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

1981 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 1

(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF:

F R Harden Jones
D Harding
J H Nichols
C J Garrod
P R Witthames
C L Whiting
L Cox
S P Milligan
S H Coombs (IMER)
Ms C A Fosh (IMER)

DURATION:

Left Grimsby 1654 h 5 January
Arrived Grimsby 1600 h 19 January

All times are Greenwich Mean Time.

AIMS:

To study the vertical distribution of plaice on their spawning grounds in relation to gonad maturation stage, time of day, and state of tide.

PLAN:

Three research vessels and a chartered fishing vessel were to work together on this exercise. Ripe plaice fitted with acoustic transponding tags were to be tracked by sector scanning sonar from RV CLIONE; the distribution of plaice eggs in early stages of development would be determined by RV CIROLANA which would also fish for plaice in midwater with an Engel trawl; RV CORELLA would fish for plaice on the bottom with a Granton trawl; while the double beamer SUSAN BIRD (rigged for scallop dredging) would test the hypothesis that there were large mature female plaice buried so deeply in the bottom as to avoid capture with a bottom trawl.

NARRATIVE:

CIROLANA left Grimsby at 1654 h, 5 January 1981, and steamed to the working area in the Southern Bight of the North Sea. A 24 station plaice egg survey grid was started the following morning and completed at 1240 h, 7 January. A further close survey was made to delimit an area 15 miles SSW of the Brown Ridge where plaice eggs were most abundant. For the next three days this egg patch provided the focal point for joint work with RV CORELLA, working a bottom trawl, while RV CIROLANA worked plankton nets (Lowestoft 30" High Speed Plankton Sampler and IMER Longhurst-Hardy Plankton Sampler) and a 1600 Engel trawl. In the early hours of 10 January there was a mishap when hauling the Engel midwater trawl which was lost when both warps parted. The complete gear was recovered in strong winds by early afternoon but by then bad weather, which was to dominate the rest of the cruise, prevented further work until the next morning. Advantage was taken of this break for the two research vessels to exchange roles: a bottom trawl was rigged on CIROLANA while CORELLA steamed to Ijmuiden to change doors for midwater fishing. On 11 January CIROLANA completed a second egg survey which

showed that the area of maximum egg abundance was now centred further to the southwest. Bad weather again interupted work which was not continued until 13 January when CIROLANA was joined by the chartered double beamer SUSAN BIRD (rigged for scallop dredging). Although a slight improvement in the weather allowed CIROLANA to fish with a bottom trawl, it was too rough for SUSAN BIRD to work, and as conditions were going to get very much worse, the vessel steamed to Ijmuiden for shelter. Bad weather prevented any further work until the afternoon of 15 January when one tow with the Granton trawl was completed before conditions again worsened. A third egg survey was completed on 16 January which showed that the centre of the egg distribution now lay still further to the southwest. Following an improvement in the weather CORELLA and SUSAN BIRD returned to the working area, the beamer completing one haul before leaving for Newhaven. In the last two days of the cruise the weather improved and CORELLA and CIROLANA worked together in the area of maximum egg abundance as conditions allowed. CIROLANA stopped work at 2345 h on 18 January and steamed to Grimsby to enter port on 19 January at 1600 h.

RESULTS:

1. Distribution of eggs. Figures 1, 2, and 3 show the distribution of Stage 1A plaice eggs plotted as numbers beneath one square metre. The data has been contoured at appropriate intervals. Figure 4 shows the stations where samples were collected with the Longhurst-Hardy Plankton Recorder and the Lowestoft Changing Net. The high concentrations of 1A eggs (not more than 48 h old) indicate the approximate positions of greatest spawning. The figures show that over the period of the cruise the intensity of spawning increased at two main sites centred at 52°25'N, 03°12'E and 52°15'N, 02°52'E. Stratified samples taken with the LNPR and Lowestoft Changing Sampler were not fully analysed on board.

2. Plaice taken in midwater. The positions of 4 Engel trawl hauls are shown in Figure 5. These hauls were made within the centre of egg abundance to the southwest of the Brown Ridge and caught 23 males and 10 females; 17 of the males were in stage VI (running), while 6 of the females were immature, 2 in stage IV and 2 in stage V.

