

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

1996 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 1

STAFF:

A P Scott (SIC)  
P R Witthames  
R J Turner  
P J Bromley  
M K Easey  
E Vermeirssen (MAFF external contract)

DURATION: 3-12 January 1996

LOCALITY: Southern North Sea

AIMS:

1. Collection of blood, sperm and testis samples from male plaice caught on and off the main spawning areas of the North Sea - to determine the extent to which sperm production and sex steroid levels are affected by the presence of ripe spawning females. This is a continuation of studies which were started on Corystes 1/94.
2. Concomitant plankton net collections of fertilised plaice eggs to assess the intensity of spawning in the sampling areas (Bromley).
3. Collection and preservation of plaice ovaries in formalin (for subsequent sizing and counting on the HIAC) and Chan's fixative (for staging the oocytes).
4. Collection of plaice pituitaries for purification of gonadotrophins.
5. Collection of plaice brain hypothalami for possible purification of Gonadotrophin-releasing hormones by Dr Sherwood of the University of Victoria in Canada.
6. Collection of plasma from spawning female flounders for steroid identification by Dr Jan Lambert of the University of Utrecht.
7. Experiments in the deck tanks to determine the time course in the drop in sex steroid levels which has been found in captured male plaice (Vermeirssen).
8. *In vitro* incubations of plaice oocytes to test the effectiveness of '17,20b-P'-like steroids in triggering final oocyte maturation (Scott).
9. Collection of live male plaice for return to the laboratory.

NARRATIVE

RV Corystes left Lowestoft at 2000h on Wednesday, January 3, 1996 and steamed overnight to the first fishing position (233; Fig. I; Table 1) ca. 30 miles North West of Texel. A program of trawling and tin tow netting commenced at 1130h on January 4

and continued up to station 8 (position 3) at 2300h. The weather deteriorated overnight and all of January 5 and the morning of January 6 was spent dodging at position 4. The ship then moved closer to Texel between 1200h and 2000h to avoid further bad weather. On January 7, the ship moved away from Texel at 1100h and trawling was started again, at position 4, at 1630h. Fishing and tin tow netting were carried out until 0630h on January 8 (stations 9 to 19). This completed the easternmost transect of the plaice spawning grounds (positions 233, 1, 2, 3, 4, 5, 6, 8). The ship then started steaming towards the south western corner of the other two remaining transects. However, with further bad weather having been forecast, and with the collection of live male plaice (for return to the laboratory) being the outstanding priority, trawling was commenced again at 1000h when the ship got to position 349. However, only nine male plaice were caught in three 30 min tows (stations 20 to 22). These were used for a 'steroid drop off' experiment by EV. The ship moved westward and tried two other positions (333 and 329; stations 23 to 25) but without success. Trawling had to be stopped at 1800h due to deteriorating conditions. It was decided to return to position 5, where many male plaice had been caught in a single tow. Due to the weather, however, the ship could not move until 1200h on January 9. The ship arrived at 1730h. However, while the beam trawl was being prepared for shooting, one of the deckhands injured his arm and the Captain had to make arrangements for him to be lifted off by helicopter. Trawling (half hour tows) was resumed at 2230h and continued throughout the night until 1000h on January 10 (stations 26 to 41), by which time ca. 170 live male plaice had been collected. Two one hour tows with the beam trawl, and a half hour with the tin tow (stations 42 to 44), were then carried out in order to repeat the measurements which had been made at this same position (5) on January 7. Half hour tows were then reinitiated in order to bring the number of live males in the deck tanks up to 200. Ten stage IV females were also collected. Fishing was stopped at 2200h. Fishing and tin tow netting was started again at 0507 on January 11 at position 4, in order to repeat the measurements made on January 7. The ship then moved on to positions 3, 2 and 1. The final tow was made at 1830h. The ship headed for port and returned to Lowestoft at 1215h on January 12.

