

R/V Dana

Cruise 02/2017

"DK IBTS 1Q 2017"



Vessel: R/V DANA

Cruise dates (planned): 2/2 – 19/2 2017

Cruise number: 02/17

Cruise name: DK IBTS 1Q 2017

Port of departure:	Hirtshals	Date:	02 Feb
Port of return:	Hirtshals	Date:	18 Feb
Other ports:	Esbjerg	Date and justification:	10 Feb Scheduled exchange of scientific staff and crew

Participants

Leg 1: Hirtshals – Esbjerg		
Name	Institute	Function and main tasks
Helle Rasmussen	DTU Aqua, Monitoring	Cruise leader, Fish lab
Maria Jarnum	DTU Aqua, Monitoring	Technician, Fish lab
Lise Sindahl	DTU Aqua, Monitoring	Technician, Fish lab
Flemming Taarup	DTU Aqua, Monitoring	Technician, Fish lab
Tom Svoldgaard	DTU Aqua, Monitoring	Technician, Fish lab
Gert Holst	DTU Aqua, Monitoring	Technician, Fish larvae
Ronny Sørensen	DTU Aqua, Monitoring	Technician, CTD, Maintenance
Bastian Huwer	DTU Aqua, Marine Living Resources	Scientist, Fish larvae

Leg 2: Esbjerg – Hirtshals		
Name	Institute	Function and main tasks
Kai Wieland	DTU Aqua, Monitoring	Cruise leader, Fish lab
Helle Rasmussen	DTU Aqua, Monitoring	Technician, Fish lab
Lise Sindahl	DTU Aqua, Monitoring	Technician, Fish lab
Tom Svoldgaard	DTU Aqua, Monitoring	Technician, Fish lab
Jane Gudmandsen	DTU Aqua, Monitoring	Technician, Fish lab
Gert Holst	DTU Aqua, Monitoring	Technician, Fish larvae
Ronny Sørensen	DTU Aqua, Monitoring	Technician, CTD, Maintenance
Bastian Huwer	DTU Aqua, Marine Living Resources	Scientist, Fish larvae

Objectives

The survey is part of the 1st quarter International Bottom Trawl Survey (IBTS) in the North Sea, 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 standardised 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;

The area to be covered by Denmark with RV Dana in the 1st quarter 2016 was allocated during the most recent IBTS Working Group meeting. Technical details are described in the current version of the survey manual (ICES 2015: Manual for the International Bottom Trawl Surveys. Series of ICES Survey Protocols. SISP 1-IBTS IX. SISP 2 – MIK2. <http://datras.ices.dk/Documents/Manuals/>).

Itinerary

R/V Dana left Hirtshals on Thursday 2 February at 14:00 local time. The field work started in the western Skagerrak (Fig. 1). The vessel stayed in the port of Esbjerg on Friday 10 February from 9:30 to 13:00 for the scheduled exchange of scientific staff and crew. Favorable weather conditions during almost the entire cruise (Fig. 2) made it possible to complete the sampling program and R/V Dana returned to Hirtshals on Saturday 18 February at 7:00 local time.

Achievements

The original working area consisted of 39 ICES statistical rectangles located in IBTS roundfish areas 2, 4, 6 and 7 (Fig. 1). In addition, 1 rectangle in roundfish area 8 and another rectangle in roundfish area 7 were fished with the GOV and 5 additional MIK hauls were conducted in rectangles which otherwise would not have adequately been covered by other countries due to technical problems. The following activities were carried out:

43 valid trawl hauls with a GOV 36/47 (chalut á Grande Overture Verticale), all hauls were carried with the standard groundgear A (see IBTS Manual for specifications). These standard tows were made with 60 m sweeps irrespectively of water depth.

43 CTD profiles (with additional sensors for dissolved oxygen, fluorescence and turbidity).

87 valid hauls with a 2 m ring net (MIK, see IBTS manual for specification). 86 of these tows with one 20 cm fine-meshed ringnet (MIKey M) attached. 4 additional tows were conducted for flowmeter calibration.

