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MFV *Walrus*

Survey 1619H – Part One (1619Ha)

REPORT

15 July – 21 July 2019

Loading: Aultbea, 14 July 2019
Boarding: Aultbea, 15 July 2019
Unloading: Aultbea, 21 July 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	
J Clarke	MSS (SIC)
J Mair	MSS

Project: 7 days, SP02R0 (20490)

Sampling Gear & Equipment
Fish traps (6 fleets of 2 traps)
2 Stereo Baited Remote Underwater Video Camera (SBRUV) frames (BUC1 & BUC2)
4 LED light assemblies in GPH housing
4 SJCAM SJ6 Legend HD action cameras and custom-built acetylene housings

Overview

Cruise 1619Ha was designed to provide additional data on the habitat associations of juvenile cod, haddock, whiting and saithe in the period following settlement.

Objectives

1. To deploy fish traps over various habitat types within Loch Ewe.

2. To synchronously deploy baited remote underwater video camera frames fitted with twin cameras calibrated for post-survey analysis.

Narrative

Scientific equipment was loaded onto the *Walrus* on the evening of 14 July. Staff boarded the following morning and the vessel departed immediately.

SBRUV frames and fish traps baited with approximately 500 g of defrosted mackerel and crushed crabs were deployed at stations LE_05 and LE_30 (see Fig. 1). The remaining fleets were deployed further to the north, towards the mouth of the loch, along the western side and to the north-west of the Isle of Ewe. Footage of the seabed was captured using a small hand-held drop frame in order to classify substrate and habitat type post-survey. Start and end waypoints and sounder depth were recorded each time a fleet was deployed.

The stereo-camera moorings were recovered, rebaited and redeployed. Micro SD cards from each camera were downloaded to external media at the end of each working day.

Walrus worked around the loch over the next six days and was able to successfully survey every fish trap and SBRUV station. Traps and baited frames were safely and efficiently deployed from the stern of the boat and recovered using a davit system and electric motor. This new approach allowed the operator to carefully control how the static gear was handled and moved and significantly improved deck safety. Similarly, traps can now be easily closed and secured using elasticated cord and a hook, further streamlining this survey method.

Attempts to gather baitfish were reasonably productive and enough mackerel were caught to provide for the entire charter. Crabs caught in the traps were used as bait the following day.

Unloading occurred in Aultbea on the evening of 21 July and scientific staff returned to Aberdeen the following morning.

Results

Fish Trap Survey

Fleets were deployed during daylight hours and were left for between 4 hours 44 minutes and 6 hours 38 minutes, averaging 6 hours and 11 minutes per deployment. **Table 1** gives trap fleet mid-point latitude and longitude (degree decimal), average depth in metres and soak-times of each deployment – mid-points are plotted in **Figure 1**.

Table 1: Spatial (fleet mid-points) and attribute data of fish trap deployments. Latitude and longitude in degree decimal format.

Station	Latitude	Longitude	Depth (m)	Soak Time	Trap No.s in Fleet
FT_LE_05	57.85656	-5.64560	13.9	06:16:40	1 & 2
FT_LE_29	57.86584	-5.65478	20.6	06:18:38	3 & 4
FT_LE_07	57.87820	-5.65962	19.1	06:20:31	5 & 6
FT_LE_03	57.86296	-5.68163	16.3	06:23:37	7 & 8
FT_LE_25	57.85168	-5.68220	15.4	06:23:32	9 & 10
FT_LE_06	57.83969	-5.64735	14.7	04:43:46	11 & 12
FT_LE_22	57.83617	-5.58722	12.3	06:35:58	1 & 2
FT_LE_01	57.81223	-5.58938	27.5	06:34:06	3 & 4
FT_LE_18	57.81768	-5.60693	20.0	06:31:08	5 & 6
FT_LE_02	57.79039	-5.62477	15.0	06:29:26	7 & 8
FT_LE_24	57.79212	-5.58511	16.5	06:37:37	9 & 10
FT_LE_14	57.79557	-5.59525	31.6	06:05:03	11 & 12
FT_LE_16	57.80923	-5.64090	30.9	06:01:39	1 & 2
FT_LE_12	57.80822	-5.66336	9.8	06:01:21	3 & 4
FT_LE_11	57.79291	-5.65637	13.4	06:05:46	5 & 6
FT_LE_28	57.77766	-5.62336	9.5	06:04:45	7 & 8
FT_LE_23	57.77031	-5.61381	8.5	06:28:03	11 & 12
FT_LE_15	57.79821	-5.60811	26.4	06:32:08	9 & 10
FT_LE_21	57.82326	-5.62547	13.1	06:09:01	1 & 2
FT_LE_17	57.82143	-5.64944	28.5	06:07:34	3 & 4
FT_LE_09	57.82834	-5.66296	11.8	06:08:37	5 & 6
FT_LE_10	57.83724	-5.67564	13.3	06:09:41	7 & 8
FT_LE_08	57.84916	-5.68968	10.0	06:10:24	9 & 10
FT_LE_04	57.85538	-5.68662	14.5	06:04:42	11 & 12
FT_LE_26	57.83662	-5.60782	16.4	05:56:32	1 & 2
FT_LE_27	57.84378	-5.62582	16.9	06:02:00	3 & 4
FT_LE_19	57.85022	-5.61489	10.2	06:04:25	5 & 6
FT_LE_13	57.84980	-5.63911	14.9	06:05:56	7 & 8
FT_LE_20	57.86317	-5.64598	15.1	06:06:32	9 & 10
FT_LE_30	57.86956	-5.65059	18.8	06:05:02	11 & 12

