Overview of the international fishing activities on the Dogger Bank

Update with Dutch, British, Danish, German, Belgian, Swedish and French data for 2010-2015

Katell G. Hamon, Niels T. Hintzen, Hans J. A. E. van Oostenbrugge

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This report is an update of the data and analysis on the value of the fishing activities of the Dutch, British, Danish, German, Belgian, Swedish and French fishing fleets on the proposed closed areas on the Dogger Bank. The effort, value and landings are presented for a five-year period (2010-2015) and show large variations over the last years, driven mainly by fishing opportunities for plaice for the Dutch and British fleets and sandeel for the Danish and German fleets.

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Summary

An update of the data and analysis on the value of the fishing activities of the Dutch, British, Danish, German, Belgian, Swedish and French fishing fleets on the proposed closed areas on the Dogger Bank has been prepared on request of the Dutch Ministry of Economic Affairs. This report uses the method presented in Chapter 5 of *Effects of seabed protection on the Frisian Front and Central Oyster Grounds* (Van Oostenbrugge et al. 2015) to update the reports already published by Wageningen Economic Research on fishing activity on the Dogger Bank (Bartelings, Hamon et al. 2013; Oostenbrugge and Hamon 2014; Oostenbrugge and Hamon 2014). The effort, value and landings by the Dutch, UK, Danish, German, Belgian, Swedish and French fishing fleets are presented for a five-year period (2010-2015) and show large variations over the last years, driven mainly by fishing opportunities for plaice for the Dutch and British fleets and sandeel for the Danish and German fleets. Despite a decreasing trend in landings themselves for the different countries from 11 thousand tonnes in 2010 down to 5 thousand tonnes in 2015, the total value of landings has remained relatively stable on the Dogger Bank, varying from a minimum of about €4.2m in 2014 up to a maximum of €7.7m in 2011. The dependency of the Dutch fleet on the proposed closure is low at the fleet level (less than 1% of the revenue) but within fleets, the dependency of individuals on the areas to be closed varies. For the Dutch fisheries about 30 to 50 vessels (among the 280 fishing with bottom contact gears) fish a minor part of their revenue (less than 10%) from the proposed closed areas and only 1 or 2 vessels get between 10% and 20% of their revenue from the proposed closures. While sandeel represents most of the catch in volume, plaice makes for most of the value of landings from the area.

Key words: Cost-benefit analysis, Bottom fishing, Natura 2000, Dogger Bank

1 Introduction

In response to a request to Wageningen University & Research from the Dutch Ministry of Economic Affairs an update of the data and analysis on the value of the fishing activities of the Dutch, British, Danish, German, Belgian, Swedish and French fishing fleets on the proposed closed areas on the Dogger Bank (in and outside the Dutch EEZ) (see Figure 1.1) for the years 2010 to 2015 has been made. This report is a follow-up on the previous analysis of fishing activity performed by Wageningen Economic Research (Bartelings, Hamon et al. 2013, Oostenbrugge and Hamon 2014, Oostenbrugge and Hamon 2014). The first step in order to assess the effects of the closures on the fishing sector is the quantification of the historic fishing activities in the areas. This is important for the estimation of the costs of closures as historic data provide the basis for any analysis of effects of closures and the effect of closures depend on the extent of fishing activities, the type of fisheries in the area and the dependency of these fisheries on the area. In this update the same data sources and methods have been used as in Chapter 5 of the cost-benefit analysis of the Frisian Front and Central Oyster Grounds (Oostenbrugge, Slijkerman et al. 2015). Research institutes of Great Britain (CEFAS), Denmark (DTU-AQUA), Germany (TI), Belgium (ILVO), Sweden (SLU) and France (IFREMER) were asked to provide aggregated data on the fishing activities of their countries in the proposed closed areas on the Dogger Bank, to obtain an overview of the international activities on the Dogger Bank.

This exercise was undertaken for all bottom-trawling fleets for the period 2010-2015. Fishing activities in the areas were quantified in terms of effort, landings volume, landings value and contribution to the Gross Value Added (GVA). The GVA is especially important as this metric indicates the value of the fishing activities to society: the returns on the invested capital (fishing vessel) and labour by the crew. The analyses is restricted to the fishing activities inside the closed areas and not beyond.

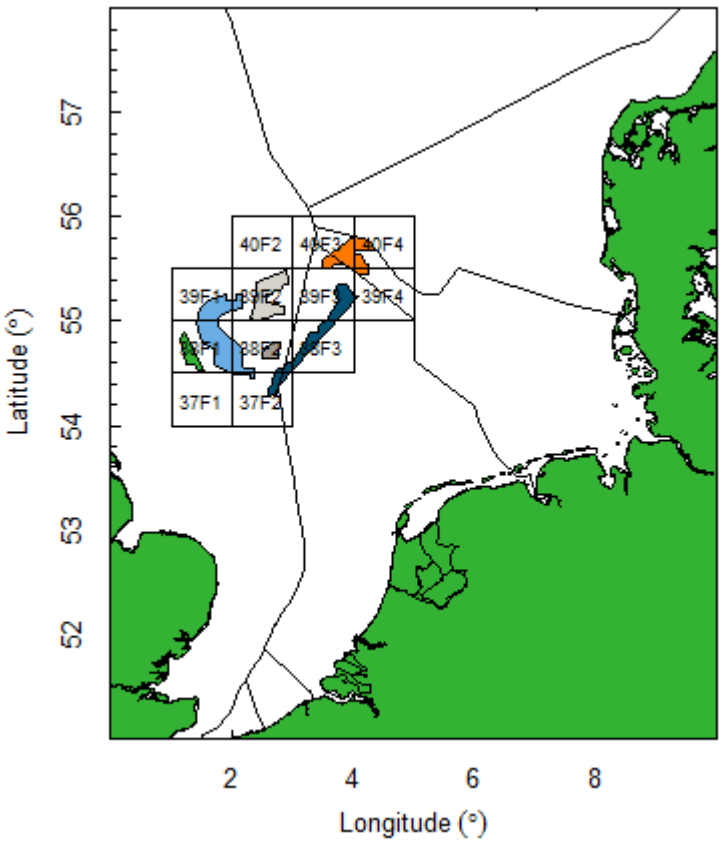

Figure 1.1 *Map of the proposed closed areas on the Dogger Bank with the adjacent ICES rectangles*

2 Methodology

2.1 Data

Several data sources were used in this study: Vessel Monitoring System (VMS) data, catch data from logbooks (Fish Registration and Information System), Fleet data from the Netherlands Register of Fishing Vessels (NRV), and Data on landings value and economic performance of all fleets that were obtained from the database[1] of the Annual Economic Report of the EU fishing fleets (STECF, 2016).

2.2 Fishing activity

2.2.1 Base data

The data above-mentioned sources are being analysed in a standardised manner, where a script is developed that describes the processing and analysis of the data sets and can be applied by any nation that has similar VMS and logbook data in a standardised format. The same standardised script was applied to Dutch, German, Danish and British data. Sweden already had data available that had been processed in a way that was very similar to the process outlined by Wageningen University & Research. France used own software to process the data but followed similar steps as outlined by Wageningen University & Research. The script calculates effort, total landings and landings of the main fish species in the area of interest based on VMS and logbook data for the years 2010 to 2015, which were processed to remove erroneous fields.

The same method (and script) was used for all countries involved in this study because all of them use the same type of data, except for France and Sweden (see Hintzen, Bastardie et al. 2012 for a description of the data format). The pre-processing of the dataset for the Dutch data follows the approach developed in Hintzen et al. (2013).

VMS records are removed when they are:
- Duplicates or pseudo-duplicates
- Not positioned on the globe
- Located in a harbour
- Located on land
- Associated with vessel speeds >20 knots.

Logbook records are removed when they:
- Are duplicates
- Have arrival times before departure times
- Start before the 1st of January of the year considered (despite the fact that the end of the trip falls within the considered year)
- Overlap with other trips.

2.2.2 Link VMS and logbook data

To further analyse the data, the spatial resolution in the VMS data must be linked to the catch and effort data in the logbooks. Therefore, the VMS and logbook data in the ICES rectangles of interest were selected. All ICES rectangles overlapping with the Dogger Bank area were selected (see

[1] https://stecf.jrc.ec.europa.eu/documents/43805/1481615/2016_STECF+16-11+-+EU+Fleet+Economic+and+Transversal+data+tables.zip and https://stecf.jrc.ec.europa.eu/documents/43805/1034590/2015_STECF+15-07+-+EU+Fleet+Economic+data+tables.zip downloaded on 21 September 2016

Figure 1.1). Because the Dogger Bank is particularly sensitive to bottom contact gears, we selected only those gear types (see full list of the gears considered in Table 2.1).

VMS and logbook datasets are linked using the vessel identifier and date-time stamp. In other words, records (also called pings) in the VMS dataset that fall within the departure-arrival timeframe of a trip described in the logbook are assigned the unique trip number from the logbook record and allow for an analysis of the two datasets simultaneously.

2.2.3 Define fishing activity

For each gear type, the activity of the vessel (floating, fishing or steaming) is defined based on the instantaneous speed in VMS records (see Table 2.1). For each ping, the state of the vessel is identified based on gear and speed.

Table 2.1 *Determination of fishing activity based on the vessel speed. The speeds used in the Dutch fleet are presented*

Gear	Gear code	Floating	Fishing	Steaming
Beam trawls	TBB	<2 knots	2-8 knots	>8 knots
Danish and Scottish Seines	SDN and SSC	<0.5 knots	0.5-6 knots	>6 knots
Dredges	DRB	<1 knots	1-5 knots	>5 knots
Otter board or twin trawls	OTB and OTT	<1 knots	1-5 knots	>5 knots
Pair trawls	PTB	<1 knots	1-5 knots	>5 knots

For other countries, the speeds can be modified based on the specifics of the fleet.

2.2.4 Assign effort and landings to pings

Each VMS ping represents a certain amount of time, usually equal to the interval rate at which VMS pings are emitted, ranging from 30 minutes to 2 hours. The fishing effort is defined as the sum of these time steps for those pings where the previous analysis indicated a 'fishing' state.

The landings are recorded by trip, per ICES rectangle and day in the logbook. For this analysis, we retained the landings of the top 10 species (in volume) and the total landings per year and per country for the ICES rectangles and gears of interest.

For each trip that could be linked to VMS data, the landings and the days at sea, as registered in the logbooks, are allocated to the VMS pings in a stepwise process: If a match in trip, ICES rectangle, and fishing day is found, the registered landings are assigned to the VMS pings, weighted by the average time each VMS ping represents (ranging from 30 minutes to 2 hours). If a match cannot be found, fishing day and/or ICES rectangle is left out of the equation. Any remaining logbook record that could not be matched to any VMS ping is assigned to following the same stepwise process, but dropping the requirement that vessel ID in both datasets must be the same. This results in a full allocation of all landings of the logbook data to the VMS data.

For the trips that could not be linked to VMS points (e.g. small vessels that do not carry VMS transducers on board), the total days at sea and landings in the adjacent ICES rectangle are aggregated.

2.2.5 Define pings in the areas of interest

The coordinates of each VMS ping are compared to the location of the proposed closed areas on the Dogger Bank (see Figure 1.1). When a VMS ping is located inside any of the areas, it is selected and assigned to the area of interest (see Appendix 1 for information on each of the areas).

The data for each country is hereafter aggregated by year, subarea, gear type and vessel length category. Vessel length is used to link the data to economics (see Section 2.3). The logbook records without VMS data are also aggregated by year, ICES rectangle, gear type and vessel length category.

2.2.6 Uncertainty in the analyses

In the analyses a number of assumptions have to be made related to fishing activity and linking catches to VMS pings. Although these assumptions have been tested thoroughly, consultations with fishermen to verify our assumptions and international consultations on these methods have taken place, the final results are uncertain and changes in assumptions will likely affect the numeric values presented in the results. It is anticipated however that these differences do not alter the conclusions. No exercise has been undertaken to quantify the uncertainty however.

