

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

MRV *Alba na Mara*

Survey 1713A

## PROGRAMME

16 November – 4 December 2013

### Ports

**Loading:** Greenock (14 November 2013)

**Sailing:** Greenock (16 November 2013)

**Half Landing:** Fraserburgh (flexible)

**Unloading:** Leith (4 December 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

C Robinson (SIC)

G Packer

K MacNeish

M Russell (TBC - To join the vessel for one day in the Firth of Forth, when the vessel will undertake sampling for microplastics with new Manta trawl)

**Fishing gear:** BT 158 and 2m beam trawl, both with 50 mm cod-ends;  
Manta net (Firth of Forth), bongo net, sandeel dredge.

**Estimated Days per Project:** 13 days ST03n; 3 days ST014; 2 days ST013; 1 day ST007

### Objectives

1. To undertake flat fish sampling in the Clyde estuary, Firth of Clyde, East Scotland Coast, Forth estuary and Firth of Forth in support of OSPAR CEMP and MSFD Descriptor 8 temporal and spatial trend monitoring studies of contaminants and their effects.
2. To identify possible new fishing sites in support of MSFD Descriptor 8 monitoring.
3. To undertake sediment sampling in the Solway Firth, Clyde, East Scotland coast, and Forth sea areas in support of OSPAR CEMP and MSFD Descriptor 8; to collect subsamples of sediments for the analysis of dinoflagellate cysts in support of ST03p.
4. To collect samples of *Nephrops* in support of MSFD Descriptor 9 ROAME ST014.
5. To sample the sea surface in the inner Firth of Clyde and inner Firth of Forth for microplastics in support of ROAME ST013.

6. To analyse bile samples generated during the survey.
7. To collect and oestrogenise thornback rays for Aberdeen University PhD project.
8. If weather and time allow, to collect samples of sandeels for the Picmatops project (ST007).
9. To trial new Manta trawl for the collection of microplastics in the Firth of Forth (if time is available at the end of the survey)

## **Procedure**

Fishing and scientific gear will be loaded onto the *Alba na Mara* in Greenock on 14 November. The scientific staff will travel to Greenock and join the vessel on 16 November. The survey programme will be followed, with any amendments (due to weather, etc) made as required, and *Alba na Mara* is expected to berth in Leith on the evening of 3 December.

Throughout the survey by-catch of species identified as suitable for Descriptor 9 monitoring (*Nephrops*, haddock/cod, monk, herring) will be sampled for subsequent contaminants analyses. Additionally, trawling specifically for *Nephrops* and other D9 species will take place in the Minches and in the Moray Firth.

With the survey starting in Greenock on 16 November, the vessel will first sample the Bowling site (flounder), before sediment sampling and fishing at the Holy Loch site for plaice and dab (flounder if dab not available) and then sampling for sea surface microplastics in the inner Firth of Clyde. Further flatfish (plaice) and sediment sampling will take place at Hunterston and Garroch Head. Sediments will be collected from the outer Clyde, near Ailsa Craig en route to the Solway where sediments will be collected and trawling undertaken to collect rays; these will be oestrogenised and kept alive until being sampled one week later. Weather permitting, the potential for a fishing site (beam trawl) for flounder off the Kyle of Tongue will be investigated and sediments (if suitable) sampled. A half-landing will be taken in either a port on the NW coast or in Fraserburgh. On the east coast, the potential for a new flounder site in the Tay estuary will be investigated, and flounder and sediments sampled from St Andrews Bay. Further investigations of new sampling sites for dab and sediment will take place in the outer Firth of Forth before flounder and sediments will be collected from the Forth estuary (Tancred Bank). Any buckies caught from the Firth of Forth will be returned to MLA for imposex determination. Floating microplastics will be sampled from the Forth estuary and the inner Firth of Forth; if the new manta net is available then Marie Russell will join the vessel to oversee its use, otherwise the bongo net will be used.

