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*FV Lady Nicola UL 584*

Survey: Drop-down video survey of seabed habitats and Priority Marine Features in the Small Isles

## REPORT

13 - 17 August 2018

**Loading:** Mallaig, 12 August 2018

**Boarding:** Mallaig, 13, 14 and 16 August 2018, Canna 15 and 17 August

**Unloading:** Mallaig, 17 August 2018

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.

<b>Personnel</b>	<b>Organisation</b>	<b>Role</b>
G. Pasco	Seascope Fisheries Research	SIC
M. Carruthers	Scottish Natural Heritage	13 – 15 August
S. Cunningham	Scottish Natural Heritage	16 - 17 August

**Project:** 5 days

### Gear

DDV camera frame, umbilicals (300m + 100m), camera system, lights and control unit.

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

## **Background and Objectives**

This project is a partnership project between Marine Scotland (MS) and Scottish Natural Heritage (SNH) and is 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). More information on the project can be found at: <https://www2.gov.scot/Topics/marine/marine-environment/mpanetwork/MPAmonitoring/EMFFproject>.

The objectives for this survey were:

- To undertake a programme of targeted drop-down video (DDV) sampling to enhance our understanding of the distribution and extent of MPA protected features and other Priority Marine Features (PMFs) within the Small Isles MPA.

The focus of the sampling was to carry out targeted surveys of seabed habitats. The footage 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.

## **Narrative**

Scientists joined the vessel at Mallaig from 13 – 17 August 2018, with the exception of 14 and 16 August when staff stayed overnight on Canna.

The plan was to deploy the DDV camera system, from the fishing vessel at or near to pre-identified coordinates within the survey polygons in Figure 1. Actual stations sampled are shown in Figure 2, with detailed locations in Figures 3-6. 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 (SD) 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. 'Snapshot' still images of the seabed were taken at intervals to get a clearer image of the seabed type and flora/fauna. The SCU displayed live 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 was recorded directly on the SCU.

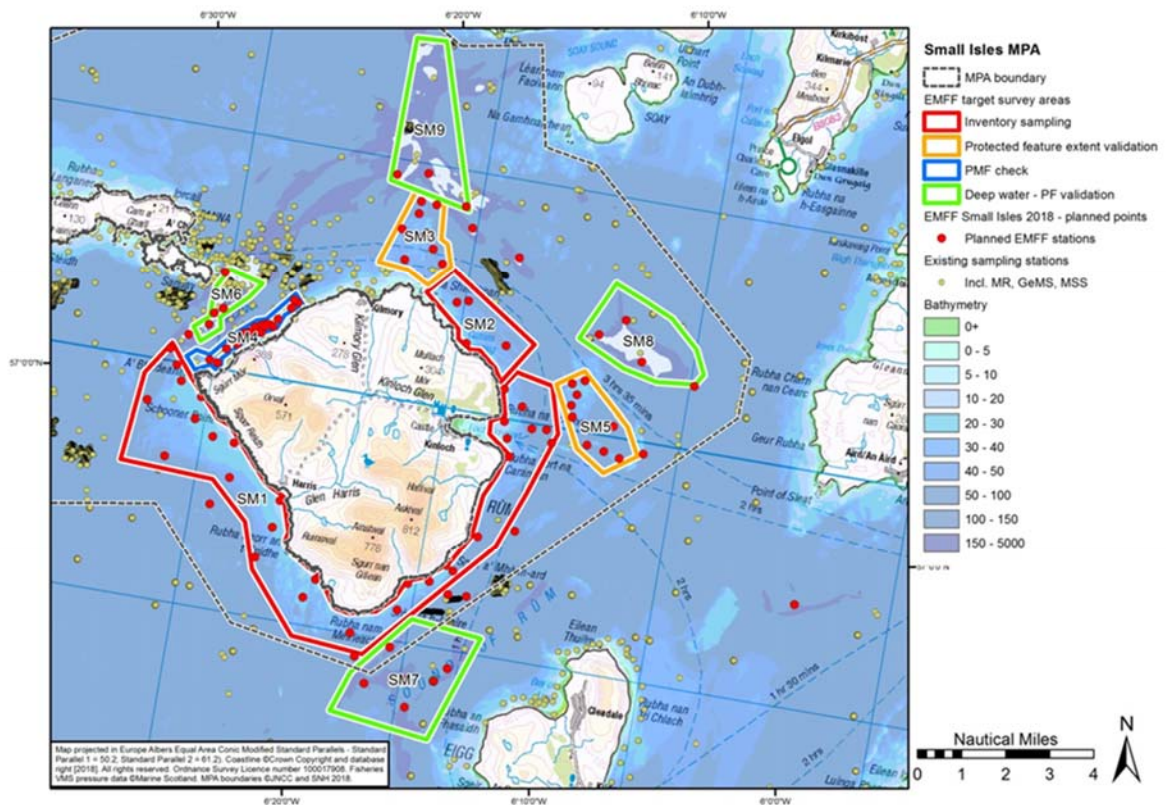
Sample location and other metadata were recorded on paper forms throughout the survey, with forms stored ashore at the end of each survey day and used to assist in quality control. Sample metadata are shown in Tables 1 and 2. Video files were downloaded from the camera at the end of each survey day, and data backed up according to the agreed protocols.

