ICES WKDATR-BoB REPORT 2018

ECOSYSTEM OBSERVATION STEERING GROUP

ICES CM 2018/EOSG:43

REF ACOM AND SCICOM

Report of the Workshop on DATRAS surveys in Bay of Biscay and Iberian Coast

(WKDATR-BoB)

4 – 5 July 2018

ICES HQ, Copenhagen, Denmark

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Recommended format for purposes of citation:

ICES. 2018. Report of the Workshop on DATRAS surveys in Bay of Biscay and Iberian Coast (WKDATR-BoB). 4–5 July 2018, Copenhagen, Denmark. ICES CM 2018/EOSG:43. 17 pp. https://doi.org/10.17895/ices.pub.8174

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Executive summary

The Workshop on DATRAS surveys in Bay of Biscay and Iberian Coast (WKDATR-BoB) met in Copenhagen, 4–5 July 2018 and was chaired by Vaishav Soni, ICES Secretariat, and Corina Chaves, Portugal.

Four participants, representing France, Portugal, and the ICES Data Centre, joined the full meeting, and one participant from Spain (Francisco Velasco) joined part of the meeting via skype. The main goals of the workshop were to incorporate new trawl surveys, missing data submissions and missing data products into DATRAS, as well as to resolve some submission doubts and issues from the data submitters. Another goal was to identify and resolve data quality issues in DATRAS, proposing quality check procedures for missing data to be applied during uploading/reloading processes, as well as in already existing exchange data.

DATRAS (http://datras.ices.dk) is the ICES Database on Trawl Surveys. The database contains data of seventeen surveys, most of them coordinated by one of the three ICES trawl survey working groups, Baltic International Fish Survey Working Group (WGBIFS), International Bottom Trawl Survey Working Group (IBTSWG) and Working Group on Beam Trawl Surveys (WGBEAM). The fish stock assessment working groups rely on data products from DATRAS, such as CPUE per haul by length and age, age–length keys (ALK), etc. Most of these indices are derived from data collected under the DCF funding scheme, which require good quality error-free survey data submissions and outputs.

Primarily, the participants of the workshop worked towards identifying the issues regarding current missing time-series for exchange data, resolve them, and identify the hurdles. Participant data submitters worked closely with the DATRAS team of ICES Data Centre to resolve their issues, which allowed them to upload the data directly into DATRAS after applying the necessary changes to their data. Erroneous data and misinterpreted data have been corrected in this workshop. In addition, the workshop facilitated discussions about future calculation methods for length- and age-based products. There are still challenges in order to resolve all submission issues such as data errors, screening facility problems, how to create the exchange files or the need of additional training. WKDATR-BoB worked on these submission issues in order to improve the submission and data gathering processes.

1 Terms of reference

The **Workshop on DATRAS surveys- Bay of Biscay and Iberian Coast** (WKDATR-BoB), Co-Chaired by Corina Chaves (Portugal), and Vaishav Soni, ICES, will be established and will meet at ICES Headquarters, Copenhagen, 4-6 July 2018 to:

a) Incorporate new trawl surveys into DATRAS, including checking procedures to be applied during uploading/reloading processes, targeting:
   i) Review the reporting format
   ii) Agree on errors and warnings that should apply to the new datasets
   iii) Produce test files for uploading

b) Incorporate missing data submissions to the existent surveys already hosted within DATRAS. The missing data can relate to:
   i) Historical data (to achieve full time series)
   ii) Biological data for all analysed species (length and age)

c) Incorporate missing data products to existent surveys already hosted within DATRAS. The missing products can relate to CPUE products, indices, etc. The main objectives would be to:
   i) Prepare data product calculation documentation

WKDATR- BoB will report by 1 September 2018) to the attention of SCICOM, ACOM, and DIG.

