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MRV *Scotia*

Survey 0714S

## PROGRAMME

3-25 June 2014

**Loading:** Aberdeen 31 May 2014

**Sailing:** Aberdeen 3 June 2014

**Half landing:** Greenock 14 June 2014

**Unloading:** 25 June 2014

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.

## Personnel

A Weetman (SIC)  
C Shand  
N Collie  
C Mesquita  
M Inglis  
G McAllister  
K Boyle  
S Dickens  
Prof M Roberts (Heriot-Watt, 11-14 June 2014)  
A Lyndon (Heriot-Watt, 11-14 June 2014)  
N Valeyrie (Heriot-Watt, 11-14 June 2014)  
R Hoban (SIFT, 11-14 June 2014)

**Estimated days by project:** 8 days RV1404 20251 (North Sea)  
12 days RV1405 20252 (West Coast)  
3 days MSMASTS1 20072 (Clyde AUV project)

## Gear

2 x Scotia BT175 80mm prawn trawls  
2 x Day grabs and 1 x sieving table  
Towed UWTV sledge and the UWTV drop frame (large frame version)  
2 x 600m umbilical towing cables and associated TV equipment (including back up)  
AUV equipment (provided by Heriot-Watt University)

## Objectives

1. To obtain estimates of the abundance and distribution of *Nephrops* burrow complexes at Fladen, in the North Minch, the South Minch, the Firth of Clyde, in the Sound of Jura and at Devil's Hole. If time and weather permits, stations at the Noup may also be surveyed.
2. To use the TV footage to record the occurrence of other benthic fauna as well as evidence of commercial trawl activity.
3. To collect sediment samples at each station.
4. To carry out trawling for *Nephrops*, based on one haul in each sediment stratum in each of the main survey areas, to obtain samples of *Nephrops* for size composition analysis.
5. To collect samples of *Nephrops* for comparison of reproductive condition and morphometrics in each of the different survey areas (functional units).
6. To collect *Nephrops* biological samples for DNA analysis from the west coast on behalf of IMR Norway.
7. To carry out proof of concept activities on *Nephrops* grounds in the Clyde using an Autonomous Underwater Vehicle (AUV) provided, and managed, by Heriot-Watt University.
8. To record and retain marine litter obtained from trawling activities in as part of the MSFD.

## Procedures

The main areas in which the survey will take place have been surveyed on an annual basis for a number of years and are shown in Figure 1. A combination of two approaches will be used to derive the survey positions. The majority of stations will be generated by employing the traditional stratified random technique in all areas except the North Minch, where stations will be randomly generated within the boundaries of commercial *Nephrops* fishing effort, obtained from the Vessel Monitoring System. The location of all TV stations will be provided ahead of the cruise.

Weather permitting, it is planned that the vessel will first steam to the deep water in the Southern Trench (in the East of the Moray Firth), where a training session in deploying the sledge and approximately 450 m of cable, will be deployed. The sledge will then be recovered and when this procedure is completed to the satisfaction of all involved, the vessel can then progress on to the first of the *Nephrops* burrow TV stations at the SW edge of the Fladen ground. Once the work at Fladen has been completed, the vessel will then steam around to the west coast and survey stations in the North and South Minches.

Time will be limited in the Minches as the vessel needs to reach a rendezvous point off Campbeltown (precise location yet to be established) on the morning of 11 June. Here, three members of staff from Heriot-Watt University and one staff member from SIFT will be transferred to *Scotia* via the ship's RIB (involving two journeys). All their equipment, including the AUV, will be loaded on 31 May and unloaded on 14 June at the half landing. TV and AUV operations will be carried out in parallel when in the Clyde. The AUV will be released and recovered by *Scotia's* RIB. Each deployment of the AUV will last approximately four hours in which time normal TV operations will continue. Once recovered

the AUV will require a similar amount of time on board to download the data before being redeployed. RIB operations and, therefore, AUV deployments will only take place during daylight hours.

Due to staff commitments the half landing has to take place no later than 14 June at Greenock (a berth has been provisionally booked). At this time all staff from Heriot-Watt and SIFT will disembark and all related equipment will be unloaded. There are no plans for a change of MSS staff at the half landing.

Following the half landing any remaining TV stations in the Clyde will be surveyed before continuing the survey in the Sound of Jura, followed by the remaining South and North Minch stations whilst working north. If time and weather permits, a small number of stations at the Noup will be attempted before heading east. Any additional stations in Fladen (if required), or those not covered on the first leg of the cruise, will be completed before heading to the final survey area at the Devils Hole.

When on station, sledge deployments and TV observations will be carried out 24 hours a day. There will be three teams working eight hour shifts and all will be involved in deploying and recovering the TV equipment, recording data and liaising with the ship's compliment. Two of the teams will comprise of two people and one team will have three people. There will be a requirement for staff to review video footage at sea outwith their shift period, as well as assisting in working up trawl catches, data entry and if required, assisting with AUV operations when in the Clyde. All work will be carried out in accordance with WTD regulations. The names of staff on each shift, watch leaders and the shift patterns will be provided to the ship prior to sailing.

At each TV station a video camera mounted on to the TV sledge will be towed along the seabed for approximately 10 minutes at approximately one knot and in to the tide – the ship's dynamic positioning will be required for this. Observed *Nephrops* burrows, individual *Nephrops* and other benthic fauna will be recorded onto DVD for analysis. The depth and distance travelled by the sledge, as well as camera height from the sea bed, will be recorded automatically. Where practical sediment samples will be taken using the mini van Veen grab mounted on the sledge. However, it may be necessary to use the Day Grab on occasion, if the mini van Veen fails. All sediment samples will be frozen.

Trawl caught samples of *Nephrops* will be collected and information on size composition, maturity and morphometrics will be recorded. In addition DNA samples taken from *Nephrops* will be collected and stored in Ethanol. Microsol, a sterilising solution, will also be used in very small quantities. COSHH and risk assessments will be made available prior to sailing – both products have a low risk rating used in normal working conditions. Up to five trawls may be made in Fladen with a maximum of three tows in each of the other survey areas. Trawls will be carried out over different sediment types as defined by BGS. Trawls will be no longer than one hour long and carried out at either dawn or dusk. Any litter collected in the trawl will be recorded as per protocol and placed in bags to be disposed of on return to port. There will be a requirement for the trawl to be cleaned by 'streaming' it behind the vessel for 15 minutes between the main fishing areas, as well as a final, more prolonged clean at the end of the survey.

During the survey, normal contacts will be maintained with the Laboratory.

Submitted:  
A Weetman  
21 May 2014

Approved:  
I Gibb  
26 May 2014

# Survey areas for Scotia 0714S