Forecast for most of the week was for predominantly SW winds, so Day 1 was the only opportunity to sample Western Rum stations in relatively calm conditions. Rough weather (SW 4-5) was encountered on 17 August, which restricted sampling to the north coast of Canna. On 14 August no ancillary GPS waypoint/track data was saved for stations 15-22 inclusive, as the handheld GPS unit was lost overboard in the afternoon. A spare GPS unit was used for the remainder of the survey.

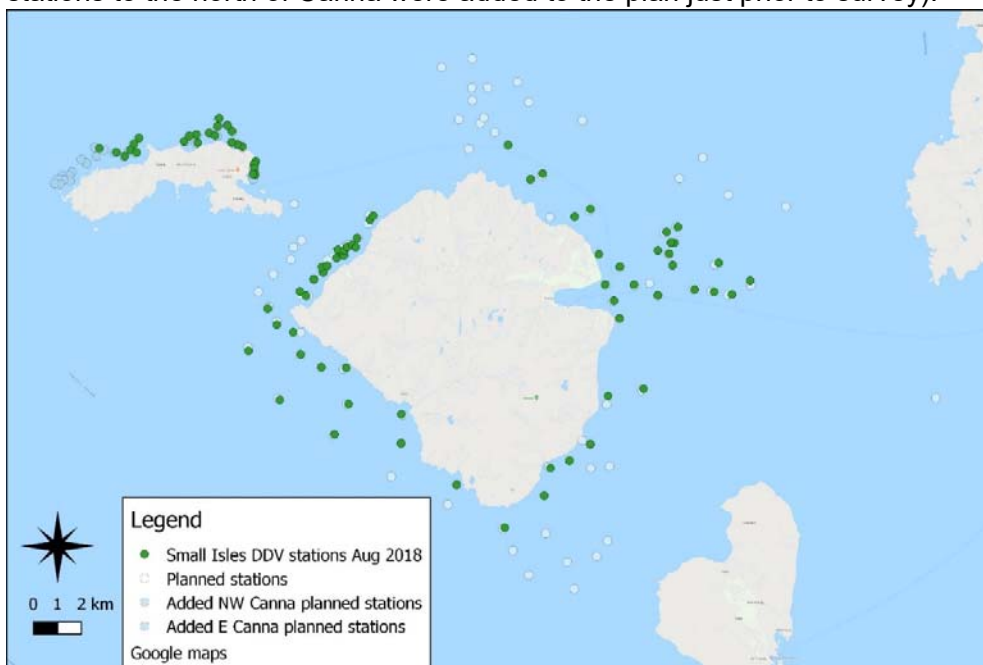
Eighty seven video samples and 1135 accompanying still images were collected. Poor weather prevented sampling at the deep water planned locations more exposed to the south west, and additional stations to the north of Canna were added to the plan just prior to the survey.

