

R/V Dana

Cruise 02/2016

"DK IBTS 1Q 2016"



Vessel: R/V DANA
Cruise number: 02/16

Cruise dates (planned): 1/2 – 18/2 2016
Cruise name: DK IBTS 1Q 2016

Port of departure:	Hirtshals	Date:	03 Feb
Port of return:	Hirtshals	Date:	18 Feb
Other ports:	Esbjerg	Date and justification:	9 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
Jens Holm	DTU Aqua, Monitoring	Technician, Fish lab
Tom Svoldgaard	DTU Aqua, Monitoring	Technician, Fish lab
Gert Holst	DTU Aqua, Monitoring	Technician, Fish larvae
Eik Ehlert Britsch	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
Lise Sindahl	DTU Aqua, Monitoring	Technician, Fish lab
Gert Holst	DTU Aqua, Monitoring	Technician, Fish larvae
René Erlandsen	DTU Aqua, Monitoring	Technician, Fish lab
Dirk Tijssen	DTU Aqua, Monitoring	Technician, Fish lab
Per Christensen	DTU Aqua, Monitoring	Technician, Fish lab
Eik Ehlert Britsch	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 Wednesday 3 February at 5:00 local time. The delayed departure was due to extremely bad weather conditions. The field work started first on 4 February in the morning in the central North Sea (Fig. 1). Unfavorable weather conditions (Fig. 2) did not allow intense sampling during the 1st cruise leg. The vessel stayed in the port of Esbjerg on Tuesday 9 February from 9:00 to 13:30 for the scheduled exchange of scientific staff and crew. More favorable weather conditions during the 2nd cruise made it possible to complete the sampling program with almost all planned stations covered and R/V Dana returned to Hirtshals on Thursday 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, 3 rectangles in roundfish area 8 which otherwise would not have adequately been covered by another country were sampled in the end of the survey. The following activities were carried out:

41 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.

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

82 valid standard hauls with a 2 m ring net (MIK, see IBTS manual for specification). All of these tows with one 20 cm fine-meshed ringnet (Mini-MIK) attached. 5 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). The remaining deviations from the theoretical values for door spread and in particular net opening are likely due to the high sensibility of the GOV to current effects. The actual facilities on DANA, however, do not allow to measure adequately current strength and direction in the near bottom layer. Sensors for wing spread worked properly during all standard tows, and the data indicate a close linear relationship with door spread (Fig. 4).

In total, about 70 different species of fish and invertebrates were found in catches. The total weight of the catches from the 41 standard tows has been 10.6 tons (Tab. 1), and compared to previous years, anchovy was more numerous and widely distributed in the surveyed area. 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 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 38.7 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

Selected mixed fish and shellfish species collections were taken for education and an open ship arrangements.

Samples of several fish species were collected for genetic analyses (Tab. 4), and previous collections of samples for eDNA analysis were supplemented.