Supporting information

Priority	Currently DATRAS provides survey data products for advice and science working groups. Significant added value by the database is that quality control procedures are used regularly to check data as they are uploaded to the database. Including complete survey data to stock assessments and science working groups through a quality controlled pipeline will prevent the use of erroneus data.
Scientific justification	Errors in input data to stock assessments from surveys, which at present are not part of the DATRAS system or where not all required variables are provided, have been recently reported. Incorporating complete datasets and products for these surveys in DATRAS will increase options for quality control and transparency/traceability of assessment outcomes. Targeted surveys will be
Resource requirements	This workshop is supported through an EU special request on Quality assuring DCF gathered data.
Participants	4 persons from member countries responsible for data submisisons of trawl survcey data. In addition, an WG co-chair from the ICES Secretariat and two support persons from the ICES Data Centre and Advisory Department will participate.

PT-IBTS	PORTUGAL
SP-ARSA	Spain
SP-NORTH	Spain
BTS	France, Italy
FR-CGFS	France
EVHOE	France

Secretariat facilities	A meeting room at ICES HQ will be facilitated for the dates of the workshop. In addition, assistance from the ICES Data Centre and Advisory Department will b provided.
Financial	This workshop is supported through an EU special request on Quality assuring DCF gathered data.
Linkages to advisory and science committees	There are linkages to SCICOM, ACOM, and DIG.
Linkages to other groups	EGs coordinating surveys in DATRAS (IBTSWG, WGBEAM), assessment WGs (WGBIE, WGEF, WGHANSA, WGWIDE)
Linkages to other organizations	JRC, OSPAR, HELCOM

2 Overview

2.1 Background

Quality assurance of advice starts by quality assuring the input data to stock assessment. There are several stages and tasks underlying this; first steps being to assure that all data are held in databases with transparent and quality assured outputs (e.g. survey indices, raised catch data) and even before this that the data are produced in a quality assured way.

In late 2017 a DG Mare special request[1] highlighted three stages of quality assurance for data collected under the DCF and requested ICES to review and engage with a) development of the SmartDots platform for age reading data, b) specifications of the RDBES (Regional DataBase and Estimation System) for commercial catch sampling data, and c) inclusion of DCF-funded fisheries independent surveys/variables not yet held in DATRAS into such database. All three developments would enable ICES to reduce uncertainty and error, but also to more precisely quantify errors in input data to assessments.

The current workshop is one of two addressing the 3rd of these topics, namely surveys and variables not yet included in DATRAS:

c) Inclusion of DCF surveys and missing variables into DATRAS.
In the light of the most recent errors in input data to the assessments from surveys which at present are not part of the DATRAS system, or where not all required variables are provided, ICES is requested to incorporate these surveys in DATRAS. This would increase options for quality control and transparency/traceability of assessment outcomes.

Two designated Workshops have been established; the Bay of Biscay and Iberian Coast (WKDATR-BoB), followed by the Greater North Sea and Celtic Sea workshop (WKDATR NSCS). These are intended to ensure experts have the time and dedicated technical support to work on identified surveys (based on the Liaison Meeting 2017 analysis of surveys). The objective being inclusion of quality assured data within DATRAS and output of appropriate products.

The surveys highlighted for inclusion in the workshop are given in table 1 and include surveys with missing variable(s) or products in DATRAS.

Table 2.1.1. Targeted surveys for WKDATR-BoB.

PT-IBTS	Portugal
SP-ARSA	Spain
SP-NORTH	Spain
DYFS	France
FR-CGFS	FRance
EVHOE	France

DATRAS is an online database of trawl surveys hosted by ICES. DATRAS stores data from internationally coordinated fish trawl surveys in ICES Area 27 in a standardized

[1](http://ices.dk/explore-us/Documents/Cooperation%20agreements/EU/2018_ICES_EC_AA_signed_WEB.pdf) and **ICES Request code:** 1711_DCF_quality

format and provides a data quality check upon data upload. The DATRAS portal offers online services for uploading and downloading of survey data. Details of the data exchange flat file (* .txt) format can be also be found at the portal.

On successful submission the exchange files are mapped and uploaded to the DATRAS SQLserver relational database and made publically available (see Appendix 5 for schema).

3 Review of national submission issues

3.1 Portugal

The Portuguese participant contributed to the Workshop focussing in three main objectives:

1) The Portuguese surveys PT-IBTS conducted in 2006, and 2007, previously included in quarter 3, were merged to quarter 4 and were re-uploaded in DATRAS.

