

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

2003 RESEARCH VESSEL PROGRAMME

REPORT: RV ENDEAVOUR: CRUISE 7/03

STAFF: Simon Jennings (SIC)  
Dave Carlin  
Tracy Dinmore  
Nick Dulvy (2IC joint)  
Chris Firmin  
Jan Hiddink (University of Wales)  
Bill Meadows  
Craig Mills  
Adam Nicholls  
Michaela Schratzberger (2IC joint)  
Karema Warr

DURATION: 11 September – 24 September

LOCALITY: North Sea (IVa, IVb and IVc)

AIMS:

The aims of this cruise were to (1) describe the impacts of trawling disturbance on the structure and productivity of benthic communities (2) examine the effects of fishing on the trophic structure of fish communities and (3) identify new sites in the central and northern North Sea for assessing the effects of fishing on the environment.

The specific objectives were:

1. To sample infaunal and epifaunal invertebrates at a series of sites subject to different levels of trawling disturbance for production studies.
2. To sample infaunal and epifaunal invertebrates and fish at a series of sites subject to different levels of trawling disturbance for food web studies.
3. To survey sites in the central and northern North Sea with side scan sonar in an attempt to locate new areas for the study of fishing impacts.
4. To collect fish and benthic invertebrate species for stable isotope analysis

NARRATIVE: (all times are GMT)

Endeavour sailed from Lowestoft at 20.00 h on 11 September. She proceeded to a 4 m and 2 m beam trawl site on Barmade Bank (Trawl line 54° 50.127'N, 00° 19.842'E to 54° 52.577'N, 00° 14.948'E) to collect demersal fish for size-spectra and stable isotope studies. This work was completed by 17.50 h on 12 September and Endeavour continued to steam N to a series of sites subject to different levels of fishing disturbance, approximately 60 miles E of Peterhead. Hamon grabbing (5 replicates) and 2m beam trawling (3 replicates) was completed at each of 7 sites, beginning at 07.50 h on 13 September and ending at 12.50 on 14 September. All sites were also side-scanned during the night of 13-14 September.

From the Peterhead sites, Endeavour steamed south to Devil's Hole (Trawl line 56° 10.080'N, 00° 10.000'E to 56° 07.746'N, 00° 14.678'E). She arrived on station at 19.30 h on 14 September, and swathe bathymetry equipment was calibrated until 02.00 h. At 03.19 h 4 m and 2 m beam trawling for fish and invertebrates began, and these continued until 08.00 h on 15 September. From Devil's Hole, Endeavour steamed S to the NW Rough (Trawl line 55° 00.800'N, 01° 18.500'E to 55° 03.770'N, 01° 12.400'E), to complete work on a third 4 m and 2 m beam station. Work began at 13.56 h on 15 September and was completed by 17.50h on the same day. From the NW Rough, Endeavour steamed south to a fourth 4 m and 2 m beam station on the Indefatigable Banks (Trawl line 53° 50.050'N, 02° 10.000'E to 53° 47.530'N, 02° 15.061'E). Trawling began at 03.51 h on 16 September and was completed by 07.30 on 16 September. Endeavour then steamed north to the final 4 m and 2 m beam station in the Hills (Trawl line 54° 25.050'N, 01° 00.000'E to 54° 22.282'N, 01° 05.401'E), beginning work on site at 13.00 h and completing work at 17.25 h.

From the Hills, Endeavour steamed to a second grid of fishing impacts sites on the N Dogger Bank. Hamon grabbing (5 replicates), 2 m beam trawling (3 replicates) and dredging (3 replicates) was completed at each of 7 sites, beginning at 04.55 h on 17 September and ending at 15.00 h on 18 September. All sites were also side-scanned during the night of 17-18 September. From 15.00 h on 18 September, the Hipap system was tested on the 2m beam. This work was completed at 00.00 h on 18 September and Endeavour steamed NE to the Middle Rough to sample infauna with the Hamon grab for community size-structure studies (10 replicates at 10 sites in box from 55° 44.0' N to 55° 45.0' N and 03° 00.0' E to 03° 01.6'E). Hamon grabbing began at 06.00 h on 19 September and was completed by 18.30 h on 19 September. Endeavour then steamed SW to Barmade Bank, to commence sampling of pelagic fish with the international young gadoid trawl. The trawl and trawl sensors were tested from 07.00- 19.30 h, but tests showed that it was not possible to fish a standard tow at a set depth at Barmade Bank with the equipment available. Trawling was abandoned at 19.30 h and Endeavour sailed south to the Hills to sample infauna with the Hamon grab for community size-structure studies. Hamon grabbing (10 replicates at 10 sites in box from 54° 26.0' N to 54° 27.0' N and 01° 07.0' E to 01° 08.7'E) began at 06.00 h on Sunday 21 September and was completed by 16.15 h on 21 September. From 18.00-24.00 h the dynamic positioning system was tested, and Endeavour remained on station until Monday 22 September.

