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MRV *Alba na Mara*

Survey 0823A

REPORT

2-16 June 2023

Loading: Fraserburgh, 30 May 2023

Gear change: Fraserburgh 10 June 2023

Unloading: Fraserburgh, 16 June 2023 (please note most equipment will remain on board for 0923A)

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 per project: 20696 - 15 days

Equipment

SBE CTD with fluorometer

International Young Gadoid Trawl PT154 with 4.8 mm Codend;

Jackson Rockhopper Trawl BT158 with **10 mm Codend** (error on board meant fishing with a 35mm codend)

Prawn sorting table

Scanmar depth unit, trawl width and height units

Day Grabs x 2 and sieving table

Background and Objectives

0823A will conduct a survey of fish distributions within and around offshore windfarm development sites in the Moray Firth. This survey is part of the PrePARED (Predator and Prey Around Renewable Energy Development) project and aims at quantifying the fine and broad scale effects of OWF (Offshore Windfarm Development) on fish distributions and, indirectly, the effects of changes in prey distributions on marine top-predators.

Objectives

- 1. To conduct a fisheries acoustic survey to assess the distribution and abundance of pelagic fish in the Moray Firth OWF development sites**

To undertake an acoustic survey of sandeels and clupeid fish in the water column using 38 and 120 kHz. Concentrations of fish will be sampled using the pelagic trawl. Species composition and length frequency distributions of fish caught will be determined. Subsamples will be weighed and their otoliths removed to establish length-weight relationships and age composition.

2. **To conduct RoxAnn survey of the substrate along the acoustic survey track (Figure 1).**

3. **To conduct a demersal fishing survey in the Moray Firth adjacent to the Windfarm sites**

To assess abundance, length-frequency-distribution, and weight-at-length of demersal fish at fixed stations in the Moray Firth region by demersal trawl survey. Samples will be retained for energy content analysis at a later date.

4. **CTD and FLNTU**

To sample variation in water temperature, conductivity, turbidity and chlorophyll-a through the water column using a SBE CTD sampler and Fluorometer at all demersal trawl stations and additional where required.

Narrative

Alba na Mara departed Fraserburgh harbour by 09:40 hours on 2 June 2023 after all scientific staff had joined the vessel.

Alba na Mara steamed towards transect number 12 and started acoustic surveying after completing a CTD station. Surveying continued till some marks suitable for fishing were detected in the sounder and the pelagic, mid-water net (PT154), was deployed to sample the identified marks. Figure 1 shows the complete survey with Figure 2 and 3 focusing on CTD stations and trawling respectively.

Issues with the CTD winch and the discrepancies between its amount of paid out wire and the actual depth indicated by the sounder were investigated and solved on 4 June.

Acoustic surveying along the predetermined transects, CTD sampling and fishing continued daily till 5 June when *Alba na Mara* sailed towards Scapa Flow in Orkney to calibrate the EK60 equipment. Given Scapa Flow's sheltered nature it is often an optimal location choice for calibration.

Alba na Mara anchored at Scapa Flow from the evening of 5 June and began calibrating the 200 kHz frequency till 22:00 hours. *Alba na Mara* anchored in Scapa Flow for the night. The following day the calibration continued and was completed successfully for all frequencies. *Alba na Mara* then slowly made passage south towards the south part of Transect 1 in readiness to restart the acoustic survey on the morning of 6 June.

Once Transect 1 was completed the survey continued south by steaming towards Transect 13 and completing it by 17:00 hours. Along Transect 13 some small marks were seen on the sounder and were fished on with the pelagic net. After the haul Transect 13 was restarted and completed by 17:00 hours. Given the distance to the anchorage planned for that evening at Spey Bay the *Alba na Mara* started steaming on completion of the Transect.

The survey continued on 8 and 9 June with one more fishing event at Transect 14. On the Evening of 9 June the *Alba na Mara* went to Fraserburgh harbour and moored up.

On Saturday 10 June the fishing gear was changed from the pelagic net (PT154) to the bottom trawl (BT158). This was completed by the afternoon of that day. The acoustic technician disembarked at this point.