Submitted: Charlotte Johnston 26 November 2018

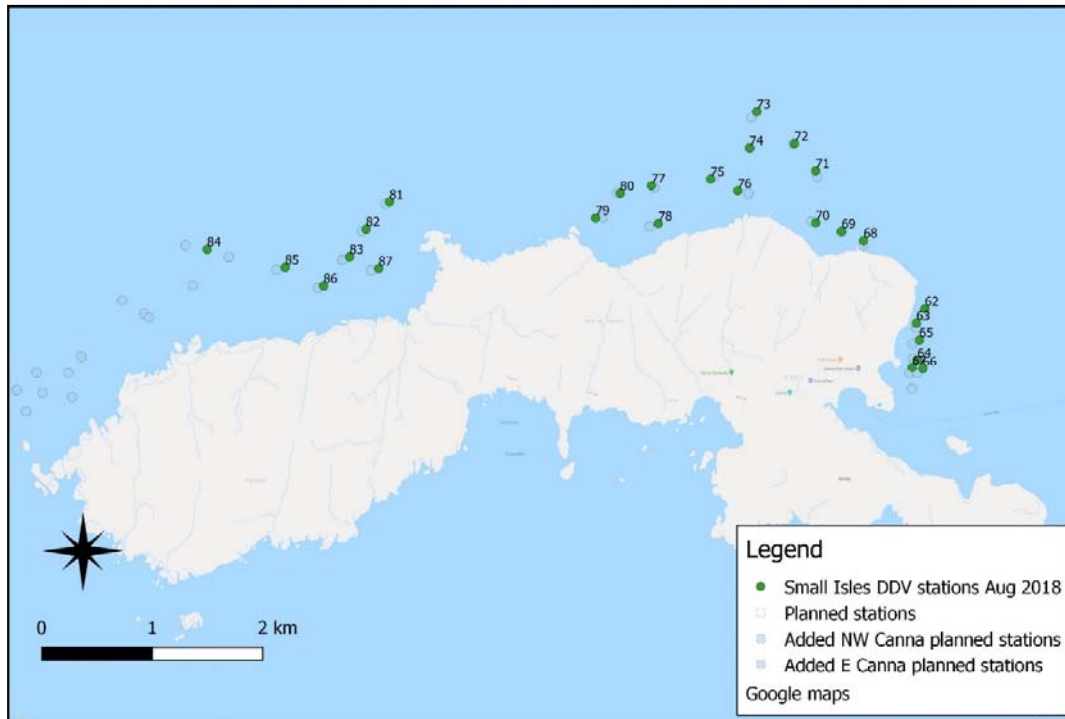
Approved: P Boulcott 03 February 2020



**Figure 1.** Planned 2018 sampling areas within and adjacent to the Small Isles MPA (additional stations to the north of Canna were added to the plan just prior to survey).



**Figure 2.** Drop down video stations surveyed in 2018 around the Small Isles (Rum and Canna), with initial planned stations in background.



**Figure 3.** Drop down video stations around Canna surveyed in 2018 in the Small Isles, with planned stations in background.



**Figure 4.** Drop down video stations around NW Rum surveyed in 2018 in the Small Isles, with initially planned stations in background.



**Figure 5.** Drop down video stations around S Rum surveyed in 2018 in the Small Isles, with initially planned stations in background.



**Figure 6.** Drop down video stations around NE Rum surveyed in 2018 in the Small Isles, with initially planned stations in background.

**Table 1: Small Isles sampling station locations, August 2018**

Project code	Survey area name	Site name	Station ref	Gear code	Date sampled	Start time (UTC)	Start Lat. Deg	Start Lat. mins	Start Long. Deg	Start Long. mins	End time (UTC)	End Lat. Deg	End Lat. mins	End Long. Deg	End Long. mins
MS EMFF	Small Isles	West of Rum	1	DDV	13/08/2018	10:40:00	57	0.546	-6	28.513	10:47:00	57	0.461	-6	28.511
MS EMFF	Small Isles	West of Rum	2	DDV	13/08/2018	10:57:00	57	0.190	-6	28.140	11:07:00	56	59.997	-6	28.025
MS EMFF	Small Isles	West of Rum	3	DDV	13/08/2018	11:20:00	56	59.595	-6	29.304	11:27:00	56	59.496	-6	29.288
MS EMFF	Small Isles	West of Rum	4	DDV	13/08/2018	11:44:00	57	0.021	-6	27.470	11:53:00	57	0.055	-6	27.577
MS EMFF	Small Isles	West of Rum	5	DDV	13/08/2018	12:02:00	56	59.516	-6	27.156	12:08:00	56	59.507	-6	27.132
MS EMFF	Small Isles	West of Rum	6	DDV	13/08/2018	12:17:00	56	59.230	-6	26.305	12:22:00	56	59.229	-6	26.275
MS EMFF	Small Isles	West of Rum	7	DDV	13/08/2018	12:45:00	56	58.501	-6	28.019	12:51:00	56	58.458	-6	27.986
MS EMFF	Small Isles	West of Rum	8	DDV	13/08/2018	13:22:00	56	59.216	-6	25.288	13:30:00	56	59.227	-6	25.329
MS EMFF	Small Isles	West of Rum	9	DDV	13/08/2018	13:42:00	56	58.408	-6	25.192	13:47:00	56	58.411	-6	25.166
MS EMFF	Small Isles	West of Rum	10	DDV	13/08/2018	13:59:00	56	57.734	-6	25.773	14:07:00	56	57.730	-6	25.720
MS EMFF	Small Isles	West of Rum	11	DDV	13/08/2018	14:24:00	56	58.182	-6	23.025	14:30:00	56	58.205	-6	23.009
MS EMFF	Small Isles	West of Rum	12	DDV	13/08/2018	14:43:00	56	57.533	-6	23.033	14:49:00	56	57.551	-6	23.014
MS EMFF	Small Isles	West of Rum	13	DDV	13/08/2018	15:08:00	56	56.596	-6	20.751	15:13:00	56	56.600	-6	20.701
MS EMFF	Small Isles	West of Rum	14	DDV	13/08/2018	15:34:00	56	55.638	-6	18.776	15:42:00	56	55.632	-6	18.572
MS EMFF	Small Isles	Rum South East	15	DDV	14/08/2018	08:51:00	56	58.589	-6	14.533	8:53:00	56	58.624	-6	14.523
MS EMFF	Small Isles	Rum South East	16	DDV	14/08/2018	09:23:00	57	0.332	-6	14.059	9:32:00	57	0.389	-6	14.069
MS EMFF	Small Isles	Rum South East	17	DDV	14/08/2018	09:41:00	57	0.723	-6	14.286	9:48:00	57	0.738	-6	14.271
MS EMFF	Small Isles	Rum South East	18	DDV	14/08/2018	09:56:00	57	1.084	-6	14.653	10:02:00	57	1.121	-6	14.682
MS EMFF	Small Isles	Rum South East	19	DDV	14/08/2018	10:13:00	57	1.758	-6	14.913	10:21:00	57	1.822	-6	14.947
MS EMFF	Small Isles	Rum South East	20	DDV	14/08/2018	10:32:00	57	1.481	-6	14.050	10:40:00	57	1.561	-6	14.106
MS EMFF	Small Isles	Rum South East	21	DDV	14/08/2018	11:00:00	57	1.844	-6	12.487	11:08:00	57	1.303	-6	12.843