Survey	Year	Quarter	Ship/Country	Number of hauls
PT-IBTS	2006	3	NOR/POR	27
PT-IBTS	2007	3	NOR/POR	34

Survey	Year	Quarter	Ship/Country	Number of hauls
PT-IBTS	2006	4	NOR/POR	61
PT-IBTS	2007	4	NOR/POR	63

Survey	Year	Quarter	Ship/Country	Number of hauls
PT-IBTS	2008	3	NOR/POR	88

Although the 2008 survey was performed in quarter 3, due to national requirements, it was agreed that the survey is actually a quarter 4 survey and this was noted in DATRAS.

2) Review of the PT-IBTS survey description for DATRAS (see Annex 2) has been provided and updated on website;

3) Review of the calculation procedures for the CPUE product: the step by step procedure of the CPUE base calculation was discussed including CPUE calculations per length and age for data collected by Portugal. The calculations are the same as used in Spanish-North so this discussion was done by the 2 countries and the ICES representant.

Indices are stratified, which means CPUE data are aggregated and weighted by strata. Each strata is a combination of Area Code (Area Type 16 for PT-IBTS) and Depth Strata (TS DepthStratum 20–100 m, 101–200 m, 201–500 m, and 501–750 m).

A single ALK is used for the total area surveyed and the ALK is developed annually by the stock co-ordinators and it will be shared with ICES Data Centre (DC) for further calculation of the CPUE product.

The agreed calculation procedure for the CPUE index is described in Annex 3.

Action description	Action responsible
SMALK,ALK,CPUE per length and CPUE per age data need to be calculated and published on DATRAS web	ICES DC
- It has been found that 2006, 2007 data on marine litter collected during PT-IBTS need to be allocated to quarter 4 - 2008 data on marine litter collected during PT-IBTS need to be allocated to quarter 4	ICES DC
Successful upload of 2017 HH and HL exchange files. The CA exchange file will be uploaded in early 2019.	Portuguese data submitter
The historical data from 1990 to 2001 will be submitted by Portugal in 2019 with only target species information in the CA and HL exchange files.	Portuguese data submitter

3.2 Spain

The main goal of the Spanish data submitters was to upload as much data as possible for the different surveys. Information included all hauls (including non-standard hauls; *not currently used by assessment expert groups)* all species (mainly fish, decapods crustaceans and decapod cephalopods). It was agreed that the information related to standard species will be uploaded yearly after the surveys, following the standard quality checking. On the other hand the non-standard hauls/species will be uploaded two years after the survey to allow for more processing time. During the workshop, the Spanish submitters committed to, in the near future, upload a time-series including all species from the years 1990-2015.

By the end of the workshop, the Spanish participant had:

- Created the exchange file for the survey SP-NORTH including data from the years 1998-2002.
- Corrected the file format, where non-standard hauls (i.e. those including non-standard species), which until now had a DATRAS validity code "I" (Invalid), should have validity code "A" (Additional).
- Adopted the methodology for CPUE calculation from the Portuguese PT-IBTS protocol.

Problems identified	**Comment**
Areas: area strata in the survey SP-NORTH are different in different years. This was solved using a file that contains the general survey design but tailored information regarding area strata. The files also contain the vessel, first and last day of the survey and additional detail not used in the data products calculations (See Annex : 4)	The area strata does not change every year. During the SP-NORTH history there have been two area stratifications. The second and most recent period covers up to n 2017datasince the data collected in 2018 surveys haven't been processed yet.
Special hauls are not considered in the abundance indices.	This is a remark to be taken into account when considering data products. Special hauls have been uploaded with validity code A (Additional)
Validity code to use for hauls outside the area covered by the survey or 0 minutes-hauls.	Same as previous. Uploaded with validity code A
Problems with the uploading of ALKs were identified. For example the ALK for megrim.	The issue was solved during the Workshop.
Standard species will be uploaded yearly after the surveys and follow the standard quality check. The non-standard species would be uploaded two years after the survey is conducted. During 2018 data submitters plan to upload the whole historical time series (1990-2015) including all the species.	Just a protocol proposed to give us some time to exploit the data before they are available/open to the *public*

3.3 France

The main objective of the French participant was to update the FR-ORHAGO survey data in DATRAS (BTS-VIII).

