

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

2013 RESEARCH VESSEL PROGRAMME

PROGRAMME: RV CEFAS ENDEAVOUR: SURVEY 15

STAFF:

Part A

Fishing:

S McCully (SIC)

B Harley (2IC)

R Humphreys

B Hatton

M Eade

J Silva

Part B

B Harley (SIC)

R Humphreys

B Hatton

M Eade

L Cox

D Doran

Plus:

A Pliru

D Sivyer

R Coombes

A Rosales Villa

G Tomlinson

M Lilley

E Capuzzo

R Coombes

P Gardiner

A Marshall

DURATION: 3 August – 3 September

LOCATION: North Sea

PRIMARY AIMS:

1. To carry out a groundfish survey of the North Sea (Figure 1) as part of the ICES coordinated IBTS, 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 CTD rosette and Niskin Bottle.
 - f) Length weight & maturity information using individual fish measurements, in support of the EU Data Regulation.
2. Fish a minimum of 10 selected stations with ‘Poly GOV’ in Northern area of the sampling grid.
3. Total alkalinity and dissolved inorganic carbon analysis of seawater by filtration at every station.

SECONDARY AIMS:

4. As part of a project looking at the improvement methods for jellyfish monitoring (ACOJEL), we aim to:
 - Collect acoustic data in order to identify jellyfish distribution and relative density in the North Sea.
 - Collect, enumerate and process (weight and umbrella lengths) jellyfish caught in the GOV.
 - Collect jellyfish tissue samples for population genetics and species haplotype profiling if possible, freeze animals for post-survey analysis if not.
 - Collection and freezing of mucus and bell material from *Cyanea* species for work at L'Observatoire Oceanologique de Villefranche sur Mer, France.
5. Tag and release specimens of starry smooth-hound *Mustelus asterias*, greater-spotted dogfish *Scyliorhinus stellaris*, spurdog *Squalus acanthias*, tope *Galeorhinus galeus*, common skate *Dipturus batis* species-complex, and blonde ray *Raja brachyura*, in support of the ICES Working Group for Elasmobranch Fishes work to inform on stock units for demersal elasmobranchs.
6. To freeze any unusual fish species for subsequent identification / verification in the laboratory, including specimens of eelpout (*Zoarces*, *Lycodes* and *Lycenchelys*), sea scorpions (Cottidae, sub-area IVa only), *Sebastes* spp., and any unusual fish species, which may also be used in otolith research.
7. To freeze samples of smooth-hound (*Mustelus* spp.) for biological studies.
8. Record litter caught in the trawl in support of Defra projects.
9. Record sightings of sea birds and cetaceans for JNCC and Sea Watch Foundation.
10. Retain all dead species of shad and lamprey for study by Cefas scientists.
11. Collect plankton biodiversity samples from selected stations for pigment and analytical flow cytometry analysis, in support of the EU project, DEVOTES.
12. To develop capabilities using the new litter/ plankton passive sampler system and collect zooplankton samples for size spectra analysis in support of DEVOTES.
13. Collect stomachs of hake, grey gurnard, mackerel and red mullet from selected hauls throughout the North Sea – as part of the EU Contract MARE/2012/02 “*Study on stomach contents of fish to support the assessment of good environmental status of marine food-webs and the prediction of MSY after stock restoration*”.
14. Collect a minimum of 10 carbonate samples from the gut and otoliths of all species caught where possible, to estimate the contribution of calcium carbonate produced by marine teleosts, contributing to the global ocean inorganic carbon cycle and influencing surface ocean chemistry and potentially contributing to carbonate sediments. This work is in support of NERC funded research by the University of Exeter in collaboration with Cefas, and the Met Office (global carbon cycle modelling).

15. Sampling of sediments using a box corer and taking Sediment Profile Images to improve understanding of the nitrogen cycle in North Sea sediments. In particular, focus will be on using oxygen penetration depth (OPD) and redox depth (aRPD) from SPI to describe organic matter breakdown through nitrogen. The sediments will be characterised and incubations undertaken at 10-15 sites across the muddy/sand parts of the North Sea.
16. Deploy a baited underwater camera system at selected stations across the grid.
17. Deploy a 2000m rated self recording HD format underwater camera, built by Plymouth University in deepwater stations as a system trial.
18. Collect continuous fisheries acoustic data at three operating frequencies (38 kHz, 120 kHz and 200 kHz), using the Simrad EK60 split beam sounder. The data will contribute to the existing 13 year time series of acoustic data in the North Sea and will be used as part of the Defra funded project Poseidon to extract information on mackerel distribution and abundance.
19. Retain and freeze whole specimens of Mackerel, herring, sardines/pilchards, sprats, sea bass, dogfish, halibut, turbot and blue whiting (where above minimum landing sizes if applicable) for testing tissue samples for contaminants, in support of the EU Marine Strategy Framework Directive, descriptor 9 (relating to levels of contaminants in fish and shellfish for human consumption).
20. Collect additional biological information (disc width, disc width and pre-pelvic length) for starry ray *Amblyraja radiata*, as a test species to better inform on conversion factors of *Amblyraja* spp. in the Antarctic, in support of an FCO project.
21. Collect fin clips from all turbot *Scophthalmus maximus*, for DNA analysis by the Agricultural and Fisheries Research (ILVO) in Ostend, Belgium.

