Not to be cited without prior reference to Marine Scotland, Marine Laboratory, Aberdeen.

MRV *Scotia*

Survey 1721S

PROGRAMME

14 November – 6 December 2021

Loading: Aberdeen, 12 November 2021
Half landing: Greenock, *dates flexible*
Unloading: Aberdeen, 6 December 2021

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.

Out-turn days: 21 – RV2114/20699, 2 – C80040/20397

Fishing Gear: GOV Trawl (BT 137) fitted with ground gear D.
Hydrographic Gear: Seabird 19+ CTD

Objectives

1. Demersal trawling survey (SCOWCGFS-Q4) of the grounds off the north and west of Scotland in ICES Subarea 6a and 7b.

2. To obtain temperature and salinity data from the surface and seabed at each trawling station.

3. Collect additional biological data in connection with the EU Data Collection Framework (DCF).

4. Retrieval and re-deployment of COMPASS moorings located at discrete sites within the survey area.

5. Opportunistic retrieval of 4 acoustic receiver moorings from locations east of Barra Point for the Atlantic Salmon Trust (AST).

6. Potential recovery and retrieval of Hydrographic Glider from a location within the North Minch during the second half of the survey for the National Oceanographic Centre (NOC).

Procedures

General

Loading of the remaining trawl gear and scientific equipment will take place on Friday 12 November with rigging of the gear also commencing on the same day. *Scotia* will sail early on Sunday 14 November. A training haul will be undertaken during the passage north to ensure all fishing gear/sensors are working effectively. *Scotia* will then commence fishing operations the next morning on predefined stations off the north Scottish coast and west of 4'W with weather conditions thereafter determining the route taken on the survey.

Trawling

This is a random-stratified survey design with trawl stations being distributed within 12 predefined strata that cover ICES subarea 6A and 7B (see Figure 1). A total of 60 primary and 38 secondary stations have been generated (Tables 2 and 3 respectively). The intention is for the 60 trawls to be undertaken on suitable ground as near to the specified primary station positions as is practicable, and within a radius of five nautical miles of the station location. In the event that trawling is not possible within 5 nm of any primary station then the nearest appropriate secondary station located within the same stratum will be used. Hauls will be of 30 minutes duration unless circumstances dictate otherwise. Where possible, fishing operations will be restricted to daylight hours. Exact start and finish times will, however, vary slightly according to geographical location. The Scanmar system will be used to monitor the headline height, wing spread and door spread for each haul. Bottom contact data from each trawl will also be collected using the NOAA bottom contact sensor which will be mounted on a bar in the centre of the ground-gear. In addition to the routine sampling, biological data and samples will be collected for target species in line with the EU data regulation and other external projects.

Fish Sampling

All fish will be processed in accordance with the protocols as described in the Manual of the IBTS North Eastern Atlantic Surveys. *Series of ICES Survey Protocols SISP 15. 92 pp. http://doi.org/10.17895/ices.pub.3519.*

Hydrography

A CTD cast will be taken at each trawl station, weather permitting. Top and bottom temperatures will be reported and in addition a calibration sample will be retained from the surface.

Compass Moorings

Eight acoustic moorings were deployed at six separate sites within the survey area and during the first half of 2021. Two days have been allocated from this survey in order to retrieve and redeploy these moorings. Completion of this objective will be at a time and period within the survey that is conducive to both the vessel captain as well as the SIC. An acoustic release system will be deployed from the vessels side deck which, once within range will trigger the hydrostatic release mechanism for each mooring. It will then surface where it can then be retrieved from the side deck. Re-deployment of moorings will similarly be undertaken from the side deck. A table and map providing the confirmed mooring locations can be found below in Table 1 and are also plotted in Figure 1. The Hyskier(1) and Shiants(1) moorings were unable to be recovered during the last opportunity in June, however second moorings were deployed at both these sites. The intention during this survey will be to recover all eight moorings on the list and redeploy one mooring at every one of the six sites listed in table 1.

Table 1: Positions of COMPASS moorings located within the 1721S survey area.

