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IN CONFIDENCE: Not to be quoted without reference to the Laboratory

## CRUISE REPORT

FRS SCARBA

6 - 29 July 1971

## OBJECTIVES:

1. To survey the abundance and distribution of 0-group gadoids in midwater in the northern North Sea.
2. To investigate the growth rates and food of 0-group gadoids during their pelagic phase.
3. To investigate whether young gadoids undertake diurnal vertical migrations.
4. To obtain live fish for aquarium experiments.
5. To investigate the distribution and food of selected sea birds (Dixon, Aberdeen University).

## NARRATIVE

"Scarba" sailed from Aberdeen at 1000 hours on July 6 and began trawling five hours later. The ship worked steadily northwards, occupying stations within 60 miles of land, and by the morning of July 10 was 30 miles north of Flugga. "Scarba" then steamed east with the intention of fishing at a number of stations along the 100 fathoms contour. Only two stations were completed before bad weather made it necessary to stop work and to 'dodge'. After 24 hours with no indication that the weather was moderating it was decided to steam to a position close to the east coast of Shetland where it would be possible to work in sheltered conditions on objective 3.

The intention was to do a series of hauls at three different depths throughout three 24-hour periods. Two mishaps prevented the completion of this experiment: on July 13 one of the trawl doors struck the screw during hauling and on the following day the gear hit the bottom, badly damaging the net and one trawl door. "Scarba" then proceeded to Lerwick where the damaged trawl door was repaired and a diver was sent down to examine the screw. "Scarba" left Lerwick on the morning of July 18 and resumed the survey, working her way south from 60° 44' N 0° 33' E. By July 25 the ship was in the vicinity of Aberdeen and was instructed by the Marine Superintendent to proceed to Leith for dry-docking on July 27. The scientific staff returned to Aberdeen on the afternoon of July 26, taking with them a number of live fish for the aquarium.

## RESULTS

### Objective 1

70 pelagic hauls, each of one hour's duration, were made at fishing depths of 10-30 fathoms from the surface. 0-group Cod (Gadus morhua) were distributed mainly between Lats 57°00'N and 60°30'N and Longs 02°00'W and 01°00'E. They were never taken in large quantities, the biggest catch per hour being 77 fish.

0-group Haddock (Melanogrammus aeglefinus) were found over the whole of the area surveyed but were most abundant (up to 4300 fish per hour) between Lats 58°30'N and 60°30'N and between longs 01°00'W and 02°00'E.

0-group Whiting (Merlangius merlangus) were widely distributed throughout the area bounded by Lats 57°00'N and 59°30'N and Longs 03°00'W and 02°00'E. The largest catch per hour was 165 fish.

0-group Saithe (Pollachius virens) were scarce, being taken in largest numbers between Lats 59°00'N and 60°30'N and Longs 00°00' and 01°00'E.

0-group Norway Pout (Trisopterus esmarkii) were found in greatest abundance (up to 64,000 fish/hour) between Lats 59°00'N and 61°00'N and Longs 01°00'W and 02°00'E although smaller numbers were taken almost everywhere.

0-group Blue Whiting (Micromesistius poutassou) were caught over a wide area, extending as far to the southeast as 57°40'N 01°29'E but were most abundant between Lats 59°00'N and 61°00'N and Longs 01°00'W and 02°00'E.

Sandeels were the only other fish caught in large numbers. To the south of Lat 59°00'N they were largely coastal in their distribution but farther north they were caught as far off shore as Long 01°45'E.

### Objective 2

Samples of 0-group gadoids from each haul were preserved in formalin for stomach contents analysis in the Laboratory. Either the entire catch, or a sample, of the 0-group gadoids from each haul were measured to the nearest mm. The mean lengths will be used to investigate areal differences in growth rates. Samples of haddock, saithe, blue whiting, Norway pout and sandeels were sorted into 5 mm length groups and deep frozen in sealed polythene bags. These samples will be used for the investigation of weight/length relationships and the calculation of condition factors.

### Objective 3

Ten hauls were made in the same locality at different depths and times of day but due to damage to the gear this project could not be completed.

### Objective 4

0-group cod, haddock, whiting and Norway pout were brought back alive to the aquarium.

## Objective 5

Nearly 50 sea birds were shot at sea and deep frozen for Aberdeen University. The species sampled were: herring gull, lesser black-backed gull, kittiwake, fulmar, great skua, arctic skua, guillemot, razorbill and puffin.

## ENVIRONMENTAL STUDIES

Surface chlorophyll a and surface and bottom temperature and salinity data were collected from each statistical rectangle visited. Three standard net samples were taken at positions near the Scottish east coast. The Dutch Gulf III was used at one station in each statistical rectangle.

Counts and measurements were made of the medusae captured with the midwater trawl. The species most commonly encountered were Aurelia aurita, Cyanea capillata and C. lamarckii. Aurelia were most abundant to the south of Lat 59° 00' N and to the west of Long 02° 00' W. The two Cyanea species were rather more restricted in their distribution, being found chiefly to the south of Lat 59° 00' N, between Longs 01° 00' W and 01° 00' E.

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