Not to be cited without prior reference to Marine Scotland Marine Laboratory, Aberdeen

MRV *Scotia*

Survey 0113S

PROGRAMME

5-22 January 2013

Loading: Aberdeen, 27 December 2012
Port Call: Rosyth, 9 January 2013
Unloading: Aberdeen, 22 January 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.

Personnel

Name:	Part 1: 5-9 January	Part 2: 9-22 January
D Moore	✓ SIC	
M Robertson	✓	
N Collie	✓	
TOTAL Rep (TBC)	✓	
M Russell	✓	✓ SIC
C Robinson	✓	✓
E Dalgarno	✓	✓
T Betts	✓	✓
K MacNeish	✓	✓
G Packer	✓	✓
P Stainer	✓	✓
N Aldridge	✓	✓
A Taylor		✓

Part 1 Elgin Survey
Part 2 CSEMP Survey

Staff changeover at Rosyth after completion of Elgin Survey and CSEMP Montrose Bank Station.

Gear: BT 101 with tickler chains
Day grab and sieves
Bongo net
VMUX camera system

Objectives - Part 1

1. Sampling of fish and sediment at predefined stations.
2. Camera and video work at selected stations.
3. Fish samples will be prepared for sensory analysis and will be blast frozen on board.
4. Sediment samples will be frozen on board.

Objectives - Part 2

1. To undertake water, sediment and biological sampling for the Clean Seas Environmental Monitoring Programme (CSEMP).
2. To collect water samples for nutrient studies as part of the Scottish Coastal Eutrophication Assessment Survey (SCEAS).
3. Undertake CSEMP sediment sampling in the Firth of Forth for SEPA.
4. Undertake additional fish sampling for integrated assessment ROAME
5. Monitor and record all litter brought aboard in all trawls. Sample water column and sediment for microplastic litter.

Estimated Days Per Project: 3 days ST03o;12 days ST03n; 1 day STO3q; 2 days ST002.

Procedure

Elgin Survey (Part 1)

A sampling strategy has been devised for the Elgin field that takes account of the historical and more recent surveying and seeks to determine whether the release of oil based muds associated with the incident in early 2012 is either detectable or has created a demonstrable impact in the area.

Scotia will occupy a total of 28 stations outside the 500 m safety zone of the Elgin facility at which three (3) 0.1m^2 Day grabs will be obtained. Each grab will be digitally photographed, one will be sub-sampled for physico-chemical characteristics and the other two will be sieved through a 500µ and 1 mm mesh with the residue being fixed and preserved under formaldehyde. Actual station positions are presently being checked by Total Oil to ensure there is no potential for interaction with sub-sea infrastructure. As soon as these are available they will be forwarded to the vessel.

Video footage will be collected at selected stations in association with high quality digital images.

Fish samples will be obtained from four of the trawl stations originally sampled in an earlier Scotia campaign (details of the trawl tracks should be with the vessel). Fish flesh will be prepared on board the vessel and stored frozen for return to the Marine Laboratory where it will be assessed by the taste panel.

Contact will be maintained with the Elgin Platform throughout the sampling period and a representative of Total Oil will be present on the vessel.

CSEMP Survey (Part 2)

At the four CSEMP fixed sites (NMMP85, NMMP95, NMMP105, NMMP165) sediment and fish will be sampled.

Stratified random samples of sediment will be taken from one stratum on the East coast, four strata in the Fladen Ground, two strata in Shetland, two strata in the Moray Firth, two strata in the North Minch and one stratum in the Sea of Hebrides (Table 1; Figure 1). Fish sampling will be carried out within these strata, except for the Sea of Hebrides (Table 1).

Sediments will be sampled for chemical analyses at all locations. Sediment will be sieved for macrobenthos analysis (1 mm sieve) only at the stratified random sampling locations. Fish will be sampled for biological effects measurements and chemical analyses. Some biological effects measurements will be carried out during the cruise.