To overcome the uploading problems, prior to the workshop, the 2013 data file was revised and successfully submitted to DATRAS with the assistance of the ICES secretariat. This work allowed to finalize the script that converts the French data format to DATRAS format. This task was completed during the meeting with the support of the survey data managers.

The files from France from the years 2014 to 2017 were screened and uploaded during the first two days of the meeting. No major problem was encountered for this task and only warning messages were highlighted by the screenings. The warnings were checked, sometimes revealing some small possible errors that were i) corrected when it was justified, or ii) recorded for further checks.

During the workshop data prior to 2013 were also screened. Because they were not originally recorded in the French standard format, the screenings revealed more problems. They were solved during the meeting for the years 2012 and 2011 and survey data of these two years were uploaded. However, time constraints didn't allow experts to correct the errors highlighted by the screening from the year 2010. Consequently, data from surveys conducted between 2007 and 2010 (both included) still need to be revised and uploaded.

Note that when the screening showed that some original value does not align with NOAA routine for the assignment of a haul to day or night, the original value were kept (1 haul in 2011, 2 hauls in 2012). Therefore, indices derived from DATRAS should be identical to the indices that were used in the stock assessment of sole in the Bay of Biscay in former years. . Note also that stations that are not part of the standard station grid were marked with HaulVal A (i.e. Additional hauls). Furthermore, because sole (*Solea solea*) is the main target species for the survey, CA data are only uploaded for that single species.

Status of new submission:

Survey	Year	Quarter	Ship/Country	Number of hauls	Insertion date
BTS-VIII	2011	4	GWD/FRA	114	06/07/2018 16:17:00
BTS-VIII	2012	4	GWD/FRA	109	06/07/2018 15:20:00
BTS-VIII	2017	4	35C4/FRA	49	06/07/2018 09:16:00
BTS-VIII	2016	4	35C4/FRA	49	05/07/2018 18:31:00
BTS-VIII	2015	4	35C4/FRA	50	05/07/2018 18:23:00
BTS-VIII	2014	4	35C4/FRA	56	05/07/2018 18:11:00

4 References

Cargador, F. and Borges, M. F. (1982). Mesh se1ection of Hake (*Merluccius merluccius*) and Horse -mackere1 (*Trachurus trachurus*) on the Portuguese Coast. C. M. 1982/B:34 Fish capture committee. Ref.Demersa1 Fish C. http://www.ices.dk/sites/pub/CM%20Documents/1982/B/1982_B34.pdf

Annex 1: List of participants

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Annex 2: Portuguese surveys text included in the DATRAS web

The Portuguese groundfish surveys have been conducted along the Portuguese continental waters since 1979 with the RV "*Noruega*". The area extends from latitude 41°20' N to 36°30' N (ICES Division 9.a) and from 20 to 500 m depth. Surveys took place three times a year, in winter, summer and autumn. The winter survey took place in 1992 and 1993, and from 2005 to 2008 when it was interrupted. The summer survey series started in 1979 and stopped in 2002. The autumn survey is conducted since 1979 with the exception of years 1984 and 2012 when the vessel was in reparation and since 2009 it is the only Portuguese groundfish survey to be performed.

Initially (1979) the main objectives of the surveys were to estimate the abundance and distribution of the most important commercial species in the Portuguese trawl fishery: hake (*Merluccius merluccius*), horse mackerel (*Trachurus trachurus*), blue whiting (*Micromesistious poutassou*), Axillary seabream (*Pagellus acarne*) and Norway lobster (*Nephrops norvegicus*). Recruitment, abundance and distribution for hake and horse mackerel were monitored in the autumn surveys. Additionally, trawl selectivity experiments for hake and horse mackerel with 40 mm mesh size, were also conducted during the 1981 surveys using the covered codend method (Cargador and Borges, 1982).