## RESULTS

Aim 1: Blood, sperm and testis samples were collected from male plaice at eight positions on a single transect across one of the major spawning areas (Fig. 2). Due to the amount of time lost due to bad weather and the paucity of male plaice to the west of this transect, sampling from two other planned transects was not carried out. Instead, sampling was repeated at five of the positions on the original transect. All males (20 from each position) were weighed and measured. A blood sample was taken and the plasma frozen for subsequent analysis of steroid levels. Sperm was stripped by hand and collected in plastic pipettes. A small amount of the sperm was sucked up in a capillary tube, spun in a haematocrit centrifuge for 30 min and the packed cell volume (top-most band) recorded. The plastic pipettes were then frozen so that they could be weighed back at the laboratory. The testes were dissected out of the males and frozen in plastic vials so that they could also be weighed back at the laboratory. The total number of males which was sampled was 265. Preliminary results are shown in Table 2 and Fig. 3. The size of the males increased with increasing distance from the land. When the first transect was carried out, a clear

difference was found in steroid levels between males caught on and off the known spawning areas. The difference was not so clear-cut when the second transect was carried out. More specific hormone analyses are still required, however.

Aim 2: Plaice eggs were sampled using a 53cm diameter encased body tin tow net fitted with a 20cm diameter aperture, conical nose cone. The net was 60 mesh per inch, nylon plankton netting and the end bag was of similar specification. The net was deployed on a double oblique tow, at 4.5 knots, from the surface to a depth of 25m. On the first transect, the average towing time was 12 min. When the transect was repeated, the average towing time was 24 min. Plaice eggs are buoyant and the sampling procedure was designed to give a relative measure of egg abundance, whilst cutting down sampling time to a minimum.

One TTN deployment was made at each of the beam trawl sites during the transect. On the first transect, no plaice eggs were collected at positions 233, 1, 2 and 3; one egg at positions 4 and 5; four to five eggs at positions 6 and 8. On the repeat sampling ca. four days later, when tin tow netting was carried for twice as long, eight eggs were found at position 5, none at position 4 and four, two and one at positions 3, 2 and 1, respectively. The relatively small number of eggs were compatible with it being the beginning of the spawning season. Interestingly, all the eggs at position 4 showed signs of malformation.

Aim 3: Blood and ovary samples were collected from thirty five stage V to VI female plaice. These should be sufficient for comparing methods of oocyte staging.

Aims 4 and 5: Pituitaries, hypothalami and the 'rest of the brain' were collected from approximately 60 male and female plaice and stored frozen in liquid nitrogen. When convenient, these will be sent to Canada for isolation and identification of the gonadotrophin-releasing factors

Aim 6: No flounders were caught at any of the stations. This aim could therefore not be achieved.

Aim 7: A single experiment was carried out in the deck tanks on nine male plaice.

Aim 8: Due to the bad weather and pressure to achieve some of the other more major aims, no *in vitro* incubations were carried out. This aim can be achieved in the laboratory, however.

Aim 9: Two hundred male plaice and twenty four female stage IV plaice were returned live to the laboratory.

A P Scott  
15 January 1996

SEEN IN DRAFT

M. Willcock (Master)  
R. Grahame (Fishing Skipper)

INITIALLED: G. Arnold

DISTRIBUTION:

Basic list+

A P Scott (SIC)