Additional sediment sampling will be carried out at 5 sites in the Firth of Forth, in support of CSEMP sampling for SEPA (Table 2).

Surface water will be collected for hydrographic nutrient studies (SCEAS) throughout the cruise at fixed time intervals. Nutrient samples will be analysed at sea where possible, otherwise will be appropriately stored and returned to the laboratory for analyses. Weather permitting one of the outward/return leg on the west coast will be to the west of the Hebrides to allow offshore sampling for nutrients.

In support of the Integrated Assessment ROAME both plaice and dab will be sampled, if present, in the outer Moray Firth, Montrose Bank, Shetland, North Minch and the Fladen Ground.

Monitoring of all litter brought on board during trawling operations will continue throughout the cruise. Testing of the sampling equipment for microplastics in the water column will be carried out in each of the fishing areas, weather and time permitting. Sites will be those within the CSEMP cruise track and will be defined in advance. Additional sediment samples will also be taken at all sites sampled for microplastics in the water column.

Weather and time permitting extra sediment will be collected to provide a chemistry laboratory reference material. Where possible if sufficient suitable fish not required for other studies are obtained during trawling livers will be sampled for a reference material.

General Arrangements

Liquid nitrogen and formaldehyde will be carried aboard for the preservation and storage of biological material.

Normal contacts will be maintained with the laboratory.

Submitted:
D Moore and M Russell
13 December 2012

Approved:
I Gibb
14 December 2012

Table 1

CSEMP sampling

CSEMP Site	**Water samples** (nutrients TOxN, phosphate, silicate, nitrite, and ammonia analyses)	**Sediment Chemistry** (PAH, CB, BFR, trace metals, PSA, TOC)	**Macrobenthos (1mm sieved fraction)**	**Fish Chemistry** Chemistry (CB, BFR, trace metals) and biological effects (EROD and PAH bile metabolites)
Continuous water sampling in support of SCEAS				
East Coast stratified random		5 samples	5 samples	-
NMMP 165 (Montrose Bank)		1 sample	-	5 pools of 5 plaice## 56 30.00N 001 30.00W
Fladen ground stratified random		3 samples from each of 4 strata	3 samples from each of 4 strata	5 pools of 5 fish## 59 12.00N 001 27.00W
Moray Firth stratified random		5 samples from stratum 1, 10 from stratum 2	5 samples from stratum 1, 10 from stratum 2	-
NMMP 95 (Intermediate Moray Firth) 57°40.00'N 003°49.00'W		1 sample	-	5 pools of 5 plaice 57 50.00N 003 39.48W
NMMP 105 (Outer Moray Firth)		1 sample	-	5 pools of 5 fish## 58 03.00N 003°00.00'W
North Minch stratified random		5 samples from each of 2 strata	5 samples from each of 2 strata	
NMMP 85 (North Minch) 58°00.00'N 005°40.00'W		1 sample	-	5 pools of 5 plaice## 58 23.00N 005 40.00W
Sea of Hebrides stratified random		10 samples	10 samples	
Shetland east coast stratified random		5 samples	5 samples	-
Shetland west coast stratified random		5 samples	5 samples	
Shetland northeast coast (Balta)				5 pools of 5 plaice## 60 46.19N 000 37.58W

Extra fish sampling for dab at these sites for the integrated assessment ROAME.

Table 2

Sampling for SEPA - Firth of Forth.

CSEMP Site	Sediment Chemistry (organics, metals, TOC and PS)
Firth of Forth at Fairway Buoy	1 sample
Firth of Forth Spatial Survey Station 49	1 sample
Firth of Forth Spatial Survey Station 42	1 sample
Firth of Forth Spatial Survey Station 38	1 sample
Firth of Forth Spatial Survey Station 33	1 sample

Figure 1: Sediment and fish sampling stations for 0113s (includes trawl, grab and possible microlitter sites). Water sampling will continue at predefined intervals throughout the survey.