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MFV *Walrus*

Survey 1619H – Part Two (1619Hb)

REPORT

24 September – 2 October 2019

Loading: Aultbea, 23 September 2019
Boarding: Aultbea, 24 September 2019
Unloading: Aultbea, 2 October 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: 8 days, SP02R0 (20490) + 1 day, C80320 (20491)

Sampling Gear & Equipment
12 Fish traps (6 fleets of 2 traps)
2 Baited Remote Underwater Video Camera (SBRUV) frames
4 LED light assemblies in GPH housing
4 SJ6 Legend cameras & underwater housings
Mini drop-frame ('habitat-cam') with GitUp Git 2 camera and Nautilux video light housings
Holding tank for live fish

Overview

Cruise 1619Hb was designed to provide additional data on the habitat associations of juvenile cod, 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 *Walrus* the morning of 23 September.

SBRUV frames and fish traps baited with approximately 500 g of defrosted mackerel and crushed crabs were deployed at stations LE_13 and LE_20 (see Fig. 1). The remaining fleets were deployed further to the north, towards the mouth of the loch, and along the western side. The first two days of charter concentrated on surveying the more exposed sites as the forecast predicted northerly and north-easterly winds later in the week. 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 steadily over the next seven days and was able to successfully survey every station. Fish traps and baited frames were safely and efficiently deployed from the stern of the boat and recovered using a davit system and electric motor.

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

Traps were positioned to the south and south-west of the Isle of Ewe, as this area had yielded good numbers of small whiting earlier in the week and would offer shelter from the strengthening northerly winds. These were left overnight (1 October) and hauled the following morning. Target species (mainly whiting and the occasional cod and wrasse) were transferred to the tank and later to an on-shore vehicle for transport back to the lab.
Unloading occurred in Aultbea on the evening of 2 October and scientific staff returned to Aberdeen the following morning.

Results

Fish Trap Survey

Fleets were deployed during daylight hours and were left for between 6 hours and 6 hours 28 minutes, averaging 6 hours and 7 minutes per deployment. **Table 1** details 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_13	57.84922	-5.64008	21.0	06:00:16	11 & 12
FT_LE_20	57.86275	-5.64634	14.8	06:06:29	9 & 10
FT_LE_30	57.86968	-5.65065	16.8	06:06:00	7 & 8
FT_LE_07	57.87721	-5.66003	19.2	06:05:43	5 & 6
FT_LE_03	57.86232	-5.68240	12.3	06:05:48	3 & 4
FT_LE_25	57.85089	-5.68241	12.3	06:06:17	1 & 2
FT_LE_01	57.81242	-5.58906	24.5	06:01:50	1 & 2
FT_LE_14	57.79548	-5.59413	28.7	06:01:29	3 & 4
FT_LE_24	57.79231	-5.58540	15.2	06:01:42	5 & 6
FT_LE_15	57.79836	-5.60753	23.9	06:01:57	7 & 8
FT_LE_26	57.83730	-5.60749	18.3	06:09:18	9 & 10
FT_LE_27	57.84502	-5.62557	16.6	06:07:18	11 & 12
FT_LE_19	57.85029	-5.61552	10.0	06:01:32	11 & 12
FT_LE_06	57.83919	-5.64742	15.6	06:00:12	9 & 10
FT_LE_08	57.84921	-5.68897	9.6	06:01:28	7 & 8
FT_LE_04	57.85542	-5.68719	12.4	06:02:00	5 & 6
FT_LE_29	57.86501	-5.65542	19.0	06:07:33	3 & 4
FT_LE_05	57.85588	-5.64636	11.0	06:06:14	1 & 2
FT_LE_02	57.78976	-5.62489	15.0	06:14:16	1 & 2
FT_LE_16	57.80890	-5.64192	27.5	06:09:39	3 & 4
FT_LE_11	57.79305	-5.65660	12.5	06:06:22	5 & 6
FT_LE_12	57.80821	-5.66303	9.5	06:04:39	7 & 8
FT_LE_09	57.82836	-5.66296	9.7	06:02:59	9 & 10
FT_LE_10	57.83761	-5.67480	12.6	06:10:04	11 & 12
FT_LE_18	57.81664	-5.60761	29.6	06:15:19	11 & 12
FT_LE_21	57.82338	-5.62612	14.9	06:22:45	9 & 10
FT_LE_17	57.82146	-5.64965	27.1	06:21:50	7 & 8
FT_LE_28	57.77787	-5.62344	9.6	06:15:12	5 & 6
FT_LE_23	57.77034	-5.61420	8.4	06:28:05	3 & 4
FT_LE_22	57.83596	-5.58879	13.7	06:11:51	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**
25/09/2019	*Ctenolabrus rupestris*	0	0	0	0	0	1	0	0	0	0	0	0
	Gadus morhua	0	1	0	0	0	0	0	0	0	0	0	0
	Myoxocephalus scorpius	0	0	0	0	0	0	2	0	0	0	0	0
	Pollachius virens	8	2	4	1	0	0	0	0	0	0	0	0
	Trisopterus minutus	2	3	0	1	0	3	1	1	9	1	0	0
	Cancer pagurus	0	0	0	0	0	0	0	0	0	0	11	9

