

CRUISE REPORT

FRS "SCOTIA"

PART I 15 June-7 July 1970

PART II 14 July-4 August 1970

OBJECTIVES

1. To carry out a midwater trawling survey for 0-group gadoids in the north-western North Sea and the area to the north of Scotland.
2. To carry out further trials with the "Scotia" Young Fish Pelagic Trawl to determine whether the diurnal variations in catches of 0-group gadoids observed in 1969 were primarily due to net avoidance or to diurnal changes in the depth distribution of the fish.
3. To collect stomach samples of young gadoids for studies of their food and feeding in this life history stage.
4. To obtain live fish for aquarium experiments.

NARRATIVE

PART I - 15 June-7 July

Repairs to the freshwater storage tanks delayed "Scotia's" arrival in Aberdeen until the morning of Thursday, June 18; further delays were occasioned by crew shortage and latterly by coastal fog, so that "Scotia" did not sail until noon on Saturday, June 20. After a haul near Aberdeen to test the gear, "Scotia" proceeded to the grounds to the east of Shetland and began fishing on June 21. The next seven days were spent working in the area between latitudes 59° 00'N and 61° 00'N, and longitudes 00° 30'W and 02° 30'E. On June 29, a call was made at Lerwick and the ship sailed on the morning of the following day. It had been intended that most of the work during the remainder of the first part of the cruise should be done to the south of latitude 59° 00'N and to the east of longitude 01° 00'W, but a succession of gales resulted in most of the fishing being carried out considerably further to the west. Even in the comparatively sheltered area close to the coast about 36 hours were lost due to bad weather. "Scotia" docked in Aberdeen on Sunday, July 5, and a number of live fish were transferred to the Laboratory. On the following day the ship proceeded to Collieston and successfully lifted the hydrographic buoy moored there before returning to Leith.

PART II - 14 July-4 August

The "Scotia" left Aberdeen for the second half of the survey at 1030 on July 15 and, after checking the position of the radio buoy off Collieston, remained in that area until 0300 on July 16 to avoid bad weather. A trial haul was made in the Moray Firth before the ship began a survey along the north coast of Scotland. Four hauls were made between the Orkneys and the Butt of Lewis but bad weather subsequently resulted in only two hauls being made in the ensuing 48 hours. The intention was to shoot the trawl over deep water but as the wind was persistently strong a course was set for the east side of Shetland. After a day's trawling in this area the ship docked at Lerwick at 1130 on July 23.

"Scotia" left Lerwick at 1530 on July 24, and for the next four days worked to the north and west of the Shetlands. Late on July 27 the ship passed between Fair Isle and Sumburgh Head to trawl at positions in the North Sea where samples of fish had been taken on the first half of the cruise. On July 29 the ship

moved to the south-eastern part of the survey area that had not been sampled in Part I. Bad weather stopped trawling at 0400 on July 30 and a course was set for Aberdeen to land a sick man. The ship docked at Aberdeen at 1200 on July 31.

RESULTS

(i) Midwater Trawling Survey

PART I

During the first part of the survey 45 hauls were made with the midwater trawl in the north-western North Sea and 0-group gadoids were caught in almost all hauls. In most cases the net was fished at depths between 10 and 20 fathoms. 0-group haddock were found to be widely distributed, the largest catch (419 fish) being taken in statistical rectangle 18F. 0-group cod were similarly widely distributed but were most numerous (up to 134/hr) off the Aberdeenshire coast. 0-group whiting were extremely scarce and only 11 were caught during this part of the cruise. 0-group saithe were taken in most hauls but were found in greatest numbers in and near the Moray Firth. As in the 1969 surveys, Norway pout were the most numerous of the 0-group gadoids caught on the survey, the largest catch being 17,745 fish. They were found to be most abundant on the Fladen ground. 0-group flatfish (chiefly long rough dabs and witches) were frequently caught, as were juvenile clupeoids and sandeels. Adults of a number of species, especially haddock, gurnard, dogfish and lumpsucker, were also caught in a number of hauls during the survey.

Strong echo traces in midwater were infrequent during Part I. The best catch of 0-group haddock was, however, taken when the net was towed through a 'spotty' trace, extending from just below the surface to a depth of 10 fathoms. Similarly, the largest catch of Norway pout resulted from a tow through a large dense trace rising rapidly towards the surface.

PART II

During the second part of the cruise a total of 19 hauls were made to the west of Orkney and Shetland, and a further 19 in the North Sea, mostly in depths of 10-20 fathoms, the depth at which echo traces were usually found. A trace at 25-30 fathoms, occurring only to the west of the Orkneys and Shetlands appeared to consist predominantly of Salpa fusiformis and subsequently traces of this type were avoided because of the difficulties in handling and working up the catch.

During an evening haul 5 miles S.W. of Foula, a trace ascended, apparently from the bottom. The trawl was hauled twice through the trace, the catch consisting of appreciable numbers of 0-group Norway pout. Fishing through other echo traces often yielded quantities of sandeels and, on one occasion west of Shetland, seven baskets of 30 cm haddock were caught. Apart from the trace thought to be Norway pout, there was no evidence of midwater traces attributable to other 0-group gadoids, and in general few were caught.

Catches of all 0-group gadoids were poor west of Orkney and Shetland with the exception of the two hauls of Norway pout close to Foula, the largest, with ca. 17,000 fish/hour. The largest hauls of other species in this area were 47 whiting, one haddock and one saithe. In the North Sea catches of haddock were generally higher, the maximum being 264/hr 30 miles east of Shetland. The most cod caught was 42/hr near Fladen.

Other species caught included small numbers of large haddock, herring, Squalus acanthias, grey gurnard, sprat and numerous sandeels. Single adult long rough dabs were taken in two hauls. 0-group flatfish, clupeoids and sandeels were taken, sometimes in considerable numbers, also small numbers of young horse mackerel, grey gurnard, stickleback, blue whiting, Sebastes viviparus, Argentina

spp, Myctophids (over deep water only) and one Lophius piscatorius. Most of these were preserved in formalin or deep-frozen for further study in the Laboratory.

(ii) Investigations of Diurnal Variation in Catch

Owing to the small catches it was not possible to obtain reliable data on the diurnal variation of catch rates except in the case of Norway pout. In this species only small numbers were taken during the day and all hauls containing more than 1,000 individuals were made at night.

(iii) Feeding Investigations

A large number of 0-group gadoids were preserved in formalin for subsequent analysis of their stomach contents. Stomachs of adult haddock, gurnard and Squalus acanthias were examined at sea to discover the extent of predation by these fish on young gadoids. The main prey organisms were found to be Crustacea and sandeels and young gadoids were found only in the stomach of one gurnard.

(iv) Size Composition

As many of the fish taken were extremely small, especially during Part I, identification was often difficult, and so numerous samples were preserved in formalin for identification in the Laboratory. Because of this it is not yet possible to present reliable mean lengths of each species for the first part of the survey. On the second part of the cruise mean lengths (mm) of the main species were as follows:

	Norway pout	Whiting	Haddock	Saithe	Cod
North Sea	54.9	49.6	83.1	92.4	58.9
Western area	53.8	30.9	36.5	-	-

Thus the haddock and whiting caught to the west were on average smaller than those caught in the North Sea. In general, catches containing large numbers of individuals consisted of larger fish.

(v) Live Fish Collection

A number of live 0-group fish (cod, haddock, saithe, whiting and Norway pout) were brought back for use in the aquarium. Most were in excellent condition and fed voraciously whilst in the deck tank aboard ship. Norway pout, however, avoided the other species in the tank and none remained alive during Part II.

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