

CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE  
LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK, NR33 0HT  
2015 RESEARCH VESSEL PROGRAMME

DRAFT PROGRAMME: RV CEFAS ENDEAVOUR: 22/15

STAFF:

Part 1 (3<sup>rd</sup> -13<sup>th</sup> of October)

1. Jeroen van der Kooij (SIC)
2. Elisa Capuzzo (2IC)
3. Joana Silva (2IC)
4. John Pinnegar
5. Dave Brown
6. MIST person
7. Richard Humphreys
8. Matt Eade
9. Paul Bouch
10. James Pettigrew
11. Plankton specialist
12. Philip Lamb
13. Marinelife observer
14. Marinelife observer
15. Marinelife observer

Part 2 (13– 21<sup>st</sup> of October)

1. Jeroen van der Kooij (SIC)
2. Elisa Capuzzo (2IC)
3. Joana Silva (2IC)
4. Chris Lynam (?)
5. Dave Brown
6. Ken May
7. Richard Humphreys
8. Matt Eade
9. Paul Bouch
10. James Pettigrew
11. Phil Lamb
12. Marinelife observer
13. Marinelife observer
14. Marinelife observer

DURATION: 3<sup>rd</sup> –21<sup>st</sup> of October

LOCATION: Western Channel and Celtic Sea (ICES areas VIIe, f, g)

AIMS:

1. To carry out the fourth in a series of five annual multidisciplinary pelagic survey of the Western Channel and Celtic Sea waters to estimate the biomass of-, and gain insight into the population of the small pelagic fish community (sprat, sardine, mackerel, anchovy, horse mackerel, herring).
  - a. To carry out a fisheries acoustic survey during daylight only using four operating frequencies (38, 120, 200 and 333 kHz) to investigate:
    - distribution of small pelagic species
    - abundance of small pelagic species
    - distribution of the pelagic species in relation to their environment
  - b. To trawl for small pelagic species using a 20x40m herring (mid-water) trawl (taking the Cosmos Fotø and Engels 800 as back up) in order to obtain information on:
    - Species- and size composition of acoustic marks
    - Age-composition and distribution, from all small pelagic species
    - Length weight and maturity information on pelagic species
    - Stomach contents (see also 11 )
2. To collect plankton samples using 2 different mesh ringnets (80 µm, and 270 µm mesh) at fixed stations along the acoustic transects at night by vertical haul. Samples will be processed onboard:

- a. Ichthyoplankton (eggs and larvae, 270  $\mu\text{m}$ ) of pelagic species will be identified, counted and (in case of clupeids) measured onboard and combined with information from maturity to identify spawning areas.
  - b. Zooplankton samples (from ringnet with 80  $\mu\text{m}$  mesh) will be stored for further analysis back in the lab.
3. Water column sampling. At fixed stations along the acoustic transect, an ESM2 (where possible fixed to a Rosette sampler) will be deployed to obtain a vertical profile of the water column. Water column profiles and water samples will provide information on chlorophyll concentration, dissolved oxygen concentration, salinity, temperature, inorganic nutrients concentration and the relevant QAQC samples for calibration of the equipment. Water samples will be collected and fixed on board for analysis post-hoc.
  4. Seabirds and Marine Mammals. Locations, species, numbers and activities observed will be recorded continuously during daylight hours by two Marinelife observers from bridge.
  5. Additional high resolution ESAS observations will be conducted on critically endangered Balearic shearwaters and other seabirds.
  6. Ferrybox Continuous CTD/Thermo-salinograph/pCO<sub>2</sub>. Continuously collect oceanographic data at the sea surface (4 m depth) during steaming.
  7. To conduct further experiments with the online flow-cytometer to obtain continuous data on phytoplankton functional groups in collaboration with project JERICO NEXT.
  8. To collect discrete samples of phytoplankton and micro-zooplankton at predetermined 18 primary stations for further analysis back to the lab (species composition, abundance, biomass and size distribution).
  9. To collect water samples for nutrient and TA/DIC analysis at one station per day in support of a programme on ocean acidification (Naomi Greenwood) to continue autumn time-series in area.
  10. To map the acoustically derived zooplankton densities using the new 333 kHz frequency and compare it with data collected under 2 (and where possible 7) as part of Defra project HAZARD.
  11. To collect genetic samples of gut contents and jellyfish for a UEA PhD studentship aiming to identify and quantify predation of jellyfish (Philip Lamb)
  12. To collect and freeze samples of jellyfish for isotope work (Clive Trueman, NOC)
  13. To quantify the size, biomass, distribution of the gelatinous species as part of a collaboration with the Nerc-Defra funded Marine Ecosystem Research Programme (MERP)

#### PLAN:

Provisionally all staff will join RV CEFAS Endeavour at the afternoon of the 2<sup>nd</sup> of October in Portland. Following an induction for staff new to the RV (18:30 BST), she will sail at 6:00 in the morning of the 3<sup>rd</sup> of October.

