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MRV *Scotia*

Survey 0818S

PROGRAMME

3–25 June 2018

Loading: Aberdeen, May 2018

Sailing: Aberdeen, 03 June 2018

Half landing: Campbeltown, ~14 June 2018

Unloading: Aberdeen, 25 June 2018

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 (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

Personnel

A Weetman (SIC)

K Boyle

M Inglis

G McAllister

C Mesquita

A Tait

M Watson

I Young (Part 1)

L Blackadder (Part 2)

Estimated days by project: 9 Days RV1807, 20501 (North Sea)
12 days RV1808, 20502 (West Coast)
1 day RV1807, 20397 (COMPASS)
1 day RV1808, 20397 (COMPASS)

Gear

2 x Scotia BT175 80mm prawn trawls

2 x Day grabs and 1 x sieving table

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 seven mooring sites)

ADCP mooring

Objectives

1. To obtain estimates of the abundance and distribution of *Nephrops* burrow complexes at Fladen, in the North Minch, the South Minch, the Firth of Clyde, in the Sound of Jura and at Devil's Hole. If time and weather permits, stations at the Noup 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 collect sediment samples at each station.
4. To carry out trawling for *Nephrops*, based on one haul in each sediment stratum in each of the main survey areas, in order to obtain samples of *Nephrops* for size composition analysis.
5. To collect samples of *Nephrops* from the trawls for comparison of reproductive condition and morphometrics in each of the different survey areas (Functional Units).
6. To record and retain marine litter obtained from trawling as part of the MSFD.
7. To recover COMPASS moorings at seven sites on the west coast, and to deploy replacement devices at each site.
8. To re-deploy Hydrographic ADCP mooring at location, 59° 16.96' N 001° 15.26' W

Procedures

TV objectives - The main areas in which the underwater television (UWTV) survey will take place have been surveyed on annual basis for a number of years and are shown in Figure 1. A combination of two approaches will be used to derive the survey positions: a stratified random approach and fixed stations. The majority of stations will be generated by employing the traditional stratified random technique based on sediment distribution in all areas except the North Minch, where stations will be randomly generated within the boundaries of commercial *Nephrops* fishing effort, obtained from Vessel Monitoring System (VMS) data. Alternatively, at the Devils Hole, as well as within some of the other survey areas, deployments will be carried out at a number of fixed sites. The location of all TV stations will be provided ahead of the survey.

Weather permitting, it is planned that the vessel will first carry out a training session in deploying the sledge *en route* to the Fladen grounds. Initially, approximately 450 m of the TV cable will be paid out with a large buoy attached to the end of the cable which will be lowered into the water. This will add back tension to the cable on recovery, creating tighter turns on the winch and reducing the potential for damaging the cable. The sledge will then be attached to the umbilical to carry out a training session where the sledge will be shot, and then approximately 100 m of cable paid out and finally, recovered. When this procedure is completed to the satisfaction of all involved, the vessel will then progress to the first of the *Nephrops* burrow TV stations at the SW edge of the Fladen ground. Once the work at Fladen has been completed, the vessel will then steam to the west coast and to begin surveying 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, surveying TV sites and carrying out trawls as required. The timing of the half landing will depend on how well the work has progressed and berth availability at

Campbeltown, but it is anticipated that the Clyde will be surveyed before the half landing; although this can be reviewed nearer the time and adjustments made accordingly. At the half landing I Young will leave the vessel and L Blackadder will join.

If the Clyde leg of the survey has already been completed prior to the half landing, the survey will resume in the Sound of Jura, followed by the remaining South and North Minch stations whilst working north. If time and weather permits, a small number of stations at the Noup may be attempted *en route*. Any additional stations in Fladen (if required), or those not covered on the first leg of the survey, will be completed before heading to the final survey area at the Devils Hole.

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. There will be two teams with two staff, and one team of three staff, each working an eight hour shift and all will be involved in deploying and recovering the TV equipment, recording data and liaising with the ship's compliment. There will be a requirement for staff to work outwith their shift period, which will include tasks such as reviewing video footage, assisting in working up trawl catches and data entry. These additional tasks will not involve working on the deck. All work will be carried out in accordance with WTR regulations. 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 analysis. The depth and distance travelled by the sledge, as well as camera height from the seabed will be recorded automatically. Where practical sediment samples will be taken using the mini van Veen grab mounted on the sledge. However, if the mini van Veen fails it may be necessary to use the Day Grab. All sediment samples will be frozen.