The *Alba na Mara* stayed in Fraserburgh harbour for the night of Saturday 10 June. The following day (11 June 2023) the ship left Fraserburgh harbour at 07:00 hours and did a "shakedown" trawl 10 NM northwest of Fraserburgh to ensure the BT158 was fishing correctly. After this successful trial the ship steamed towards a tow in the vicinity of Transect 14 and deployed the BT158 for a 30 minute sample. Fish were processed and samples were retained for bomb calorimetry work. Table 1 shows the main species per haul.

Two hauls were undertaken on 12 June at the northern ends of Transects 6 and 1 and fish processed and samples taken. On 13 June two more fishing operations took place one at the southern end of Transect nine and the second at the roughly in the middle of transect 17. The vessel then slowly steamed over tight to the southern end of Transect one ready to fish.

At 07:00 hours on 14 June we deployed the net to fish at the southern end of Transect 1, and after completing this made way for the southern end of Transect 5 where we deployed the net again at 11:00 hours. This was the final haul of the trip and we steamed to anchor in Macduff Bay.

The vessel made way for Fraserburgh after cleaning the fishing gear and began de-rigging the BT 158 for the next survey. We arrived in Fraserburgh around 12:25 hours and finished scrubbing down and cleaning the scientific spaces.

It was subsequently noticed that the BT158 had the wrong codend attached and fishing was undertaken with a 35 mm codend. This would not have retained any small fish including sandeel and many small clupeids. Attempts will be made to resample some of the demersal stations.

Submitted:
R Main
July 2023

Approved:
J Wilson
February 2024

Figure 1: Map showing the acoustic transects (black lines), pelagic trawls (pink crosses), demersal trawls (blue crosses) and CTD in the Moray Firth. Also shown is the calibration location in Scapa Flow (green circle).