P R Witthames

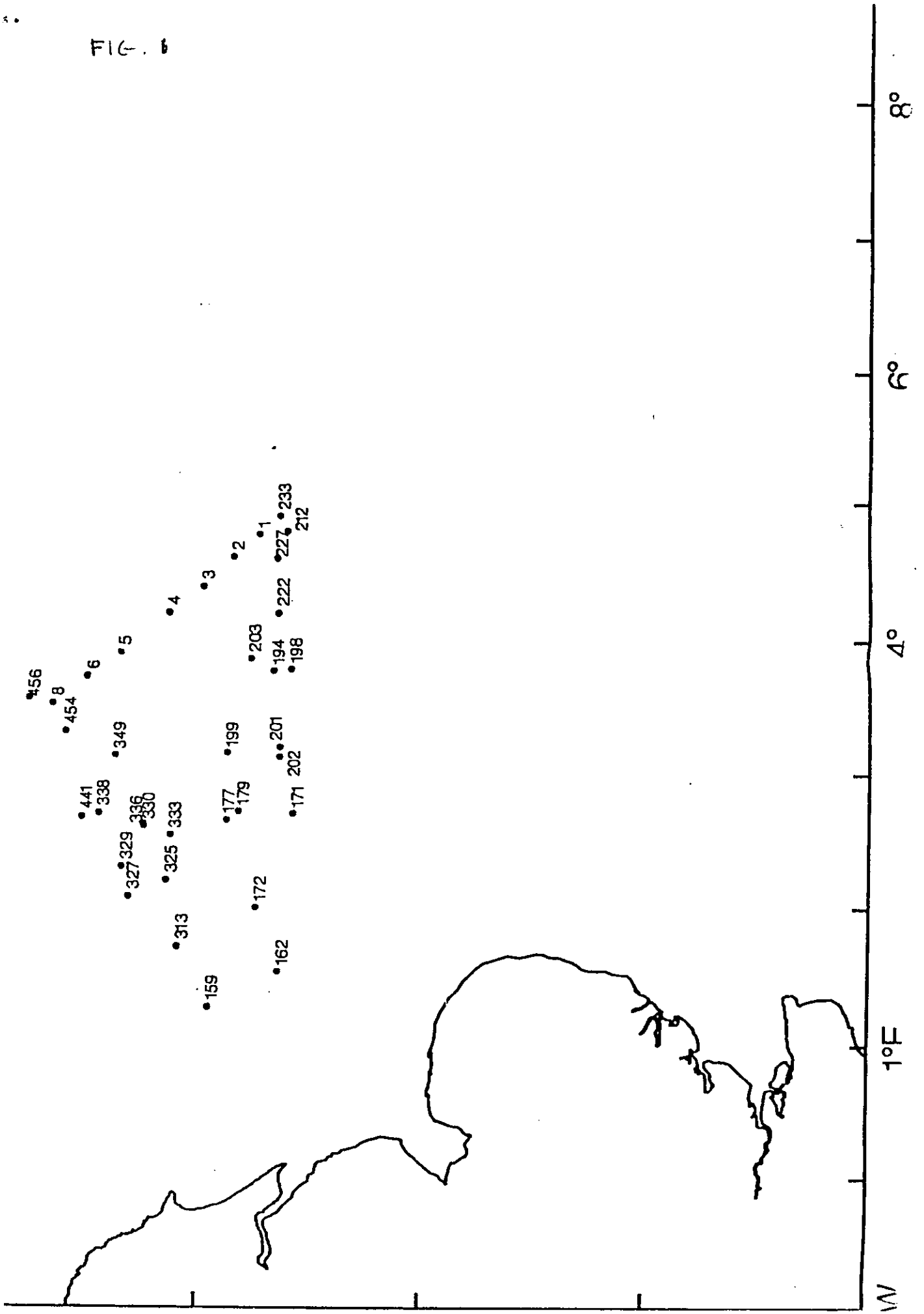
R J Turner

P J Bromley

M K Easey

E Vermeirssen

FIG. 6