Others

A cruise summary report has been delivered online to

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

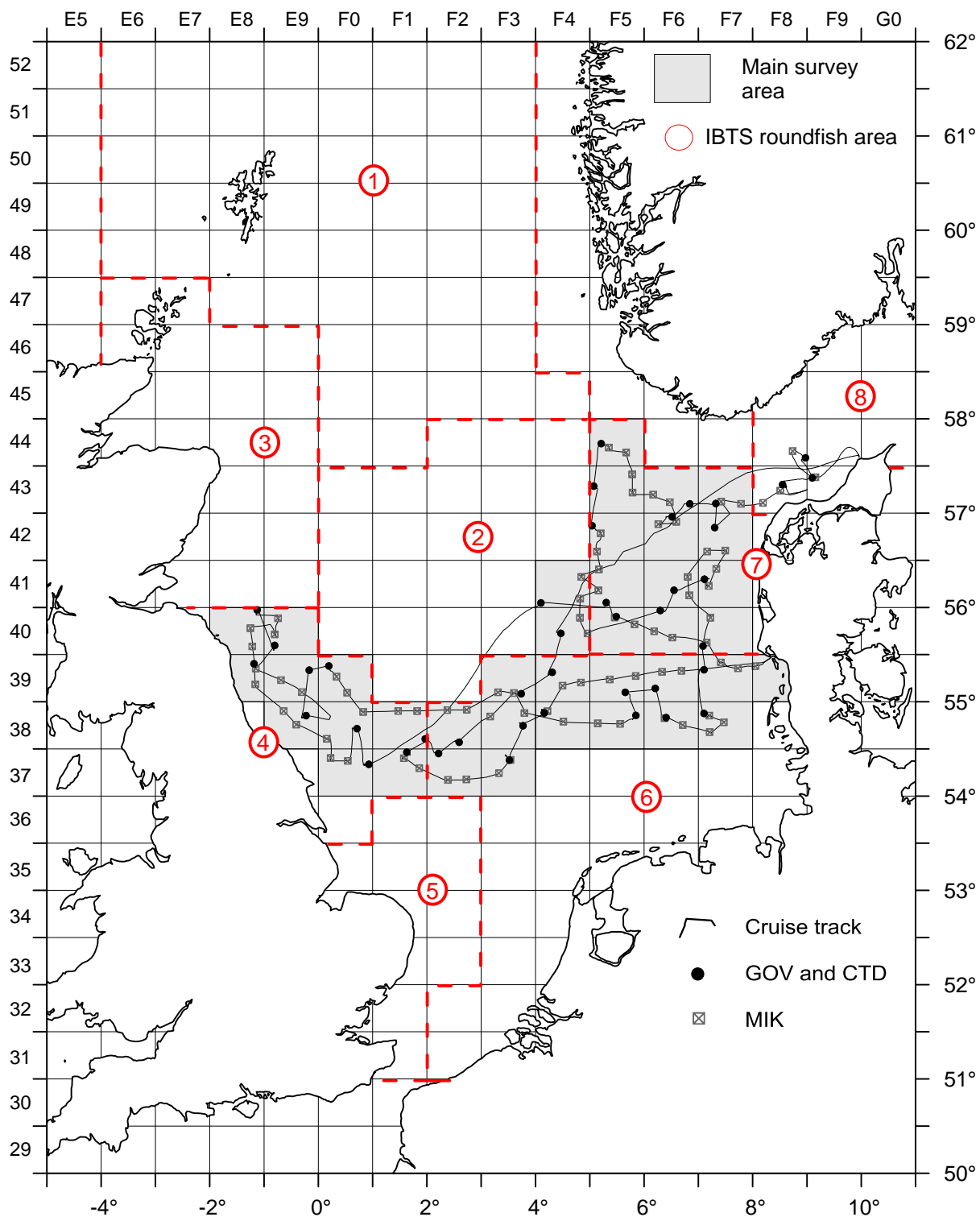


Fig. 1: Survey map with cruise track and sampling locations, Dana DK IBTS 1Q 2016.

