

R/V Dana

Cruise 01/2025

"DK IBTS 1Q 2025"



Vessel: R/V DANA

Cruise dates (planned): 10/1 – 29/1 2025

Cruise number: 01/25

Cruise name: DK IBTS 1Q 2025

Port of departure:	Hirtshals	Date:	10 January
Port of return:	Hirtshals	Date:	28 January
Other ports:	none	Date and justification:	

Participants

Hirtshals – Hirtshals		
Name	Institute	Function and main tasks
Kai Wieland	DTU Aqua, Monitoring Hirtshals	Cruise leader (Part 1), Scientist, Fish lab
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Tom Svoldgaard	DTU Aqua, Monitoring Hirtshals	Technician, Fish lab
Rasmus F. Jensen	DTU Aqua, Monitoring Hirtshals	Technician, Fish lab
Viktor Hyltoft Kjeldsen	DTU Aqua, Monitoring Hirtshals	Technician, Fish lab
Bastian Huwer	DTU Aqua, Marine Living Resources	Scientist, Fish eggs and larvae
Christian Petersen	DTU Aqua, Monitoring Hirtshals	Technician, CTD, Maintenance
Janine Anna Steffens	DTU Aqua,	MSc student, Jellyfish
Troy A.Gibbs-Brown	Aarhus University	MSc student, Jellyfish
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Objectives

The survey is part of the 1st quarter International Bottom Trawl Survey in the North Sea (NS-IBTS), which is coordinated by the ICES International Bottom Trawl Survey Working Group and has been conducted with standard fishing gear in the 1st quarter since 1983.

The IBTS aims to provide ICES assessment and science groups with consistent and standardized data for examining spatial and temporal changes in (a) the distribution and relative abundance of fish and fish assemblages; and (b) of the biological parameters of commercial fish species for stock assessment purposes. The main objectives in the 1st quarter IBTS are to:

- To determine the distribution and relative abundance of pre-recruits of the main commercial species (cod, haddock, whiting, Norway pout, saithe, herring, sprat, and mackerel) with a view of deriving recruitment indices;
- To monitor changes in the stocks of commercial fish species independently of commercial fisheries data;
- To monitor the distribution and relative abundance of all fish species and selected invertebrates;
- To collect data for the determination of biological parameters for selected species;
- To collect hydrographical and environmental information;

- To determine the distribution of in particular herring and sprat larvae.

Technical details are described in the current version of the survey manual (ICES. 2020. Manual for the North Sea International Bottom Trawl Surveys. Series of ICES Survey Protocols SISP 10-IBTS 10, Revision 11. 102 pp. <http://doi.org/10.17895/ices.pub.7562> , and ICES. 2013. Manual for the Midwater Ring Net sampling during IBTS Q1. Series of ICES Survey Protocols SISP 2-MIK 2. 18 pp. <http://doi.org/10.17895/7578>.

The area to be covered by Denmark with RV Dana in the 1st quarter 2025 (Fig. 1) was allocated during the most recent IBTS Working Group meeting in April 2024. The survey area consisted of 45 ICES statistical rectangles located in the Skagerrak and the North Sea. In these rectangles, one GOV/CTD station and two MIK stations were planned.

Itinerary

R/V Dana departed from Hirtshals as scheduled on Friday 10th January at 10:00 local time and field work started in the western Skagerrak (Fig. 1) in the afternoon. The survey finished on Tuesday 28th January at 19:15 local time with the arrival in Hirtshals.

Favorable weather conditions prevailed during almost the entire survey (Fig. 2) so that all routine work was completed in time, and some additional stations were conducted.

Achievements

All standard trawl hauls were carried out with a 36/47 polyethylene GOV (chalut á Grande Overture Verticale) with the standard groundgear A (see IBTS Manual for specifications), 60 m sweeps and Vonin flyers replacing the standard kite, representing the standard rigging used for the IBTS on DANA since 2019.

The following sampling activities were performed:

50 standard GOV hauls with a nominal duration of 30 min except for two hauls for which tow duration was 20 min (poor bottom condition) and 27 min (technical issue), respectively. 1 tow was invalid (trawl damage) and this station was repeated on an alternative track in the same rectangle.

49 CTD profiles (with additional sensors for dissolved oxygen and turbidity).

99 valid MIK (2 m diameter ring net) hauls, performed during nighttime, all with MIKey (20 cm diameter fine meshed ring net) net attached. Furthermore, 2 MIK tows for flowmeter calibration were carried out.

6 experimental tows with the Jackson trawl (JTS 610 downscaled version) which is supposed to become the new IBTS standard trawl in the near future.

Results

Routine sampling

The trawl parameters for the standard GOV tows (vertical net opening and door spread) as monitored with a Scanmar system were in the range or close to the suggested theoretical limits specified in the IBTS manual in most cases except for headline height for the GOV #2 tows with two flyers (Fig. 3a). This indicates that the setup of the two GOV's hasn't been identical. Marport sensors for wing spread worked reliably on most of the stations. The obtained data indicates a sufficiently close relationship door spread so that the few missing observations for wing spread can be estimated by linear regression (Fig. 3b).

Headline height as well as door and wing spread for the JTS trawl, which was towed with some shorter wire than the GOV and at a towing speed of 3.5 kn over ground instead of the standard SOG for the GOV of 4 kn, were close to the average GOV values within its theoretical limits (GOV #1 with 2 flyers and GOV #1 with 1 flyer, Fig. 3).

In total, about 80 different species of fish, cephalopods and crustaceans were found in catches, and the total weight of the catches amounted to 21.9 tons of which more than 50 % was haddock (Tab. 1). Total catch and species richness in the standard tows ranged from 30,2 to 1755.0 kg or 648 to 34896 fish per haul and from 11 to 34 different fish and IBTS mandatory invertebrate species (Fig. 4).

Length measurements were made for all commercial and non-commercial fish species. Sharks, skates and rays and selected shellfish species were measured separately by sex (length composition and weight). Single fish data (length, weight, sex and maturity) and otoliths were collected for the main commercial species (cod, haddock, whiting, Norway pout, saithe, herring, sprat, mackerel and plaice) as well as for dab and lemon sole (Tab. 2). In addition, individual length and weight were recorded for all specimens for which stomachs or genetic samples were taken (see below).

