

Indexed *AK*

PG

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

REPORT : RV CLIONE : Cruise 11b.

STAFF : P O Johnson
N Pearson
T J Hulme
J. Casey
A M Watson
C Middleton

DURATION : Left Lowestoft 1145h 25 August
Arrived Lowestoft 0610h 7 September
(Times GMT)

LOCALITY : West central North Sea

AIMS :

1. To carry out an acoustic survey for spawning herring concentrations off the north east coast of England, concentrating on the Yorkshire coast grounds. This will involve the use of a towed body fitted with a 38 kHz transducer, and Simrad echo-integration equipment.
2. To obtain biological samples of herring using a pelagic trawl for age, maturity and fecundity studies.
3. To collect samples of spawning herring for lipid studies, involving preservation of eyes and portions of ovaries (University of Bergen).
4. To follow through the aggregation, spawning and dispersal phases of individual spawning concentrations using acoustic methods supplemented by underwater TV/camera towed sled observations. CTD observations will also be made on the spawning grounds.

NARRATIVE:

CLIONE sailed from Lowestoft at 1145h (GMT) on 25 August and made passage in a gale force NW'ly wind to Bridlington Bay where anchorage was made at 0230h on 26 August to await an improvement in weather. This did not materialise until the morning of the 28th when the survey was able to commence off Flamborough Head at 1000h. Weather conditions remained generally good for the remainder of the trip during which the survey covered an area from north of Whitby (54°42'N) to south of Flamborough Head (53°58'N), extending up to 14-15 miles off the coast. The area was broadly divided into three sectors, each of which was covered several times during the course of this survey:

A brief intermission resulted on 3-4 September when CLIONE had to replenish her fresh water tanks at North Shields.

An overnight return was made to Lowestoft on 6-7 September, docking at 0610h.

RESULTS:

- 1) A total of 1366 nautical miles were acoustically integrated using the SIMRAD QMII and QD systems with an EK 400 sounder and DAFS towed body housing a 38kHz transducer.
- 2) Early in the survey larger shoals were found only in the Flamborough area where a fleet of large Dutch and German trawlers were working 12-15 miles E/SE

of the Head. These were taking large catches, although they reported many smaller fish present. On 2 September, when a small patch of spawning fish was located in this area, shoal density had become considerably reduced compared with a few days earlier.

Shoals were relatively small and widely scattered over the Whitby-Scarborough area during the first part of the trip, and didn't commence aggregating into large spawning concentrations until 5-6 September at the end of the survey.

3) A total of 13 Engel pelagic trawl hauls were made yielding 8 good samples of herring. Sizes of catch ranged from about 1 tonne up to the net completely filled after a few minutes fishing.

4) A limited number of temperature and salinity observations were made with the CTD unit and water bottle sampler on spawning sites.

Due to the fact that large spawning concentrations did not commence developing until near the trip's end, a suitable opportunity for use of the underwater TV/camera sledge was not found in the limited time available.

5) Samples of herring were deep frozen for further biological examination and fecundity studies.