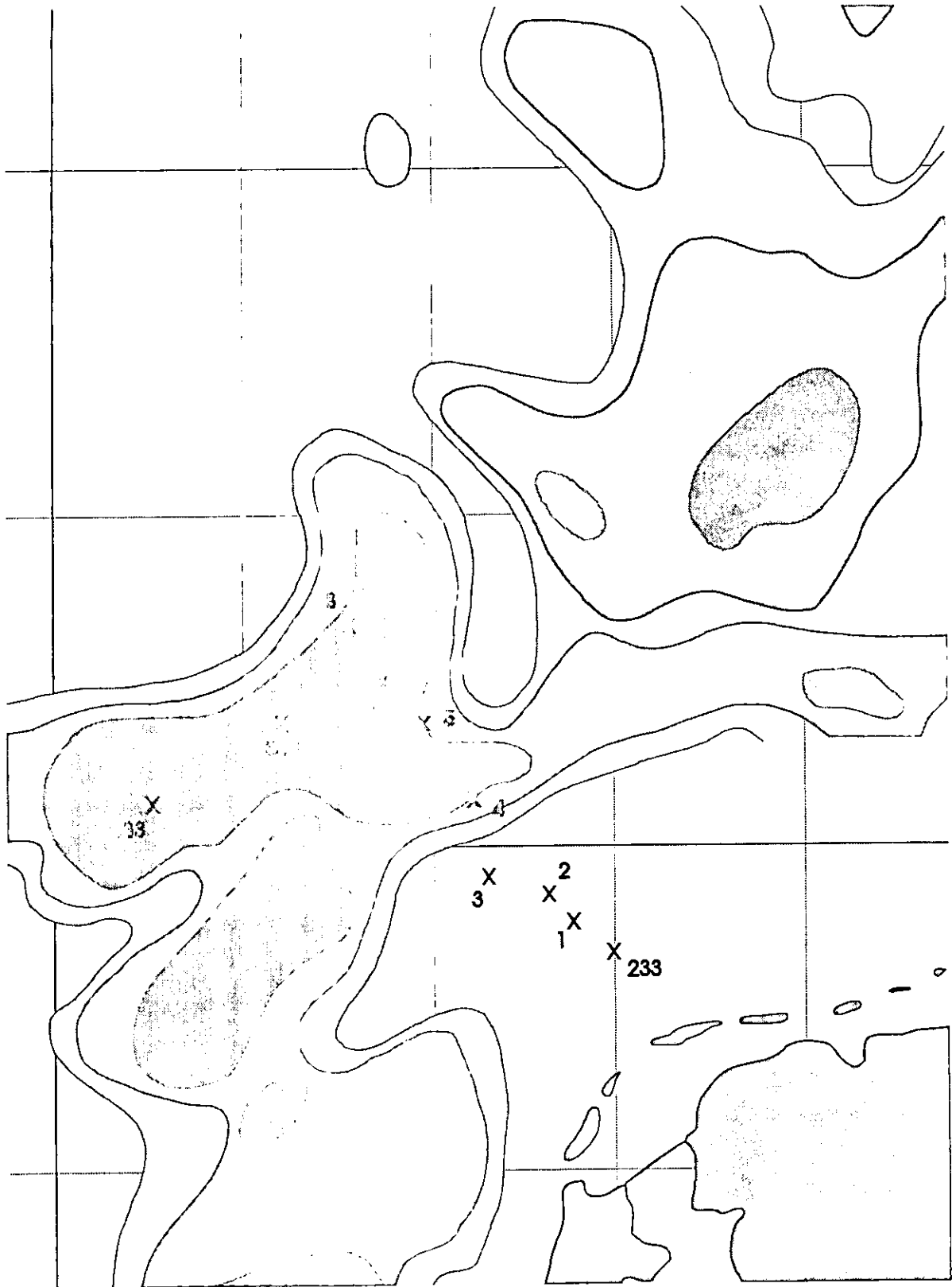


Fig. 2. Trawling positions superimposed on plaiice egg abundance data (as shown in MAFF Atlas)

