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MRV Scotia

Survey 0218S

REPORT

23rd January – 12th February 2018

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Objectives

1. To complete Scotland's commitments to the Quarter 1 International Bottom Trawl Survey (Q1 IBTS) 2018 in the North Sea in ICES area IV.
2. To undertake a concurrent plankton survey during the hours of darkness within the trawl survey area to provide indices on:
 - pre-metamorphosed herring and sprat larvae
 - stage 1 cod and plaice eggs
3. To collect temperature and salinity data from the surface and seabed water at each trawling station.
4. To collect additional biological data in connection with the EU Data Collection Framework (DCF).

Out-turn days: 21 days, RV1801

Survey Gear:

- GOV Trawl (BT 137) rigged with 47m sweeps and ground gears A and B
- Midwater Ring Net (MIK) with attached subsidiary ring net (MIKeyM)
- CTD (Seabird 19+)

Narrative

Scotia sailed from Aberdeen at the relatively late hour of 1300 on 23rd January to accommodate last minute crew changes. To accommodate this and, despite plans for the first half of the survey to concentrate on the northern stations where groundgear B would be used, the GOV trawl was initially rigged with ground gear A to allow a shakedown haul to be

undertaken in the closest square (43E8). With all the fishing gear and net monitoring instrumentation working correctly the haul was considered valid for the survey and was subsequently worked up. Following this the vessel changed over to groundgear B while proceeding with the MIK sampling working north. Thereafter the survey proceeded as planned with the GOV trawl stations being undertaken during daylight hours then switching over to the MIK sampling during the hours of darkness.

On the morning of the 26th Jan scientific staff were informed that when towing the MIK net the loading on the crane used for MIK deployment was at unsafe levels and permission was refused to use the crane for this purpose. With no alternatives available for deployment and no repairs to existing hardware possible in the short term MIK sampling was discontinued for the duration of the survey and associated staff moved onto dayshift.

Over the next two days Scotia surveyed around Orkney and the NW of the sampling area completing two hauls in the lee of Yell during strong southerly gales then shifting east through Bluemull sound overnight of the 27th as the wind moved round to coming from the west and conditions became unworkable. Following this survey continued in the lee of Shetland then worked back over to the west as good sea conditions prevailed. On 1st Feb three hauls to the west of Sumburgh were completed and Scotia steamed south for the half landing and staff change, arriving in Aberdeen on the morning of 2nd Feb. On 3rd Feb Scotia began work in 44E8, the nearest square to be surveyed with groundgear B and continued the survey to the north then back into the central North Sea. On 8th Feb the change to groundgear A was made and all the southern stations were completed without incident over the next three days. The vessel ended the survey on the morning of the 11th February some 50nm southeast of Aberdeen and from there made passage to Harbour. Scotia was alongside Aberdeen harbour by 2000 on the same day. All scientific equipment was unloaded on 12th February and staff departed the vessel the same day.

Strong winds and poor sea conditions were experienced during several periods throughout the survey however no trawl survey time was lost on account of poor weather.

RESULTS

Demersal Trawl Survey

All demersal trawling was undertaken with the GOV trawl with ground gear B being used north of 57°30N (46 valid hauls) and ground gear A used for all stations south of that latitude (11 valid hauls). The Scanmar system was used throughout the survey to monitor headline height, wing spread and door spread. The vessels GPS navigation system provided data on vessel speed over the ground and distance covered during each haul. A self-recording bottom contact sensor was attached to the ground gear with the data being downloaded and checked after each tow to monitor groundgear contact with the seabed.

Overall all 57 out of the 59 programmed stations were sampled successfully (Figure 1). All rectangles had at least one valid haul therein however two rectangles (48E7 and 42E8) out the eleven that were initially planned to have two hauls had only one valid haul completed. There were 3 occurrences of invalid hauls, 2 of which involved significant damage to the trawl. On 2 of the 3 occasions the station was successfully repeated elsewhere within the rectangle.

A total of 82 different species were observed during the trip with a total catch weight of 31719kgs for 26.5 hours combined valid trawl time. Overall 5214 biological samples were collected.

Table 1 shows the preliminary indices for all vessels participating in the 2018 Q1 North Sea international bottom trawl survey. The indices are based on the numbers of fish caught per hour below a pre-defined length selected as a probable delimiter of age 1+ fish. The definitive indices will be calculated once all the catch data from all the surveys have been uploaded together with the corresponding age data.

Table 1. Preliminary 1+grp indices of selected species for Q1 IBTS 2018 (All countries).