3. Plaice taken on the bottom. The positions of 8 Granton trawl hauls are shown on Figure 6. Five hauls made on the same day (61, 63, 64, 65 and 66) showed that fish were more numerous and bigger at the westerly stations (65 and 66). As station 65 was very close the centre of spawning at 52°15'N, 02°52'E, standard hauls were made at this position during the latter part of the cruise. At these stations the ratio of mature males to mature females ranged from 17:1 to 24:1. The first spent females were caught on 18 January.

4. Commercial fishing. On 6 January, 20 dutch beam trawlers were working directly to the north of the centre of egg abundance centred at 52°25'N, 03°12'E, while on 7 January several beamers were working close to egg survey station 25 (52°00'N, 02°45'E). On 13 January the beamers had moved from their position immediately to the southwest of the Brown Ridge and were fishing in an area centred on the position 52°32.5'N, 02°48'E. On 14 January beamers were fishing at a position 52°17.3'N, 03°04.5'E, 6 miles to the east of the central position of our standard bottom tow.

5. Other activities. Mr Witthames collected plaice blood plasma for ammonia and area analyses; plaice carcases were frozen for metabolic studies; and plaice ovaries were preserved for histological studies. Mr Coombs made many density measurements of pelagic eggs, particularly those of plaice and cod.

Several baskets of herring were taken in midwater to the southwest of the Brown Ridge. Samples were frozen.