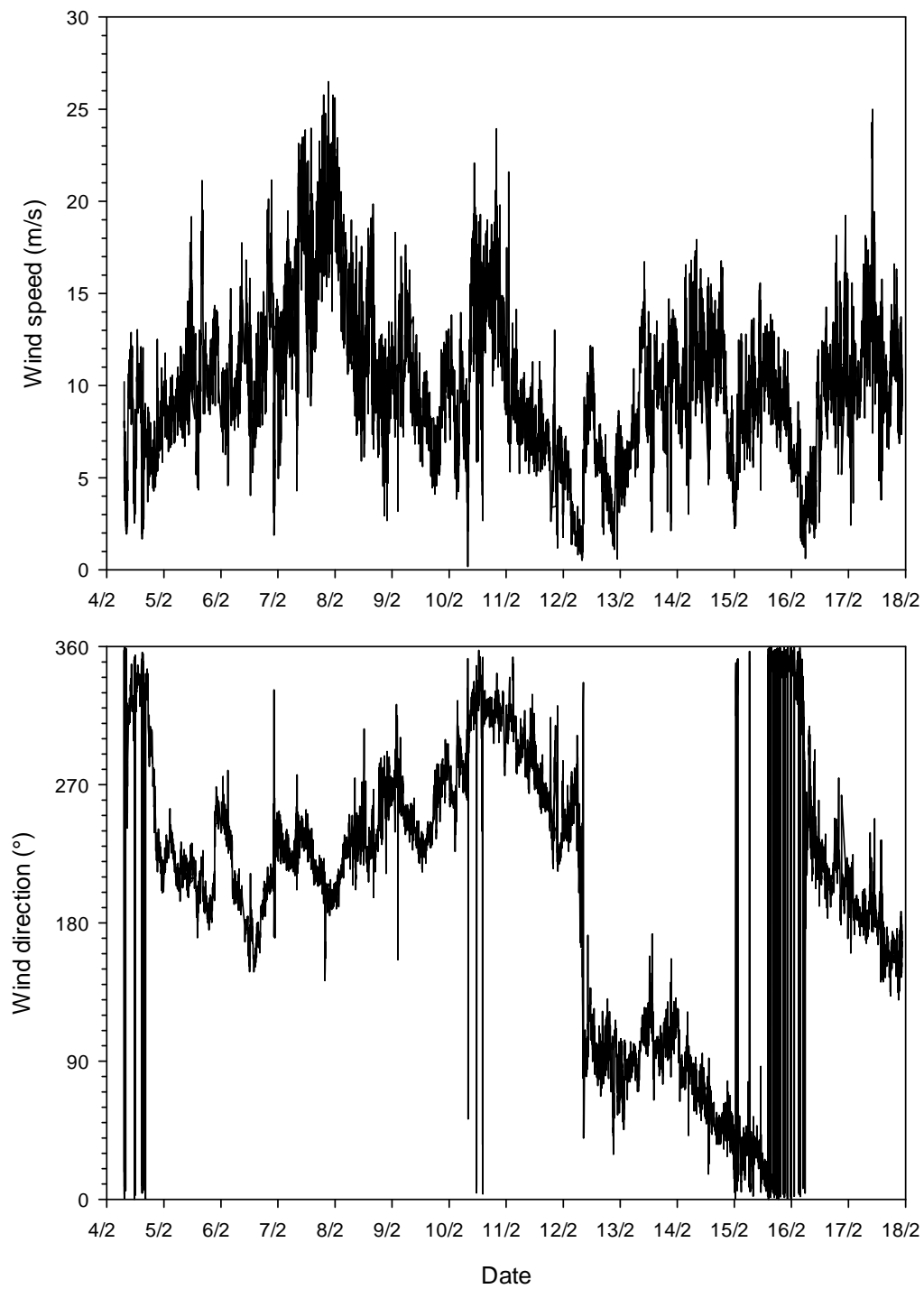


Fig. 2. Wind speed (m/s) and wind direction (°) recorded along the cruise track, Dana DK IBTS 1Q 2016.

