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Commercial Vessel M/V Heather Sprig (BCK 181).

Charter Cruise 1097H (EC FAIR Contract on Fish/Nephrops Damage and Survival)

REPORT

28 July - 22 August 1997

Personnel

G I Sangster	HSO (in charge)	shore based with diving team
R J Kynoch	SO	shore based with diving team
M Breen	SO	shore based with diving team
G N Graham	SO	shore based with diving team
D J Bova	SO	shore based with diving team
M Burns	ASO	on board
N Lowry	(DIFTA)	on board
M Andersen	(DIFTA)	on board
N Madsen	(DIFTA)	on board, part time (28 July - 3 August)
T Moth-Poulsen	(DIFTA)	on board, part time (3 August - 10 August)
U J Hansen	(DIFTA)	on board, part time (10 August - 22 August)
R R Harris	(DIFTA/Leic Univ)	on board part time, shore based at harbour laboratory
M Andrews	(DIFTA/Leic Univ)	on board part time, shore based at harbour laboratory
A V Soldal	(IMR Bergen)	on board part time, part time at harbour laboratory
O Cruickshank	(IMR Bergen)	on board
M Ulmestrand	(SEIMR Sweden)	on board part time, part time at harbour laboratory
D Valentinsson	(SEIMR Sweden)	on board part time, part time at harbour laboratory
H. Milliken	(Massachusetts, USA)	Visitor on board, part time (17 - 22 August)
M. Farrington	(New England Aquarium)	Visitor on board, part time (17 - 22 August)

Out-turn days to project : 26 days – C544

Objectives

To assess the damage to, and survival rates of (a) Nephrops and (b) commercial species of fish with respect to length, age and mesh size after escaping from a typical 500/600hp dual purpose fish/prawn trawl.
To measure the selectivity characteristics of each "test" cod-end using hoop-supported covers.

Narrative

The Marine Laboratory mini-bus transferred the participating foreign staff between Dyce Airport and their Gairloch accommodation on 27 July. M/V "Heather Sprig" arrived at Gairloch (from Buckie) on the morning of 28 July. Swedish and Marine Lab staff sailed for the Inner Sound, between Skye and Red Point, with the local boat "Sealgair Mara" and "Heather Sprig" to collect creel caught "control" category Nephrops for the survival experiment. These undamaged individuals were collected as the creels came on board and housed in individual stoppered perforated plastic tubes immersed in deck tanks of running seawater. Sampling was done to try to ensure that the

size range also covered the expected size range of animals escaping from the trawl cod-ends. The tanks were then transferred on to "Heather Sprig". On her arrival at the Longa Island cage site, FRS divers immediately put each Nephrops into an individual cell of three 2.5m x 2.5m fibreglass holding pens designated for controls categories. Each pen housed 96 Nephrops in identical individual cells to prevent fighting and cannibalism. Each cell contained an artificial burrow and sediment. 15 pens were used to investigate all "treatment" and control categories. On her return to Gairloch harbour, "Heather Sprig" was immediately loaded with the fishing gear and instrumentation equipment. FRS, DIFTA, IMR and SEIMR staff prepared and set up all their scientific equipment on board the vessel. The towed fish transport container was loaded onto the ship's stern at high water, transferred to near the Longa Island cage site area and lowered onto the seabed. The next day was used for testing out the new cod-end cover acoustic release system. This system was successfully developed in the DIFTA flume tank at Hirtshals in June 1997, but had not been fully tested in the open sea under commercial fishing conditions. The remaining days were used for trawling to provide the various fish and Nephrops categories for (a) the survival/damage assessment experiments and (b) selectivity data for each of the "test" cod-ends. Twelve 35 cubic metre cages on the seabed were used for the fish survival experiments. Fish "controls" were caught by hand-lining with barbless hooks. Transfers of fish from cod-end cover to cage was simplified by shepherding them to swim through a netting corridor ahead of a bubble curtain apparatus. In this way, fish in the cages were all alive prior to the commencement of the daily survival monitoring. The FRS diving team on board the local vessel "Salar" liaised daily with "Heather Sprig" and the Longa Island raft to arrange a rendezvous time for the release of the cod-end cover. The work continued uninterrupted for the remaining charter period which included trawling, collecting and transferring Nephrops and fish for either "survival", or "selectivity" experiments, with periodic changeovers of the 60mm square mesh, 70mm, and 100mm diamond mesh cod-ends. M/V "Heather Sprig" was off-loaded on 22 August and immediately sailed for Buckie. The minibus returned the visiting scientific staff to Dyce Airport and all FRS personnel returned to Aberdeen on 22 August.

RESULTS

No days were lost due to adverse weather. 33 hauls were carried out, 13 of which were rejected due to damage, fasteners or acoustic release failures. Selectivity estimates will be obtained for haddock, whiting and Nephrops when the data are analysed The cod-end cover acoustic release system worked sucessfully on the majority of hauls. Four hauls were lost due to rope and/or float entanglements and breakages. Only one fish or Nephrops "survival" category sample was taken from a trawl haul. Three sets of Nephrops samples were collected from each of the following categories (a) 60mm square mesh discards, (b) 70mm diamond mesh escapes, (C) 100mm diamond mesh escapes and (d) 100mm diamond mesh discards. Nephrops discards were collected randomly after the cod-end had been emptied and sorted in the normal manner by the vessel's crew. Triplicated samples of haddock and whiting escapes from 70mm and 100mm diamond mesh cod-ends were also collected. Triplication of the groups would show the variance in the eventual survival results. Once a fish cage or Nephrops pen experiment commenced, monitoring and feeding were carried out each day by divers to check on survival and to remove dead specimens for body damage investigation. Furthermore, post mortem examinations were performed on any fish dying while in captivity in the experiment. The results of these examinations will be used to determine the probable cause of death in each case. The survival experiments were monitored by the FRS diving team after the end of the vessel charter period for a period of approximately 30 days or until such time that fish and Nephrops mortality in the cages and pens had more or less ceased. The data obtained from this joint FRS/DIFTA/IMR/SEIMR project will be analysed by

all four Institutes according to the tasks laid down in the agreed EU Contract workplan.

G I Sangster
7 November 1997