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

MRV *Scotia*

Survey 0820S

PROGRAMME

15-30 June 2020

Loading: Aberdeen, 12 June 2020
Sailing: Aberdeen, 15 June 2020 (TBC)
Half landing: NA
Unloading: Aberdeen, 30 June 2020

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.

Estimated days by project:

3	days RV2011	20585 (Firth of Forth)
4	days RV2007	20581 (North Sea)
8	days RV2008	20582 (West Coast)
1	day C80040	20397 (COMPASS)

Gear

2 x towed UWTV sledges
3 x 600m umbilical towing cables and associated TV equipment (including back up)
COMPASS work: VEMCO deck box, transponder and charging unit for acoustic release;
100kg clump weight, two sensors, mooring line, shackles (one for each of five mooring sites

Objectives

1. To obtain estimates of the abundance and distribution of *Nephrops* burrow complexes in the Firth of Forth, at Fladen, in the North Minch, the South Minch, and in the Firth of Clyde. If time and weather permits, stations in the Moray Firth 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 recover COMPASS moorings at five sites on the west coast, and to deploy replacement devices at each site.

4. To recover MarPAMM moorings at two sites on the west coast.

Procedures

Due to COVID19 related Health and Safety guidance resulting in the possibility that MRV Alba-na-Mara will be unavailable to carry out the annual *Nephrops* underwater television survey (UWTV) in the Firth of Forth and Moray Firth, the 0820S survey on MRV *Scotia* will be adapted to incorporate as much of the planned *Alba* survey as possible. This will require a reduction in the number of planned stations in most areas visited, a reduction in the number of areas surveyed and the removal of some objectives normally associated with this survey.

The specific survey related changes on 0820S include:

A reduction in the number of station proposed in all but the South Minch.
No UWTV operations at Stanton Bank, the Noup, Devils Hole or in the Sound of Jura.
No trawling.
No sediment sampling.
Reduced MSS staff.
No half landing.

UWTV Objectives - The areas in which the 0820S UWTV survey will take place have been surveyed on regular basis for a number of years, either by MRV *Scotia* or MRV *Alba-na-Mara*, and the data used to provide fisheries management advice. The stations have been created by employing the traditional stratified random technique based on sediment distribution in all areas except the North Minch, where stations are randomly generated within the boundaries of commercial *Nephrops* fishing effort, obtained from Vessel Monitoring System (VMS) data. The location of all TV stations will be provided ahead of the survey.

Weather permitting, the vessel will head south towards the Firth of Forth from Aberdeen. *En route*, and at a suitable location, a large buoy will be attached to the end of the UWTV cable which will be lowered in to the water and approximately 450 m of the UWTV cable will paid out. On recovery, this will add back tension to the cable, creating tighter turns on the winch and in turn will reduce the potential for damaging the cable during the survey. Once in the vicinity of the first TV station, the sledge will be attached to the umbilical to allow a training session to be carried out, where the sledge will be shot, an appropriate amount of cable will be paid out depending on the depth of water and finally recovered. During this procedure a calibration grid will be attached to the skids on the sledge. Once this procedure is completed to the satisfaction of all involved, the grid will be removed and the vessel will then begin surveying *Nephrops* burrow TV stations as scheduled. Once the work in the Firth of Forth has been completed, the vessel will then steam north and begin to survey at the Fladen, prior to continuing on to the stations in the North and South Minches.

It is anticipated that the vessel will work south along the western side of the Minches and then on towards the Clyde. On completing the Clyde, the vessel will then return north working up the east side of the South and then North Minch. If weather and time permits, stations in the Moray Firth will be undertaken, before returning to Aberdeen prior to unloading on 30 June.

