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MRV *Alba na Mara*

Survey 0513A

## PROGRAMME

25 April – 13 May 2013

### Ports

**Loading:** Fraserburgh, 22 April 2013

**Departing:** Fraserburgh, 25 April 2013

**Unloading:** Fraserburgh, 13 May 2013

**Half Landing:** (provisional) Montrose, 05 May 2013

In setting the cruise 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 cruise with staff on-board before work is commenced.

In the interest of efficient data management it is now mandatory to return the Cruise Report, to I Gibb and the Cruise Summary Report (old ROSCOP form) to M Geldart, within four weeks of a cruise ending. In the case of the Cruise Summary Report a nil return is required, if appropriate.

### Scientific Personnel

25–30 April	1–5 May	5–13 May	provisional dates
Philip Boulcott John Clarke José González	Philip Boulcott John Clarke José González Clare Greathead Mike Stewart	Philip Boulcott John Clarke José González Clare Greathead T.B.C.	SIC

**Estimated days by project:** 19 days, ST0070

### Sampling Gear & Equipment

- Gulf III plankton sampler (x2), flow meters and cradle.
- Seabird CTD, reversing bottles and chlorophyll water sampling kit.
- Dual Bongo net (68µm and 200µm mesh) and flow meters.
- 2m square Methot net (x 2) and 5m bridles (x2).
- Scanmar depth units (x2).

- International Young Gadoid Trawl PT154 with 6 mm Codend.
- Jackson Rockhopper Trawl BT158 with 10 mm Codend.
- Prawn sorting table.
- Formaldehyde + Isopropanol sample bottles.

## **Overview**

The work carried out during this survey will inform the PICMATOP research project that examines the effects of climate change on forage fish dynamics. Sandeel larvae collected will be aged and the data used to perform a larval survival analysis. Pelagic and demersal fish surveys along with bird surveys are carried out under PICMATOP to examine trophic relationships in the marine ecosystem.

## **Objectives**

### **1. Larval sampling**

- 1.1. To sample sandeel larvae at 21 stations off the east-coast of Scotland and within the Wee Bankie/Marr Bank PICMATOP study area (Figure 1). Two plankton tows will be performed at each station using the Gulf III plankton sampler and the Methot net. Samples will be preserved in isopropanol (propan-2-ol, 80% conc.) and analysed (aged) in the laboratory. Whole larval samples (n=50) will also be collected and frozen at five stations (see Figure 1) for otolith microchemistry.
- 1.2. To sample plankton communities at each station. Samples will be collected at the 21 stations using a vertically deployed, dual bongo net. These samples will be stored in formalin and will be analysed in the laboratory at a later time for sandeel prey.
- 1.3. To sample the variation in temperature and salinity in the water column using a Seabird CTD sampler. The CTD will be deployed in conjunction with the dual bongo net.
- 1.4. To collect further water samples and chlorophyll samples at each station. Water samples will be taken during the deployment of the dual bongo nets. Water sample depths will vary between stations.

### **2. Pelagic fishing & Bird Survey**

- 2.1. 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.
- 2.2. To conduct RoxAnn survey of the substrate along all acoustic survey tracks.
- 2.3. To conduct seabird at sea survey and survey of marine mammals along the acoustic survey track.

### 3. Demersal fishing survey

- 3.1. To assess abundance, length-frequency-distribution, and weight-at-length of demersal fish predators at 19 fixed stations in the area off Wee Bankie by demersal trawl survey. Samples will be retained for stomach analysis at a later date.
- 3.2. To sample variation in water temperature, salinity and fluorometry through the water column using a Seabird CTD sampler at all demersal trawl stations and at 44 locations on and between the demersal trawl stations. Water (at varied depths) and chlorophyll samples will also be collected at each station

#### Procedure

Scientific equipment will be loaded onto *Alba na Mara* on 22 April at Fraserburgh harbour. Scientists will join the vessel in the late afternoon of Wednesday 24 April. *Alba na Mara* will make passage to the study site the following morning to begin the larval sampling programme. Daily scientific sampling will occur between 0600 hrs and 1800 hrs. Plankton samples (using the bongo net), water samples, and CTD transects will be taken at each station during a single vertical deployment from the side of the vessel. Further samples of sandeel larvae will then be collected using the GULF III plankton sampler, towed in a double oblique pattern, and the Methot net. The successful completion of the most eastward stations may require the vessel to lie-out overnight, weather permitting. It is expected that the vessel will berth in Leith docks on the afternoon of the 30 April where additional equipment will be loaded. Indicated changes to scientific staff take place at this time.

*Alba na Mara* will leave Leith at the earliest possible juncture on the morning of Wednesday 1 May, at which time work on the acoustic survey will commence following the route indicated in Figure 2. Concentrations of pelagic fish will be sampled using the PT154, aiming to fish twice each day if possible. Trawl samples will be worked up to determine the total catch at length of each species. Sub-samples of herring, sprats and sandeels will be weighed to determine length-weight relationships and will have their otoliths removed for age composition assessment back at the laboratory. RoxAnn data will be collected along the acoustic transect to enable the development of seabed sediment maps. Seabirds at sea data will also be collected 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. This acoustic survey work will require approximately four to five days.

*Alba na Mara* will return to Montrose in the late afternoon of the 4 May (provisional date) for the purposes of a half landing. Changes to equipment and scientific staff will be made at this time. The vessel will then leave Montrose as early as is possible after the completion of a 24 hour rest period.

