

Annual Report on the Danish National Data Collection Programmes for 2016

**National Institute for Aquatic Resources
Danish AgriFish Agency
Department of Food and Resource Economics
Statistics Denmark**

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Contents

I. General framework.....	5
II. National Data Collection Organisation	5
II.A National correspondent and participating institutes	5
II.B Regional and International coordination	8
II.B 1 Attendance of International meetings	8
II.B 2 Follow-up of regional and international recommendations.....	8
III. Module of the evaluation of the fishing sector	8
III.A General description of the fishing sector	8
III.B Economic variables	10
III.B.1 Achievements: Results and deviation from NP proposal.....	10
III.B.2 Data quality: Results and deviation from NP proposal.....	10
III.B.3 Follow-up on Regional and international recommendations	11
III.B.4 Actions to avoid shortfalls	11
III.C Metier-related variables	11
Baltic Sea (ICES areas III b-d).....	12
III.C.1 Achievements: Results and deviation from NP proposal.....	12
III.C.2 Data quality: results and deviation from NP proposal	13
III.C.3 Follow-up of regional and international recommendations	15
III.C.4 Actions to avoid shortfalls	15
North Sea (ICES areas IIIa, IV and VIIId)	16
III.C.1 Achievements: Results and deviation from NP proposal.....	16
III.C.2 Data quality: results and deviation from NP proposal	16
III.C.3 Follow-up of regional and international recommendations	17
III.C.4 Actions to avoid shortfalls	17
North Atlantic (ICES areas V-XIV and NAFO areas)	17
III.C.1 Achievements: Results and deviation from NP proposal.....	17
III.C.2 Data quality: results and deviation from NP proposal	17
III.C.3 Follow-up of regional and international recommendations	17
III.C.4 Actions to avoid shortfalls	17
III.D Biological - Recreational fisheries.....	17
The Baltic Sea and the North Sea and Eastern Arctic	18

III.D.1 Achievements: results and deviation from NP proposal.....	18
III.D.2 Data quality: results and deviation from NP proposal	21
III.D.3 Follow-up of regional and international recommendations	22
III.D.4 Actions to avoid shortfalls	22
III.E Biological - stock-related variables.....	22
The Baltic Sea (ICES areas IIIb-d).....	22
III.E.1 Achievements: results and deviation from NP proposal	22
III.E.3 Follow-up of regional and international recommendations	23
III.E.4 Actions to avoid shortfalls	23
The North Sea and Eastern Arctic (ICES areas IIIa, IV and VIIId)	23
III.E.1 Achievements: results and deviation from NP proposal	23
III.E.2 Data quality: results and deviation from NP proposal	23
III.E.3 Follow-up of regional and international recommendations	24
III.E.4 Actions to avoid shortfalls	24
The North Atlantic (ICES areas V-XIV and NAFO areas)	24
III.E.1 Achievements: results and deviation from NP proposal	24
For detailed information see III.E.3.....	24
III.E.2 Data quality: results and deviation from NP proposal	24
III.E.3 Follow-up of regional and international recommendations	25
III.E.4 Actions to avoid shortfalls	25
III.F Transversal variables.....	25
III.F.1 Capacity.....	25
III.F.2 Effort	25
III.F.3 Landings	26
III G Research surveys at sea	26
III G 1 Achievements: results and deviation from NP proposal.....	26
III G 2 Data quality: results and deviation from NP proposal.....	47
III G 3 Follow-up of Regional and international recommendations.....	47
III G 4 Action taken to avoid shortfalls	47
IV. Module of the evaluation of the economic situation of the aquaculture and processing industry.....	47
IV.A Collection of data concerning the aquaculture	47
IV.A.1 Achievements: Results and deviation from NP proposal	47

IV.A.2 Data quality: Results and deviation from NP proposal	47
IV.A.3 Actions to avoid deviations	47
IV.B Collection of data concerning the processing industry	47
IV.B.1 Achievements: Results and deviation from NP proposal	47
IV.B.2 Data quality: Results and deviation from NP proposal.....	49
IV.B.3 Follow-up of regional and international recommendations	49
IV.B.4 Action to avoid shortfalls.....	49
V. Module of evaluation of the effects of the fishing sector on the marine ecosystem.....	49
V. 1 Achievements: results and deviation from NP proposal	49
V. 2 Actions to avoid shortfalls	50
VI. Module for management and use of the data.....	50
VI. 1 Achievements: results and deviation from NP proposal	50
VI. 2 Actions to avoid shortfalls	51
VII. Follow-up of STECF recommendations.....	51
VIII. List of acronyms and abbreviations.....	52
IX. Comments, suggestions and reflections.....	54
X. References	54
Annex 1	55

I. General framework

This document presents the Annual Report (AR) on the work carried according to the Danish National Programme (NP) for data collection in the fisheries sector for the year 2016. The programme has been carried out in accordance with the rules laid down in the “*Commission Regulation (665/2008) and Commission Decision (2010/93/EC) adopting a multi annual Community programme pursuant to Council Regulation (EC) No 199/2008 establishing a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy*”, hereafter referred to as “DCF” in this AR.

The format of this report is structured following the most recent guidelines from the Commission¹. The AR is structured in a number of modules. In the following chapters a description is given of the activities related to the DCF that have been carried out by Denmark.

Denmark has in 2010 initiated a work to improve the sampling design of the metier based sampling following the outcomes of ICES WKACCU and WKPRECISE. This outcome has led to a change in the sampling frame from 2011 to a more statistically sound sampling program and since 2012 a full implementation of a statistical sound sampling schemes for the collection fisheries data. The achievements of sampling in 2016 were at a similar level compared to the latest three years, however improvement in the sampling design has been made.

The list of derogations applied for and whether these have been approved or rejected is given in table 1.A.1

Denmark has for years made agreement on collection of biological sampling of landings or bilateral cooperation with a number of MS such as Sweden, Belgium, Germany, Ireland and the Netherlands. This bilateral coordination has been continued in 2016. These agreements are listed in table 1.A.2.

In general, the Danish national data collection programme has been carried out in 2016 as in the previous years.

It is important to stress when comparing the Danish NP with the AR 2016 that the NP was written in 2011 based on the reference years 2009 and 2010 and that the Commission has asked MS just to roll over the 2011 programme also to cover the programme period 2014-2016. Fleets, fisheries and quotas may have changed between 2009/2010 and the AR year 2016 and therefore not necessarily comparable.

II. National Data Collection Organisation

II.A National correspondent and participating institutes

Denmark has assigned Senior Fisheries Advisor Jørgen Dalskov, Secretariat for Public Sector Consultancy at DTU Aqua as the National Correspondent.

¹ Guidance for the submission of Annual Report on the National Data Collection Programmes under Council Regulation (EC) 199/2008, Commission Regulation (EC) 665/2008 and Commission Decision 2010/93/EC, Version for Annual Report 2015 (January 2016)

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In Denmark four institutes or organisations have been involved in carrying out the collection of, the management of and the use of data within the fisheries, aquaculture and the fish processing sectors:

1. National institute of Aquatic Resources (DTU Aqua) is an institute under the Technical University of Denmark. The institute carries out research, monitoring and provides advice concerning sustainable exploitation of live marine and fresh water resources. Furthermore, the institute is responsible for providing data for ICES stock assessment work and participates in various ICES assessment working groups, planning and expert groups as well as in the ACOM work. The institute is having a public sector consultancy contract with the Danish Ministry for Agriculture, Fisheries and Food.

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2. The Danish AgriFish Agency (NAER) is an agency under the Ministry of Food, Agriculture and Fisheries. The staff of the Danish AgriFish Agency, a total of approximately 1,200, strives countrywide to create the optimal conditions for sustainable growth and green transformation in the fields of:

- Agriculture
- Fisheries and aquaculture
- Plants and horticulture

The aim of the agency is to secure an efficient and professional administration and reap the most benefits from working across our respective areas.

In addition, one of the tasks of the agency are to provide service to the Minister and the political level, assist in law proposals and contribute to international negotiations. Furthermore, NAER is responsible for making rules and regulations in the Danish fisheries as well as administer the Danish fishing, to inspect and control fishing activities and finally to make primary statistics on fisheries.

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3. Department of Food and Resource Economics (IFRO) is an institute under KU Life, a faculty of life science a part of the University of Copenhagen. The Researchers and academic staff of the Institute have backgrounds and experience in economics, agricultural and resource economics, agronomy, as well as a wide range of statistical methods and applied research tools.

Danish Food and Resource Economics Institute (IFRO)

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4. Statistics Denmark (DST) The aim of the institution is to collect, process and publish statistical information on social and economic conditions. Additional DST contributes to the international statistical cooperation. Furthermore, DST is also actively involved in the statistical activities in the UN, OECD, IMF and in the Nordic countries, etc. DST is also carrying out statistical tasks for private and public customers.

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A Steering Group has been established with members from all four involved Institutes. The main objective of the Steering Group is to coordinate the work to be carried out according to the DCF.

Once or twice a year representatives from the involved institutes meet for discussing the coming year or present years programme. Usually these meetings take 1-2 hours. Main topics to discuss are the production and the content of the DFAD data base (see section VI.1 for details) and participation in various expert working group meetings. As it is very clear which of the partners are responsible for the various tasks it is only necessary to make sure deadlines for providing data to each other are agreed.

The daily cooperation can be made by using e-mails or phone calls. The representatives from the involved institutes have been working together for a number of years and therefore, no major disagreements or other issues are troublesome.

The national DCF website is up running <http://www.dcf-denmark.dk/>.

II.B Regional and International coordination

II.B 1 Attendance of International meetings

Most of the planned meetings have been attended by Danish representation in 2016. Denmark attended the DCF coordination meetings for the Baltic region and for the North Sea and Eastern Arctic region. The meeting attendance is listed in table II.B.1.

All surveys are coordinated internationally by ICES planning groups. The survey planning groups, which were relevant to Denmark the BIFSWG, IBTSWG, WGIPS were in 2016 attended by representatives from Denmark.

Denmark is a member of a large number of ICES WG, WK or PG groups. Those groups which have a major interest for Denmark one or more DTU Aqua staff members participate at the meeting. The ICES or other international meetings attended by Denmark are listed in table II.B.1. Some other ICES group meeting have minor interest and DTU staff members only participate at correspondence level and all Danish data is provided to the group.

II.B 2 Follow-up of regional and international recommendations

General recommendations made by RCM Baltic, the RCM NS &EA and the RCM NA dealt with by the Liaison group in 2015 and actions taken by Denmark are listed in table II.B.2.

III. Module of the evaluation of the fishing sector

III.A General description of the fishing sector

The number of vessels registered for Denmark in the Community Fishing Fleet Register on the 1st of January 2015 was 2,444, of which 970 had no activity in 2015. The 1,474 vessels which were active during 2015 had landings of fish to a total value of EUR 406 million or 89.2 per cent of the total value of the Danish fishery in 2015. The remaining 10.8 per cent of the value of the Danish fishery in 2015, totalling EUR 49 million, were landed from vessels entering the register after the beginning of the year (cf. table 1).

Table 1. Active registered vessels in the Danish Fishery 2015.

	Vessels registered the whole year	Exits register during year	Enters and stay in register during year	Enters and exits during year	Active fishermen with no vessels	Total active register units
Vessel length groups	----- Active registered vessels -----					
<10 m	952	48	57	9	-	1,066
10 - <12 m	90	17	17	5	-	129
12 - <18 m	195	32	30	9	-	266
18 - <24 m	62	9	11	6	-	88
24 - <40 m	28	10	7	4	-	49
40 m and above	26	5	5	-	-	36
All length groups	1,353	121	127	33	-	1,634
Total value of landings in 1000 EUR	360,742	44,966	47,229	1,971	-	454,908
Per cent share of value of landings	79.30%	9.88%	10.38%	0.43%	0.0%	100.0%

During the year 2015 an additional 202 vessels were registered of which 160 vessels became active. So the total number of Danish vessels with landings of fish in 2015 was 1,634. Many of these vessels are small boats used part time by fishermen, who have more than a single vessel at hand, and shift between one and the other dinghy depending on the work to be done (setting out poles for nets and/or traps, emptying gear, fishing for bait etc.). Also the fishery regulation system has for many years linked the right to fish a certain amount of fish to the vessel. So some fishermen have additional vessels, which are not used as separate production units, in order to keep the right to fish and ensure their income. Though all quotas today no longer are stuck to the physical vessel there are still a number of “additional or secondary” vessels registered, and some of the landings of fish are registered on those vessels.

In order to calculate the production for each fisherman and fishing firm it is necessary to identify the production unit that has been in use for the year. In most cases that is a single vessel, which has been owned and used by the same fisherman the whole year. Another situation exists when a fisherman sometime during the year shifts vessel and carry on fishery from the other vessel with his crew, or if he some months uses two vessels simultaneously like fishermen using fixed nets and traps sometimes does. In those cases the production and other economic data for each part time of the year must be added up to form a complete operating year.

The Danish programme for collection of economic data covers all fishing activity for the year and includes both vessels that are registered from the start of the year as well as vessels that become registered during the year and

commences fishery in the year. The population of fishing units (vessels) covers therefore the whole production in the fishing sector.

The number of inactive vessels in the text above is not the same as the number of inactive vessels in the Fleet Economic Report. The figures on inactive vessels in the text above include all entities (vessels ID + entry date + exit date) on the register without landings, but many of those may have been entered into the register with another vessel ID for another period of the year, and can have landings registered for that period. The true number of inactive vessels for 2015 is 459 vessels, as specified in the Fleet Economic Report.

III.B Economic variables

Supra Region: Baltic Sea, North Sea and Eastern Arctic, and North Arctic.

The total volume of the Danish fishery in 2015 was 869,094 tonnes to a value of 453 million EUR. The main part of the fishery takes place in the North Sea (290 million EUR), Skagerrak/Kattegat (80 million EUR), and the Baltic Sea (37 million EUR), but some vessels had also been fishing in the Norwegian Sea (11 million EUR) and the waters around the British Isles and Ireland (21 million EUR).

III.B.1 Achievements: Results and deviation from NP proposal

Statistics Denmark receive the yearly extract from the Danish Fishing Fleet Register together with the registered logbook and sales note data at the beginning of April the year after the accounting year. This is when the data on the administrative registers has been checked and a freeze version of the data can be produced for statistical use. During April and May we combine these data to produce the population and the fleet segmentation for the account statistic for fishery. The accounts are sampled during the summer and all encountered errors between the register based population and the de facto real population are corrected in the process. In October the statistics is prepared based on the corrected final population. This is exactly as planned in the Danish NP. But every year we get a note on apparent errors saying: No data reported for 2016 (= the year before the reporting year) at national and fleet segment levels (recurring issue). We will never be able to report data on capacity and landings just two months after the end of the year, as the registered data is not ready to use before April, and it is necessary to combine and analyse the data to identify the population and make the correct segmentation.

We use a harmonized balanced accounting form to collect the economic data. The 2015 sample included 276 accounts, 51 per cent, of the 544 unit frame population. We simulate individual accounts for every unit in the population that is not in the sample. These simulations are done by selection of one to three of the sampled accounts that are valuated to be best possible replacement for the simulated unit, and calibrate the average of the 1 to 3 matching units to equal the registered revenue and of that unit.