		Trap ID											
Date	Species	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	Liocarcinus depurator	0	0	0	0	0	0	0	0	0	11	19	35
	Necora puber	0	1	1	0	0	1	0	1	0	6	1	0
26/09/2019	*Limanda limanda*	0	0	0	0	1	1	0	0	0	0	0	0
	Merlangius merlangus	1	3	2	4	3	4	16	7	4	0	1	6
	Trisopterus minutus	31	17	23	7	39	69	24	24	26	32	6	48
	Zeugopterus spp.	0	0	0	0	0	1	0	0	0	0	0	0
	Cancer pagurus	0	0	0	0	0	1	2	2	0	5	0	0
	Carcinus maenas	0	0	1	0	45	17	0	0	1	0	0	0
	Liocarcinus depurator	1	0	8	2	12	6	12	10	19	6	2	1
	Majidae	0	0	0	0	0	0	0	0	3	0	0	1
	Munida rugose	1	0	0	0	0	0	0	0	0	0	0	0
	Necora puber	0	0	0	0	0	0	0	0	0	1	0	0
27/09/2019	*Limanda limanda*	0	0	0	0	0	1	0	0	2	1	0	0
	Merlangius merlangus	0	0	0	1	0	0	0	0	0	0	0	0
	Myoxocephalus scorpius	0	0	0	1	0	0	0	0	0	1	0	0
	Trisopterus minutus	0	0	0	0	4	0	0	0	5	0	0	5
	Cancer pagurus	0	2	1	0	0	0	1	1	1	3	0	0
	Carcinus maenas	0	0	0	0	0	0	1	0	0	0	0	2
	Liocarcinus depurator	7	2	0	0	0	0	1	0	2	0	46	18
	Necora puber	0	1	0	0	5	0	0	1	1	1	1	7
28/09/2019	*Gadus morhua*	1	0	0	0	0	0	0	0	0	0	0	0
	Limanda limanda	0	0	0	0	0	0	0	0	1	0	0	0
	Merlangius merlangus	2	0	9	3	0	0	0	0	0	0	0	3
	Myoxocephalus scorpius	0	0	0	0	0	0	0	0	1	0	0	0
	Pollachius pollachius	0	0	0	0	0	0	0	1	0	0	0	0
	Pollachius virens	0	0	0	0	0	0	0	0	2	9	0	0
	Trisopterus minutus	1	3	37	35	4	0	1	0	1	0	0	0
	Cancer pagurus	0	1	3	0	0	0	0	0	0	0	0	0
	Carcinus maenas	1	0	0	0	0	0	5	3	0	0	0	1
	Liocarcinus depurator	25	14	2	0	0	7	224	1	6	0	2	15
	Majidae	0	1	0	0	0	0	0	1	0	0	0	0
	Munida rugose	0	0	3	0	0	0	0	0	0	0	0	0
	Necora puber	1	0	1	0	0	0	1	2	5	1	0	0
	Paguridae	0	0	0	0	0	0	0	2	0	0	0	0
29/09/2019	*Merlangius merlangus*	0	0	8	4	0	3	3	9	0	0	8	12
	Pollachius virens	0	0	1	0	0	0	0	0	0	0	0	0
	Trisopterus minutus	0	0	0	0	0	0	120	18	0	0	207	262
	Cancer pagurus	0	0	0	0	1	0	0	0	2	1	5	2
	Carcinus maenas	0	0	87	79	91	0	0	0	0	0	0	0
	Liocarcinus depurator	0	0	0	0	0	1	6	8	5	3	6	8
	Necora puber	0	0	0	0	0	0	0	0	0	1	0	0
30/09/2019	*Merlangius merlangus*	0	0	0	0	0	0	0	0	0	0	2	0
	Trisopterus minutus	0	0	0	0	0	0	0	0	0	0	4	3
	Cancer pagurus	0	0	0	0	0	0	0	0	0	0	1	2
	Carcinus maenas	0	0	0	0	0	0	0	0	0	0	18	58

Date	Species	Trap ID											
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	Liocarcinus depurator	0	0	0	0	0	0	0	0	0	0	6	14
	Majidae	0	0	0	0	0	0	0	0	0	0	1	0
	Necora puber	0	0	0	0	0	0	0	0	0	0	2	1
	Paguridae	0	0	0	0	0	0	0	0	0	0	1	0