It is hoped that between 6 May and the morning of 12 May a total of 19 trawl stations (Figure 3) will be fished using the BT158. All stations have been fished in previous surveys. Each catch will be worked up to determine numbers at length of all species caught. Trawl performance characteristics will be monitored using Scanmar equipment to enable swept area to be determined. Catch size will then be converted to point density estimates. Size stratified samples of cod, haddock and whiting will be weighed to determine their length-weight relationships. Samples of fish will be retained for analysis back at the laboratory to determine diet and food consumption rates, energy reserve status and age. Prior to each demersal fishing operation, the Seabird CTD sampler will be deployed. In addition, a further 25 deployments of the CTD will be made between fishing stations. The demersal survey will cease in time to arrive in Fraserburgh by the evening of the 12 May. Scientific equipment

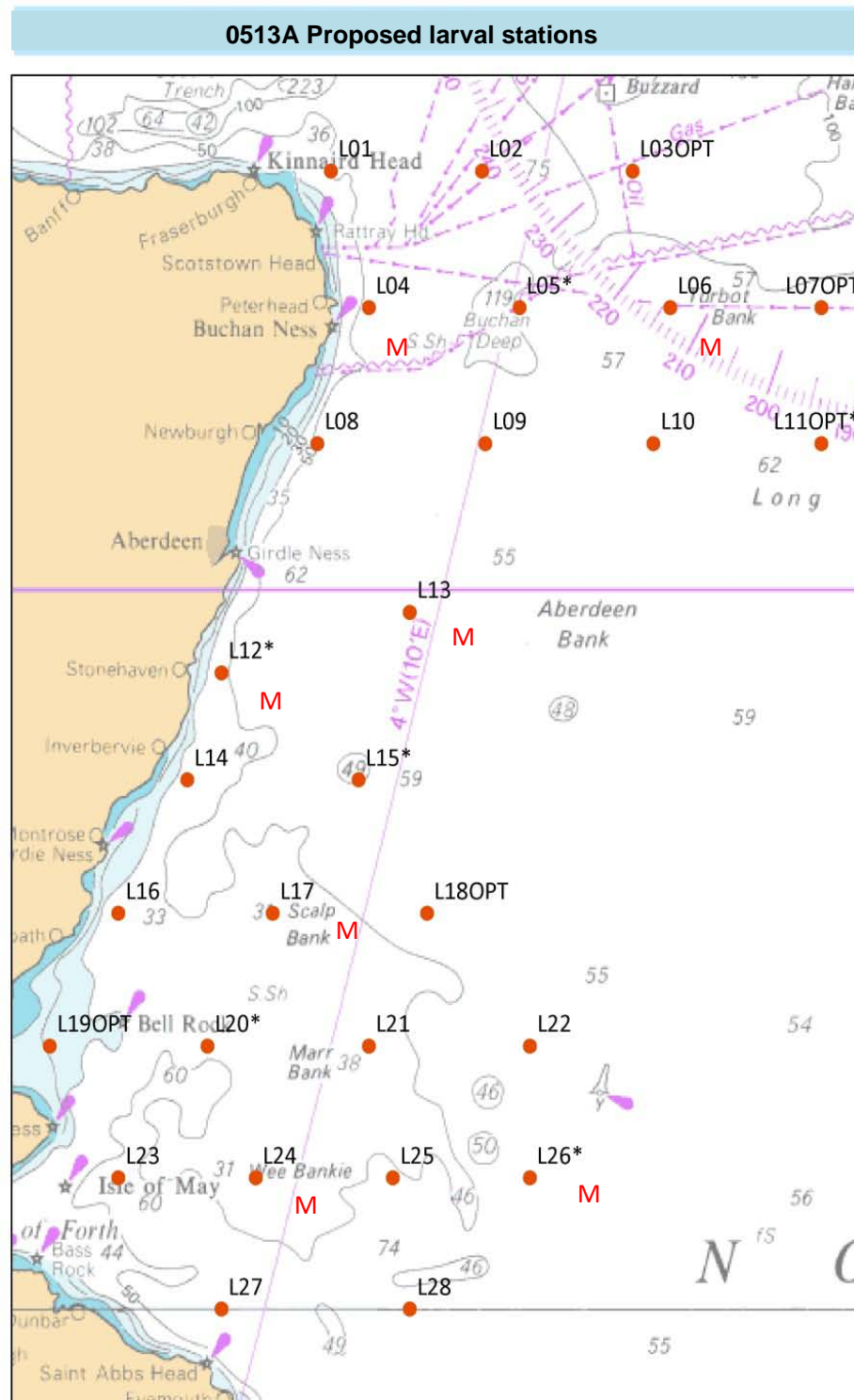
will be offloaded at the earliest opportunity on Monday 13 May, and the scientists will leave the vessel.

Normal contacts will be maintained with the Marine Laboratory.

Submitted  
P Boulcott  
17 April 2013

Approved  
I Gibb  
18 April 2013.

**Figure 1:** Proposed larval sampling stations. A vertical deployment of the bongo net, double oblique tow of the Gulf III plankton sampler, and a single oblique tow of the Methot net will be made at each of the stations. Stations marked with a red “M” denote sites where frozen larvae (n=50) will be collected for the purposes of otolith microchemistry.





**Figure 3:** 0513A demersal fishing + CTD (blue circle) and CTD (red) stations.