Project code	Survey area name	Site name	Station ref	Gear code	Date sampled	Start time (UTC)	Start Lat. Deg	Start Lat. mins	Start Long . Deg	Start Long. mins	End time (UTC)	End Lat. Deg	End Lat. mins	End Long . Deg	End Long. mins
MS EMFF	Small Isles	Rum South East	22	DDV	14/08/2018	11:30:00	57	0.844	-6	12.487	11:36:00	57	0.900	-6	12.407
MS EMFF	Small Isles	Rum South East	23	DDV	14/08/2018	11:52:00	57	1.084	-6	13.465	11:59:00	57	1.138	-6	13.493
MS EMFF	Small Isles	Rum-East	24	DDV	14/08/2018	13:04:00	57	1.513	-6	11.878	13:13:00	57	1.564	-6	11.775
MS EMFF	Small Isles	Rum-East	25	DDV	14/08/2018	13:21:00	57	1.773	-6	12.027	13:28:00	57	1.810	-6	11.915
MS EMFF	Small Isles	Rum-East	26	DDV	14/08/2018	13:36:00	57	2.014	-6	11.809	13:41:00	57	2.033	-6	11.711
MS EMFF	Small Isles	Rum-East	27	DDV	14/08/2018	13:49:00	57	2.016	-6	11.955	13:59:00	57	2.047	-6	11.782
MS EMFF	Small Isles	Rum-East	28	DDV	14/08/2018	14:07:00	57	2.257	-6	12.129	14:14:00	57	2.268	-6	11.991
MS EMFF	Small Isles	Rum-East	29	DDV	14/08/2018	14:22:00	57	2.369	-6	11.663	14:30:00	57	2.376	-6	11.497
MS EMFF	Small Isles	Rum-East	30	DDV	14/08/2018	14:50:00	57	0.972	-6	10.980	15:10:00	57	0.994	-6	10.727
MS EMFF	Small Isles	Rum-East	31	DDV	14/08/2018	15:21:00	57	0.922	-6	10.177	15:30:00	57	0.975	-6	10.026
MS EMFF	Small Isles	Rum-East	32	DDV	14/08/2018	15:42:00	57	0.864	-6	9.446	15:48:00	57	0.900	-6	9.315
MS EMFF	Small Isles	Rum-East	33	DDV	14/08/2018	16:03:00	57	1.172	-6	8.696	16:14:00	57	1.248	-6	8.480
MS EMFF	Small Isles	Rum-East	34	DDV	14/08/2018	16:37:00	57	1.569	-6	9.987	16:53:00	57	1.690	-6	9.690
MS EMFF	Small Isles	Guirdil	35	DDV	15/08/2018	07:56:00	57	0.930	-6	27.196	8:01:00	57	0.970	-6	27.197
MS EMFF	Small Isles	Guirdil	36	DDV	15/08/2018	08:11:00	57	0.837	-6	26.938	8:18:00	57	0.859	-6	26.981
MS EMFF	Small Isles	Guirdil	37	DDV	15/08/2018	08:29:00	57	1.359	-6	26.241	8:36:00	57	1.437	-6	26.144
MS EMFF	Small Isles	Guirdil	38	DDV	15/08/2018	08:42:00	57	1.475	-6	26.287	8:58:00	57	1.762	-6	25.913
MS EMFF	Small Isles	Guirdil	39	DDV	15/08/2018	09:16:00	57	1.200	-6	26.620	9:25:00	57	1.282	-6	26.482
MS EMFF	Small Isles	Guirdil	40	DDV	15/08/2018	09:32:00	57	1.501	-6	26.078	9:51:00	57	1.746	-6	25.706
MS EMFF	Small Isles	Guirdil	41	DDV	15/08/2018	09:59:00	57	1.684	-6	25.682	10:20:00	57	1.956	-6	25.402
MS EMFF	Small Isles	Guirdil	42	DDV	15/08/2018	10:31:00	57	1.795	-6	25.535	10:40:00	57	1.927	-6	25.435
MS EMFF	Small Isles	Guirdil	43	DDV	15/08/2018	10:50:00	57	1.860	-6	25.627	10:56:00	57	1.962	-6	25.549



