CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE, LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK NR33 0HT

2003 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 1

STAFF:

B Harley (SIC)
T W Boon (2IC)
J Dann
M Etherton
D Brown
M Parker-Humphreys
A Tidd (12 Feb – 20 Feb)

DURATION: 12 February – 25 February

LOCATION: North Sea

AIMS:

1. To participate in the ICES co-ordinated International Bottom Trawl Survey for quarter 1 and in support of the EC Data Collection regulations. To fish over an allocated area of the North Sea using a standard GOV trawl in order to obtain information on:
   a) Distribution, size composition and abundance of all fish species caught.
   b) Age – length distribution of selected species.
   c) Distribution of fish in relation to their environment.
   d) Distribution of macrobenthos and anthropogenic debris.
   e) Surface and bottom temperature and salinity data using miniCTD.
   f) Length, weight and maturity information using individual fish measurements.

2. To collect data and samples to estimate cod reproductive potential as part of the reproduction and stock evaluation for recovery (RASER) project. (P Witthames, CEFAS Lowestoft).

3. To collect Scanmar readings from BACA trawl to provide SFIA, Hull, with proofing data for flume tank model.

4. Trial re-rigged GOV trawl to address problems of slack net in lower wings dragging along seabed and assess suitability for fishing GOV on hard ground.

NARRATIVE:

(All times are GMT)
With sailing having been delayed from 24 January, due to various problems with the winches and later with the engine control systems, RV CIROLANA finally sailed on Wednesday 12 February at 1800h. Originally acoustic work was to be carried out but it had to be dropped due to the work commitments for the staff involved. CIROLANA steamed overnight to the southern end of the survey grid to fish the first station in the Thames Estuary. Sampling at each ICES rectangle consisted of one thirty-minute tow with the GOV 36/47 trawl (36m-headline/47m-groundrope), with Scanmar gear and mini-CTD unit attached. The first haul was shot at 0829h but was abandoned when a problem with the hydraulic pipes of the newly installed winches was noted. Once corrected the tow was repeated at 0959h, and although the shooting and hauling speed of the winches was notably slower than that of the original winches, the station was fished satisfactorily. After hauling, on inspection of the net a split was found along the starboard salvage, but the station was still deemed valid. A second valid station was fished in the adjoining rectangle before dusk. The next fishing day started with fine weather and the first station was fished without incident. However, the second tow was invalid when the net was damaged along the port wing and belly. The upper bridle was also damaged. The net was repaired and the bridle replaced. This station in 34F1 was not repeated and the vessel steamed to 33F2 and the final station of the day was fished.

Over the next three days, nine valid stations were fished without incident. On Tuesday 18, four stations were fished in rectangles off Flamborough Head. The last haul of the day came up with a large hole in the belly. There was significant damage to the number seven panel in the belly and two holes in panels six and eight. The number seven panel was replaced and the other holes were mended. The station was not repeated and the CIROLANA steamed overnight to continue fishing in 39F0 the following morning. Three tows were fished on 19 February but on the last tow the brake liners on both new winches finally wore away. The tow was successfully completed but new brake liners needed to be fitted so we sailed to the mouth of the Tyne.

One scientist was put ashore by sea-rider at 0800h on 20 February.

Later that same day two winch engineers came onboard and repairs to the brakes of the winches commenced. Repairs were completed that evening and CIROLANA steamed north-east to fish at the station in 39E8 the following morning. However, during shooting, the winch engineers informed the bridge that the winches were still not working correctly. The station was fished successfully and we headed back to the Tyne with the intention of picking up more spares. While steaming back, the engineers attempted to solve the problem once more, and this time their attempts were successful. The GOV was shot on a tow that was to be used in the BACA trials and a successful 45-minute tow was fished. The winch engineers were then dropped off at North Shields by sea-rider and the survey continued.

Overnight, the GOV trawl was replaced by the BACA and upon returning to the area previously fished the BACA trials commenced. Two valid 45-minute tows were fished at the position 11 nautical miles east of Druridge Bay before heading north-east to fish at the IBTS survey station in 39E8. The first tow was aborted after 12 minutes when Scanmar readings indicated that the net was not fishing correctly. However, on hauling no damage was noted. The

tow was repeated successfully and the CIROLANA steamed northward to fish the final IBTS survey station the next day. Overnight, the BACA was removed and the GOV reattached. The GOV was shot on the position in 40E8 but was hauled after 20 minutes when the ground became very peaky. The net came up with a hole in the lower starboard wing but was deemed valid.

The remaining six stations consisted of 30 minute tows with the GOV rigged in slightly different ways, with the advice obtained from the team at the SFIA flume tank in Hull. All fishing activity finished at 1626h on Monday 24 and CIROLANA return to Lowestoft and docked at 1600h on Tuesday 25 February.

RESULTS:

Aim 1. Twenty-one 30-minute GOV trawl stations were successfully completed. Two more hauls were invalidated with severe gear damage and not repeated. Light gear damage was sustained on four of the valid hauls. Trawling was carried out using the standard specification for International Young Fish Surveys (full description can be found in 'Manual for the International Bottom Trawl Surveys- Revision VI', ICES CM 1999/D2 Addendum 2, Ref. G). All bar one tow recorded successful mini-CTD casts, giving five-second recordings of temperature and salinity data throughout the tow. A chart indicating the ICES rectangles worked and positions fished is attached (Figure 1). Scanmar equipment was used to monitor headline height, wing spread and door spread. At each station, the catch of each species was weighed and all fish, or representative samples, were measured. Samples of otoliths for age determination were taken as specified in standard instructions. Benthos and crustacea were identified to the species wherever possible and recorded as present. Any anthropogenic waste material was recorded and weighed. The resultant data were input to computer database using the CEFAS Electronic Data Capture System. These data will be analysed at CEFAS Lowestoft and will provide an input to the ICES assessment of North Sea gadoids and pelagic species.