Location name	Date deployed	Depth (m)	Latitude (deg dec min)	Longitude (deg dec min)	Latitude (dec deg)	Longitude (dec deg)
Hyskier(1)	07/03/2021	49	57° 2.125 N	6° 45.171 W	57.035417	-6.75285
Hyskier(2)	09/06/2021	51	57° 2.126 N	6° 45.171 W	57.03543	-6.75285
Shiant Isles(1)	08/03/2021	69	57° 52.161 N	6° 16.188 W	57.86935	-6.2698
Shiant Isles(2)	08/06/2021	70	57° 52.156 N	6° 16.186 W	57.869267	-6.269767
Tolsta Hd	07/06/2021	104	58° 23.634 N	6° 0.220 W	58.3939	-6.00367
Stoer Hd	16/06/2021	100	58° 15.468 N	5° 32.096 W	58.2578	-5.53493
Stanton Bank	06/07/2021	61	56° 4.120 N	8° 3.860 W	56.06867	-8.06433
Garvellachs	10/06/2021	76	56° 14.106 N	5° 45.570 W	56.2351	-5.7595

AST moorings and NOC Hydrographic Glider recovery

Both of the above objectives will only be attempted once the SIC is satisfied that any diversion to effect their retrieval/recovery will not compromise either the trawl or COMPASS mooring objectives.

Normal contact will be maintained with the Marine Laboratory.

