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MRV *Alba na Mara*

Survey 0915A

REPORT

10-30 June 2015

Loading: Fraserburgh, 8 June 2015
Boarding: Fraserburgh, 17:00 hours, 9 June 2015.
Unloading: Fraserburgh, 30 June 2015

Personnel

P Boulcott	SIC
J Clarke	10-30 June
T Regnier	10-22 June
M O'Malley	10-15 June
D Eerkes-Medrano	10-15 June
C Greathead	15-30 June
J González-Irusta	15-22 June
C Hall	22-30 June
J Mair	22-30 June

Project: 21 days, RE0060

Gear

10-15 June	**15-22 June**	**22-30**
PT154	2m beam trawl	3 x fish traps + accessories
Birdwatching chairs	4ft modified scallop (sandeel) dredge	2 x Day grab + table + wts + square sieve (3 x 0.5mm)
Nephrops sorting table	Scanmar depth unit	Round sieve table. Circular sieves: 5mm , 1mm
BT158 + spares or patchings		Pyramid frame and underwater video camera kit
Scanmar depth, head and wing units		Pyramid frame calibration mesh (2 x wire panels)

Background

The central objective of EIWiF is to monitor the broader ecological environmental impact of offshore renewable developments. This work will concentrate on the developments proposed east of the Firth of Forth estuary. Several potential impacts have been identified in the scientific literature, varying from seemingly negative to seemingly positive impacts, but these impacts are often highly nuanced and have been difficult to detect. EIWiF maximises the power to detect

effects by focusing upon components of the ecosystem where impacts might be seen to be greatest: i.e. in fish, seabird, epifaunal, and infaunal communities. The project also utilises long-running, historical data collected over the past 23 years by MSS. The study will combine these historical data with targeted, pre- and post- impact surveys in a before/after control/impact (BACI) framework to document changes in community structure.

Objectives

1. To undertake an acoustic survey of sandeels and clupeid fish in the water column using 38 and 120 kHz.

2. To conduct RoxAnn survey of the substrate along all acoustic survey tracks.

3. To conduct seabirds-at-sea survey and a survey of marine mammals along the acoustic survey track.

4. To assess abundance, length-frequency-distribution, and age- weight-at-length of demersal fish predators at eight fixed stations in the Firth of Forth area by demersal trawl survey.

5. To assess abundance, length-frequency-distribution, and age- weight-at-length of demersal fish, and abundance and total biomass of benthic invertebrates, in the Neart na Gaoithe development site and three further control areas.

6. To assess abundance, length-frequency-distribution, and age- weight-at-length of sandeels in the Neart na Gaoithe development site and three further control areas.

7. To conduct a UW TV survey of stations in the Neart na Gaoithe development site and three further control areas.

8. To conduct a survey of demersal fish using fish traps in the Neart na Gaoithe development site and three further control areas.

Narrative

Scientists joined the vessel at 17:00 hours on the evening of 9 June, making way for the study site at 04:00 hours the next day. The acoustic survey began on the morning of 11 June. Five transects were surveyed acoustically at 38 and 120 kHz to examine the abundance of sandeels and clupeid fish in the water column. Concentrations of fish were sampled in three trawls using the PT154 pelagic trawl (Figure 2). Species composition and length frequency distributions of fish caught were determined and sub-samples were weighed and their otoliths removed to establish length-weight relationships and age composition. RoxAnn data was collected throughout the acoustic transects to support the development of seabed sediment maps. Seabirds at sea data was also collected simultaneously using standard transect census methods to determine the numbers of seabirds using the study area on a daily basis, and their distribution over the area. The acoustic survey was completed on the afternoon of 13 June. At this time the *Alba na Mara* made way for Montrose to load on nets for the demersal survey.

Alba na Mara left Montrose to begin the demersal survey at 14:00 hours on 13 June. A total of eight demersal trawl stations were fished using the BT158 over the next two days (Figure 3). All

eight demersal stations have been fished in previous PICMATOP cruises, supporting a database extending back to 1997. Each catch was worked up to determine numbers at length of all species caught. Trawl performance metrics were recorded using Scanmar equipment to enable swept area to be determined. In addition, size stratified samples of cod, haddock and whiting were weighed to determine their length-weight relationships. The abundance and biomass of selected invertebrate species was also recorded from each catch.