If time and weather allow, ten minute tows using the sandeel dredge will be done in ICES squares 45E4, 46E4, and 46E5; further dredge tows may be undertaken to east and west of Orkney.

Figure 1 shows the sampling locations for contaminant monitoring objectives for the survey; Tables 1 and 2 list the contaminant monitoring sites for sediment and fish, respectively; Table 3 lists the number of contaminant monitoring samples to be collected from each area.

On completion of this survey, passage will be made to Leith where all scientific gear and samples will be transferred to the ML Aberdeen.

## **Rest Day Provision**

This is a 19 day survey, starting on a Saturday and due to finish on a Wednesday. Ahead of the survey, staff will take a REST day on Friday 15 November, a half-landing rest day will be taken

during the survey, and a further rest day will be taken once the survey is completed and the equipment & samples have been offloaded and stored in Aberdeen.

**General Arrangements**

Liquid nitrogen and other chemicals (e.g. methanol, formalin) will be carried abroad for the preservation and storage of biological material.

Normal contacts will be maintained with the Laboratory.

Submitted:  
C. Robinson  
29 October 2013

Approved:  
*I. Gibb*  
14 November 2013

Table 1: Sediment sampling locations

Region	Area	Site	Lat	Long
Clyde	Inner Firth (Dunoon)	East of Strone Point	55.984	-4.881
Clyde	Inner Firth (Dunoon)	Lunderston Bay	55.923	-4.911
Clyde	Inner Firth (Dunoon)	Weymss Point	55.896	-4.926
Clyde	Inner Firth (Dunoon)	E of Toward (UIFM 2)	55.868	-4.945
Clyde	Inner Firth (Dunoon)	Holy Loch Trawl FRS	55.971	-4.892
Clyde	Inner (Largs Channel )		55.793	-4.891
Clyde	Inner (Largs Channel )		55.786	-4.892
Clyde	Inner (Largs Channel )		55.775	-4.891
Clyde	Inner (Largs Channel )	Hunterston Trawl FRS	55.764	-4.885
Clyde	Inner (Largs Channel )		55.74	-4.906
Clyde	Middle Offshore	Garroch Head	55.66	-4.986
Clyde	Outer	SE Ailsa Craig	55.224	-5.058
Clyde	Outer	SW Ailsa Craig	55.166	-5.223
Clyde	Outer	E Johnstons Point	55.32	-5.368
Clyde	Outer	NMMP 35	55.333	-5.083
Clyde	Outer	NE Ailsa Craig	55.341	-5.039
Irish Sea	Solway	NMMP site 25	54.75	-4
Irish Sea	Solway	Solway Firth BP1	54.766	-3.835
Irish Sea	Solway	Solway Firth BP2	54.756	-3.863
Irish Sea	Solway	Solway Firth BP3	54.75	-3.916
Irish Sea	Solway	Solway Firth BP4	54.727	-3.96
Tay*	Outer estuary	Broughty Castle	56.461	-2.873
Tay*	Outer estuary	Newcome (SEPA)	56.461	-2.9
Tay*	Outer estuary	Off Craigie	56.46	-2.92
EScotland	St Andrews Bay	Surveillance site 1	56.362	-2.628
EScotland	St Andrews Bay	Plankton Station 15	56.438	-2.66
EScotland	St Andrews Bay	Surveillance site 2A	56.346	-2.616
EScotland	St Andrews Bay	Off Buddo Ness	56.373	-2.698
EScotland	St Andrews Bay	FRS Mid trawl	56.38	-2.746
Forth	OuterFirth	E Isle of May	56.2	-2.41
Forth	OuterFirth	Rath Grounds	56.15	-2.66
Forth	OuterFirth	S Isle of May	56.133	-2.535
Forth	OuterFirth	NE Torness	56.1	-2.34
Forth	OuterFirth	N Wheat Stack	56	-2.25