Submitted:
F Burns
10 November 2021

Approved:
I Gibb
11 November 2021

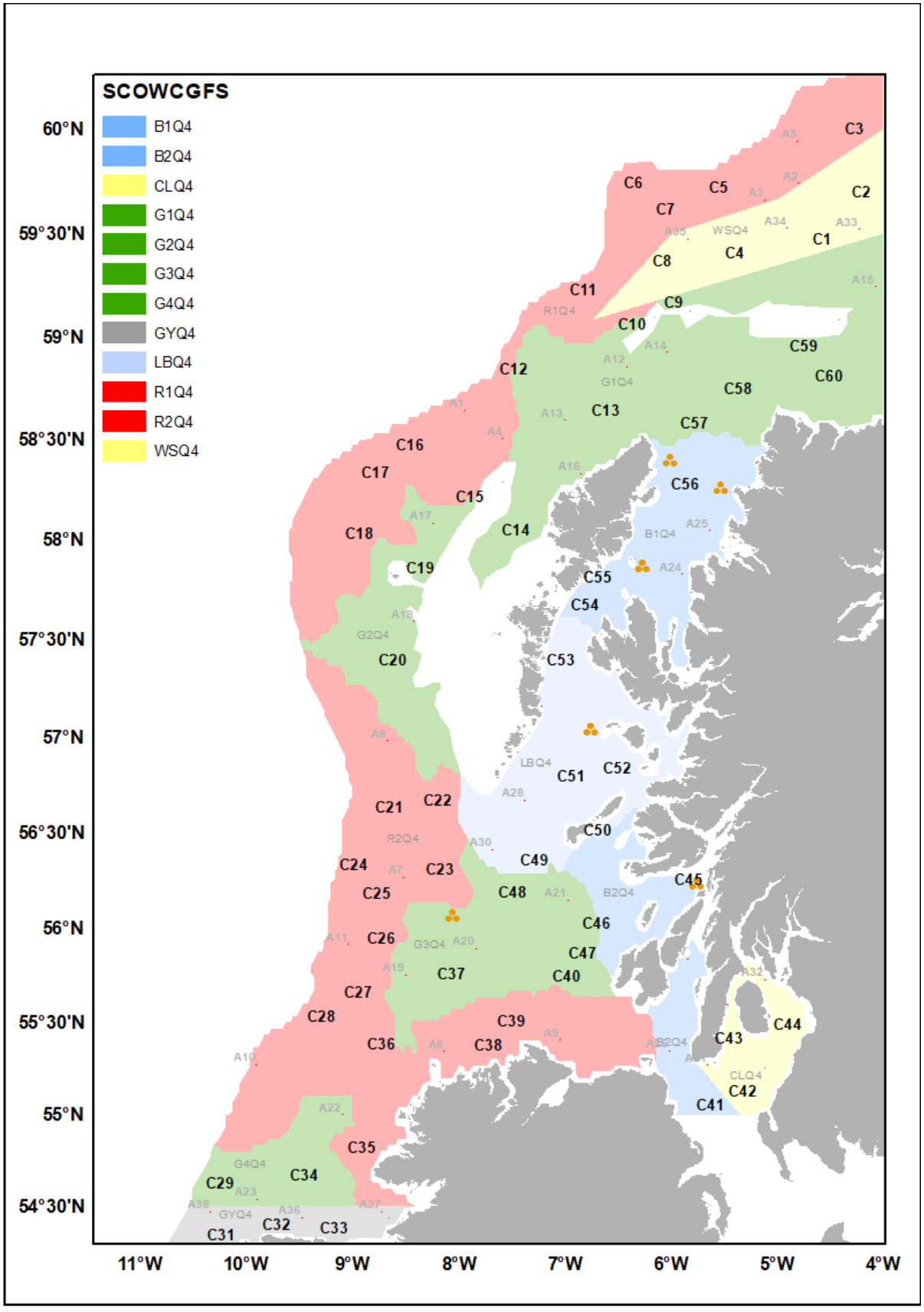

Figure 1: 1721S (SCOWCGFS-Q4) – 2021 ICES Subarea 6A/7B Survey Strata showing primary (bold face) and secondary trawling stations (red dot - plain face). Orange clustered floats denote locations of COMPASS moorings.

Table 2: 1721S – Positions of primary sampling stations.

Station	Decimal Lat	Decimal Lon	Lat	Lon	Stratum	Station	Decimal Lat	Decimal Lon	Lat	Lon	Stratum
C1	59.47034	-4.562933	5928.22N	0433.78W	windsock	C31	54.29572	-10.243213	5417.74N	1014.59W	grey
C2	59.69762	-4.196103	5941.86N	0411.77W	windsock	C32	54.35232	-9.722466	5421.14N	0943.35W	grey
C3	59.9994	-4.260226	5959.96N	0415.61W	red1	C33	54.36804	-9.180128	5422.08N	0910.81W	grey
C4	59.40493	-5.386453	5924.30N	0523.19W	windsock	C34	54.66957	-9.456775	5440.17N	0927.41W	green4
C5	59.71854	-5.546301	5943.11N	0532.78W	red1	C35	54.81796	-8.919511	5449.08N	0855.17W	red2
C6	59.74281	-6.344003	5944.57N	0620.64W	red1	C36	55.37865	-8.649123	5522.72N	0838.95W	red2
C7	59.61157	-6.041026	5936.69N	0602.46W	red1	C37	55.75473	-8.069589	5545.28N	0804.18W	green3
C8	59.36334	-6.090561	5921.80N	0605.43W	windsock	C38	55.37331	-7.726518	5522.40N	0743.59W	red2
C9	59.16422	-5.969089	5909.85N	0558.15W	green1	C39	55.50212	-7.50971	5530.13N	0730.58W	red2
C10	59.06142	-6.365147	5903.69N	0621.91W	green1	C40	55.71131	-6.98904	5542.68N	0659.34W	green3
C11	59.22586	-6.824476	5913.55N	0649.47W	red1	C41	55.04805	-5.60397	5502.88N	0536.24W	blue2
C12	58.83961	-7.484621	5850.38N	0729.08W	green1	C42	55.12185	-5.325885	5507.31N	0519.55W	clyde
C13	58.6404	-6.612474	5838.42N	0636.75W	green1	C43	55.4078	-5.455287	5524.47N	0527.32W	clyde
C14	58.04672	-7.457771	5802.80N	0727.47W	green1	C44	55.48492	-4.999425	5529.10N	0459.97W	clyde
C15	58.21218	-7.901108	5812.73N	0754.07W	red1	C45	56.25104	-5.83078	5615.06N	0549.85W	blue2
C16	58.46989	-8.460272	5828.19N	0827.62W	red1	C46	56.02498	-6.698562	5601.50N	0641.91W	green3
C17	58.33369	-8.78244	5820.02N	0846.95W	red1	C47	55.8624	-6.771596	5551.74N	0646.30W	green3
C18	58.02805	-8.937995	5801.68N	0856.28W	red1	C48	56.18343	-7.496789	5611.01N	0729.81W	green3
C19	57.85394	-8.366916	5751.24N	0822.01W	green2	C49	56.35712	-7.219254	5621.43N	0713.16W	lightblue
C20	57.38635	-8.626747	5723.18N	0837.60W	green2	C50	56.51022	-6.693515	5630.61N	0641.61W	lightblue
C21	56.6322	-8.657348	5637.93N	0839.44W	red2	C51	56.79142	-6.936582	5647.49N	0656.19W	lightblue
C22	56.66605	-8.1961	5639.96N	0811.77W	red2	C52	56.8344	-6.505996	5650.06N	0630.36W	lightblue
C23	56.30892	-8.178423	5618.54N	0810.71W	red2	C53	57.38995	-7.046541	5723.40N	0702.79W	lightblue
C24	56.33187	-9.094426	5619.91N	0905.67W	red2	C54	57.66679	-6.919127	5740.01N	0655.15W	blue1
C25	56.17918	-8.771125	5610.75N	0846.27W	red2	C55	57.80829	-6.689638	5748.50N	0641.38W	blue1
C26	55.94115	-8.70902	5556.47N	0842.54W	red2	C56	58.2754	-5.872666	5816.52N	0552.36W	blue1
C27	55.65464	-8.945958	5539.28N	0856.76W	red2	C57	58.54173	-5.781824	5832.50N	0546.91W	green1
C28	55.52483	-9.298615	5531.49N	0917.92W	red2	C58	58.74516	-5.371793	5844.71N	0522.31W	green1
C29	54.62159	-10.161759	5437.30N	1009.71W	green4	C59	58.98333	-4.749151	5859.00N	0444.95W	green1
C30	54.27805	-10.534226	5416.68N	1032.05W	grey	C60	58.80977	-4.506571	5848.59N	0430.39W	green1