On the afternoon of 15 June, *Alba na Mara* made way for Montrose. Due to a failure in the steering mechanism, the vessel remained at her berth in Montrose for the following four days awaiting repair. Due to the concomitant loss of survey days, the planned switch over to the TV survey was cancelled. Changes in scientific crew roster were also made to accommodate this change. Once repairs were effected the vessel returned to the survey site at 12:00 hours on 19 June to begin the beam trawl survey. A further crew change was undertaken on the morning of 20 June. The beam survey resumed at 13:00 hours on the same day and continued until a reoccurrence of the steering problem on 23 June forced the vessel to return to port. The vessel berthed in Leith at 13:30 hours on the same day awaiting engineering support. The vessel resumed the survey activities two days later at 16:00 hours on 25 June. However, all survey activity ceased on the evening of 26 June due to a further recurrence of the vessel's steering problem. Due to safety concerns it was decided to end the survey at this juncture. The vessel made way for Fraserburgh on 27 June, two days earlier than scheduled, arriving at her berth at 18:30 hours.

Results

The acoustic survey of the five transects surrounding the development area and the seabird at sea survey were completed in their entirety (Figure 1.). In total, 15 demersal trawls, and three pelagic trawls were completed during the survey (Figure 2). Seven of these demersal trawls specifically targeted the Neart na Gaoithe (NNG) development. Ten sandeel trawls were performed targeting likely sediment within NNG and two control boxes (Figure 3). To sample epibenthos, 30 beam trawls, ten in each area, were completed within the confines of NNG and the two controls (Figure 4.).

Due to time lost to survey, Objectives 7 and 8 were not met during the survey. A proportion of the survey work designed to underpin Objectives 5 and 6 was also sacrificed. No survey work of the Firth of Forth control box was undertaken during the survey.

Submitted:
P Boulcott,
28 June 2015

Figure 1: The broad scale study area showing the five acoustic transects (green dashed line) used in the pelagic fish and seabird at sea survey. Proposed renewable developments (red line) and survey boxes (purple boxes) are also shown.

