CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE

LOWETSOFT LABORATORY, LOWESTOFT, SUFFOLK, NR33 0HT

2014 RESEARCH VESSEL PROGRAMME

DRAFT PROGRAMME: RV CEFAS ENDEAVOUR: 20/14

STAFF:

Part 1 (30th Sept-11th of October)	Part 2 (11– 19th of Oct)
Jeroen van der Kooij (SIC)	Jeroen van der Kooij
Elisa Capuzzo (2IC)	Elisa Capuzzo
Joana Silva (2IC)	Joana Silva
Dave Brown	Richard Ayers
Ken May	Chris Lynam
Mark Etherton	Ken May
Richard Humphreys	Richard Humphreys
Samuel Roslyn	Matt Eade
James Pettigrew	James Pettigrew
Scott Davis	Scott Davis
Kate Collingridge	Conor Mulholland
Conor Mulholland (Irish Observer)	Nigel Symes
Nigel Symes (Marinelife observer)	Ruth Molloy
Ruth Molloy (Marinelife observer)	

DURATION: 30th September –19th of October

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

AIMS:

1. To carry out the third 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 (stomach will be extracted frozen for future work)
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 and at a subset of trawl stations during the day. Samples will be processed onboard:
   a. Ichtyoplankton (eggs and larvae, 270 μm) of pelagic species will be identified and counted onboard and combined with information from maturity to identify spawning areas.
   b. Zooplankton will be stored for further analysis back in the lab.

3. Water column sampling. At fixed stations along the acoustic transect, a Rosette and ESM2 will be deployed to obtain a vertical profile of the water column. Water column profile and water samples will provide information on chlorophyll, oxygen, salinity temperature, nutrients 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. Ferrybox Continuous CTD/Thermo-salinigraph. Continuously collect oceanographic data on the sea surface during steaming.
6. To conduct a one day P&O training exercise of the use of the pelagic trawl at the start of the survey.
7. Continuous plankton sampler: to further test the ability of a new (continuous) passive zooplankton sampler to supplement ringnet plankton nets with high resolution data on the surface. Focus includes sardine spawning, and key zooplankton prey.
8. 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 a new Defra funded project HAZARD, supplemented by Seedcorn project DP366.
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 collect, where possible, and freeze 2 kg samples each of mackerel, herring, sardine, sprat, blue whiting and dogfish for dioxin analysis as part of MSFD, descriptor 9 "contaminants in seafood" (Robin Law)
11. If possible to conduct an inter-vessel platform calibration exercise with the *RV Celtic Explorer* (Marine Institute, Ireland). Location and timing will be agreed between the SICs of the two surveys.
12. If possible, to collect a range of samples using vessel based equipment, west of the Isles of Scilly as part of a calibration exercise of the equipment mounted on multiple gliders which will be deployed as part of the MASSMO project.

PLAN:

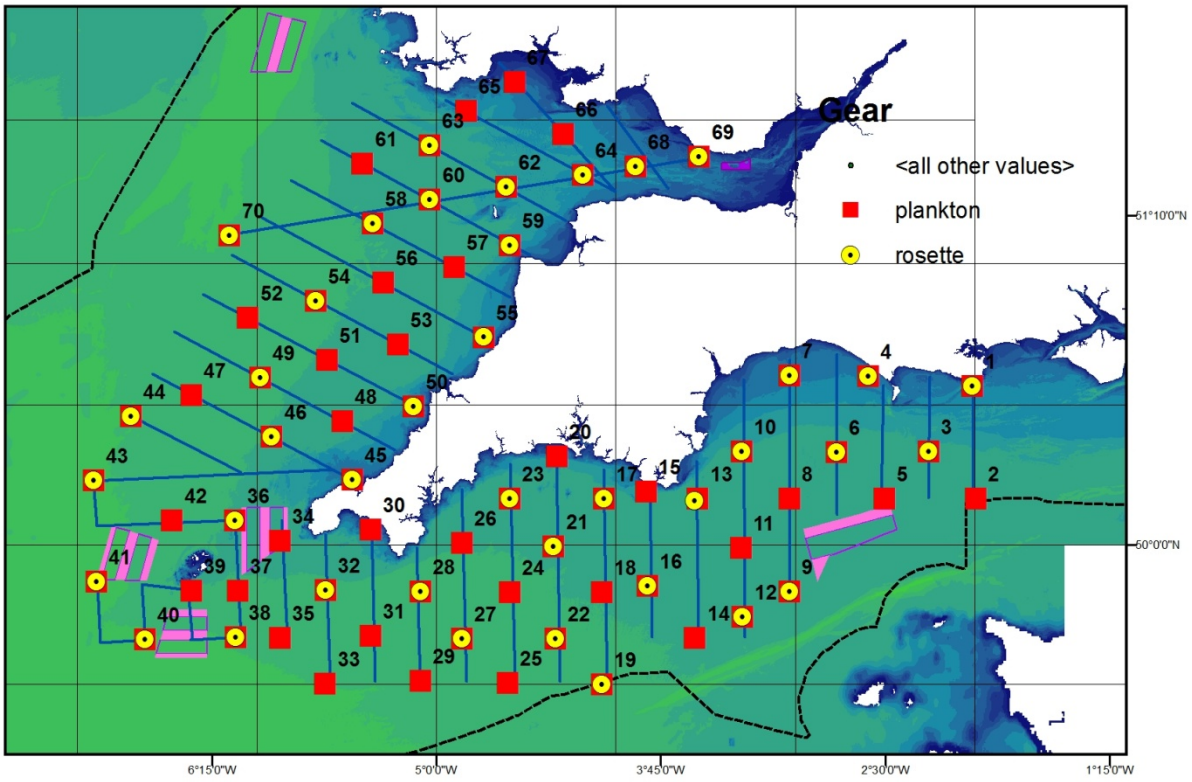
Provisionally all staff will join RV CEFAS Endeavour at the afternoon of the 29th of September in Portland. Following an induction for staff new to the RV (18:00 BST), she will sail at 6:00 in the morning of the 30th of September.

Before the survey starts properly one day each will be spent to test the 20x40 herring mid-water trawl for training purposes and to calibrate the four acoustic frequencies (off the Isle of Portland). Particularly the latter is weather dependent so will be conducted with higher priority.

The survey proper will then commence; in contrast to previous two years, acoustic transects (map below), and marine mammal and bird observations will be conducted during daylight only. As will the ad hoc pelagic trawl operations will be carried out to identify acoustic marks and obtain biological information. Biological samples will be processed between trawls. At night, plankton and oceanographic data will be collected using frame-mounted ringnets and Rosette 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 age of small pelagic species.

At first light on the 11th of October a brief staff change will take place by sea-rider, probably off Falmouth, with 3 or 4 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 fronts on top predators. Finally, time permitting, where possible an inter-ship calibration will be conducted with the *RV Celtic Explorer* of the Marine Institute during their Celtic Sea herring survey. On completion of the work the ship will return to Swansea on the high tide of the 19th of October (~16:00).

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 06/08/2014

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