Aim 2. 30 male and one female cod samples were taken for Peter Witthames, CEFAS Lowestoft, to estimate cod reproductive potential as part of the reproduction and stock evaluation for recovery (RASER) project.

On each valid station for aims three and four, the catch of each species was weighed and all fish, or representative samples, were measured. Benthos and crustacea were identified to the species wherever possible and recorded as present. Any anthropogenic waste material was recorded and weighed. The resultant data were input to computer database using the CEFAS Electronic Data Capture System

Aim 3. Two valid 45-minute and one 30-minute tow was completed with the BACA on suitable ground north-east of the Tyne. The Scanmar data from these and the invalid 12 minute tow will be given to the team at SFIA flume tank, Hull, to proof their model of the BACA when tank testing. Using the limited number of tows with the BACA and comparing them with the tows fished on the same ground with the GOV, the following observations can be made. On the fine ground off Druridge Bay, the BACA trawl caught over four times the weight of fish (between 660kg and 700kg) than the GOV (150kg), and 20% more fish species. However, on the tow at IBTS station position in 39E8, were the ground was considered to be slightly harder and more

uneven, there was only 20kg difference in total weight of fish caught and almost no variation in the number of fish species caught, although the composition varied slightly.

Aim 4. In order to address problems of the lower wings of the GOV hanging slack and dragging along the seabed when fishing (observations seen from model of GOV in SFIA flume tank, Hull), re-rigging trials were to be carried out in an attempt to lift the slack netting up from the belly of the wing. If this was successful an attempt to fish the GOV on hard ground, not normally fished, was also to be made.

The first adjustment to be made to the GOV was to remove the Exocet Kite, which gave a dynamic lift of approx. 100kg and replace it with twelve 11inch plastic floats. Each float gave a static lift of 8.5kg, giving a total static lift equivalent to 102kg. Three 11inch floats were attached to each wing end, two were placed in both the port and starboard centre sections and two more in the middle of the headline. Using the Scanmar log the 30-minute tow using this rig gave an average headline height of 4.55m and a wingspread of 21.42m, compared with 5.27m and 21.84m with the standard rig GOV on the same tow with the same towing speed and similar tidal conditions. The total weight of catch at this station was approximately 220kg with 20 separate fish species caught. Next the centre bridle and extension were removed. This gave an average headline height of 4.76m and wingspread of 21.29m. The total weight of catch at this station was also approximately 220kg with 22 separate fish species caught. Then the remaining upper and lower bridles were extended by 20m, with the lower bridle having a diameter of 22mm and the upper with 14mm. This gave readings that averaged 5.89m and 20.26m, although this tow was fished on slack water, the speed over the ground was four knots. This tow saw a significant increase in the total weight of catch, approximately 670kg, of which 606kg were whiting. The number of separate fish species caught remained at 22. The following day three 5-meter sections from the middle of the ground gear were replaced by three 5-meter sets of rolling gear. Each section was made up of 14 rubber rolling discs with a 360mm diameter and 130mm width and 15 metal Lancaster spacers each 200mm in length. This was successfully fished on the same tow with an average headline height of 5.33 meters and a wingspread of 21.12m; the tide and speed over the ground were consistent with the tows fished the day before. The total weight of catch at this station was approximately 370kg with 21 separate fish species caught.

Now that the gear was performing in a satisfactory manner, harder ground was sought. The first hard ground tow was 12 nautical miles east of Tees Bay. The SIMRAD ES400 echo sounder showed that the bottom was even but hard, giving blue and yellow with occasional red on the back-scatter. The net was hauled after 30 minutes with no damage, the shoes of the doors showed heavy shining, consistent with harder ground. The total weight of catch at this station was approximately 430kg (401kg of this was whiting) with only 17 separate fish species caught. CIROLANA steamed a further six nautical miles east, to ground that was considered to be even harder and shot again. The echo sounder displayed a plot consistent with much harder ground and although the Scanmar readings remained fairly steady throughout the tow, on hauling significant damage was done to the starboard lower wing, down through panels four, five, six and seven (the majority of the belly). The tow was invalid and due to the large amount of damage and the age of the net, it was recommended that it be written off.

The adjustments made, particularly the extension of the bridles, seemed to have given the increase in headline height, around the full headline, and thus the lifting of the meshes in the lower wings that was sought (the large whiting catches, Scanmar readings and lack of damage on moderately hard ground, being the main indicators for this). From the observation made, it could

be deduced that this newly rigged GOV might be suitable for moderately hard ground but not for very hard ground.

Additional Aims:

1. 50 whiting tails from each of three separate areas around the survey grid were frozen down, for Jim Ellis, on request from a French colleague.
2. 50 fish, of various species and 50 specimens of various benthic species were frozen for use on a CEFAS display for local schools, at the request of Jim Ellis.

Brian Harley
25 February 2003

SEEN IN DRAFT:

Master	R McCurry
Senior Fishing Mate	B Salter

INITIALLED:

Surveys Contract Manager R Millner

DISTRIBUTION:

Basic list +
B Harley
T W Boon
J Dann
M Etherton
D Brown
M Parker-Humphreys
A Tidd

Figure 1. Station positions for Ciro 1/03