2.3 Economics

The resulting effort (sea days) and landings per gear type, vessel length class, country and year are used to calculate the value of landings and gross value added (GVA). The landings data were combined with economic information from the database of the Annual Economic Report of 2016 (STECF 2016). In this database, catch information (landings volume and value) is available at the level of gear type, vessel length category and ICES subarea (e.g. Central North Sea). Because of this, the landings value in the Dogger Bank (DBvalue) was estimated by combining the landings volume in the proposed closed areas on the Dogger Bank with the average fish price (value/landings) for each gear type *g*, vessel length class *l*, country *c* and year *y* in the Central North Sea (see Appendix 2):

$$DBvalue_{g,l,c,y} = DBlandings_{g,l,c,y} \cdot \frac{CNSvalue_{g,l,c,y}}{CNSlandings_{g,l,c,y}}$$

The GVA generated in the Dogger Bank by each gear *g*, vessel length category *l*, country *c* and year *y* ($DBGVA_{g,l,c,y}$) was estimated using the value of landings in the Dogger Bank for the gear, vessel length category, country and year and the GVA per euro landed for each fleet of the same vessel length category using the gear, weighted by the value of landings in the Central North Sea, caught by the fleet in question with the gear (see Appendix 2):

$$DBGVA_{g,l,c,y} = DBvalue_{g,l,c,y} \cdot \frac{\sum_f \left(\frac{GVA_{f,c,y}}{value_{f,c,y}} CNSvalue_{f,g,l,c,y} \right)}{\sum_f CNSvalue_{f,g,l,c,y}}$$

Because STECF 2016 data only covers economic data until 2014, 2015 GVA values are calculated based on the GVA and fleet values of 2014. The GVA calculation is done as follow:

$$GVA_{f,c,y} = \frac{value_{f,c,y} + rightincome_{f,c,y} + otherincome_{f,c,y}}{EnergyCost_{f,c,y} + rightCost_{f,c,y} + VariableCost_{f,c,y} + RepairCost_{f,c,y} + FixedCost_{f,c,y}}$$

Where *rightincome* and *rightCost* represent the income and costs to lease quota out or in, *otherincome* are all the other income sources apart from value of landings and right income. In addition to right costs, energy costs, repair costs, other variable costs and fixed costs are also considered in the calculation of the GVA.

2.4 Individual dependency to proposed closure

It is possible to go beyond the fleet indicators and to look at the dependency of vessels on areas to be closed. This analysis can be useful for areas that are not so important at the fleet level but where a couple of fishers fish intensively. Reallocation of effort to new fishing grounds becomes more

complicated when a large part of the known fishing grounds of a fisher closes. It is therefore important to identify whether an area closure will potentially substantially impact individuals.

At the vessel level we look at the estimated proportion of revenue coming from the proposed closed areas. The ratio of the value of landings from the proposed closed areas over the total value of landings for fisher *i* is called 'individual stress-level'.

$$ISL_{i,y} = \frac{DBvalue_{i,y}}{Totvalue_{i,y}}$$

Because this analysis requires access to individual vessel data, it was only performed for the Dutch fishery. As for the other countries, owing to confidentiality issues, only fleet-aggregated data were made available.

2.5 Relative importance of the proposed closed areas compared to the Dogger Bank

To evaluate the relative importance of the proposed closed areas on the Dogger Bank, we defined fishing activity in the proposed closed areas and on the total Dogger Bank separately (Figure 2.1). We present the results as percentage of the total Dogger Bank area. We also investigate the fishing opportunities in the rest of the Dogger Bank and the possibility to displace effort to other areas by comparing the catch-rates per unit of surface for a number of key species inside and outside the proposed closed areas.

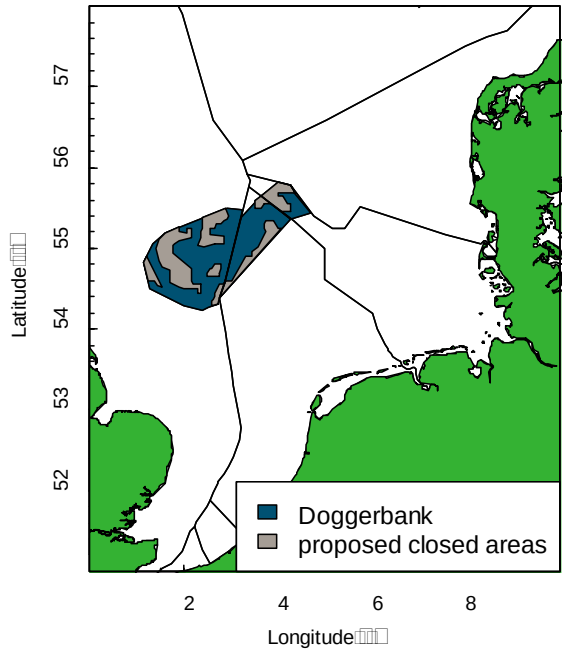

Figure 2.1 *Map of the Dogger Bank and proposed closed areas*

2.6 Seines in the German part of the Dogger Bank

Given that specific measures are proposed regarding the use of seines (Danish and Scottish) in the German part of the proposed closed areas, the fishing activity and economics at the fleet levels will also be provided separately for area 6_GE (Figure 2.2) per gear.

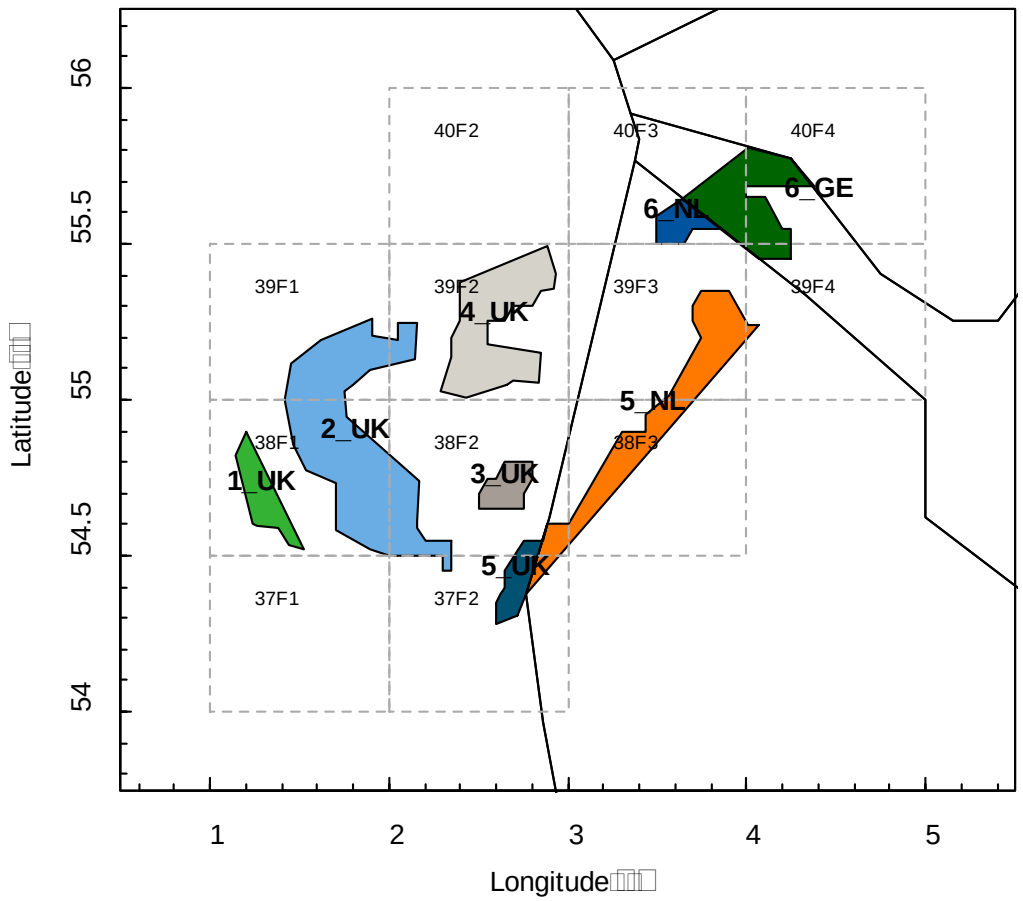

Figure 2.2 *Map of the proposed closed areas of the Dogger Bank areas*

3 Results

3.1 Fishing activity

Over the 2010-2015 period the amount of fishing activities has been quite different in the proposed closed areas on the Dogger Bank from year to year with no clear trend (Table 3.1 and Figure 3.1). Most of the logbook records in the Dogger Bank areas could be matched with VMS data (see Table A3.1 in Appendix 3); for all countries the coverage rate of VMS data was above 97%. This result allows us to focus more on the dataset where VMS and Logbooks are linked and provide greater spatial and temporal resolution.

When using only the combined VMS logbook information, we see that the effort in the area has varied from year to year with different patterns for the different countries but without a clear trend. Over the period, the Dutch and British effort was on average 188 and 235 days at sea respectively, about 6 times more than the German effort (31 days at sea) and more than 20 times the effort of Belgium (8 days at sea) and Sweden (6 days at sea). The effort of Denmark lies in between, at 134 days at sea. France bottom fishing vessels had no activity in the areas during the 2010-2015 period. The landings amounted to 4.579 tonnes on average for Denmark, 1.297 tonnes for Great Britain, 839 tonnes for the Netherlands, 324 tonnes for Germany, 35 tonnes for Belgium and 407 tonnes for Sweden, representing a value of 1.331 k€ (Denmark), 2.326 k€ (Great Britain), 2.004 k€ (the Netherlands), 578 k€ (Germany), 60 k€ (Belgium) and 90 k€ (Sweden) and a GVA of 904 k€ (Denmark), 604 k€ (Great Britain), 785 k€ (the Netherlands), 126 k€ (Germany), 23 k€ (Belgium) and 56 k€ (Sweden). The values for the various subareas can be found in Appendix 1.

Table 3.1 *Overview of effort, landings and values and gross value added of the fishing sector in the proposed closed areas of the Dogger Bank of the different fleets (VMS and logbook merged data only)*

Country	2010	2011	2012	2013	2014	2015*	Average
Effort (days at sea)							
Netherlands	69	161	285	224	110	281	188
Great Britain	189	285	219	262	209	247	235
Denmark	107	127	92	167	212	100	134
Germany	49	53	11	22	26	28	31
Belgium	6	2	1	29	3	6	8
Sweden	5	6	0	6	12	7	6
France	0	0	0	0	0	0	0
Total	**425**	**633**	**609**	**711**	**572**	**670**	**603**
Landings (tonnes)							
Netherlands	278	658	1,275	1,077	408	1,340	839
Great Britain	1,035	1,799	1,230	1,435	977	1,303	1,297
Denmark	8,785	7,401	471	4,116	4,837	1,862	4,579
Germany	564	817	44	208	92	219	324
Belgium	3	5	0	163	11	30	35
Sweden	476	360	6	379	735	488	407
France	0	0	0	0	0	0	0
Total	**11,141**	**11,040**	**3,026**	**7,379**	**7,061**	**5,241**	**7,481**
Value (1,000 euros)							
Netherlands	729	1,680	2,888	2,385	937	3,405	2,004
Great Britain	1,901	3,205	2,443	2,176	1,632	2,601	2,326
Denmark	2,247	2,089	240	1,491	1,369	546 a)	1,331
Germany	287	620	97	201	75	176	243
Belgium	6	14	0	218	27	97	60
Sweden	116	80	2	111	134	97	90
France	0	0	0	0	0	0	0
Total	**5,285**	**7,688**	**5,670**	**6,582**	**4,175**	**6,921**	**6,053**

Gross Value Added (1,000 euros)							
Netherlands	271	553	984	887	453	1,560	785
Great Britain	601	806	614	483	467	652	604
Denmark	1,634	1,455	143	1,094	785	311	904
Germany	166	284	43	127	40	95	126
Belgium	3	6	0	92	8	29	23
Sweden	99	39	1	71	72	52	56
France	0	0	0	0	0	0	0
Total	**2,774**	**3,143**	**1,784**	**2,754**	**1,825**	**2,699**	**2,497**

a) 2015 GVA data are based on the 2014 GVA factors, 2015 value of landings for Denmark is based on 2014 factor.

Source: Logbook data and VMS data and data from the Annual Economic report (STECF 2015), processed by WUR, CEFAS, TI,DTU, ILVO, SLU and IFREMER.