Preliminary abundance indices for the recruits of main commercial species indicate that herring, whiting and sprat were widely distributed in the sampled area. Considerable amounts of small mackerel and haddock were found as well whereas age 1 cod was rare (Tab. 3).

Stomach data were collected for haddock, mackerel, turbot, brill, pollack and tub gurnard according to a request from the EU. The number of individuals (≥ 15 cm length) examined and the number of stomachs collected for later analysis are listed in table 4.

Marine litter was recorded in each GOV catch using four main categories: plastic, glass, metals and miscellaneous, which were subdivided into several minor categories to meet the request by the ICES Working Group for Marine Litter. The total amount of marine litter sorted from the catches retained in the codend was 6.1 kg for the 49 valid tows with highest values at the offshore limit of the German Bight (Fig. 4).

Temperature, salinity and dissolved oxygen content at surface and bottom were extracted from the CTD profiles for storage in the institute's fish database. The temperature and salinity values will be submitted to the ICES DATRAS database together with the GOV catch results and measurements of surface and bottom currents (speed and direction) at the trawl stations to DATRAS, and the complete CTD profiles will be submitted to the ICES hydrographical data center.

The water column was well mixed as typical for this time of the year (Fig. 5). In summary, surface and bottom temperatures ranged from 6.6 to 8.3 °C and from 6.7 to 8.5 °C, respectively, with the highest values for both in the west and the lowest values in the east (Fig. 5). Bottom layer turbidity was uniform for most of the area except for two high values in Danish coastal waters (Fig. 5).

Herring larvae were found mainly in the western part of the survey area whereas sardine larvae occurred predominantly in the east (Fig. 6). Further results of the MIK and MIKey plankton sampling for herring larvae, fish eggs and jellyfish conducted during the night will be reported later elsewhere, e.g. to ICES WGSINS.

Special requests

Infestation with gill parasites was recorded for haddock, whiting, cod, Norway pout, saithe and pollack from all individuals for which single fish data were taken. Haddock infestation with 1 to 4 individual gill parasites was 17.6% on average, and 0.2 and 1.3 % for whiting and Norway pout respectively (max. 1 parasite per fish recorded in one single individual). Liver worms, which were not recorded quantitatively, occurred frequently in all gadoids.

Genetic samples of cod were taken (n=4) for a national project along with the recording of single fish data (length, weight, sex and maturity).

110 fish samples (adult herring, whiting, haddock, dab, plaice and grey gurnard, > 20 cm TL) were collected for a national project on Vitamin D production in the sea.

Several sets of fish samples were collected for species identification and anatomy courses.

Special observations

- High abundance and wide distribution of haddock at medium size (30 – 35 cm TL)
- Wide distribution and relatively high number of large squids (*Loligo forbesi* and *L. vulgaris*)
- Higher number of *Sepia* squids than in previous years

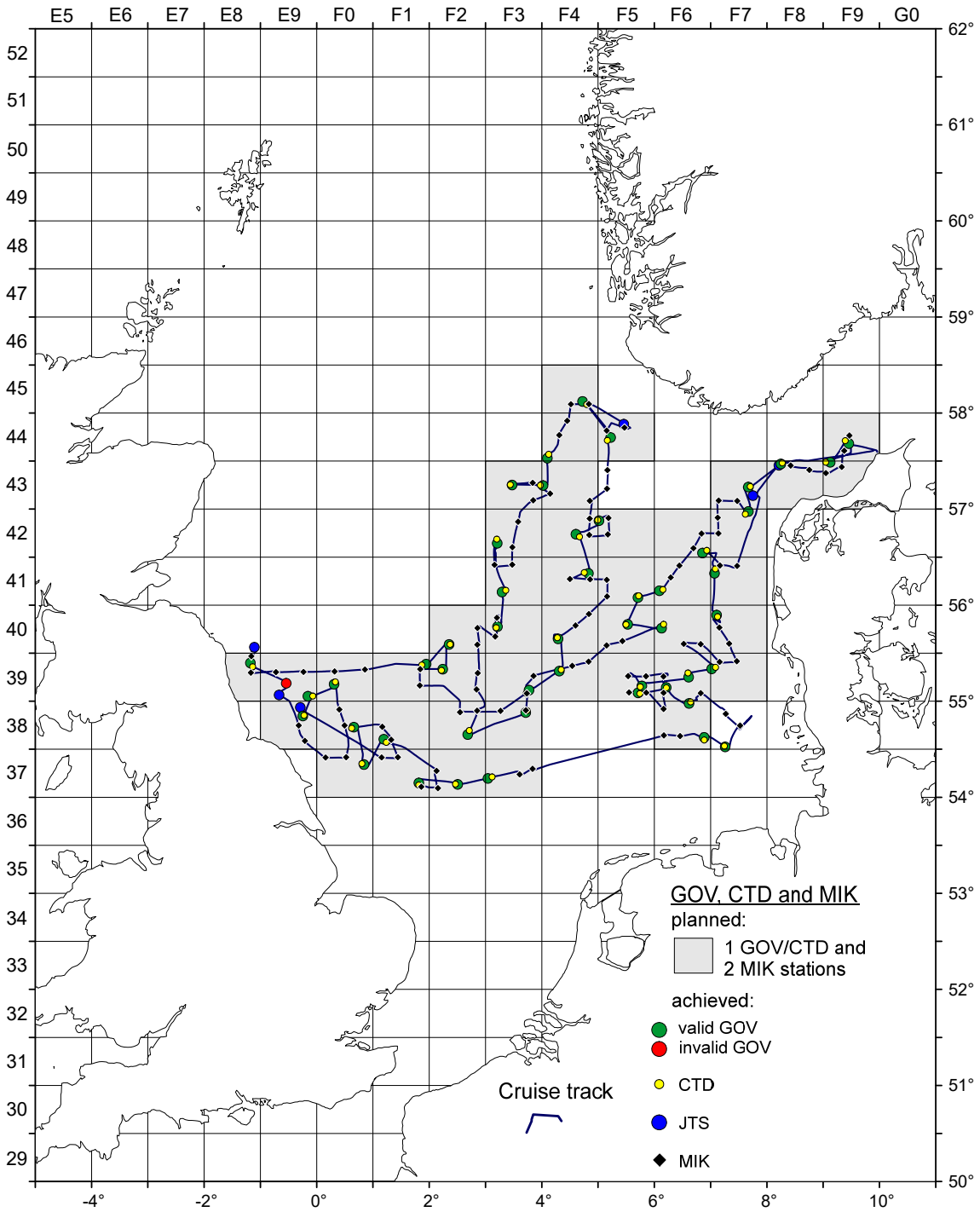


Fig. 1: Survey map with cruise track and sampling locations, RV Dana DK IBTS 1Q 2025.

