Overview of the international fishing activities on the Cleaver Bank and Frisian Front

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

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Summary

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 Cleaver Bank and Frisian Front was prepared. 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 proposed closed areas on the Cleaver Bank and Frisian Front (Hamon et al. 2013; Oostenbrugge and Hamon 2014). The effort, value and landings by the Dutch, British, Danish, German, Belgian, Swedish and French fishing fleets are presented for a five year period (2010-2015) and show variations over the last years but generally show a decline in effort in both areas. Value of landings and gross value added show an upward trend for the Dutch fishery in the Cleaver Bank (with a low point in 2013) but a downward trend for the British, German and Belgian fleets and for the Frisian Front. Main target species of the Cleaver Bank are plaice, targeted by the beam trawl fleet, followed by mackerel, cod and whiting in the rest of the demersal fleet. On the Frisian Front, gillnets target mainly sole and cod. The total value of landings has remained relatively stable on the Cleaver Bank between €1.6m and €2m over years (with the exception of the low 2013 value at €0.7m) while it remained low for the Frisian Front around €17,000 per year on average for the fleets from the countries considered. Within fleets, the dependency of individuals on the areas to be closed can greatly vary although the value of landings in the proposed closures represent less than 1% of the total value of landings for the Dutch fleet. For the Dutch fisheries about 30 to 40 vessels fish a minor part (less than 10%) of their revenue from the proposed closed areas on the Cleaver Bank and only 1 or 2 vessels get more than 10% of their revenue from the proposed closures. Between 15 and 20 vessels would be impacted by a seasonal closure on the Frisian Front net fishery, of those vessels only one fished more than 10% of its revenue in the proposed closure for one year.

1 Introduction

In response to a request to Wageningen University & Research from the Dutch Ministry of Economic Affairs on 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 Cleaver Bank for bottom-contact gears[1] and of the seasonal closure of the Frisian Front for gillnets (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 (Hamon et al. 2013; 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 report 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 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 Cleaver Bank and the Frisian Front, to obtain an overview of the international activities on the Cleaver Bank and the Frisian Front.

This exercise was undertaken for the period 2010-2015 for all bottom-trawling fleets for the Cleaver Bank and for gillnet fleets between June and November on the Frisian Front. 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 are restricted to the fishing activities inside the closed areas and not beyond.

[1] Alternative closures for the Cleaver Bank have been investigated in Hintzen et al. 2017.

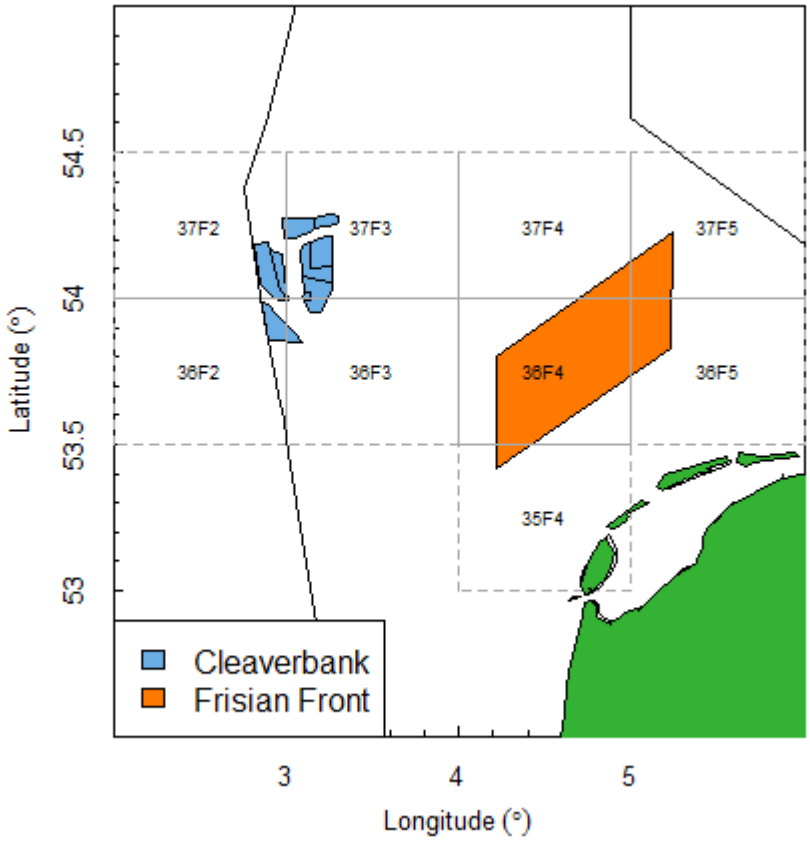

Figure 1.1 *Maps of the proposed closed areas on the Cleaver Bank and the Frisian Front with the adjacent ICES rectangles*

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[2] of the Annual Economic Report of the EU fishing fleets (STECF, 2016).

