

R1/6

Not to be cited without prior reference to the Marine Laboratory, Aberdeen

FRV *Clupea*

Cruise 1001C

## REPORT

25-31 July 2001

**Loading:** Fraserburgh

**Unloading:** Fraserburgh

## Personnel

A D McIntosh (in charge)

M Gubbins

L Campbell

G Packer

**Fishing gear:** BT 116 and light beam trawl

## Objective

To undertake fish and sediment sampling in the Firth of Forth and Firth of Tay in support of temporal trend and biomarker monitoring studies.

**Out-turn days per project:** 7 days AE11p

## Narrative

All scientific gear and personnel joined *Clupea* on the morning of 25 July 2001 and after everything was secured, *Clupea* sailed at 1200 hours and made passage for the Firth of Forth anchoring overnight in Largo Bay. Fishing and related sediment sampling on the Kingston Hudds and Tancred sites was completed on 26 July with the vessel anchoring overnight at Tancred. During 27 July fishing and related sediment sampling was successfully completed at the Blackness and Bo'ness sites, and the vessel again anchored overnight at Tancred. The Grangemouth/Longannet and Port Edgar sites were completed during 28 July, anchoring overnight at Charleston Roads. During 29 July, sediment samples were taken at regular intervals between Hound Point and Kingston Hudds before *Clupea* made passage to St Andrew's Bay where fish and related sediments were sampled. After anchoring overnight in Gaa Spit, off Carnoustie, a limited fishing and sediment sampling survey was conducted in the outer estuary of the Firth of Tay before *Clupea* made passage to Fraserburgh where docking was completed by 1930 hours on 30 July. All scientific gear and samples were transferred to the Marine Laboratory on 31 July.

## Results

A total of four bottom trawls and 29 beam trawls were taken. This provided 125 flounder, 70 plaice and 30 dab samples for plasma vitellogenin, hepatic biomarker, polycyclic aromatic

hydrocarbon (PAH) and bile metabolite analyses, and muscle tissue for PAH analysis. In support of the SEPA East NMMP, 25 plaice at Kingston Hudds and 25 flounder at Blackness were sampled for chlorobiphenyls (CB), Cd and Pb in fish liver and Hg in fish muscle tissue. Sediment samples were taken at the start, mid point and end of each trawl site and provided 24 samples for PAH, particle size (PSA) and heavy metal (HM) analyses. In addition to these, 22 sediment samples were taken between the trawl sites to provide PAH and HM analysis along a transect from Grangemouth to Kingston Hudds. At nine of the sites, duplicate sediment samples were taken and wet sieved through 2 mm mesh. The > 2 mm fraction was discarded and the < 2 mm fraction retained for subsequent comparative PAH and CB analyses.

*Nephrops norvegicus* were sampled from Kingston Hudds and will be analysed for PAH in support of establishing a background/reference concentration value for *Nephrops* from commercially exploited stocks in Scottish waters.

Shore crabs, *Carcinus maenas* were sampled at the Grangemouth/Longannet (n=19) and the St Andrews Bay (n=10) reference site. Urine was sampled by syringe from antennal glands for PAH metabolite analysis. From the same animals, hepatopancreas was also sampled for PAH burden and enzyme level biological effects measurements.

A McIntosh  
16 August 2001

Seen in draft: A Nicol, OIC *Clupea*