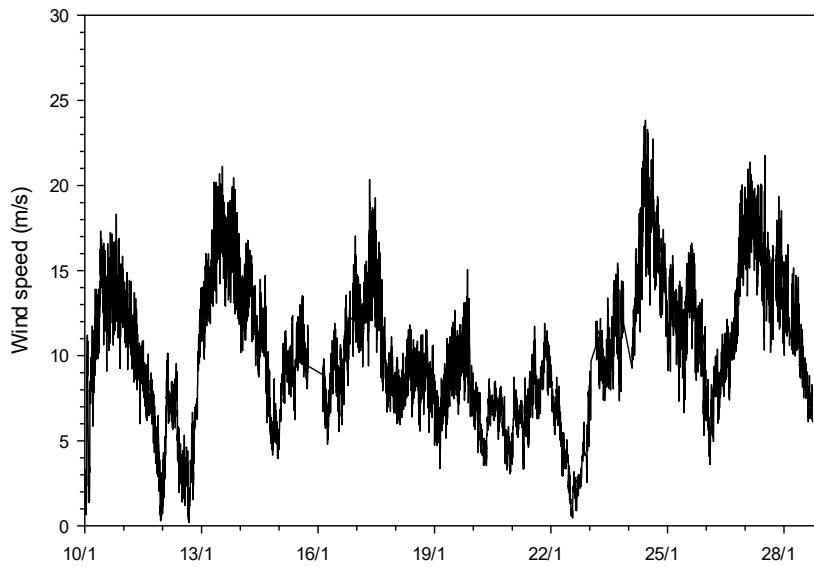
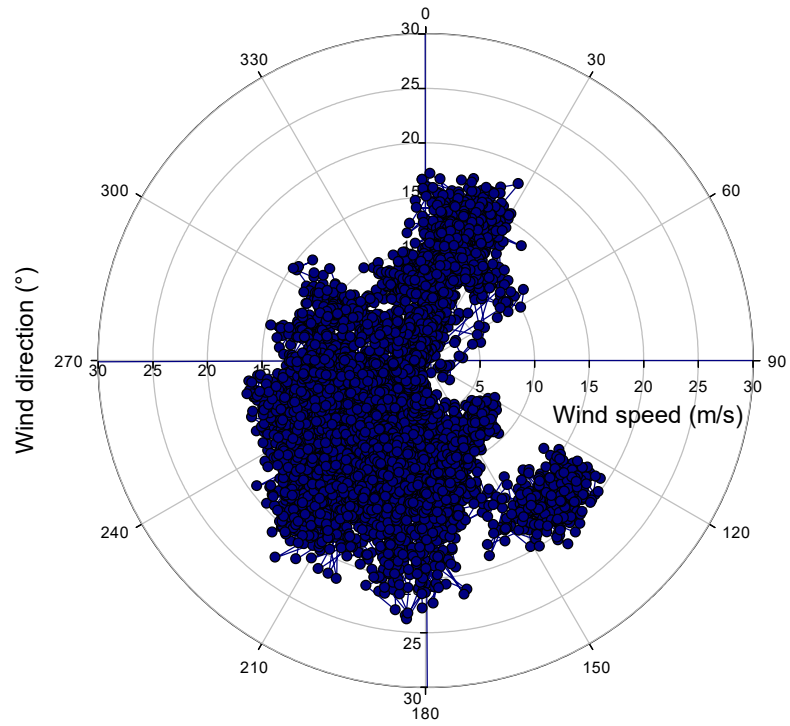


Fig. 2. Wind speed (m/s) and wind direction (°) recorded along the cruise track, RV Dana DK IBTS 1Q 2025.