Frozen fish samples were transported back to the lab and will be processed at a later date. **Table 2** gives a breakdown of invertebrate and fish species catch frequencies by trap.

Table 2: Summary of invertebrate and fish species frequency by date and trap ID.

		Trap ID											
Date	Species	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
16/07/2019	*Ctenolabrus rupestris*	0	0	0	0	0	0	0	0	0	0	1	0
	Gadus morhua	0	0	0	0	0	0	0	0	0	0	0	1
	Limanda limanda	0	0	0	0	0	0	0	0	0	0	0	1
	Myoxocephalus scorpius	1	0	0	0	0	0	1	0	0	0	0	0
	Pholis gunnellus	0	0	0	0	0	0	0	1	0	0	0	0
	Pollachius virens	0	0	0	0	0	0	0	1	0	0	0	0
	Trisopterus minutus	1	0	0	0	3	0	0	0	0	0	0	0
	Cancer pagurus	0	1	0	0	0	0	0	0	0	0	0	0

		Trap ID											
Date	Species	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	Carcinus maenas	8	0	0	0	0	0	0	0	0	0	0	0
	Liocarcinus depurator	1	5	0	0	0	0	0	0	0	2	0	0
	Necora puber	2	0	0	0	0	0	0	0	4	0	0	0
17/07/2019	Blenniidae	0	0	0	0	1	0	0	0	0	0	0	0
	Ctenolabrus rupestris	0	0	1	1	0	0	0	0	0	0	0	0
	Gadus morhua	0	0	0	1	0	0	0	0	0	0	0	0
	Limanda limanda	0	0	0	0	0	0	3	1	0	1	0	0
	Merlangius merlangus	2	1	0	2	0	0	0	0	5	1	0	2
	Myoxocephalus scorpius	0	0	0	0	0	0	1	0	0	0	0	0
	Pholis gunnellus	0	0	0	0	1	0	0	0	0	0	0	0
	Scyliorhunis canicula	1	0	0	0	0	0	0	0	0	0	0	0
	Trisopterus minutus	0	0	5	3	2	3	1	0	0	1	0	2
	Paguridae	1	0	0	0	0	1	0	0	0	5	0	0
	Cancer pagurus	0	0	1	0	0	0	0	0	1	0	0	0
	Carcinus maenas	51	12	0	0	0	0	27	6	50	24	5	0
	Liocarcinus depurator	2	0	0	0	0	0	0	0	0	1	0	0
	Nephrops norvegicus	0	0	0	0	2	0	0	0	0	0	1	3
18/07/2019	Blenniidae	0	0	0	0	0	0	0	0	1	0	0	0
	Ctenolabrus rupestris	0	0	0	0	0	1	0	0	0	0	0	0
	Freshwater eel (indet.)	0	0	0	0	0	0	0	0	0	0	0	1
	Gadus morhua	0	0	1	0	0	0	0	2	0	0	0	0
	Limanda limanda	0	0	1	0	0	2	0	4	0	0	0	1
	Merlangius merlangus	1	4	11	36	1	1	1	6	0	2	1	3
	Pholis gunnellus	0	0	0	0	0	1	0	0	0	0	0	0
	Scyliorhunis canicula	0	0	0	0	0	0	0	0	0	0	0	1
	Trisopterus minutus	4	3	0	0	2	11	0	2	1	2	0	1
	Cancer pagurus	1	0	1	0	0	0	0	0	1	2	0	0
	Carcinus maenas	0	0	92	44	1	1	96	83	2	2	145	65
	Liocarcinus depurator	13	14	0	3	3	3	0	0	1	6	0	0
	Necora puber	0	0	8	0	1	10	0	0	0	0	0	0
	Nephrops norvegicus	3	1	0	0	0	0	0	0	1	0	0	0
	Paguridae	0	0	0	1	0	0	0	0	0	0	0	0
19/07/2019	*Limanda limanda*	0	1	0	1	0	0	2	0	1	0	0	0
	Merlangius merlangus	4	7	3	2	0	0	4	0	0	0	0	0
	Pholis gunnellus	0	0	1	0	0	1	0	0	0	0	0	0
	Pollachius virens	0	0	0	0	0	0	0	0	0	0	1	4
	Trisopterus minutus	0	0	1	2	0	0	0	0	0	0	0	5
	Carcinus maenas	0	1	2	0	0	2	2	2	1	1	0	0
	Cancer pagurus	0	0	0	0	0	0	1	2	4	1	0	0
	Liocarcinus depurator	9	22	67	69	0	0	41	3	4	0	3	0
	Munida rugosa	0	0	6	1	0	0	0	0	0	0	0	0
19/07/2019 cont…	*Necora puber*	2	2	0	0	8	2	10	3	11	5	1	2
20/07/2019	*Ctenolabrus rupestris*	0	0	0	0	0	0	0	0	1	0	0	0
	Limanda limanda	0	0	1	0	0	0	0	0	1	0	0	0
	Merlangius merlangus	1	1	1	12	4	1	11	0	0	0	0	0