Results

Routine sampling

The trawl parameters (Net opening and door spread) as monitoring with a ScanMar system were in the range or close to the suggested limits specified in the IBTS manual in most cases (Fig. 3). Too low net opening was recorded in 4 cases and consequently the trawl has been exchanged. Sensors for wing spread worked properly during most of the tows, and the data indicate a close linear relationship with door spread (Fig. 4).

In total, about 80 different species of fish and invertebrates were found in catches. The total weight of the catches from the 43 tows has been 8.6 tons (Tab. 1), which was lower than in previous years. 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 grey gurnard, dab, monkfish, turbot, brill, witch flounder, sole and lemon sole (Tab. 2). The preliminary abundance indices for the main commercial species (Tab. 3) were reported to the coordinator of the 1st quarter IBTS.

Marine litter was recorded in each GOV catch using four main categories: plastic, glass, metals and miscellaneous, which were subdivided in several minor categories to meet the request by the IBTS Working Group. The total amount of marine litter was 6 kg.

The MIK (500 µm cod end mesh size) samples were pre-sorted onboard and herring larvae were counted prior to conservation in 96% ethanol for later detailed analysis and completion of length measurements in the laboratory. A small fine-meshed (250 µm) ring net for collecting fish eggs was attached to the main MIK, and the samples from the small ring net were conserved in buffered formaldehyde for later analysis at IMR Bergen in Norway.

Temperature, salinity and dissolved oxygen content at surface and bottom were extracted from the CTD profiles for storage in the institute's fish data base, and the temperature and salinity values will be submitted to the ICES DATRAS database together with the GOV catch results.

Additional activities

Samples of several fish species were collected for genetic analyses: cod (in spawning conditions, south from 56°N; for DTU Aqua Silkeborg), saithe (in spawning condition; for IMR Bergen), sole, flounder, plaice and dab and turbot (irrespective of maturity stage; for DTU Aqua Silkeborg).

Samples of cod livers were collected for parasite analysis (for a DTU Aqua Msc thesis).

The Jellyfish species *Mnemiopsis leidyi* and *Bolinopsis infundibulum* were sorted from the MIK samples for genetic analyses (for IFM Kiel) and crystal/transparent goby were sampled (for Zoological museum Copenhagen).

Selected mixed fish and shellfish species collections were taken for education and an open ship arrangements at DTU Aqua, and some live fish and invertebrates were brought on shore for the Aquarium in Esbjerg.

Others

A cruise summary report has been delivered online to

http://seadata.bsh.de/csr/online/V1_index.html.