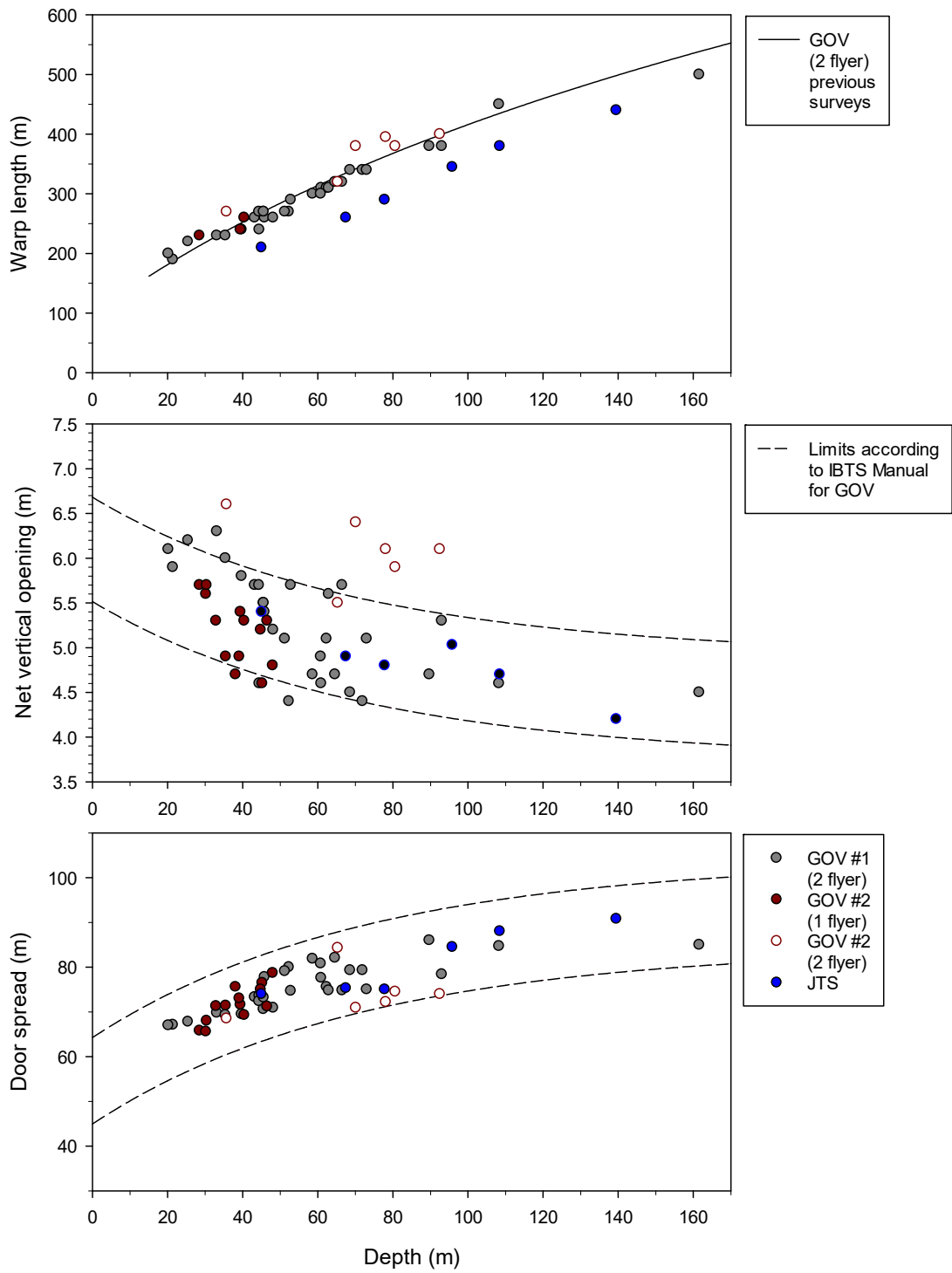


Fig. 3a: Warp length, net opening and door spread in relation to depth, RV Dana DK IBTS 1Q 2025.

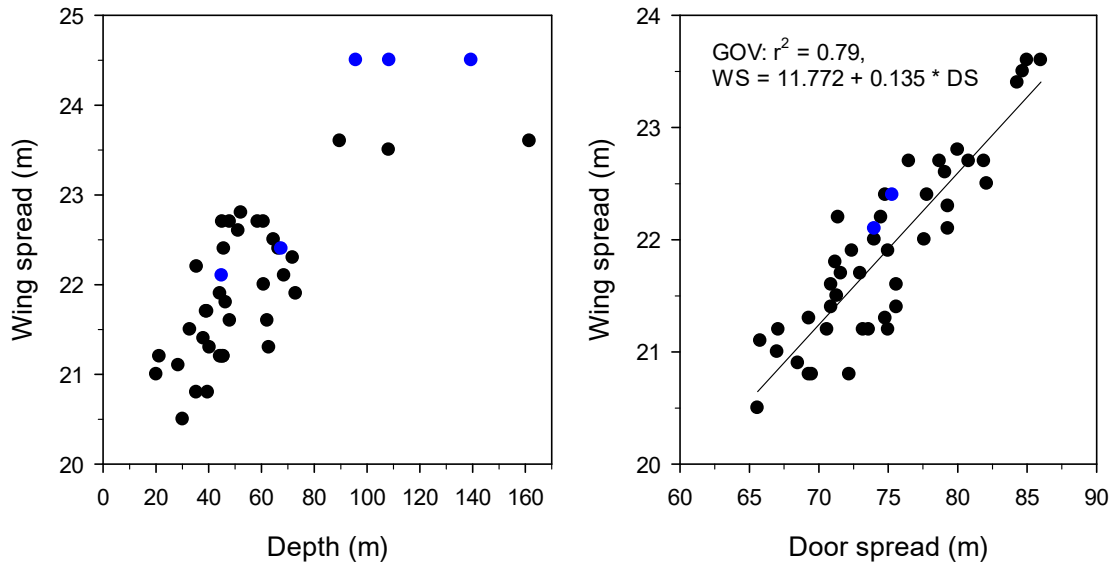


Fig. 3b: Wing spread in relation to depth and relationship between door and wing spread (black circles: GOV, blue circles: JTS), RV Dana DK IBTS 1Q 2025.