2.2 Fishing activity for bottom-contact gears

2.2.1 Base data

The above-mentioned data sources were 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, British and Belgian 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 pre-VMS and logbook data for the years 2010 to 2015, which were processed to remove erroneous fields, the script calculates effort, total landings and landings of the main fish species in the area of interest.

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 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] 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

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 Cleaver Bank area were selected (see Figure 1.1). Because the Cleaver Bank is particularly sensitive to bottom-contact gears, we selected only those gear types (see full list of the gears considered in Table 2.21).

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 2.21). For each ping, the state of the vessel is identified based on gear and speed.

Table 2.21 *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 are 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 Cleaver 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 2.4). 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 Fishing activity for gillnetters

2.3.1 Base data

Because the fishing activity of passive gears is so notoriously difficult to estimate using VMS data (the speed of towing a gear does not apply in this case), only logbook data are used to estimate the spatial distribution of passive gears (including gillnets). The same standardised script was applied to Dutch, German, Danish, British and Belgian data. Sweden had processed data available already which was processed 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 logbook data for the years 2010 to 2015 (processed as for bottom-contact gears), the script calculates effort, total landings and landings of the main fish species in the ICES rectangles around the area of interest (see map Figure 1.1).

2.3.2 Assign effort and landings to proposed closures

Logbook data define catch and effort by ICES rectangle. For passive gears this is the best available information. To estimate the proportion of the effort and landings of an ICES rectangle coming from the area of interest, we assume that within a month the effort and landings are distributed evenly within the ICES rectangle and take the proportion of the surface of the ICES rectangles overlapping with the area of interest (see Table 2.3). Because the closure of the Frisian Front would be seasonal (from 1 June to 30 November) we only select the activity happening during these months. Similarly to the method used for the bottom-contact gears, 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.

Table 2.3 *Percentage of the ICES rectangles overlapping with the Frisian Front*

ICES rectangle	Percentage in the Frisian Front
35F4	1.7
36F4	55.1
36F5	9.9
37F4	3.8
37F5	8.1

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 2.4.

2.3.3 Uncertainty in the analyses

In the analyses a number of assumptions have to be made related to the distribution of fishing activity at the ICES rectangle level. The final results remain uncertain and changes in assumptions will 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.

2.4 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 areas of interest (AoIvalue) was estimated by combining the landings volume in the proposed closed areas (AoIlanding) with the average fish price (CNSvalue/CNSlandings) for each gear type *g*, vessel length class *l*, country *c* and year *y* in the Central North Sea CNS (see Appendix 2):

$$AoIvalue_{g,l,c,y} = AoIlandings_{g,l,c,y} \cdot \frac{CNSvalue_{g,l,c,y}}{CNSlandings_{g,l,c,y}}$$

The GVA generated in the areas of interest by each gear *g*, vessel length category *l*, country *c* and year *y* ($AoIGVA_{g,l,c,y}$) was estimated using the value of landings in the areas of interest 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):

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

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.

2.5 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 area of interest over the total value of landings for fisher *i* is called 'individual stress-level', or ISL.

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

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.

The results were aggregated by home port, defined based on the vessels registration name. To simplify the visualisation the home ports were pooled by region: Zeeland, Holland (for South and North Holland), and North for the harbours of Friesland and Groningen. Urk was kept apart.

3 Results

3.1 Cleaver Bank

3.1.1 Fishing activity

Over the 2010-2015 period the amount of fishing activities with bottom-contacting gear has varied significantly from year to year in the proposed closed areas on the Cleaver Bank and seems to be declining (**Fout! Verwijzingsbron niet gevonden.** and

Table 3.1). Most of the logbook records in the Cleaver 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 94% on average for the period studied. This result allows us to focus more on the dataset where VMS and Logbooks are linked and provide greater spatial and temporal resolution.

