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MRV Alba na Mara

Survey 0919A

PROGRAMME

8-12 June 2019

Ports: Fraserburgh

Loading: Fraserburgh, 04 June 2019
Unloading: Fraserburgh, 12 June 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.

Costs to Project: RE01W0 (5 days).

Equipment:
Pelagic net PT 154
"Bongo" net plankton sampling equipment
Seabird SBE19 CTD
Water sampling mini-rosette
Sandeel dredge
Day grab and grab table
EK 60 sounder

Objectives:

Primary objectives

1. To study the distribution of prey species (fish schools, zooplankton patches) across the Smith Bank in relation to data available from BOWL post-construction digital aerial surveys and UoA PAM surveys of top predators.

2. To compare the distribution of schooling sandeels in summer with data on their presence in the sediment from the BOWL/MORL winter sandeel monitoring

Secondary objectives:

1. To collect hydrographic data to further validate the Scottish Shelf Model (SSM) and incorporate its outputs into assessment of drivers of predator distribution.

Procedure

All sampling gear will be transported to Fraserburgh and rigged will on 4 June.

Visitors and MS staff will join the vessel the day before sailing from Marine Scotland, departing Aberdeen at 10:00 on Friday 7 June.

On Saturday 8 June the *Alba na Mara* will sail towards the first transect at the BOWL sampling location. The survey will finish on 11 June and all staff and visitors, scientific equipment and collected samples will return to the Marine laboratory on 12 June.

Contact will be maintained during the survey with the MEOW operations team to ensure that additional survey investigations can be undertaken if and when piling activities are instigated.

Primary Objectives:

Alba na Mara will conduct acoustic surveys using the EK60 sounder along key transects that are concurrently being surveyed using HiDef digital aerial surveys and PAM deployments.

The time period of this survey covers a similar period as the BOWL post-construction digital aerial surveys (May to July 2019), when sandeels are in the water column during daylight to feed.

Acoustic surveys will be made within five pre-selected aerial survey transects (see Figure 2) passing between wind farm turbine rows.

Acoustic data will be collected for all available frequencies.

Concurrent visual surveys collect data at different levels of the trophic web using a multi-disciplinary approach.

Line-transect surveys will be conducted at an average speed of 8 knots. Two replicates of the line transects will be carried out within each 500m wide aerial survey transect (Figure 2).

Pelagic sampling for sandeels using the PT 154 net will be conducted early on in the day to capture the change of light.

A sandeel dredge will be deployed as a back-up should the pelagic net not catch any samples.

Shooting positions will be chosen along the survey transects but not necessarily in the same orientation as these.

The shooting and hauling position of the trawls will be recorded. The trawl duration will be of 30 minutes.

Due to the light periods relevant to sandeel capture this survey will operate a working timetable of 06:00 to 18:00.

Plankton sampling will be done using the “bongo” net dual sampler using nets of 200 and 68µm mesh size. Collected samples will be preserved in a number of ways: 70% alcohol, 4% formaldehyde and vital stain neutral red. Positions for these have been planned as stratified random positions along the transect lines, Figure 3 shows these positions.

Survey activities during turbine piling activities

The *Alba na Mara* will survey around any turbine piling activities should these start at the MEOW site. *Alba na Mara* will collect biological samples at a predetermined safety distance from the piling activities. Daily contact with the MEOW operation team will ensure that the Alba can sample soon after piling events are completed.

Secondary objective:

1) A grid of hydrographic sampling stations will be sampled during the survey to collect data for the SSM. At each station a CTD together with a water sampler will be deployed. The plankton sampling net will also be deployed at these locations. See Figure 3

CTD profiles will be collected throughout each transect at stratified random positions to provide information on the temperature and salinity. Water sampling will be performed at the same time using the mini-rosette in conjunction with the CTD.

Should the CTD not work in conjunction with the mini-rosette, reversible bottles will be used for collecting the required water samples.