F R Harden Jones
Naturalist-in-Charge
2 February 1981

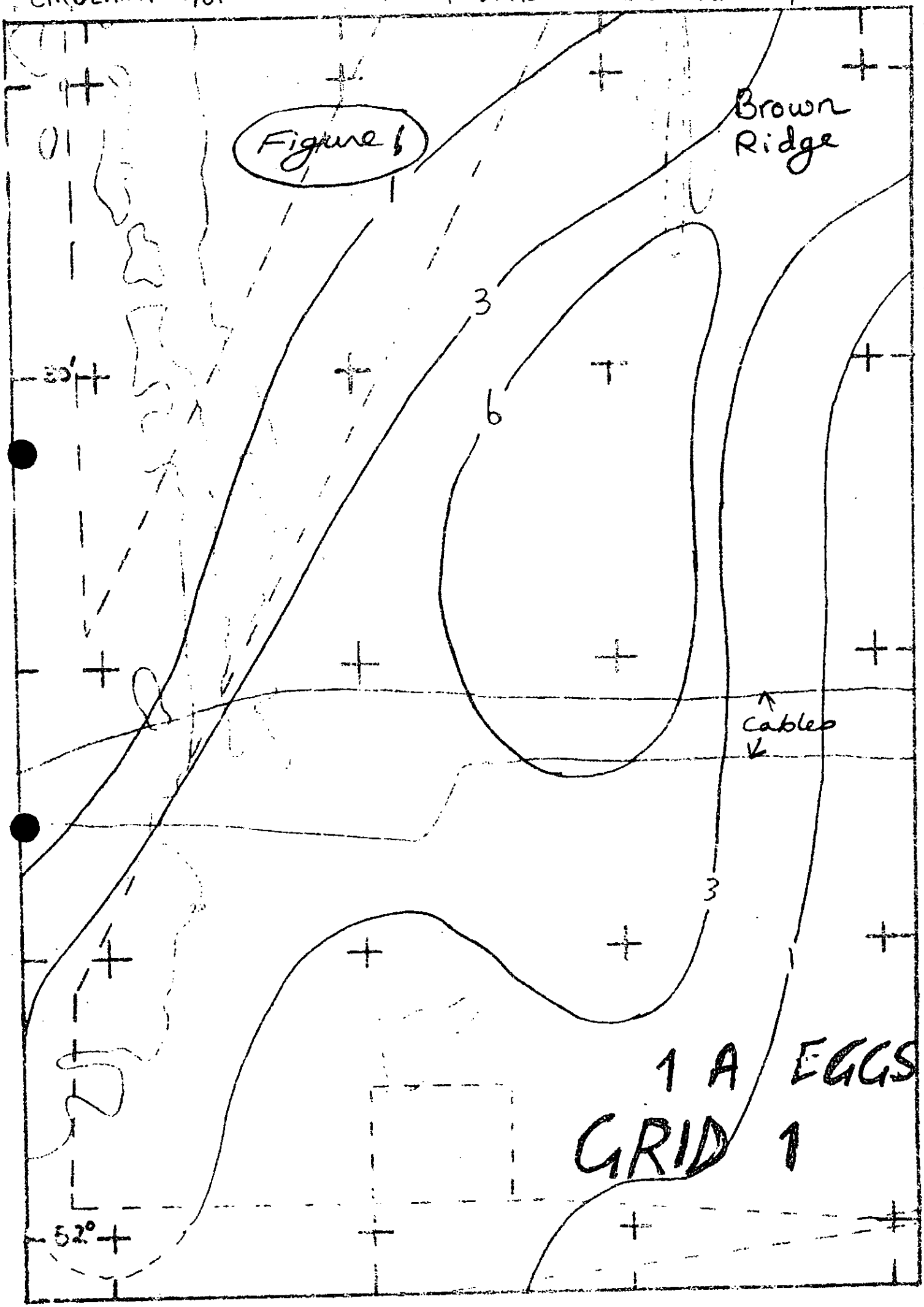
SEEN IN DRAFT:
T H F
E W P

INITIALLED:
D J G

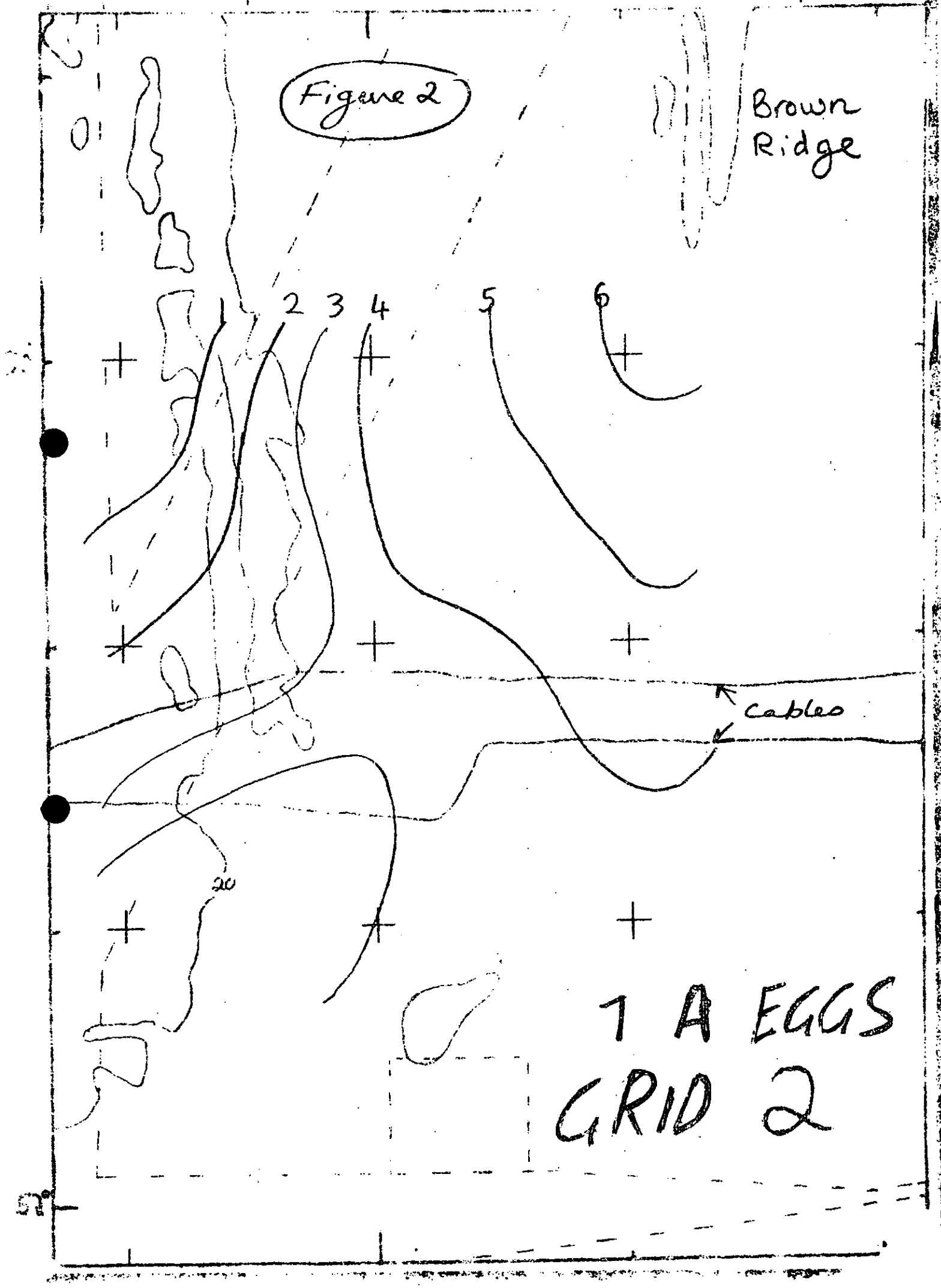
DISTRIBUTION:
Basic List +

Scientists on cruise including IMER
Dr Arnold
Dr Greer Walker

CIROLANA 1/81 3° GRID 1 STAGE 1A PLAICE EGGS. NOS/M² 30'