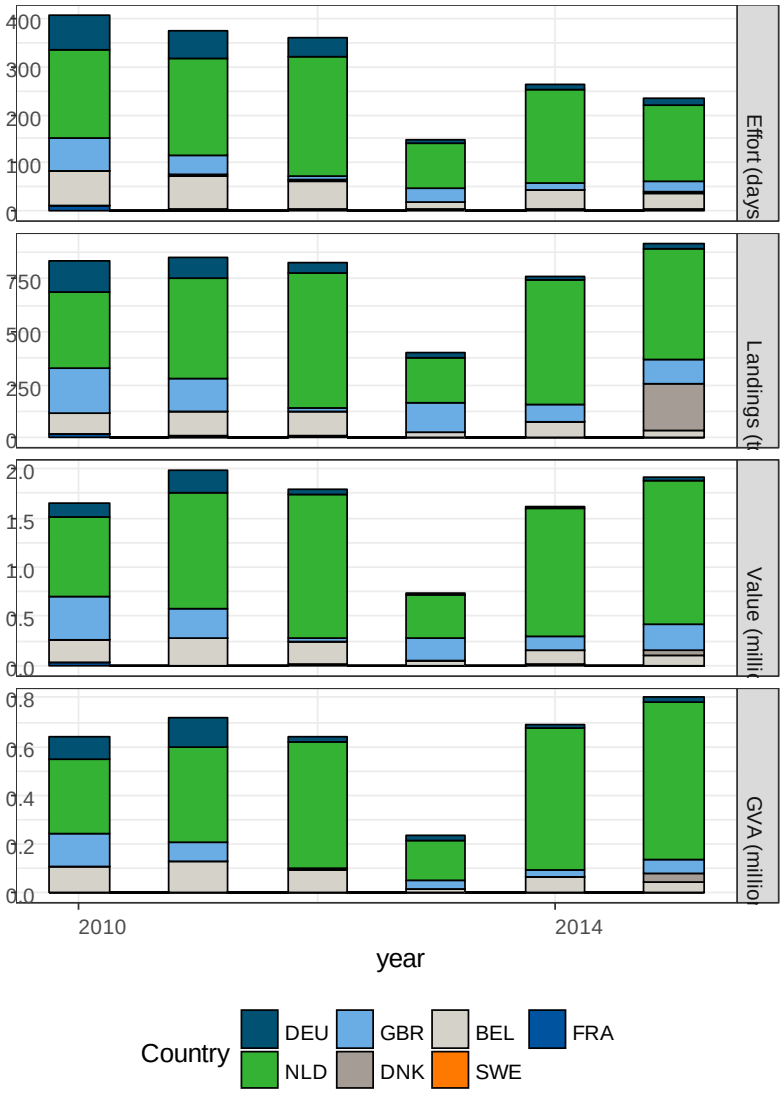

Figure 3.1 *Historical trend of the fishing activities by the different fleets in the proposed closed areas of the Cleaver Bank. Effort, landings, value of landings and GVA are given by country. Source: Logbook data and VMS data and data from the Annual Economic report (STECF 2016), processed by Wageningen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

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. For Belgian, British and German fishing activities effort seems to be declining while Dutch activity is more variable without a clear trend. Swedish, French and Danish activity is minor on the Cleaver Bank. Over the period, the Dutch effort was on average 181 days, while British, German and Belgian activities amounted to 29, 33 and 49 days at sea respectively, about 10 to 4 times less. The effort of Sweden, France and Denmark lies in between 0-3 days at sea. While the effort showed a downward trend, the landings remained relatively stable over the period at an average of 466 tonnes for the Netherlands, 369 tonnes for Great Britain, 75 tonnes for Belgium, 59 tonnes for Germany, 38 tonnes for Denmark, 7 tonnes for France and 1 tonnes for Sweden representing a value of 1.110 k€ (Netherlands), 231 k€ (Great Britain), 170 k€ (Belgium), 86 k€ (Germany), 11 k€ (Denmark), 10 k€ (France) and less than 1 k€ (Sweden), and a GVA of 434 k€ (Netherlands), 56 k€ (Great Britain), 76 k€ (Belgium), 46 k€ (Germany), 6 k€ (Denmark), 2 k€ (France) and less than 1 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 Cleaver Bank of the different fleets (VMS and logbook merged data only)*

Country	2010	2011	2012	2013	2014	2015[a]	Average
Effort (days at sea)							
Netherlands	185	204	252	95	193	160	181
Great Britain	66	37	6	28	16	21	29
Denmark	1	3	2	0	1	3	2
Germany	72	56	38	8	10	15	33
Belgium	74	72	60	17	39	34	49
Sweden		0					0
France	10	2	2	2	2	3	3
Total	**408**	**374**	**361**	**150**	**262**	**235**	**298**
Landings (tonnes)							
Netherlands	354	474	639	217	584	528	466
Great Britain	211	150	17	140	77	114	118
Denmark	1	8	0	0	2	218	38
Germany	148	97	45	19	20	25	59
Belgium	104	111	108	22	72	34	75
Sweden		6					1
France	16	5	13	2	6	0	7
Total	**834**	**851**	**822**	**401**	**761**	**919**	**769**
Value (1,000 euros)							
Netherlands	814	1,168	1,454	448	1,308	1,467	1,110
Great Britain	428	306	34	228	137	253	231
Denmark	0	4	0	0	1	60[a]	11
Germany	149	234	54	22	23	36	86
Belgium	237	267	227	41	148	98	170
Sweden		1					0
France	30	5	15	3	7	0	10
Total	**1,658**	**1,984**	**1,785**	**743**	**1,624**	**1,915**	**1,619**
Gross Value Added (1,000 euros)							
Netherlands	307	389	513	166	580	646	434
Great Britain	131	78	7	34	30	55	56
Denmark	0	2	0	0	0	35	6
Germany	90	118	23	15	13	19	46
Belgium	109	128	90	16	65	45	76
Sweden		1					0
France	0	1	5	1	3	0	2
Total	**638**	**717**	**639**	**233**	**691**	**800**	**620**