Location names:

- Beatrice Offshore Wind farm Limited (BOWL)
- Moray East Offshore Wind farm (MEOW)
- Moray West Offshore Wind farm (MWOW)

The locations of waypoints for start/end of transects, hydrographic sampling points and map of general area to be studies can be seen in Figure 2 and 3 and the geographic positions of these in tables 1 and 2.

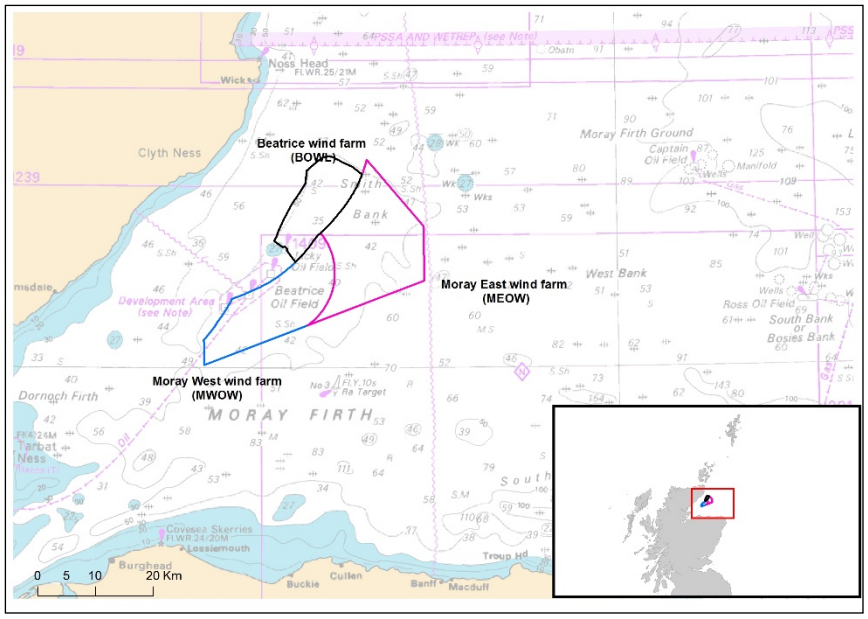

Figure 1: Survey location and wind farm development sites.