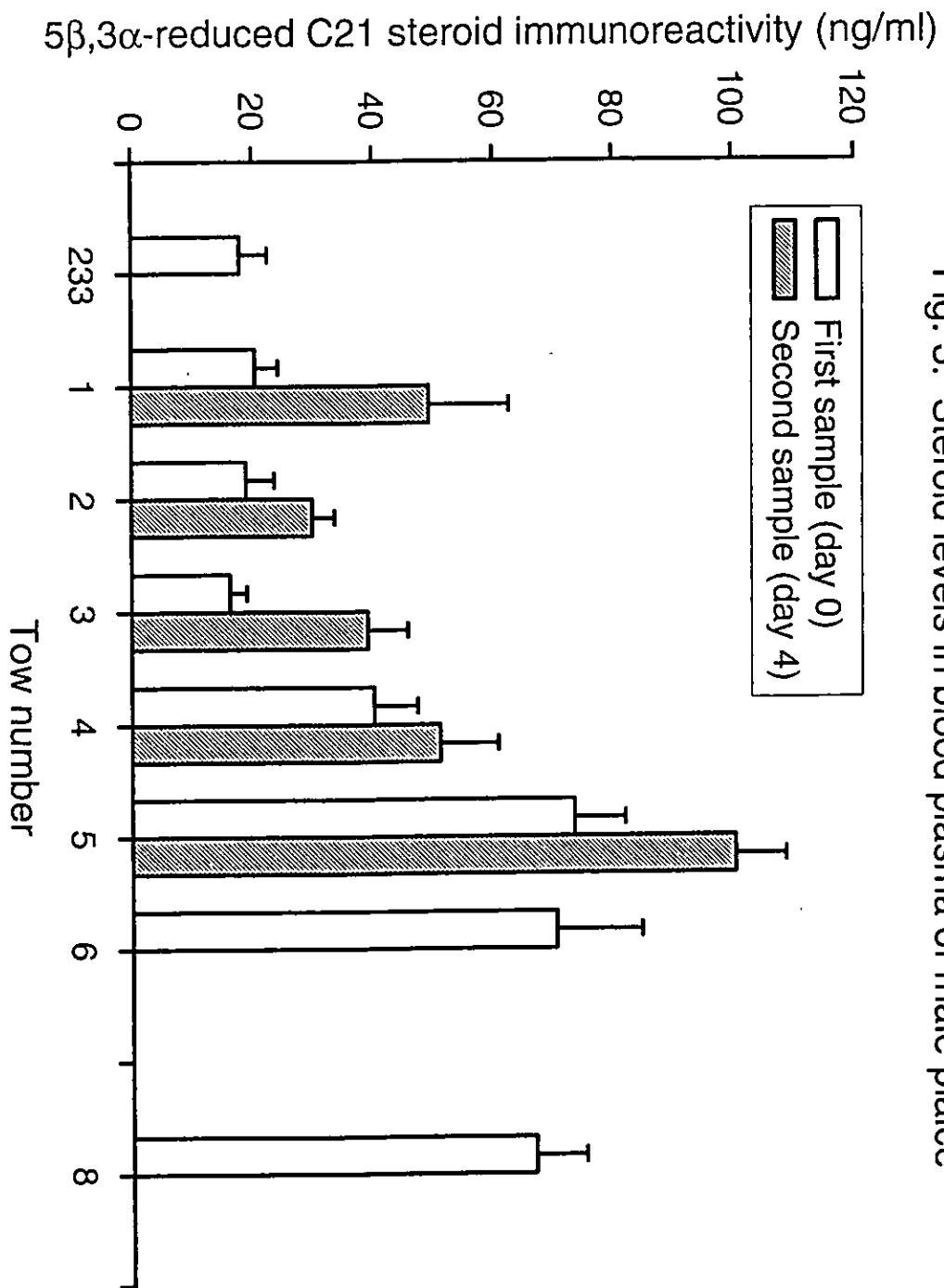