Stereo Baited Remote Underwater Video (SBRUV) Survey

The SBRUV frames were deployed in depths ranging from 2.9 to 34.0 m, capturing a combined total of 50 hours 28 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	Lat (degree decimal minutes)	Long (degree decimal minutes)	Depth (m)	Date / Time	Soak Time (HH:MM:SS)
BUC1_LE_13	57.85119	-5.63230	057° 51.07140' N	005° 37.93800' W	13.6	25/09/2019 07:34	01:32:57
BUC2_LE_20	57.85908	-5.64779	057° 51.54480' N	005° 38.86740' W	13.2	25/09/2019 07:49	01:33:11
BUC1_LE_30	57.86681	-5.65636	057° 52.00800' N	005° 39.38160' W	19.0	25/09/2019 09:53	01:30:31
BUC2_LE_07	57.87424	-5.65749	057° 52.45440' N	005° 39.44940' W	22.2	25/09/2019 10:17	01:32:56
BUC2_LE_03	57.85838	-5.68476	057° 51.50280' N	005° 41.08560' W	13.4	25/09/2019 13:22	02:10:01
BUC1_LE_25	57.85187	-5.67462	057° 51.11220' N	005° 40.47720' W	17.3	25/09/2019 13:34	01:33:32
BUC1_LE_01	57.80727	-5.59252	057° 48.43620' N	005° 35.55120' W	12.4	26/09/2019 07:41	02:24:43
BUC2_LE_14	57.79907	-5.59880	057° 47.94360' N	005° 35.92800' W	34.0	26/09/2019 07:51	01:33:07
BUC1_LE_24	57.79675	-5.58314	057° 47.80500' N	005° 34.98840' W	8.4	26/09/2019 10:21	01:35:34
BUC2_LE_15	57.79568	-5.61497	057° 47.74080' N	005° 36.89820' W	27.3	26/09/2019 10:42	01:31:52
BUC2_LE_27	57.84208	-5.61635	057° 50.52480' N	005° 36.98100' W	16.9	26/09/2019 13:13	01:31:36
BUC1_LE_26	57.83445	-5.60132	057° 50.06700' N	005° 36.07920' W	11.2	26/09/2019 13:23	01:58:39
BUC2_LE_19	57.85137	-5.62383	057° 51.08220' N	005° 37.42980' W	11.7	27/09/2019 07:27	02:05:41
BUC1_LE_06	57.84360	-5.64284	057° 50.61600' N	005° 38.57040' W	14.6	27/09/2019 07:40	01:32:30
BUC1_LE_08	57.84434	-5.68725	057° 50.66040' N	005° 41.23500' W	9.1	27/09/2019 10:00	01:32:16
BUC2_LE_04	57.86107	-5.68363	057° 51.66420' N	005° 41.01780' W	10.4	27/09/2019 10:15	01:31:48
BUC2_LE_29	57.86117	-5.64704	057° 51.67020' N	005° 38.82180' W	13.5	27/09/2019 13:20	01:41:04
BUC1_LE_05	57.85257	-5.63804	057° 51.15420' N	005° 38.28240' W	6.2	27/09/2019 13:31	02:04:00
BUC1_LE_02	57.79271	-5.61817	057° 47.56200' N	005° 37.09020' W	12.6	28/09/2019 07:42	01:34:52
BUC2_LE_16	57.80556	-5.63175	057° 48.33360' N	005° 37.90500' W	27.6	28/09/2019 07:55	01:32:25
BUC1_LE_11	57.79588	-5.65983	057° 47.75280' N	005° 39.58980' W	9.1	28/09/2019 10:40	01:31:30
BUC2_LE_12	57.81169	-5.65992	057° 48.70140' N	005° 39.59520' W	10.0	28/09/2019 11:06	01:32:59
BUC2_LE_10	57.84138	-5.67606	057° 50.48220' N	005° 40.56300' W	11.9	28/09/2019 13:43	01:32:54
BUC1_LE_09	57.82327	-5.65690	057° 49.39620' N	005° 39.41400' W	6.6	28/09/2019 13:57	02:01:46
BUC1_LE_18	57.81717	-5.61372	057° 49.03020' N	005° 36.82320' W	25.8	29/09/2019 07:25	01:32:59
BUC2_LE_21	57.82691	-5.63403	057° 49.61460' N	005° 38.04180' W	15.9	29/09/2019 07:37	01:33:14

Station ID	Latitude	Longitude	Lat (degree decimal minutes)	Long (degree decimal minutes)	Depth (m)	Date / Time	Soak Time (HH:MM:SS)
BUC2_LE_17	57.81771	-5.65108	057° 49.06260' N	005° 39.06420' W	18.2	29/09/2019 10:44	01:39:58
BUC2_LE_28	57.77417	-5.61690	057° 46.45020' N	005° 37.01400' W	4.5	29/09/2019 13:20	01:52:47
BUC1_LE_23	57.77236	-5.60568	057° 46.34160' N	005° 36.34080' W	2.9	29/09/2019 13:28	01:33:20
BUC1_LE_22	57.83180	-5.58585	057° 49.90800' N	005° 35.15040' W	13.3	30/09/2019 07:24	01:32:59

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.