At present, the main objective of the **Autumn survey** is to monitor the recruitment, abundance and distribution of hake and horse mackerel. Additionally, the survey also estimate (i) abundance indices and biomass of the most important commercial species, (ii) biological parameters (e.g. maturity, ages, sex-ratio, weight, food habits), and (iii) biodiversity indicators. The primary species are hake, horse mackerel, blue whiting, mackerel (*Scomber scombrus*), Atlantic chub mackerel (*Scomber colias*), anglerfish (*Lophius spp*.), megrim (*Lepidorhombus spp*.) and Norway lobster.

Sampling design was progressively modified in order to improve the precision of the abundance and biomass estimates. During 1979-1980 a stratified random sampling design was adopted with a total of 15 strata. Each stratum was divided into units of approximately 25 $nm^{2.}$ The stratification was based on 3 depth intervals and 5 geographical areas, being the depth ranges 20–100 m, 101–200 m and 201–500 m. During 1979–1980, the number of hauls per stratum performed was based on the previous information of the relative abundance of the target species in each geographical area and on the ship time available. During 1981–1989, the number of strata was increased to 36, (12 sectors and 3 depth ranges) and two random units were sampled by stratum, whenever possible, to allow an estimate of the standard error of the stratified mean by stratum.

In 1989 a fixed stations sampling design was adopted, comprising 97 positions spread over 12 sectors, which one divided into 4 depth ranges: 20–100 m, 101–200 m, 201–500 m and the new 501–750 m, making a total of 48 strata. The positions of the 97 fixed stations were based on common stations sampled during 1981–1989 surveys and taking into account that at least two stations per stratum should be sampled. A maximum of 30 supplementary stations were planned to be carried out if ship time was available or to replace positions that due to particular factors were not possible to trawl.

A new sampling scheme was implemented in 2005. The design is a mixture of a fixed sampling scheme with trawl positions distributed over a fixed grid with 5′ per 5′ nm and additional random trawl positions. The 500–750 m depth stratum was removed due to limited trawlable area and low relevance for the survey purposes. The **Autumn ground-**

fish survey plan comprises 96 fishing stations, 66 at fixed (grid) positions and 30 at random that are sampled during day light. The tow duration is 30 min, with a trawl speed of 3.5 knots..

The surveys are conducted with the Portuguese RV "*Noruega*", which is a stern trawler of 47.5 m length, 1500 horse power and 495 GRT. In the Autumn surveys the fishing gear used is a bottom trawl (type Norwegian Campell Trawl 1800/96 NCT) with a 20 mm codend mesh size. The main characteristic of this gear is the ground-rope with bobbins. The mean vertical opening is 4.6 m and the mean horizontal opening between wings and doors is 15.1 m and 45.7 m, respectively. The polyvalent trawl doors used are rectangular (2.7 m x 1.58 m) with an area of 3.75 m^2 and weighting 650 Kg. In autumns 1996, 1999, 2003 and 2004, the Portuguese RV "Noruega" was unavailable and RV "*Capricórnio*" was used. RV "*Capricórnio*", is a stern trawler of 46.5 m length, 1200 horse power (880 KW) and 494 GRT. The fishing gear used is a bottom trawl net (CAR) type FGAV019, without rollers in the groundrope. The mean horizontal opening between the wings is 25 m, the mean vertical opening is 2.5 m and the codend mesh size is 20 mm. The trawl doors used are the same as those used in the NCT gear.

Annex 3: CPUE method calculation used to produce Portuguese and Spanish CPUE data

The original file is available in the DATRAS website at: https://datras.ices.dk/documents/calculationsteps/CPUECalculation_PT_IBTS.xlsx