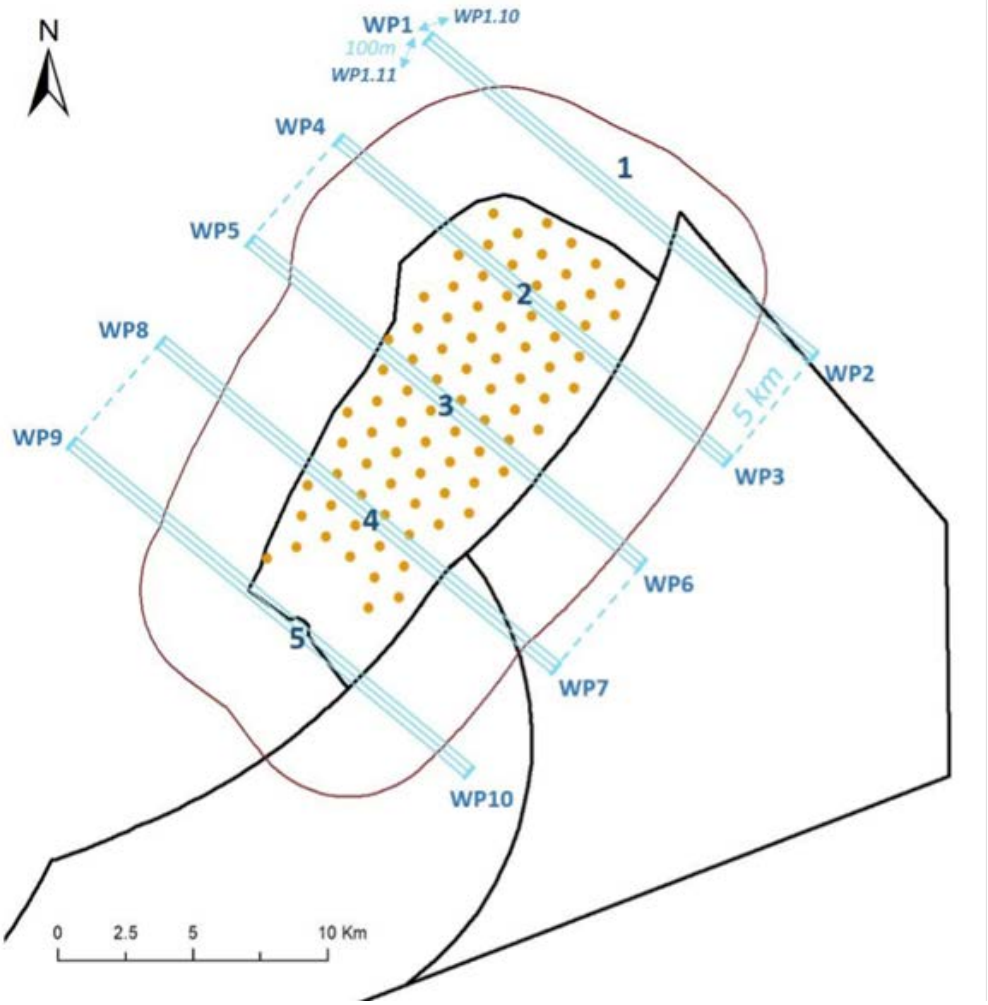

Figure 2: Proposed transects for fisheries acoustic surveys.

Table 1: Proposed way points for fisheries acoustic survey transects.

Transect	Way point number	lat (decimal degrees)	long (decimal degrees)	Distance from Hidef survey line	Baseline	lat (degrees , decimal minutes)	long (degrees, decimal minutes)
1	1	-2.897489	58.380951	0	B	58° 22.857' N	2° 53.849' W
1	2	-2.653912	58.274445	0	B	58° 16.467' N	2° 39.235' W
2	3	-2.708511	58.239958	0	B	58° 14.397' N	2° 42.511' W
2	4	-2.953942	58.347214	0	B	58° 20.833' N	2° 57.237' W
3	5	-3.010374	58.31349	0	B	58° 18.809' N	3° 0.622' W
3	6	-2.763082	58.205488	0	B	58° 12.329' N	2° 45.785' W
4	7	-2.81762	58.17104	0	B	58° 10.262' N	2° 49.057' W
4	8	-3.066785	58.279778	0	B	58° 16.787' N	3° 4.007' W
5	9	-3.123175	58.246079	0	B	58° 14.765' N	3° 7.390' W
5	10	-2.872136	58.136605	0	B	58° 8.196' N	2° 52.328' W
1	1	-2.896398	58.381643	100	N	58° 22.899' N	2° 53.784' W
1	2	-2.652816	58.275133	100	N	58° 16.508' N	2° 39.169' W
2	3	-2.707417	58.240646	100	N	58° 14.439' N	2° 42.445' W
2	4	-2.952854	58.347907	100	N	58° 20.874' N	2° 57.171' W
3	5	-3.009288	58.314183	100	N	58° 18.851' N	3° 0.557' W
3	6	-2.76199	58.206177	100	N	58° 12.371' N	2° 45.719' W
4	7	-2.81653	58.171729	100	N	58° 10.304' N	2° 48.992' W
4	8	-3.065701	58.280471	100	N	58° 16.828' N	3° 3.942' W
5	9	-3.122094	58.246773	100	N	58° 14.806' N	3° 7.326' W
5	10	-2.871048	58.137295	100	N	58° 8.238' N	2° 52.263' W
1	1	-2.898579	58.38026	100	S	58° 22.816' N	2° 53.915' W
1	2	-2.655008	58.273757	100	S	58° 16.425' N	2° 39.300' W
2	3	-2.709606	58.23927	100	S	58° 14.356' N	2° 42.576' W
2	4	-2.95503	58.346522	100	S	58° 20.791' N	2° 57.302' W
3	5	-3.01146	58.312797	100	S	58° 18.768' N	3° 0.688' W
3	6	-2.764175	58.2048	100	S	58° 12.288' N	2° 45.850' W
4	7	-2.81871	58.170351	100	S	58° 10.221' N	2° 49.123' W
4	8	-3.067869	58.279085	100	S	58° 16.745' N	3° 4.072' W
5	9	-3.124257	58.245385	100	S	58° 14.723' N	3° 7.455' W
5	10	-2.873223	58.135915	100	S	58° 8.155' N	2° 52.393' W
B= Baseline, N = North, S= South							