Project code	Survey area name	Site name	Station ref	Gear code	Date sampled	Start time (UTC)	Start Lat. Deg	Start Lat. mins	Start Long . Deg	Start Long. mins	End time (UTC)	End Lat. Deg	End Lat. mins	End Long . Deg	End Long. mins
MS EMFF	Small Isles	Guirdil	44	DDV	15/08/2018	11:06:00	57	1.739	-6	25.385	11:16:00	57	1.816	-6	25.313
MS EMFF	Small Isles	Guirdil	45	DDV	15/08/2018	11:25:00	57	1.842	-6	25.374	11:32:00	57	1.936	-6	25.309
MS EMFF	Small Isles	Guirdil	46	DDV	15/08/2018	11:40:00	57	1.925	-6	25.246	11:49:00	57	0.217	-6	25.192
MS EMFF	Small Isles	Guirdil	47	DDV	15/08/2018	11:58:00	57	1.966	-6	25.040	12:08:00	57	2.044	-6	24.990
MS EMFF	Small Isles	Guirdil	48	DDV	15/08/2018	12:15:00	57	1.919	-6	24.893	12:23:00	57	1.984	-6	24.861
MS EMFF	Small Isles	Guirdil	49	DDV	15/08/2018	12:32:00	57	2.118	-6	24.846	12:42:00	57	2.188	-6	24.814
MS EMFF	Small Isles	Guirdil	50	DDV	15/08/2018	12:50:00	57	2.528	-6	24.314	13:06:00	57	2.659	-6	24.314
MS EMFF	Small Isles	Guirdil	51	DDV	15/08/2018	13:17:00	57	2.618	-6	24.181	13:23:00	57	2.683	-6	24.223
MS EMFF	Small Isles	Rum-East	52	DDV	16/08/2018	09:33:00	57	2.768	-6	15.259	9:40:00	57	2.850	-6	15.206
MS EMFF	Small Isles	Rum-East	53	DDV	16/08/2018	09:56:00	57	2.599	-6	15.905	10:00:00	57	2.620	-6	15.830
MS EMFF	Small Isles	Rum-East	54	DDV	16/08/2018	10:13:00	57	3.439	-6	17.722	10:20:00	57	3.496	-6	17.686
MS EMFF	Small Isles	Rum-East	55	DDV	16/08/2018	10:29:00	57	3.567	-6	17.218	10:36:00	57	3.619	-6	17.123
MS EMFF	Small Isles	Rum South East	56	DDV	16/08/2018	11:53:00	56	58.751	-6	13.076	12:00:00	56	58.791	-6	12.984
MS EMFF	Small Isles	Rum South East	57	DDV	16/08/2018	12:25:00	56	57.512	-6	15.259	12:31:00	56	57.531	-6	15.234
MS EMFF	Small Isles	Rum South East	58	DDV	16/08/2018	12:46:00	56	57.143	-6	16.121	12:52:00	56	57.165	-6	16.113
MS EMFF	Small Isles	Rum South East	59	DDV	16/08/2018	13:04:00	56	56.974	-6	16.898	13:09:00	56	56.975	-6	16.873
MS EMFF	Small Isles	Rum South East	60	DDV	16/08/2018	13:20:00	56	56.351	-6	17.157	13:26:00	56	56.354	-6	17.130
MS EMFF	Small Isles	North east Rum	61	DDV	16/08/2018	14:52:00	57	4.203	-6	18.637	14:58:00	57	4.206	-6	18.570
MS EMFF	Small Isles	Canna-East	62	DDV	16/08/2018	16:04:00	57	3.840	-6	29.005	16:09:00	57	3.852	-6	28.968
MS EMFF	Small Isles	Canna-East	63	DDV	16/08/2018	16:16:00	57	3.770	-6	29.081	16:24:00	57	3.823	-6	29.052
MS EMFF	Small Isles	Canna-East	64	DDV	16/08/2018	16:34:00	57	3.589	-6	29.071	16:39:00	57	3.605	-6	29.026
MS EMFF	Small Isles	Canna-East	65	DDV	16/08/2018	16:49:00	57	3.688	-6	29.054	16:53:00	57	3.688	-6	29.054