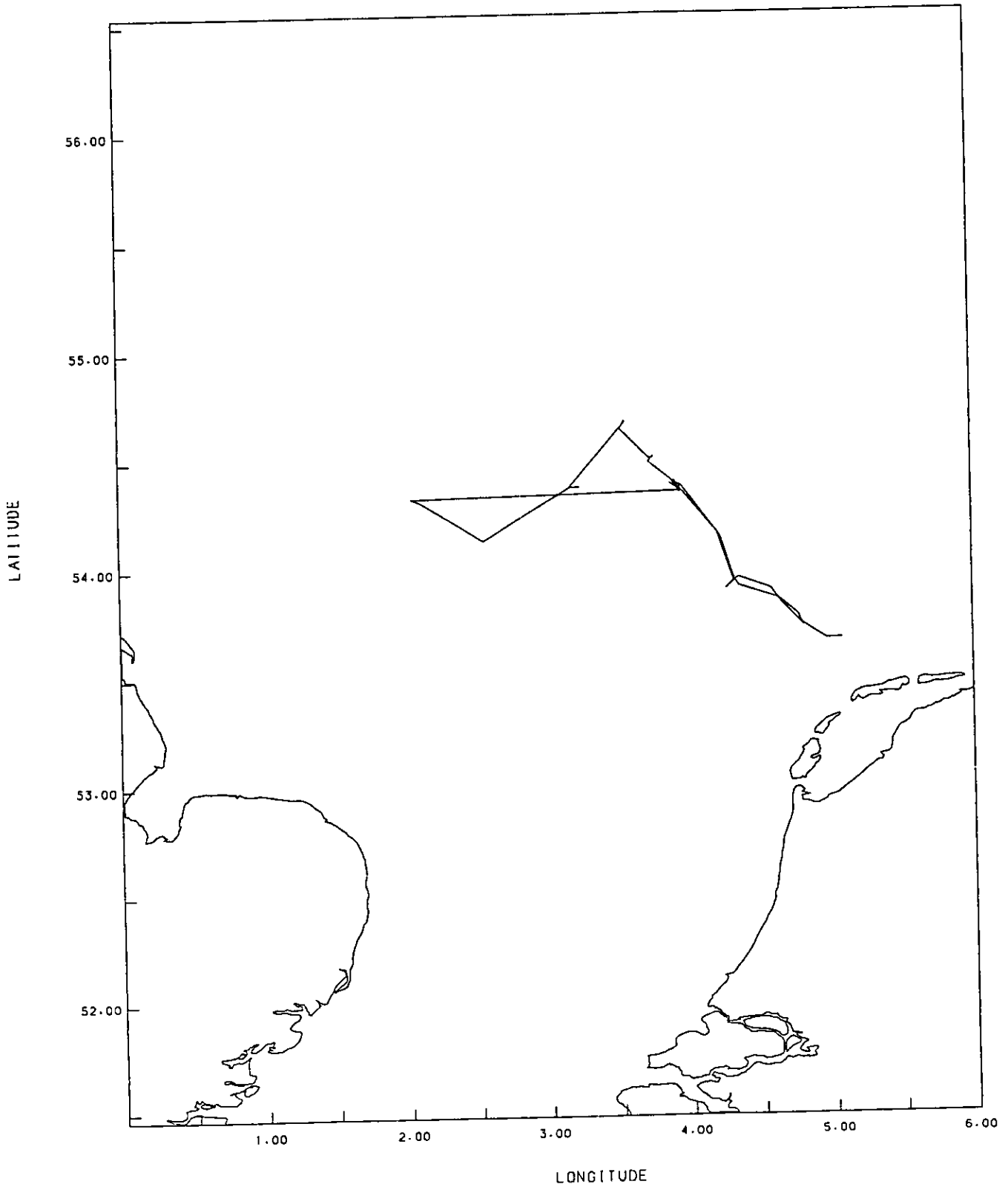