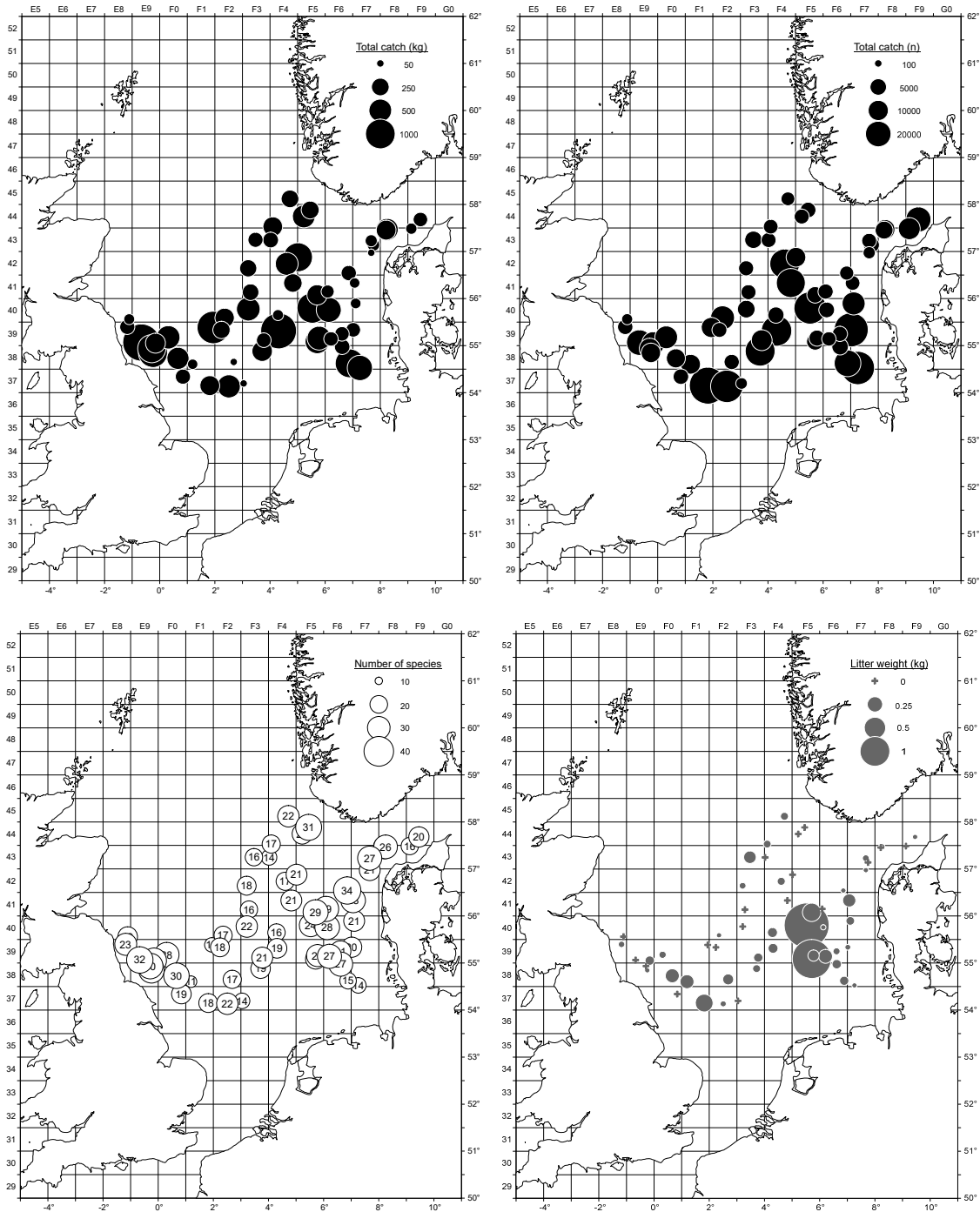


Fig. 4: Distribution of total catch of fish and shellfish in weight and in numbers, species richness per tow (Note: catch in kg or number per tow, i.e. not adjusted for differences in tow duration or swept area fished), and marine litter (Plastic, metal and glass), Dana DK IBTS 1Q2025.

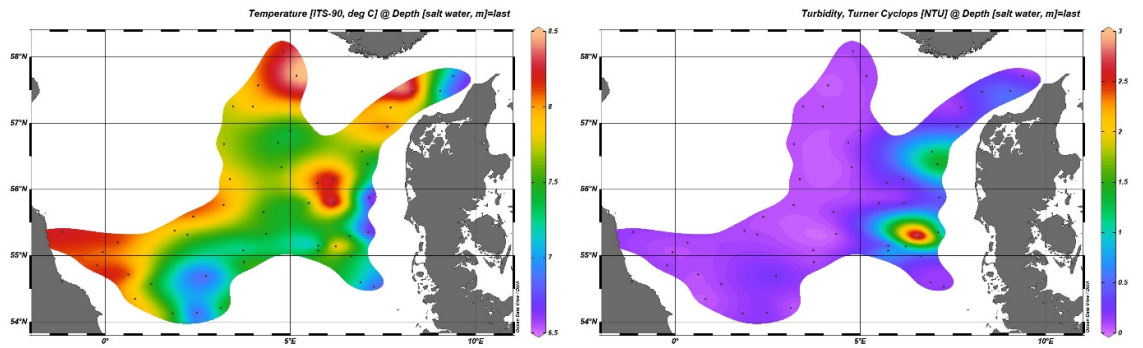
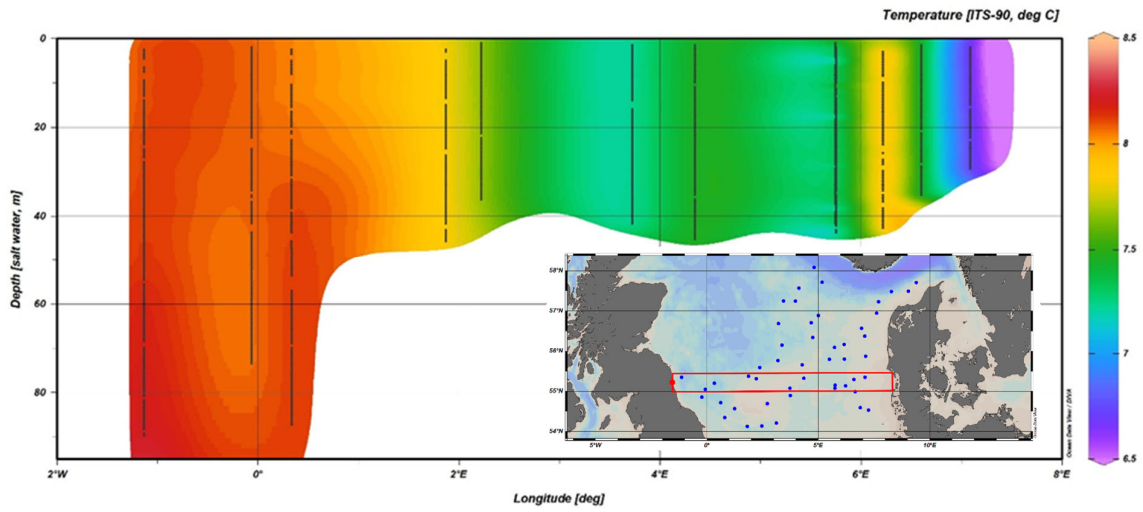


Fig. 5: Temperature transect at about 55°15'N, and distribution of bottom temperature and turbidity, Dana DK IBTS 1Q 2025.