Project code	Survey area name	Site name	Station ref	Gear code	Date sampled	Start time (UTC)	Start Lat. Deg	Start Lat. mins	Start Long. Deg	Start Long. mins	End time (UTC)	End Lat. Deg	End Lat. mins	End Long. Deg	End Long. mins
MS EMFF	Small Isles	Canna-East	66	DDV	16/08/2018	17:03:00	57	3.546	-6	29.023	17:08:00	57	3.546	-6	29.023
MS EMFF	Small Isles	Canna-East	67	DDV	16/08/2018	17:14:00	57	3.552	-6	29.118	17:20:00	57	3.552	-6	29.118
MS EMFF	Small Isles	Canna-East	68	DDV	17/08/2018	06:21:00	57	4.172	-6	29.553	6:27:00	57	4.169	-6	29.553
MS EMFF	Small Isles	Canna-East	69	DDV	17/08/2018	06:36:00	57	4.217	-6	29.750	6:41:00	57	4.203	-6	29.750
MS EMFF	Small Isles	Canna-East	70	DDV	17/08/2018	06:47:00	57	4.258	-6	29.982	6:53:00	57	4.245	-6	29.982
MS EMFF	Small Isles	Canna-East	71	DDV	17/08/2018	07:01:00	57	4.512	-6	29.983	7:06:00	57	4.547	-6	29.983
MS EMFF	Small Isles	Canna-East	72	DDV	17/08/2018	07:15:00	57	4.643	-6	30.172	7:21:00	57	4.668	-6	30.172
MS EMFF	Small Isles	Canna-East	73	DDV	17/08/2018	07:30:00	57	4.799	-6	30.509	7:35:00	57	4.845	-6	30.509
MS EMFF	Small Isles	Canna-East	74	DDV	17/08/2018	07:44:00	57	4.622	-6	30.574	7:49:00	57	4.632	-6	30.574
MS EMFF	Small Isles	Canna-East	75	DDV	17/08/2018	07:56:00	57	4.471	-6	30.923	8:01:00	57	4.478	-6	30.923
MS EMFF	Small Isles	Canna-East	76	DDV	17/08/2018	08:07:00	57	4.414	-6	30.680	8:13:00	57	4.421	-6	30.680
MS EMFF	Small Isles	Canna-East	77	DDV	17/08/2018	08:21:00	57	4.439	-6	31.452	8:26:00	57	4.467	-6	31.452
MS EMFF	Small Isles	Canna-East	78	DDV	17/08/2018	08:33:00	57	4.254	-6	31.390	8:38:00	57	4.253	-6	31.390
MS EMFF	Small Isles	Canna-East	79	DDV	17/08/2018	08:45:00	57	4.282	-6	31.951	8:50:00	57	4.315	-6	31.951
MS EMFF	Small Isles	Canna-East	80	DDV	17/08/2018	08:57:00	57	4.401	-6	31.731	9:02:00	57	4.428	-6	31.731
MS EMFF	Small Isles	Canna-West	81	DDV	17/08/2018	09:29:00	57	4.359	-6	33.795	9:35:00	57	4.410	-6	33.795
MS EMFF	Small Isles	Canna-West	82	DDV	17/08/2018	09:43:00	57	4.227	-6	34.005	9:50:00	57	4.284	-6	34.005
MS EMFF	Small Isles	Canna-West	83	DDV	17/08/2018	09:57:00	57	4.093	-6	34.152	10:03:00	57	4.270	-6	34.152
MS EMFF	Small Isles	Canna-West	84	DDV	17/08/2018	10:14:00	57	4.129	-6	35.427	10:19:00	57	4.151	-6	35.427
MS EMFF	Small Isles	Canna-West	85	DDV	17/08/2018	10:31:00	57	4.042	-6	34.729	10:36:00	57	4.083	-6	34.729
MS EMFF	Small Isles	Canna-West	86	DDV	17/08/2018	10:45:00	57	3.952	-6	34.385	10:50:00	57	3.983	-6	34.385
MS EMFF	Small Isles	Canna-West	87	DDV	17/08/2018	10:58:00	57	4.036	-6	33.893	11:03:00	57	4.079	-6	33.893