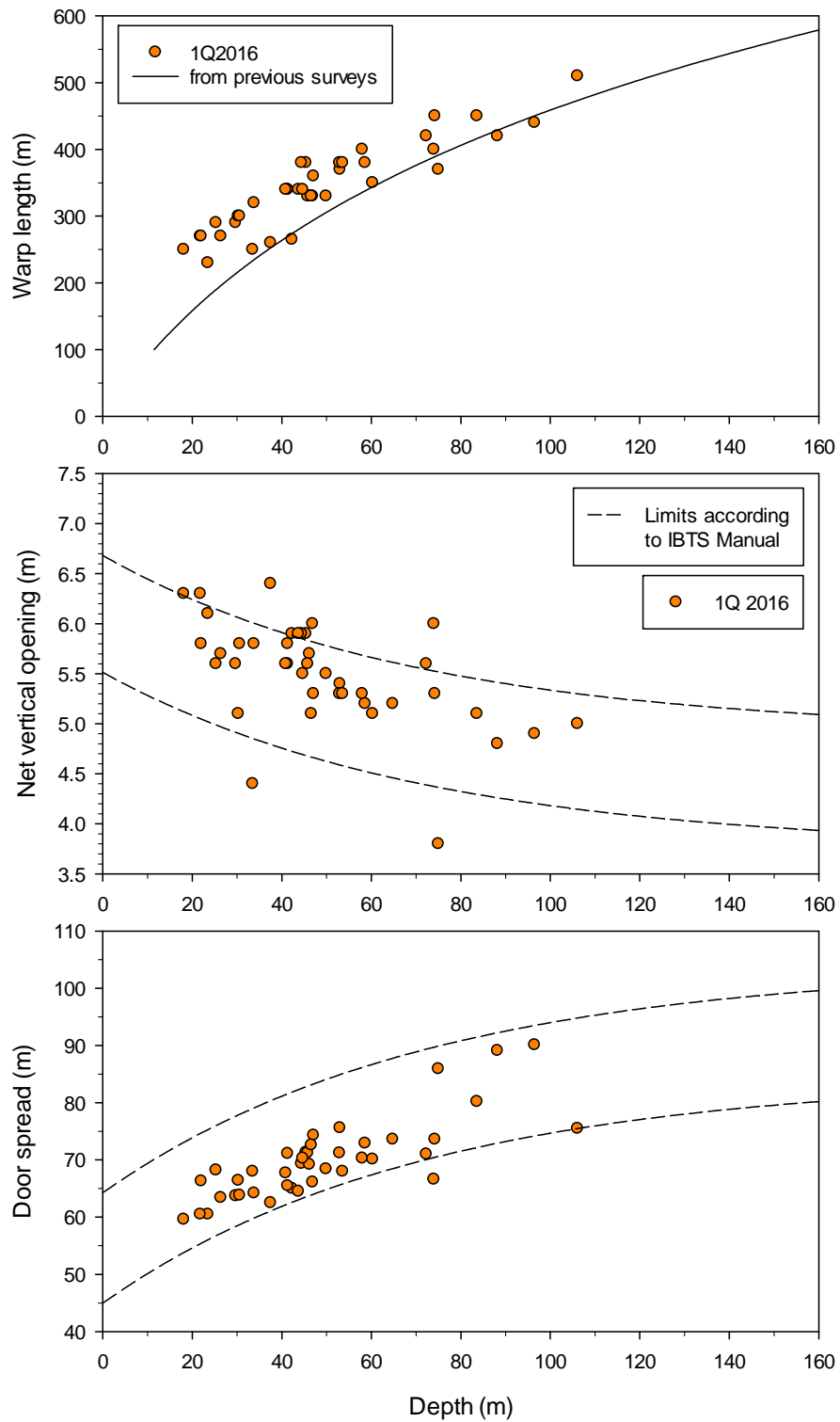


Fig. 3: Warp length, net opening and door spread in relation to depth, Dana DK IBTS 1Q 2016

