CRUISE SUMMARY REPORT – RV CELTIC EXPLORER CE21017

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Fishery survey: 23/08/2021 - 02/09/2021

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1. CRUISE DETAILS

1.	Cruise number		RV Celtic Explorer – CE21017
2.	Date/time	Ostend TD Ostend TA	23/08/2021: 13u 02/09/2021: 9u
3.	Chief Scientist Participating institutes		Msc. Ir. Heleen Raat ILVO Marine One PhD student joined from Wageningen Marine Research (WUR)
4.	Area of interest		Central and southern North Sea (Belgian, French and English Continental shelves)

2. LIST OF PARTICIPANTS

Institute	NAME	Gender	23/08-02/09/21
ILVO	Heleen Raat (Chief scientist)	F	X
	Lies Vansteenbrugge (2nd chief scientist)	F	X
	Laura Lemey	F	X
	Patrick Calebout	M	X
	Benedict Deputter	M	X
	Coenraad De Putter	M	X
	David Vuylsteke	M	X
	Wim Allegaert	M	X
	Peter van Boven	M	X
WUR	Eleanor Greenway	F	X
		Total number of participants:	10

3. SCIENTIFIC OBJECTIVES

ILVO – NS-BTS

The Beam Trawl Survey (BTS) survey is compulsory within the European Data Collection Framework (DCF) and part of the Belgian National Data Gathering Program, in fulfilment of the requirements of Council Regulation (EC) No 2017/1004.

The survey consists of 62 fixed trawl stations spread over the south-western North Sea. The time series of the Belgian BTS survey with a 4 m beam trawl with chain mats as standard gear started in 1992. At each station the tow time is 30 minutes at a speed of 4 knots against the tide. The specific objectives of the NS-BTS are:

- Obtain fisheries-independent data on distribution and abundance of commercial flatfish species (at first mainly plaice and sole, but increasingly important are dab, flounder, lemon sole, turbot, brill, …). The data will be incorporated in the survey database “DATRAS” of the "International Council for the Exploration of the Sea (ICES)" and will be used in analytical population studies of these species/stocks, mainly serving as tuning indices in several stock assessments leading to the fishing TACs and quota.
- Collection of biological data for ecosystem analysis purposes:

    - On all fish (including elasmobranchs) species, including length, age (for seven species) and catch weight measurements
    - On commercially important shellfish and cephalopod species (*Nephrops norvegicus, Cancer pagurus, Hommarus gammarus, Loligo vulgaris, Loligo forbesii* and *Sepia officinalis*), including length and catch weight measurements
    - On all epibenthic species, including count and catch weight measurements
- Collection of marine litter by international standards
- Collection of environmental data, such as surface temperature and -salinity and bottom conductivity, -temperature and depth profiles at each trawl station

ILVO – RAYWATCH

RAYWATCH is a EMFF (The European Maritime and Fisheries Fund) project that runs from 2020 until 2022. The project focusses on rays and skates in the Western waters (Celtic Sea, English Channel) and aims to fill data gaps on biological information and survival of rays. It will give advice on new stock assessment models to improve the management of these species. On the NS-BTS skate morphometric and reproductive data is collected of blonde and thornback rays.

ILVO – SOLEDNA

In the framework of the project proposal SoleDNA (submitted to EMFF) water samples are collected close to the sea bottom at 10 stations. One of the objectives is to investigate whether free DNA in sea water (eDNA) can be used to detect the occurrence and estimate the biomass of sole and plaice. This method has the potential to collect information on data limited fish stocks in a quick, sustainable and non-invasive way. Seawater is collected with the help of Niskin bottles and samples are stored at -20°C. Next to the water samples also environmental parameters such as temperature, salinity and depth are measured using a CTD. Water samples are collected at the same locations as the BTS stations, so biomass profiles based on eDNA can be validated with real counts for both species.

WUR – PHD RESEARCH ELEANOR GREENWAY

The aim of the PhD research is to gain better understanding of the distribution and population dynamics of the thornback ray and blonde ray using DNA analysis and tags. The insights are used to improve management measures and recovery of the species. On the NS-BTS DNA samples are taken of a number of blonde and thornback rays, after which they are tagged and released.

ILVO – SEA(A)BASS

To gain a better understanding of the distribution and spatial use of European sea bass, biological data are collected within the Sea(A)Bass project. This data contributes to a better understanding of the spatial ecology of sea bass in and around Belgian waters, which will be the basis for evaluating fishing measures.

Individual length, weight and location/time of capture is registered. Some scales are collected for DNA analysis. If a tag is present, the number of the tag needs to be written down. In case the sea bass is in good condition and is not tagged, it receives a dart tag and is released afterwards.

4. OPERATIONAL COURSE

All times are given in local time (GMT+2). All coordinates in WGS84.