**Table 2 Small Isles sampling station descriptions, August 2018**

Station ref	Site name	Date sampled	Start Depth (m BCD)	End Depth (m BCD)	Vessel speed Kn	Video duration	Seabed physical type	Flora and fauna
1	West of Rum	13/08/2018	36	44	0.8	00:07	Bedrock, boulders into sandy shell and gravel	L. celtica??
2	West of Rum	13/08/2018	27	29	1.3	00:10	Boulders and cobbles	Dead mans fingers, sponges
3	West of Rum	13/08/2018	60	59	1	00:07	Shelly sand	
4	West of Rum	13/08/2018	19	21	1	00:09	Bedrock and boulders	Kelp, red algae and alcyonium canopy
5	West of Rum	13/08/2018	22	24	0.4	00:06	Boulders	Red algae, echinoderms + alcyonium
6	West of Rum	13/08/2018	22	24	0.2	00:05	Boulders	Red algae, sponges and starfish
7	West of Rum	13/08/2018	56	64	0.4	00:06	Silted boulders onto muddy sand and cobbles	
8	West of Rum	13/08/2018	13	13	0.3	00:08	Cobbles and sand	L. hyperborea canopy
9	West of Rum	13/08/2018	42	42	0.2	00:05	Silty sand	
10	West of Rum	13/08/2018	39	44	0.2	00:08	Silty boulders	Swiftia??
11	West of Rum	13/08/2018	14	13	0.6	00:06	Sand and boulders	L. hyperborea canopy and foliose red
12	West of Rum	13/08/2018	27	28	0.2	00:06	Sand with ripples + silt	
13	West of Rum	13/08/2018	27	27	0.3	00:05	Sand and cobbles with encrusting red	
14	West of Rum	13/08/2018	38	45	0.8	00:08	Boulders and cobbles with some scallop shells. Large boulder at end	
15	Rum South East	14/08/2018	64	65	0.5	00:02	Muddy sand	L. celtica?
16	Rum South East	14/08/2018	30	28	0.5	00:09	Silty sand	hydroid tufts? sparse sugar kelp
17	Rum South East	14/08/2018	20	21	0.2	00:07	Sand	cerianthus??
18	Rum South East	14/08/2018	14	14	0.3	00:06	Silty sand with small burrows	
19	Rum South East	14/08/2018	24	25	0.6	00:08	Muddy sand with small burrows, large boulders	with metridium + Tuntella
20	Rum South East	14/08/2018	29	45	0.5	00:08	Mud with burrows, boulders with metridium	Squats, seapens,
21	Rum South East	14/08/2018	107	113	0.5	00:08	Burrowed mud	Nephrops, seapens, virgularia
22	Rum South East	14/08/2018	37	49	0.3	00:06	Shelly sand with cobbles	Squats
23	Rum South East	14/08/2018	75	75	0.5	00:07	Burrowed mud	Nephrops
24	Rum-East	14/08/2018	31	36	0.7	00:09	Shell, gravel, boulders, bedrock(silty)	hydroids, sponges
25	Rum-East	14/08/2018	37	35	0.7	00:07	Shelly sand	tuntella, squats, Neopendactyla?

Station ref	Site name	Date sampled	Start Depth (m BCD)	End Depth (m BCD)	Vessel speed Kn	Video duration	Seabed physical type	Flora and fauna
26	Rum-East	14/08/2018	23	32	0.7	00:05	Maerl?, then into Shelly sand	Maerl?
27	Rum-East	14/08/2018	21	30	0.8	00:10	Shelly gravel, then onto invert encrusted boulder outcrop	invert encrusted
28	Rum-East	14/08/2018	28	30	0.7	00:07	Shelly sand with occ. Boulders	sponges, hydroids
29	Rum-East	14/08/2018	42	36	0.6	00:08	Sandy mud with small burrows	Shells and virgularia
30	Rum-East	14/08/2018	46	62	0.3	00:20	Silty boulders with cup corals, burrowed mud	Swiftia, featherstars, virgularia, pennatula, funiculina, nephrops
31	Rum-East	14/08/2018	69	57	0.6	00:09	burrowed mud	seapens, funiculina, nephrops, pachycerianthus?
32	Rum-East	14/08/2018	64	62	0.6	00:06	burrowed mud	seapens, funiculina
33	Rum-East	14/08/2018	37	106	0.8	00:11	steep slope down to 100m	burrowed mud and seapens
34	Rum-East	14/08/2018	96	86	0.8	00:16	Shelly sand, onto silty boulders	Hydroids, ?horse mussels?, squats. Cup corals on boulders, swiftia?, seapens on sandy mud
35	Guirdil	15/08/2018	34	51	0.3	00:05	Muddy sand	
36	Guirdil	15/08/2018	16	9	0.2	00:07	Clean sand	Kelp and reds
37	Guirdil	15/08/2018	17	9		00:07	Clean sand with pebbles, onto rock	Kelp bed and reds
38	Guirdil	15/08/2018	26	39	1.3	00:16	Silty sand and boulders then shelly gravel with cobble	Red algae and hydroids
39	Guirdil	15/08/2018	27	19	0.8	00:09	Boulders	Sponges, red algae, alcyonium, sea cucumbers
40	Guirdil	15/08/2018	16	24	0.9	00:19	Sand with cobbles and boulders	L. hyp, L. sach, reds, hydroids, sponges
41	Guirdil	15/08/2018	8	36	1	00:21	Silty boulders, sand with cobbles	Kelp, red algae, maerl bed
42	Guirdil	15/08/2018	22	34	1.2	00:09	Sand with cobbles	?Maerl
43	Guirdil	15/08/2018	29	52	1.1	00:06	Sand with cobbles, onto fine sand	
44	Guirdil	15/08/2018	16	21	0.7	00:10	Clean sand with cobbles	Kelps and reds.
45	Guirdil	15/08/2018	24	27	1	00:07	Cobbles and shells on sand	?Maerl
46	Guirdil	15/08/2018	25	37	0.8	00:09	Cobbles and shells on sand	?Maerl, cerianthus
47	Guirdil	15/08/2018	21	21	0.6	00:10	Sandy cobble sediment with shells	red algae, hydroids, ?possible flame shell beds
48	Guirdil	15/08/2018	16	16	0.5	00:08	Sandy with occasional boulders	L. sach, L. hyp and reds
49	Guirdil	15/08/2018	21	22	0.6	00:10	Shelly sand	Red seaweeds
50	Guirdil	15/08/2018	29	47	0.5	00:16	Shelly gravel with cobble	cerianthus
51	Guirdil	15/08/2018	31	42	0.6	00:06	Sandy with shells and cobbles	
52	Rum-East	16/08/2018	45	44	0.8	00:07	Mud with burrows	sea pens (tall), nephrops
53	Rum-East	16/08/2018	17	19	0.5	00:04	Silty mud, few burrows	