Species	Final 2017	Preliminary 2018	Mean (Av. 1980-2017)
Cod	9.4	0.9	7
Haddock	219	34	513
Whiting	613	216	456
Norway pout	4357	1941	2948
Herring	2396	669	2020
Sprat	3588	2998	1262
Mackerel	551	158	107

MIK Survey

A total of 22 MIK hauls covering 11 rectangles each with 2 samples were completed before deployment was discontinued (Figure 1). All 22 samples were found to contain pre-metamorphosed herring larvae however none of them contained those of sprat or pilchard. The vertical profile of each haul was monitored using a Scanmar depth sensor. One sample from the MIKeyM nets was collected from each of the rectangles covered (total 11 samples) which will be processed at a later date in Norway.

Biological Sampling / Age determination/Additional DCF sampling

In total 5214 biological samples were collected as part of the routine biological sampling programme on a broad range of mainly commercial species. Otoliths from cod, haddock, whiting, saithe, Norway pout, herring, mackerel and sprat were collected for ageing back at the institute. In addition hake and plaice otoliths were also retained from the survey and will be aged at a later date (Table 2).

Table 2. Numbers of routine biological samples collected.

Species	No. Sampled	Whole Weight	Gutted Weight	No. Aged
Angler (<i>Lophius piscatorius</i>)	30	30	30	0
Blue Skate (<i>Dipturus flossada</i>)	7	7	-	-
Brill (<i>Scophthalmus rhombus</i>)	2	2	2	tba
Cod (<i>Gadus morhua</i>)	733	733	732	733
Cuckoo Ray (<i>Leucoraja naevus</i>)	32	32	-	-
Flapper Skate (<i>Dipturus intermedia</i>)	11	11	-	-
Haddock (<i>Melanogrammus aeglefinus</i>)	1151	1151	1147	1151
Hake (<i>Merluccius merluccius</i>)	124	124	113	tba
Herring (<i>Clupea harengus</i>)	641	641	-	641
Lemon Sole (<i>Microstomus kitt</i>)	93	93	93	-
Mackerel (<i>Scomber scombrus</i>)	176	176	-	176
Megrim (<i>Lepidorhombus whiffiagonis</i>)	48	48	47	0

Norway Pout (<i>Trisopterus esmarkii</i>)	391	391	390	391
Plaice (<i>Pleuronectes platessa</i>)	168	168	167	tba
Saithe (<i>Pollachius virens</i>)	320	320	320	320
Spotted Ray (<i>Raja montagui</i>)	64	64	-	-
Sprat (<i>Sprattus sprattus</i>)	273	273	-	273
Spurdog (<i>Squalus acanthias</i>)	98	98	-	-
Starry Ray (<i>Amblyraja radiata</i>)	5	5	-	-
Starry Smooth Hound (<i>Mustelus asterias</i>)	12	12	-	-
Thornback Ray (<i>Raja clavata</i>)	3	3	-	-
Turbot (<i>Scophthalmus maximus</i>)	3	3	3	tba
Whiting (<i>Merlangius merlangus</i>)	829	829	818	829

Hydrographic Data

The CTD and reverser bottle were successfully deployed at 53 out of a possible 57 valid GOV stations in order to obtain temperature/salinity data. In addition surface and near-seabed water samples were collected from each station for analysis of nitrate, silicate and phosphate content back in the lab.

Marine Litter

All marine litter picked up in the trawl was classified, quantified and recorded then retained for appropriate disposal ashore.

Invasive species

All hauls were checked for particular invasive marine species and their presence/absence recorded. These invasive species were absent from all hauls during 0218S.

Miscellaneous

The following miscellaneous tasks and sample collection were also undertaken

- 6 experimental 'zero minute' hauls were completed (3 in 47E7 with groundgear B, 3 in 43E9 with groundgear A) and catches worked up. The trawl net was carefully shaken down prior to, and between, each experimental haul to ensure no cross-contamination of catch.
- 22 Anglerfish gall bladders (20 from *Lophius piscatorius*, 2 from *L. budegassa*) were removed and preserved in 96% ethanol for parasite analysis at Marine Scotland and Aberdeen University.
- 5 tissue samples from *L. piscatorius* from the southern part (south of 57°30N) of the survey area were treated with RNA-later and frozen to contribute to a study of Angler stock identification in the north Atlantic at AZTI.
- All shelled molluscs and selected haddock stomachs samples were collected and frozen for the McKay reference collection.
- 30+ specimens of *Loligo sp* were collected and frozen for study at Aberdeen University
- 65 red gurnards (*Chelidonichthys cuculus*) and 65 lesser spotted dogfish (*Scyliorhinus canicula*) were collected and frozen as dissection material for Aberdeen University
- 50+ red gurnards were collected and frozen for studies into population structuring at Marine Scotland.