Table 3: 1721S – Positions of secondary sampling stations.

Station	Decimal Lat	Decimal Lon	Lat	Lon	Stratum	Station	Decimal Lat	Decimal Lon	Lat	Lon	Stratum
A1	58.64277	-7.940647	5838.57N	0756.44W	red1	A20	55.89189	-7.835228	5553.51N	0750.11W	green3
A2	59.74016	-4.790567	5944.41N	0447.43W	red1	A21	56.14802	-6.965859	5608.88N	0657.95W	green3
A3	59.66165	-5.111757	5939.70N	0506.71W	red1	A22	55.0016	-9.09125	5500.10N	0905.48W	green4
A4	58.50389	-7.576714	5830.23N	0734.60W	red1	A23	54.53986	-9.892453	5432.39N	0953.55W	green4
A5	59.94154	-4.800565	5956.49N	0448.03W	red1	A24	57.82703	-5.886983	5749.62N	0553.22W	blue1
A6	55.34363	-8.130284	5520.62N	0807.82W	red2	A25	58.04637	-5.630017	5802.78N	0537.80W	blue1
A7	56.26773	-8.512938	5616.06N	0830.78W	red2	A26	55.34756	-6.010697	5520.85N	0600.64W	blue2
A8	56.9783	-8.668718	5658.70N	0840.12W	red2	A27	55.83684	-5.830827	5550.21N	0549.85W	blue2
A9	55.40529	-7.044524	5524.32N	0702.67W	red2	A28	56.67105	-7.376639	5640.26N	0722.60W	lightblue
A10	55.27173	-9.899678	5516.30N	0953.98W	red2	A29	57.15518	-7.208784	5709.31N	0712.53W	lightblue
A11	55.91309	-9.031751	5554.79N	0901.91W	red2	A30	56.41257	-7.67512	5624.75N	0740.51W	lightblue
A12	58.85739	-6.414392	5851.44N	0624.86W	green1	A31	55.27014	-5.647999	5516.21N	0538.88W	clyde
A13	58.59282	-6.999496	5835.57N	0659.97W	green1	A32	55.72731	-5.112712	5543.64N	0506.76W	clyde
A14	58.92538	-6.025645	5855.52N	0601.54W	green1	A33	59.52274	-4.223056	5931.36N	0413.38W	windsock
A15	59.24362	-4.069545	5914.62N	0404.17W	green1	A34	59.52662	-4.897992	5931.60N	0453.88W	windsock
A16	58.32876	-6.843126	5819.73N	0650.59W	green1	A35	59.47384	-5.836987	5928.43N	0550.22W	windsock
A17	58.08413	-8.236848	5805.05N	0814.21W	green2	A36	54.43835	-9.471763	5426.30N	0928.31W	grey
A18	57.58807	-8.415118	5735.28N	0824.91W	green2	A37	54.47206	-8.720044	5428.32N	0843.20W	grey
A19	55.75387	-8.494869	5545.23N	0829.69W	green3	A38	54.47161	-10.337488	5428.30N	1020.25W	grey