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54	Rum-East	16/08/2018	25	38	0.6	00:07	Boulders, cobbles with silt, then drop to mud with burrows	Asterias rubens, urchins
55	Rum-East	16/08/2018	52	50	0.6	00:07	Burrowed mud	sea pens (tall) and Pennatula
56	Rum South East	16/08/2018	43	60	0.6	00:07	Boulders with silt, change to burrowed mud	Featherstars? Urchins
57	Rum South East	16/08/2018	65	63	0.2	00:06	Mud, occasional boulder/silt. Vertical rock wall	Squat lobster, featherstars
58	Rum South East	16/08/2018	26	25	0.3	00:06	Sand, coarse sediment on top of bedrock underneath?	
59	Rum South East	16/08/2018	19	19	0.1	00:05	Sand, coarse sand on top of bedrock	
60	Rum South East	16/08/2018	29	28	0.2	00:06	Boulders	Urchin, starfish, featherstar
61	North east Rum	16/08/2018	33	48	0.4	00:06	Boulders with silt. Bedrock wall	Cup coral? urchins
62	Canna-East	16/08/2018	43	52	0.3	00:05	Sandy mud, cobbles at start	Plumose anenome on cobbles, worms/burrowing anenomes on mud
63	Canna-East	16/08/2018	20	22	0.3	00:08	Sandy mud, some boulders	featherstars, burrowing anenomes?
64	Canna-East	16/08/2018	40	48	0.4	00:05	Muddy sand with shell fragments, small burrows	
65	Canna-East	16/08/2018	41	48	0.2	00:04	Mud, muddy sand with burrows, shells	
66	Canna-East	16/08/2018	39	45	0.4	00:05	Mud, muddy sand with burrows, shells	Nephrops
67	Canna-East	16/08/2018	24	36	0.3	00:06	Sandy mud, occasional boulder, muddy sand some burrows, shells	seaweed on boulders
68	Canna-East	17/08/2018	11	10	0.1	00:06	Coarse sand with pebbles, some shell. ?sand over bedrock	Kelp, seaweed
69	Canna-East	17/08/2018	14	13	0.2	00:05	Sand+pebbles, ?some sand over bedrock	Kelp, seaweed
70	Canna-East	17/08/2018	15	14	0.3	00:06	Sand, pebbles + shell	Kelp, seaweed
71	Canna-East	17/08/2018	48	51	0.3	00:05	Sand, pebbles + shell	Starfish/brittlestar
72	Canna-East	17/08/2018	63	59	0.5	00:06	Sand + shell	
73	Canna-East	17/08/2018	53	57	0.4	00:05	Sand + shell, occasional cobble/boulder	Squat lobsters
74	Canna-East	17/08/2018	46	44	0.2	00:05	Sand, shell + pebble	
75	Canna-East	17/08/2018	22	23	0.2	00:05	Sand, cobbles, pebbles, shell	dead mans fingers
76	Canna-East	17/08/2018	17	19	0.7	00:06	Coarse sand, shell, gravel	kelp and red seaweed
77	Canna-East	17/08/2018	27	28	0.7	00:05	Coarse sand, shell, gravel, cobbles	kelp (small strands)

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78	Canna-East	17/08/2018	17	16	0.6	00:05	Bedrock with sand on top	sparse kelp at end
79	Canna-East	17/08/2018	17	19	0.4	00:05	Sand, shell, some sand on top of bedrock	
80	Canna-East	17/08/2018	25	26	0.2	00:05	Sand, shell, gravel	kelp-sparse, small strands
81	Canna-West	17/08/2018	22	26	0.5	00:06	Cobbles, boulders, sand. Into more gravel, sand + pebble	red seaweeds, sponge, urchin, dead mans finger
82	Canna-West	17/08/2018	20	16	0.6	00:07	Coarse sand, bedrock underneath? few boulders, more at end	kelp, sponge
83	Canna-West	17/08/2018	20	18	0.6	00:06	Sand, pebbles, boulders, onto more bedrock	kelp, red seaweed
84	Canna-West	17/08/2018	24	24	1	00:05	Coarse sand, shell, pebbles, boulders	sponge
85	Canna-West	17/08/2018	20	21	0.6	00:05	Course sand (ripples), shell, pebbles	kelp-sparse
86	Canna-West	17/08/2018	18	19	0.9	00:05	Coarse sand over bedrock, few boulder + cobble	kelp-sparse
87	Canna-West	17/08/2018	19	19	0.5	00:05	Sand, pebble, shell	kelp