The simulations are performed using a BANFF MASSIMPUTATION model in SAS. Donors are matched according to known registered data for catches on selected species, crew size, engine power and days at sea in Ices III and Ices IV.

III.B.2 Data quality: Results and deviation from NP proposal

The improved calculation model, where we simulate individual accounts for every unit in the population that is not in the sample, has now been in place for four years (2012-2015). As such we have now improved the program to calculate effort and the quantity and value of landings based on data from the administrative registers for all

production units. In the 2017 Fleet Economic Report, covering the period 2008-2015, the data on effort and the quantity and value of landing has been revised for the years 2012-2014.

Documentation of the Danish Account Statistics for Fishery following the ESS Standard for Quality Reports (Eurostat) is available on Statistics Denmark [web-page](#).

III.B.3 Follow-up on Regional and international recommendations

No action is needed.

III.B.4 Actions to avoid shortfalls

We are aware of an recurring issue about differences in the reported data at MS and FS levels for investment and for the variables 'variable costs' and 'other income'. These errors come from several manual corrections which have to be carried out on the sheets to be uploaded for the report. The problem is that the JRC upload system does not allow for negative values on investment (totInvest) and other income (totOtherInc).

In the Danish Accounts system both purchase and sale investment goods are included in the investment, which of course can result in a negative value. Likewise, the variable "Other income" can be negative. Other income include the following variables: Additional payments regarding production from earlier years (see directions) +/- Received/handed over amounts to cover landings by/for other vessels (pair-trawl) + Other fishery income + Leasing or hire out of vessels and other operative assets + Other sources, for instance salvage money.

Apparently, the uploading system for the Aquaculture Economic Report does not reject negative values on investment and other income. We will contact JRC to ask for the possibility for negative values in the Fleet Economic upload system also.

III.C Metier-related variables

The Danish NP concern sampling schemes for four areas; the Baltic Sea (ICES areas III b-d), the North Sea (ICES areas IIIa, IV and VIIId), Eastern Arctic (ICES areas I and II) and North Atlantic (ICES areas V-XIV and NAFO areas).

DTU Aqua is using the AgriFish Agency databases to combine logbook data with the sales slip data and vessel register data and has with this information created a database; the DFAD. Here total annual commercial landings by métier can be provided for all species and areas, according to level 2, level 3, level 4, level 5 and level 6, of geographical disaggregation according to Appendix II of Commission Decision 2010/93/EC. The figures are based on all recorded landings stored in this database. The recorded landings in this database are census data.

Results of the sampling in 2016 in relation to what was planned are presented in tables III.C.3, III.C.4, and III.C.6. The sampling achievements in 2016 were at a similar level compared to 2015, however the sampling design has changed since the reference years and therefore for some metiers/ area and stocks have large differences between the archived and applied sampling. This is especially the case for some pelagic stocks such as sandeel and Norway pout where the stock and quota fluctuates a lot between years. Denmark has initiated work to improve the sampling design of the commercial sampling following the outcomes of ICES WKACCU, WKPRECISE, WKCATCH, WKPICS, SGPIIDS and latest the FishPi programme. This outcome has since 2011 led to a gradually change from

an ad-hoc sampling programme to a statistically sound sampling in the observer programme where trips/vessel are the primary sampling unit within some pre-defined fleet lists. The draw list is pre-defined to account for unique vessels based on the fishery pattern the previous year, the same vessel cannot be present in more than one list and the lists are therefore relatively broad to hold the main activity within a fleet group. In 2016 Denmark applied seven fleet lists for the observer programme. As the vessels are randomly selected in a database based on last years fishery, large changes in fishing pattern between years can affect the sampling in a given year.

In 2014 the harbour sampling program was also changed from an ad-hoc quota sampling programme to a statistically sound sampling programme. The harbours were grouped in a list with small and large harbours. Harbours were only included in the sampling frame if they were part of the top 80% of the landings, trips and value per stock. Depending on the size of the harbour site (small or large) different effort was allocated to the harbour visits. As was the case for the observer programme the transition from one program to another is not finalised within one year and improvement in the harbour sampling program will be an ongoing process for the coming years. As an example it is not straight forward to follow the sale places, and to conduct a cost effective sampling programme it is of importance to locate places where the fish is sold in larger quantities and it is still possible to receive all correct information on fishing gear and area. A main overall reason for deviations from what was planned is that the sampling design is conducted on harbours sites (harbour * day) and fisheries (main fleets) and not on metiers and therefore the sampling by metier will be a post evaluation of the outcome in the sampling program. Also, to have a statistically sound sampling design, random sampling is one of the most important items, indicating that if sampling is random it is not always possible to target all events with the present effort. When sampling is conducted on shore; in harbours or at markets, all information on the metiers and fishing location are selected. However, the sampling scheme is not conducted by metier but by harbour and day and within a harbour and a given day, species and sorting groups are selected. Therefore, it can not always be ensured that all metiers be sampled or be encountered that all stocks targeted in the given program at every sampling event.

As the new system is selecting the vessels randomly, the logistics have become a bigger challenge as we have to travel more to Islands and enter the vessels from rather small ports. The numbers of different vessels selected for the observer program has increased with this new improved system. However, it has at least in the first year been at the expense of numbers of trips conducted. The main part of the deviations in 2016 from the aim is caused by the logistic more challenging system and that we now are not “hunting” the fish but are having harbour and week as our primary sampling unit and then measuring the fish present the given day

Baltic Sea (ICES areas III b-d)

III.C.1 Achievements: Results and deviation from NP proposal

Deviation from sampling on shore and at sea. The Danish sampling program is targeting vessels/ trips as the primary sampling unit this indicate that metier is not selected for in this system and we can therefore not guaranty that we will be able reach the planned numbers of trips proposed by metier. However, the total numbers of conducted trips should be similar to the proposed number.

The effort allocation in the harbour sampling programs is visits of marked days by a given harbour. Therefore, the information on both numbers of fishing trips by metiers and subareas from the harbours sampling program given in table 3.III.C are number of fishing trips sampled per domain. Denmark sample boxes and not fishing trips

at the auctions, boxes per size sorting and stock. This means that by change every single box sampled at a market*day could be from different fishing trips.

Detailed information on deviations by metier can be found in table 3.III.C

III.C.2 Data quality: results and deviation from NP proposal

One of the main quality improvement with a sampling schemes based on statistical principles is that it enables us to calculate unbiased estimators e.g. catch at age and discard amount. The sampling program may still be biased due to refusal, but refusals are now tracked and it is therefore possible to check for biases by comparing the VMS tracks and logbook information between vessels where observers are welcome and vessels that refuses to bring observers. In the former program although bias was anticipated it was not possible to quantify the level.

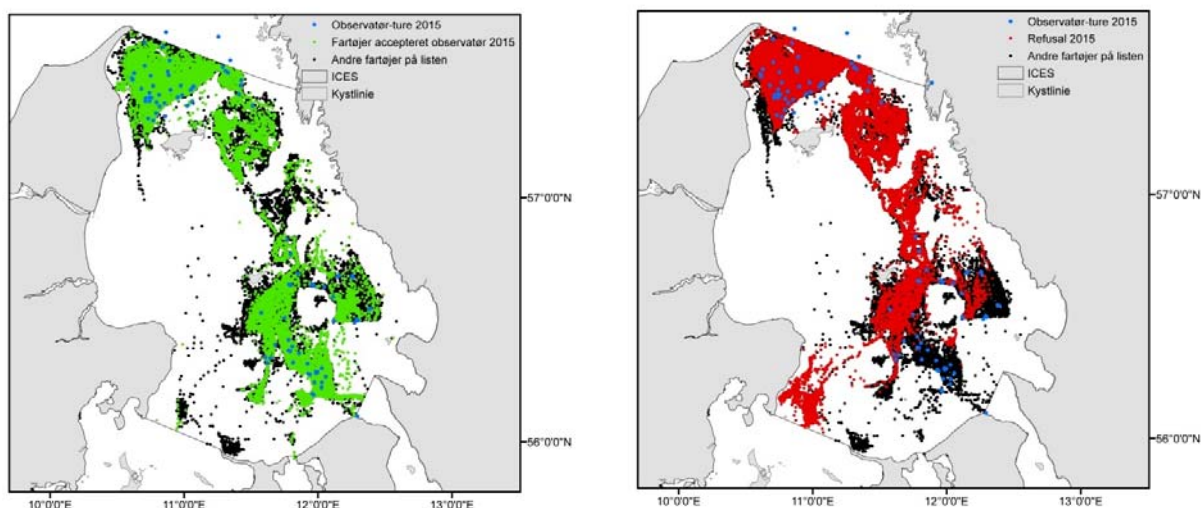


Figure 1. Comparison in VMS tracks between vessels agreeing to bring observers onboard (green dots), with vessels refusing to bring observers on-board (red dots) and the total fleet (black dots). Blue dots indicate hauls sampled by observers.

The quality from the harbours sampling program is further checked by post evaluation of the coverage where the sampled landings (red dots) by ICES square is compared with the landings per square from the logbooks (blue squares) in figures 1 and 2. From this figure it can be seen that cod is relatively well covered in the sampling program except in an area just east of Bornholm. Here the cod are landed in Poland and not sampled in the Danish sampling program.

Refusal rates are collected according to the recommendations in the SGPIIDS III report and the answers are divided in 6 categories; No contact, no contact information, not available, observer decline, industry decline and sampled.

Refusal rate from the trawler fleet list in the eastern Baltic has increased in 2016 to 22% compared to the later years 10-18%. The reason for the increase could be caused the landing obligation. An increase in refusal rate could off course have an effect on the estimate.

In the western Baltic Sea the refusal rate increased from 21% in 2015 to 26% in 2016.

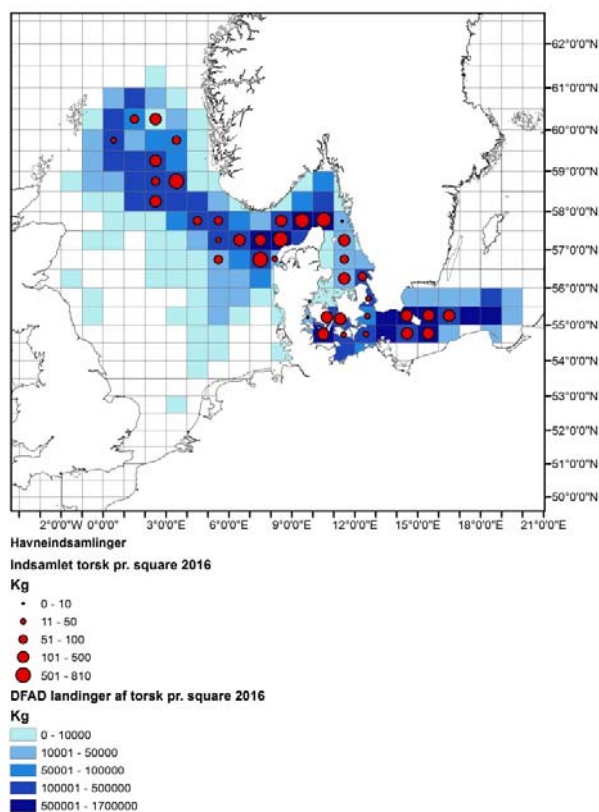


Figure2. Danish landings of cod by ICES square (blue squares) compared with the amount (in kg) of sampled cod by square (red dots).

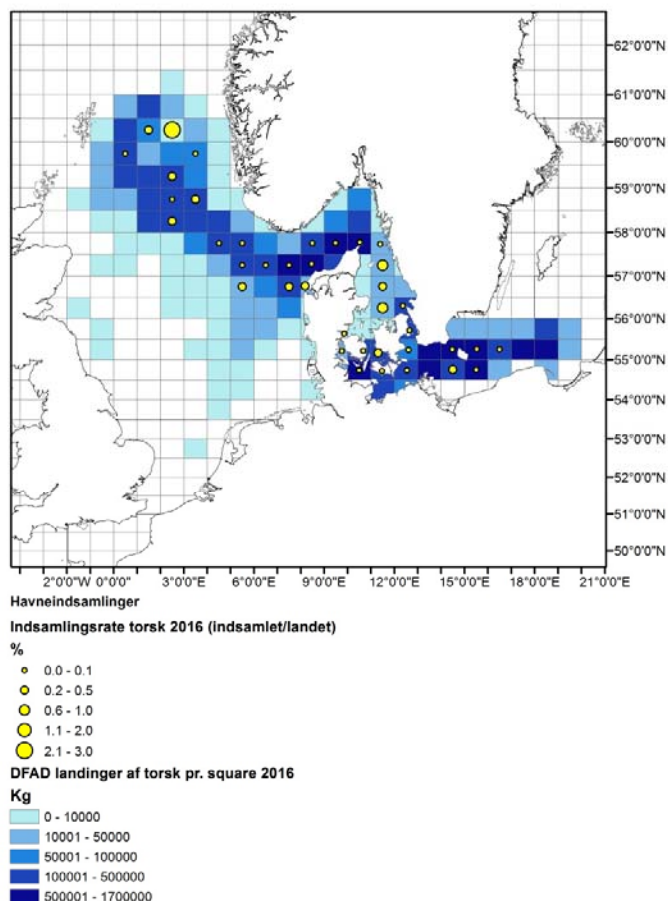


Figure 3. This figure shows the relative distribution of the harbour samples (yellow dots) compared to the landings (blue).

III.C.3 Follow-up of regional and international recommendations

Recommendations relevant to this chapter are listed in in table II.B.2.

III.C.4 Actions to avoid shortfalls

In 2010-2011 a proper statistically sound sampling frame was developed and implemented in the observer program. This has reduced some of the problems mentioned in ICES WKACCU and WKPRECISE and latest WKPICS in 2012 as to avoid shortfalls. However, the new sampling program has in practice been more difficult to implement than expected mainly, due to the increased logistics problems that arise when vessels are randomly

selected from a database (vessels with homeports on small islands, skippers that we do not normally have contact with ect.). However, some of the obvious pitfalls are avoided, such as only selecting a well-known part of the fleet, to have a clear procedure on how to follow up on refusal and to collect this information. Furthermore, Denmark is now weighing the possibility of selecting all active vessel equally although smaller vessels below 10 meters have been excluded. The main reasons to exclude the below 10 meters vessels are lack of logbooks and thereby gear information making it very difficult to ensure targeting the selected fishery. The advances with the system is the increased number of vessels included in the sampling as well as a documentation of the refusals. The numbers of vessels have increased by 30% since the change of the sampling programme and as it has been shown in other studies that the main part of the uncertainties is between vessels, it makes good sense to increase the number of unique ships to be sampled. Another reason for inconsistencies between planned no of trips and achieved number is the dynamic in the fishery making it difficult to predict spatial and temporal fishing patterns for some metiers at the time of planning the NP. However, with the new system we try to follow the fishery by calling the selected fisherman and if he is going on a trip, we are obliged to sample according to the DCF, we will conduct the trip although it is conducted in another area and with another metier. The improved Danish observer sampling program, in place since 2011, has incorporated refusal rates from the random selected fishermen giving a much better overview of the bias in the sampling program in connection to the sampling population and the coverage of this. In 2012 and 2013 some smaller improvements have been incorporated in the designs to make it more operational and user-friendly. The design has also been presented in international working groups (WKPICS I and II and SGPIDS III) where standardization towards other MS designs has been incorporated.