Steps:	Description about sheets	
A	Exchange Data	Selected haul from HL record
B	SelectValidHauls	Criteria = Valid, AND SpecValCode = 1 OR NULL
C	SelectedDatabyHauls	Get the HLnoAtLenght for Valid Hauls
D	CPUE_PerLengthPerHauls	Aggregation based on Category (to be defined) and produce CPUE by length
E	SumCPUE_PerLengthPerHaul	Sum CPUE per haul by lengthclass strata
F	ValidSelectedHauls	Count Valid AND SpecValCode = 1 OR NULL
G	CPUEperLengthPerSubArea	Weighting of the haul
H	CPUEWeightedSumperLengthClass	Calculate Weighted sum per length class
I	CPUEWeightedSum	Calculate sum at CPUE
J	Sum of CPUE	Calculates sum of CPUE from (G)
K	MeanWithoutZeroRectangle	Calculates the mean without zero rectangles
L	ZeroRectangle	Include only Zero rectangle
M	MeanlengthSubArea	K+L
N	SumofCPUE	Suming CPUE per Subarea
O	Average of SumofCPUE	Average over (N)

Annex 4: Strata and geographic sectors in the Spanish North Ground Fish Survey (SP-North).

- 1983–1996:

Strata area		Geographic sectors *					
		MF	**FE**	**EP**	**PA**	**AB**	**TOTAL**
Depth strata	**30-100**	500	524	734	1006	1113	**6021**
	101-200	2910	3217	3712	3611	1527	**14357**
	201-500	1115	3015	725	1326	764	**8235**
	total	4549	6762	5162	5944	2929	**28585**
Special hauls [2]	**<70**	1		1	1	1	**4**
	>500	3	3	2	3	1	**12**

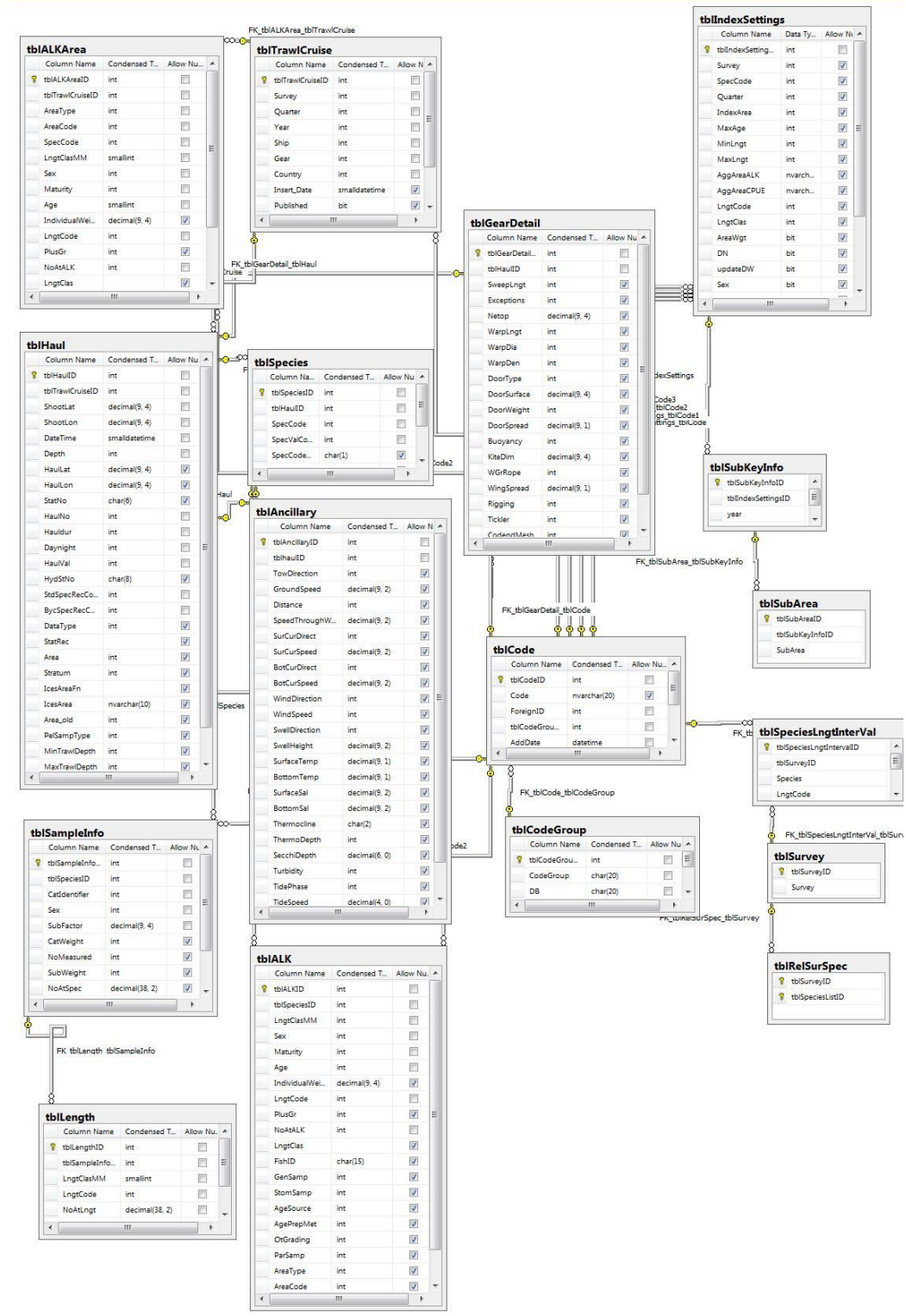
- 1997–2017:

Strata area		Geographic sectors*					
		MF	**FE**	**EP**	**PA**	**AB**	**TO-TAL**
Depth strata	**70-120**	1444	1224	1334	1006	1113	**6021**
	121-200	2410	3817	3712	3211	1227	**14357**
	201-500	1115	4115	1225	1226	664	**8235**
	total	4949	91	6262	5444	2929	**28585**
Special hauls [1]	**<70**	1		1	1	1	**4**
	>500	3	3	2	3	1	**12**

* https://datras.ices.dk/Documents/Manuals/Survey_Maps_Datras.pdf

[2] Planned number of special hauls performed yearly if possible.

Annex 5: DATRAS Relational Database Model Schema



	HH_Unique_Key		HL_Unique_Key		CA_Unique_Key
1	RecordType	1	RecordType	1	RecordType
2	Quarter	2	Quarter	2	Quarter
3	Country	3	Country	3	Country
4	Ship	4	Ship	4	Ship
5	Gear	5	Gear	5	Gear
6	SweepLngt	6	SweepLngt	6	SweepLngt
7	GearExp	7	GearExp	7	GearExp
8	DoorType	8	DoorType	8	DoorType
9	StNo	9	StNo	9	StNo
10	HaulNo	10	HaulNo	10	HaulNo
11	Year	11	Year	11	Year
12	Month	12	SpecCodeType	12	SpecCodeType
13	Day	13	SpecCode	13	SpecCode
14	TimeShot	14	SpecVal	14	AreaType
15	Stratum	15	Sex	15	AreaCode
16	HaulDur	16	TotalNo	16	LngtCode
17	DayNight	17	CatIdentifier	17	LngtClass
18	ShootLat	18	NoMeas	18	Sex
19	ShootLong	19	SubFactor	19	Maturity
20	HaulLat	20	SubWgt	20	PlusGr
21	HaulLong	21	CatCatchWgt	21	AgeRings
22	StatRec	22	LngtCode	22	CANoAtLngt
23	Depth	23	LngtClass	23	IndWgt
24	HaulVal	24	HLNoAtLngt		
25	HydroStNo				
26	StdSpecRecCode				
27	BycSpecRecCode				
28	DataType				
29	Netopening				
30	Rigging				
31	Tickler				
32	Distance				
33	Warplngt				
34	Warpdia				
35	WarpDen				
36	DoorSurface				
37	DoorWgt				
38	DoorSpread				
39	WingSpread				
40	Buoyancy				
41	KiteDim				
42	WgtGroundRope				
43	TowDir				
44	GroundSpeed				
45	SpeedWater				
46	SurCurDir				
47	SurCurSpeed				
48	BotCurDir				
49	BotCurSpeed				
50	WindDir				
51	WindSpeed				
52	SwellDir				
53	SwellHeight				
54	SurTemp				
55	BotTemp				
56	SurSal				
57	BotSal				
58	ThermoCline				
59	ThClineDepth				