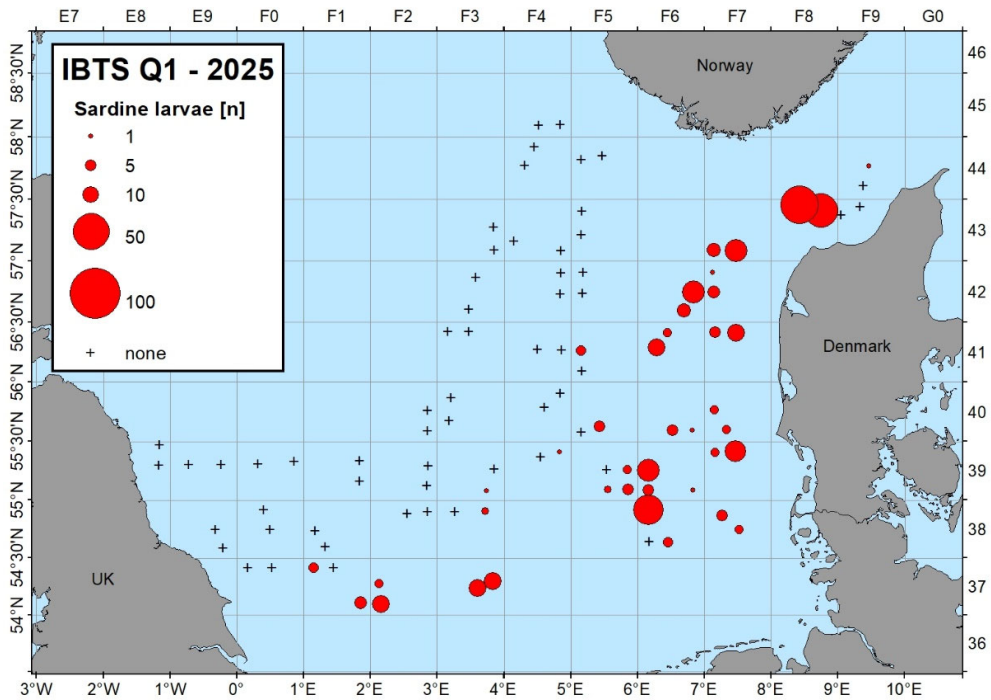
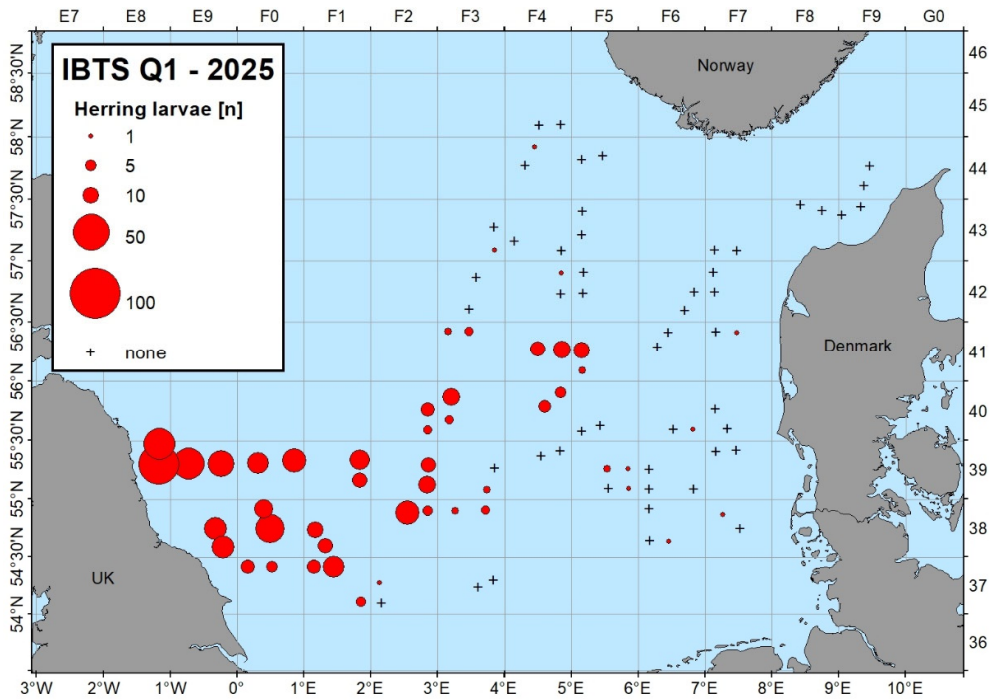


Fig. 6: Distribution of herring and sardine larvae, Dana DK IBTS 1Q 2025.

Tab. 1: Species list, Dana DK IBTS 1Q 2025 (L: total length in cm below (fish); ML: mantle length (cephalopods); CPL or CPW: carapace length or width (crustaceans)).