To decrease the refusal rates in the different frames effort has been taken place in 2016 to inform the fishermen on how the data is being used this has been conducted on local annual general meeting (AGM) in the fishermen's organisations and to meetings in a regional context.

In 2014 Denmark implemented a new harbour sampling program also probability based. The new harbour sampling design have optimised where to target the landed fish, however this have introduced some new challenges with lesser quality information in some sampling sites in connection to area and gear used in the fishery. This needs to be improved and could lead to a change in some of the sampling sites due to the low information quality.

North Sea (ICES areas IIIa, IV and VIId)

III.C.1 Achievements: Results and deviation from NP proposal

For more general deviations and results see text under the Baltic Sea. For detailed information on deviations by metier can be found in table 3.III.C

III.C.2 Data quality: results and deviation from NP proposal

As the sampling design implemented in Denmark in 2011 for the observer program and 2014 for the harbours sampling is in depended of area. The same issues from the Baltic Sea are relevant for the North Sea and East Arctic.

Refusal rates are collected according to the recommendations in the SGPIDS III report and the answers are divided in 6 categories; No contact, no contact information, not available, observer decline, industry decline and sampled.

Refusal rate from the beam trawler fleet list in the North Sea is relatively low and was recorded to 13% in 2016 the same level as in 2014 and 2015. For the combined trawler and Danish Seine list in the North Sea the refusal rate in 2016 was recorded to be 16% higher than last year's 14%. The refusal rate for the combined trawlers and Danish Seine in Skagerrak (IIIaN) has decreased from 29% in 2015 to 13% in 2016.

III.C.3 Follow-up of regional and international recommendations

Recommendations relevant to this chapter are listed in in table II.B.2.

III.C.4 Actions to avoid shortfalls

As the sampling programme is developed for the whole area the actions to avoid shortfalls are similar to the Baltic Sea.

North Atlantic (ICES areas V-XIV and NAFO areas)

III.C.1 Achievements: Results and deviation from NP proposal

Detailed information on deviations by metier can be found in table 3.III.C

III.C.2 Data quality: results and deviation from NP proposal

See Baltic section

III.C.3 Follow-up of regional and international recommendations

Recommendations relevant to this chapter are listed in in table II.B.2.

III.C.4 Actions to avoid shortfalls

See under Baltic Sea

III.D Biological - Recreational fisheries

In order to estimate the quarterly harvest of cod, eel, sea trout and since 2015 sharks and Baltic salmon (fish caught and kept) by Danish recreational fisheries an interview based recall survey has since 2009 been conducted by DTU Aqua in cooperation with Statistics Denmark. To estimate 2016 data two interview surveys were conducted in August 2016 and February 2017 respectively.

Statistics Denmark and DTU Aqua developed a concept for a combined telephone and internet survey for the Danish recreational fishery. To estimate the seasonal and annual fluctuations in the catches the survey is conducted on a biannually basis every year. Since 2013 the interview survey has been exclusively web based.

For 2016 two surveys were conducted resulting in recall periods on 7 - 8 months. The Baltic Salmon was included on a trial basis in 2015 as it has been considered a fishery not suited for the sampling approach used in present survey. This is simply because the fraction of anglers practicing this fishery is believed to be very low. The catch estimate should hence be interpreted with caution. The surveys have since 2010 also included the catches of sea trout in marine waters. Since 2015, second half catches of sharks have been included in the survey.

The interview survey presented in this report was separated into two different phases with their own questionnaires and targeting two different groups of respondents: 1) The Omnibus survey targeting a random subsample of Danish residents between 16 and 74 years of age and 2) Annual license holders. The omnibus was conducted four times

in 2009 and 2010 with similar results. It is assumed that the results from this interview are unlikely to change much from year to year. The license list survey is conducted biannually covering the period from January to June and July to December.

Anglers - domestic as well as tourists - between 18 and 65 years of age have to purchase a license for a year, week or day if fishing in the sea in Danish waters. All passive gear fishers have to have an annual license and you are not allowed to fish before the age of 12. The license is personal and non-transferable.

The results for 2016 will also be presented in the ICES group for recreational fisheries surveys WGRFS where data will be published.

The Baltic Sea and the North Sea and Eastern Arctic

III.D.1 Achievements: results and deviation from NP proposal

For the Baltic Sea, salmon, shark, eel and cod are to be reported and for the North Sea cod, shark, seabass and eel. There is no sharks in the Baltic Sea and therefore not sampled. For seabass in the North Sea information indicate negligible catches, but to ensure the correctness of this information Denmark has in 2017 started a screening on seabass catches. Denmark has provided data for the recreational harvest estimated for 2016. Data have been delivered to the relevant ICES working groups (WGBFAS and WGBAST) for them to include in the assessments. However, as the survey has only been conducted for a few years it has until now not been possible for the WG to use the data directly in assessment. Cod data has been suggested to be included for the western Baltic cod stock, in the WGBFAS, at the next benchmark and a meeting between Denmark, Sweden and Germany will be conducted in fall 2017 to verify the methods and data.

Table 1. Recreational fisheries quarterly cod harvest 2016 for different types of gear and license type.

Gear Type	Period	Baltic Sea harvest (tons)	The North Sea and Eastern Arctic harvest (tons)
Fykenets	1. Jan - Mar	2.7	0.7
Fykenets	2. Apr - Jun	0.2	0.0
Fykenets	3. Jul - Sep	25.1	1.4
Fykenets	4. Oct - Dec	2.7	0.4
Fykenets	Total	30.6	2.5
Gillnets	1. Jan - Mar	26.5	20.7
Gillnets	2. Apr - Jun	10.3	6.7
Gillnets	3. Jul - Sep	38.2	20.8
Gillnets	4. Oct - Dec	32.9	11.0
Gillnets	Total	107.8	59.2
Angling (passive gear licence)	1. Jan - Mar	22.8	33.2
Angling (passive gear licence)	2. Apr - Jun	25.6	50.0
Angling (passive gear licence)	3. Jul - Sep	26.5	49.0
Angling (passive gear licence)	4. Oct - Dec	27.1	20.5
Angling (passive gear licence)	Total	102.0	152.6
Angling (angling licence)	1. Jan - Mar	365.3	122.7
Angling (angling licence)	2. Apr - Jun	212.3	195.0
Angling (angling licence)	3. Jul - Sep	93.5	174.1
Angling (angling licence)	4. Oct - Dec	101.8	101.7
Angling (angling licence)	Total	772.8	593.3
Passive gear total	Angling	874.8	745.9
Angling total	Passive Gear	138.4	61.7
Grand total	Total	1013.2	807.7

Table 2. Recreational fisheries quarterly eel harvest for 2016.

Gear type	Period	Baltic Sea harvest (tons)	The North Sea and Eastern Arctic harvest (tons)
Fykenets	1. Jan - Mar	22.5	3.2
Fykenets	2. Apr - Jun	2.8	1.5
Fykenets	3. Jul - Sep	63.8	38.6
Fykenets	4. Oct - Dec	8.3	13.3
Grand total	Total	97.5	56.6

Table 3. Recreational fisheries quarterly seatrout harvest 2016 for different types of gear and license type.

Gear type	Period	Baltic Sea harvest (tons)	The North Sea and Eastern Arctic harvest (tons)
Fykenets	1. Jan - Mar	0.4	0.2
Fykenets	2. Apr - Jun	0.0	0.1
Fykenets	3. Jul - Sep	8.8	2.8
Fykenets	4. Oct - Dec	0.4	0.5
Fykenets	Total	9.5	3.6
Gillnets	1. Jan - Mar	9.9	9.0
Gillnets	2. Apr - Jun	8.2	4.4
Gillnets	3. Jul - Sep	27.2	16.9
Gillnets	4. Oct - Dec	2.4	5.2
Gillnets	Total	47.7	35.3
Angling (passive gear licence)	1. Jan - Mar	4.8	6.1
Angling (passive gear licence)	2. Apr - Jun	9.0	3.6
Angling (passive gear licence)	3. Jul - Sep	3.7	6.2
Angling (passive gear licence)	4. Oct - Dec	17.1	3.5
Angling (passive gear licence)	Total	34.6	19.4
Angling (angling licence)	1. Jan - Mar	95.8	33.9
Angling (angling licence)	2. Apr - Jun	60.3	43.6
Angling (angling licence)	3. Jul - Sep	50.3	16.8
Angling (angling licence)	4. Oct - Dec	25.0	8.5
Angling (angling licence)	Total	231.3	102.7
Passive gear total	Angling	265.9	122.2
Angling total	Passive Gear	57.2	38.9
Grand total	Total	323.1	161.1

The majority of recreational fishers in Denmark are occasional anglers using private boats or fishing from piers or using waders along the Danish coasts. A survey conducted by Bohn & Roth (1997) showed that around 1/3 of all recreational fishers were members of an association. In Denmark there are several associations for recreational fishers, with three dominant associations active in advisory committees to the government. These are the Danish

Anglers' Association, the Danish Amateur Fishers' Association and the Danish Recreational Fishers' Organization.

Sharks were included on a less comprehensive basis in the 2015 survey as no recreational fisheries are targeting sharks and out of more than 5000 respondents only 5 sharks were reported caught in the North Sea and Eastern Arctic.

Salmon was included in the survey in 2015, but as with sharks to get an indication of respondents participating in this fishery, as it was considered that the subsampling of the target frame used in the recall survey doesn't yield enough respondents. The marine recreational salmon fishery is limited to the Baltic Sea where the majority of the catches most likely origin from the trolling fishery with relatively few participants compared to other types of recreational fisheries. New methods (on-site survey) giving more detailed information from the Salmon fishery in the Baltic are being developed and tested in 2017 – 2018.

Salmon in the Baltic

The Danish recreational fishery for salmon is increasing in popularity, as catches have been increasing in recent years and the activity is further promoted by popular fishing tournaments. It is especially popular around the island Bornholm, but fishing also takes place further west in the Baltic Sea. The recreational fishery is primarily carried out by trolling from small boats and vessels. Some small harbours on the north and east of the island of Bornholm have specialized on servicing the trolling fishery.

The fishing season starts in September and ends in May. Both Danish nationals and foreign anglers attend the fishery, either for regular private fishing trips or as participants in angling competitions. In addition to angling, a traditional non-commercial long-line fishery with only a few hooks is carried out by locals part of the year around the island Bornholm.

Trolling: The official number of recreational caught salmon is 7500 per year (ICES, 2017). This information is based on data collected from larger trolling fishing competitions in the spring period and information on effort in the western part of the Baltic. More than 75 % of the total catches taken by the Danish trolling fishers were registered in three competitions. A new survey aiming to estimate the yearly salmon catch in the trolling fishery for salmon is running in 2017 – 2018.

Recreational long-line fishing: The yearly catch is estimated to be 500 salmon which should also be taken with some caution as no catches are reported at all.

The preliminary total number of Danish recreational caught salmon in the Baltic estimated using data from the recall survey is around 8,400. The number is estimated by extrapolating catches from 60 respondents to population level and hence should be interpreted with caution.

III.D.2 Data quality: results and deviation from NP proposal

The recall survey has been reviewed twice by the ICES group for recreational fisheries surveys WGRFS in 2014 and 2015 respectively and the conclusion was that data was suitable for implementation in assessment work if

supplemental data and verification of data is collected. The data for 2016 is available as quarterly weight of catch for cod, sea trout and eel with corresponding RSE values.

III.D.3 Follow-up of regional and international recommendations

Recommendations relevant to this chapter are listed in table II.B.2.

III.D.4 Actions to avoid shortfalls

Since 2009 Denmark has initiated a survey for sampling catch and effort data on the recreational fishery and it has been conducted biannually since 2010. In 2010 the survey was expanded to sea trout. However, the same level of knowledge has not been achieved for Salmon and a more statistical sound method to sample this fishery has to be developed.

III.E Biological - stock-related variables

To get catch-in-numbers (CANUM) and weight-in-catch (WECA) by age group, sampling of the landings and discards is undertaken. Although the landing obligation was initiated in 2015 for the Baltic area (cod and salmon) and for all pelagic the observer program has been maintained to ensure that the biological information on the discard fragment would still be obtained. For pelagic stocks simple random sampling is undertaken in land. Here an unsorted sample is taken by the control sent to DTU-Aqua and analysed at the institute. This sampling strategy is the case for sprat, sandell, herring, boarfish, and Norway pout. For sand-ell, sprat and Norway pout the sampling is supplemented by a self-sampling program sampling haul by haul and frozen directly. For all species landed by sorting groups another program is applied; A fixed number of fish boxes by selected species are sampled randomly within market size category (if sorted) /unit (unit =harbour, time). All individuals in a sample are analyzed according to length, weight and age for round fish and for flatfish 2 fish / cm / box is sampled for ages and individual weight. Sampling strategy on surveys and onboard fishing vessels differs from market sampling and was performed as follows all individuals (or a sub sample) were length stratified sampled by species and a fixed number per length class was sampled for age and weight. For stocks sampled on surveys and onboard fishing vessels, the length can be given an age by using an Age-Length-Key. Maturity data is only estimated on scientific surveys to achieve a higher expertise, the correct time of year and to be able to get non gutted fish.

International survey manuals give guidelines on number of individuals / length class to be sampled for age, sex and maturity. These were followed and the actual sampled number is therefore dependent on the amount of catch.

The Baltic Sea (ICES areas IIIb-d)

III.E.1 Achievements: results and deviation from NP proposal

All stocks sampled during 2016 for biological variables, age, length, weight, sex and sexual maturity are listed in table III.E.3. The variables are collected from different sources like survey, market or sea sampling and sampling strategy differs. For most stocks the sampling sources are listed and the results presented in separate rows. In table III.E.3 in the NP most consume species have listed survey and harbour sampling as data sources however for most of the consume species sea sampling should also have been listed as data source.

Detailed information on the deviations can be found in III.E.3.

III.E.3 Follow-up of regional and international recommendations

Recommendations relevant to this chapter are listed in table II.B.2.

III.E.4 Actions to avoid shortfalls

It is sometimes challenging to archive the correct level for sex and maturity. This is partly due to the fact that maturity is only measured at surveys (and often only in the 1st quarter survey – spawning time) and it can be challenging to plan exactly how many fish are caught during the survey.

Denmark has according to the guidelines outlined in the WGPICS1-3, SGPIDS1-3 and PGCCDBS developed and improved our sampling strategy in the national programs to be a random statistical sound sampling. This indicate that all vessels selected for commercial sampling are selected in a random way and that the responses are registered. For our harbour sampling program the statistically random sampling program has recently been developed.

For 2 stocks, the sole and the flounders extra effort has in 2016 been planned to increase the sampling level of fish. For sole the landings are so small that it has been very difficult the sample enough fish in the random harbour sampling program. Therefore, a new initiative has been launch in 2016 with a sole a reference fleet. This has led to an increased sampling level of sole in 2016. All flounders (also the human consumption fraction of the catch) in the Baltic have in 2016 been sampled from observer trips to ensure a better sample size.

The North Sea and Eastern Arctic (ICES areas IIIa, IV and VIIId)

III.E.1 Achievements: results and deviation from NP proposal

All stocks sampled during 2016 for biological variables, age, length, weight, sex and sexual maturity are listed in table III.E.3. The variables are collected from different sources like survey, market or sea sampling and sampling strategy differs. For most stocks the sampling sources are listed and the results presented in separate rows.