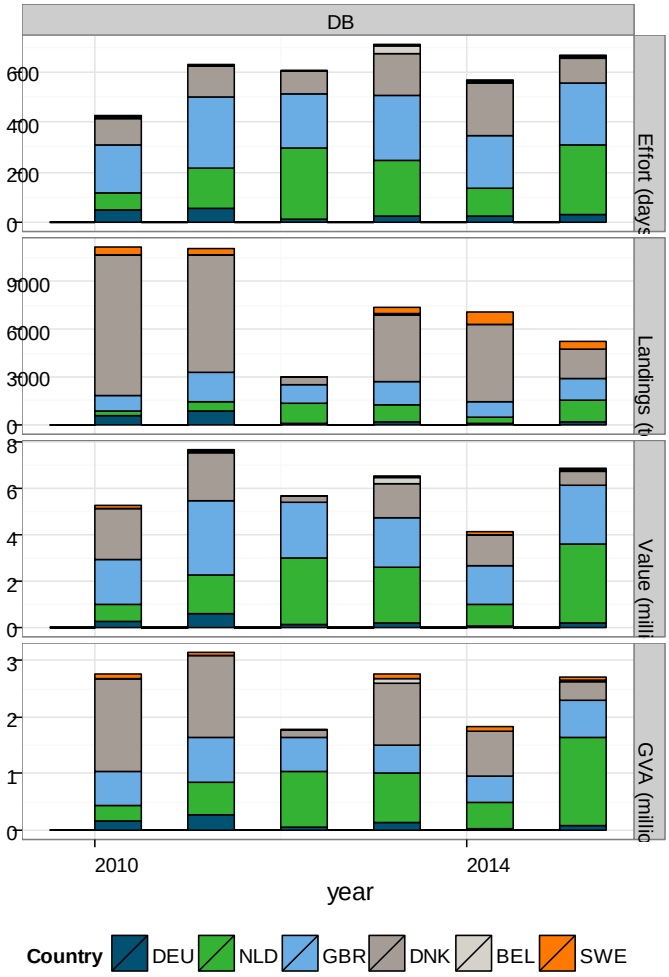

Figure 3.1 *Historical trend of the fishing activities by the different fleets in the proposed closed areas of the Dogger Bank. Effort, landings, value of landings and GVA are given by country Source: Logbook data and VMS data and data from the Annual Economic report (STECF 2016), processed by WUR, CEFAS, TI,DTU, ILVO, SLU and IFREMER.*

The majority of the fishing activities on the Dogger Bank by Dutch and British vessels is carried out by beam trawls and otter-board trawls. For the German and Danish fleets, demersal trawls and seines (mainly otter-board trawls for the German vessels and otter trawls and Danish seines for the Danish fleet) are most important in the area (Figure 3.2). The Belgian fleet operates with Scottish seines and the Swedish fleet with otter-board trawls.

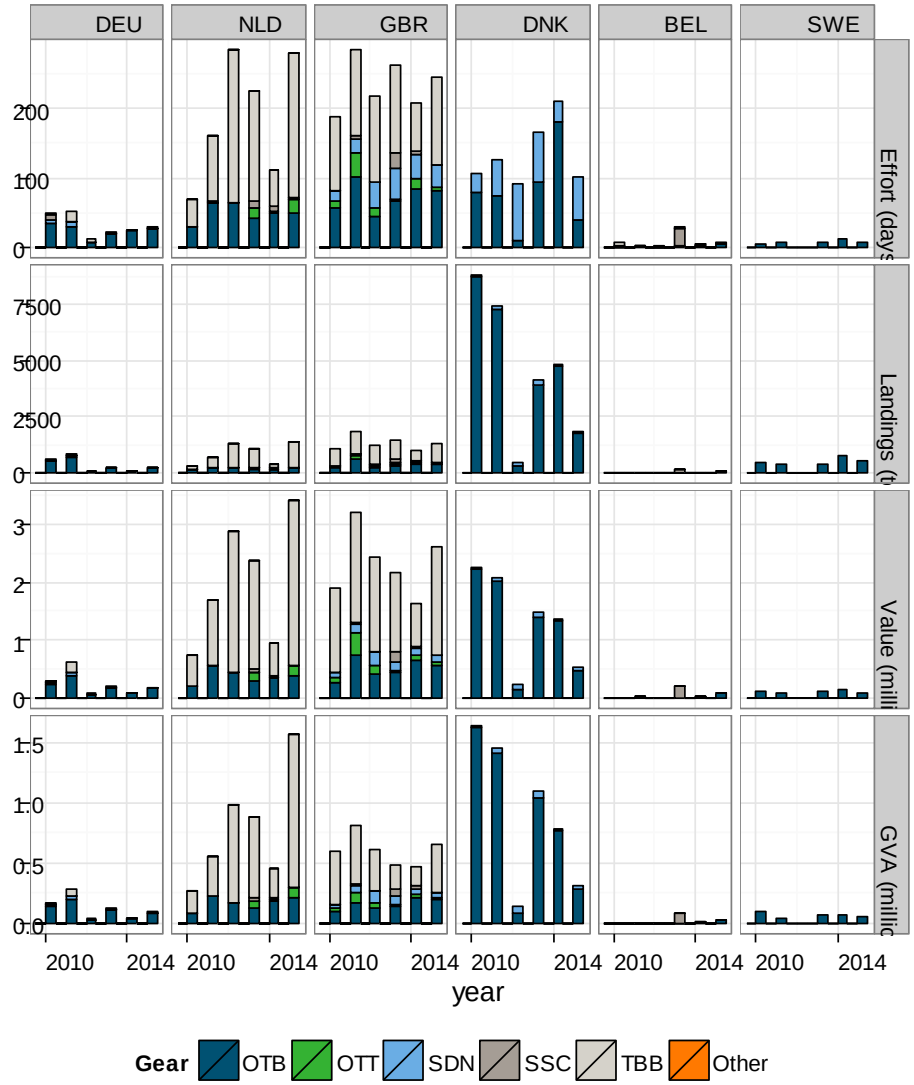

Figure 3.2 *Historical trend of the fishing activities with different gears in the Dogger Bank area for the different countries. Effort, landings, value of landings and GVA are given by country*
Source: Logbook data and VMS data and data from the Annual Economic report (STECF 2016), processed by WUR, CEFAS, TI, DTU, ILVO, SLU and IFREMER.

3.2 Species targeted

The two main species targeted on the Dogger Bank are sandeel for the German, Danish and Swedish demersal trawls and seines, and plaice for the Dutch and British beam trawl and otter-board fleet and Belgian Scottish seiners. All other species have much lower landings (Figure 3.3). The 2012 drop in Danish activity and sandeel landings comes from a sudden decrease of the sandeel TAC for the area for that year.

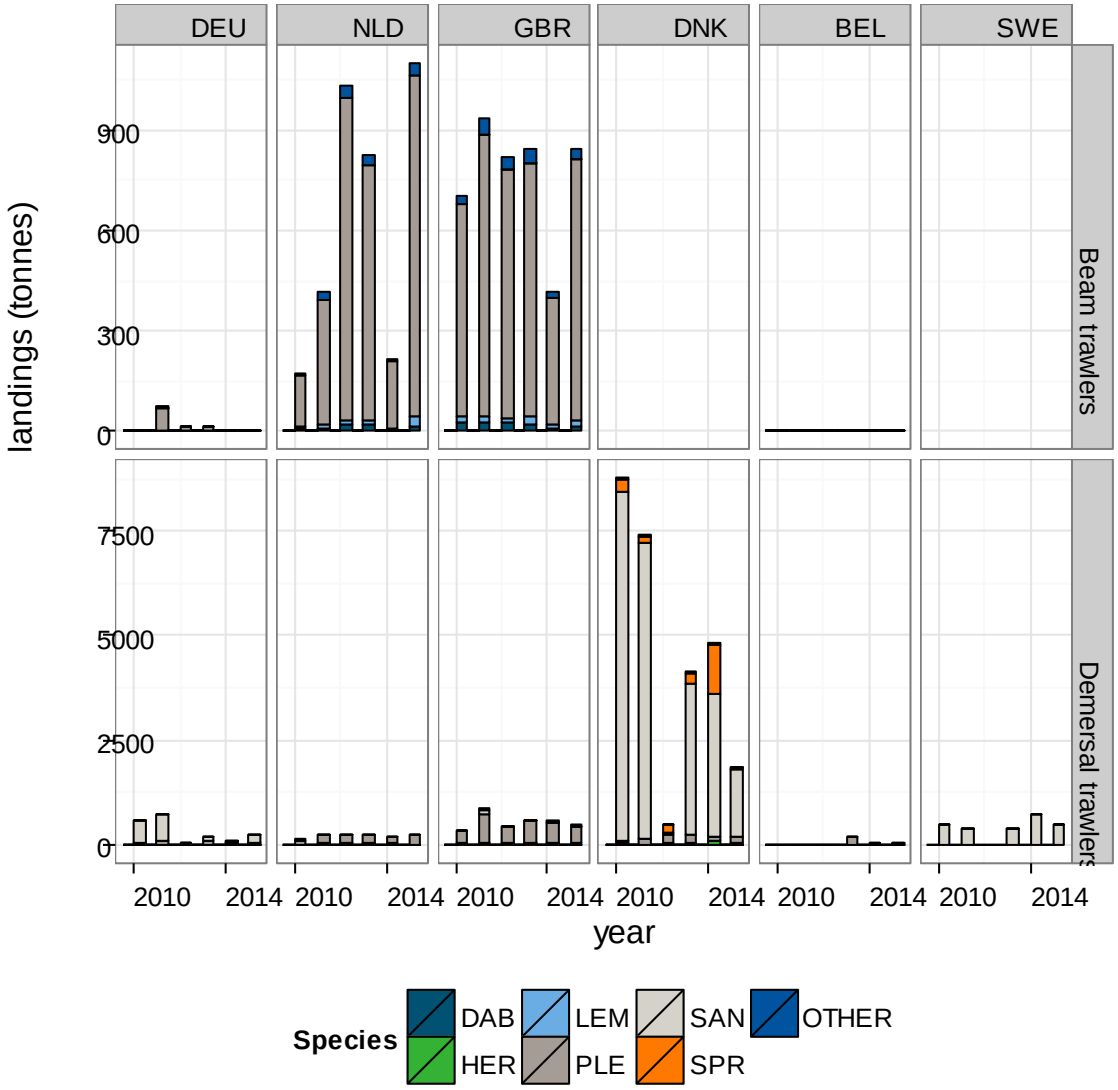

Figure 3.3 *Landings in tonnes for the top 5 species per country on the proposed closed areas of the Dogger Bank for bottom contact gears*
Source: Logbook data processed by WUR, CEFAS, TI,DTU, ILVO, SLU and IFREMER. DAB=dab, HER= herring, PLE= plaice, SAN= sandeel, SPR= sprat

3.3 Individual dependency to proposed closure

The dependency of the Dutch fleet to the proposed closure is low at the fleet level (less than 1% of the revenue of the vessels operating at least part of the year with bottom contact gears, see Figure 3.4). The vessels from Urk and South and North Holland represent most of the activity in the closed areas but vessels are individually not highly dependent on the proposed closed areas. On average around 40 vessels among a fleet of 280 vessels fishing with bottom contact gears had some revenue from the area but for the large majority this represented less than 10% of their total revenue (Figure 3.5). The number of vessels fishing in the proposed areas is higher since 2011 compared to earlier reaching 50 vessels in 2012 (Figure 3.6).

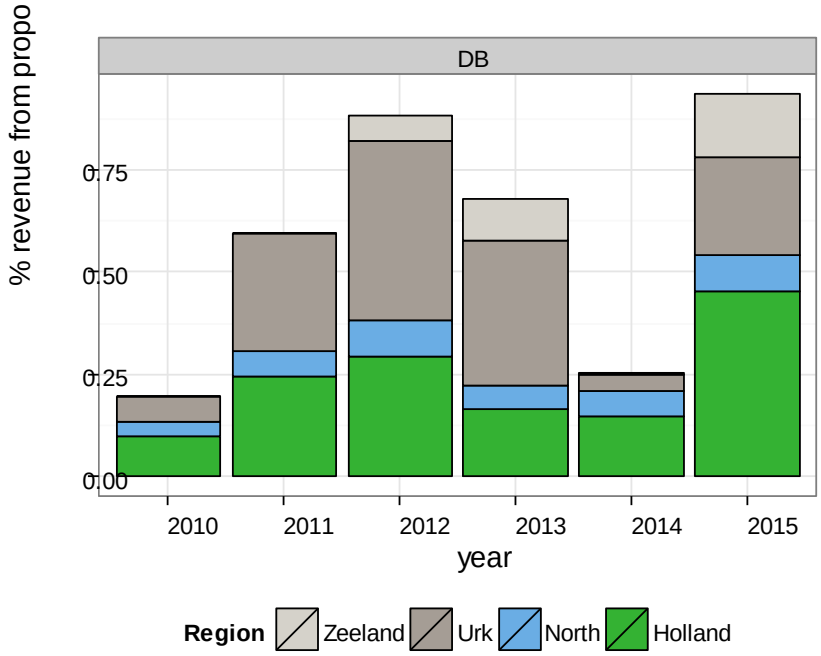

Figure 3.4 *Revenue per year and per region of origin in the proposed closed areas by bottom contact gears as a percentage of the total revenue for the Dutch fleet using bottom contact gears at least part of the year. Holland represents the regions North Holland and South Holland*

