

RESEARCH VESSEL PROGRAMME (DRAFT)

**RV CEFAS ENDEAVOUR
Survey: C END 15 - 2019**

STAFF:

Part 1		Part 2	
Name	Role	Name	Role
Jeroen van der Kooij	SIC	Joana Silva	SIC
Joana Silva	2IC	Fabio Campanella	2IC
Richard Humphreys	Deckmaster	Richard Humphreys	Deckmaster
Oliver Twigge	Oceanography	Oliver Twigge	Oceanography
Marc Whybrow	MIST	Marc Whybrow	MIST
Fabio Campanella	Acoustics	Sílvia Rodríguez- Climent	Acoustics
Matt Eade	Sampler	Allen Searle	Sampler
Sam Barnett	Sampler	Sam Barnett	Sampler
James Pettigrew	Plankton	Hayden Close	Plankton
Nevena Almeida	Plankton	Hannah Lloyd-Hartley	Plankton
James Scott (PhD, UEA)	PIA	James Scott (PhD, UEA)	PIA
Chris Brodie (PhD, Univ Salford)	Environmental	Chris Brodie (PhD, Univ Salford)	Environmental
Roweena Patel (PhD, Univ Reading)	Sampler	Roweena Patel (PhD, Univ Reading)	Sampler
Marine mammal /bird observer	Observer	Marine mammal /bird observer	Observer
Marine mammal /bird observer	Observer	Marine mammal /bird observer	Observer

DURATION: 1st – 28th October (28 days)

LOCATION: Western Channel and Celtic Sea (ICES Divisions 7.d, e, f , g)

AIMS:

1. To carry out the eighth annual multidisciplinary pelagic survey of the western Channel and Celtic Sea to estimate the biomass of-, and gain insight into the population of the small pelagic fish community including sprat (*Sprattus sprattus*), sardine (*Sardina pilchardus*), mackerel (*Scomber scombrus*) , anchovy (*Engraulis encrasicolus*), horse mackerel (*Trachurus trachurus*).
 - a. To carry out a fisheries acoustic survey during daylight hours only using four operating frequencies (38, 120, 200 and 333 kHz) to map and quantify the small pelagic species community.
 - b. To trawl for small pelagic species using a 20x40m herring (mid-water) trawl in order to obtain information on:
 - Species and size composition of acoustic marks
 - Age-composition and distribution, for small pelagic species

- Length weight and maturity information of pelagic species
 - Stomach contents of selected species
2. To collect biological data (size, weight, age and maturity) on range of data-limited fish species, including European seabass (*Dicentrarchus labrax*), black seabream (*Spondyliosoma cantharus*), red mullet (*Mullus barbatus*), garfish (*Belone belone*), saury pike (*Scomberesox saurus*).
 3. To collect plankton samples using two ring-nets with 80 μm , and 270 μm mesh sizes at fixed stations. Carried out at night by vertical haul and samples will be processed onboard:
 - a. Ichthyoplankton (eggs and larvae, 270 μm) of pelagic species will be identified, counted and (in case of clupeids) staged and measured onboard to identify spawning areas.
 - b. Zooplankton (80 μm) will be stored for further analysis back in the lab.
 4. Water column sampling. At fixed stations along the acoustic transect, a CTD (either an ESM2 profiler or a Seabird mounted on a Rosette sampler) will be deployed to obtain measurements of environmental properties within the water column. Water column profile and water samples will provide information on chlorophyll concentration, dissolved oxygen, salinity, temperature, turbidity, and dissolved inorganic nutrients concentration as well as the relevant QA/QC samples for calibration of the equipment. Water samples will be collected and fixed on board for analysis post-survey. Samples for analysis of the phytoplankton and microzooplankton communities will also be collected at the subsurface at fixed sampling stations.
 5. Seabirds and Marine Mammals. Locations, species, numbers and activities observed will be recorded continuously during daylight hours by Marinelife observers located on the bridge.
 6. Ferrybox Continuous CTD/Thermo-salinograph. Continuously collect oceanographic data at 4 m depth during steaming, including chlorophyll concentration (from calibrated fluorescence).
 7. To carry out hourly measurements of the phytoplankton functional groups using an online flow-cytometer, connected to the Ferrybox; in collaboration with project JERICO NEXT.
 8. To further trial the continuous Plankton Image Analyser (PIA, James Scott, PhD).
 9. To collect and process samples of environmental DNA and assess method as monitoring tool for pelagic fish, cetaceans and diversity (Chris Brodie, PhD).
 10. To collect stomach contents of small pelagic fish (e.g. anchovy and sardine) for onboard and post-survey analysis (Roweena Patel, PhD).
 11. To collect small pelagic fish stomachs for a study on proliferation of microplastics through food webs
 12. To collect a zooplankton sample using the 200 μm mesh ring-net at the West Gabbard2 SmartBuoy, for the Lifeform project (Defra) as part of the UK monitoring network of zooplankton.
 13. To collect and freeze sardine specimens at three different locations: eastern English Channel, Western English Channel and Bristol Channel for genetic and otolith morphometric study (Ana Verissimo, CIBIO, Portugal)

14. To collect 15 tissue samples of sardine for each ICES rectangle for a Portuguese study to integrate genetic analysis into fisheries biology and assessment (Ana Rita Vieira, MARE, University of Lisbon, Portugal)

PLAN:

Provisionally all staff will join RV Cefas Endeavour on the afternoon of the 30th September in Swansea. Following safety inductions for staff new to the RV, the vessel will sail at the next high tide (date and time to be confirmed). On the morning of the 1st of October, the Endeavour will start running the first acoustic transect, at some point conducting a shake-down tow with the 20x40 m herring mid-water trawl, the Rosette/CTD and zooplankton nets. The vessel will continue completing the remaining transects in the Bristol Channel.