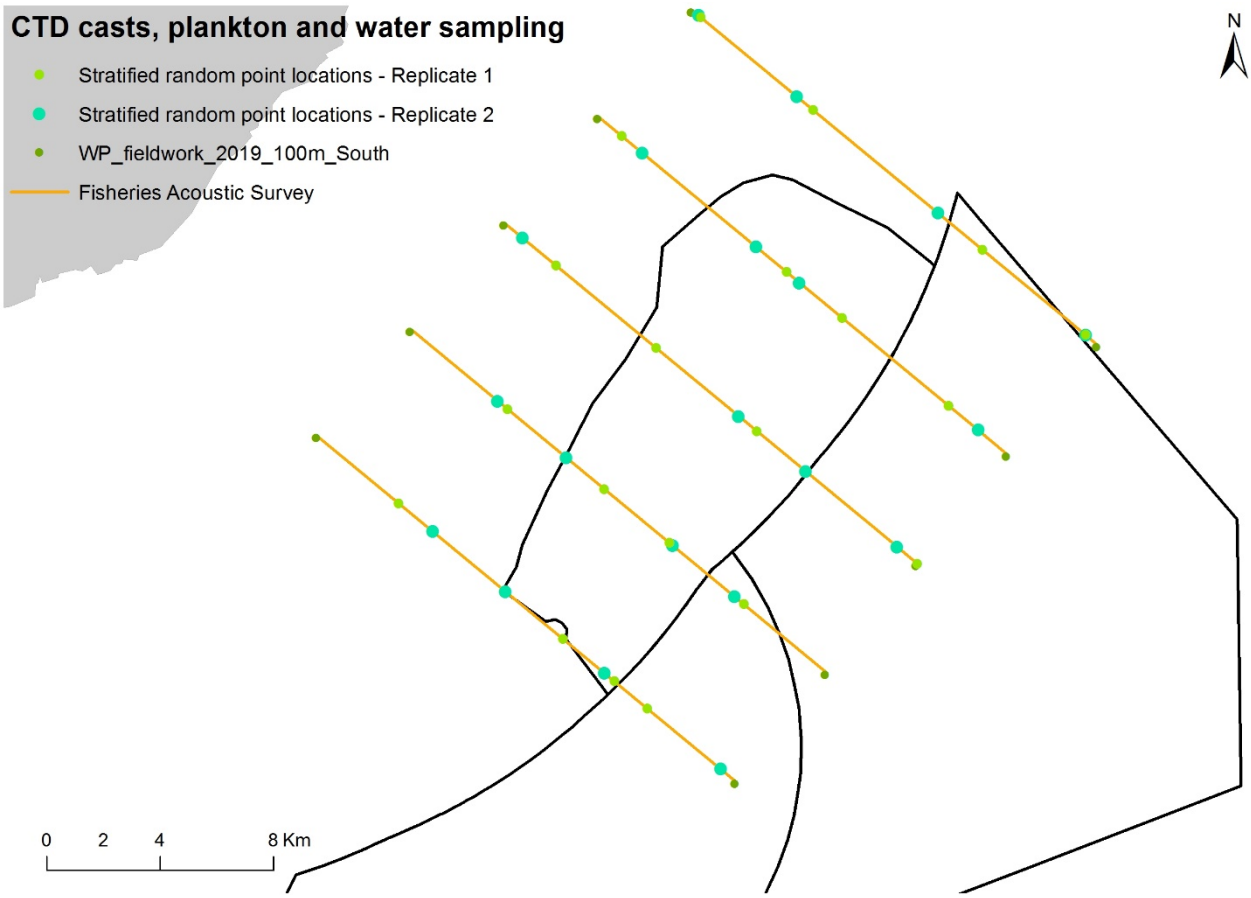

Figure 3: Hydrographic and plankton sampling positions.

Table 2: Hydrographic and plankton sampling positions.

Replicate	lat (decimal degrees)	long (decimal degrees)	lat (degrees , decimal minutes)	long (degrees, decimal minutes)
1	58.278	-2.662	58° 16.674' N	2° 39.703' W
1	58.305	-2.723	58° 18.298' N	2° 43.402' W
1	58.256	-2.744	58° 15.334' N	2° 44.639' W
1	58.206	-2.763	58° 12.333' N	2° 45.793' W
1	58.283	-2.808	58° 17.007' N	2° 48.469' W
1	58.349	-2.825	58° 20.967' N	2° 49.508' W
1	58.298	-2.841	58° 17.884' N	2° 50.476' W
1	58.248	-2.859	58° 14.856' N	2° 51.558' W
1	58.193	-2.867	58° 11.570' N	2° 52.040' W
1	58.379	-2.893	58° 22.732' N	2° 53.562' W
1	58.212	-2.912	58° 12.739' N	2° 54.721' W
1	58.274	-2.920	58° 16.443' N	2° 55.196' W
1	58.160	-2.925	58° 9.595' N	2° 55.523' W
1	58.341	-2.940	58° 20.480' N	2° 56.427' W
1	58.168	-2.945	58° 10.109' N	2° 56.703' W
1	58.229	-2.951	58° 13.760' N	2° 57.062' W
1	58.182	-2.976	58° 10.917' N	2° 58.557' W
1	58.300	-2.980	58° 18.012' N	2° 58.795' W