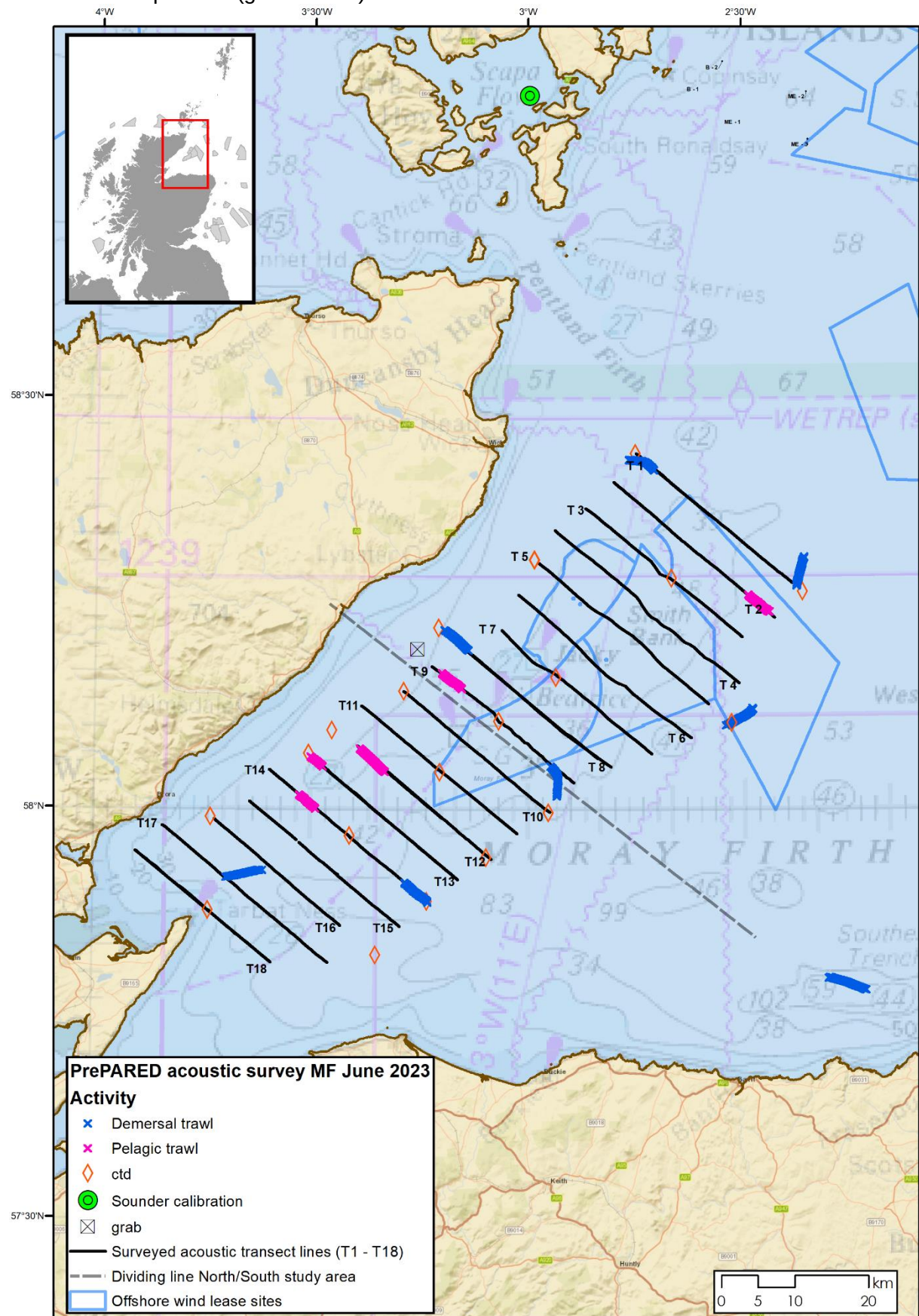


Figure 2: Map showing the acoustic transects (black lines), pelagic (pink crosses) and demersal (blue crosses) trawl stations in the Moray Firth.

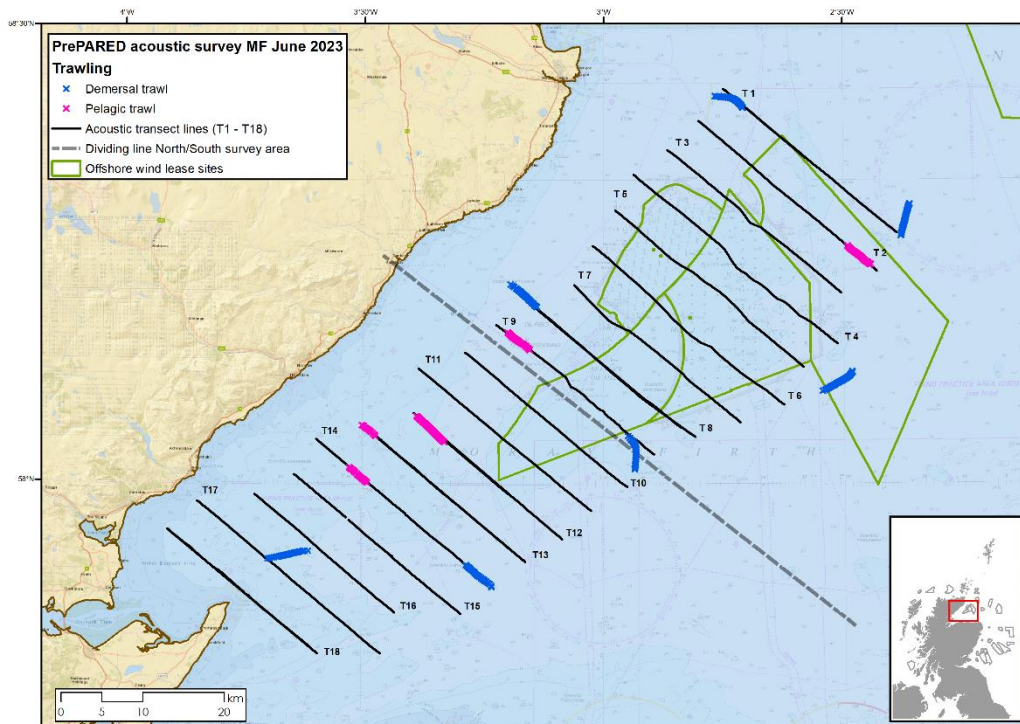
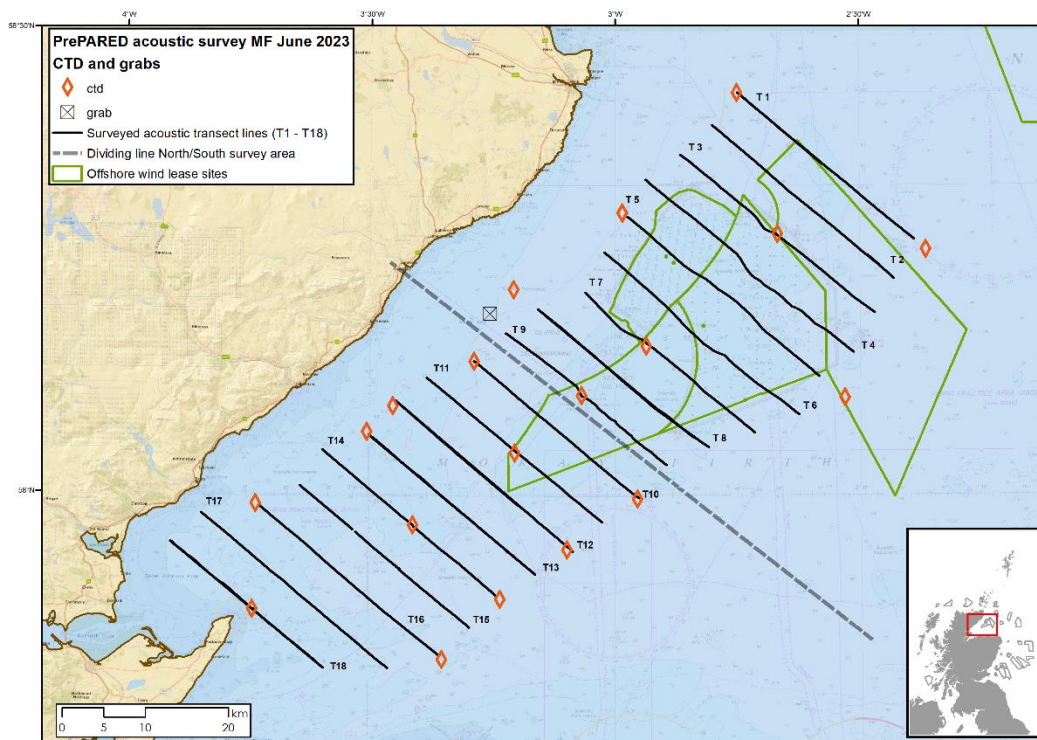