For detailed information on the deviations see III.E.3

Information on measured sharks and stingrays has like last year been included although not applied for as they are all appendix IV species. Both in surveys and at observer programs as by-catch they have been recorded.

III.E.2 Data quality: results and deviation from NP proposal

See Baltic section for general remarks. The numbers of unique vessels encountered with the new harbour sampling program has increased in the North Sea area but been at a similar level in the Baltic and inner Danish waters (figure 3). The reason for the latter is partly due to decrease in numbers of active vessels in this area.

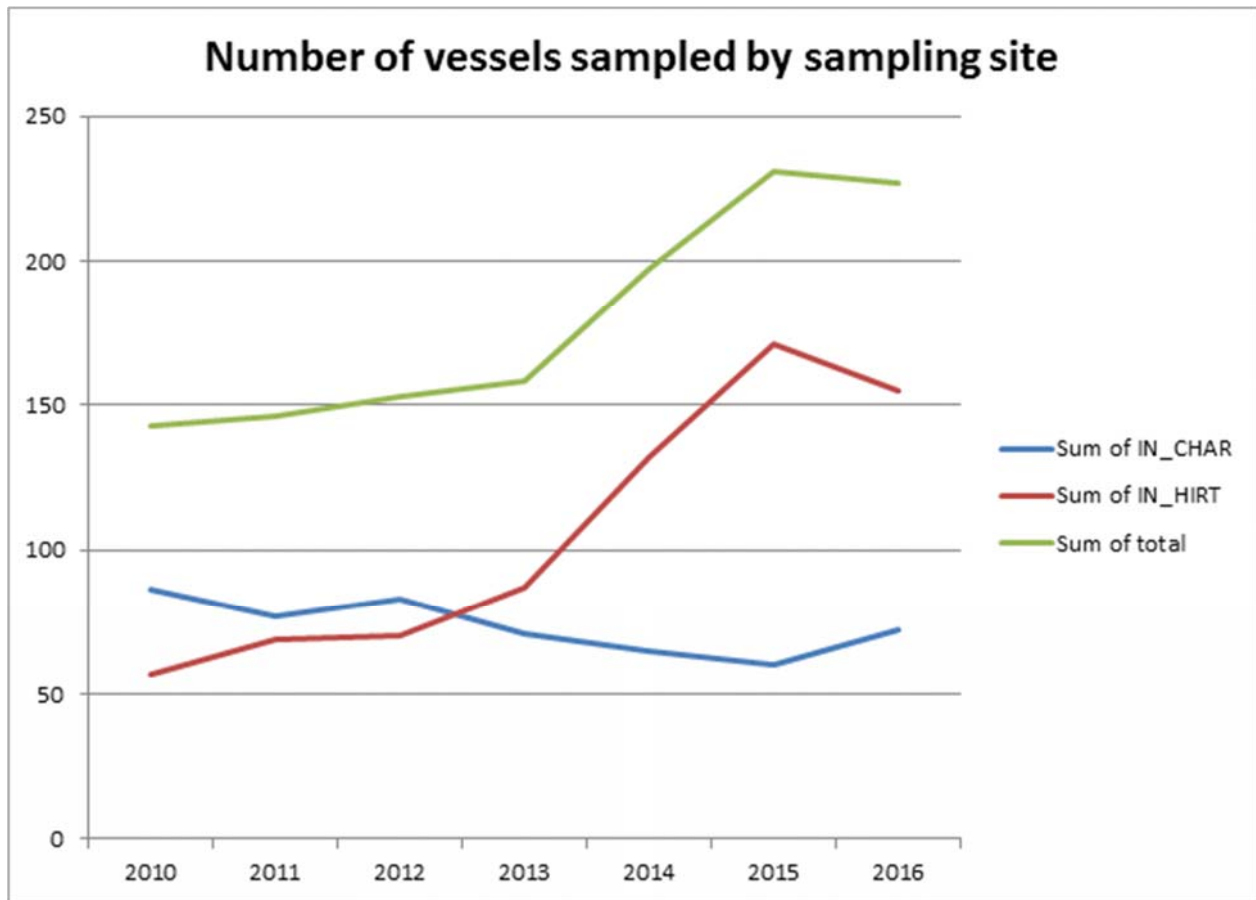


Figure 3. Numbers of vessels encountered at sampling sites by year. Purple line indicate the total numbers of unique vessels sampled, the green line is numbers of vessels sampled in the North Sea and Eastern Arctic, the orange line is in the Baltic sea.

III.E.3 Follow-up of regional and international recommendations

Recommendations relevant to this chapter are listed in in table II.B.2.

III.E.4 Actions to avoid shortfalls

See section III.E.4. Baltic

The North Atlantic (ICES areas V-XIV and NAFO areas)

III.E.1 Achievements: results and deviation from NP proposal

For detailed information see III.E.3

III.E.2 Data quality: results and deviation from NP proposal

III.E.3 Follow-up of regional and international recommendations

None of the recommendations are relevant to Denmark, as Denmark has only had a fishery for boar fish and blue whiting.

III.E.4 Actions to avoid shortfalls

None.

III.F Transversal variables

III.F.1 Capacity

III.F.1.1 Achievements: results and deviation from NP proposal

No shortfalls and/or deviations exist in relation to what was stated in the national programme.

III.F.1.2 Data quality: results and deviation from NP proposal

As the information in the Vessels Register is registered according to Regulation (EC) N° 2930/1986, N° 2090/1998 and N° 26/2004 and is updated daily data on fishing capacity is assumed to be correct

Therefore, no deviations exist in relation to what was stated in the national programme.

III.F.1.3 Actions to avoid shortfalls

No action is needed.

III.F.2 Effort

III.F.2.1 Achievements: results and deviation from NP proposal

If a vessel less than 10 m (or less than 8 m in the Baltic) is having at least one sales note at a calendar day, a fishing day is assumed and counted as one fishing day.

According to the Danish NP the following derogations have been asked:

‘Hours fished’: It is not possible to estimate ‘Hours fished’ since this is not recorded in the Danish logbooks and according to the EU logbook regulation it is not mandatory to record that. Therefore, Denmark request for derogation for recording and submitting “Hours fished”.

The variables concerning numbers of gear (‘Number of rigs’, ‘Number of fishing operations’, ‘Number of nets, length’, ‘Number of hook, number of lines’, ‘Number of pots, traps’) and ‘Soaking time’ are not recorded in the Danish logbooks. According to the EU logbook regulation it is not mandatory to record this detailed information. Therefore, Denmark request for derogation for recording and submitting this information

As the Danish NP has been approved the above derogation has been granted.

Therefore, no deviations in relation to what was stated in the national programme exist.

III.F.2.2 Data quality: results and deviation from NP proposal

All logbook data is recorded in accordance with the provisions in the Control Regulation (Commission Regulation (EC) N° 404/2011). Even though effort from the national authorities is put into the improvement of the fishers logbook recordings errors might occur. The obligation to use e-logbook for all vessels above 12 meter in length will most likely improve the quality of the data. Still improvements can be made, but this needs a revision of the Control Regulation (Commission Regulation (EC) N° 404/2011).

III.F.2.3 Follow-up of regional and international recommendations

No relevant recommendations have been made about the collection of effort data.

III.F.2.4 Actions to avoid shortfalls

According to the Danish NP no shortfalls have occurred.

III.F.3 Landings

III.F.3.1 Achievements: results and deviation from NP proposal

In Denmark first hand fish buyer has to report to the authorities the amount of fish in kilo and value, the size grade, the quality, the area of origin, from whom the fish is bought from as well as other information. The volume of fish landed in Denmark has always been recorded using sales slips as sales slips information is 100% accurate. Logbook data is only used to determine which métier and statistical rectangle the amount in weight and value according to the individual sales slip should be related to. There have been no deviations in relation to what was stated in the national programme.

III.F.3.2 Data quality: results and deviation from NP proposal

All fish landed in Denmark is recorded, therefore census data. No deviations in relation to what was stated in the national programme exist.

III.F.3.3 Follow-up of regional and international recommendations

No related recommendations have been made about the collection of landings data.

III.F.3.4 Actions to avoid shortfalls

As no shortfalls have happened no actions have to be made.

III G Research surveys at sea

III G 1 Achievements: results and deviation from NP proposal

In table III.G.1 an overview is given of the planned and achieved numbers of days at sea and the number of fishing hauls, transects length with acoustic data integration (Echo NM) or number of stations.

The biological data from surveys are stored in the national biological database “Fiskeline”. The BITS and IBTS survey data have been submitted to ICES and are stored in the ICES DATRAS database.

The acoustic data are stored in a national acoustic database for later submission to a data base at ICES which is currently under development.

MIK data are stored in a national database for later and have been submitted to the international coordinator.

CTD and other hydrographical and meteorological information are stored in national databases and the CTD profiles from the BITS, IBTS, Norwegian Sea and NS-Acoustic surveys and have been submitted to the ICES oceanographic database.

Detailed information on marine litter for the IBTS and the BITS surveys have been submitted to the ICES DATRAS database.

Baltic International Trawl Survey (BITS)

The survey is carried out in both the first and fourth quarters with participation of the research vessel R/V DANA and the smaller research vessel R/V HAVFISKEN. The primary purpose of the part undertaken by R/V DANA is to estimate abundance indices for recruitment and stock abundance of the Baltic cod stocks. The second part undertaken by R/V HAVFISKEN provides in addition to cod also abundance indices for flatfish. The BITS survey is coordinated by the ICES Baltic International Fish Survey Working Group.

Types of data collected:

- Species composition
- Length and age measurements
- Samples of cod for estimating age composition, stomach content, sex ratios, maturity and growth parameters
- Information about litter
- Plankton and fish larval CPUE
- Acoustic information
- CTD: temperature, salinity and dissolved oxygen content

Achievements in 2016:

In the summary table below the number of planned and achieved days at sea and the number of valid fish hauls on R/V DANA and R/V HAVFISKEN are listed (Number of stations not fished due to bottom oxygen < 0.5 ml/l given in brackets).

Survey	Vessel	Planned days at sea	Achieved days at sea	Planned fish hauls	Achieved fish hauls
BITS 1 st quarter	Dana	18	18	50	49 (0)
BITS 1 st quarter (KASU I)	Havfisken	20	16	49	57
BITS 4 th quarter	Dana	18	18	50	56 (13)
BITS 4 th quarter (KASU II)	Havfisken	20	19	49	56

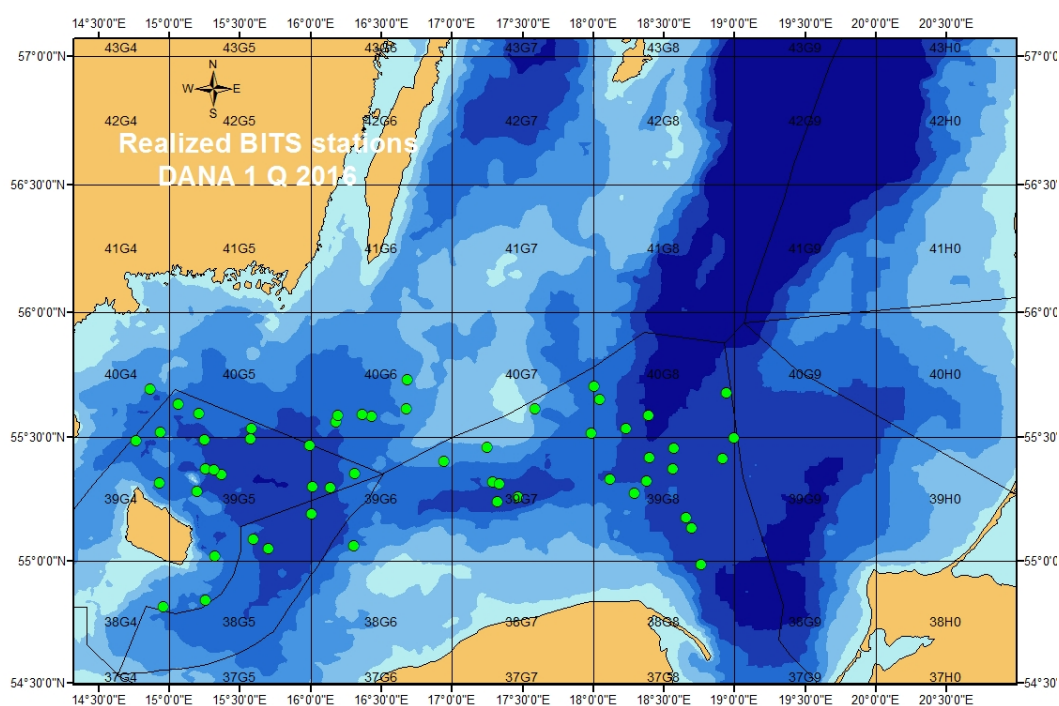


Figure III.G.1 BITS 1st quarter 2016 RV Dana bottom trawl positions.

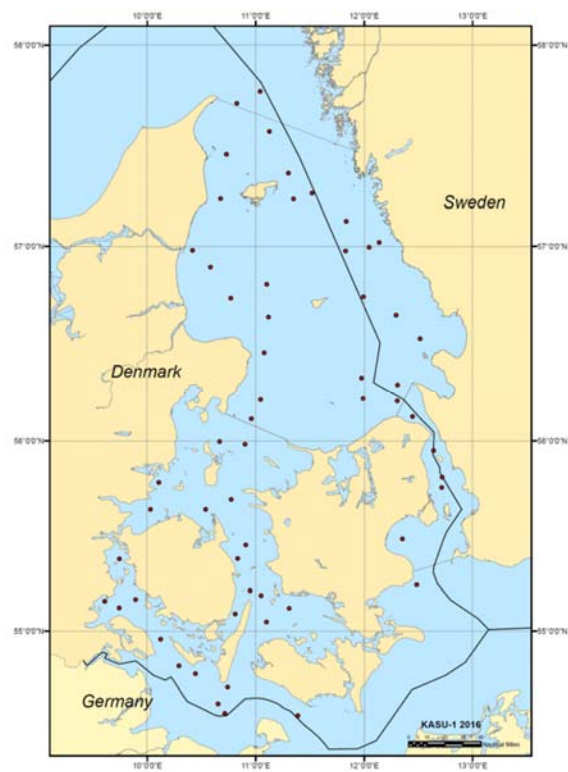


Figure III.G.2 BITS 1st quarter 2016 RV Havfisken bottom trawl positions.