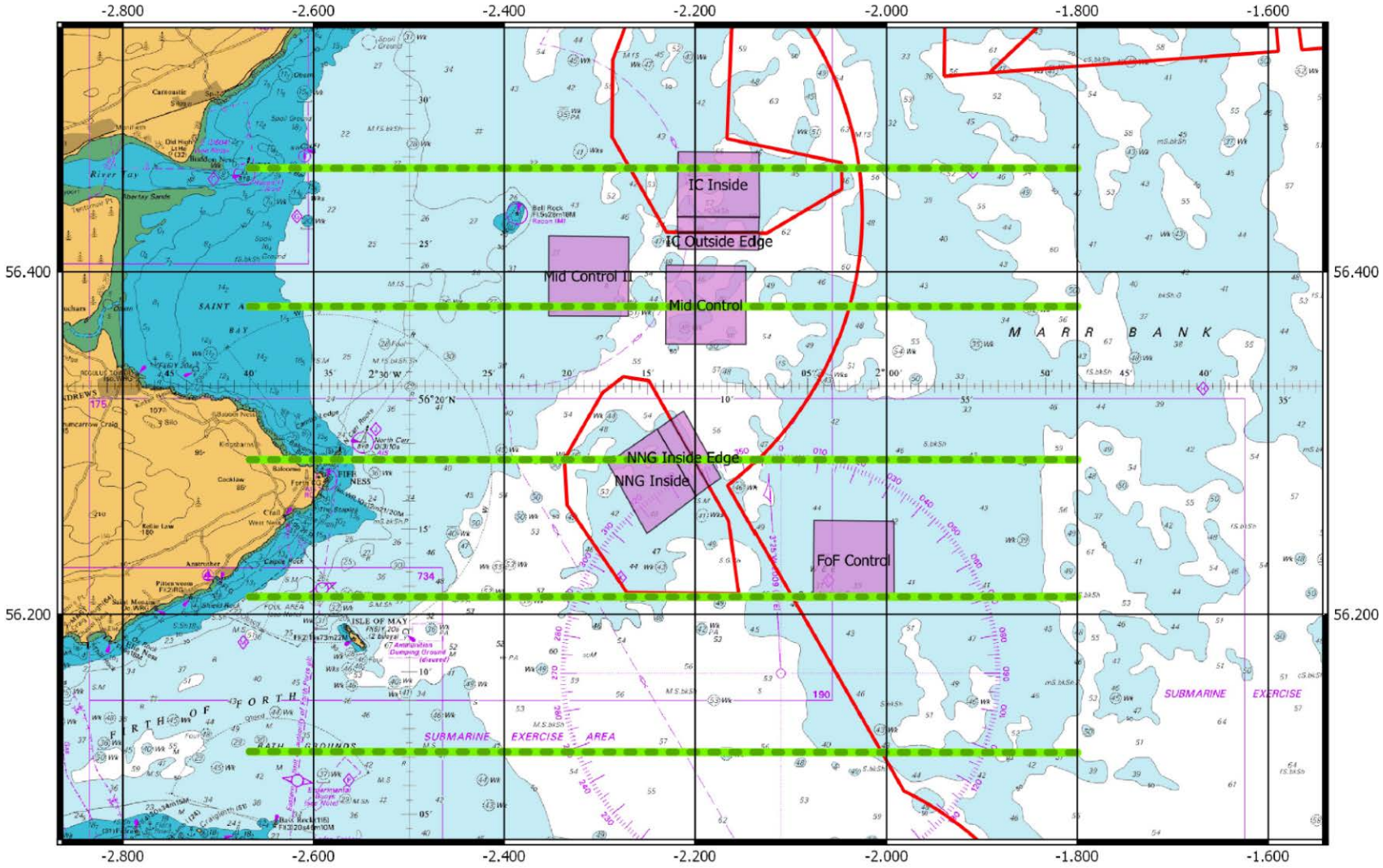

Figure 2: The 15 demersal stations (red) sampled with the BT158 net (30 minutes.) during the broad-scale survey (eight tows) and a target survey of the NNG development (seven tows). Three pelagic tows performed during the broad-scale survey are shown in green.

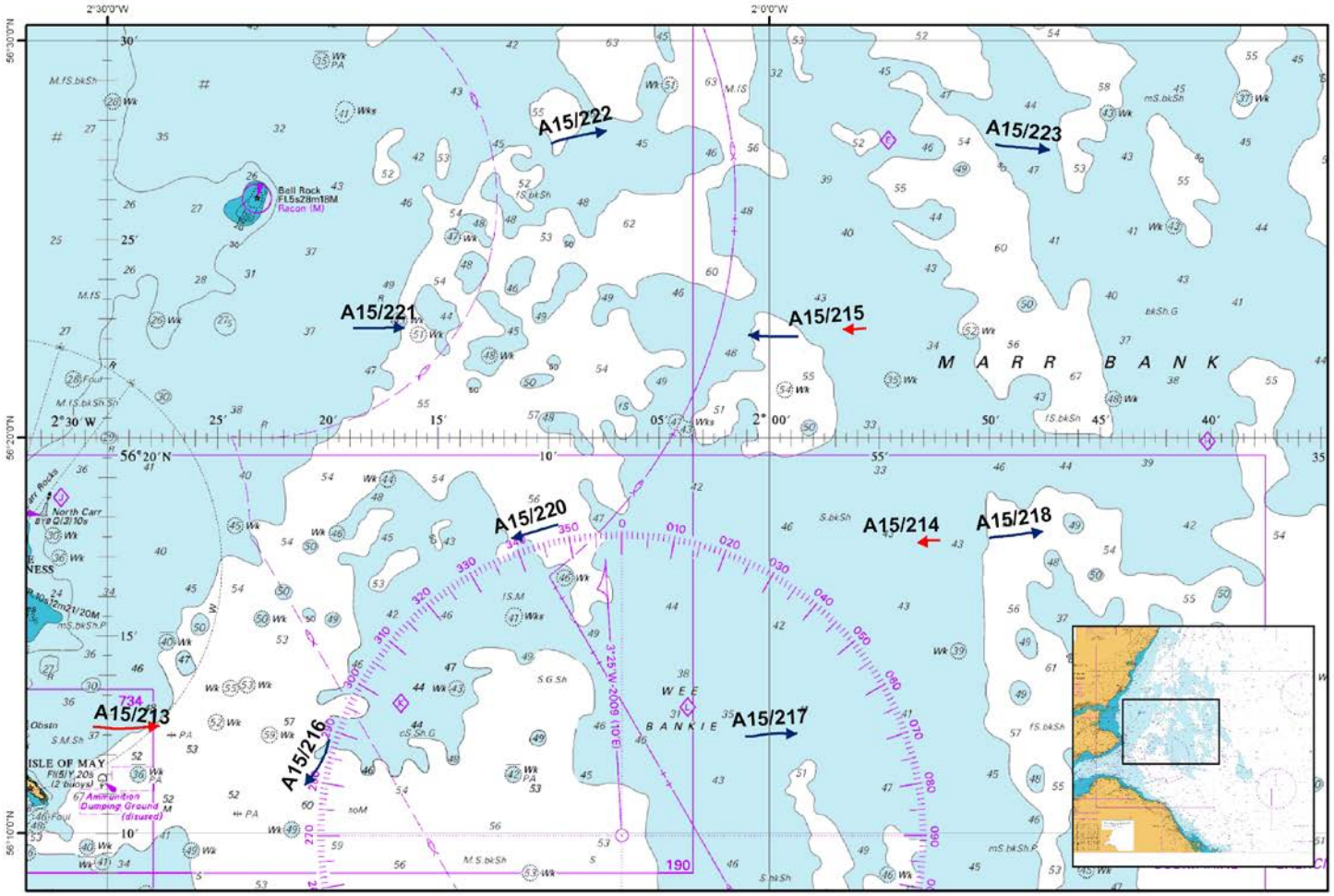

Figure 3: The position of sandeel tows (10 minutes) performed in 0915a.