Figure 3: Map showing the acoustic transects (black lines) and CTD stations (orange diamond) in the Moray Firth.



	Gear type>>>	pelagic	pelagic	pelagic	pelagic	pelagic	demersal	demersal	demersal	demersal	demersal	demersal	demersal
	Haul number>>>	A23/143	A23/144	A23/145	A23/146	A23/147	A23/148	A23/149	A23/150	A23/151	A23/152	A23/153	A23/154
Species caught													
HAD nos.		57	6	2	-	1	153	520	464	137	89	674	343
HAD wgt. (kg)		10.09	1.1	0.4	-	0.3	37	100.3	50	31.6	13.2	150	58.7
WHI nos.		-	-	-	-	-	119	47	118	12	38	304	230
WHI wgt. (kg)		-	-	-	-	-	11.13	6.3	6.8	0.97	1.6	32.6	17.2
SPR nos.		-	-	-	-	-	30	-	399	-	-	-	64
SPR wgt. (kg)		-	-	-	-	-	0.33	-	5.7	-	-	-	0.7
HER		-	-	-	-	-	40	-	-	-	-	113	1
HER wgt. (kg)		-	-	-	-	-	1.3	-	-	-	-	6.4	0.06
CDA nos.		-	-	4	-	-	631	58	408	497	158	233	306
CDA wgt. (kg)		-	-	0.12	-	-	20.4	2.2	11.5	19.8	4.6	9	10.6
LSO nos.		-	-	1	-	-	3	19	68	58	-	214	164
LSO wgt. (kg)		-	-	0.06	-	-	0.1	1.36	21.2	2.8	-	17.7	10.5
PLA nos.		-	-	3	-	-	192	109	312	256	179	124	118
PLA wgt. (kg)		-	-	0.2	-	-	16.4	12.6	3.3	18.5	15.9	10.4	18.3
RSA nos.		-	45	-	-	1	-	-	-	-	-	-	-
RSA wgt. (kg)		-	0.01	-	-	0.02	-	-	-	-	-	-	-
Notes					only jellyfish caught								

Table 1: Weights of main species caught per haul.