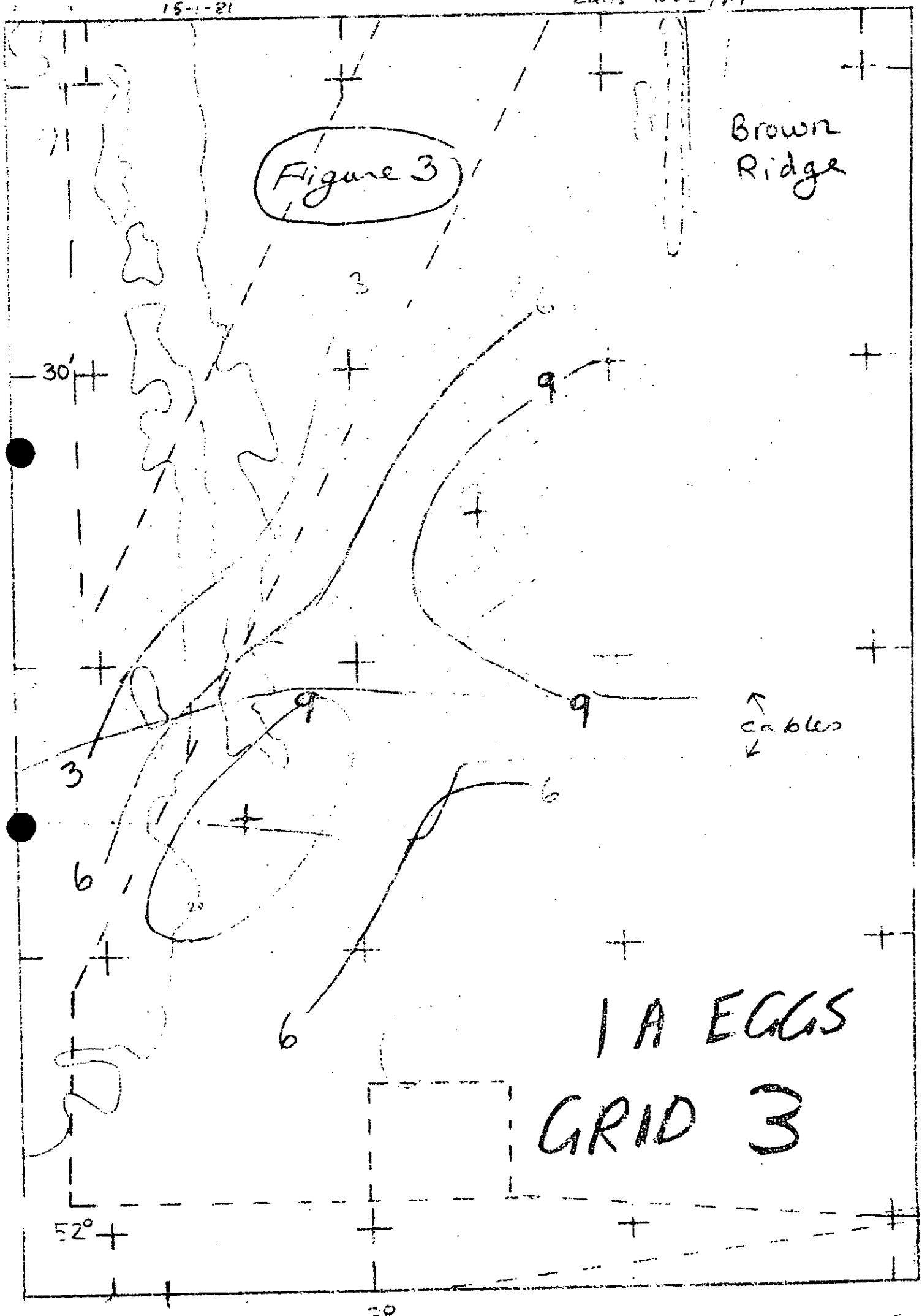


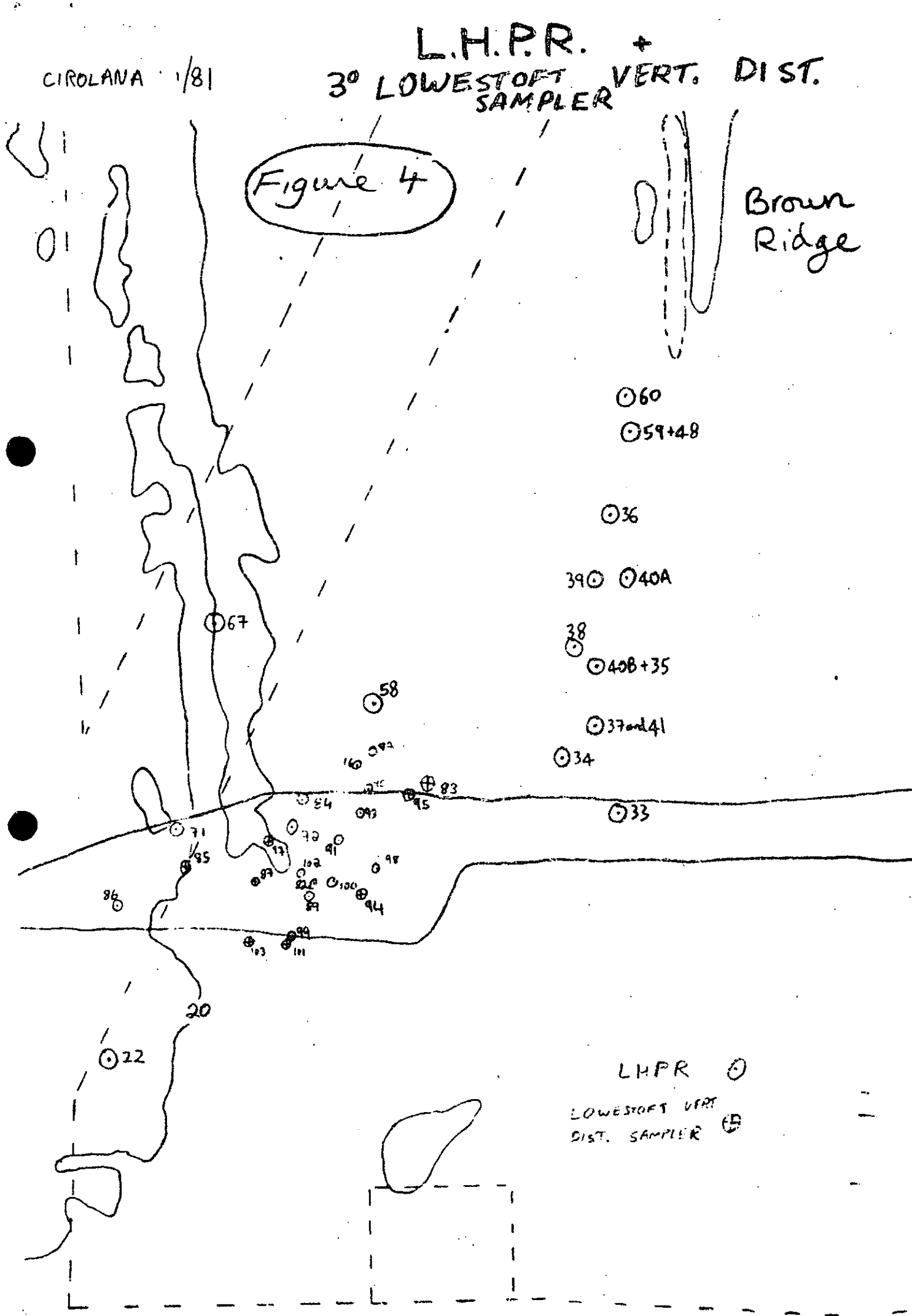
CIROLANA 1/81 3° GRID 2 STAGE 1A PLAICE EGGS NOS/M² 30'