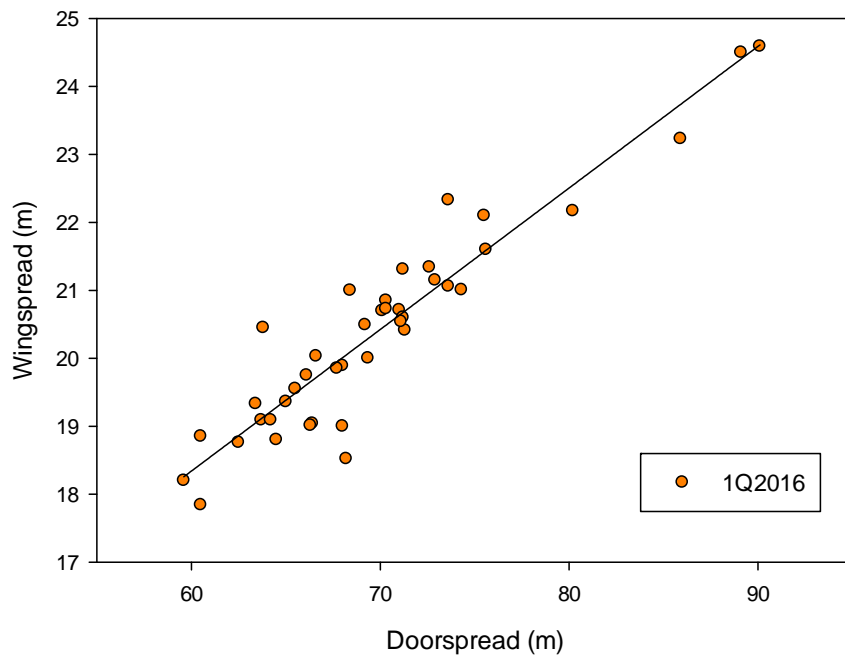


Fig. 4: Wing spread in relation to depth (no limits specified in the IBTS Manual) and wing spread in relation to door spread, Dana DK IBTS 1Q 2016.

Tab. 1: Species list, Dana DK IBTS 1Q 2015.

Latin name	Uk name	Danish name	Number	Weight (kg)	Type of registration	
<i>Aequipecten opercularis</i>	Queen scallop	Jomfruesters	4	0.064	-	∴: not measured
<i>Agonus cataphractus</i>	Pogge	Ulk-panserulk	13	0.340	*	*: length
<i>Alloteuthis subulata</i>	European common squid	Dværgblæksprutte	2692	9.226	*	**∴: length by sex
<i>Alosa fallax</i>	Twaite shad	Stavsild	6	1.775	*	***∴: single fish data
<i>Amblyraja radiata</i>	Starry ray	Tærbe	65	31.258	**	(length,weight,sex, age)
<i>Ammodytes marinus</i>	Sandeel	Tobis-hav	16	0.051	*	+∴: maturity
<i>Arnoglossus laterna</i>	Scaldfish	Tungeharre	11	0.177	*	
<i>Buglossidium luteum</i>	Solenette	Glastunge	48	0.466	*	
<i>Callionymus lyra</i>	Common dragonet	Fløjfisk (str)	35	1.019	*	
<i>Callionymus maculatus</i>	Spotted dragonet	Fløjfisk (pl)	9	0.102	*	
<i>Cancer pagurus</i>	Edible crab	Taskekrabbe	24	15.119	**	
<i>Chelidonichthys lucerna</i>	Red gurnard	Knurhane (rød)	1	0.186	*	
<i>Clupea harengus</i>	Herring	Sild	114850	4615.427	***	
<i>Echiichthys vipera</i>	Lesser weever	Fjæsing lille	51	1.112	*	
<i>Eledone cirrhosa</i>	Horned octopus	Eledone Blæksprutte	1	0.098	*	
<i>Enchelyopus cimbrius</i>	Four-bearded rockling	Havkæbbe (4tr)	14	0.464	*	
<i>Engraulis encrasicolus</i>	Anchovy	Ansjos	381	2.079	*	
<i>Eutrigla gurnardus</i>	Grey gurnard	Knurhane (grå)	7971	743.842	*	
<i>Gadus morhua</i>	Cod	Torsk	64	148.542	***+	
<i>Gasterosteus aculeatus</i>	Three-spined stickleback	Hundestejle 3 p	1	0.001	*	
<i>Glyptocephalus cynoglossus</i>	Witch	Skærsising	18	3.229	***+	
Gobiidae	True gobies	*kutling	13	0.010	*	
<i>Hippoglossoides platessoides</i>	American plaice	Håising	1128	40.574	*	
<i>Homarus gammarus</i>	Lobster	Hummer (alm.)	1	1.704	**	
<i>Hyperoplus lanceolatus</i>	Greater sandeel	Tobiskonge	10	0.315	*	
<i>Illex coindetii</i>	Southern shortfin squid		3	0.515	*	
<i>Leucoraja naevus</i>	Cuckoo ray	Pletrokke	1	0.734	**	
<i>Limanda limanda</i>	Common dab	Ising	22189	1376.270	*	
<i>Lithodes maja</i>	Norway king crab	Troldkrabbe	15	6.665	**	
Loliginidae			4123	12.765	*	
<i>Loligo forbesii</i>	Northern squid		24	6.403	*	
<i>Loligo vulgaris</i>	European squid		16	4.192	*	
<i>Lophius piscatorius</i>	Monk	Havtaske	2	1.206	***+	
<i>Lumpenus lumpretaeformis</i>	Snake blenny	Langebarn sph.	1	0.031	*	
<i>Maurolicus muelleri</i>	Sheppy argentine / Pearlside	Laksesild	4	0.006	*	
<i>Melanogrammus aeglefinus</i>	Haddock	Kuller	416	87.833	***+	
<i>Merlangius merlangus</i>	Whiting	Hvilling	29936	1767.957	***+	
<i>Microchirus variegatus</i>	Thickback sole	Båndet tunge	1	0.022	*	
<i>Microstomus kitt</i>	Lemon sole	Rødtunge	383	53.696	***+	
<i>Mullus surmuletus</i>	Striped red mullet	Stribet (rød) Mulle	18	1.521	*	
<i>Mustelus asterias</i>	Starry smooth hound	Stjernehaj	10	4.260	**	
<i>Myoxocephalus scorpius</i>	Sculpin	Ulk	11	1.899	*	
<i>Nephrops norvegicus</i>	Norway lobster	Jomfruhummer	638	20.587	**	
<i>Platichthys flesus</i>	Flounder	Skrubbe	21	6.645	*	
<i>Pleuronectes platessa</i>	Plaice	Rødspætte	2700	504.152	***+	
<i>Pollachius virens</i>	Saithe	Sej	2	5.966	***+	
<i>Raja clavata</i>	Thornback ray(roker)	Sømrrokke	1	1.472	**	
<i>Raja montagui</i>	Spotted Ray	Storpletet Rokke	3	1.131	**	
<i>Rossia macrosoma</i>	Stout bobtail squid		5	0.010	-	
<i>Sardina pilchardus</i>	Pilchard	Sardin	1	0.046	*	
<i>Scomber scombrus</i>	Mackerel	Makrel	7	1.578	***+	
<i>Scophthalmus maximus</i>	Turbot	Pighvarre	13	9.661	***+	
<i>Scophthalmus rhombus</i>	Brill	Slethvarre	5	3.660	***+	
<i>Scyliorhinus canicula</i>	Lesser spotted dogfish	Rødhaj (smpl)	12	6.112	**	
Sepiidae	Bobtail squids	Bobtail squids sp*	157	0.330	-	
<i>Solea solea</i>	Sole	Tunge	19	5.778	***+	
<i>Sprattus sprattus</i>	Sprat	Brisling	126245	787.433	***	
<i>Squalus acanthias</i>	Picked dogfish	Pighaj	14	18.901	**	
Syngnathidae	Pipe-fishes	*tangnål	3	0.003	*	
<i>Todaropsis eblanae</i>	Lesser flying squid		3	0.152	*	
<i>Trachinus draco</i>	Greater weever fish	Fjæsing	53	11.659	*	
<i>Trachurus trachurus</i>	Horse mackerel	Hestemakrel	73	2.907	*	
<i>Trisopterus esmarkii</i>	Norway pout	Sperling	6075	60.142	***+	
<i>Trisopterus luscus</i>	Bib	Skægtorsk	3	0.278	*	
<i>Trisopterus minutus</i>	Poor cod	Glyse	10	0.577	*	
<i>Zeus faber</i>	John dory	Sct. peter fisk	1	0.311	*	