Date	Species	Trap ID 1	2	3	4	5	6	7	8	9	10	11	12
	Pholis gunnellus	0	0	0	0	1	0	0	0	0	0	0	0
	Trisopterus minutus	0	0	0	1	0	0	0	0	0	0	0	0
	Cancer pagurus	0	0	0	1	0	1	0	2	1	0	0	0
	Carcinus maenas	19	10	1	6	27	6	34	9	1	0	0	0
	Liocarcinus depurator	12	9	0	4	9	13	3	10	0	0	0	0
	Majidae	1	6	0	0	1	2	0	0	0	0	0	0
	Necora puber	0	0	1	0	2	0	0	0	0	3	0	1
	Octopoda	0	0	0	0	0	0	0	0	0	0	0	1
	Paguridae	0	0	0	0	0	3	0	2	0	0	0	0

Stereo Baited Remote Underwater Video (SBRUV) Survey

The SBRUV frames were deployed in depths ranging from 4.5 to 32.5 m, capturing a combined total of 54 hours 55 minutes worth of high definition footage. Video was recorded in 1920 by 1080p resolution, at 60 frames per second. Deployment coordinates, depth, start time and duration are summarised in **table 3**. Video files were edited for extraneous footage and will be analysed at a later date.

Fig. 1 shows the positions of each SBRUV deployment within the loch.