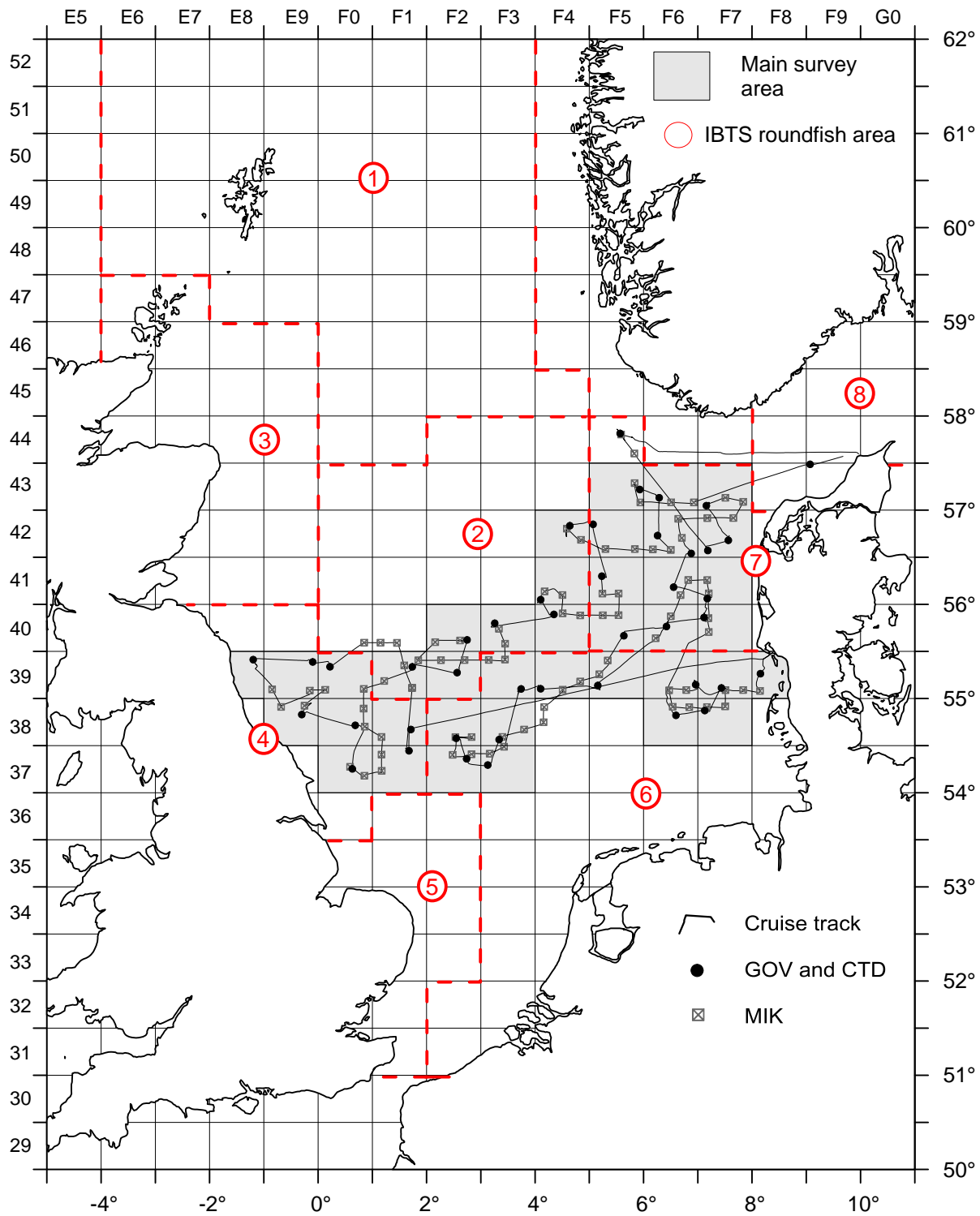


Fig. 1: Survey map with cruise track and sampling locations, Dana DK IBTS 1Q 2017.

