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MRV Scotia

Survey 1022S

PROGRAMME

23 August (TBC) – 13 September 2022

Ports

Loading: Leith, 23 August 2022 (TBC following rudder repairs)

Departure: Leith, 23/24 August 2022 (TBC following rudder repairs)

Crew Change: Aberdeen 30 August 2022

Unloading: Ullapool, 13 September 2022

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 Iain Gibb and the Survey Summary Report (old ROSCOP form) to Matt 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 Per Project: 22 days – IBTSNS/20671

Fishing Gear: GOV Trawl (BT 137) with Ground Gear A & B

MIK Net (Round frame with IK depressor)

Objectives

1. To complete an internationally coordinated demersal trawling survey in the North Sea in ICES areas IVa and IVb.
2. In case of additional available survey time, to undertake experimental tows in water depths of 250 to 300 m or conduct tows around Shetland to increase resolution in perceived areas of high cod abundance.
3. To obtain temperature, salinity and dissolved oxygen concentration data from the water column at each trawling station using a RBR CTD.
4. To sample surface and bottom water for Nutrients, Chlorophyll and dissolved oxygen calibration samples from 34 stations (**Lower freezer to be kept free of fish for samples**).
5. On Part 1, undertake opportunistic MIK sampling for pre-metamorphosed clupeoid larvae during the hours of darkness within the trawl survey area.
6. To collect additional biological data in connection with the Data Collection Framework (DCF) and UK Work Plan.

7. To identify and quantify all gelatinous zooplankton caught during trawling.
8. To collect and quantify all marine litter encountered on the survey for MSFD.
9. To identify and quantify the presence of non-indigenous species observed.
10. To collect low nutrient sea water from for the MSS chemistry department.
11. To collect stomach samples from Whiting, Anglers and Megrim for an EU pilot into international stomach sampling on fisheries surveys.
12. To obtain data and frozen samples for pelagic fish (Herring, Mackerel and Blue Whiting) for weight loss analysis.
13. To collect a retained marine molluscs and gastropod shells for distribution mapping.
14. To obtain data and Whiting samples for an AFBI-NI study into genetic differences in populations between areas.
15. To collect and freeze juvenile Mackerel for an IMR Bergan study on the myxozoan parasite *Kudoa thyrsites*.

Procedures

General

Loading of all trawl gear and MIK net gear will take place on 23 August (TBC) following repairs in Leith, with rigging of ground gear A and testing being completed on the same day. Loading of the scientific gear will also take place on the same day. *Scotia* will then sail upon completion of loading. Once safety drills have been completed, *Scotia* will proceed to the first station East of Leith where the first trawl station will be undertaken as a shakedown tow in order to check the net configuration and SCANMAR units. If all systems perform normally the station will be counted and *Scotia* will proceed to the second station. An operational daily survey plan will be formulated by the SIC subsequent to meetings with both the Fishing Master and Captain.

Trawling

There are 70 programmed stat-squares to be surveyed, 20 stat-squares are to be sampled twice as presented on the attached charts (Figure 1. & 2.) with a minimum distance of 10 nm where possible. The programmed stat-squares may change due to other countries completing Scottish allocated stations where possible. Trawling will be undertaken during the hours of daylight which will vary depending on the vessels latitude at any given time. Standard towing time at each station is 30 minutes at a speed of 3.5 to 4.5 kts (average of ~3.9 kts). *Scotia* will intend to complete the southern part of the survey first (IVb) with the intention of completing the programmed stat-squares North of Shetland last. This will allow, if time permits, to conduct the experimental tows in the 250-300 m depth range to increase species distribution resolution or conduct tows around Shetland to increase resolution in perceived areas of high cod abundance.

The GOV survey trawl will be used solely with the 47 m (short) sweeps throughout the survey. Two ground gear types will be used during the survey, the lighter "A" rig being used on all stations south of 57° 30' N and the heavier "B" rig being used north of 57° 30' N. This will require a ground gear swap during the survey following the completion of all stations south of 57° 30' N.

The SCANMAR system will be used to monitor the headline height, depth, wing spread and door spread for each haul whilst the Trawleye will be used to monitor catches to limit the impact of pelagic spawning aggregations. Bottom contact data from each haul will also be collected using the NOAA bottom contact sensor which will be mounted in the centre of the ground gear.

In addition to the routine sampling utilising the EDC system, biological data will be collected for target species in line with the UK Work Plan. All fish will be processed in accordance with IBTS manuals and MSS SOPs.

Hydrography

A stationary CTD cast will be taken at every trawl station using an RBR Concerto CTD. These provide temperature, salinity and dissolved oxygen profiles of the water column. Water samples from 5 m above the sea floor and 5 m below the surface will be collected at each CTD station for calibration. The water samples will also be used at 34 stations to calibrate the dissolved oxygen concentration readings from the CTD and examine the seawater nutrient and chlorophyll concentrations.