Tab. 2: Number of single fish data (length, weight, sex and maturity) and samples for ageing, Dana DK IBTS 1Q 2016.

Species	IBTS Roundfish area					Total
	2	4	6	7	8	
Herring (<i>Clupea harengus</i>)	73	92	334	337	0	836
Sprat (<i>Sprattus sprattus</i>)	35	138	186	164	0	523
Cod (<i>Gadus morhua</i>)		49			15	64
Haddock (<i>Melanogrammus aeglefinus</i>)		112			0	112
Whiting (<i>Merlangius merlangus</i>)		310			0	310
Norway pout (<i>Trisopterus ermarkii</i>)		74			-	74
Mackerel (<i>Scomber scombrus</i>)		6			-	6
Saithe (<i>Pollachius virens</i>)		2			-	2
Plaice (<i>Pleuronectes platessa</i>)		644			72	716
Hake (<i>Merluccius merluccius</i>)		-			-	-
Monkfish (<i>Lophius piscatorius</i>)		1			-	1
Turbot (<i>Psetta maxima</i>)		10			1	11
Brill (<i>Scophthalmus rhombus</i>)		2			3	5
Witch flounder (<i>Glyptocephalus cynoglossus</i>)		18			-	18
Sole (<i>Solea solea</i>)		9			10	19
Lemon sole (<i>Microstomus kitt</i>)		157			0	157
					Sum:	2854
-: not caught						