- 30+ each of poor cod (*Trisopterus minutus*) and norway pout were collected and frozen for parasite analysis as part of an honours degree project at Napier University
- Three staff belonging to the Scottish Fisherman's Federation were trained in fish identification, subsampling and otolith collection for observer duties.
- Conveyor footage of single species (Haddock, Whiting, Cod, Hake, Angler, Norway pout, Sprat, Plaice, Common Dab (*Limanda limanda*), Long Rough Dab (*Hippoglossoides platessoides*)) was recorded for use in the continuing development of CCTV monitoring technology at Marine Scotland.

Submitted:
J Drewery
8th March 2018

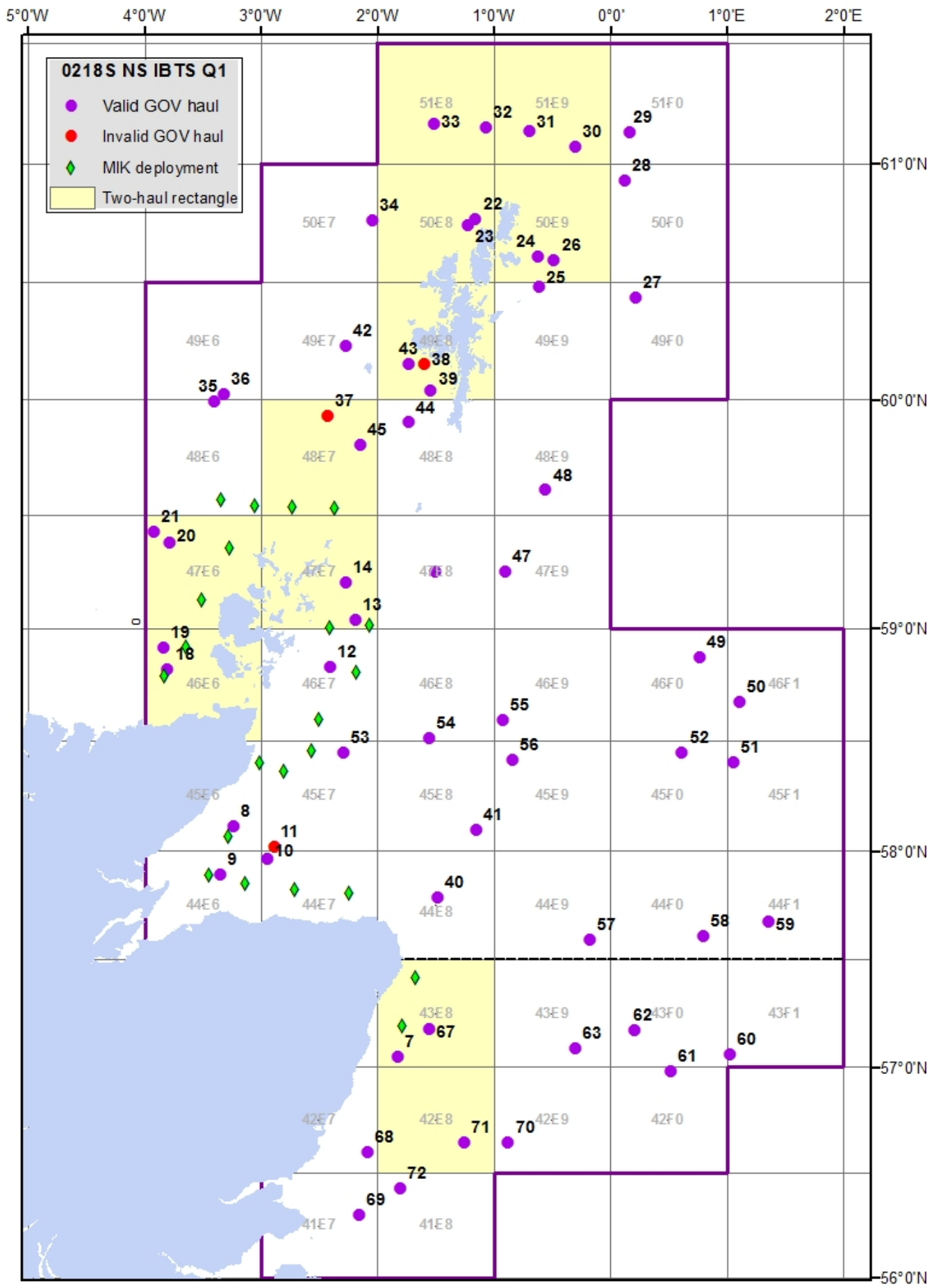


Figure 1. Scottish North Sea Q1 IBTS survey area and deployments for 2018. All symbols indicating deployment of GOV or MIK represent approximate midpoints. Missing haul numbers refer to zero-minute hauls. Dashed line represents dividing line at 57°30N between groundgears used (A – South of division line, B – North of division line). Squares in orange indicate those where two hauls were planned, all other squares had 1 haul only planned.