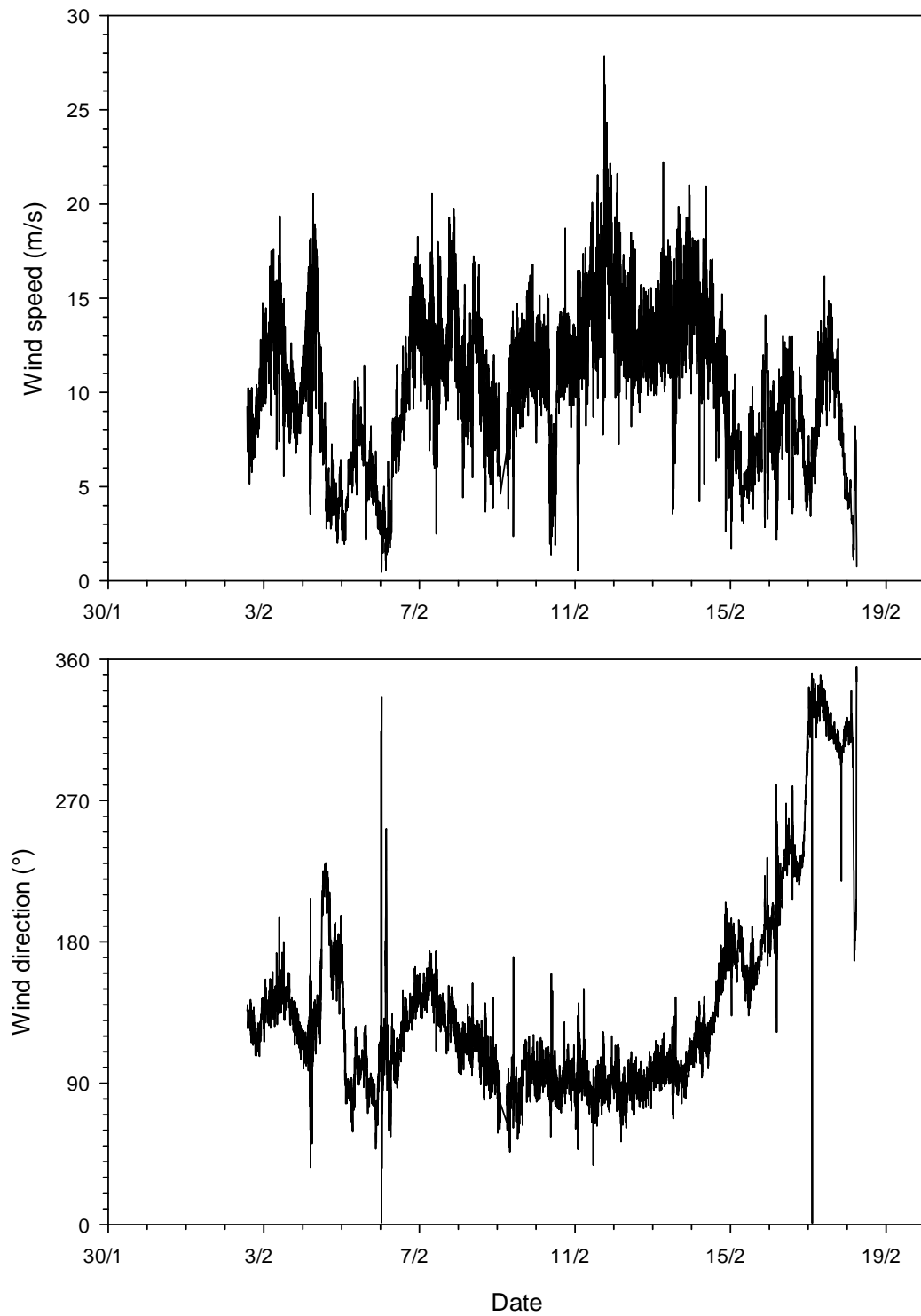


Fig. 2. Wind speed (m/s) and wind direction (°) recorded along the cruise track, Dana DK IBTS 1Q 2017.