Trawl caught samples of *Nephrops* will be collected and information on size composition, maturity and morphometrics will be recorded. Up to five trawls may be made in Fladen with a maximum of three tows in each of the other survey areas. Where possible trawls will be carried out on each of the different sediment types in each area, as defined by BGS. 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. 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 cruise.

COMPASS objective - In addition to the regular UWTV work, seven moorings located on the West coast between Tolsta Head and Stanton Banks are required to be recovered and replacement devices redeployed at the same site, shown in Figure 2. This operation replicates the work carried out on the IBTS *Scotia* cruise in Q1 2018. 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 will be 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 deck. Before moving off station, a replacement mooring will have been prepared and ready to launch down the stern ramp 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 hydrographic ADCP mooring will also be deployed at location 59° 16.96' N 001° 15.26'W at the most convenient time during the survey.

The vessel will return to Aberdeen for unloading on 25 June 2018.

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

Submitted:
A Weetman
22 May 2018

Approved:
I Gibb
25 May 2018

Survey areas for Scotia 0818S

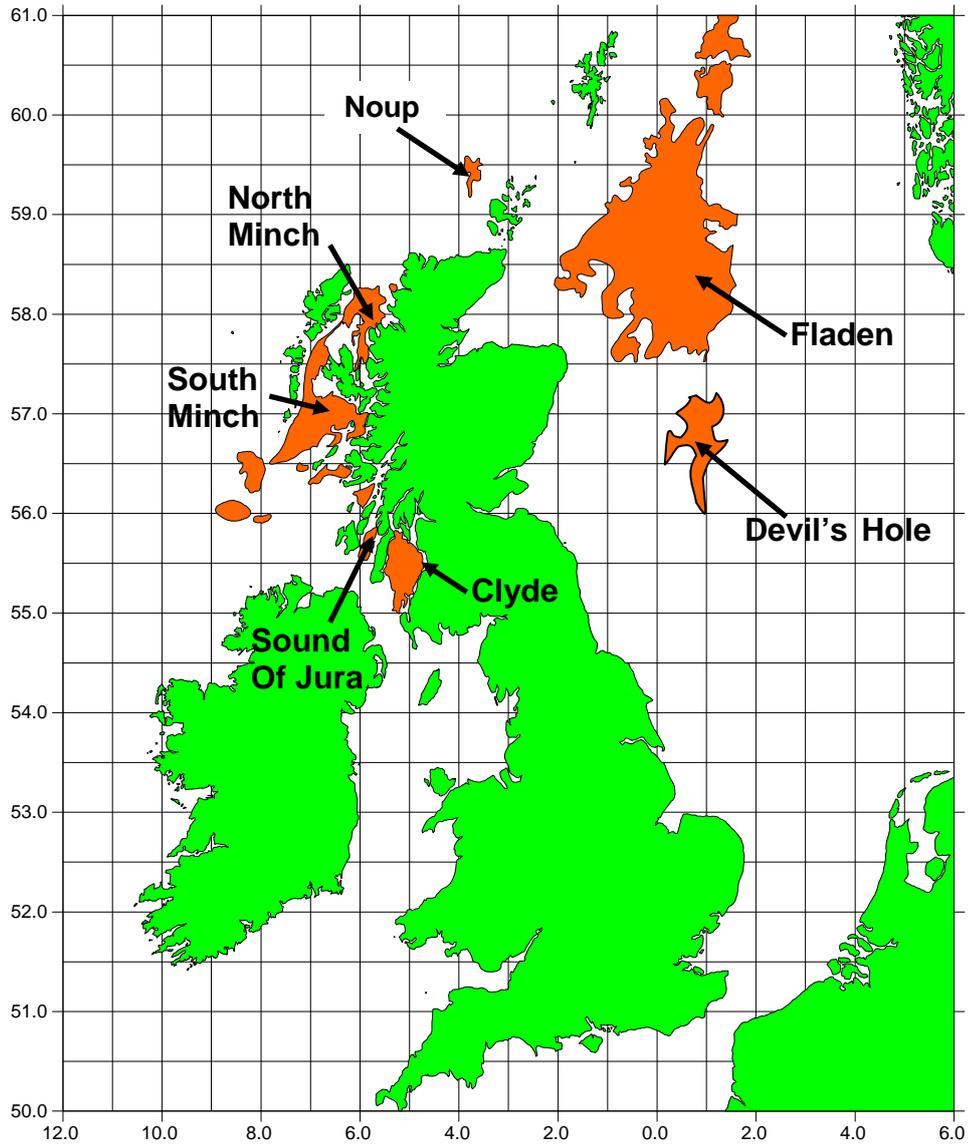


Figure 1: Areas to be surveyed during the *Nephrops* burrow abundance underwater TV (UWTV) survey 0818S.