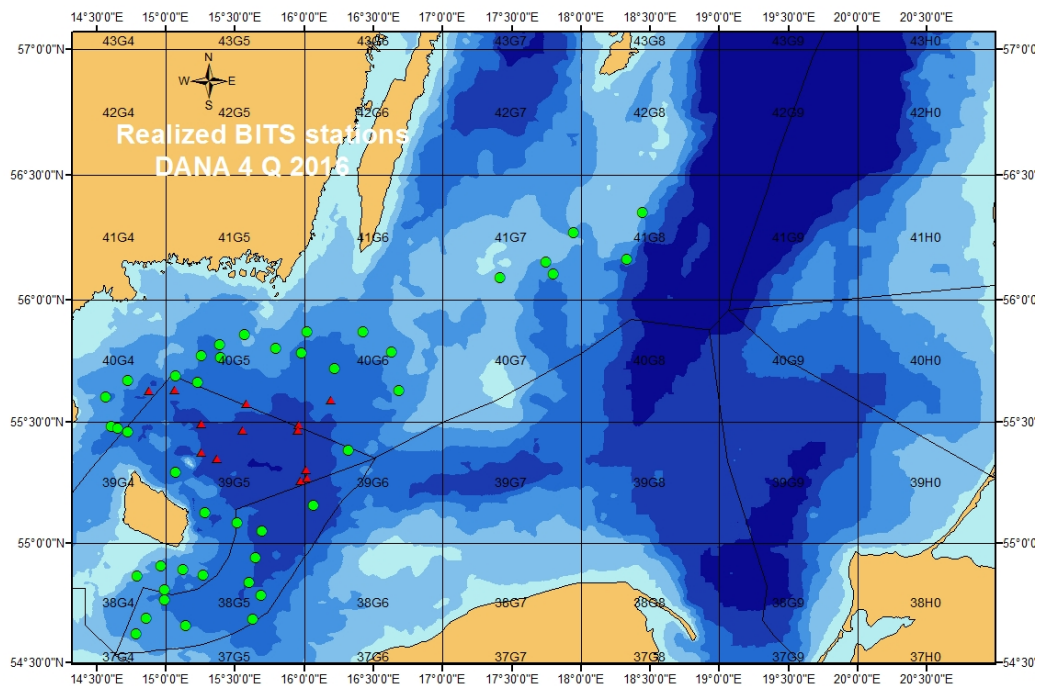


Figure III.G.3 BITS 4th quarter 2016 RV Dana bottom trawl (green circles) and CTD positions (red triangles: bottom oxygen < 0.5 ml/l)

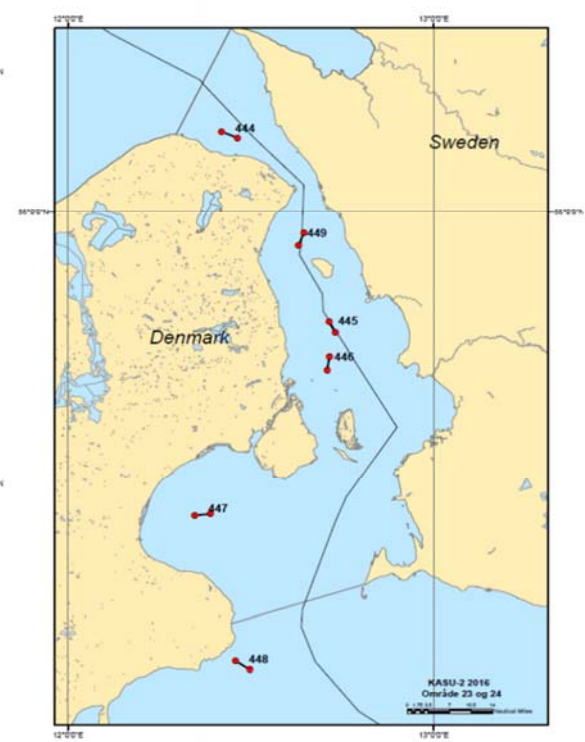
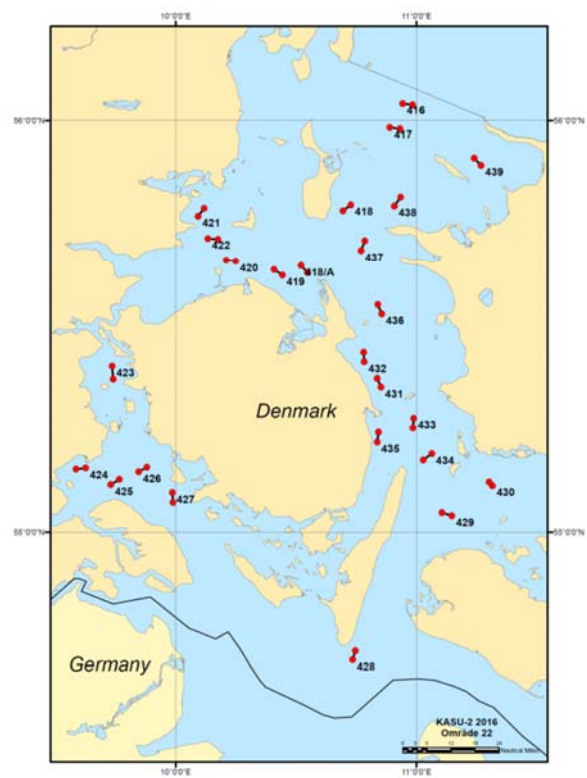
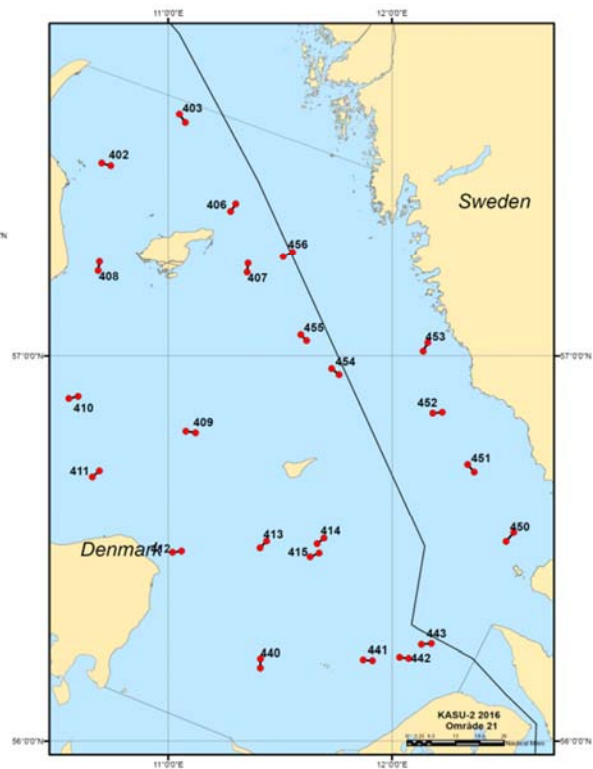
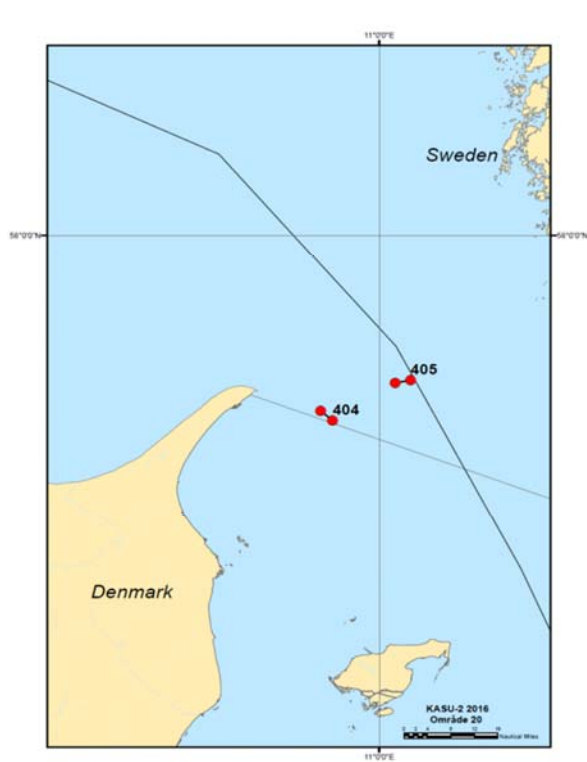


Figure III.G.4 BITS 4th quarter 2016 RV Havfisker bottom trawl positions.

International Bottom Trawl Survey (IBTS)

The purpose of the survey is to estimate abundance of commercial (cod, haddock, whiting, Norway pout, saithe, herring, sprat, and mackerel) and non-commercial fish species by means of bottom trawling and to collect otoliths of commercial species to assess abundance by age, in particular for the recruiting year classes in the North Sea, Skagerrak and Kattegat. It is a trawl survey using GOV-trawl. The IBTS survey is coordinated by the ICES International Bottom Trawl Survey Working Group.

Types of data collected:

- Species composition
- Length and age measurements
- MIK: plankton, fish larvae (only first quarter)
- CTD: temperature and salinity at fishing stations

RV Dana covered the area allocated to Denmark by the coordinator as planned in the 1st and 3rd quarter 2016 (Figs. III.G.5 and III.G.6).

The exceptional good weather conditions for this time of the year made it possible to complete the sampling program for the 1st quarter survey ahead the original schedule. In the 3rd quarter survey several stations were fished with 15 min tow duration instead of the standard 30 min tow duration. This resulted in a higher number of stations than usual and was done following the decision of IBTSWG and the rectangle and tow duration allocation received from the 3Q NS-IBTS.

Achievements in 2016 (number of days at sea and number of valid trawl stations):

Survey	Vessel	Planned days at sea	Achieved days at sea	Planned fish hauls	Achieved fish hauls
IBTS 1 st quarter	Dana	18	16	40	41
IBTS 3 rd quarter	Dana	18	18	50	59

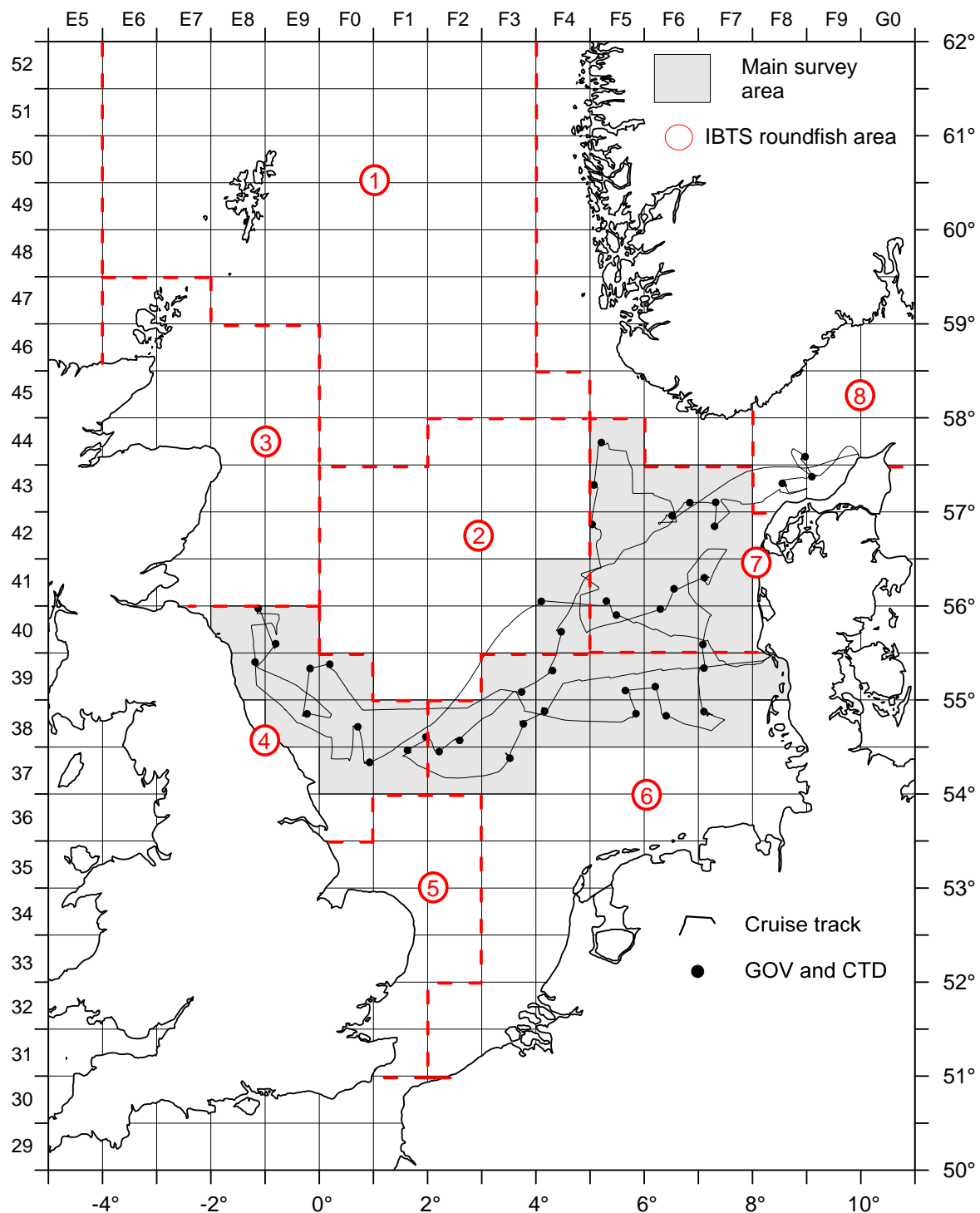


Figure III.G.5 IBTS 1st quarter 2016 RV Dana survey area, cruise track, valid GOV bottom trawl haul and CTD positions.

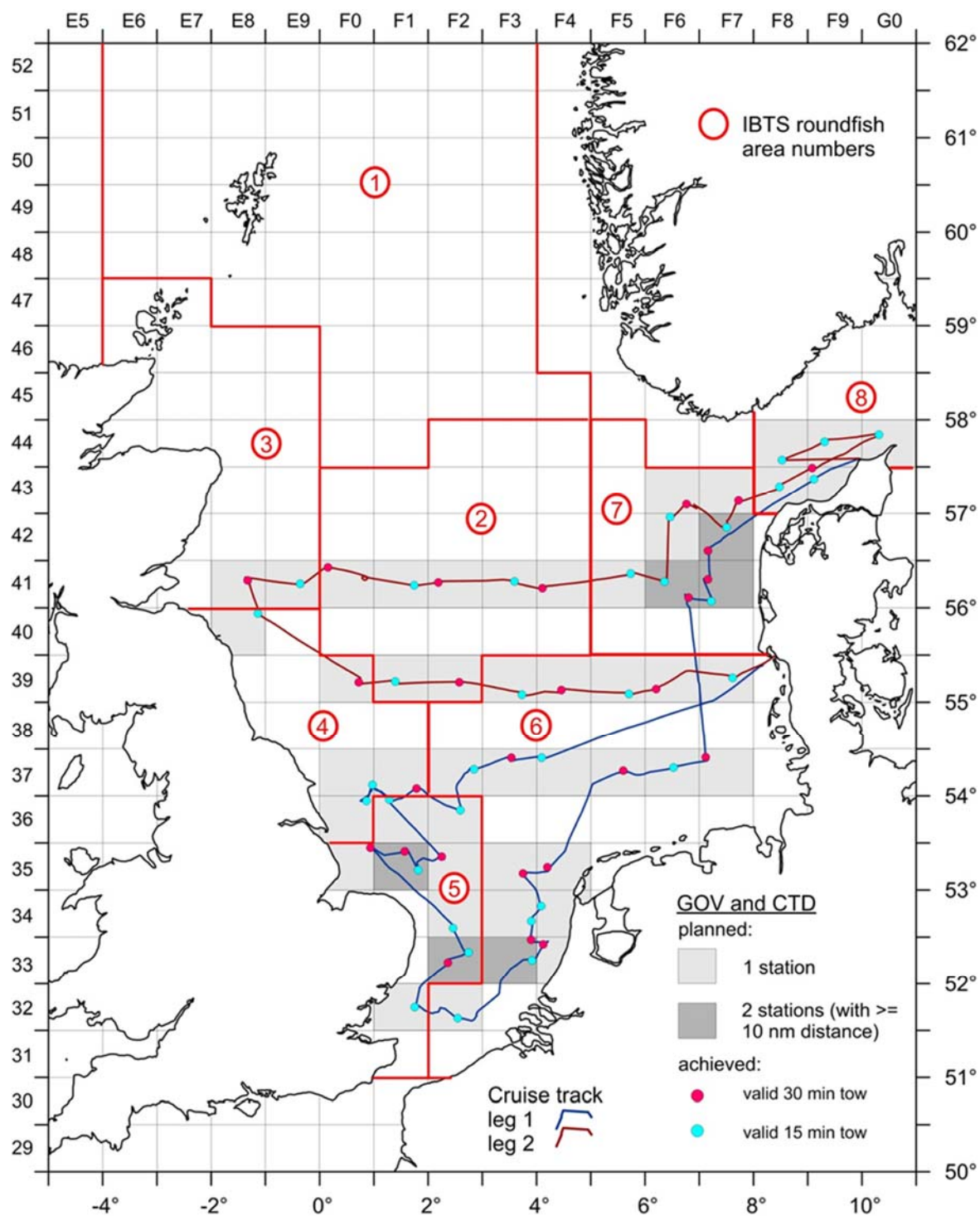


Figure III.G.6 IBTS 3rd quarter 2016 RV Dana survey area, cruise track, GOV bottom trawl haul and CTD positions.