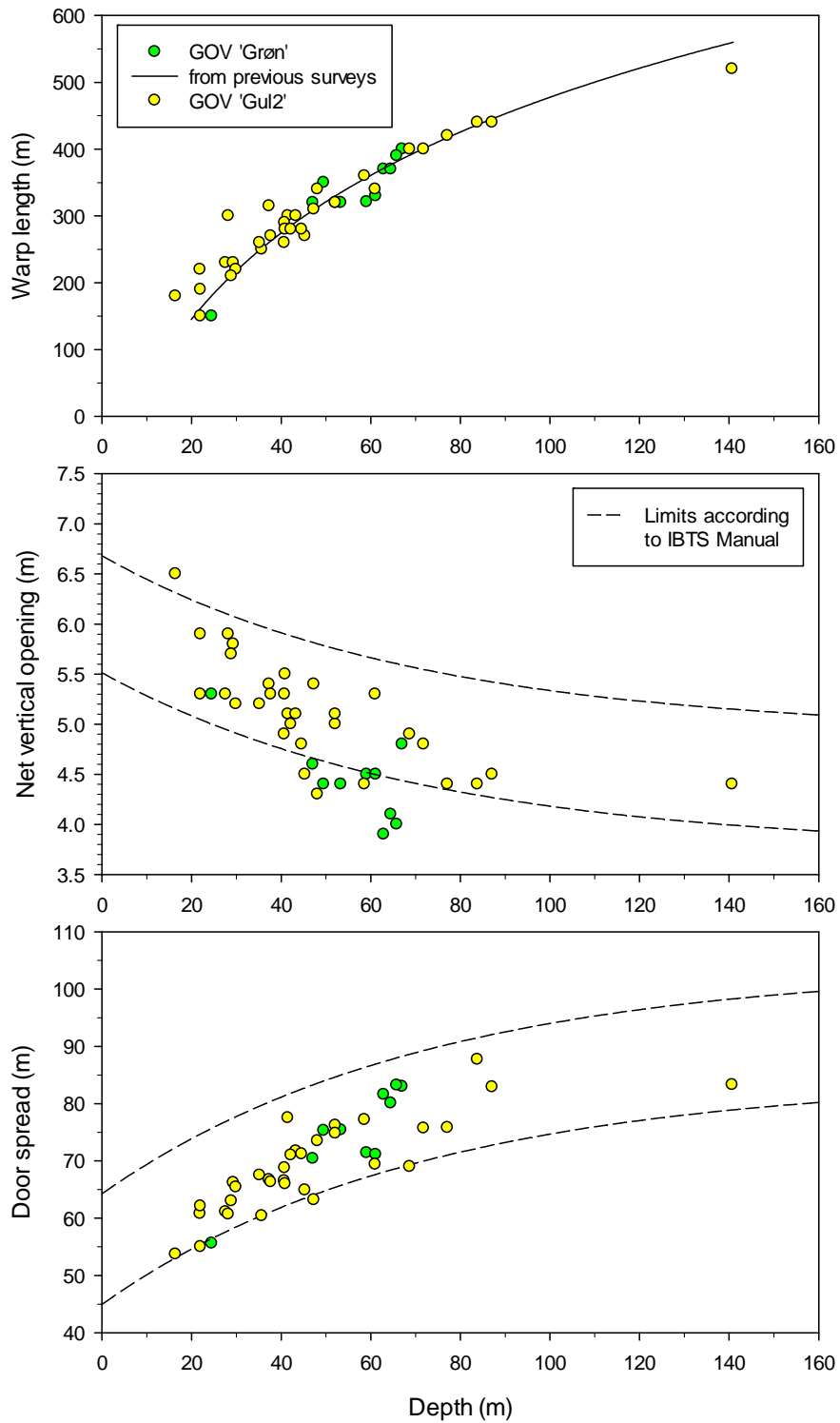


Fig. 3: Warp length, net opening and door spread in relation to depth, Dana DK IBTS 1Q 2017