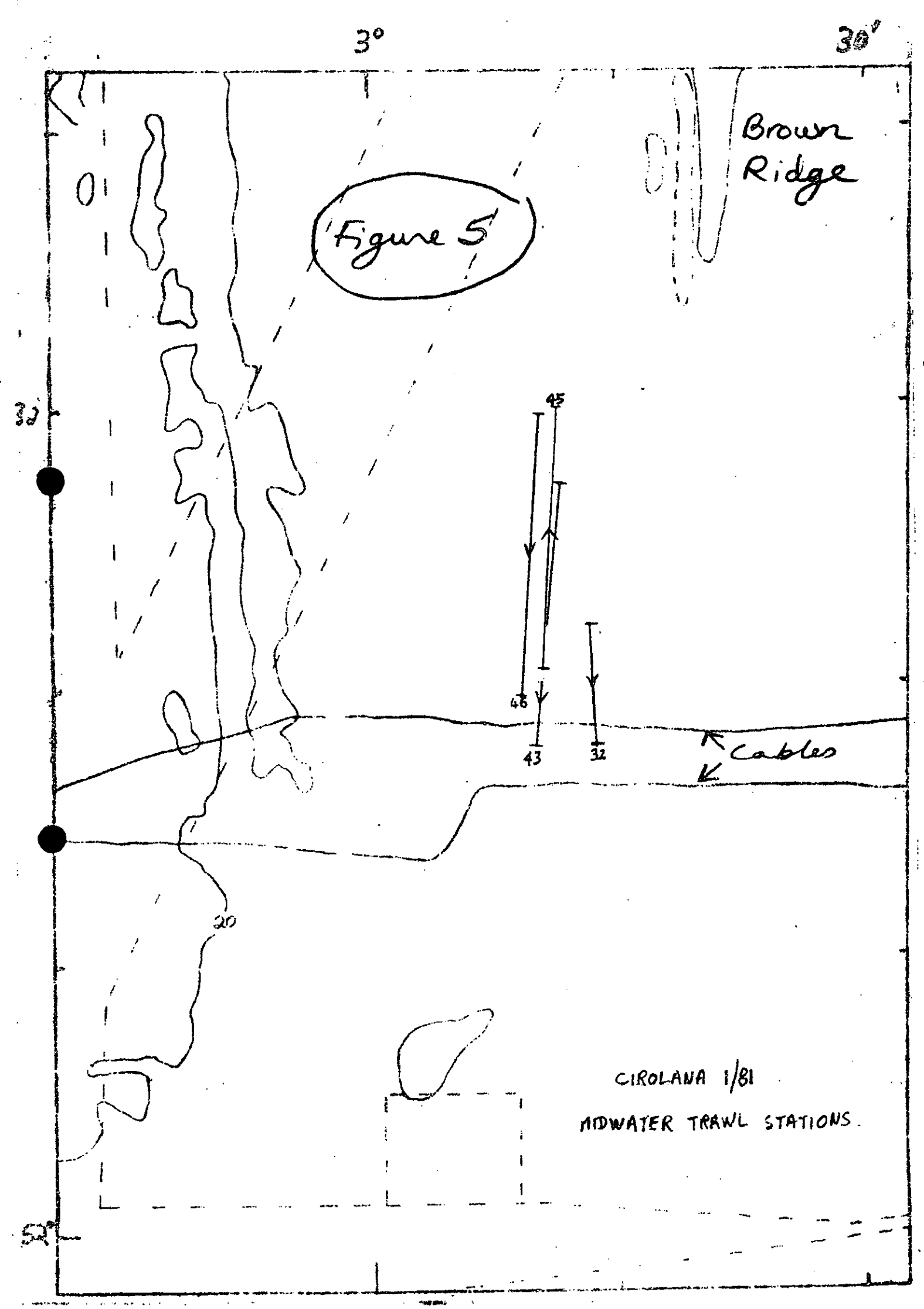


CIROLANA 1/81 30 GRID 3 STAGE 1A HERRING EGGS NOS/M²

15-1-81




L.H.P.R. +
3° LOWESTOFT VERT. DIST. SAMPLER
CIROLANA 1/81
Figure 4
Brown Ridge
60
59+48
36
39
40A
38
40B+35
37and41
34
58
67
33
20
22
LHPR
LOWESTOFT VERT DIST. SAMPLER


3°
30'
Brown Ridge
Figure 5
45
46
43
32
Cables
20
52°
CIROLANA 1/81
MIDWATER TRAWL STATIONS.