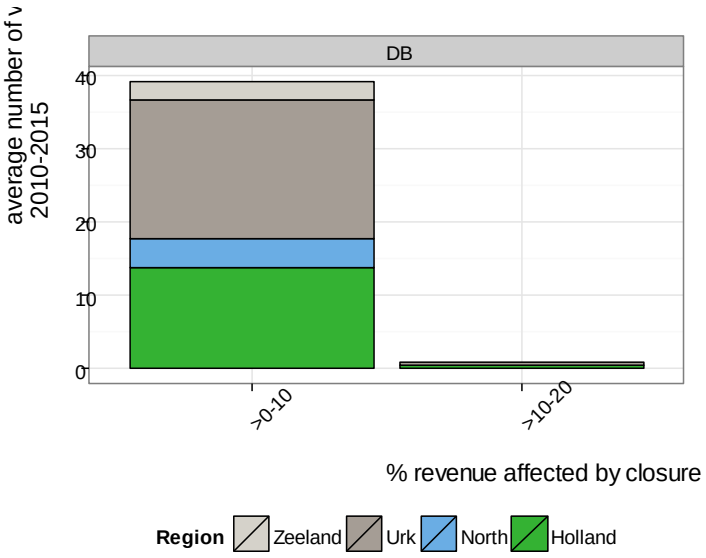

Figure 3.5 *Average stress profile of the Dutch bottom contact gear fleet over the years 2010-2015. Holland represents the regions North Holland and South Holland*

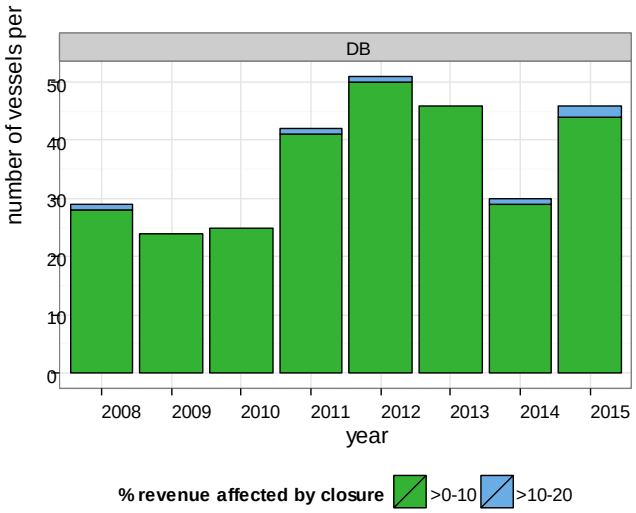

Figure 3.6 *Number of vessels active in the proposed closed areas per year and percentage of their revenue with bottom contact gears in these areas*

3.4 Relative importance of the proposed closed areas

The proposed closed areas represent 6.712 km^2 or about 36% of the total Dogger Bank area. The fishing activity in the proposed closed areas for the different countries represents on average 23-24% of the total effort on the Dogger Bank for the German, Dutch and British fleets, around 20% for the Belgian fleet about 17% for the Danish fleet and less than 8% for the Swedish fleet (Figure 3.7). In terms of landings, the proposed closed areas represent 24% of the total Dogger Bank for the Netherlands, 22% for Great Britain, 17% for Germany and Belgium, 15% for Denmark and 8% for Sweden.

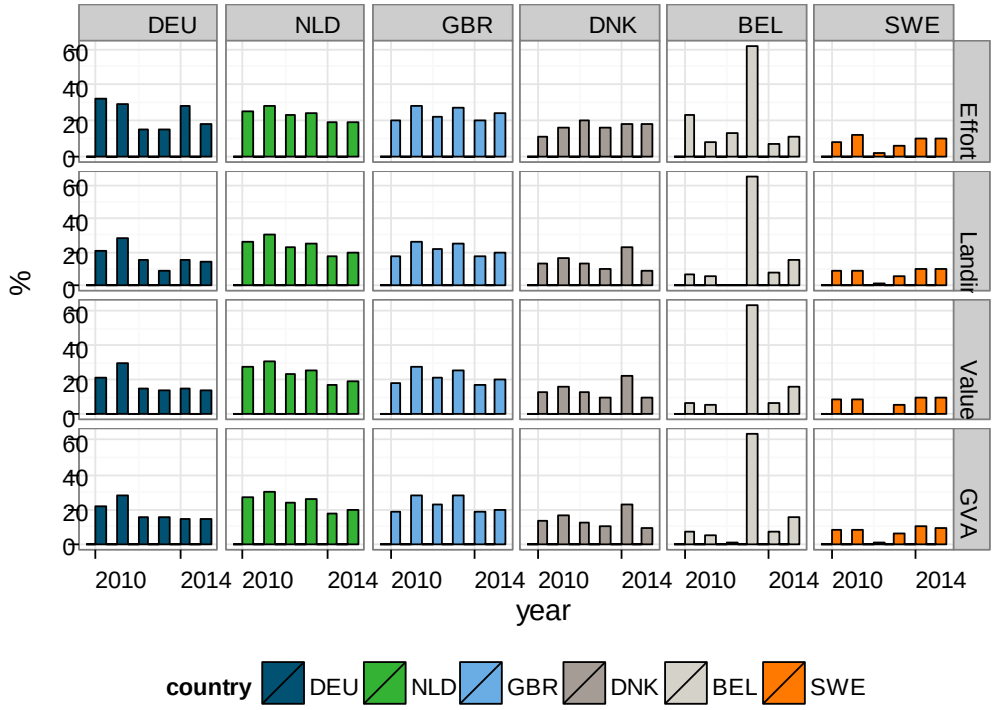

Figure 3.7 *Relative importance of the proposed closed areas expressed as the percentage of effort, landings, value and GVA in the proposed closed areas compared to the total Dogger Bank area*

The fishing opportunities have been higher in the proposed closures than in other parts of the Dogger Bank for Danish herring and sprat fisheries (2011-2014) and for Belgian dab and plaice (2013) (Table 3.2). For all other years, fleet and species, the importance of the proposed closed areas is proportionally lower than in the areas of the Dogger Bank that remain open.

Table 3.2 *Ratio of landings per unit of surface inside and outside the proposed closed areas of the Dogger Bank*

COUNTRY	species	2010	2011	2012	2013	2014	2015
DEU	DAB	0.45	0.53	0.32	0.71	0.48	0.25
NLD	DAB	0.53	0.51	0.46	0.75	0.44	0.54
GBR	DAB	0.38	0.68	0.39	0.67	0.35	0.54
BEL	DAB	0.26	0.03	-	1.10	0.36	0.15
DNK	HER	0.36	1.19	2.10	1.33	1.43	0.22
DEU	PLE	0.64	0.93	0.32	0.53	0.34	0.28
NLD	PLE	0.68	0.81	0.55	0.61	0.37	0.43
GBR	PLE	0.42	0.76	0.50	0.69	0.39	0.53
DNK	PLE	0.21	0.39	0.63	0.65	0.28	0.65
BEL	PLE	0.12	0.07	0.00	3.45	0.13	0.35
DEU	SAN	0.47	0.67		0.12	0.31	0.30
GBR	SAN	-	0.22		0.03		-
DNK	SAN	0.28	0.34	0.05	0.17	0.44	0.17
SWE	SAN	0.17	0.16	0.02	0.11	0.19	0.19
DNK	SPR	0.44	11.09	2.04	4.66	1.77	0.42

3.5 Seines in the German part of the Dogger Bank

The fishing activity in the German part of the proposed closed areas with seines is limited, only a few countries have been active with Seines in the areas and show irregular effort contributions (Table 3.3).

Table 3.3 *Overview of effort, landings and values and gross value added of the fishing sector in the German part of the proposed closed areas of the Dogger Bank of the seines only (VMS and logbook merged data only)*

Country	2010	2011	2012	2013	2014	2015 a)
Effort (days at sea)						
Netherlands	-	-	-	-	-	-
Great Britain	-	3.2	-	0.4	0.6	-
Denmark	0.2	2.3	1.2	4.9	-	-
Germany	-	-	-	-	-	-
Belgium	-	-	-	0.4	-	-
Sweden	-	-	-	-	-	-
France	-	-	-	-	-	-
Landings (tonnes)						
Netherlands	-	-	-	-	-	-
Great Britain	-	19.2	-	1.2	2.2	-
Denmark	0.1	1.4	1.9	5.2	-	-
Germany	-	-	-	-	-	-
Belgium	-	-	-	1.3	-	-
Sweden	-	-	-	-	-	-
France	-	-	-	-	-	-
Value (1,000 euros)						
Netherlands	-	-	-	-	-	-
Great Britain	-	26.3		1.4	3.3	-
Denmark	0.0	0.7	1.0	2.8	-	-
Germany	-	-	-	-	-	-
Belgium	-	-	-	1.7	-	-
Sweden	-	-	-	-	-	-
France	-	-	-	-	-	-
Gross Value Added (1,000 euros)						
Netherlands	-	-	-	-	-	-
Great Britain	-	8.7		0.5	1.3	-
Denmark	0.0	0.3	0.5	1.5	-	-
Germany	-	-	-	-	-	-
Belgium	-	-	-	0.7	-	-
Sweden	-	-	-	-	-	-
France	-	-	-	-	-	-

a) 2015 GVA data are based on the 2014 GVA factors, 2015 value of landings for Denmark is based on 2014 factor.

Source: Logbook data and VMS data and data from the Annual Economic report (STECF 2015), processed by WUR, CEFAS, TI,DTU, ILVO, SLU and IFREMER.

4 Discussion and conclusion

The fishing intensity in the proposed closed areas on the Dogger Bank has shown large variations over the 2010-2015 period, driven mainly by fishing opportunities for plaice for the Dutch and British fleets and sandeel for the Danish fleet. Belgian Germany and Sweden are also active in the area but at a lower level and France had no recorded activity in the proposed closures of the Dogger Bank for the period 2010-2015. Despite large variations in landings themselves for the different countries, the total value of landings has remained relatively stable on the Dogger Bank ranging from about €4.2m in 2014 up to €8.6m in 2011. While sandeel represents most of the catch in volume, plaice makes for most of the value of landings from the area. Price variability, although present, is not the driver of the varying landings.

The proposed closed areas represent 8 to 24% of the fishing activity on the Dogger Bank depending on the fleet considered, but 36% of the Dogger Bank surface. They are therefore on average less fished than the rest of the Dogger Bank.

No clear trend in fishing could be identified in the proposed closed areas of the Dogger Bank for the period 2010-2015. When we extend the period of analysis with the early reports from Oostenbrugge and Hamon (2014a, 2014b) on the activity of the Dutch fleet in the Dutch and German parts of the Dogger Bank, two periods can be identified: 2006-2010 when the activity was low and stable, 2011-2013 when the activity of the Dutch fleet in the Dutch and German Dogger Bank increased. For the Netherlands, the lowest level of activity of the current time series is also 2010, about 1.6 to 4 times lower than the rest of the time series, meaning that the activity in the past 5 years is higher than 5-10 years ago. Unfortunately, no additional information is available for the other countries and none of them show the same pattern (2010 much lower than any other year), so we cannot assume that they follow the same trend as the Netherlands.

The reported values of the areas of interest do not necessarily reflect the value of these areas for the fishing sector in the (near) future. The value of an area results from the combination of available fish and the effort applied in an area. If one of these factors changes, the value of such an area changes as well. When fishers move their effort to different locations, the future value of these areas will decline and closure of these specific areas may result in smaller economic losses. We assume that fishers move their effort to other locations in case of area closures. The effects of moving effort to another location (displacement) on catch and revenue are less well understood. Research in the field of displacement is therefore necessary. If effects are small at the scale of the fleet, this does not imply that individual fishers will not be affected substantially by a closure of a specific area at sea. The effects of closing a specific area are generally thought to have less effect fleet wide than on specific individuals or fishing companies.

