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MRV *Scotia*

Survey 0721S

## PROGRAMME

28 May - 19 June 2021

**Loading:** Aberdeen 26 May 2021  
**Sailing:** Aberdeen 28 May 2021  
**Half landing:** TBC, (water and maintenance)  
**Unloading:** Aberdeen 19 June 2021

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.

<b>Estimated days by project:</b>	5 days RV2111	20666 (Firth of Forth and Moray Firth)
	8 days RV2107	20662 (Fladen and Devils Hole)
	9 days RV2108	20663 (West Coast)
	1 day C80040	20397 (COMPASS)

## Gear

2 x towed UWTV sledges  
2 x 600m copper umbilical towing cables and associated TV equipment (including back up)  
1 x 600m fibre optic/copper hybrid umbilical towing cable and associated TV equipment  
2 x Scotia BT175 60mm prawn trawls  
2 x Day grabs and 1 x sieving table  
2 sets SS4 Scanmar door sensors and chargers  
COMPASS work: VEMCO deck box, transponder and charging unit for acoustic release;  
100kg clump weight, two sensors, mooring line, shackles (one for each of the six mooring sites)

## Objectives

1. To obtain estimates of the abundance and distribution of *Nephrops* burrow complexes in the Firth of Forth, Moray Firth, Fladen, in the North Minch, the South Minch, the Sound of Jura and in the Firth of Clyde. If time and weather permits, stations at Devils Hole and Stanton Bank 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 six sites on the west coast, and to deploy replacement devices at each site.

4. To collect sediment samples at each UWTV station.
5. To carry out trawling for *Nephrops* in order to obtain samples of *Nephrops* for size composition analysis.
6. To collect samples of *Nephrops* from the trawls for comparison of reproductive condition and morphometrics in each of the different survey areas (Functional Units).
7. To record and retain marine litter obtained from trawling as part of the MSFD.
8. To record details of any skate that may appear in the catch.

## **Procedures**

Due to COVID19 related Health and Safety guidance and rescheduling of surveys, MRV *Alba-na-Mara* will be unavailable to carry out the annual *Nephrops* underwater television survey (UWTV) during 2021 in the Firth of Forth and Moray Firth in late summer. The 0721S survey on MRV *Scotia* will, therefore, be adapted to incorporate as much of the survey as possible that *Alba* would normally cover in an unaffected year. In addition, there will be no half landing during this survey to minimise the risk of COVID related infections being returned to the vessel.

## **UWTV objectives -**

The areas in which the 0721S 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 *Nephrops* 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, established 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 be 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 the Moray Firth, followed by surveying Fladen and then 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 Sound of Jura and the Clyde. On completing the Clyde, the vessel will then return north working up the east side of the South and then North Minch. Time and weather permitting, UWTV operations may be carried out at Stanton Bank when in the vicinity on COMPASS mooring duties, preferably on the journey south, although UWTV work here has a low priority. Additionally, stations at Devils Hole may also be surveyed (time and weather permitting) on the return journey prior to unloading in Aberdeen on 19 June. Some amendments maybe required to this plan during the survey as a result of poor weather or other uncontrollable factors.

Throughout the survey, sledge deployments and TV observations will be carried out 24 hours a day, weather permitting. Whilst on the West coast, there may be 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 may be 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 three teams with two staff on each team, each team working an eight hour shift on deck and will be involved in deploying and recovering the TV equipment, recording data and liaising with the ship's compliment. Additional work involving data entry and video reviewing will be conducted outwith this eight hour shift and during long transit periods. These tasks will not require 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 have been forwarded to the Ships Liaison Manager.

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. On occasion two cameras will be attached to the sledge for video quality comparative purposes.

The location of each UWTV station will be provided prior to sailing.

**COMPASS objective** - In addition to the regular UWTV work, six COMPASS moorings located on the West coast between Tolsta Head and the Garvellachs, and one mooring at Stanton Bank, are required to be recovered and replacement devices redeployed at the same site. Exact positions for each mooring will be provided prior to sailing. This operation replicates the work carried out on previous surveys.

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 hangar winch which in turn will haul the equipment to the surface and eventually on 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.

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

**Trawling objective** - Trawl caught samples of *Nephrops* will be collected and information on size composition, maturity and morphometrics will be recorded. It is anticipated one trawl will be carried out in each Functional Unit, although more may be completed if time allows. Trawls will be no longer than one hour and carried out at either dawn or dusk. Any litter collected in the trawl will be recorded as set out in the SOP and placed in bags to be disposed of on return to port. Any catches of skate will be recorded, measured and photographed. 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.

**Sediment objective** – sediment samples will be attempted using a van Veen sampler mounted on the sledge, to be deployed at the end of each sledge run. Samples will be frozen and no chemicals will be involved. A Day Grab will be available for sampling if the van Veen fails on a regular basis and if time allows.

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

Submitted:  
A Weetman  
12 May 2021

Approved:  
I Gibb  
21 May 2021