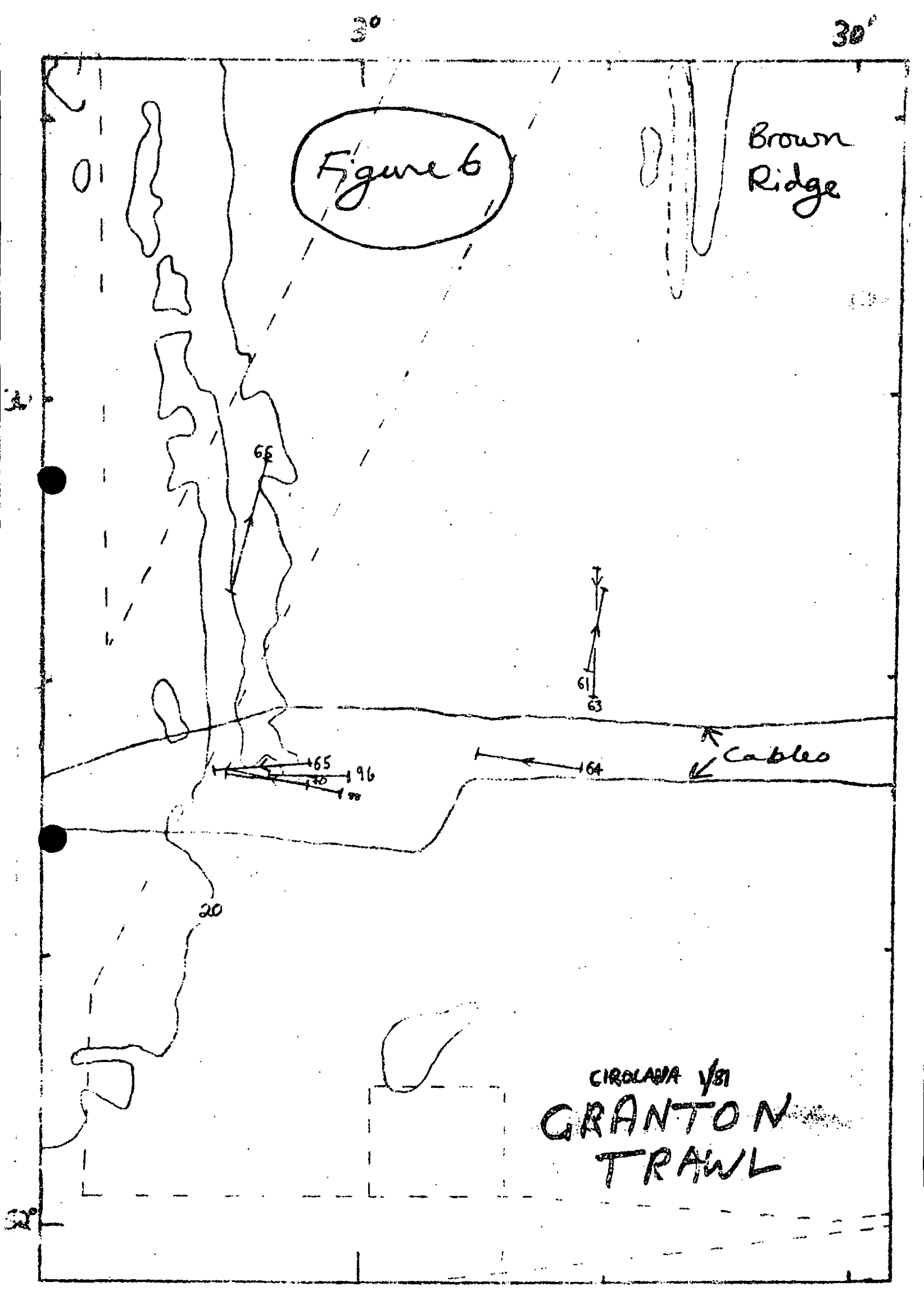


Figure 6
Brown Ridge
66
61
63
65
96
64
Cables
20
CIROLANA 1/81
GRANTON TRAWL