If weather permits the first day will be used to calibrate the four acoustic frequencies (off Portland head) and to conduct shake-down tows with the 20x40 herring mid-water trawl, the Rosette/CTD and zooplankton nets.

The survey proper will then commence; acoustic transects (map below), and marine mammal and bird observations will be conducted during daylight only. As will the ad hoc pelagic trawl operations to identify acoustic marks and obtain biological information. Biological samples will be processed between tows. At night, plankton and oceanographic data will be collected using frame-mounted ringnets and Rosette (or Niskin bottles) respectively at fixed primary stations. Depending on time available and weather conditions, pelagic fish egg and larvae will be identified, measured (larvae) and quantified from the plankton samples on board and fish otoliths will be read onboard to determine the age of small pelagic species.

Provisionally, at first light on the 13<sup>th</sup> of October a brief staff change will take place by searider, probably off Falmouth, with 2 scientific staff coming off and the same number coming on. The RV will sail out to complete the final part of the survey which will include transects around the Isles of Scilly and the Bristol Channel, according to the same protocol as described above. Weather and time permitting a transect will be ran between the inner Bristol Channel and the Celtic Deep area to

study the effects of frontal systems on top predators. On completion of the work the ship will disembark in Swansea in the afternoon of the 21<sup>st</sup> of October.

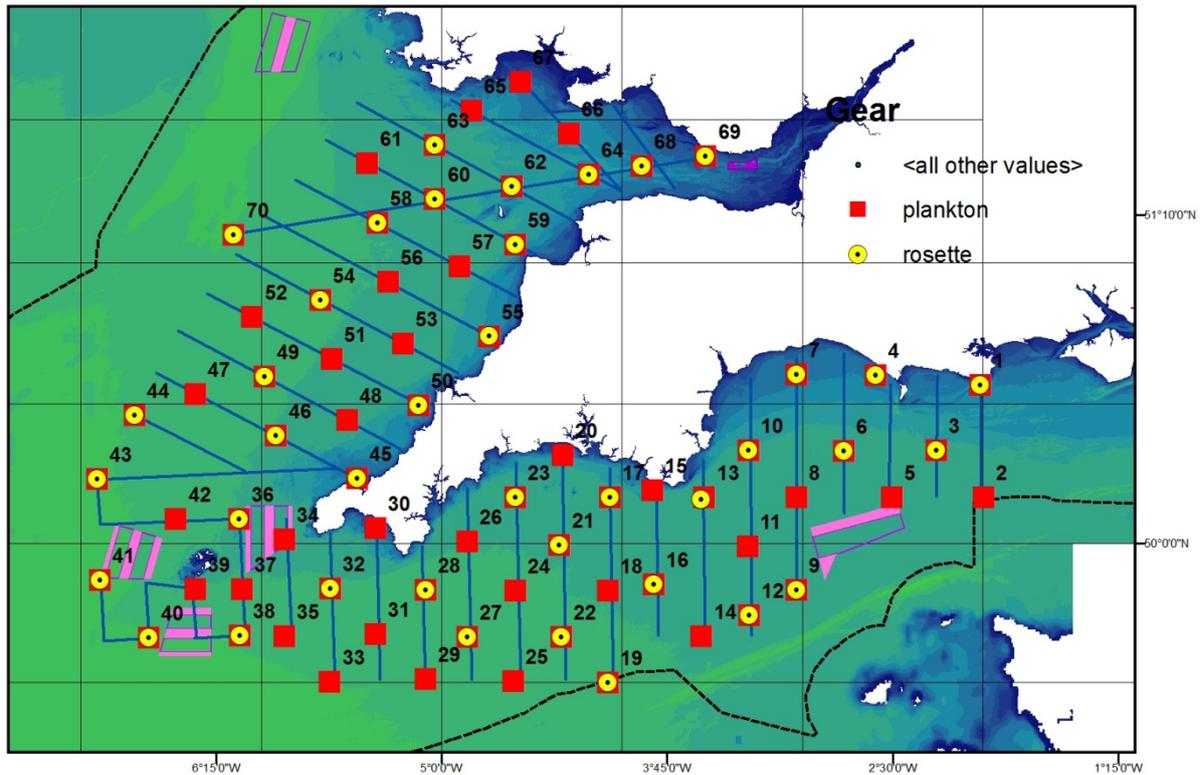


Figure 1: Survey design (acoustic transects in blue, plankton stations red squares and CTD stations represented by yellow circles). Please note that trawl positions are not known as yet:

GEAR:

List distributed separately and marked to relevant individuals for action.

Jeroen van der Kooij 25/06/2015

DISTRIBUTION:

Basic list+

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