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FRV "Goldseeker" 5GR87

Cruise 5/87 LD

Report

13 April - 1 May

Personnel

J Morrison SSO (in charge)
P Rankine SO

Objectives

1. To carry out a series of larval surveys at Ballantrae Bank and in adjacent areas of the Clyde to obtain estimates of larval production.

2. To carry out a limited series of hydrographic surveys using reversing bottles at Ballantrae Bank to establish the temperature/salinity profile over the period of the survey.

3. To carry out trawl hauls at Ballantrae to identify any fish traces observed.

4. To carry out a grab survey on Ballantrae Bank to check for the presence of herring spawn.

Narrative

Scientific staff and crew loaded "Goldseeker" on the afternoon of 13 April and the vessel proceeded to Ballantrae the following day, where the northern half of the metre net grid was completed. "Goldseeker" made for Stranraer for the night, and the next day, the remaining stations of the metre net grid were completed. That day, in addition, one trawl haul at the edge of the "Bank" and four hydro stations were completed. The night was spent at Cairnryan, and on the morning of 16 April, "Goldseeker" returned to Ballantrae where two hydro stations were completed, with the remainder of the day being spent on a grab survey to the northwest of Ballantrae. In one grab taken on this survey, a small quantity of eggs that were judged to be within a few days of hatching were observed. Further larval surveys at Ballantrae were carried out on 17 and 18 April, and further grab survey work was also carried out on 17 April - but no more eggs were encountered. Work was interrupted by bad weather on the afternoon of 18 April and all day on 19 April, but had improved sufficiently by 20 April, to allow a metre net grid to be completed at Ballantrae, en route north to Troon for the half-landing. No larvae were observed in any of the metre net samples that had been taken up to this point in the cruise.

"Goldseeker" left Troon on 22 April after the half landing and immediately made for Ballantrae where four horizontal metre net hauls and the northern half of the Ballantrae metre net grid were completed before making for Stranraer for the night. On 23 April the southern half of the metre net grid was completed, and the rest of the day was spent carrying out an extensive

grab survey at the north end of Ballantrae Bank. A few yolksac larvae were observed in the metre net samples taken on both 22 and 23 April, and in addition three grab samples were taken which contained "mats" of herring eggs, several layers deep, in which the top layer of eggs was judged to be very near to hatching. "Goldseeker" continued to use Stranraer each night until 26 April, when she made for Troon for the second half landing. During this period, three larval grids, six hydro stations and an extensive series of grab stations were carried out, enabling a larval patch and an extensive area of herring spawn to be delineated.

"Goldseeker" left Troon again on 28 April, and after arriving at Ballantrae, spent the remainder of the day grabbing in order to continue the mapping of the egg patch. "Goldseeker" returned to Stranraer overnight, and the next day carried out a complete metre net survey over Ballantrae Bank, as well as one hydro station immediately over the egg patch. On returning to Stranraer, however, a fault developed in "Goldseeker's" clutch, and as a consequence, on 30 April, "Goldseeker" returned to Troon and the trip was terminated.

Results

Larval surveys

Eight grids of double oblique tows with a metre net drum (160 stations in all) and 8 horizontal tows with the same gear were completed during this cruise. No larvae were encountered until 23 April, but thereafter, larval production continued until the survey had to be terminated on 29 April. By this time, larval numbers had increased very considerably, and one of the samples from a 2 minute double oblique tow was estimated to contain 10000-15000 yolksac larvae.

During the period 23 to 29 April there was relatively little wind at Ballantrae and although the larval patch gradually extended in area, it remained remarkably static, suggesting that wind induced currents may be very important in determining the ultimate fate of larvae from this area.

Hydrographic work

Fourteen hydro stations were completed during this cruise. From this the temperature/salinity profile on Ballantrae Bank over the period of the survey can be established, an an attempt will be made to back-calculate the data of spawning, using temperature and egg development data in conjunction with the hatching dates.

Trawling

Only one trawl haul was carried out on this cruise, and as there were no herring in the catch, and as the evidence of the egg patches suggested that spawning had taken place some time previously, available time was spent on other activities.

Grab survey

Three hundred and thirty-eight grab stations were carried out with a Day grab in an attempt to find and delimit egg patches on Ballantrae Bank. This objective was successfully achieved, and an extensive egg "mat" measuring

approximately 550 metres long by 140 metres wide was mapped out. This "mat" appeared to be continuous and was from 3 to 10 layers thick. Samples of the egg "mat" were retained in order that an estimate of the total number of eggs in the egg patch could be made. In addition, samples of the eggs were kept in sewater aboard "Goldseeker", and approximately 200 of the larvae which subsequently hatched from the eggs were measured so that this length frequency could be compared with that of larvae from artificially fertilised eggs from Ballantrae, hatched at Loch Ewe.

Conclusions

Efforts have been made since 1983 to establish the timing of herring spawning and subsequent larval production at Ballantrae. In 1986 larval production was found to take place from 18 April onwards and this year larval production was noted between 23 and 29 April. The evidence from grab sample taken on 28 April, of eggs in the underlying egg layers still being relatively undeveloped, suggests that larval production may continue well into May, and data from "Goldseeker" cruise 6/87 which follows this cruise will clarify this point. Since larval production seems to extend over a long period in this area, on the basis of the evidence to date, grab surveys may give a far more cost-effective method of estimating the spawning biomass of this stock.

J Morrison

18 June 1987

Seen in draft: A Mair

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