P17/15

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FRV *Scotia*

Cruise 1701S

REPORT

19 November - 1 December 2001

Landings

Peterhead, 21 November
Invergordon, 23 November

Personnel

D G Reid	(In charge)
R S T Ferro	(23 Nov - 1 Dec)
F G O'Neill	(19-23 Nov)
P J Copland	
P J Barkel	
E G Jones	
N S Collie	(19-23 Nov)
C G Davis	
I Penny	
O Goudie	
D Mayor	(Visitor, Southampton University)

Objectives

1. To assess the performance of the newly designed small mesh cod-end cover with respect to its effect, if any on the geometry and water flow in the cod-end of the trawl.

2. To obtain quantitative information on fish populations in the mouth of the trawl using the Reson Seabat mounted on the RCTV along with simultaneous video footage using the SIT and CCD cameras where possible to give information on species identification.

3. To mount low light CCD cameras on the trawl extension in order to make quantitative counts of fish passing into the cod-end which can be correlated with cod-end and cover catches.

4. Time permitting, to indirectly assess whole gear selectivity by changing either ground gear or altering sweep lengths and monitoring consequent changes in catch composition.

Out-turn days per project: MF0662 - 13 days

Narrative

All equipment was loaded in Aberdeen prior to 16 November. Staff joined the vessel on the 19th and departure was at 1400 hours. Departure was delayed for minor repairs. The vessel steamed to the inner part of the Moray Firth (approximately 58°06'N and 3°25'E, water depth approximately 50 m). The first activity carried out in this location was to check the operation of all equipment prior to carrying out the cod-end cover trials. Testing revealed major problems with the performance of the television and sonar system and vehicle. Initial investigations suggested this was due to faults in the new umbilical cable and this was changed for a shorter one. This did not solve the problems which were isolated to fluctuations in the vessels 3-phase 440 v supply. Arrangements were made to return the umbilical for testing and obtaining a generator to isolate the system from ships supply. Initial trials with the GOV for the cover tests proceeded well on the 20th including the mounting of strain gauges and flow meters.

The vessel steamed to Peterhead for am on the 21st and transferred the generator and tow cable, and then returned to the trial site. The use of the generator removed the problems of power supply and the vessel was able to continue with the trials of the small mesh cover. On the first deployment of the net and cover, the cover was immediately torn off and lost. This effectively put an end to this part of the work programme.

Work subsequently continued on the second objective – using the RCTV mounted sonar to quantify fish in the net opening. The first part of this objective was to develop the ability to deploy the net and RCTV together with both arriving in the towing position simultaneously. After a small number of trials this was achieved. The programmed staff change on the 23rd was carried out in Invergordon at 1600 hours. The opportunity was also taken to re-embark the new umbilical cable. Following the staff change the vessel returned to the trials site. Tests on the new umbilical cable with the generator power supply proved successful and this cable was reinstalled on the television winch. Initial trials with the low light ccd cameras on the headline and trawl extension were also successful. During the night of the 23rd the vessel steamed to new trials site east of Orkney at approximately 59°12'N and 2°14'E, with deeper water (approximately 80 m). Trials with both RCTV/sonar combination and net mounted ccd cameras (in daylight hours) continued until 29 November. This included the collection of lightmeter data using a dipping frame between trawl hauls. 24–36 hours were lost due to weather and about eight hours due to ships system faults. Bad weather on the 30th forced a shift back to the original trials site, where two more tows were conducted. The vessel then steamed to Aberdeen for disembarkation am on 1 December.

In addition to the above work, a short period was used to test a new sonar (SIMRAD SM2000 – on loan from SIMRAD) for possible use in this type of work. The sonar proved less successful than the SeaBat in terms of dynamic range, repetition rate and resolution. The cruise was also used to trial a new digital video collection procedure being developed by Instrumentation. This proved very successful, although the quality of the output has yet to be assessed. The fourth objective of tests on ground gear or sweep lengths was not possible due to time constraints.

Results

During the survey a total of 32 trawl hauls were carried out. 21 of these were of a standard 30 minute duration with the RCTV maintained above the net behind the footrope with the multibeam sonar orientated in the vertical position and the catch fully worked up. These can be broken down as follows:

Thirteen Acoustic RCTV hauls where TV cameras were not used. Either early morning before 10 am or late afternoon and evening after 1500 hours. Of these, six were made with ground

gear C (three in the Moray Firth at approximately 55 m depth and three east of Orkney in 80 m depth) and seven with ground gear B (two in the Moray Firth and five off Orkney).

Eight standard Camera tows using netcams in the extension and on the headline as well as the SIT camera on the RCTV. All these tows were off Orkney where water clarity was far better than in the Moray Firth. Four of these tows were using ground gear B and 4 with ground gear C.

Ten non standard tows were completed. This number includes some of the early tows where the deployment technique was being perfected. Also tows where the RCTV was moved about the net to observe camera pods, scanmar units etc or was manoeuvred inside the net to attempt close range visual identification of insonified fish and conformation of fish behaviour.

Two exploratory tows were completed with the multibeam sonar in different orientations in order to assess the optimal method for observing fish ahead of the mouth between the wings of the net.

For the 25 fully worked up hauls the catch was worked up as per IBTS protocols providing abundance by species, length frequency and weight length relationships. No otoliths were collected for age determination. Fish samples were also taken in response to requests from CEFAS, Aberdeen University and Southampton University.

Approximately 40 Gb of acoustic data, and in excess of 40 hours of video data were collected. This will take some months after the survey to analyse.

Baseline data (flow meters and strain gauges) was collected for the GOV without any covers. This will be useful in the development of the cover work, however, the loss of the covers on deployment precluded the collection of any matching data for the net with the cover.

Overall the cruise was up to the best of expectations. Despite considerable technical problems a significant and useful corpus of data was collected. This stands to the credit of all members of the science team. The cruise required considerable flexibility and cooperation from the vessels officers and crew and this was provided in all cases. The officers and crew deserve commendation for their contribution to the successful outcome of the work.

D G Reid
18 January 2002

Seen in draft: P Ramsay, OIC *Scotia*

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***SCOTIA* VESSEL**

Programmes - Mr J A Morrison then Dr R M Stagg for approval. Reports - Mr J A Morrison for approval.
Circulation list on Director and file copies only.
Issue two copies of Record of Haul and Station Numbers pro-forma with Scientist-in-Charge's copy of *Scotia* and *Clupea* programmes. Two xerox copies of track chart for reports to be sent to Dr L Rickards. Original chart to be returned to Scientist-in-Charge of cruise.

PROGRAMMES ONLY

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~~Mr T Reid~~
~~Mr P J Copland~~
~~Mr J Dunn~~
~~Mr A Beaton~~
~~Mr G Howard~~
~~Mr A Cranna~~
~~Mr S Halewood~~

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~~Dr J Baxter~~

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Fishery Officers at

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