1	58.255	-3.009	58° 15.281' N	3° 0.553' W
1	58.225	-3.075	58° 13.494' N	3° 4.472' W
2	58.278	-2.661	58° 16.666' N	2° 39.686' W
2	58.317	-2.750	58° 18.993' N	2° 44.990' W
2	58.354	-2.835	58° 21.216' N	2° 50.080' W
2	58.379	-2.894	58° 22.764' N	2° 53.636' W
2	58.336	-2.928	58° 20.152' N	2° 55.677' W
2	58.248	-2.726	58° 14.868' N	2° 43.576' W
2	58.309	-3.000	58° 18.540' N	3° 0.005' W
2	58.211	-2.775	58° 12.653' N	2° 46.517' W
2	58.257	-3.015	58° 15.432' N	3° 0.899' W
2	58.195	-2.873	58° 11.717' N	2° 52.377' W
2	58.216	-3.054	58° 12.955' N	3° 3.237' W
2	58.141	-2.881	58° 8.442' N	2° 52.886' W
2	58.197	-3.010	58° 11.815' N	3° 0.619' W
2	58.295	-2.833	58° 17.676' N	2° 50.005' W
2	58.306	-2.860	58° 18.362' N	2° 51.576' W
2	58.235	-2.830	58° 14.091' N	2° 49.805' W
2	58.252	-2.870	58° 15.141' N	2° 52.213' W
2	58.211	-2.910	58° 12.682' N	2° 54.591' W
2	58.239	-2.974	58° 14.357' N	2° 58.432' W
2	58.171	-2.951	58° 10.265' N	2° 57.060' W

Normal contact will be maintained with the laboratory

Submitted:
R Watret
31 May 2019

Approved:
I Gibb
31 May 2019