Throughout the survey, sledge deployments and TV observations will be carried out 24 hours a day, weather permitting. Whilst on the West coast, there maybe some occasions during the hours of darkness and in areas of high creel densities where TV operations are suspended for a short time to avoid any potential gear conflict. Alternatively TV operations maybe suspended whilst the vessel surveys the planned route ahead for creels during the hours of daylight, and therefore allowing TV operations to continue throughout the hours of darkness. There will be two teams with two staff on each team each working a twelve hour shift. Both teams will be involved in deploying and recovering the TV equipment, recording data and liaising with the ship's compliment. Where long periods of transit occur, and whilst on shift, it is expected that staff will be involved in other tasks such as reviewing video footage and data entry. These additional tasks will not involve working on the deck. All work will be carried out in accordance

with WTR regulations and the amended risk assessments in light of COVID19. 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 sledge will be towed along the seabed for approximately ten minutes at approximately 0.7 knot and in to the tide – the ship's dynamic positioning will be required for this. *Nephrops* burrows observed, individual *Nephrops* and other benthic fauna will be recorded onto DVD for later analysis. The depth and distance travelled by the sledge, as well as camera height from the seabed will be recorded automatically.

COMPASS Objective - In addition to the regular UWTV work, five COMPASS moorings located on the West coast between Tolsta Head and the Garvellachs are required to be recovered and replacement devices redeployed at the same site (see Table 1 below). The location of the sixth mooring at Stanton Bank is included for reference but there is little expectation this will be recovered due to survey priorities and the limited time available. This operation replicates the work carried out on the Scotia *Nephrops* TV survey 0819S in 2020.

The devices will be retrieved by acoustically releasing a buoy which will rise to the surface. The buoy will be attached to a length of Dyneema which in turn is secured to the scientific equipment. Using a grappling hook to gather up the buoy, the Dyneema will be passed through the CTD winch which in turn will haul the equipment to the surface and eventually on to the hangar deck. Before moving off station, a replacement mooring will have been prepared and ready to launch from the hangar deck when instructed by the Bridge. No additional crew to that required for normal UWTV operations will be required. To ensure this work is as safe and efficient as possible, this work will only be carried out during daylight hours and undertaken when moorings are close to scheduled TV stations. Full risk assessments will be made available prior to sailing.

A further two MarPAMM moorings are to be recovered as described above, one located near Colonsay and one to the south of Arran. No redeployment is required.

Moorings sites will only be visited if located relatively near a TV survey site, so as not to detract from the UWTV survey.

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

Submitted:
A Weetman
5 June 2020

Approved:
I Gibb
08 June 2020

Location	Action	Project	Lat	Lon	Lat	Lon	Depth (m)	VEMCO release number	Comments
			Decimal degrees		Degrees + decimal minutes				
Tolsta Head	RECOVER-DEPLOY	COMPASS	58.392267	-6.008083	58° 23.536' N	006° 00.485' W	103	548155	Deployed by Charlotte in Feb 2020
Stoer Head	RECOVER-DEPLOY	COMPASS	58.257550	-5.538950	58° 15.453' N	005° 32.337' W	104	547008	Deployed by Charlotte in Feb 2020
Shiant Isles	RECOVER-DEPLOY	COMPASS	57.869350	-6.270517	57° 52.161' N	006° 16.231' W	88	547271	Deployed by Charlotte in Feb 2020
Hyskier	RECOVER-DEPLOY	COMPASS	57.035417	-6.752867	57° 02.125' N	006° 45.172' W	53	548154	Recovery not attempted Feb/Mar 2020
Garvellach Isles	RECOVER (DEPLOY?)	COMPASS	56.234733	-5.756800	56° 14.084' N	005° 45.408' W	80	547270	Recovery not attempted Feb/Mar 2020
Stanton Bank	(RECOVER-DEPLOY)	COMPASS	56.070950	-8.055217	56° 04.257' N	008° 03.313' W	71	547273	Deployed by Ruadhan in Mar 2020
Colonsay	RECOVER	MarPAMM	55.964167	-6.485700	55° 57.850' N	006° 29.142' W	62	547013	Deployed by Ewan in Oct 2019
Clyde Sill	RECOVER	MarPAMM	55.266533	-5.395067	55° 15.992' N	005° 23.704' W	49	547275	Deployed by Charlotte in Feb 2020
Skerryvore	RECOVER	MarPAMM	56.435783	-7.114167	56° 26.147' N	007° 06.850' W	42	?	This is likely the mooring found on Islay

Table 1: Location of the five COMPASS moorings and two MarPAMM units to be visited during 0820S (the greyed out Stanton Bank and Skerryvore sites are included as unlikely but potential sites if time and weather permits).