On Monday 22 September, pelagic trawling was resumed in shallow water (c. 30m) in the Hills area where it was easier to control and assess the gear. Two hauls were attempted from 06.00-08.30 h, but even in the shallow water the net was not fishing correctly and pelagic trawling was abandoned. From 09.00-10.30 h, Endeavour recovered the equipment used for

the previous nights testing of the dynamic positioning system, and then steamed south to the Indefatigable Banks to sample infauna with the Hamon grab for community size-structure studies (10 replicates at 10 sites in box from 53° 48.0' N to 53° 49.0' N and 02° 07.0' E to 02° 08.7'E). When Endeavour arrived on station at 15.00, however, wind had risen to 35 knots SW, veering N by 19.00. Endeavour dodged until 06.30 h on 23 September, when the wind and swell had subsided slightly and conditions were workable. However, as the day progressed, the wind and swell increased again. At 14.00 h, with the grab starting to swing dangerously, we abandoned work having completed 7 of the 10 sites. With little prospect of a reduction in the swell, Endeavour sailed for Lowestoft.

Endeavour docked at 08.00h on Wednesday 24 September

The following progress was made in relation to the objectives:

*1. To sample infaunal and epifaunal invertebrates at a series of sites subject to different levels of trawling disturbance for production studies.*

Completed in full

*2. To sample infaunal and epifaunal invertebrates and fish at a series of sites subject to different levels of trawling disturbance for food web studies.*

Completed in full

*3. To survey sites in the central and northern North Sea with side scan sonar in an attempt to locate new areas for the study of fishing impacts.*

Completed in full

*4. To collect fish and benthic invertebrate species for stable isotope analysis*

Completed for demersal fish and benthic invertebrates. Unable to complete for pelagic fish because the reliability of information provided by the Scanmar system was too poor to allow us to fish the net in a standard way and the doors provided did not appear to be suited to the net.


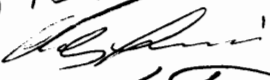
In addition to the specified work, we tested the Hipap system on the 2-m beam trawl and sandeel dredge and made intensive collections of benthic infauna to validate new methods of body size based community analysis.

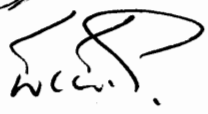
The 2IC's each took the role of SIC for one day during the cruise, Michaela Schratzberger on 17 September and Nick Dulvy on 18 September. On both days the work progressed well and according to plan.

This was a productive cruise on the new ship. Endeavour proved to be an ideal platform for conducting the 'impacts of fishing' work. There are, of course, some problems with the ship that still need to be rectified (see defects list), but all staff made a significant effort to resolve any ship and gear problems at sea (in particular rigging the pelagic trawl) and to ensure rapid and efficient changes between the many gears used on this cruise. The dynamic positioning

system reduced the time required to conduct sampling with grabs in small areas by at least 50%, but the noise from the thrusters causes significant disturbance to scientists and crew in cabins on C and D decks. The Hipap system has also improved the capacity of the vessel to fish the 2m beam trawl to a standard protocol.

Simon Jennings  
Scientist in Charge  
24 September 2003

SEEN IN DRAFT: A. Reading (Master)   
A. Lincoln (SFM) 

INITIALLED: (E.C.E. Potter, FB SAH) 

DISTRIBUTION:

Basic List +  
Dave Carlin  
Tracy Dinmore  
Nick Dulvy  
Chris Firmin  
Bill Meadows  
Craig Mills  
Adam Nicholls  
Michaela Schratzberger  
Karema Warr  
Jan Hiddink (University of Wales- [j.g.hiddink@bangor.ac.uk](mailto:j.g.hiddink@bangor.ac.uk))  
SIGS  
Fishing skipper: Endeavour  
Eastern SFC  
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