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Appendix 1 Characteristics of the activities in the sub-areas of all countries

Table A1.1 *Overview of effort and landings of the different fleets in the different sub-areas (logbook and VMS merged)*

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
BEL	2010	OTB	5_NL	0.3	325	DB.Rdata-tacsatEflalo
BEL	2010	OTB	6_GE	0.1	16	DB.Rdata-tacsatEflalo
BEL	2010	SSC	1_UK	0.5	433	DB.Rdata-tacsatEflalo
BEL	2010	TBB	1_UK	1.3	90	DB.Rdata-tacsatEflalo
BEL	2010	TBB	2_UK	2.6	180	DB.Rdata-tacsatEflalo
BEL	2010	TBB	4_UK	0.5	1,630	DB.Rdata-tacsatEflalo
BEL	2010	TBB	6_GE	0.5	141	DB.Rdata-tacsatEflalo
BEL	2011	OTB	5_NL	1.7	5,343	DB.Rdata-tacsatEflalo
BEL	2011	OTB	6_GE	0.1	119	DB.Rdata-tacsatEflalo
BEL	2012	TBB	1_UK	1.2	45	DB.Rdata-tacsatEflalo
BEL	2013	OTB	6_GE	1.4	2,507	DB.Rdata-tacsatEflalo
BEL	2013	OTB	6_NL	0.4	1,332	DB.Rdata-tacsatEflalo
BEL	2013	SSC	2_UK	25.2	155,724	DB.Rdata-tacsatEflalo
BEL	2013	SSC	4_UK	0.5	2,501	DB.Rdata-tacsatEflalo
BEL	2013	SSC	6_GE	0.4	1,279	DB.Rdata-tacsatEflalo
BEL	2013	TBB	6_GE	1.5	39	DB.Rdata-tacsatEflalo
BEL	2014	OTB	2_UK	1.0	4,103	DB.Rdata-tacsatEflalo
BEL	2014	OTB	3_UK	0.1	297	DB.Rdata-tacsatEflalo
BEL	2014	OTB	5_NL	2.1	4,992	DB.Rdata-tacsatEflalo
BEL	2014	OTB	5_UK	0.0	60	DB.Rdata-tacsatEflalo
BEL	2014	SSC	2_UK	0.3	1,346	DB.Rdata-tacsatEflalo
BEL	2015	OTB	3_UK	0.2	940	DB.Rdata-tacsatEflalo
BEL	2015	OTB	5_NL	5.3	26,228	DB.Rdata-tacsatEflalo
BEL	2015	OTB	6_NL	0.3	1,581	DB.Rdata-tacsatEflalo
BEL	2015	TBB	5_NL	0.5	920	DB.Rdata-tacsatEflalo
DEU	2010	OTB	1_UK	0.4	14,988	DB.Rdata-tacsatEflalo
DEU	2010	OTB	2_UK	9.5	110,919	DB.Rdata-tacsatEflalo
DEU	2010	OTB	3_UK	1.2	3,394	DB.Rdata-tacsatEflalo
DEU	2010	OTB	5_NL	13.2	265,834	DB.Rdata-tacsatEflalo
DEU	2010	OTB	5_UK	1.1	3,137	DB.Rdata-tacsatEflalo
DEU	2010	OTB	6_GE	8.6	85,462	DB.Rdata-tacsatEflalo
DEU	2010	OTB	6_NL	0.5	57,420	DB.Rdata-tacsatEflalo
DEU	2010	SDN	4_UK	5.4	14,895	DB.Rdata-tacsatEflalo
DEU	2010	SDN	5_NL	0.2	875	DB.Rdata-tacsatEflalo
DEU	2010	SSC	2_UK	5.4	4,478	DB.Rdata-tacsatEflalo
DEU	2010	TBB	2_UK	2.2	1,640	DB.Rdata-tacsatEflalo
DEU	2010	TBB	3_UK	1.1	780	DB.Rdata-tacsatEflalo
DEU	2010	TBB	4_UK	0.2	186	DB.Rdata-tacsatEflalo
DEU	2010	TBB	6_GE	0.1	92	DB.Rdata-tacsatEflalo
DEU	2011	OTB	1_UK	0.5	58,664	DB.Rdata-tacsatEflalo
DEU	2011	OTB	2_UK	9.0	604,270	DB.Rdata-tacsatEflalo
DEU	2011	OTB	3_UK	0.6	1,720	DB.Rdata-tacsatEflalo
DEU	2011	OTB	5_NL	14.2	39,527	DB.Rdata-tacsatEflalo
DEU	2011	OTB	5_UK	2.4	5,296	DB.Rdata-tacsatEflalo
DEU	2011	OTB	6_GE	2.2	6,263	DB.Rdata-tacsatEflalo
DEU	2011	SDN	4_UK	8.7	25,876	DB.Rdata-tacsatEflalo
DEU	2011	TBB	2_UK	0.1	346	DB.Rdata-tacsatEflalo
DEU	2011	TBB	5_NL	1.9	8,057	DB.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
DEU	2011	TBB	5_UK	8.5	49,125	DB.Rdata-tacsatEflalo
DEU	2011	TBB	6_GE	3.2	12,257	DB.Rdata-tacsatEflalo
DEU	2011	TBB	6_NL	1.4	5,510	DB.Rdata-tacsatEflalo
DEU	2012	OTB	4_UK	0.3	1,406	DB.Rdata-tacsatEflalo
DEU	2012	OTB	5_NL	3.0	10,552	DB.Rdata-tacsatEflalo
DEU	2012	OTB	5_UK	0.3	926	DB.Rdata-tacsatEflalo
DEU	2012	OTB	6_DK	0.2	659	DB.Rdata-tacsatEflalo
DEU	2012	OTB	6_GE	3.9	15,177	DB.Rdata-tacsatEflalo
DEU	2012	TBB	5_NL	0.6	2,797	DB.Rdata-tacsatEflalo
DEU	2012	TBB	5_UK	0.0	9	DB.Rdata-tacsatEflalo
DEU	2012	TBB	6_GE	2.3	10,525	DB.Rdata-tacsatEflalo
DEU	2012	TBB	6_NL	0.4	1,895	DB.Rdata-tacsatEflalo
DEU	2013	OTB	1_UK	0.3	30,853	DB.Rdata-tacsatEflalo
DEU	2013	OTB	2_UK	3.2	96,522	DB.Rdata-tacsatEflalo
DEU	2013	OTB	3_UK	2.9	10,241	DB.Rdata-tacsatEflalo
DEU	2013	OTB	4_UK	6.6	31,772	DB.Rdata-tacsatEflalo
DEU	2013	OTB	5_NL	2.1	9,899	DB.Rdata-tacsatEflalo
DEU	2013	OTB	5_UK	1.0	1,640	DB.Rdata-tacsatEflalo
DEU	2013	OTB	6_GE	3.4	15,742	DB.Rdata-tacsatEflalo
DEU	2013	TBB	6_GE	1.4	6,537	DB.Rdata-tacsatEflalo
DEU	2013	TBB	6_NL	0.8	5,025	DB.Rdata-tacsatEflalo
DEU	2014	OTB	1_UK	0.6	12,932	DB.Rdata-tacsatEflalo
DEU	2014	OTB	2_UK	9.1	53,008	DB.Rdata-tacsatEflalo
DEU	2014	OTB	3_UK	0.8	3,874	DB.Rdata-tacsatEflalo
DEU	2014	OTB	4_UK	0.1	87	DB.Rdata-tacsatEflalo
DEU	2014	OTB	5_NL	3.7	14,005	DB.Rdata-tacsatEflalo
DEU	2014	OTB	5_UK	0.3	346	DB.Rdata-tacsatEflalo
DEU	2014	OTB	6_GE	8.8	7,220	DB.Rdata-tacsatEflalo
DEU	2014	TBB	5_NL	1.5	321	DB.Rdata-tacsatEflalo
DEU	2014	TBB	6_GE	0.8	569	DB.Rdata-tacsatEflalo
DEU	2015	OTB	1_UK	1.2	9,465	DB.Rdata-tacsatEflalo
DEU	2015	OTB	2_UK	4.4	114,495	DB.Rdata-tacsatEflalo
DEU	2015	OTB	3_UK	4.0	13,981	DB.Rdata-tacsatEflalo
DEU	2015	OTB	4_UK	0.7	3,213	DB.Rdata-tacsatEflalo
DEU	2015	OTB	5_NL	12.6	58,633	DB.Rdata-tacsatEflalo
DEU	2015	OTB	5_UK	0.9	3,773	DB.Rdata-tacsatEflalo
DEU	2015	OTB	6_GE	3.9	13,763	DB.Rdata-tacsatEflalo
DEU	2015	OTB	6_NL	0.3	216	DB.Rdata-tacsatEflalo
DEU	2015	TBB	6_GE	0.5	1,275	DB.Rdata-tacsatEflalo
DNK	2010	OTB	1_UK	6.6	478,266	DB.Rdata-tacsatEflalo
DNK	2010	OTB	2_UK	25.1	1,413,990	DB.Rdata-tacsatEflalo
DNK	2010	OTB	3_UK	0.1	176	DB.Rdata-tacsatEflalo
DNK	2010	OTB	5_NL	29.7	4,492,435	DB.Rdata-tacsatEflalo
DNK	2010	OTB	5_UK	3.0	62,608	DB.Rdata-tacsatEflalo
DNK	2010	OTB	6_GE	4.1	183,826	DB.Rdata-tacsatEflalo
DNK	2010	OTB	6_NL	10.6	2,089,153	DB.Rdata-tacsatEflalo
DNK	2010	SDN	2_UK	8.1	25,545	DB.Rdata-tacsatEflalo
DNK	2010	SDN	4_UK	8.7	18,684	DB.Rdata-tacsatEflalo
DNK	2010	SDN	5_NL	11.2	20,136	DB.Rdata-tacsatEflalo
DNK	2010	SDN	6_GE	0.2	81	DB.Rdata-tacsatEflalo
DNK	2011	OTB	1_UK	12.3	2,397,373	DB.Rdata-tacsatEflalo
DNK	2011	OTB	2_UK	53.5	4,735,418	DB.Rdata-tacsatEflalo
DNK	2011	OTB	5_NL	3.2	116,347	DB.Rdata-tacsatEflalo
DNK	2011	OTB	6_GE	4.3	1,934	DB.Rdata-tacsatEflalo
DNK	2011	OTB	6_NL	0.3	8,249	DB.Rdata-tacsatEflalo
DNK	2011	SDN	2_UK	28.2	86,758	DB.Rdata-tacsatEflalo
DNK	2011	SDN	3_UK	3.8	8,329	DB.Rdata-tacsatEflalo
DNK	2011	SDN	4_UK	18.5	45,611	DB.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
DNK	2011	SDN	5_NL	0.6	56	DB.Rdata-tacsatEflalo
DNK	2011	SDN	6_GE	2.3	1,363	DB.Rdata-tacsatEflalo
DNK	2012	OTB	1_UK	0.3	14,427	DB.Rdata-tacsatEflalo
DNK	2012	OTB	2_UK	0.6	24,704	DB.Rdata-tacsatEflalo
DNK	2012	OTB	4_UK	0.1	21,057	DB.Rdata-tacsatEflalo
DNK	2012	OTB	5_NL	7.5	210,705	DB.Rdata-tacsatEflalo
DNK	2012	OTB	5_UK	0.3	249	DB.Rdata-tacsatEflalo
DNK	2012	SDN	2_UK	27.2	95,013	DB.Rdata-tacsatEflalo
DNK	2012	SDN	3_UK	10.1	17,584	DB.Rdata-tacsatEflalo
DNK	2012	SDN	4_UK	38.8	71,486	DB.Rdata-tacsatEflalo
DNK	2012	SDN	5_NL	5.9	14,036	DB.Rdata-tacsatEflalo
DNK	2012	SDN	6_GE	1.2	1,887	DB.Rdata-tacsatEflalo
DNK	2013	OTB	1_UK	15.9	1,093,349	DB.Rdata-tacsatEflalo
DNK	2013	OTB	2_UK	42.3	1,253,419	DB.Rdata-tacsatEflalo
DNK	2013	OTB	3_UK	0.1	62	DB.Rdata-tacsatEflalo
DNK	2013	OTB	4_UK	0.1	6,280	DB.Rdata-tacsatEflalo
DNK	2013	OTB	5_NL	32.4	1,462,726	DB.Rdata-tacsatEflalo
DNK	2013	OTB	5_UK	0.9	79,567	DB.Rdata-tacsatEflalo
DNK	2013	OTB	6_GE	2.1	30,550	DB.Rdata-tacsatEflalo
DNK	2013	SDN	2_UK	43.3	126,691	DB.Rdata-tacsatEflalo
DNK	2013	SDN	3_UK	3.8	8,679	DB.Rdata-tacsatEflalo
DNK	2013	SDN	4_UK	19.8	48,491	DB.Rdata-tacsatEflalo
DNK	2013	SDN	5_NL	1.4	1,050	DB.Rdata-tacsatEflalo
DNK	2013	SDN	5_UK	0.1	174	DB.Rdata-tacsatEflalo
DNK	2013	SDN	6_GE	4.9	5,170	DB.Rdata-tacsatEflalo
DNK	2014	OTB	1_UK	11.5	345,262	DB.Rdata-tacsatEflalo
DNK	2014	OTB	2_UK	149.6	3,101,769	DB.Rdata-tacsatEflalo
DNK	2014	OTB	3_UK	0.0	82	DB.Rdata-tacsatEflalo
DNK	2014	OTB	5_NL	17.4	1,300,915	DB.Rdata-tacsatEflalo
DNK	2014	OTB	6_GE	2.5	9,423	DB.Rdata-tacsatEflalo
DNK	2014	SDN	2_UK	9.4	23,375	DB.Rdata-tacsatEflalo