MONDAY 23/08/2021

07h-13h Embarkation of instruments and personnel

	Guided tour and safety training on RV Celtic Explorer
13h-dusk	Transit to station 40 + fishing at stations 40 (+water sample), 86, 1 & 2
	Transit to station 3

TUESDAY 24/08/2021

06h45-dusk	Fishing at stations 3, 4, 30, 5, 29, 63, 28 (+ water sample) & 73
	Transit to station 7

WEDNESDAY 25/08/2021

06h45-dusk	Fishing at stations 7, 8 (+ water sample), 9 (+ water sample), 26, 116, 113 & 11
	Transit to station 112

THURSDAY 26/08/2021

06h45-dusk	Fishing at stations 112 (+ water sample), 16, 17, 20, 19, 18, 114, 22 & 111
	Transit to station 60

FRIDAY 27/08/2021

06h45-dusk	Fishing at stations 60 (+ water sample), 110, 81, 115, 25, 24, 61 & 62
	End of part 1

SATURDAY 28/08/2021

Mid-survey break at sea (due to the Covid-19 pandemic no stop could be held at a foreign port).

SUNDAY 29/08/2021

06h45-dusk	Fishing at stations 107, 90, 102, 64, 82 & 92
	Transit to station 91

MONDAY 30/08/2021

06h45-dusk	Fishing at stations 91, 98, 83, 87, 93, 95 (+ water sample) & 80
	Transit to station 34

TUESDAY 31/08/2021

06h45-dusk	Fishing at stations 34, 33, 32, 85 (+ water sample), 96 & 94
	Transit to station 84

WEDNESDAY 01/09/2021

06h45-dusk	Fishing at stations 84, 38 (+ water sample), 39, 37 (+ water sample) & 36

THURSDAY 02/09/2021

Debarkation of material and personnel.

- End of campaign CE21017 –

5. TRACK PLOT

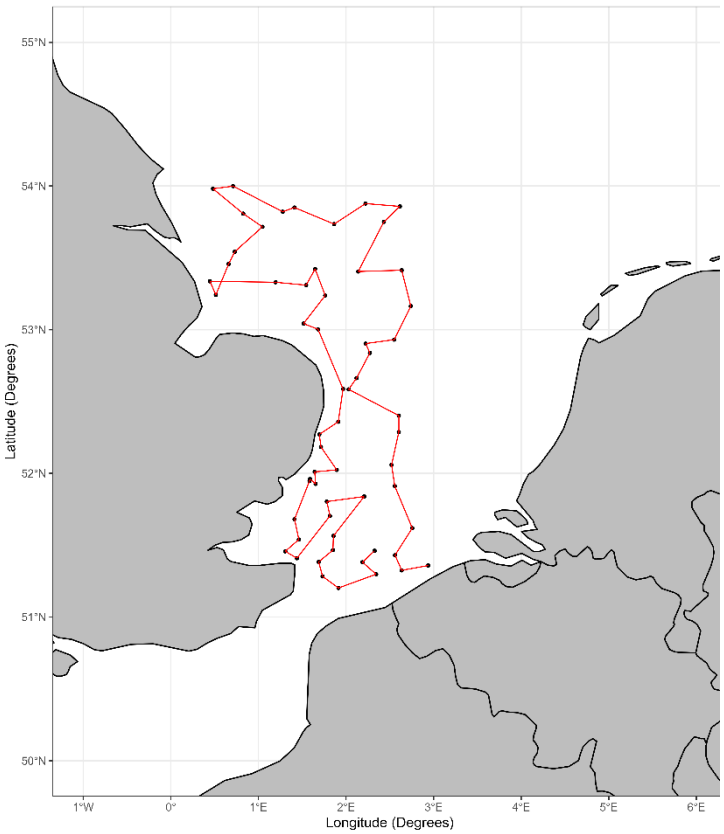

Figure 1 Track plot of campaign CE21017

6. MEASUREMENTS AND SAMPLING

Table 1 List of fishing stations (tracks) of campaign CE21017 (sampling activities for all of the above mentioned scientific objectives was performed in the catches realized on these tracks). In some stations also water samples for eDNA research were taken.