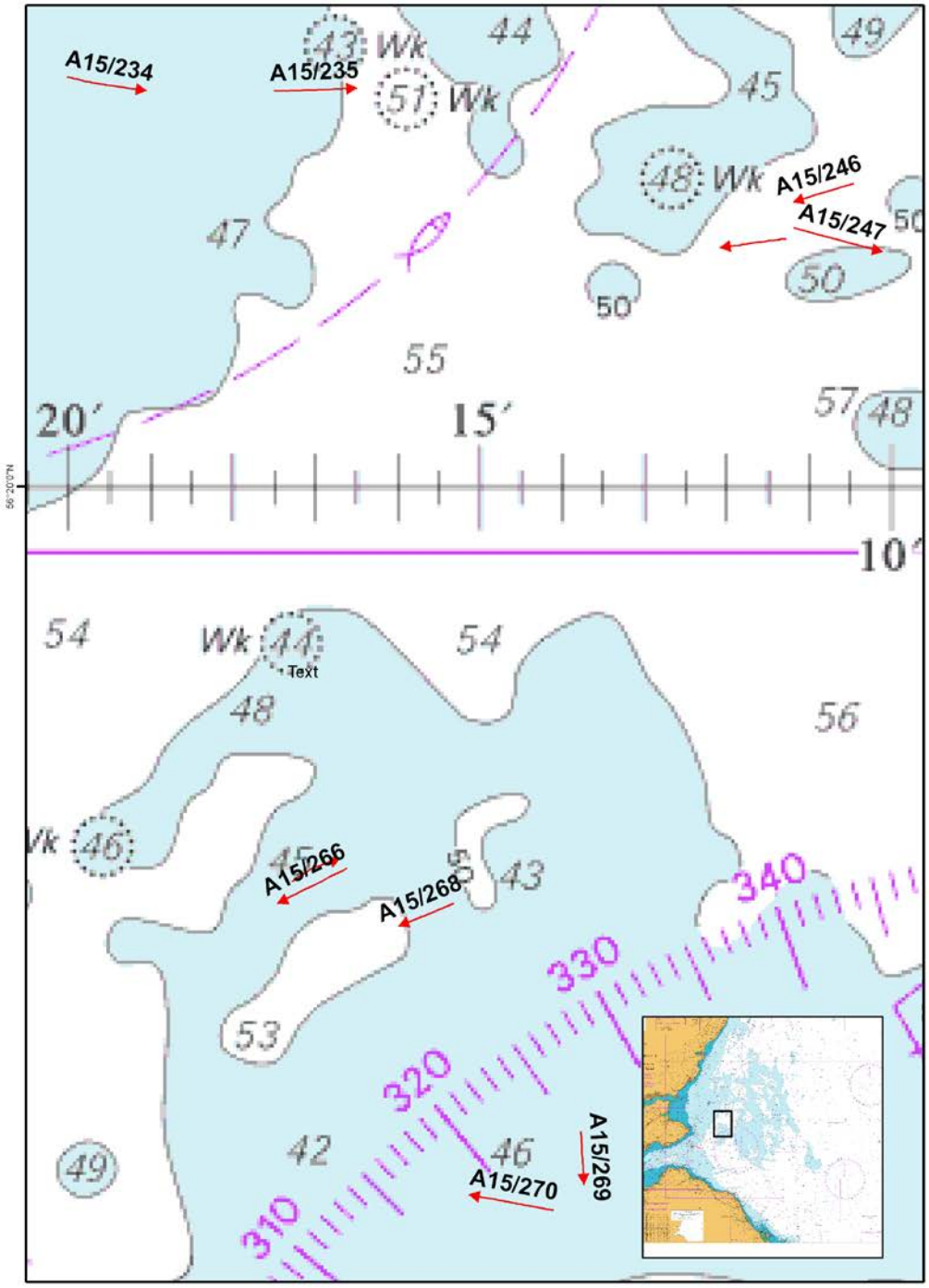

Figure 4: Locations (red lines) of beam trawl tows (5 minutes.) within the NNG development and 2 other control boxes.