\*only to be sampled if suitable fish have been obtained

Table 2: Proposed fishing locations and fish requirements

	Lat	Long	Flounder		Dab		Plaice	
			Effects	Chem.	Effects	Chem.	Effects	Chem.
Bowling	55.93	-4.5	50	25				
Holy Loch	55.95	-4.9			50	25	-	25
Hunterston	55.78	-4.88					-	25
Garroch Head	55.65	-4.94					20 (M)	25
Solway Firth	To be agreed with the Master		Approx. 12 thornback ray					
Kyle of Tongue*	58.54	-4.37	50	25				
Moray Firth	To be agreed with the Master		10 samples of <i>Nephrops</i> tails are required (approx. 40 g tissue / sample)					
Tay estuary*	56.46	-2.89	50	25				
St Andrews Bay	56.36	-2.75	50	25				
Outer Firth of Forth*					50	25		
Tancred Bank	56.03	-3.56	50	25				

\*positions to be confirmed following discussion with SEPA and with Master of Alba na Mara

Table 3: Numbers of sub-samples to be collected

		Chemistry			Benthic Ecology	Biological Effects							
		Organics	Metals (Liver/Flesh)	Organotins		Otoliths	External Disease	Bile	EROD	LMS	Histo-pathology	Micro-nucleus	Vtg
Bowling	Sediment	-	-	-	-	-	-	-	-	-	-	-	-
	Flounder	5	5 / 5	-	-	50	50	25	15	25	50	25	-
Holy Loch	Sediments	-	-	5	-	-	-	-	-	-	-	-	-
	Dab*	5	5 / 5	-	-	50	50	25	15	25	50	25	-
Hunterston	Plaice	4	-	-	-	-	-	-	-	-	-	-	-
	Sediments	5	5	5	-	-	-	-	-	-	-	-	-
Garroch Head	Plaice	4	-	-	-	-	-	-	-	-	-	-	-
	Sediments	1	1	-	-	-	-	-	-	-	-	-	-
Pladda	Plaice	5	5 / 5	-	-	-	-	25	15	-	-	-	-
	Sediments	5	5	-	5	-	-	-	-	-	-	-	-
Solway	Fish	-	-	-	-	-	-	-	-	-	-	-	-
	Sediments	5	5	-	5	-	-	-	-	-	-	-	-
Kyle of Tongue	Thornback ray	-	-	-	-	-	-	-	-	-	-	-	10
	Sediments	-	-	-	-	-	-	-	-	-	-	-	-
Tay estuary	Flounder	5	5 / 5	-	-	50	50	25	15	25	50	25	-
	Sediments	3**	3**	3**	-	-	-	-	-	-	-	-	-
St Andrews Bay	Flounder	5	5 / 5	-	-	50	50	25	15	25	50	25	15
	Sediments	5	5	-	-	-	-	-	-	-	-	-	-
Outer Forth	Flounder	5	5 / 5	-	-	50	50	25	15	25	50	25	-
	Sediments	5	5	-	5	-	-	-	-	-	-	-	-
Forth estuary	Dab	5	5 / 5	-	-	50	50	25	15	25	50	25	-
	Sediments	-	-	5	-	-	-	-	-	-	-	-	-
TOTAL	Flounder	5	5 / 5	-	-	50	50	25	15	25	50	25	-
	Sediments	29	29	18	15	-	-	-	-	-	-	-	-
	Fish	48	40 / 40	-	-	350	350	200	120	175	350	175	25

\* or flounder, depending upon availability

\*\* only collected if suitable fish were obtained

**Figure 1: 1713A sediment (brown diamond), and fish (green star) sampling sites.** Potential fishing sites off the Kyle of Tongue, in the Tay and in the outer Firth of Forth are indicated by pink stars; red crosses indicate floating microplastics sampling sites; the blue star indicates a fishing site for *Nephrops*, a further one may be required in the Minch.