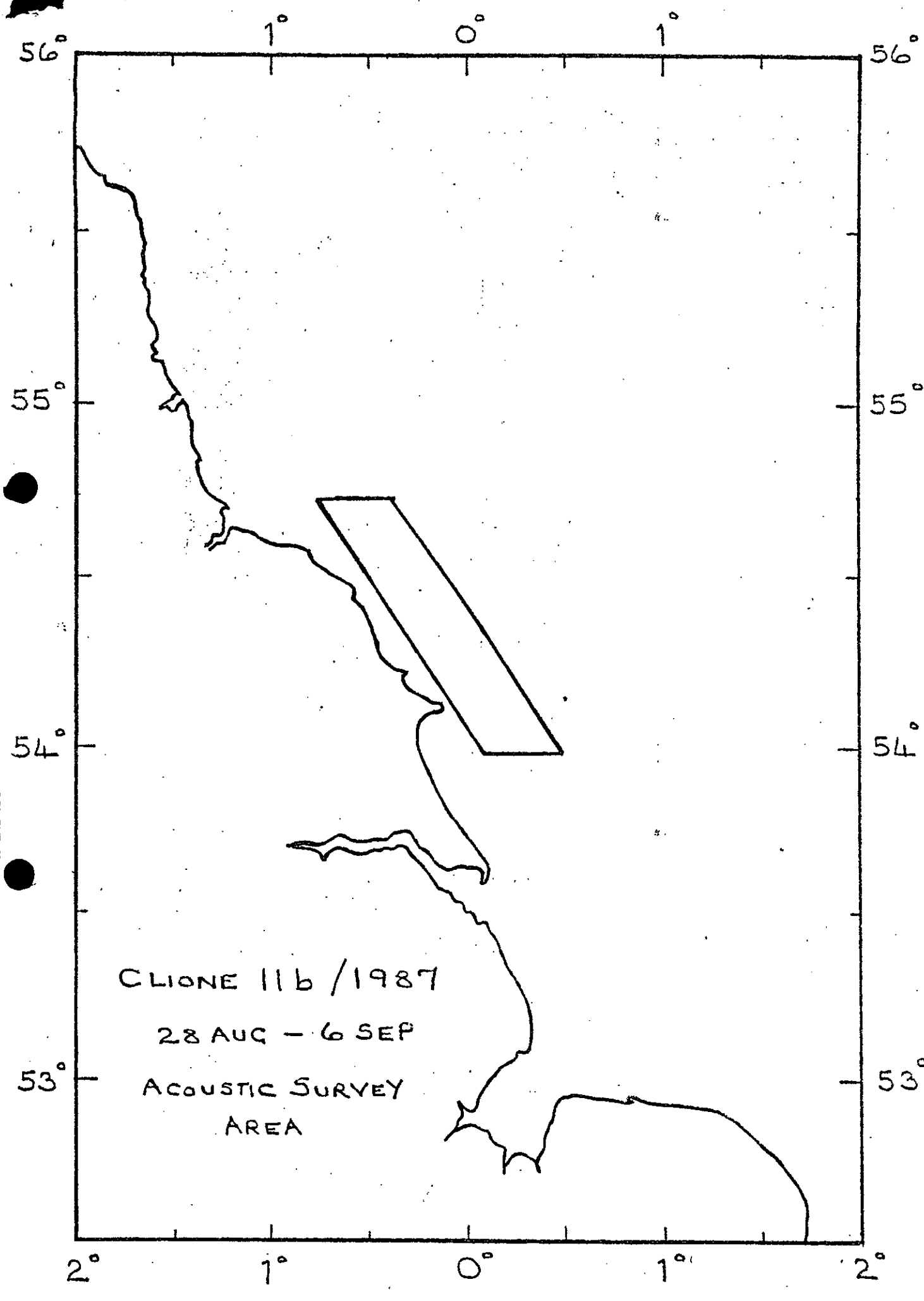
6) Two samples of herring heads individually frozen were taken, covering the size range 20-33cm (approx 50 fish in all), for lipid acid analysis of the eyes, and 50 ovary segments were deep frozen in buffer solution for mitochondrial DNA analysis. (Request of Bergen Institute of Marine Research).

GENERAL OBSERVATIONS

Several notable features emerged from the results of this survey:

- a) A fairly high proportion (up to 34% by number) of 1-ring herring, mainly 17-22.5cm length range) of the 1985 year class were evident on a number of hauls. It is unusual to find these smaller herring in this area in any quantity during the spawning period, and may confirm the expectations for this year class as an extremely abundant one, due to recruit to the spawning population next year.
- b) A significant larger modal length (28-29cm) was also evident in some samples, and this may represent the 1981 year class which made a strong recruitment to this area in 1984.
- c) There were also indications of 'Downs' herring present in some samples, these characterised by lower maturities and generally smaller size.
- d) The main spawning appears to have developed somewhat later compared with earlier years. Prior to the last two days of the survey shoals were typically small and appeared highly mobile, being practically impossible to catch in daylight (5 blank tows testified to this).
- e) There was a notable lack of planktonic scattering layer and the water appeared very sheer. Large jellyfish were also very abundant.
- f) Small schools (generally 4-5 animals) of white-beaked dolphins (*Lagenorhynchus albirostris*) were frequently observed over the survey area and often accompanied the towed body when their signals were picked up on the acoustic equipment.

P O Johnson (SIC)
22 October 1987



CLIONE 11b / 1987
28 AUG - 6 SEP
ACOUSTIC SURVEY
AREA

INITIALED: D J G

SEEN IN DRAFT: Master J French
Fishing Skipper P McKie

DISTRIBUTION:

Basic list+
P O Johnson
N Pearson
T J Hulme
J Casey
A M Watson
C Middleton