DNK	2014	SDN	3_UK	10.2	26,072	DB.Rdata-tacsatEflalo
DNK	2014	SDN	4_UK	9.6	25,629	DB.Rdata-tacsatEflalo
DNK	2014	SDN	5_UK	1.5	4,756	DB.Rdata-tacsatEflalo
DNK	2015	OTB	1_UK	4.6	410,580	DB.Rdata-tacsatEflalo
DNK	2015	OTB	2_UK	6.0	215,847	DB.Rdata-tacsatEflalo
DNK	2015	OTB	5_NL	28.0	1,087,426	DB.Rdata-tacsatEflalo
DNK	2015	OTB	5_UK	0.1	9,603	DB.Rdata-tacsatEflalo
DNK	2015	OTB	6_GE	1.1	24,073	DB.Rdata-tacsatEflalo
DNK	2015	SDN	2_UK	30.6	61,815	DB.Rdata-tacsatEflalo
DNK	2015	SDN	3_UK	21.1	43,181	DB.Rdata-tacsatEflalo
DNK	2015	SDN	4_UK	8.4	9,270	DB.Rdata-tacsatEflalo
DNK	2015	SDN	6_NL	0.6	276	DB.Rdata-tacsatEflalo
GBR	2010	OTB	2_UK	8.7	55,170	DB.Rdata-tacsatEflalo
GBR	2010	OTB	3_UK	5.0	25,379	DB.Rdata-tacsatEflalo
GBR	2010	OTB	4_UK	2.5	15,078	DB.Rdata-tacsatEflalo
GBR	2010	OTB	5_NL	14.2	48,741	DB.Rdata-tacsatEflalo
GBR	2010	OTB	5_UK	15.0	61,301	DB.Rdata-tacsatEflalo
GBR	2010	OTB	6_GE	9.7	38,039	DB.Rdata-tacsatEflalo
GBR	2010	OTB	6_NL	0.6	3,095	DB.Rdata-tacsatEflalo
GBR	2010	OTT	2_UK	0.8	5,607	DB.Rdata-tacsatEflalo
GBR	2010	OTT	3_UK	4.5	17,268	DB.Rdata-tacsatEflalo
GBR	2010	OTT	5_NL	5.5	17,463	DB.Rdata-tacsatEflalo
GBR	2010	OTT	5_UK	0.9	2,658	DB.Rdata-tacsatEflalo
GBR	2010	OTT	6_GE	0.2	343	DB.Rdata-tacsatEflalo
GBR	2010	SDN	2_UK	7.1	20,635	DB.Rdata-tacsatEflalo
GBR	2010	SDN	5_NL	0.9	1,380	DB.Rdata-tacsatEflalo
GBR	2010	SDN	5_UK	6.6	19,090	DB.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
GBR	2010	SSC	3_UK	0.3	1,130	DB.Rdata-tacsatEflalo
GBR	2010	TBB	2_UK	7.4	54,694	DB.Rdata-tacsatEflalo
GBR	2010	TBB	3_UK	0.9	6,483	DB.Rdata-tacsatEflalo
GBR	2010	TBB	4_UK	23.7	196,135	DB.Rdata-tacsatEflalo
GBR	2010	TBB	5_NL	19.5	146,607	DB.Rdata-tacsatEflalo
GBR	2010	TBB	5_UK	10.0	44,959	DB.Rdata-tacsatEflalo
GBR	2010	TBB	6_GE	35.5	200,223	DB.Rdata-tacsatEflalo
GBR	2010	TBB	6_NL	9.2	53,434	DB.Rdata-tacsatEflalo
GBR	2011	OTB	1_UK	1.6	87,558	DB.Rdata-tacsatEflalo
GBR	2011	OTB	2_UK	9.9	89,085	DB.Rdata-tacsatEflalo
GBR	2011	OTB	3_UK	4.5	25,019	DB.Rdata-tacsatEflalo
GBR	2011	OTB	4_UK	11.0	68,850	DB.Rdata-tacsatEflalo
GBR	2011	OTB	5_NL	23.4	71,398	DB.Rdata-tacsatEflalo
GBR	2011	OTB	5_UK	13.7	57,350	DB.Rdata-tacsatEflalo
GBR	2011	OTB	6_GE	29.8	137,024	DB.Rdata-tacsatEflalo
GBR	2011	OTB	6_NL	6.6	34,861	DB.Rdata-tacsatEflalo
GBR	2011	OTT	2_UK	0.8	4,908	DB.Rdata-tacsatEflalo
GBR	2011	OTT	3_UK	2.7	11,223	DB.Rdata-tacsatEflalo
GBR	2011	OTT	4_UK	5.6	39,147	DB.Rdata-tacsatEflalo
GBR	2011	OTT	5_NL	8.5	29,615	DB.Rdata-tacsatEflalo
GBR	2011	OTT	5_UK	0.6	1,333	DB.Rdata-tacsatEflalo
GBR	2011	OTT	6_GE	14.9	86,317	DB.Rdata-tacsatEflalo
GBR	2011	OTT	6_NL	2.1	15,503	DB.Rdata-tacsatEflalo
GBR	2011	SDN	1_UK	0.2	45	DB.Rdata-tacsatEflalo
GBR	2011	SDN	2_UK	17.3	78,498	DB.Rdata-tacsatEflalo
GBR	2011	SDN	4_UK	0.8	73	DB.Rdata-tacsatEflalo
GBR	2011	SDN	5_UK	2.1	1,142	DB.Rdata-tacsatEflalo
GBR	2011	SSC	5_NL	1.9	5,688	DB.Rdata-tacsatEflalo
GBR	2011	SSC	6_GE	3.2	19,230	DB.Rdata-tacsatEflalo
GBR	2011	TBB	2_UK	1.6	14,746	DB.Rdata-tacsatEflalo
GBR	2011	TBB	3_UK	2.4	9,442	DB.Rdata-tacsatEflalo
GBR	2011	TBB	4_UK	43.1	331,004	DB.Rdata-tacsatEflalo
GBR	2011	TBB	5_NL	14.5	51,653	DB.Rdata-tacsatEflalo
GBR	2011	TBB	5_UK	2.2	12,396	DB.Rdata-tacsatEflalo
GBR	2011	TBB	6_GE	50.3	424,850	DB.Rdata-tacsatEflalo
GBR	2011	TBB	6_NL	9.9	91,204	DB.Rdata-tacsatEflalo
GBR	2012	OTB	2_UK	15.5	103,277	DB.Rdata-tacsatEflalo
GBR	2012	OTB	3_UK	3.6	14,452	DB.Rdata-tacsatEflalo
GBR	2012	OTB	4_UK	12.2	66,434	DB.Rdata-tacsatEflalo
GBR	2012	OTB	5_NL	4.8	13,904	DB.Rdata-tacsatEflalo
GBR	2012	OTB	5_UK	4.4	13,026	DB.Rdata-tacsatEflalo
GBR	2012	OTB	6_GE	2.3	7,928	DB.Rdata-tacsatEflalo
GBR	2012	OTB	6_NL	1.3	6,036	DB.Rdata-tacsatEflalo
GBR	2012	OTT	2_UK	5.6	27,745	DB.Rdata-tacsatEflalo
GBR	2012	OTT	3_UK	2.2	8,988	DB.Rdata-tacsatEflalo
GBR	2012	OTT	5_NL	2.7	8,354	DB.Rdata-tacsatEflalo
GBR	2012	OTT	5_UK	1.1	3,322	DB.Rdata-tacsatEflalo
GBR	2012	OTT	6_GE	0.4	1,980	DB.Rdata-tacsatEflalo
GBR	2012	OTT	6_NL	1.5	7,955	DB.Rdata-tacsatEflalo
GBR	2012	SDN	2_UK	34.7	120,841	DB.Rdata-tacsatEflalo
GBR	2012	SDN	5_UK	1.8	6,337	DB.Rdata-tacsatEflalo
GBR	2012	TBB	1_UK	0.0	3	DB.Rdata-tacsatEflalo
GBR	2012	TBB	2_UK	11.0	89,144	DB.Rdata-tacsatEflalo
GBR	2012	TBB	3_UK	0.6	4,304	DB.Rdata-tacsatEflalo
GBR	2012	TBB	4_UK	30.0	223,942	DB.Rdata-tacsatEflalo
GBR	2012	TBB	5_NL	24.5	135,698	DB.Rdata-tacsatEflalo
GBR	2012	TBB	5_UK	1.2	5,686	DB.Rdata-tacsatEflalo
GBR	2012	TBB	6_GE	48.7	293,934	DB.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
GBR	2012	TBB	6_NL	8.8	67,203	DB.Rdata-tacsatEflalo
GBR	2013	OTB	1_UK	0.2	8,450	DB.Rdata-tacsatEflalo
GBR	2013	OTB	2_UK	17.2	107,897	DB.Rdata-tacsatEflalo
GBR	2013	OTB	3_UK	3.4	13,295	DB.Rdata-tacsatEflalo
GBR	2013	OTB	4_UK	25.7	146,379	DB.Rdata-tacsatEflalo
GBR	2013	OTB	5_NL	7.9	24,261	DB.Rdata-tacsatEflalo
GBR	2013	OTB	5_UK	2.0	3,829	DB.Rdata-tacsatEflalo
GBR	2013	OTB	6_GE	8.2	23,099	DB.Rdata-tacsatEflalo
GBR	2013	OTB	6_NL	1.6	4,028	DB.Rdata-tacsatEflalo
GBR	2013	OTT	2_UK	4.0	26,738	DB.Rdata-tacsatEflalo
GBR	2013	SDN	2_UK	43.5	91,503	DB.Rdata-tacsatEflalo
GBR	2013	SDN	3_UK	1.4	3,998	DB.Rdata-tacsatEflalo
GBR	2013	SSC	2_UK	16.4	103,733	DB.Rdata-tacsatEflalo
GBR	2013	SSC	4_UK	5.5	31,384	DB.Rdata-tacsatEflalo
GBR	2013	SSC	6_GE	0.4	1,153	DB.Rdata-tacsatEflalo
GBR	2013	TBB	2_UK	4.4	29,673	DB.Rdata-tacsatEflalo
GBR	2013	TBB	3_UK	4.0	19,171	DB.Rdata-tacsatEflalo
GBR	2013	TBB	4_UK	24.3	183,573	DB.Rdata-tacsatEflalo
GBR	2013	TBB	5_NL	24.9	149,257	DB.Rdata-tacsatEflalo
GBR	2013	TBB	5_UK	2.1	24,694	DB.Rdata-tacsatEflalo
GBR	2013	TBB	6_GE	54.7	364,851	DB.Rdata-tacsatEflalo
GBR	2013	TBB	6_NL	10.7	74,278	DB.Rdata-tacsatEflalo
GBR	2014	OTB	1_UK	0.3	1,713	DB.Rdata-tacsatEflalo
GBR	2014	OTB	2_UK	14.2	73,206	DB.Rdata-tacsatEflalo
GBR	2014	OTB	3_UK	4.5	24,368	DB.Rdata-tacsatEflalo
GBR	2014	OTB	4_UK	11.4	83,363	DB.Rdata-tacsatEflalo
GBR	2014	OTB	5_NL	15.2	55,907	DB.Rdata-tacsatEflalo
GBR	2014	OTB	5_UK	15.2	77,354	DB.Rdata-tacsatEflalo
GBR	2014	OTB	6_GE	20.5	59,168	DB.Rdata-tacsatEflalo
GBR	2014	OTB	6_NL	3.4	22,208	DB.Rdata-tacsatEflalo
GBR	2014	OTT	2_UK	4.2	12,930	DB.Rdata-tacsatEflalo
GBR	2014	OTT	4_UK	6.7	43,193	DB.Rdata-tacsatEflalo
GBR	2014	OTT	5_NL	1.8	5,469	DB.Rdata-tacsatEflalo
GBR	2014	OTT	5_UK	0.4	3,870	DB.Rdata-tacsatEflalo
GBR	2014	SDN	2_UK	32.4	62,523	DB.Rdata-tacsatEflalo
GBR	2014	SDN	3_UK	2.7	6,216	DB.Rdata-tacsatEflalo
GBR	2014	SDN	5_UK	0.4	25	DB.Rdata-tacsatEflalo
GBR	2014	SSC	2_UK	3.0	13,030	DB.Rdata-tacsatEflalo
GBR	2014	SSC	3_UK	0.2	1,079	DB.Rdata-tacsatEflalo
GBR	2014	SSC	4_UK	0.3	1,881	DB.Rdata-tacsatEflalo
GBR	2014	SSC	5_NL	0.1	520	DB.Rdata-tacsatEflalo
GBR	2014	SSC	5_UK	1.7	11,830	DB.Rdata-tacsatEflalo
GBR	2014	SSC	6_GE	0.6	2,159	DB.Rdata-tacsatEflalo
GBR	2014	TBB	2_UK	2.9	27,026	DB.Rdata-tacsatEflalo
GBR	2014	TBB	3_UK	1.9	11,604	DB.Rdata-tacsatEflalo
GBR	2014	TBB	4_UK	15.2	94,982	DB.Rdata-tacsatEflalo
GBR	2014	TBB	5_NL	16.4	79,156	DB.Rdata-tacsatEflalo
GBR	2014	TBB	5_UK	2.0	16,893	DB.Rdata-tacsatEflalo
GBR	2014	TBB	6_GE	28.9	166,029	DB.Rdata-tacsatEflalo
GBR	2014	TBB	6_NL	2.4	19,143	DB.Rdata-tacsatEflalo
GBR	2015	OTB	2_UK	20.9	104,817	DB.Rdata-tacsatEflalo
GBR	2015	OTB	3_UK	4.2	7,175	DB.Rdata-tacsatEflalo
GBR	2015	OTB	4_UK	14.1	99,860	DB.Rdata-tacsatEflalo
GBR	2015	OTB	5_NL	20.9	62,467	DB.Rdata-tacsatEflalo
GBR	2015	OTB	5_UK	12.0	82,806	DB.Rdata-tacsatEflalo
GBR	2015	OTB	6_GE	10.2	8,043	DB.Rdata-tacsatEflalo