Twenty-four 20 litre carboys will be filled with low nutrient sea water, according to the Water Collection SOP (0805 – Section 8.3.1) for the Chemistry department at MSS.

MIK Sampling

During part 1 of the survey, pre-metamorphosed clupeoid larvae will be opportunistically sampled during the hours of darkness with the MIK mid-water trawl (round frame). The vertical profile of the tow will be monitored using the Scanmar system. Catches will be processed as per the most recent version of the MIK sampling manual.

Additional Sampling

- All gelatinous zooplankton retained by the trawl will be identified (where possible) and quantified.
- As part of the MSFD for MSS and IBTS, all marine litter retained by the trawl will be identified (where possible), quantified and retained for disposal ashore. All fouling species will be identified and recorded.
- All shelled molluscs will be retained for identification and species distribution mapping.
- All non-indigenous species will be identified and quantified.
- Stomach samples from Whiting, Anglers and Megrin will be retained for an EU pilot into international stomach sampling on fisheries surveys.
- Data and frozen samples for pelagic fish (Herring, Mackerel and Blue Whiting) will be collected for weight loss analysis at MSS.
- A variety of species will be retained for the Aberdeen University MSC Species Diversity Practical. Haddock will also be retained for the ABU MSC Haddock Dissection Practical.
- Data and genetic samples for Whiting will be collected for an AFBINI study into genetic differences in populations between areas.
- Juvenile Mackerel will be retained and frozen for IMR Bergan for a study of the myxozoan parasite *Kudoa thyrsites*.

Normal contacts will be maintained with the Laboratory.

Scotia will steam to Ullapool (TBC) to allow all staff and required equipment to be unloaded on the morning of 13 September 2022.