PLAN:

RV Cefas Endeavour will sail from Lowestoft at 07:00 on 3 August and fish the stations detailed in Figure 1. Cefas Endeavour will proceed to stations in the southernmost North Sea and start the IBTS survey. The survey will then continue northwards until docking in Aberdeen on the evening of 21 August for a mid-cruise break to allow personnel changes, and if required to have the Scanmar sensors calibrated. The second half of the survey will sail from Aberdeen on the morning of 23 August and the survey will continue and dock in Lowestoft on 3 September.

GEAR:

List distributed separately and marked to relevant individuals for action. Antonio Pliru and Martin Lilley are responsible for supplying the necessary equipment and carrying out Aim 4, Sophy McCully for Aim 5, 16 and 20, Elisa Capuzzo for Aims 11 and 12, Guy Tomlinson and Abigail Marshall for Aim 13 and 14, and Alida Rosales Villa and Dave Sivyver for Aim 15.

S McCully
Scientist in Charge
11 July 2013

DISTRIBUTION:

Basic list +

S McCully	B Harley
R Humphreys	B Hatton
M Eade	L Cox
J Silva	D Doran
A Pliru	E Capuzzo
R Wilson	M Lilley
A Marshall	D Sivyer
R Coombes	M Lewis
P Gardiner	C Lynam
E Hunter	J Pinnegar
R Parker	N Greenwood
K Howell	J Ellis
T Maes	M Nicolaus
R Forster	R Law
J Van Der Kooij	

Inshore Fisheries and Conservation Authorities (IFCA's): East, North-east, Northumberland, Essex and Kent.

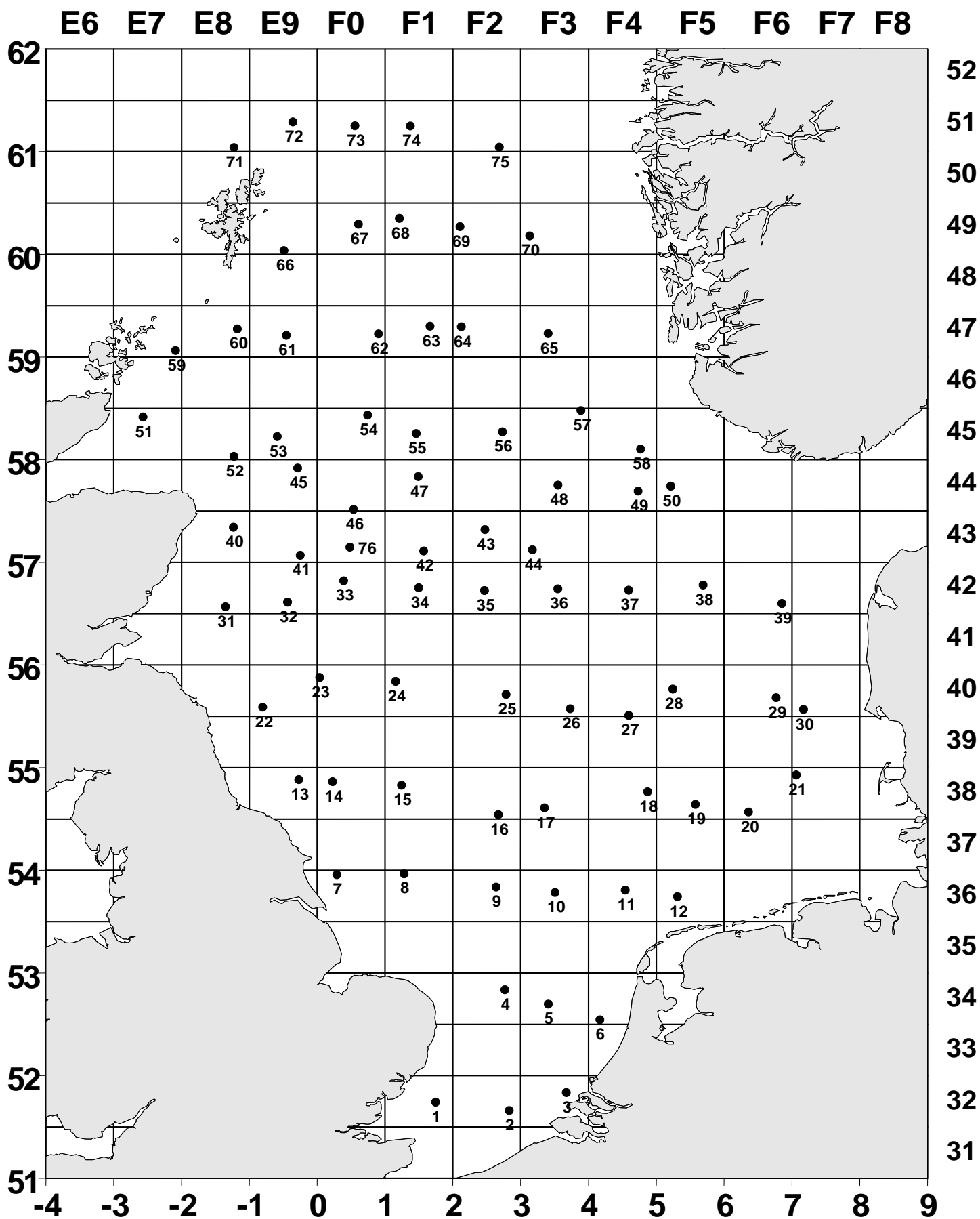


Figure 1: Fishing station of IBTS North Sea Groundfish Survey