GBR	2015	OTB	6_NL	0.1	413	DB.Rdata-tacsatEflalo
GBR	2015	OTT	2_UK	1.3	2,154	DB.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
GBR	2015	OTT	4_UK	3.4	22,733	DB.Rdata-tacsatEflalo
GBR	2015	SDN	2_UK	28.6	59,916	DB.Rdata-tacsatEflalo
GBR	2015	SDN	3_UK	0.4	524	DB.Rdata-tacsatEflalo
GBR	2015	SDN	4_UK	2.7	5,220	DB.Rdata-tacsatEflalo
GBR	2015	SDN	5_NL	0.9	365	DB.Rdata-tacsatEflalo
GBR	2015	TBB	2_UK	10.1	79,963	DB.Rdata-tacsatEflalo
GBR	2015	TBB	3_UK	7.5	40,920	DB.Rdata-tacsatEflalo
GBR	2015	TBB	4_UK	32.7	229,226	DB.Rdata-tacsatEflalo
GBR	2015	TBB	5_NL	9.5	62,079	DB.Rdata-tacsatEflalo
GBR	2015	TBB	5_UK	0.5	3,243	DB.Rdata-tacsatEflalo
GBR	2015	TBB	6_DK	0.1	591	DB.Rdata-tacsatEflalo
GBR	2015	TBB	6_GE	57.2	362,875	DB.Rdata-tacsatEflalo
GBR	2015	TBB	6_NL	9.1	67,452	DB.Rdata-tacsatEflalo
NLD	2010	OTB	2_UK	5.5	23,790	DB.Rdata-tacsatEflalo
NLD	2010	OTB	3_UK	5.9	30,391	DB.Rdata-tacsatEflalo
NLD	2010	OTB	5_NL	11.5	36,865	DB.Rdata-tacsatEflalo
NLD	2010	OTB	5_UK	5.7	16,019	DB.Rdata-tacsatEflalo
NLD	2010	OTB	6_GE	0.3	150	DB.Rdata-tacsatEflalo
NLD	2010	SSC	5_NL	0.6	314	DB.Rdata-tacsatEflalo
NLD	2010	TBB	1_UK	1.6	4,520	DB.Rdata-tacsatEflalo
NLD	2010	TBB	2_UK	1.7	6,848	DB.Rdata-tacsatEflalo
NLD	2010	TBB	3_UK	0.9	1,241	DB.Rdata-tacsatEflalo
NLD	2010	TBB	4_UK	5.0	31,718	DB.Rdata-tacsatEflalo
NLD	2010	TBB	5_NL	7.1	28,764	DB.Rdata-tacsatEflalo
NLD	2010	TBB	5_UK	1.8	9,028	DB.Rdata-tacsatEflalo
NLD	2010	TBB	6_GE	21.0	85,319	DB.Rdata-tacsatEflalo
NLD	2010	TBB	6_NL	0.7	3,466	DB.Rdata-tacsatEflalo
NLD	2011	OTB	2_UK	5.3	24,665	DB.Rdata-tacsatEflalo
NLD	2011	OTB	3_UK	7.6	35,625	DB.Rdata-tacsatEflalo
NLD	2011	OTB	5_NL	31.7	104,202	DB.Rdata-tacsatEflalo
NLD	2011	OTB	5_UK	11.9	40,346	DB.Rdata-tacsatEflalo
NLD	2011	OTB	6_GE	3.7	11,682	DB.Rdata-tacsatEflalo
NLD	2011	OTB	6_NL	3.9	16,529	DB.Rdata-tacsatEflalo
NLD	2011	SDN	5_NL	0.7	695	DB.Rdata-tacsatEflalo
NLD	2011	SDN	5_UK	0.3	610	DB.Rdata-tacsatEflalo
NLD	2011	SSC	2_UK	0.2	143	DB.Rdata-tacsatEflalo
NLD	2011	SSC	3_UK	2.0	4,707	DB.Rdata-tacsatEflalo
NLD	2011	SSC	5_NL	0.1	55	DB.Rdata-tacsatEflalo
NLD	2011	TBB	2_UK	3.3	14,840	DB.Rdata-tacsatEflalo
NLD	2011	TBB	3_UK	2.4	5,494	DB.Rdata-tacsatEflalo
NLD	2011	TBB	4_UK	9.4	34,271	DB.Rdata-tacsatEflalo
NLD	2011	TBB	5_NL	32.6	149,190	DB.Rdata-tacsatEflalo
NLD	2011	TBB	5_UK	4.8	20,901	DB.Rdata-tacsatEflalo
NLD	2011	TBB	6_DK	0.1	926	DB.Rdata-tacsatEflalo
NLD	2011	TBB	6_GE	34.6	164,398	DB.Rdata-tacsatEflalo
NLD	2011	TBB	6_NL	5.8	28,304	DB.Rdata-tacsatEflalo
NLD	2012	OTB	2_UK	3.5	24,652	DB.Rdata-tacsatEflalo
NLD	2012	OTB	3_UK	10.3	56,087	DB.Rdata-tacsatEflalo
NLD	2012	OTB	4_UK	4.1	24,066	DB.Rdata-tacsatEflalo
NLD	2012	OTB	5_NL	27.8	79,328	DB.Rdata-tacsatEflalo
NLD	2012	OTB	5_UK	12.5	41,334	DB.Rdata-tacsatEflalo
NLD	2012	OTB	6_GE	3.3	8,055	DB.Rdata-tacsatEflalo
NLD	2012	OTB	6_NL	3.4	5,018	DB.Rdata-tacsatEflalo
NLD	2012	TBB	2_UK	2.3	8,320	DB.Rdata-tacsatEflalo
NLD	2012	TBB	3_UK	1.2	6,352	DB.Rdata-tacsatEflalo
NLD	2012	TBB	4_UK	11.1	45,914	DB.Rdata-tacsatEflalo
NLD	2012	TBB	5_NL	41.3	174,230	DB.Rdata-tacsatEflalo
NLD	2012	TBB	5_UK	2.7	4,816	DB.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
NLD	2012	TBB	6_GE	139.3	686,958	DB.Rdata-tacsatEflalo
NLD	2012	TBB	6_NL	22.4	109,650	DB.Rdata-tacsatEflalo
NLD	2013	DRB	5_NL	0.0	0	DB.Rdata-tacsatEflalo
NLD	2013	OTB	2_UK	3.0	17,975	DB.Rdata-tacsatEflalo
NLD	2013	OTB	3_UK	2.4	11,710	DB.Rdata-tacsatEflalo
NLD	2013	OTB	4_UK	10.9	55,113	DB.Rdata-tacsatEflalo
NLD	2013	OTB	5_NL	17.7	60,853	DB.Rdata-tacsatEflalo
NLD	2013	OTB	5_UK	2.7	11,652	DB.Rdata-tacsatEflalo
NLD	2013	OTB	6_GE	2.9	12,337	DB.Rdata-tacsatEflalo
NLD	2013	OTB	6_NL	1.2	2,020	DB.Rdata-tacsatEflalo
NLD	2013	OTT	4_UK	3.2	7,981	DB.Rdata-tacsatEflalo
NLD	2013	OTT	5_NL	12.6	36,407	DB.Rdata-tacsatEflalo
NLD	2013	OTT	6_GE	0.8	1,672	DB.Rdata-tacsatEflalo
NLD	2013	SSC	2_UK	0.6	941	DB.Rdata-tacsatEflalo
NLD	2013	SSC	3_UK	1.1	5,738	DB.Rdata-tacsatEflalo
NLD	2013	SSC	4_UK	7.2	28,657	DB.Rdata-tacsatEflalo
NLD	2013	TBB	2_UK	2.7	8,982	DB.Rdata-tacsatEflalo
NLD	2013	TBB	3_UK	1.5	3,133	DB.Rdata-tacsatEflalo
NLD	2013	TBB	4_UK	27.1	151,909	DB.Rdata-tacsatEflalo
NLD	2013	TBB	5_NL	25.3	125,537	DB.Rdata-tacsatEflalo
NLD	2013	TBB	6_DK	0.4	456	DB.Rdata-tacsatEflalo
NLD	2013	TBB	6_GE	90.3	468,244	DB.Rdata-tacsatEflalo
NLD	2013	TBB	6_NL	10.8	65,724	DB.Rdata-tacsatEflalo
NLD	2014	OTB	2_UK	1.1	8,969	DB.Rdata-tacsatEflalo
NLD	2014	OTB	3_UK	8.3	37,493	DB.Rdata-tacsatEflalo
NLD	2014	OTB	4_UK	0.5	1,062	DB.Rdata-tacsatEflalo
NLD	2014	OTB	5_NL	14.0	42,968	DB.Rdata-tacsatEflalo
NLD	2014	OTB	5_UK	4.4	21,823	DB.Rdata-tacsatEflalo
NLD	2014	OTB	6_GE	19.2	58,510	DB.Rdata-tacsatEflalo
NLD	2014	OTB	6_NL	0.4	1,437	DB.Rdata-tacsatEflalo
NLD	2014	OTT	5_NL	1.2	4,889	DB.Rdata-tacsatEflalo
NLD	2014	OTT	6_GE	1.2	1,292	DB.Rdata-tacsatEflalo
NLD	2014	OTT	6_NL	2.4	2,539	DB.Rdata-tacsatEflalo
NLD	2014	SSC	1_UK	0.2	40	DB.Rdata-tacsatEflalo
NLD	2014	SSC	2_UK	4.8	12,301	DB.Rdata-tacsatEflalo
NLD	2014	SSC	4_UK	0.5	542	DB.Rdata-tacsatEflalo
NLD	2014	TBB	2_UK	7.6	23,573	DB.Rdata-tacsatEflalo
NLD	2014	TBB	3_UK	1.2	5,574	DB.Rdata-tacsatEflalo
NLD	2014	TBB	4_UK	4.4	18,270	DB.Rdata-tacsatEflalo
NLD	2014	TBB	5_NL	11.8	40,431	DB.Rdata-tacsatEflalo
NLD	2014	TBB	5_UK	0.5	1,435	DB.Rdata-tacsatEflalo
NLD	2014	TBB	6_GE	23.2	111,886	DB.Rdata-tacsatEflalo
NLD	2014	TBB	6_NL	3.0	13,162	DB.Rdata-tacsatEflalo
NLD	2015	OTB	1_UK	0.1	278	DB.Rdata-tacsatEflalo
NLD	2015	OTB	2_UK	4.1	17,524	DB.Rdata-tacsatEflalo
NLD	2015	OTB	3_UK	5.7	42,158	DB.Rdata-tacsatEflalo
NLD	2015	OTB	4_UK	4.6	16,548	DB.Rdata-tacsatEflalo
NLD	2015	OTB	5_NL	15.2	44,497	DB.Rdata-tacsatEflalo
NLD	2015	OTB	5_UK	3.1	11,492	DB.Rdata-tacsatEflalo
NLD	2015	OTB	6_GE	9.1	24,035	DB.Rdata-tacsatEflalo
NLD	2015	OTB	6_NL	7.2	30,669	DB.Rdata-tacsatEflalo
NLD	2015	OTT	2_UK	0.1	482	DB.Rdata-tacsatEflalo
NLD	2015	OTT	3_UK	5.8	17,019	DB.Rdata-tacsatEflalo
NLD	2015	OTT	5_NL	15.0	33,604	DB.Rdata-tacsatEflalo
NLD	2015	OTT	6_GE	0.3	1,744	DB.Rdata-tacsatEflalo
NLD	2015	SSC	5_NL	0.1	137	DB.Rdata-tacsatEflalo
NLD	2015	TBB	2_UK	18.4	94,341	DB.Rdata-tacsatEflalo
NLD	2015	TBB	3_UK	30.1	172,498	DB.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
NLD	2015	TBB	4_UK	15.7	85,363	DB.Rdata-tacsatEflalo
NLD	2015	TBB	5_NL	37.7	187,656	DB.Rdata-tacsatEflalo
NLD	2015	TBB	5_UK	12.3	56,013	DB.Rdata-tacsatEflalo
NLD	2015	TBB	6_GE	83.1	436,782	DB.Rdata-tacsatEflalo
NLD	2015	TBB	6_NL	12.9	66,850	DB.Rdata-tacsatEflalo
SWE	2010	OTB	2_UK	2.9	306,735	DB.Rdata-tacsatEflalo
SWE	2010	OTB	5_NL	2.1	168,825	DB.Rdata-tacsatEflalo
SWE	2011	OTB	1_UK	1.0	73,674	DB.Rdata-tacsatEflalo
SWE	2011	OTB	2_UK	3.3	204,537	DB.Rdata-tacsatEflalo
SWE	2011	OTB	4_UK	0.6	38,342	DB.Rdata-tacsatEflalo
SWE	2011	OTB	6_NL	1.0	43,156	DB.Rdata-tacsatEflalo
SWE	2012	OTB	2_UK	0.2	5,645	DB.Rdata-tacsatEflalo
SWE	2013	OTB	1_UK	3.5	225,625	DB.Rdata-tacsatEflalo
SWE	2013	OTB	2_UK	1.1	67,739	DB.Rdata-tacsatEflalo
SWE	2013	OTB	5_NL	0.7	52,084	DB.Rdata-tacsatEflalo
SWE	2013	OTB	6_GE	0.4	22,755	DB.Rdata-tacsatEflalo
SWE	2013	OTB	6_NL	0.2	10,731	DB.Rdata-tacsatEflalo
SWE	2014	OTB	1_UK	0.8	58,474	DB.Rdata-tacsatEflalo
SWE	2014	OTB	2_UK	10.7	676,851	DB.Rdata-tacsatEflalo
SWE	2015	OTB	1_UK	0.4	31,342	DB.Rdata-tacsatEflalo
SWE	2015	OTB	2_UK	3.2	260,977	DB.Rdata-tacsatEflalo
SWE	2015	OTB	5_NL	1.1	55,876	DB.Rdata-tacsatEflalo
SWE	2015	OTB	6_GE	2.6	139,706	DB.Rdata-tacsatEflalo