Latin name	English name	Danish name	Weight (kg)	Number	Lmin (cm)	Lmax (cm)	Remark
Melanogrammus aeglefinus	Haddock	Kuller	1149.296	43434	14.0	48.0	
Merlangius merlangus	Whiting	Hvilling	4120.578	45775	8.0	43.0	
Clupea harengus	Herring	Sild	1249.597	47065	8.5	32.0	
Limanda limanda	Common dab	Ising	1187.720	21624	7.0	33.0	
Sprattus sprattus	Sprat	Brisling	1091.883	215269	5.5	15.0	
Eutrigla gurnardus	Grey gurnard	Grå knurhane	655.660	10928	7.0	33.0	
Pleuronectes platessa	Plaice	Rødspætte	394.173	3384	12.0	47.0	
Trisopterus esmarkii	Norway pout	Sperling	345.275	20758	8.0	24.0	
Pollachius virens	Saithe	Sej	174.710	250	39.0	52.0	
Scomber scombrus	Mackerel	Makrel	167.400	3763	16.0	31.0	
Gadus morhua	Cod	Torsk	151.067	157	12.0	100.0	
Hippoglossoides platessoides	Long-rough dab	Håising	98.405	2235	6.0	24.0	
Alloteuthis subulata	European common squid	Dværblæksprutte	88.552	15136	2.0	11.0	
Scyliorhinus canicula	Lesser-spotted dogfish	Småpletlet rødhaj	81.331	174	23.0	68.0	
Nephrops norvegicus	Norway lobster	Jomfruhummer	67.595	1519	2.0	6.5	CPL
Microstomus kitt	Lemon sole	Rødtunge	57.468	505	13.0	37.0	
Lophius piscatorius	Angler fish	Havtaske	54.707	19	10.0	73.0	
Loligo forbesii	Northern squid	Loligo blæksprutte	53.278	272	3.0	36.0	ML
Mustelus asterias	Starry smooth-hound	Sternehaj	42.577	60	34.0	91.0	
Molva molva	Ling	Lange	38.800	9	53.0	130.0	
Raja clavata	Thornback ray	Sømrøkke	35.076	16	42.0	81.0	
Cancer pagurus	Edible crab	Taskerkrabbe	34.872	72	8.0	20.9	CPW
Loligo vulgaris	European squid	Europæisk loligo	28.835	79	12.0	34.0	ML
Trisopterus minutus	Poor-cod	Glyse	20.856	497	8.0	24.0	
Ammodytes marinus	Lesser sandeel	Havtobis	19.955	5671	8.0	17.5	
Raja montagui	Spotted Ray	Storpletlet Rokke	17.242	18	28.0	81.0	
Trachurus trachurus	Horse mackerel	Hestemakrel	16.992	680	9.0	37.0	
Amblyraja radiata	Starry ray	Tærbe	14.844	36	15.0	47.0	
Squalus acanthias	Spurdog	Pighaj	14.358	38	28.0	92.0	
Todaropsis eblanae	Lesser flying squid		13.798	167	4.0	13.0	ML
Trachinus draco	Greater weever fish	Fjæsing	11.900	57	22.0	40.0	
Raja brachyura	Blonde ray	Småpletlet rokke	10.924	6	40.0	79.0	
Trisopterus luscus	Bib	Skægtorsk	10.757	158	11.0	25.0	
Scophthalmus maximus	Turbot	Pighvarre	9.846	13	24.0	44.0	
Scophthalmus rhombus	Brill	Slæthvarre	8.238	13	28.0	43.0	
Platichthys flesus	Flounder	Skrubbe	7.804	31	23.0	36.0	
Mullus surmuletus	Striped red mullet	Stribet rød Mulle	7.716	97	9.0	27.0	
Lithodes maja	Norway king crab	Troldkrabbe	5.205	11	2.2	10.9	CPL
Micromesistius poutassou	Blue whiting	Blåhvilling	5.025	34	22.0	36.0	
Sepia officinalis	Common cuttlefish	Sepia blæksprutte	3.942	21	5.0	20.0	ML
Callinectes lyra	Common dragonet	Stribet fløjfisk	3.936	100	7.0	23.0	
Merluccius merluccius	Hake	Kulmule	3.441	48	7.0	47.0	
Illex coindetii	Southern shortfin squid	Rød blæksprutte	3.007	230	4.0	15.0	ML
Cyclopterus lumpus	Lumpfish	Stenbider	2.877	2	19.0	39.0	
Buglossidium luteum	Solenette	Glastunge	2.805	309	5.0	12.0	
Glyptocephalus cynoglossus	Witch	Skærsising	2.184	8	24.0	42.0	
Aequipecten opercularis	Queen scallop	Jomfruesters	2.113	51	-	-	
Enchelyopus cimbrius	Four-bearded rockling	Firetrådet havkvabbe	2.018	44	11.0	28.0	
Sardina pilchardus	Pilchard	Sardin	1.785	171	7.0	26.0	
Trigla lucerna	Tub gurnard	Rød knurhane	1.784	10	23.0	29.0	
Dicentrarchus labrax	Seabass	Havbars	1.646	2	42.0	44.0	
Aspitriglia cuculus	Red gurnard	Tværstribet knurhane	1.420	8	23.0	27.0	
Echiichthys vipera	Lesser weever	Fjæsing lille	1.343	47	8.0	16.0	
Anguilla anguilla	Eel	Ål	1.293	1	75.0	75.0	
Zeus faber	John dory	Sanktpetersfisk	1.255	3	14.0	33.0	
Argentina sphyraena	Lesser silver smelt	Strømsild	1.247	34	6.0	24.0	
Homarus gammarus	European lobster	Hummer	0.943	2	7.2	9.7	CPL
Gadiculus argenteus	Silvery pout	Sølvorsk	0.942	222	5.0	9.0	
Pecten maximus	Great scallop	Stor kammusling	0.852	3	-	-	
Helicolenus dactylopterus	Blue-mouth redfish	Blåkæft	0.758	7	16.0	22.0	
Pollachius pollachius	Pollack	Lyssej	0.722	1	44.0	44.0	
Arnoglossus laterna	Scaldfish	Tungehvarre	0.684	60	5.0	14.0	
Trigloporus lastoviza	Streaked gurnard	Båndet knurhane	0.650	4	24.0	27.0	
Solea solea	Sole	Tunge	0.598	3	19.0	30.0	
Engraulis encrasicolus	Anchovy	Ansjos	0.586	86	8.0	18.0	
Leucoraja naevus	Cuckoo ray	Pletrokke	0.410	1	38.0	38.0	
Rossia macrosoma	Stout bobtail squid	Ross's blæksprutte	0.404	72	-	-	
Myoxocephalus scorpius	Sculpin	Almindelig uk	0.358	3	16.0	23.0	
Eledone cirrhosa	Horned octopus	Eledone blæksprutte	0.300	1	-	-	
Hyperoplus lanceolatus	Greater sandeel	Plettet tobiskonge	0.132	3	23.5	28.5	
Agonus cataphractus	Pogge	Panserulk	0.120	10	7.0	14.0	
Gaidropsarus vulgaris	Three-bearded rockling	Tretrådet havkvabbe	0.108	3	15.0	18.0	
Callionymus maculatus	Spotted dragonet	Plettet fløjfisk	0.068	5	12.0	15.0	
Sepioteuthis atlantica	Atlantic bobtail squid		0.059	26	-	-	
Syngnathus acus	Great pipefish	Stor tangnål	0.040	2	35.0	36.0	
Phrynorhombus norvegicus	Norwegian topknot	Småhvarre	0.038	7	5.0	8.0	
Pomatoschistus spp.	Sand gobies	*Sandkutlinger	0.036	56	3.0	5.0	
Myxine glutinosa	Hagfish	Slimål	0.032	2	15.0	31.0	
Gymnammodytes semisquamatus	Smoothed sandeel	Nøgentobis	0.028	1	21.0	21.0	
Callionymus reticulatus	Reticulated dragonet	Kortfinnet fløjfisk	0.022	6	5.0	10.0	
Lumpenus lampretaeformis	Snake blenny	Spidshalet langebarn	0.020	1	29.0	29.0	
Aphia minuta	Transparent goby	Glaskutting	0.007	15	3.0	4.0	
Syngnathidae	Pipefishes and seahorses	*Tangnåle	0.007	4	6.0	24.0	
Gasterosteus aculeatus	Three-spined stickleback	Trepigget hundestejle	0.001	1	4.0	4.0	