Submitted:
R Gillespie-Mules
11 August 2022

Approved:
I Gibb
14 August 2022

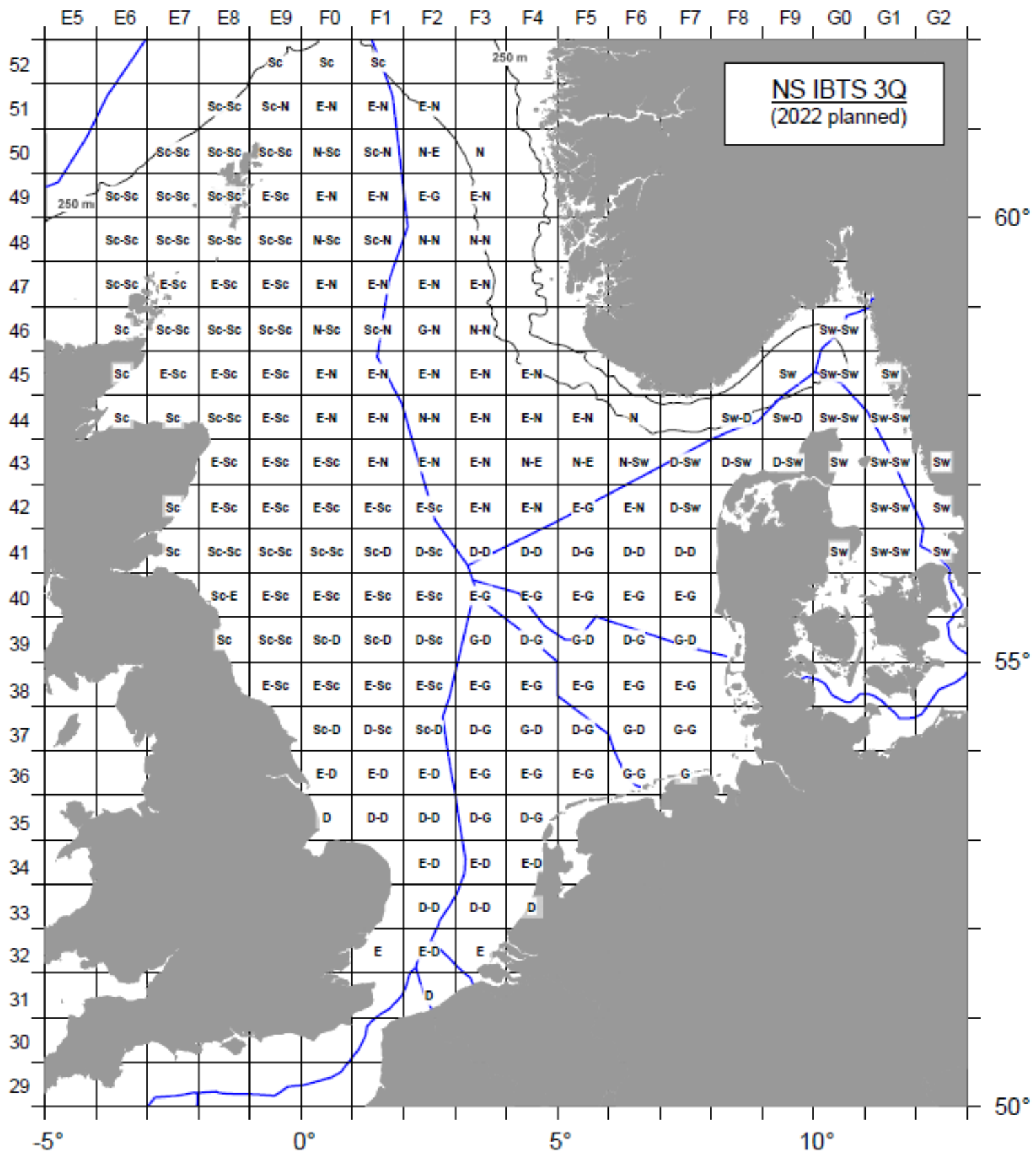


Figure 1: 2022 IBTS Quarter 3 revised survey grid - All Participants (D: Denmark, E: England, G: Germany, N: Norway, Sc: Scotland, Sw: Sweden).

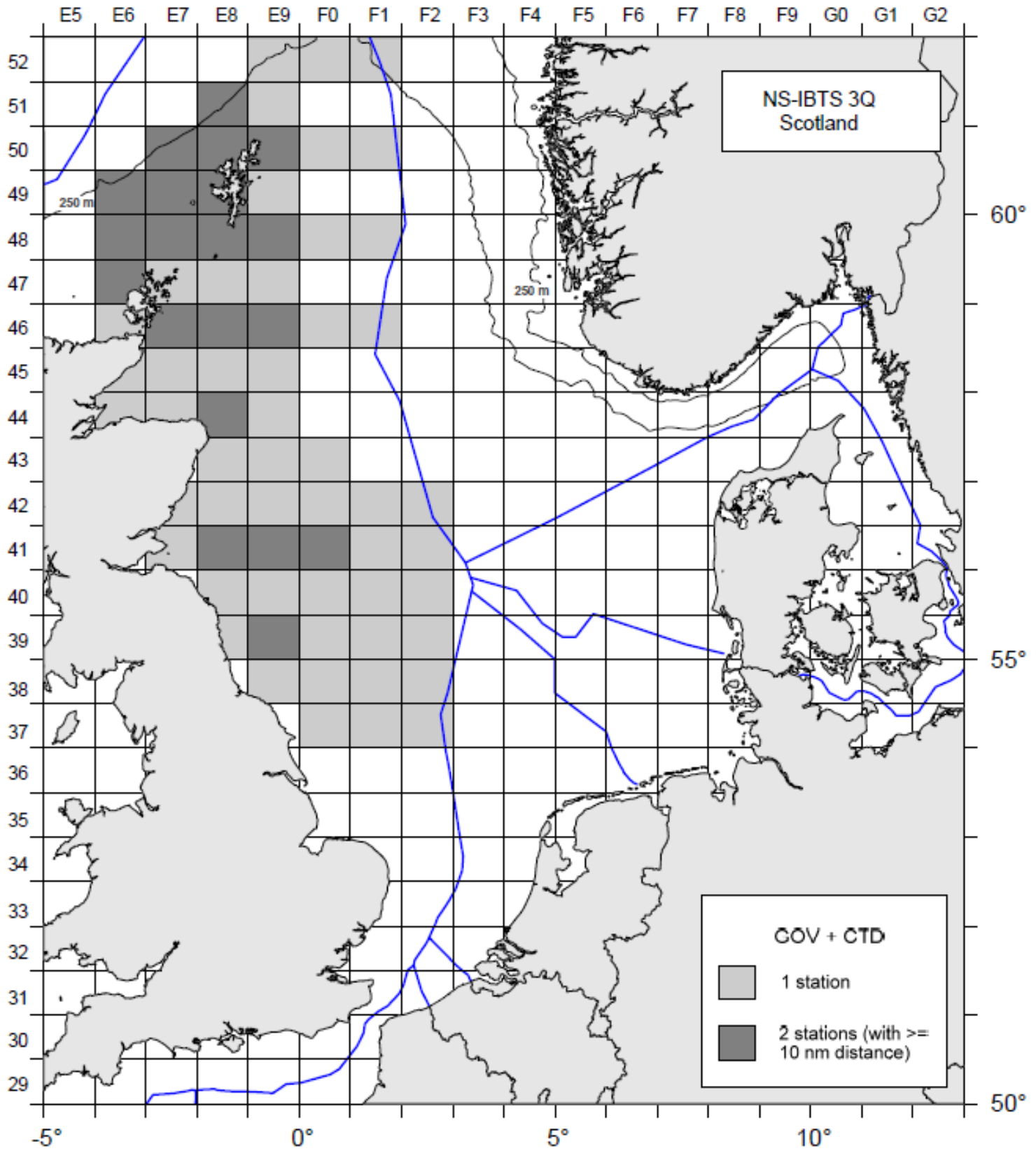


Figure 2: 2022 IBTS Quarter 3 Scotland only survey area.