

RESEARCH VESSEL PROGRAMME

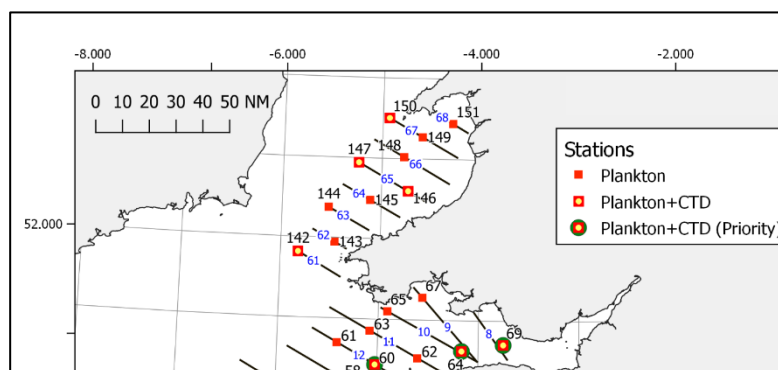
RV CEFAS ENDEAVOUR
Survey: C END 3b - 2023

STAFF:

Name	Role
Jeroen van der Kooij	SIC/Acoustics
Fabio Campanella	SIC/Acoustics
Joana Silva	SIC/Fish/Oceanography
Richard Humphreys	Lead Fishroom
Samantha Barnett	Deckmaster
Jo Smith	Fish
Nevena Almeida	Zooplankton
Izzy Lake	Shiftlead/Oceanography
Amy Mace	Zooplankton
Aimee Cuskeran	Zooplankton
Louise Straker Cox	Fish
Ian Woodgate	Population structure
Peter Howlett	ML Observer
??	ML Observer

DURATION: 13-17th March (5 days)

LOCATION: Cardigan Bay and Bristol Channel (ICES divisions 7.a and 7.f, respectively)



AIMS:

1. To carry out a one-off integrated pelagic survey in Cardigan Bay in March (due to the 2022 PELTIC survey being cut short) for Welsh Government; estimate the biomass of-, and gain insight into the populations of the small pelagic fish community including sprat (*Sprattus sprattus*), sardine (*Sardina pilchardus*), mackerel (*Scomber scombrus*), anchovy (*Engraulis encrasicolus*), horse mackerel (*Trachurus trachurus*). Timing of the survey is focussed on presumed spawning period of sprat.

- 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 conduct approximately eight trawls targeting small pelagic species using a 20x40m VDK 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*), 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 (red squares on map above). Carried out at night by vertical haul:
 - a. Ichthyoplankton (eggs and larvae, 270 μm) of pelagic species will be identified, counted and (in case of clupeids) staged and measured onboard (where possible) to identify spawning areas.
 - b. Zooplankton (80 μm) will be stored for zooscan analysis back in the lab.
 4. Water column sampling (yellow stations on map below). 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 two 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. Genomic sampling of particular fish species to improve the methodology to assess finfish, pelagic, data-limited, and non-quota UK priority stocks (Eva Garnacho/David Murray).
 8. Record macro-litter observations in the trawl (B. Silburn)

PLAN:

All staff will join RV Cefas Endeavour the afternoon at approximately 15:00 on the 12th of March in Swansea. At the next high tide at ~22:00 PM on the 12th of March the RV will sail and make its way to a sheltered site with enough depth, where, pending local conditions, the new Simrad EK80 echosounders will be calibrated. Following that, the Endeavour will start running the acoustic transects in Cardigan Bay. A shake-down tow with the 20x40 herring mid-water trawl will be conducted at some point as well.

The survey mission will involve steaming along transects (map above), continuously collecting fisheries acoustic data, surface oceanographic data and marine mammal and bird observations during daylight. Ad-hoc pelagic trawl operations will be conducted 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 completing the Cardigan Bay survey grid, the RV will steam back to Swansea, where she will dock on the early morning tide (~3:00 AM) of the 18th of March.

GEAR:

Jeroen van der Kooij, Fabio Campanella
and Jo Silva
Scientists in Charge
08/02/2023

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