Tab. 2: Number of single fish data (length, individual weight, sex and maturity, infestation with gill parasites for gadoids) and samples collected for ageing, Dana DK IBTS 1Q 2025.

Species	Total
Herring (<i>Clupea harengus</i>)	755
Sprat (<i>Sprattus sprattus</i>)	302
Cod (<i>Gadus morhua</i>)	82
Haddock (<i>Melanogrammus aeglefinus</i>)	783
Whiting (<i>Merlangius merlangus</i>)	484
Saithe (<i>Pollachius virens</i>)	12
Norway pout (<i>Trisopterus ermarkii</i>)	77
Mackerel (<i>Scomber scombrus</i>)	85
Plaice (<i>Pleuronectes platessa</i>)	561
Dab (<i>Limanda limanda</i>)	73
Lemon sole (<i>Microstomus kitt</i>)	57
Sum:	3271

Tab. 3: Preliminary recruitment indices (age 1 based on length split, number per hour trawling) for commercial IBTS species by station, Dana DK IBTS 1Q 2025.

Station	GOV Haul nr	Rectangle	Herring < 20 cm	Cod < 25 cm	Haddock < 20 cm	Whiting < 20 cm	Norway pout < 15 cm	Sprat < 10 cm	Mackerel < 25 cm
1	1	44F9	3157	10	2	3315	0	18112	0
3	2	43F9	4312	4	0	319	0	12013	0
12	3	43F8	7726	2	6	139	18	1553	0
14	4	43F7	424	0	0	62	10	3139	2
15	5	42F7	161	2	0	86	0	1431	0
26	6	41F6	622	0	0	46	0	3006	8
28	7	41F5	1028	0	0	559	0	694	0
30	8	40F5	11184	0	56	299	0	30685	10
31	9	40F6	214	0	0	787	0	224	0
41	10	38F3	3707	0	24	148	0	12893	6
42	11	38F2	792	0	0	0	0	3014	0
52	12	40F3	48	2	71	50	0	75	40
53	13	41F3	6	2	22	22	0	4	32
55	14	42F3	2	0	0	32	68	0	16
65	15	43F3	0	2	8	0	0	0	179
67	16	43F4	0	0	7	0	0	0	181
68	17	44F4	0	0	225	10	0	0	38
80	18	45F4	0	0	118	21	997	0	0
82	19	44F5	0	0	0	42	1016	0	0
92	20	42F5	169	4	49	0	189	0	8
93	21	42F4	14225	2	24	48	2	14354	2491
95	22	41F4	5511	0	0	80	24	24987	134
104	23	40F4	6	0	0	0	0	3373	367
106	24	39F4	2492	4	0	39	0	9399	124
107	25	39F3	2145	2	0	52	0	6914	10
114	26	39F2	20	6	963	129	0	0	12
116	27	40F2	1049	2	613	31	0	1854	0
117	28	39F1	2	0	478	125	0	2	8
126	30	39E8	44	0	0	378	1469	4	0
137	31	39F0	20	0	0	0	14006	24	0
139	32	39E9	214	0	0	0	5986	9899	15
141	33	38E9	9	4	0	0	2759	52	0
148	34	38F0	84	0	64	26	1704	2	2
150	35	37F0	6	0	6	15	0	0	3199
151	36	38F1	0	2	0	10	0	10	0
158	37	37F1	1346	0	0	90	0	56882	2
160	38	37F2	8140	0	0	221	366	29697	2
161	39	37F3	70	0	0	2	0	616	0
169	40	38F6	589	0	0	15618	0	1641	0
171	41	38F7	3826	0	0	19790	0	12933	0
176	42	38F6	254	0	2	472	0	1677	0
178	43	39F6	138	0	0	759	0	360	0
180	44	39F5	128	0	0	630	0	978	0
189	45	39F5	284	0	0	337	0	288	0
190	46	39F6	879	2	0	896	0	107	0
192	47	39F7	5794	0	0	662	0	49085	0
202	48	40F7	1602	0	0	97	0	17117	0
203	49	41F7	626	0	0	105	0	2671	0
205	50	42F6	97	0	0	452	0	832	0

Tab. 4: Number of stomach data collected by species (V: everted, R: regurgitated, F: feeding, E: empty, -: not caught; note: category E and F stomachs were collected for later analysis in the laboratory), Dana DK IBTS 1Q 2025.

Species	Number of stomachs per category		
	V	R	E + F
Haddock	0	0	311
Mackerel	0	0	72
Turbot	0	0	13
Brill	0	0	11
Halibut	-	-	-
Pollack	0	0	1
Tusk	-	-	-
Ling	3	0	0
Tub gurnard	0	0	1
sum:			409