Tab. 3: Preliminary abundance indices (number per hour trawling) for commercial IBTS species and number of valid MIK hauls per rectangle, Dana DK IBTS 1Q 2016.

haul	Rectangle	Herring < 20 cm	Cod < 25 cm	Haddock < 20 cm	Whiting < 20 cm	Norway pou < 15 cm	Sprat < 10 cm	Mackerel < 25 cm	Number of valid MIK hauls
1	40F4	1728	0	0	24	0	365	0	2
2	39F4	6496	0	0	51	0	264	0	2
3	39F3	6389	2	0	30	0	181	0	2
4	39F0	28	0	58	12	44	4	4	2
5	39E9	4	2	50	120	26	0	0	2
6	38E9	0	2	22	51	135	2	0	2
7	40E8	56	4	54	122	22	389	0	2
8	40E9	0	0	4	124	62	2	0	2
9	39E8	4	2	0	353	6	44	0	2
10	38F0	12	0	0	428	84	0	0	2
11	37F0	0	0	0	1738	4	733	0	2
12	41F4	781	0	0	225	0	3	0	2
13	41F5	24997	0	0	65	0	14547	0	2
14	40F5	4344	0	0	52	0	46576	0	2
15	38F4	970	0	0	155	0	5964	0	2
16	38F3	5919	0	0	5057	0	901	0	2
17	37F3	1401	0	0	21682	0	131	0	2
18	37F1	76	0	0	785	0	61	0	2
19	38F1	0	0	0	685	0	0	0	2
20	37F2	0	0	0	26	0	0	0	2
21	38F2	4	0	0	14	0	923	0	2
22	38F5	2046	0	0	142	0	17183	0	2
23	39F5	1558	0	0	86	0	6438	0	2
24	39F6	1329	0	0	915	0	1590	0	2
25	38F6	3649	0	0	572	0	3526	0	2
26	38F7	3583	0	0	78	0	14645	0	3
27	39F7	20114	0	0	90	0	13866	0	2
28	40F7	25355	0	0	85	0	5613	0	2
29	41F7	4681	0	0	209	0	1412	0	2
30	41F6	4765	0	0	282	0	8340	0	2
31	40F6	6192	0	0	486	0	5856	0	2
32	42F5	2396	0	0	944	0	26	0	2
33	43F5	0	0	0	8	0	0	0	2
34	44F5	8713	0	0	12	10344	0	2	2
35	42F6	4131	10	0	993	10	276	0	2
36	43F6	1088	0	0	706	16	49	0	2
37	43F7	1862	2	0	109	2	1074	0	2
38	42F7	1743	2	0	192	0	1261	0	2
39	43F8	271	0	0	44	0	204	0	2
40	43F9	654	0	0	66	0	755	0	1
41	44F8	1504	8	0	414	0	762	0	1
-	39F8				no GOV/CTD				1

Tab. 4: Number of samples collected for genetic analyses, Dana DK IBTS 1Q 2016.

Species	IBTS Roundfish area					Total
	2	4	6	7	8	
Cod (<i>Gadus morhua</i>)		34			15	49
Plaice (<i>Pleuronectes platessa</i>)		50			10	60
Turbot (<i>Psetta maxima</i>)		11			1	12
Brill (<i>Scophthalmus rhombus</i>)		2			3	5
Sole (<i>Solea solea</i>)		9			10	19
Flounder (<i>Pleuronectes flesus</i>)		16			-	16
					Sum:	161
-: not caught						