International Ecosystem Survey in the Nordic Seas (IESNS, previously ASH)

This survey is carried out in order to investigate distribution and migrations of the Atlanto-Scandian herring, blue whiting and other pelagic fish and to produce a biomass index for herring and a recruitment index for blue whiting for the Working Group on Widely Distributed stocks (WGWIDE). Furthermore, hydrographic conditions and plankton abundance in the Norwegian Sea and adjacent waters are monitored in order to investigate distribution and migration of herring and other pelagic fishes are influenced by environmental conditions.

The survey was coordinated with Norway as an international survey with participation of Norway, Iceland, Faroe Islands and EU, where the Danish R/V Dana conducted the EU survey part. The survey is coordinated by the ICES Working Group of International Pelagic Surveys, WGIPS, (previously WG on North East Atlantic Pelagic Ecosystem Surveys, WGNAPES). The survey is carried out as a joint EU survey with participation of UK, Ireland, Netherlands, Germany, Sweden and Denmark.

Types of data collected:

- Acoustic data
- Biological data: species composition, length measurements
- For herring and blue whiting samples following parameters was measured on 50 individuals from each haul: length, weight, sex, maturity and age (from scales of herring and otoliths of blue whiting)
- Zooplankton using a WP2 net
- CTD: hydrographical data

Achievements in 2016:

- 30 days at sea (as planned incl. calibration; 21 effective survey days in the working area)
- 33 pelagic trawl hauls
- 34 CTD stations
- 34 WP2 stations
- 3470 Nm acoustic integration

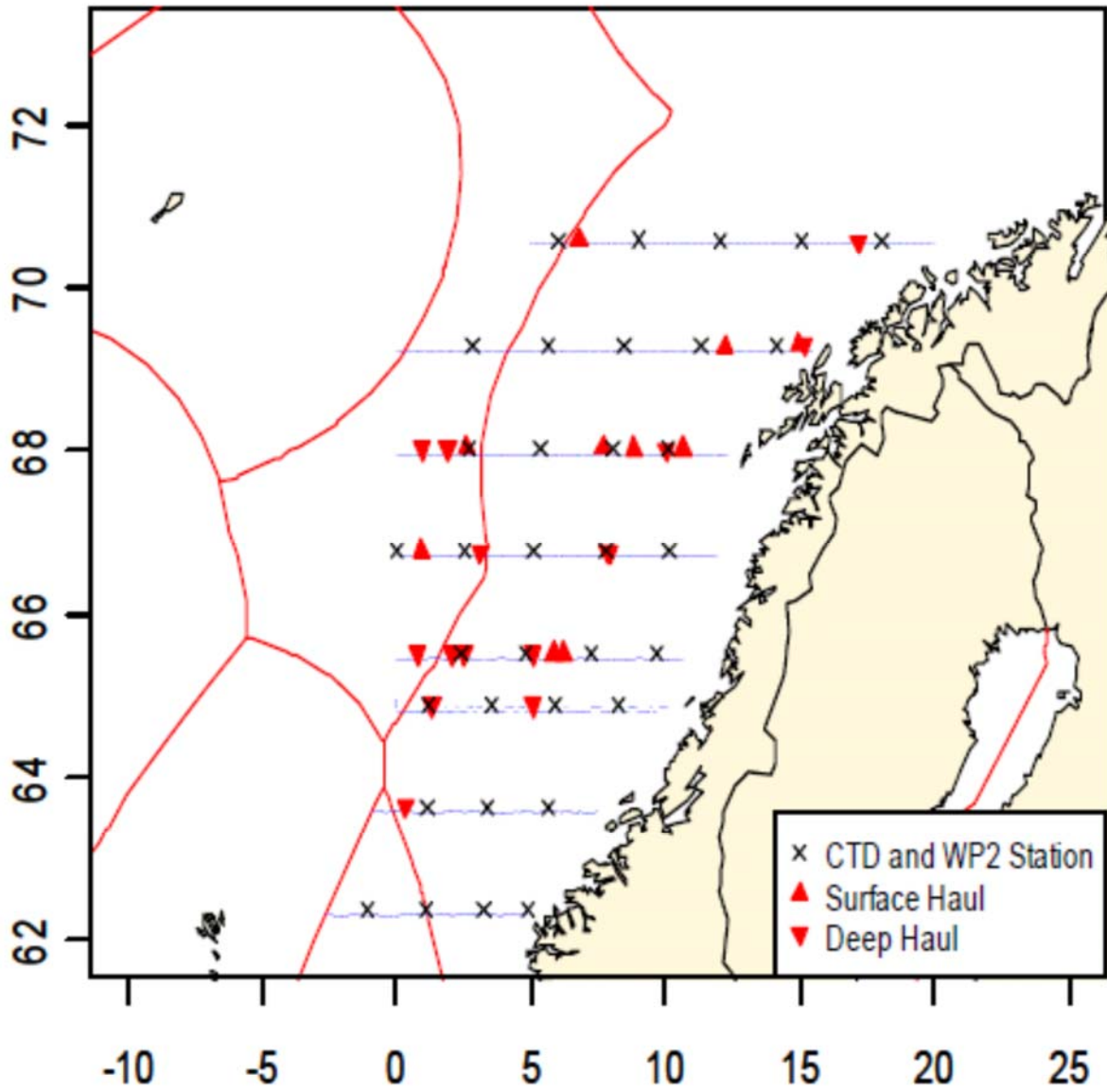


Figure III.G.7 RV Dana IESNS 2016 acoustic transects, pelagic trawl, CTD and WP2 stations.

International herring larvae survey (IHLS)

The sampling for the International herring larvae survey was done during the 1st quarter IBTS. 82 valid tows with the MIK (2 m ringnet) were conducted in 2016 (Fig. III.G.8).

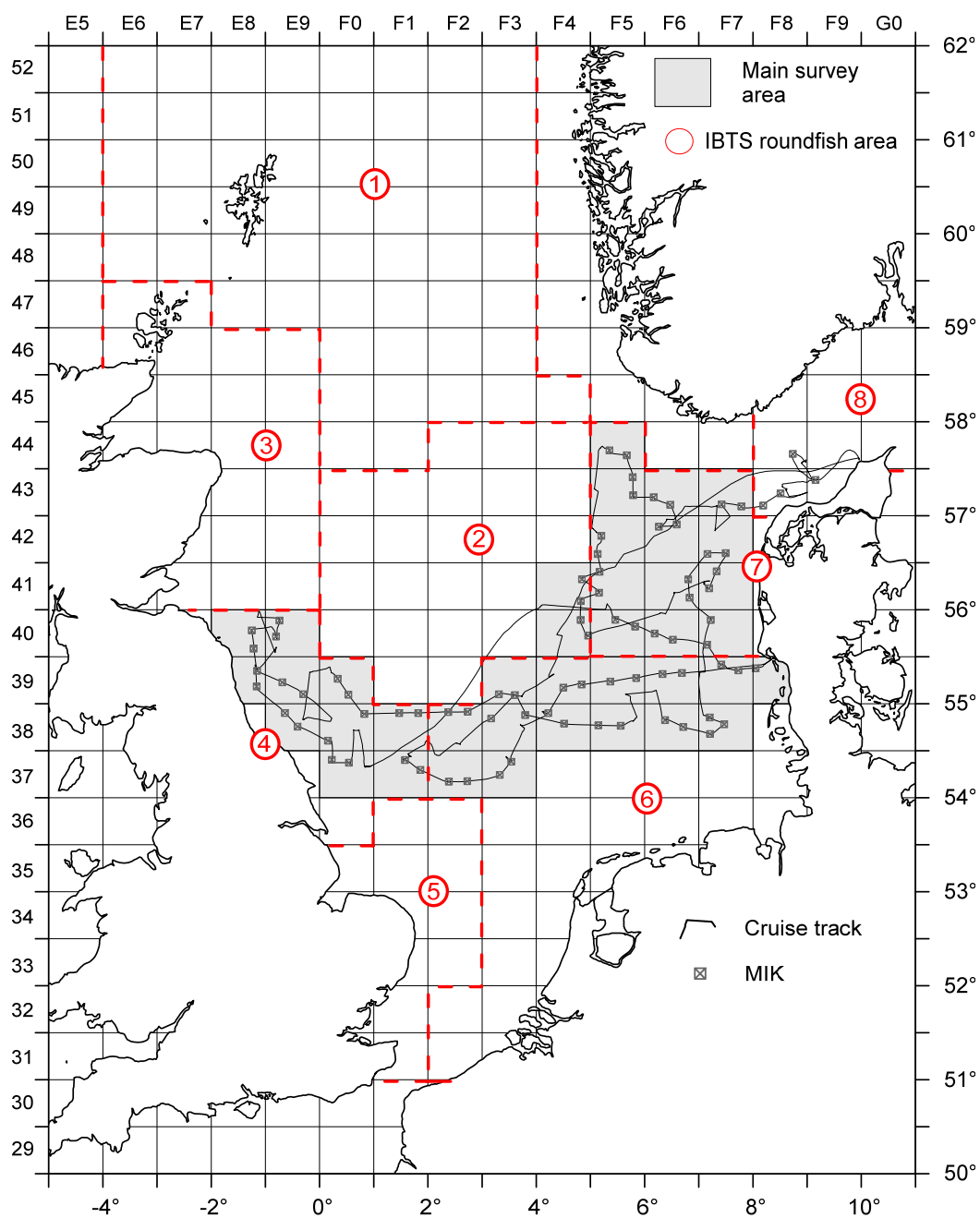


Figure III.G.8 IBTS first quarter 2016 RV Dana survey area, cruise track and MIK haul positions.

NS Herring Acoustic Survey (NHAS)

The purpose is to provide acoustic abundance estimates of herring and sprat in the North Sea (eastern part), Skagerrak and Kattegat. The survey is coordinated by the ICES Working Group for International Pelagic Surveys, WGIPS, and is a part of the international acoustic survey of the North Sea and adjacent areas.

Types of data collected:

- Acoustic data
- Biological data: species composition, length measurements, and for herring, sprat and mackerel: age and maturity measurements
- Hydrographical data using CTD
- Plankton samples using WP2 net

Achievements in 2016:

- 14 days at sea (as planned)
- 40 trawl hauls
- 40 CTD stations
- 20 WP2 stations
- 1760 Nm acoustic integration

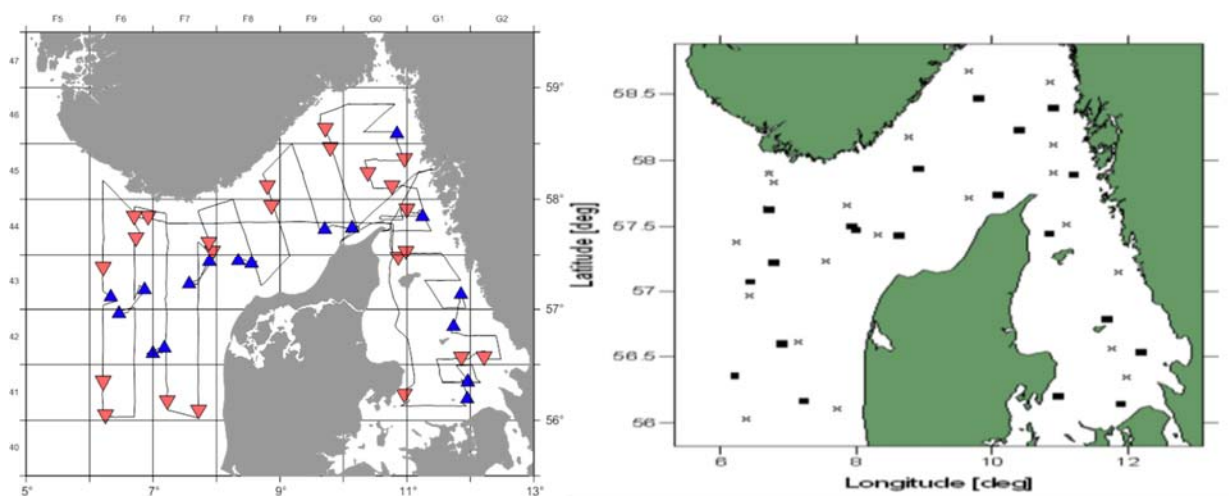


Figure III.G.9 RV Dana NHAS 2016 survey track, trawl locations (red triangles: pelagic trawl, blue triangles: bottom trawl) and CTD as well as plankton (WP2) sample positions (x are CTD stations and squares are combined CTD and WP2 stations).

Baltic International Acoustic Survey (BIAS)

Denmark has participated with one scientific staff member on the German R/V Solea in 2016.

International blue whiting spawning stock survey (IBWSS) in areas VI and VII

Denmark has participated with one scientific staff member on the Dutch R/V Tridens and the Irish R/V Celtic Explorer in 2015.

Nephrops UWTV survey in functional unit 3 and 4

The purpose of the survey is to estimate the abundance of *Nephrops* in Skagerrak and Kattegat. An underwater video technique is used and later the video footage is analysed in laboratory to estimate the *Nephrops* abundance in selected subareas. The subareas cover the main *Nephrops* fishing grounds in the Skagerrak and the Kattegat and station allocation follows a random design. Survey and data analysis is conducted in close cooperation with Sweden and coordinated by ICES WGNEPS since 2012. The Danish 2016 survey was conducted with R/V Havfisker in May. Since the new Havfisker allows 24 h operation, the survey was completed in about half of the number of days than before.

Achievements in 2016:

- 7 days at sea
- 105 stations (planned: 110).