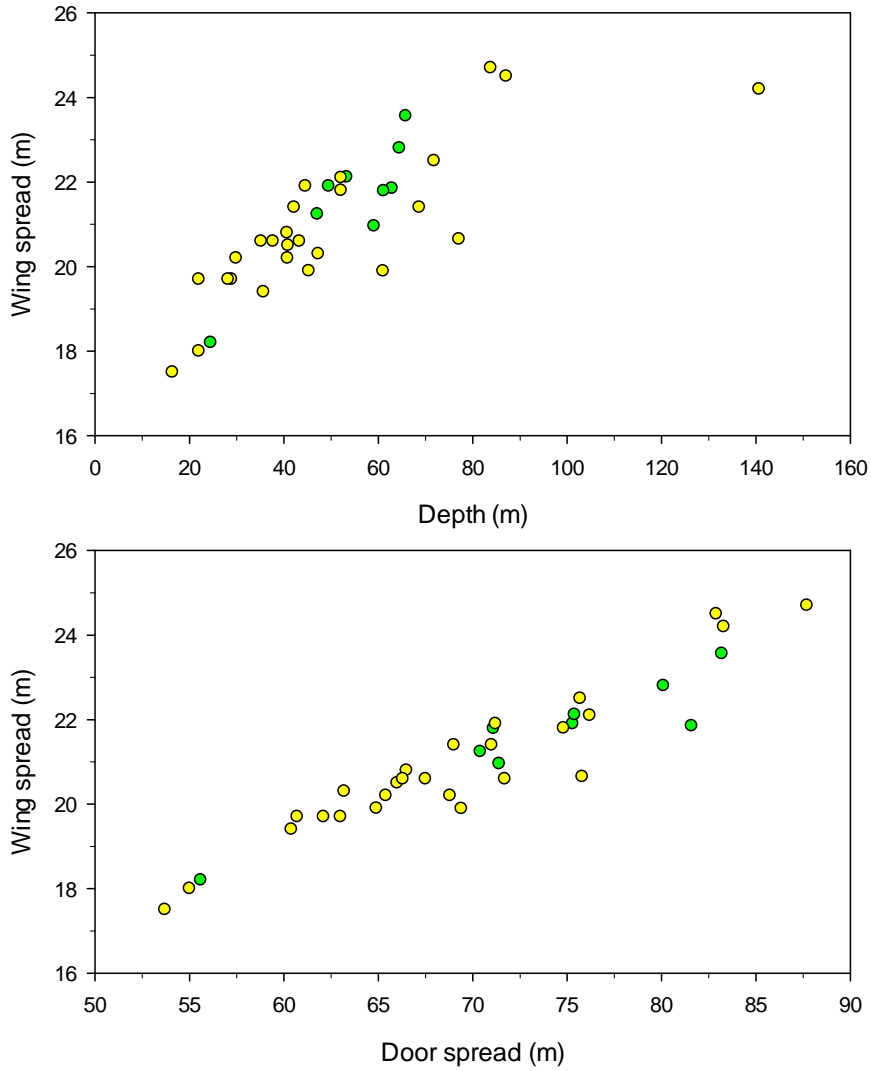


Fig. 4: Wing spread in relation to depth (no limits specified in the IBTS Manual) and wing spread in relation to door spread, Dana DK IBTS 1Q 2017.

Tab. 1: Species list, Dana DK IBTS 1Q 2017.