Fig. 3. Steroid levels in blood plasma of male plaice

# CRUISE TRACK - CORYSTES 1/96

SHOWING :  
CRUISE TRACK  
COASTLINE





## NORTHERN SERIES

TABLE 1: TRAWLING POSITIONS (CLEAR TOWS)

	SHOT		HAULED	
1	53°44'N	04°48'E	53°46'N	04°47'E
2	53°51'N	04°38'E	53°53'N	04°36'E
3*	53°59'N	04°25'E	54°00'N	04°22'E
4	54°08'N	04°14'E	54°10'N	04°12'E
5	54°21'N	03°57'E	54°23'N	03°55'E
6	54°31'N	03°47'E	54°29'N	03°44'E
8	54°40'N	03°34'E	54°38'N	03°32'E
162	53°38.52'N	01°33.22'E	53°40.5'N	01°32.6'E
172	53°44.7'N	02°1.3'E	53°44.2'N	02°4.5'E
171	53°34.9'N	02°43.1'E	53°33.5'N	02°45.2'E
202	53°38.5'N	03°9.76'E	53°40.13'N	03°7.95'E
201	53°38.42'N	03°14.41'E	53°40.39'N	03°14.19'E
198	53°35.72'N	03°49.42'E	53°33.34'N	03°50.32'E
194	53°40.2'N	03°48.86'E	53°38.41'N	03°50.33'E
222	53°39'N	04°13.83'E	53°38.96'N	04°17.15'E
227	53°39.48'N	04°37.41'E	53°38.63'N	04°40.52'E
212	53°36.9'N	04°49.5'E	53°36.2'N	04°46.6'E
233	53°38.86'N	04°56.13'E	53°39.64'N	04°59.98'E
203	53°46.65'N	03°54.2'E	53°46.61'N	03°57.48'E
199	53°52.7'N	03°11.99'E	53°52.61'N	03°15.62'E
179	53°49.3'N	02°44.12'E	53°48.5'N	02°52.77'E
177	53°52.64'N	02°40.43'E	53°50.36'N	02°40.34'E
159	53°57.3'N	01°17.4'E	53°55.3'N	01°18.2'E
313	54°5.3'N	01°44.2'E	54°5.0'N	01°48.5'E
327	54°18.4'N	02°6.3'E	54°19.2'N	02°3.9'E
329	54°20.3'N	02°19.2'E	54°19.0'N	02°16.0'E
338	54°26.72'N	02°43.34'E	54°24.71'N	02°44.66'E
325	54°8.4'N	02°13.6'E	54°8.7'N	02°17.1'E

\* DUE TO SHIPPING LANES, MOVED TO:

53°54.3'N 04°21.9'E

53°55.0'N 04°20.7'E

	SHOT		HAULED	
333	54°7.47'N	02°33.45'E	54°7.44'N	02°30.28'E
330	54°14.6'N	02°37.5'E	54°14.5'N	02°34.7'E
336	54°14.9'N	02°38.9'E	54°14.9'N	02°34.0'E
454	54°35.7'N	03°21.5'E	54°37.8'N	03°20'E
349	54°22.2'N	03°10.29'E	54°22.23'N	03°14.28'E
441	54°31.0'N	02°41.8'E	54°32.9'N	02°40.6'E
456	54°45.8'N	03°36.7'E	54°46.6'N	03°39.9'E

Table 2:  
Male plaice data  
Coystes 1/96

Coystes 1/96 Summary of male plaice catches											
Position	Station	Date	Time	Mean Length	Mean Weight	Mean GSI	Packed Sperm Vol.	Sperm wt. /body wt.	Catch: Fish per hour	Spawning fem per h	fem/male ratio
233	1	04/1/96	1130h	22.1	101.8	1.16	58.4	0.34	75	0	0.37
1	4	04/01/96	1330h	23.3	125.7	1.32	53.8	0.45	43	0	0.35
	63,64	11/01/96	1700h	24.7	154.9	1.14	49.7	0.54	49		0.45
2	5	04/01/96	1700h	26.7	195.5	1.45	50.5	0.36	52	1	0.23
	60	11/01/96	1250h	25.6	181.7	1.19	49.3	0.45	63	1	0.43
3	8	04/01/96	2015h	26.3	197.4	1.65	50.7	0.35	27	0	0.19
	58,59	11/01/96	1030h	26.7	195.1	1.39	48.4	0.48	47	1	0.39
4	9	07/01/96	1630h	26.7	205.3	1.57	50.5	0.52	34	2	0.41
	54,55	11/01/96	0600h	31.4	304.8	1.39	50.9	0.58	24	1	0.60
5	12	07/01/96	2030h	30.2	267.9	1.78	42.0	0.50	25	0	0.16
	42,43	10/01/96	1130h	31.8	311.9	1.93	43.0	0.56	21	1	0.33
6	13, 14	08/01/96	0000h	32.2	347.8	1.88	47.0	0.59	22	1	0.57
8	17,18,19	08/01/96	0400h	33.8	390.0	2.08	46.0	0.51	13	1	0.42

SIC: A.P. Scott  
23/1/96