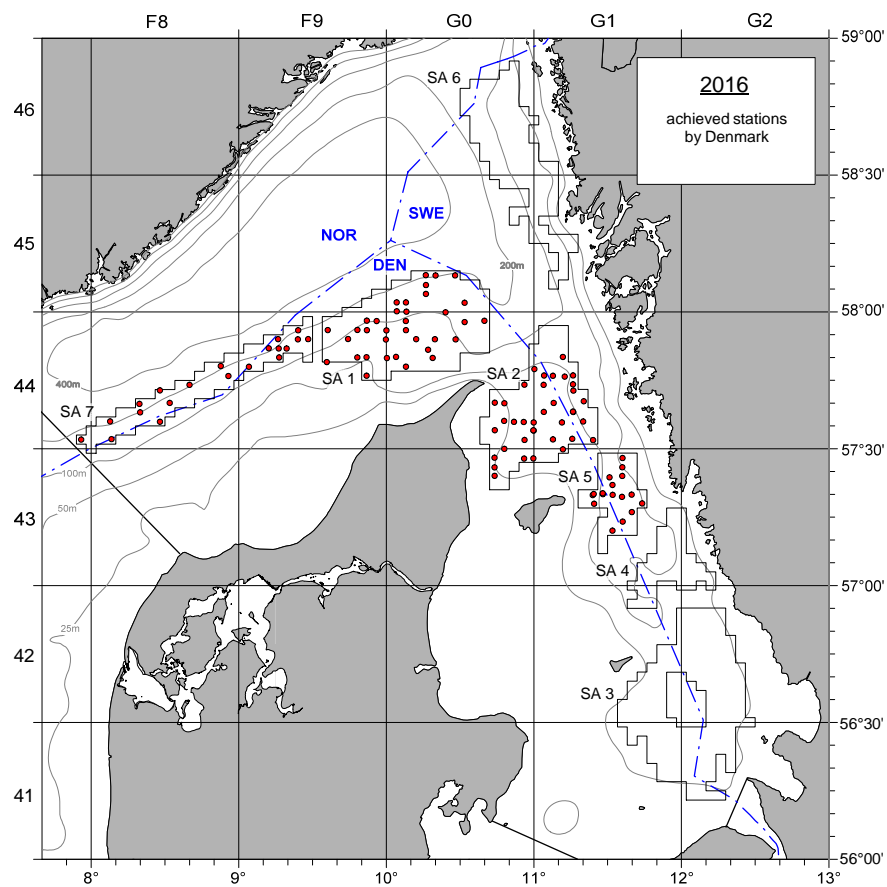


Figure III.G.10 Sampling locations in the 2016 *Nephrops* UWTV survey with RV Havfisken (SA: subarea; subareas 3, 4 and 6 covered by Sweden).

North Sea sandeel survey

The purpose of the sand eel dredge survey is to collect sand eels buried in the seabed and compare catches (number and age composition) with the previous year's collections to assess year class strength of the lesser sand eel (*Ammodytes marinus*) in the different areas adopted by ICES in 2009. Data from the dredge survey is the basis for calculating a 0-group index, which is used in stock assessment. The survey was again conducted with the commercial fishing vessel Salling.

Achievements in 2016:

- 23 days at sea (planned: 24)
- 270 dredge hauls distributed over 90 sample positions
- 27 sediment grab samples

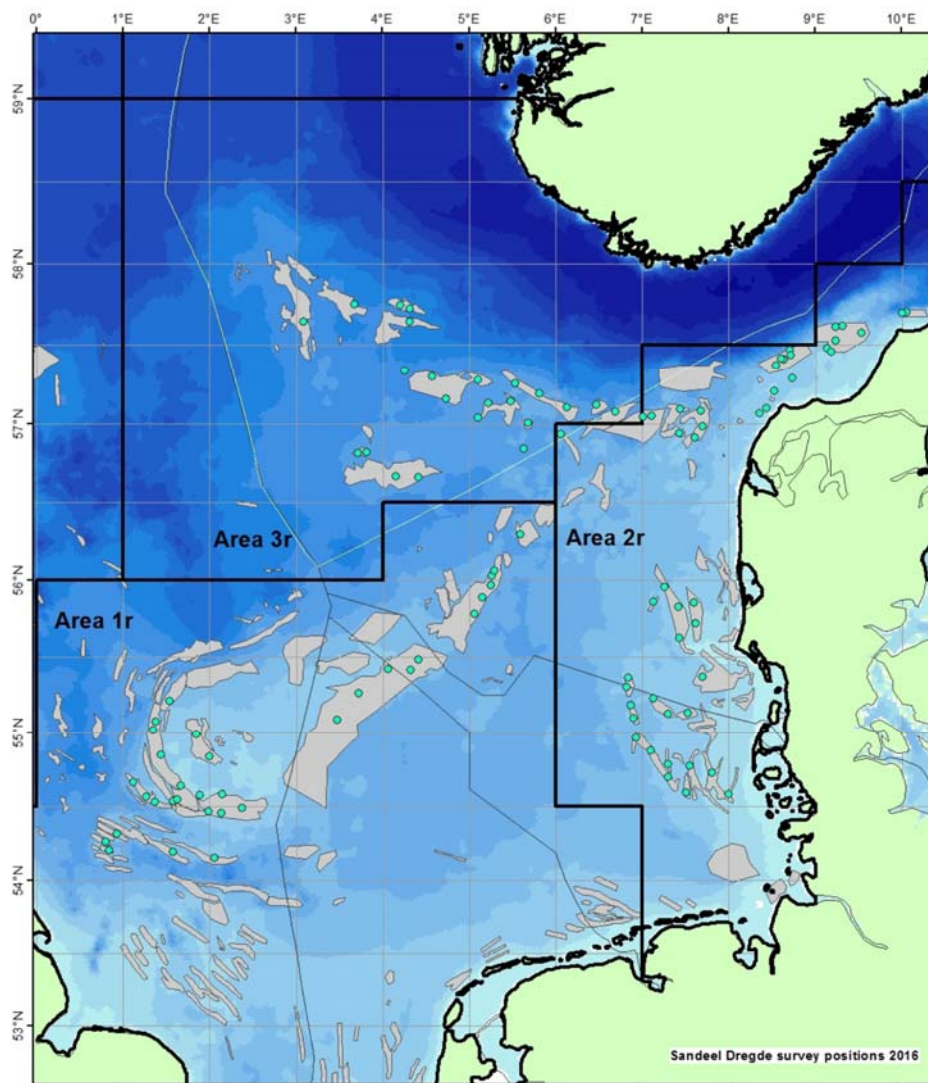


Figure III.G.11 Sampling locations in the 2016 sandeel survey with the commercial fishing vessel Salling (green circles).

Sole survey in IIIa

A survey series targeting sole in Kattegat and Skagerrak was initiated in 2004 in order to establish a time series of catch and effort data independent of the commercial fishery. The survey is conducted at night where sole are active. The survey is the main input to the Kattegat – Skagerrak sole assessment. The number of stations was reduced from 116 to 80 in 2011 but this did not change the overall trends for the most common commercial species. There were no surveys conducted in 2012 and 2013. The surveys were resumed in 2014. In 2016 the survey was conducted with one commercial trawler and RV Havfisken both using the same type of equipment, and additional stations were placed in the Jammerbugt and the northern part of the Storebælt.

Achievements in 2016:

- 24 days (planned: 24)
- 69 bottom trawl hauls were conducted at standard positions (planned: 80).

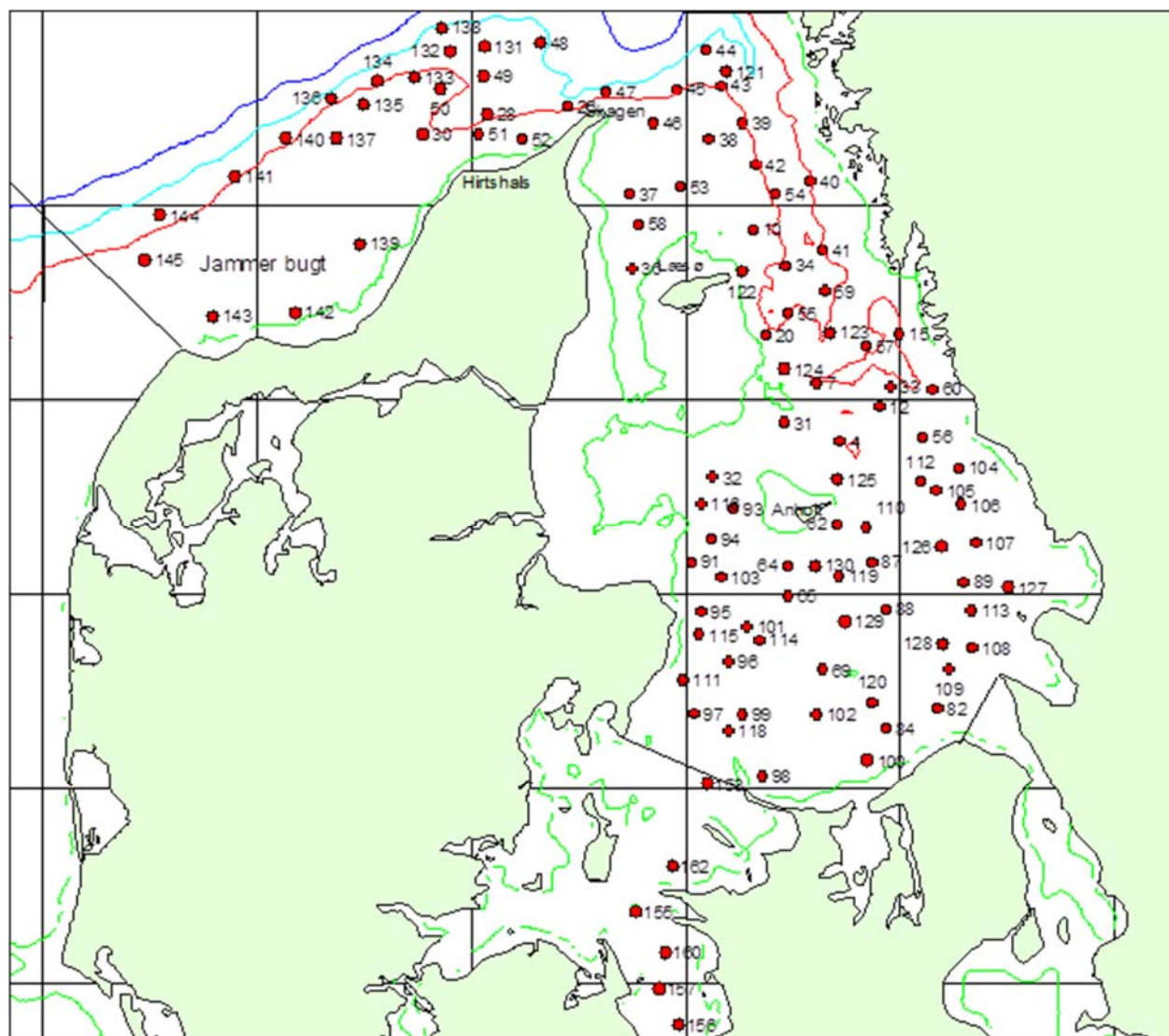


Figure III.G.12 Distribution of stations in 2016 (stations 40, 89, 106, 107, 108, 109, 113, 126, 127 and 128 were not covered because permission for Swedish coastal waters was not received).

Cod survey in IIIa south

The survey is a combined Danish- Swedish fisherman-scientist survey. The goal of the Kattegat cod survey is to estimate the abundance, biomass and distribution of cod and to establish a fisheries independent time series of

catch and effort series. Furthermore, a recruitment index is established. The results has for the first time in 2015 been used, together with commercial catch and effort data, to strengthen the scientific advice on the cod stock in Kattegat. Initially, 4 commercial trawlers (2 Swedish and 2 Danish) participated in the survey. In 2016, Sweden continued to use commercial vessel whereas Denmark used the new research vessel RV Havfisker but with the same trawl as previously on the commercial vessels.

Achievements in 2016 by Denmark:

- 12 days at sea (planned: 12)
- 40 bottom trawl hauls (planned: 40).

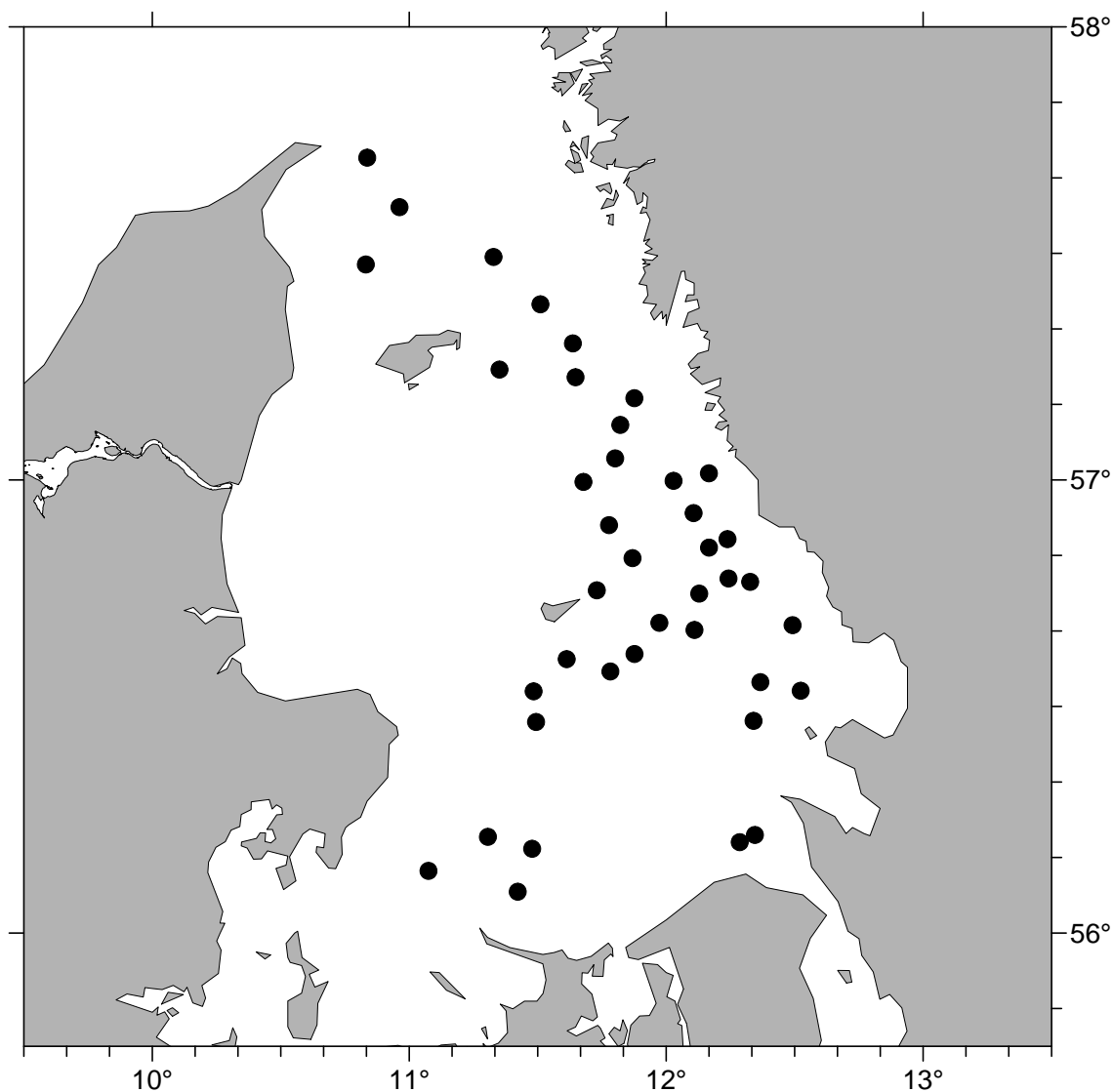


Figure III.G.13 Cod survey bottom trawl stations covered by RV Havfisker in 2016.