Station	Shoot Latitude	Shoot Longitude	Haul Latitude	Haul Longitude	Water sample for eDNA
40	51.359	2.9385	51.3388	2.8942	X
86	51.3253	2.6363	51.2947	2.6297	
1	51.431	2.5595	51.4052	2.5278	
2	51.619	2.7567	51.6497	2.7338	
3	51.9112	2.557	51.9148	2.5038	
4	52.0592	2.52	52.0293	2.4847	
30	52.2883	2.603	52.2983	2.652	

5	52.4022	2.603	52.4277	2.6287	
29	52.585	2.03	52.5913	2.0547	
63	52.6633	2.1207	52.6317	2.1225	
28	52.8385	2.2727	52.8228	2.2792	X
73	52.9032	2.2238	52.8717	2.2375	
7	52.9307	2.5493	52.9097	2.5068	
8	53.164	2.74	53.1963	2.7428	X
9	53.414	2.6358	53.4433	2.6617	X
26	53.4048	2.1388	53.4282	2.0987	
116	53.751	2.4327	53.7547	2.4867	
113	53.8583	2.6153	53.8382	2.6675	
11	53.8775	2.2225	53.9063	2.2505	
112	53.735	1.864	53.7637	1.8397	X
16	53.8502	1.4112	53.85	1.38	
17	53.821	1.2768	53.8215	1.2493	
20	53.9993	0.7113	53.9915	0.688	
19	53.9808	0.4817	53.9653	0.4932	
18	53.8078	0.826	53.7925	0.823	
114	53.7158	1.0457	53.701	1.0572	
22	53.5428	0.7298	53.5553	0.7453	
111	53.4577	0.6602	53.471	0.6733	
60	53.2425	0.514	53.2748	0.5148	X
110	53.3373	0.4458	53.3442	0.4687	
81	53.3302	1.1958	53.357	1.1685	
115	53.3103	1.5445	53.3207	1.5238	
25	53.423	1.6477	53.4375	1.639	
24	53.238	1.7625	53.219	1.8068	
61	53.0427	1.5148	53.0312	1.5317	
62	53.0028	1.6807	53.002	1.7072	
107	52.5875	1.9658	52.5545	1.9603	
90	52.3593	1.9118	52.327	1.8998	
102	52.2713	1.6953	52.2398	1.6777	
64	52.1838	1.7142	52.1957	1.7652	
82	52.0245	1.8942	52.0572	1.9063	
92	52.0107	1.6423	52.043	1.6567	
91	51.927	1.6527	51.9003	1.6163	
98	51.9603	1.5892	51.9278	1.5765	
83	51.9475	1.5832	51.9158	1.5713	
87	51.6812	1.4122	51.6538	1.3817	
93	51.5398	1.4617	51.5638	1.4997	
95	51.458	1.3063	51.4648	1.3455	X
80	51.4098	1.4392	51.41	1.4657	
34	51.704	1.8162	51.739	1.816	
33	51.8037	1.7813	51.7712	1.7823	
32	51.8392	2.2077	51.8	2.1845	
85	51.565	1.8568	51.5983	1.8913	X
96	51.4663	1.8507	51.4988	1.8683	
94	51.3843	1.688	51.415	1.7043	
84	51.2833	1.7325	51.2642	1.7207	
38	51.2027	1.9137	51.1852	1.867	X

39	51.2982	2.3443	51.3167	2.3842	
37	51.3818	2.1875	51.4075	2.2207	X
36	51.4617	2.3267	51.4767	2.3707	

7. REMARKS

- The weather conditions were sufficient to carry out all fishing activities during the two weeks of the campaign.
- Due to the presence of commercial fishing activities, station 6 had to be cancelled. There was no time later in the campaign to come back to this location.
- Station 72 had to be skipped due to lack of time. There was no time later in the campaign to come back to this location.
- We encountered some minor technical problems that were always quickly solved by the commander and crew of RV Celtic Explorer (e.g. defect of the sorting belt). This did not cause substantial delays or a loss of stations.
- **Conclusion: 60 out of a total of 62 planned stations were successfully fished and declared valid. This is within the margin of 90% of the plan to be achieved imposed by the European Commission (DG Mare).**

8. DATA STORAGE

- All biological data on fish (numbers, lengths, weights and ages) and invertebrates (numbers and sample weight for all species, in addition to lengths for commercial invertebrate species) are stored in SMARTFISH, the national database at ILVO.

- Accompanied by trip and haul information and the required abiotic parameters (temperature and salinity) the biological data will be uploaded to DATRAS, the survey-database hosted by ICES, latest by mid-2022. Litter data, collected according to the international protocol supported by the ICES community, will also be uploaded to DATRAS by September 2022.

- **All of the data that is in DATRAS is freely available for anyone to use**. Data can be accessed through: https://datras.ices.dk/Data_products/Download/Download_Data_public.aspx. Questions on how to download or use this data can be addressed to heleen.raat@ilvo.vlaanderen.be or lies.vansteenbrugge@ilvo.vlaanderen.be.

- Reporting on the specific elasmobranch data that was collected for the Raywatch project can be requested to laura.lemey@ilvo.vlaanderen.be.

- Reporting on the water samples that were collected for the SoleDNA project can be requested to lies.vansteenbrugge@ilvo.vlaanderen.be.

- Reporting on the specific elasmobranch data that was collected for the PhD project of Eleanor Greenway can be requested to eleanor.greenway@wur.nl.