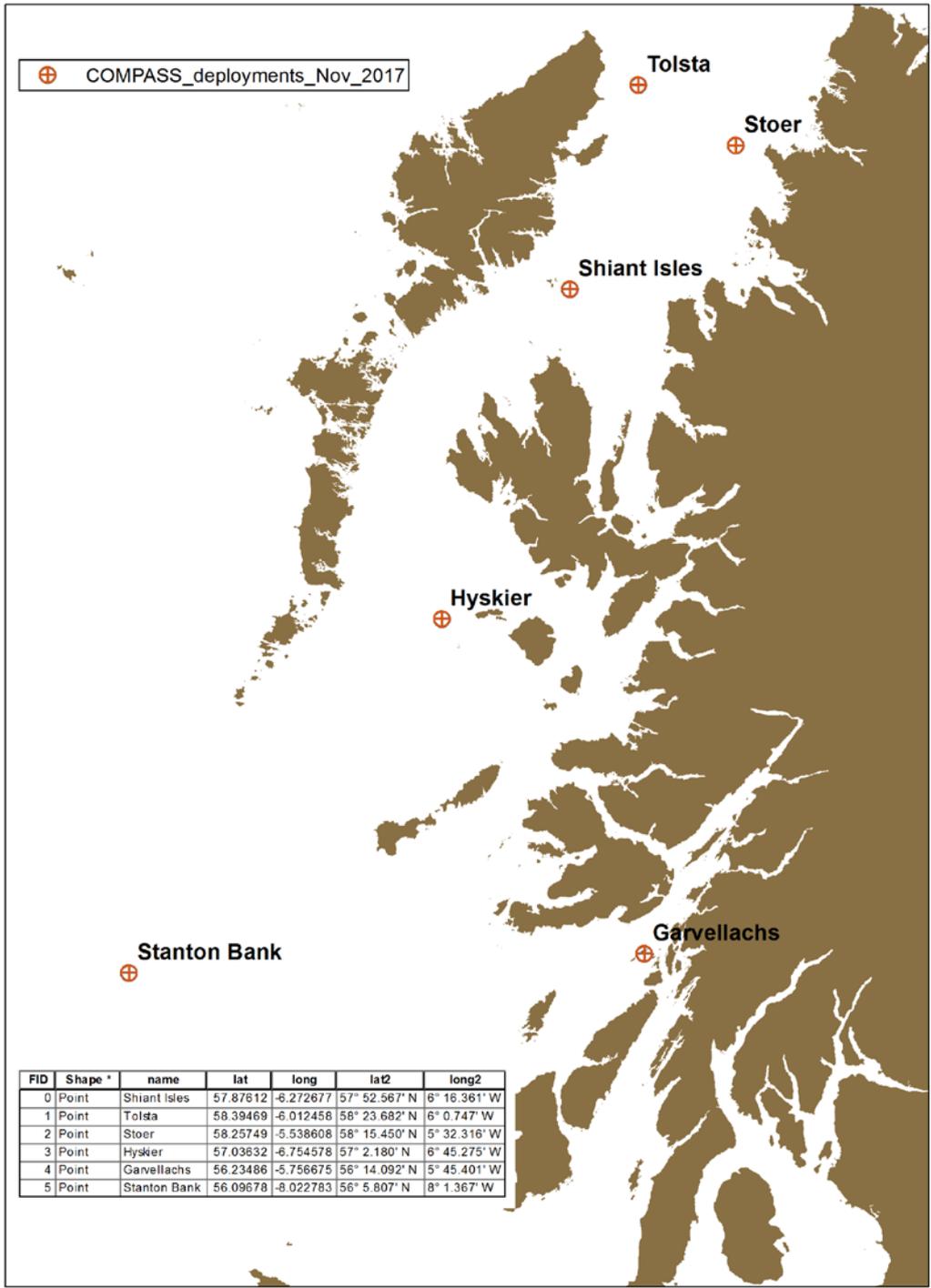


Figure 2: COMPASS mooring locations for underwater TV (UWTV) survey 0818S.