Source: Logbook data and VMS data and data from the Annual Economic report (STECF 2016), processed by WUR, CEFAS, TI,DTU, ILVO, SLU and IFREMER.

Appendix 2 Economic factors

The economic factors are calculated from the data of the Annual Economic report 2016 (STECF, 2016). The value factor (expressed in €/kg) represents the $CNSvalue_{g,l,c,y}/CNSlandings_{g,l,c,y}$ factor in 2.3 and the GVA factor (no unit) represents the proportion of the value of landings available for capital and labour payments:

$$\frac{\sum_f \left(\frac{GVA_{f,c,y}}{value_{f,c,y}} CNSvalue_{f,g,l,c,y}\right)}{\sum_f CNSvalue_{f,g,l,c,y}}$$

Table A2.1 *Value and GVA factors per year, country, gear and length class*

Country	Year	Gear	Vessel length class	value factor	GVA factor
DEU	2010	OTB	18-24	2.11	0.62
DEU	2010	OTB	>24	0.35	0.56
DEU	2010	SDN	18-24	1.81	0.62
DEU	2010	SSC	>24	2.58	0.57
DEU	2010	TBB	18-24	2.26	0.57
DEU	2011	OTB	18-24	2.51	0.53
DEU	2011	OTB	>24	0.39	0.51
DEU	2011	SDN	18-24	1.88	0.53
DEU	2011	TBB	>24	2.4	0.31
DEU	2012	OTB	18-24	1.93	0.56
DEU	2012	OTB	>24	1.02	0.38
DEU	2012	TBB	>24	2.75	0.28
DEU	2013	OTB	18-24	1.8	0.7
DEU	2013	OTB	>24	0.37	0.52
DEU	2013	TBB	>24	2.84	0.5
DEU	2014	OTB	18-24	1.87	0.58
DEU	2014	OTB	>24	0.67	0.51
DEU	2014	TBB	>24	2.92	0.48
DEU	2015	OTB	18-24	2.14	0.58
DEU	2015	OTB	>24	0.5	0.51
DEU	2015	TBB	>24	7.94	0.48
NLD	2010	OTB	18-24	2.26	0.37
NLD	2010	OTB	>24	1.91	0.38
NLD	2010	SSC	>24	1.62	0.4
NLD	2010	TBB	>24	3.04	0.37
NLD	2011	OTB	18-24	2.57	0.46
NLD	2011	OTB	>24	2.23	0.35
NLD	2011	SDN	>24	1.8	0.4
NLD	2011	SSC	>24	1.77	0.4
NLD	2011	TBB	>24	2.67	0.29
NLD	2012	OTB	18-24	2.3	0.37
NLD	2012	OTB	>24	1.73	0.37
NLD	2012	SDN	>24	1.28	0.38
NLD	2012	TBB	>24	2.35	0.34
NLD	2013	DRB	>24	2.9	0.96
NLD	2013	OTB	18-24	2	0.47
NLD	2013	OTB	>24	1.55	0.37

Country	Year	Gear	Vessel length class	value factor	GVA factor
NLD	2013	OTT	18-24	3.26	0.48
NLD	2013	OTT	>24	3.3	0.37
NLD	2013	SSC	>24	1.57	0.37
NLD	2013	TBB	>24	2.29	0.36
NLD	2014	OTB	18-24	2.05	0.57
NLD	2014	OTB	>24	1.62	0.43
NLD	2014	OTT	18-24	2.81	0.57
NLD	2014	SSC	>24	1.69	0.42
NLD	2014	TBB	>24	2.57	0.44
NLD	2015	OTB	18-24	2.26	0.57
NLD	2015	OTB	>24	1.87	0.43
NLD	2015	OTT	18-24	2.89	0.57
NLD	2015	SSC	>24	2.89	0.42
NLD	2015	TBB	18-24	2.9	0.54
NLD	2015	TBB	>24	2.6	0.44
GBR	2010	OTB	>24	1.06	0.36
GBR	2010	OTT	18-24	2.38	0.36
GBR	2010	OTT	>24	1.89	0.36
GBR	2010	SDN	18-24	1.79	0.36
GBR	2010	SSC	>24	1.64	0.36
GBR	2010	TBB	>24	2.09	0.3
GBR	2011	OTB	18-24	2.8	0.41
GBR	2011	OTB	>24	1.27	0.24
GBR	2011	OTT	18-24	2.8	0.41
GBR	2011	OTT	>24	1.95	0.13
GBR	2011	SDN	18-24	1.88	0.41
GBR	2011	SSC	>24	1.37	0.33
GBR	2011	TBB	>24	2.04	0.25
GBR	2012	OTB	18-24	2.84	0.41
GBR	2012	OTB	>24	1.86	0.29
GBR	2012	OTT	18-24	2.54	0.41
GBR	2012	OTT	>24	2.05	0.28
GBR	2012	SDN	18-24	1.81	0.41
GBR	2012	TBB	18-24	2.13	0.41
GBR	2012	TBB	>24	2.01	0.21
GBR	2013	OTB	18-24	2.36	0.41
GBR	2013	OTB	>24	1.12	0.3
GBR	2013	OTT	>24	1.5	0.28
GBR	2013	SDN	18-24	1.57	0.41
GBR	2013	SSC	>24	1.25	0.34
GBR	2013	TBB	>24	1.63	0.15
GBR	2014	OTB	>24	1.62	0.34
GBR	2014	OTT	>24	1.56	0.3
GBR	2014	SDN	18-24	1.55	0.4
GBR	2014	SSC	>24	1.54	0.4
GBR	2014	TBB	>24	1.76	0.22
GBR	2015	OTB	>24	1.57	0.34
GBR	2015	OTT	>24	1.97	0.3
GBR	2015	SDN	18-24	1.55	0.4
GBR	2015	TBB	>24	2.22	0.22
DNK	2010	OTB	>24	0.25	0.73
DNK	2010	SDN	dec-18	0.42	0.5
DNK	2010	SDN	18-24	0.53	0.53
DNK	2011	OTB	dec-18	0.28	0.5

Country	Year	Gear	Vessel length class	value factor	GVA factor
DNK	2011	OTB	18-24	0.6	0.56
DNK	2011	OTB	>24	0.28	0.7
DNK	2011	SDN	dec-18	0.42	0.5
DNK	2011	SDN	18-24	0.53	0.53
DNK	2012	OTB	>24	0.51	0.64
DNK	2012	SDN	dec-18	0.42	0.5
DNK	2012	SDN	18-24	0.53	0.53
DNK	2013	OTB	18-24	0.46	0.49
DNK	2013	OTB	>24	0.35	0.75
DNK	2013	SDN	18-24	0.53	0.53
DNK	2014	OTB	18-24	0.38	0.57
DNK	2014	OTB	>24	0.28	0.57
DNK	2014	SDN	18-24	0.53	0.53
DNK	2015	OTB	>24	0.28	0.57
DNK	2015	SDN	18-24	0.53	0.53
BEL	2010	OTB	18-24	2.9	0.43
BEL	2010	OTB	>24	1.92	0.48
BEL	2010	SSC	>24	1.98	0.51
BEL	2010	TBB	>24	2.28	0.46
BEL	2011	OTB	18-24	3.06	0.4
BEL	2011	OTB	>24	2.47	0.45
BEL	2012	TBB	>24	2.08	0.4
BEL	2013	OTB	18-24	2.93	0.42
BEL	2013	SSC	>24	1.29	0.42
BEL	2013	TBB	18-24	3.37	0.38
BEL	2014	OTB	18-24	2.65	0.3
BEL	2014	OTB	>24	2.64	0.3
BEL	2014	SSC	>24	1.31	0.3
BEL	2015	OTB	>24	3.27	0.3
BEL	2015	SSC	>24	1.81	0.3
BEL	2015	TBB	>24	2.82	0.48
SWE	2010	OTB	>24	0.24	0.85
SWE	2011	OTB	>24	0.22	0.49
SWE	2012	OTB	>24	0.28	0.42
SWE	2013	OTB	>24	0.29	0.64
SWE	2014	OTB	>24	0.18	0.54
SWE	2015	OTB	>24	0.2	0.54

Appendix 3 Coverage of VMS-logbook data

Table A3.1 *Percentage coverage of the VMS logbook data compared to the logbook data in the ICES rectangle of interest (Figure 1.1)*

Country	data	2010	2011	2012	2013	2014	2015	Average
DEU	Effort	99	96	96	100	100	98	98
NLD	Effort	97	99	98	99	99	98	99
GBR	Effort	98	98	96	95	99	100	97
DNK	Effort	100	99	100	100	99	100	100
BEL	Effort	93	97	96	100	100	92	96
SWE	Effort	100	100	100	100	100	100	100
FRA	Effort	100	100	100	100	100	100	100
DEU	Landings	100	99	99	100	100	99	99
NLD	Landings	95	99	99	100	99	98	99
GBR	Landings	100	99	95	96	100	100	98
DNK	Landings	100	99	100	100	99	100	100
BEL	Landings	96	96	96	100	100	92	97
SWE	Landings	100	100	100	100	100	100	100
FRA	Landings	100	100	100	100	100	100	100

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MEMORANDUM
2017-050

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Memorandum 2017-050

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