The fieldwork will involve steaming along transects (map below) continuously collecting fisheries acoustic data, surface oceanographic data and marine mammal and bird observations during daylight. Ad-hoc pelagic trawl operations will be conducted during the day to identify and validate acoustic marks and to obtain biological information of the fish community. At night, plankton and oceanographic data will be collected using frame-mounted ring-nets and a Rosette sampler/ESM2 profiler respectively at fixed primary stations. Depending on time and conditions, pelagic fish eggs and larvae will be identified, staged (eggs), measured (larvae) and quantified from the ichthyoplankton samples collected on board; fish otoliths will be read onboard to determine the age of small pelagic species.

After completion of the Bristol Channel and Isles of Scilly transects, a mid-survey break will occur on the 14th October, most likely in Falmouth or Fowey (1 tide, 12 hours). This will allow for changeover of crew and for the vessel to take on fresh supplies as necessary. A second short break is likely to occur on the 17th October (exact date to be confirmed) to allow for a changeover of scientific staff. The survey will then continue with transects in the western Channel, including in within French waters, according to the same protocol as described above.

The RV will sail back to resume the final transects in the western Channel, making its way to finally dock in Portland in the evening of the 28th October.

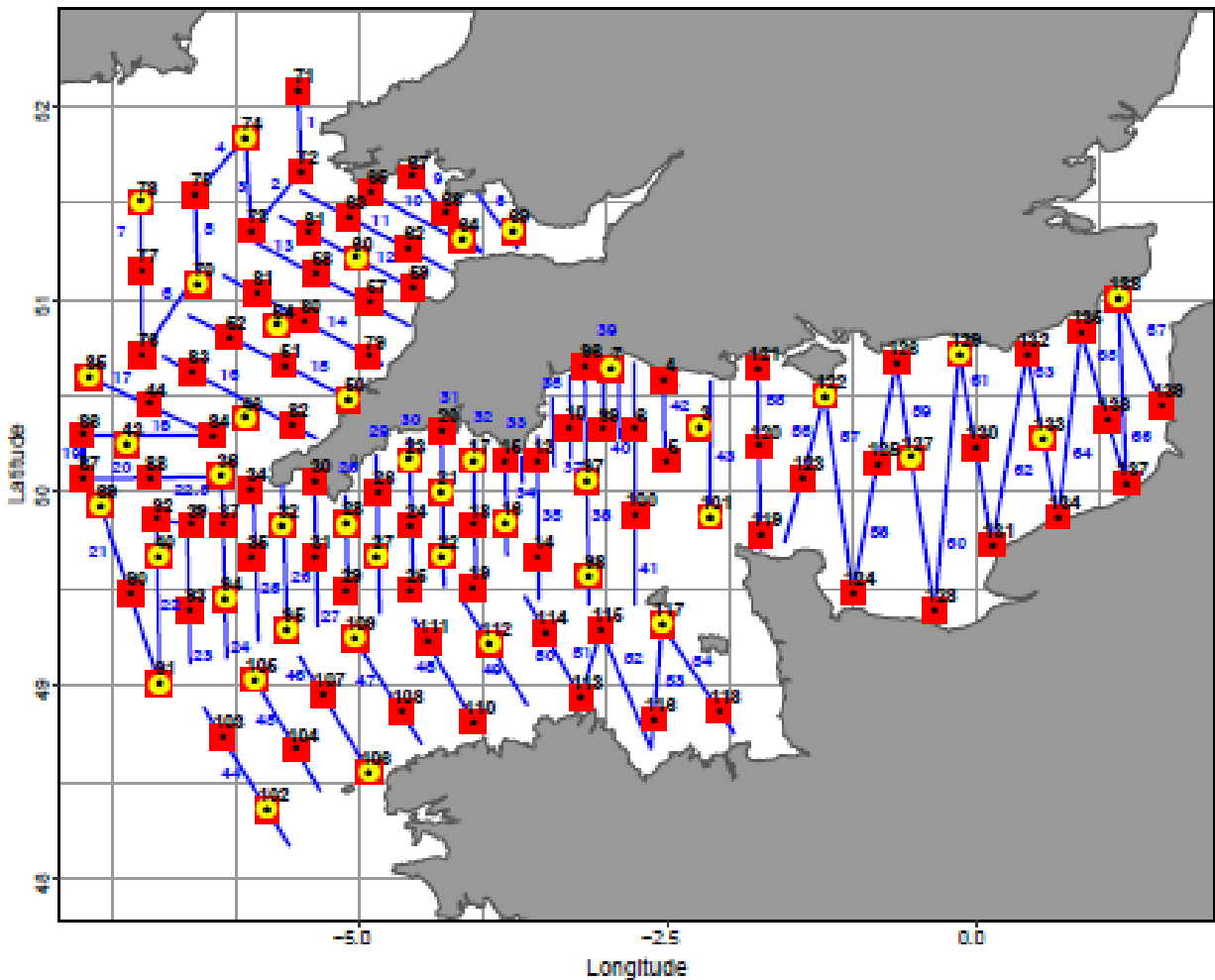


Figure 1: Survey design (acoustic transects in blue). Red and yellow marks represent plankton and CTD stations respectively. (Please note that trawl positions are not known as yet)

GEAR:

List distributed separately and marked to relevant individuals for action.

Jeroen van der Kooij/Joana Silva
Scientist in Charge
20th of August 2019

DISTRIBUTION:

Survey participants
Fisheries survey SICs/2ICs
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