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MRV *Scotia*

Survey 0119S

PROGRAMME

6-21 January 2019

Loading: Aberdeen, 18 December 2018

Unloading: Aberdeen, 21 January 2019

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

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

Fishing gear: BT 137 with Ground gear E;

Sediment Sampling: Day grab and sieves;

Litter sampling: Catamaran and neuston trawl;

Water sampling: Aquatracka fluorometer, Seabird 25 and towed frame.

Objectives

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. Monitor and record all litter brought aboard in all trawls. Sample water column and sediment for micro-plastic litter. Collect fish guts and any other biota of interest for microplastic research.
4. If possible, deploy Aquatracka and Seabird 19 to collect fluorescence data.

Estimated Days Per Project: 12 days 20461; 2 days 20463; 2 days 20234.

Procedure

The vessel will depart Leith on 6 January and after all drills have been completed will head to the first sampling station. The order in which the survey will be undertaken is weather dependent and will be decided in consultation with the Captain and Fishing Master.

Surface water will be collected for hydrographic nutrient studies (SCEAS) throughout the survey at fixed time intervals (every 30 minutes for nutrients, every hour for ammonia and every 12 hours for salinity and chlorophyll samples). From the Forth to Berwick initially, north to Montrose Bank then following the sediment/fish sampling track. Nutrient samples will be

analysed onboard as far as possible. Any remaining at end of the survey will be returned to the laboratory for analysis.

Fish sampling will be carried out at the Montrose Bank, Inner Moray, East Shetland, East Shetland Basin, Hebrides and Colonsay CSEMP sites (Table 1).

Sediment sampling will be carried out at the Montrose bank, East coast, Inner and Outer Moray Firth, East Shetland, East Shetland basin, Minch North, Minch South, Colonsay and Sea of Hebrides. Sediment sampling will also be carried out at the four CSEMP fixed sites (NMMP85 – North Minch, NMMP95 – Inner Moray Firth, NMMP105 – Outer Moray Firth, NMMP165 – Montrose Bank) (Table 1).

Sediments will be sampled for chemical analyses at all locations. Fish will be sampled for chemical analyses, biological effects and fish diseases (Table 2). Some biological effects measurements will be carried out during the survey.

Monitoring of all litter brought on board during trawling operations will continue throughout the survey. The catamaran will be deployed to sample for micro-plastics whenever possible and samples processed onboard as far as possible. Additional sediment samples will also be taken for micro-plastics where possible. Fish guts and any other biota of interest will be preserved and returned to the lab for analysis.

The Aquatracka will be deployed in the Forth and in at least one other area to obtain reference measurements.

Sediment will be collected to provide chemistry laboratory reference material. Where possible, if sufficient suitable fish are obtained which are not required for other studies then livers will also be sampled for reference material.

General Arrangements

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

Normal contacts will be maintained with the laboratory.

Submitted:
G Hermann
07 December 2018

Approved:
I Gibb
17 December 2018

Table 1: Sampling details.

Station	Water samples (nutrients TOxN, phosphate, silicate, nitrite, and ammonia analyses)	Sediment Chemistry (PAH, CB, PBDE, trace metals, PSA, TOC)	Fish Chemistry (PCB, PBDE, trace metals) Biological Effects (EROD, bile metabolites, micronucleus)	Fish Diseases
Continuous water sampling in support of SCEAS	Continuous (2 samples per hour)			
East Coast		5 sites		
NMMP 165 (Montrose Bank)		1 site	25 dab (in pools of 5 for chemistry)	50 dab for disease
East Shetland		5 sites	25 dab (in pools of 5 for chemistry)	50 dab for disease
East Shetland Basin		12 sites	25 cod (in pools of 5 for chemistry)	-
Moray Firth		15 sites		
NMMP 95 (Moray Firth)		1 site	25 plaice (in pools of 5 for chemistry)	50 dab for disease
NMMP 105 (Outer Moray Firth)		1 site		
North Minch		5 sites		
South Minch		5 sites		
NMMP 85 (North Minch)		1 site		
Colonsay		4 sites	25 dab (in pools of 5 for chemistry)	
Hebrides		5 sites	25 dab (in pools of 5 for chemistry)	50 dab for disease
Sea of Hebrides		10 sites		
Bailey		5	25 fish, (in pools of 5 for chemistry) new site, weather permitting	50 fish for disease
Rockall Plateau		5	25 fish (in pools of 5 for chemistry) new site, weather permitting	50 fish for disease
Faroe-Shetland Channel		5	25 fish (in pools of 5 for chemistry) new site, weather permitting	50 fish for disease

Table 2: Sampling detail for fish sampling.

Site	Station name	Species #1	PCBs	PBDEs	Metals (LV)	Metals (MU)	EROD (LV S9)	Histo (LV)	PAH (bile)	MN (BL)	Disease
Hebrides	Hebrides_HebIntermediate_fi01	Dab	5 pools	5 pools	5 pools	5 pools	15 (male)	25	25	25	50
Colonsay	MinchMalin_Colonsay_fi01	Plaice	5 pools	5 pools	5 pools	5 pools	15 (male)		25	25	
E Shetland Basin	EShetland_EShOpenSea_fi01	Cod	5 pools	5 pools	5 pools	5 pools	15 (male)	25	25	25	50
E Shetland (Balta)	EShetland_EShIntermediate_fi01	Dab*	5 pools	5 pools	5 pools	5 pools	15 (male)	25	25	25	50
Inner Moray 95	MorayF_MorayFirthOffshor_fi01	Dab**	5 pools	5 pools	5 pools	5 pools	15 (male)	25	25	25	50
Montrose Bank 165	EScotland_EScOpenSea_fi01	Dab	5 pools	5 pools	5 pools	5 pools	15 (male)	25	25	25	50

*may not get dab at Balta, in which case sample plaice in no.s as indicated for that spp.

**Need to sample dab; may also require plaice, in which case go back to MF on the return to Aberdeen to collect the plaice, don't collect both at the same time.

Site	Station name	Species #2	PCBs	PBDEs	Metals (LV)	Metals (MU)	EROD (LV S9)	Histo (LV)	PAH (bile)	MN (BL)	Disease
E Shetland (Balta)	EShetland_EShIntermediate_fi01	Plaice*	5 pools	5 pools	5 pools	5 pools	15 (male)	-	25	25	-
Inner Moray 95	MorayF_MorayFirthOffshor_fi01	Plaice**	5 pools	5 pools	5 pools	5 pools	15 (male)	-	25	25	-