III G 2 Data quality: results and deviation from NP proposal

No serious data quality problems or deviations from the NP occurred in 2016.

III G 3 Follow-up of Regional and international recommendations

All surveys were conducted according to international or national manuals and guidelines.

III G 4 Action taken to avoid shortfalls

None.

IV. Module of the evaluation of the economic situation of the aquaculture and processing industry

IV.A Collection of data concerning the aquaculture

IV.A.1 Achievements: Results and deviation from NP proposal

There are no deviations in the achieved data collection compared to what was planned in the relevant NP proposal.

IV.A.2 Data quality: Results and deviation from NP proposal

There are no deviations in the achieved accuracy compared to what was planned in the relevant NP proposal.

IV.A.3 Actions to avoid deviations

Skipped.

IV.B Collection of data concerning the processing industry

IV.B.1 Achievements: Results and deviation from NP proposal

Definition of population

The Danish fish processing industry is defined by the Business Register. In the Business Register the fish processing industry is defined by the NACE code 10.20. (European NACE rev. 2), which includes:

NACE 10.20.10 – Fish processing and preservation.

NACE 10.20.20 – Smoking, curing and salting of fish etc.

NACE 10.20.30 – Fish meal factories.

For enterprises that carry out fish processing, but not as a main activity, it is mandatory to collect the following data, in the first year of each period:

- a) Number of enterprise and
- b) Turnover attributed to fish processing.

The number of enterprises and the turnover attributed to fish processing can be extracted from Statistics Denmark Industrial Commodity Statistics and Account Statistics. The “purity” of the processing industry is very high. In 2014 about 97 % of the commodities, which contain fish or fish products, were produced in the branches defined by the European NACE code 10.20. There were only 4 non NACE-10-20 enterprises with fish processing in 2014. Due to the limited numbers of enterprises and rules of confidentiality the total turnover from enterprises carrying out fish processing not as a main activity cannot be shown. The reason is that one enterprise constitutes more than 80% of the total turnover from this group of enterprises, and from the general rules of securing confidentiality the sum for all enterprises carrying out fish processing not as a main activity cannot be shown.

The Danish data collection for the processing industry covers the whole population defined by the Business Register NACE 10.20, which corresponds to a 100% response rate. The data collection is based on the Danish Account Statistics collected by Statistics Denmark covering the whole population defined by the Business Register NACE 10.20. Data for the Account Statistics is collected from different sources and combined in such a way that a complete set of accounting items is computed for each business enterprise.

The industrial commodity statistics describe manufacturers' sales of commodities measured in volume and value. This statistics is used for classification of firms into subgroups by species and product form.

Planned sampling

The type of data collection is census (A).

The Danish data collection is based on data from the Account Statistics collected by Statistics Denmark. The Account Statistics covers all enterprises in the Danish fish processing industry. In collaboration with Statistics Denmark data from the Industrial Commodity- and Account Statistics are combined to comply with the variables listed in Appendix XII of Commission Decision 2008/949/EC.

The data is collected and processed by Statistics Denmark. The final segmentation and validation of data concerning the processing industry is done in cooperation between IFRO and Statistics Denmark.

Segmentation

In the national proposal the processing industry was divided into 13 sub branches. Due to the limited numbers of enterprises and rules of confidentiality, the 13 sub branches are merged to 6 sub branches.

IFRO has examined the composition of commodities from each enterprise in the processing industry for the years 2000 until 2014. This investigation has provided the background for dividing the enterprises into 6 sub branches on the basis of the enterprise's commodity production. The first criteria for the division of the sub branches is the species that the enterprise processes and secondly the degree of processing. The 6 sub branches also reflect the most important species in the Danish primary sector, and if there is a change in the supply of raw material, it will

probably reflect on these groups. The 6 sub branches will probably also reflect the social and economic impact, on the processing industry of measures taken on behalf of the common fisheries policy.

Data can also be segmented into 4 groups based on the number of employed calculated as Full-time equivalents according to Appendix XII of Commission Decision 2008/949/EC.

IV.B.2 Data quality: Results and deviation from NP proposal

All requested indicators listed in Appendix XII of Commission Decision 2008/949/EC are collected in the Danish data collection program for the fish processing industry.

In the data collection program it is suggested that the segmentation of the fish processing industry should be according to the number of persons employed (SBS 16 11 0) in each enterprise (SGECA 08 01 Lisbon). Using the number of persons employed is not the common methodology used by the statistical offices in Europe, including Eurostat. It is, therefore, suggested that the segmentation should instead be according to the number of FTE employed in the enterprise (SBS 16 14 0). The Danish segmentation is based on the segmentation in Statistics Denmark, which is based on the number of FTE employed in the enterprise.

IV.B.3 Follow-up of regional and international recommendations

IFRO expects to participate in the Regional Coordination Meetings when items concerning the collection and use of economic data for the fish processing industry are on the agenda.

There have not been any meetings under the Scientific, Technical and Economic Committee for Fisheries (STECF) concerning the processing industry in 2016. It is expected that a new meeting will be held in the fall of 2017.

Follow-up of recommendations from the STECF: Report on the Evaluation of Data Collection Related to the Fish Processing Sector (SGECA 09 03). STECF observes that the working group report presents possible deeper economic analysis based on data collected under the old and new data regulations. The possibilities presented here are ambitious, and are not feasible if economic data are provided on a national level only, as requested by the DCR/DCF. In order to be able to conduct the analyses proposed here, STECF recommends that at the national institutes, data should be disaggregated by either type of commodity or by company size.

Data for the Danish processing industry can be disaggregated by both type of species/commodity or by company size as recommended by the STECF.

IV.B.4 Action to avoid shortfalls

There are no shortfalls in the data collection program for the processing industry in Denmark.

V. Module of evaluation of the effects of the fishing sector on the marine ecosystem

V.1 Achievements: results and deviation from NP proposal

The indicators 1, 2, 3 and 4 listed in Commission Decision 2010/93/EC Appendix XIII of the Commission Decision require data on species abundance and length distribution by species from fishery independent research surveys. These data has been collected through the annual surveys carried out by DTU Aqua. The spatial and temporal coverage of data collection for the evaluation of effects of the fishing sector consists of area IV in the first and third quarters and in area IIIId in the first and fourth quarters 2016.

VMS data has been used for indicators 5-7 require. VMS data has been made available for DTU Aqua for research purpose under certain conditions such as safeguarding the confidentiality of the identity of individual the vessels. The data are available on a resolution of one record every 1 hour. As described below in section VI A “Management and the use of the data” logbooks, selling slips and VMS data are available. Therefore, it has been possible to link VMS, Logbook and sales slips data.

Indicator 8 can be calculated by using the collected at sea observer data.

Indicator 9. The economic data collection carried out by DST includes data on fuel consumption. It is therefore possible to estimate fuel costs per quarter and métier for some segments.

There has been no deviation from the NP.

V. 2 Actions to avoid shortfalls

No action is needed.

VI. Module for management and use of the data

VI. 1 Achievements: results and deviation from NP proposal

Primary data collected under the Danish programme has been as planned stored in the following computerised databases:

- Vessel register. Data on fishing capacity. (AgriFish Agency)
- Logbook database. Data on origin of catches and on effort. (AgriFish Agency)
- Sales notes database. Data on quantities landed and prices. (AgriFish Agency)
- Species composition database. Data on species composition in landings for industrial purposes. (AgriFish Agency)
- Biological database. Data on discards and biological parameters. (DTU Aqua)
- Economic data. (DST)

In order, for the three involved institutes, to use the same primary data on capacity, effort, and geographical distribution of the origin of the landings a common database has been produced every year, the Danish Fisheries Analyses Database (DFAD). This database is a database where data from the register on Danish fishing vessels, data from the Danish logbooks and the catch area declarations database together with data from the Danish sales

notes database are merged. It is therefore possible to categorise each landing in one fleet segment, in one fishery etc. This database contains most of the information requested in research projects and in relation to fisheries management. The DFAD is quarterly and yearly updated. The design and development of the database is made in a co-operation between the three above mentioned institutes.

The collected biological data has been stored in a new database (“Fiskeline”) managed by DTU Aqua. These primary data are surrounded by confidentiality and will not be passed on to other persons or authorities without permission.

Economic data has been collected by DST and stored in a database managed by the institute. These primary data are surrounded by strict confidentiality and will not in any circumstance be passed on to other persons or authorities. Each year DST produces an analytic file on the individual level, which includes relevant data for stratification and grouping for statistical purposes. Based on the analytic file a number of statistical files has been produced and are made available for external users.

All primary data collected under the programme are dealt with in confidence. Accesses to the data are limited to authorised staff members from the three institutes and no one outside the institutes has access to the data without permission.

Denmark has provided sets of data to support scientific analysis needed to advice fisheries management. It includes parameters for assessment purposes or other scientific analysis such as number-at-age, weight-at-age and maturity-at-age which have routinely been submitted to relevant ICES governed assessment groups and to relevant STECF expert groups.

Furthermore, Denmark has provided data to other end user if requested.

VI. 2 Actions to avoid shortfalls

No action is needed.

VII. Follow-up of STECF recommendations

STECF recommendations relevant to this chapter are listed in in table II.B.2.

Denmark has taken the recommendations made by the Expert Working group (Evaluation of the 2009, 2010, 2011, 2012 and 2013 Annual report and the evaluation of 2012-13 National Programme) under consideration while writing the Annual report for 2014.

For the 2013 and 2014 STECF plenary meeting reports no DCF relevant recommendations were found.

VIII. List of acronyms and abbreviations

Acronym/Abbreviation	Description
DCCA	Danish Commerce and Companies Agency
DCF	Data Collection Regulation (EC) No 199/2008
DST	Statistics Denmark
DTU Aqua	National Institute for Aquatic Resources
AgriFish Agency	AgriFish Agency
IFRO	Danish Food and Resource Economics Institute, Denmark
FTE	Full Time Equivalent
ICES	International Council for the Exploration of the Sea
IQ/ITQ	Individual quota / Individual transferable quota
WKBALPEL	Workshop on data for Baltic Pelagics
WKADS	Workshop on Age Determination of Salmon
WKBENCH	Benchmark Workshop on Saithe, Haddock, Herring and Horse Mackerel Stocks
WGBYC	Working Group on Bycatch of Protected Species
WKCOD	North Sea cod benchmark
PGCCDBS	Planning Group on Commercial Catches, Discards and Biological Sampling
ADGSANDEEL	Sandeel Advice Drafting Group
WKARGH	Workshop on Age Reading of Greenland Halibut
WKARAS	Workshop on Age reading of European Atlantic Sardine
WCSANDEEL	ACOM WebEx to finalise sandeel advice
WGMME	Working Group on Marine Mammal Ecology
WKROUNDMP	Joint ICES-STEFC Workshop on management plan evaluations for roundfish stocks

WGDEEP	Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources
HAWG	Herring Assessment Working Group for the Area South of 62°N
WKAREA-2	Workshop on Age Reading of European and American Eel
WGNAS	Working Group on North Atlantic Salmon
WGBAST	Baltic Salmon and Trout Assessment Working Group
WKCPUEFFORT	Workshop on the utility of commercial CPUE and VMS data in assessments
WCDSS	ACOM WebEx to finalize advice on deep sea surveys
WGBFAS	Baltic Fisheries Assessment Working Group
WGECO	Working Group on the Ecosystem Effects of Fishing Activities
NWWG	North-Western Working Group
AFWG	Arctic Fisheries Working Group
PGRFS	Planning Group on Recreational Fisheries Surveys
WGNSSK	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak
WGHMM	Working Group on Hake, Monk and Megrim
WGCSE	Working Group for the Celtic Seas Ecoregion
WKSHARK	Workshop on splitting of deep water shark historical catch data WKSHARK
WKMSHS	Workshop on Sexual Maturity Staging of Herring and Sprat
WGEF	Working Group on Elasmobranch Fishes
WGANSA	Working Group on Anchovy and Sardine
SGPIDS	Study Group on Practical Implementation of Discard Sampling Plans
WGHARP	Working Group on Harp and Hooded Seals
WGWIDE	Working Group on Widely Distributed Stocks

WGMIXFISH	Working Group on Mixed Fisheries Advice for the North Sea
WKNARC	Workshop of National Age Readings Coordinators
WGEEL	Joint EIFAC/ICES Working Group on Eels
SGRF	Study Group on Recruitment Forecasting
WKPCS1	Workshop on practical implementation of statistical sound catch sampling programmes
WKMSREGH	Workshop on Sexual Maturity Staging of Redfish and Greenland Halibut
WGRS	Working Group on Redfish Surveys
NIPAG	Joint NAFO/ICES Pandalus Assessment Working Group
SGBALANST	Study Group on Data Requirements and Assessments Needs for Baltic Sea Trout
SIMWG	Stock Identification Methods Working Group
WGNEW	The Working Group on Assessment of New MoU Species
WKMERGE	Joint ICES/STECF Workshop on Methods for Merging Fleet Metiers for Fishery based Sampling
WKPRECISE	Workshop on Methods to evaluate and estimate the precision of fisheries data used for assessment
SCV	Standard Catch Value = landings per species multiplied by 3-year average prices.

IX. Comments, suggestions and reflections

None

X. References

ICES, 2012a. Report of the Workshop on Eel and Salmon DCF Data (WKESDCF), 3 – 6 July 2012, ICES HQ, Copenhagen, Denmark. ICES CM / ACOM:62. 67 pp.

ICES. 2012b. Manual for the International Bottom Trawl Surveys. Series of ICES Survey Protocols. SISP IIBTS VIII. 68pp.

RCM NS&EA 2014: Report of the Regional Co-ordination Meeting for the North Sea and Eastern Arctic 2014.

RCM NS&EA 2013: Report of the Regional Co-ordination Meeting for the North Sea and Eastern Arctic 2013.

RCM Baltic 2013: Report of the Regional Co-ordination Meeting for the Baltic 2013.

RCM Baltic 2014: Report of the Regional Co-ordination Meeting for the Baltic 2014.

LM 2013: Report from the 10th Liaison Meeting 2013.

LM 2014: Report from the 11th Liaison Meeting 2014.

ICES, 2013c. Manual for the Baltic International Trawl Surveys. ADDENDUM 1:

WGBIFS BITS MANUAL 2013.

ICES. 2015. Report of the International Bottom Trawl Survey Working Group (IBTSWG), 23-27 March 2015, Bergen, Norway.

Annex 1

See attached files.

For the bilateral agreements that has not been renewed in written signed documents it has been just to prolong the agreements.