Table 3: Spatial and attribute data of SBRUV deployments

Station ID	Latitude	Longitude	Long (degree decimal minutes)	Lat (degree decimal minutes)	Depth (m)	Date / Time	Soak Time (HH:MM:SS)
BUC1_LE_05	57.8525	-5.6393	005° 38.35620' W	057° 51.14880' N	21.0	15/07/2019 06:50	02:08:09
BUC2_LE_30	57.8666	-5.6563	005° 39.37740' W	057° 51.99780' N	21.0	15/07/2019 07:31	02:21:29
BUC1_LE_07	57.8738	-5.6553	005° 39.32040' W	057° 52.42680' N	19.0	15/07/2019 09:32	01:43:39
BUC2_LE_03	57.8590	-5.6853	005° 41.11980' W	057° 51.54000' N	21.0	15/07/2019 10:08	01:59:28
BUC1_LE_06	57.8433	-5.6432	005° 38.59380' W	057° 50.59920' N	15.4	16/07/2019 06:47	02:00:48
BUC2_LE_13	57.8508	-5.6327	005° 37.96260' W	057° 51.04860' N	18.5	16/07/2019 06:57	02:19:25
BUC1_LE_29	57.8622	-5.6491	005° 38.94600' W	057° 51.73500' N	16.3	16/07/2019 09:05	01:31:57
BUC2_LE_25	57.8520	-5.6747	005° 40.47900' W	057° 51.11880' N	17.2	16/07/2019 09:34	01:37:59
BUC2_LE_22	57.8320	-5.5857	005° 35.14380' W	057° 49.91940' N	11.9	17/07/2019 06:27	02:38:02
BUC1_LE_01	57.8070	-5.5928	005° 35.56620' W	057° 48.42000' N	12.3	17/07/2019 06:42	02:55:55
BUC2_LE_18	57.8178	-5.6134	005° 36.80160' W	057° 49.07040' N	20.2	17/07/2019 09:26	01:30:47
BUC1_LE_02	57.7929	-5.6182	005° 37.09500' W	057° 47.57340' N	12.0	17/07/2019 09:55	01:34:45
BUC2_LE_24	57.7965	-5.5834	005° 35.00640' W	057° 47.79000' N	10.9	17/07/2019 11:16	01:30:13
BUC1_LE_14	57.7989	-5.5983	005° 35.90040' W	057° 47.93280' N	32.5	17/07/2019 11:42	01:27:57
BUC1_LE_16	57.8057	-5.6325	005° 37.95000' W	057° 48.34020' N	27.2	18/07/2019 06:25	01:59:54
BUC2_LE_12	57.8118	-5.6611	005° 39.66900' W	057° 48.70680' N	27.2	18/07/2019 06:38	01:41:25
BUC2_LE_11	57.7961	-5.6598	005° 39.58920' W	057° 47.76480' N	11.9	18/07/2019 08:53	01:36:39
BUC1_LE_15	57.7959	-5.6145	005° 36.86760' W	057° 47.75520' N	30.4	18/07/2019 09:08	01:37:02
BUC1_LE_28	57.7744	-5.6166	005° 36.99840' W	057° 46.46400' N	6.3	18/07/2019 12:12	01:46:33
BUC2_LE_23	57.7721	-5.6056	005° 36.33480' W	057° 46.32660' N	4.5	18/07/2019 12:20	01:46:16
BUC2_LE_21	57.8273	-5.6332	005° 37.99140' W	057° 49.63620' N	10.9	19/07/2019 06:26	01:56:49

Station ID	Latitude	Longitude	Long (degree decimal minutes)	Lat (degree decimal minutes)	Depth (m)	Date / Time	Soak Time (HH:MM:SS)
BUC1_LE_17	57.8181	-5.6510	005° 39.05940' W	057° 49.08600' N	19.6	19/07/2019 06:37	02:04:14
BUC2_LE_09	57.8237	-5.6575	005° 39.44880' W	057° 49.42080' N	11.6	19/07/2019 08:36	01:31:44
BUC1_LE_10	57.8422	-5.6770	005° 40.61820' W	057° 50.53380' N	16.0	19/07/2019 09:00	01:43:05
BUC2_LE_04	57.8611	-5.6836	005° 41.01600' W	057° 51.66780' N	11.6	19/07/2019 10:31	01:31:33
BUC1_LE_08	57.8445	-5.6873	005° 41.23680' W	057° 50.66760' N	10.9	19/07/2019 10:58	01:29:37
BUC1_LE_26	57.8342	-5.6016	005° 36.09660' W	057° 50.05200' N	NA	20/07/2019 06:19	01:55:04
BUC2_LE_27	57.8419	-5.6165	005° 36.98820' W	057° 50.51580' N	17.4	20/07/2019 06:29	01:54:17
BUC2_LE_19	57.8510	-5.6227	005° 37.36020' W	057° 51.05940' N	13.1	20/07/2019 08:39	01:26:59
BUC1_LE_20	57.8594	-5.6483	005° 38.89560' W	057° 51.56280' N	15.6	20/07/2019 08:53	01:33:31

Conclusion

The charter was very successful with all stereo camera and fish trap stations surveyed. MSS staff would like to thank the skipper and crew of the *Walrus* for their continued cooperation, patience, and willingness to provide useful advice and guidance.

Submitted: J Clarke 21 October 2019

Approved: P Boulcott 03 February 2020

Figure 1: Positions of SBRUV and fish trap deployments. Refer to tables 1 and 3 for further details. FT = fish trap; BUC = SBRUV frame. Times are in UTC.