	29	39.7	0.3	pebbles on muddy sand. Empty shells.	seaweed detritus, some Modiolus
145	Sullom Voe	31/05/2019	24.4	23.7	0.4	Modiolus bed. Pebbles and shell on muddy sand	Modiolus bed, Echinus, brittlestars, S lat
146	Sullom Voe	31/05/2019	30.3	23	0.6	Sandy mud,	Turritella, Virgularia (lots), kelp detritus, Echinus, some pebbles and shell gravel, patches of red algal turf
147	Sullom Voe	31/05/2019	28.8	32.2	0.3	Sandy mud,	Turritella, Virgularia (lots), kelp detritus, Echinus, shell gravel, patches of red algal turf, Cerianthus
148	Sullom Voe	31/05/2019	19.3	15.2	0.6	muddy sand	algal turf, brittlestars, empty shells, Virgularia, S lat, Modiolus?
149	Sullom Voe	31/05/2019	13.9	14.7	0.5	muddy sand	algal turf, brittlestars, empty shells, R kelp
150	Sullom Voe	31/05/2019	16.6	21.6	1	muddy sand	algal turf, Echinus, Modiolus shells, Virgularia (few)
151	Sullom Voe	31/05/2019	19.2	25.9	0.4	muddy sand with shells, Modiolus bed	Modiolus bed. Echinus
152	Sullom Voe	31/05/2019	17.9	25.6	0.5	Brittlestars on muddy sand with shells	Modiolus - hard to tell how many live
153	Sullom Voe	31/05/2019	22.6	24.4	0.4	Modiolus bed (just). Muddy sand, shells	Modiolus bed (just). Brittlestars. Onto mud with Virgularia
154	Sullom Voe	31/05/2019	22.8	25.9	0.3	muddy sand, shells	Queenies and Turritella, Brittlestars, some Modiolus. Onto flat mud with Virgularia
155	Sullom Voe	31/05/2019	13.8	10.1	0.4	silty seaweed with shells, patches of Modiolus shells,	some live Modiolus, scallops, brittlestars, kelp

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156	Sullom Voe	31/05/2019	19.6	20.4	0.4	muddy sand with shells, Modiolus bed	queenies, some Modiolus
157	Sullom Voe	31/05/2019	34.5	25.3	0.4	very soft mud.	brittlestars, small burrows, shell in places. Spider crab
158	Yell Sound	31/05/2019	24.9	24.8	0.4	Maerl bed	maerl bed on sand with shell gravel. Empty shells, Ensis
159	Yell Sound	31/05/2019	17.2	41.1	0.8	bedrock, dropping to boulders on sand, getting smaller with depth	Alaria on bedrock, pink enc algae, Echinus, sponges.
160	Yell Sound	31/05/2019	23.7	30	0.8	cobbles on shelly sand, pebbles, later sand.	S brittlestars, Alcyonium, Echinus, Luidia
161	East Mainland	01/06/2019	31.3	37.7	0.5	cobbles and pebbles on sand	seaweed detritus, empty shells
162	East Mainland	01/06/2019	29.9	29.4	0.7	pebbles on sand, empty shells	Asterias
163	East Mainland	01/06/2019	29	32.5	0.6	cobbles and boulders on sand, patches of maerl	pink enc algae, patches of maerl, big shoal of small fish, Flustra, Echinus, small kelp
164	East Mainland	01/06/2019	36	36.2	0.3	coarse sand, some pebbles	pink enc algae, shells
165	East Mainland	01/06/2019	15.2	20.5	0.5	bedrock/boulders on white sand	L hyp, Echinus, pink enc algae
166	East Mainland	01/06/2019	29.5	29.8	0.4	maerl bed on sand. Later boulders	initially scattered maerl on sand, then bands. Echinus. Pink encr. algae on boulders
167	East Mainland	01/06/2019	24.4	23.2	0.1	pebbles and cobbles on shell gravel	Echinus. Brittlestars, kelp and kelp detritus, Alcyonium, pink enc algae, red seaweeds, Alaria
168	East Mainland	01/06/2019	27.1	23.2	0.5	Horse mussel bed.	horse mussel bed. Patches of S brittlestars, pink enc algae, urchins
169	East Mainland	01/06/2019	29.1	31.5	0.6	100% Modiolus shells	possible live Modiolus? Brittlestars
170	East Mainland	01/06/2019	29.1	28.9	0.7	cobbles on coarse shell gravel	pink enc algae
171	East Mainland	01/06/2019	39.3	37.8	0.8	Modiolus shells on shelly sand	Modiolus (few)
172	East Mainland	01/06/2019	29.9	26.9	0.8	cobbles on coarse sand	pink enc algae, brittlestars
173	East Mainland	01/06/2019	28.7	24.1	0.7	cobbles and pebbles on shelly sand	Echinus, pink enc algae, brittlestars
174	East Mainland	01/06/2019	34.9	34.3	0.6	muddy sand, rare boulders	Echinus, brittlestars, seaweed detritus, Turritella
175	East Mainland	01/06/2019	15.1	22.6	0.7	Bedrock gullies with cobbles and boulders at base	Alaria, Alcyonium, red and green algae, pink encr. algae