Latin name	English name	Danish name	Number	Weight (kg)
<i>Aequipecten opercularis</i>	Queen scallop	Jomfrøsters	4	0.118
<i>Agonus cataphractus</i>	Pogge	Panser ulk	20	0.288
<i>Alloteuthis subulata</i>	European common squid	Dværgbleksprutte	123	0.591
<i>Alosa fallax</i>	Twaite shad	Stavsild	1	0.756
<i>Amblyraja radiata</i>	Starry ray	Tærbe	20	12.562
<i>Ammodytes marinus</i>	Sandeel	Tobis-hav	987	2.959
<i>Anarhichas lupus</i>	Catfish	Havkat	1	0.856
<i>Argentina sphyraena</i>	Lesser silver smelt	Strømsild	75	4.264
<i>Arnoglossus laterna</i>	Scaldfish	Tungehvarre	54	0.521
<i>Bathyraja brachyurops</i>	Blonde ray	Blond rokke	1	0.670
<i>Buglossidium luteum</i>	Solenette	Glastunge	40	0.392
<i>Callionymus lyra</i>	Common dragonet	Stribet fløjfisk	33	1.106
<i>Callionymus maculatus</i>	Spotted dragonet	Plettet fløjfisk	12	0.132
<i>Cancer pagurus</i>	Edible crab	Taskekrabbe	8	5.938
<i>Capros aper</i>	Boarfish	Havgalt	4	0.046
<i>Chelidonichthys cuculus</i>	Red gurnard	Tværstribet knurhane	2	0.529
<i>Chelidonichthys lucerna</i>	Tub gurnard	Rød knurhane	2	0.952
<i>Clupea harengus</i>	Herring	Sild	90015	1326.964
<i>Cyclopterus lumpus</i>	Lumpfish	Stenbider	7	12.070
<i>Echichthys vipera</i>	Lesser weever	Fjæsing lille	43	1.050
<i>Eledone cirrhosa</i>	Horned octopus	Eledone Blæksprutte	9	0.911
<i>Enchelyopus cimbrius</i>	Four-bearded rockling	Firetrådet havkvabbe	41	1.241
<i>Engraulis encrasicolus</i>	Anchovy	Ansjos	140	2.002
<i>Eutrigla gurnardus</i>	Grey gurnard	Grå knurhane	10194	894.359
<i>Gadiculus argenteus</i>	Silvery pout	Sølvorsk	13	0.047
<i>Gadus morhua</i>	Cod	Torsk	119	171.899
<i>Gasterosteus aculeatus</i>	Three-spined stickleback	Trepigget hundestejle	24	0.061
<i>Glyptocephalus cynoglossus</i>	Witch	Skærising	8	2.482
Gobiidae	True gobies	Kutling	5	0.004
<i>Hippoglossoides platessoides</i>	American plaice	Håising	1210	45.758
<i>Hyperoplus lanceolatus</i>	Greater sandeel	Tobiskonge	7	0.234
<i>Illex coindetii</i>	Southern shortfin squid	Illexcoindetii	9	0.403
<i>Leucomaja naevus</i>	Cuckoo ray	Pletrokke	2	0.871
<i>Limanda limanda</i>	Common dab	Ising	23497	1336.443
<i>Lithodes maja</i>	Norway king crab	Troldkrabbe	11	6.444
Loliginidae			13244	45.776
<i>Loligo forbesii</i>	Northern squid	Loligo forbesii	24	4.911
<i>Loligo vulgaris</i>	European squid	Loligo vulgaris	65	11.482
<i>Lophius piscatorius</i>	Monk	Havtaske	8	17.477
<i>Lumpenus lampretaeformis</i>	Snake blenny	Spidshalet langebarn	2	0.044
<i>Lycodes vahlii</i>	Vahls eelpout	Ålebromse	7	0.072
<i>Maurolicus muelleri</i>	Pearlside	Laksesild	7	0.007
<i>Melanogrammus aeglefinus</i>	Haddock	Kuller	535	94.270
<i>Merlangius merlangus</i>	Whiting	Hvilling	39290	2603.597
<i>Merluccius merluccius</i>	Hake	Kulmule	91	14.115
<i>Microchirus variegatus</i>	Thickback sole	Båndet tunge	1	0.017
<i>Micromesistius poutassou</i>	Blue whiting	Blåhvilling	263	25.337
<i>Microstomus kitt</i>	Lemon sole	Rødtunge	425	55.363
<i>Molva molva</i>	Ling	Lange	4	7.670
<i>Mullus surmuletus</i>	Striped red mullet	Stribet (rød) Mulle	68	2.093
<i>Mustelus asterias</i>	Starry smooth hound	Stjernehaj	3	1.182
<i>Myoxocephalus scorpius</i>	Sculpin	Ulk	10	1.602
<i>Myxine glutinosa</i>	Hagfish	Slimål	10	0.254
<i>Nephrops norvegicus</i>	Norway lobster	Jomfruhummer	230	10.918
<i>Platichthys flesus</i>	Flounder	Skrubbe	39	9.080
<i>Pleuronectes platessa</i>	Plaice	Rødspætte	1769	348.893
<i>Pollachius virens</i>	Saithe	Sej	54	65.480
<i>Pomatoschistus</i> spp.	Sand gobies	Sand kutling	7	0.013
<i>Raja clavata</i>	Thornback ray	Sømrokke	2	4.696
<i>Raja montagui</i>	Spotted Ray	Storpletet Rokke	5	1.834
<i>Rossia macrosoma</i>	Stout bobtail squid	Ross's blæksprutte	24	0.358
<i>Sardina pilchardus</i>	Pilchard	Sardin	7	0.151
<i>Scomber scombrus</i>	Mackerel	Makrel	10628	417.124
<i>Scophthalmus maximus</i>	Turbot	Pighvarre	5	5.074
<i>Scophthalmus rhombus</i>	Brill	Slethvarre	5	4.609
<i>Scyliorhinus canicula</i>	Lesser spotted dogfish	Småpletet rødhaj	11	4.048
<i>Sebastes viviparus</i>	Redfish	Lille rødfisk	1	0.003
<i>Sepioida atlantica</i>	Atlantic bobtail squid	Sepioida atlantica	1	0.002
Sepioidae	Bobtail squids		49	0.111
<i>Solea solea</i>	Sole	Tunge	9	2.160
<i>Sprattus sprattus</i>	Sprat	Brisling	152258	850.633
<i>Squalus acanthias</i>	Picked dogfish	Pighaj	3	8.400
<i>Syngnathidae</i> sp.	Pipe-fishes	Tangnål	2	0.006
<i>Todaropsis eblanae</i>	Lesser flying squid	Todaropsis eblanae	2	0.166
<i>Trachinus draco</i>	Greater weever fish	Fjæsing	19	4.570
<i>Trachurus trachurus</i>	Horse mackerel	Hestemakrel	41	2.413
<i>Trisopterus esmarkii</i>	Norway pout	Sperfling	7695	90.892
<i>Trisopterus luscus</i>	Whiting pout	Skægtorsk	3	0.277
<i>Trisopterus minutus</i>	Poor-cod	Glyse	60	3.716
<i>Zeus faber</i>	John dory	Sct. peter fisk	1	0.005

Tab. 2: Number of single fish data (length, weight, sex and maturity) and samples for ageing, Dana DK IBTS 1Q 2017.

Species	IBTS Roundfish area					Total
	2	4	6	7	8	
Herring (<i>Clupea harengus</i>)	82	119	226	262	26	715
Sprat (<i>Sprattus sprattus</i>)	74	124	159	147	15	519
Cod (<i>Gadus morhua</i>)		111			8	119
Haddock (<i>Melanogrammus aeglefinus</i>)		106			0	106
Whiting (<i>Merlangius merlangus</i>)		629			11	640
Norway pout (<i>Trisopterus ermarkii</i>)		111			0	111
Mackerel (<i>Scomber scombrus</i>)		61			0	61
Saithe (<i>Pollachius virens</i>)		19			0	19
Plaice (<i>Pleuronectes platessa</i>)		558			17	575
Hake (<i>Merluccius merluccius</i>)		14			0	14
Grey gurnard (<i>Eutrigla gurnadus</i>)		200			0	200
Dab (<i>Limanda limanda</i>)		200			0	200
Witch flounder (<i>Glyptocephalus cynoglossus</i>)		8			0	8
Sole (<i>Solea solea</i>)		1			0	1
Lemon sole (<i>Microstomus kitt</i>)		100			0	100
Monkfish (<i>Lophius piscatorius</i>)		3			0	3
Turbot (<i>Psetta maxima</i>)		3			0	3
Brill (<i>Scophthalmus rhombus</i>)		2			0	2
					Sum:	3396

Tab. 3: Preliminary abundance indices (number per hour trawling) for commercial IBTS species per rectangle, Dana DK IBTS 1Q 2017.

haul	Rectangle	Herring	Cod	Haddock	Whiting	Norway pou	Sprat	MackereI
		< 20 cm	< 25 cm	< 20 cm	< 20 cm	< 15 cm	< 10 cm	< 25 cm
1	43F9	220	4	0	125	0	213	0
2	43F5	92	2	2	66	66	0	0
3	43F6	725	6	0	200	0	0	1583
4	42F6	412	2	0	696	295	0	0
5	42F4	0	2	0	382	14	0	222
6	42F5	466	12	44	1874	2498	0	19234
7	41F5	8478	2	0	58	0	12343	18
8	41F4	224	6	38	12273	176	6	0
9	40F4	2	0	0	97	0	2	75
10	40F3	2	2	2	943	0	0	0
11	40F2	58	0	2	323	0	14	0
12	39F2	1470	0	0	24	0	7504	0
13	39F1	42	0	0	143	0	64	0
14	37F0	170	8	0	601	114	4	0
15	38F0	4	0	0	6093	1230	0	0
16	38E9		0	20	491	146	4	0
17	39E8	2	16	0	2126	64	196	0
18	39E9	34	10	25	265	0	222	32
19	39F0		4	46	71	951	6	0
20	37F1	4314	0	0	5897	0	655	0
21	38F1	44	0	0	761	0	13583	0
22	39F8	1906	0	0	20	0	1280	0
23	39F6	531	2	0	820	0	25636	0
24	39F7	13057	0	0	2	0	4456	0
25	38F7	122	0	0	70	0	24	0
26	38F6	8364	2	0	680	0	985	0
27	40F7	620	8	0	187	0	1298	0
28	40F6	8727	2	0	2236	0	6756	0
29	40F5	794	0	0	621	0	444	0
30	38F3	660	0	0	3402	0	1222	0
31	37F3	1745	0	0	2753	0	696	2
32	37F2	22441	0	0	114	0	5142	0
33	38F2	3189	0	0	44	0	40301	0
34	39F3	100947	0	0	92	0	73385	0
35	39F4	33045	0	0	123	0	2241	0
36	39F5	6528	2	0	10	0	8623	0
37	41F7	1001	10	0	167	0	2095	0
38	41F6	36486	2	0	72	0	15644	4
39	42F6	8033	8	0	590	0	276	0
40	43F7	18	2	0	34	0	20	0
41	42F7	8	6	0	201	0	271	6
42	42F7	115	0	0	94	0	533	0
43	44F5	0	0	0	0	8416	0	2