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

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

The majority of the fishing activities on the Cleaver Bank is carried out by Dutch vessels followed by Belgian, British and German fleets. The fishing occurs mainly with by beam trawls and otter-board trawls (Figure 3.1). The Dutch fleet also operates seines in the area.

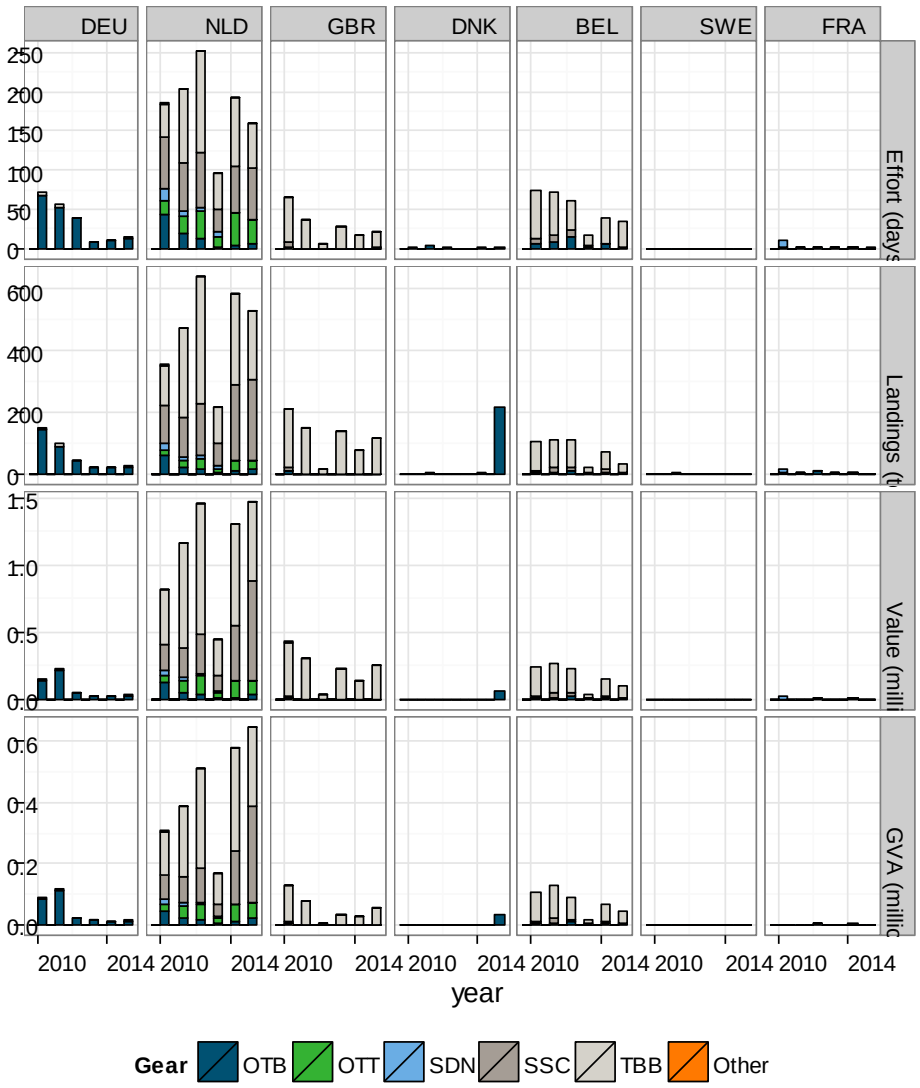

Figure 3.1 *Historical trend of the fishing activities with different gears in the proposed closure of the Cleaver Bank for the different countries. Effort, landings, value of landings and GVA are given by country.*
Source: Logbook data and VMS data and data from the Annual Economic report (STECF 2016), processed by Wageningen UR, CEFAS, TI, DTU, ILVO, SLU and IFREMER.

3.1.2 Species targeted

The main species targeted by the beam-trawl fleet on the Cleaver Bank is plaice. The other demersal gears catch a combination of species such as mackerel, plaice cod and whiting. Some sole and nephrops are caught as well. All other species have much lower landings with the notable anomaly of the Danish fleet in 2014 that caught anchovy and sprat (Figure 3.1).

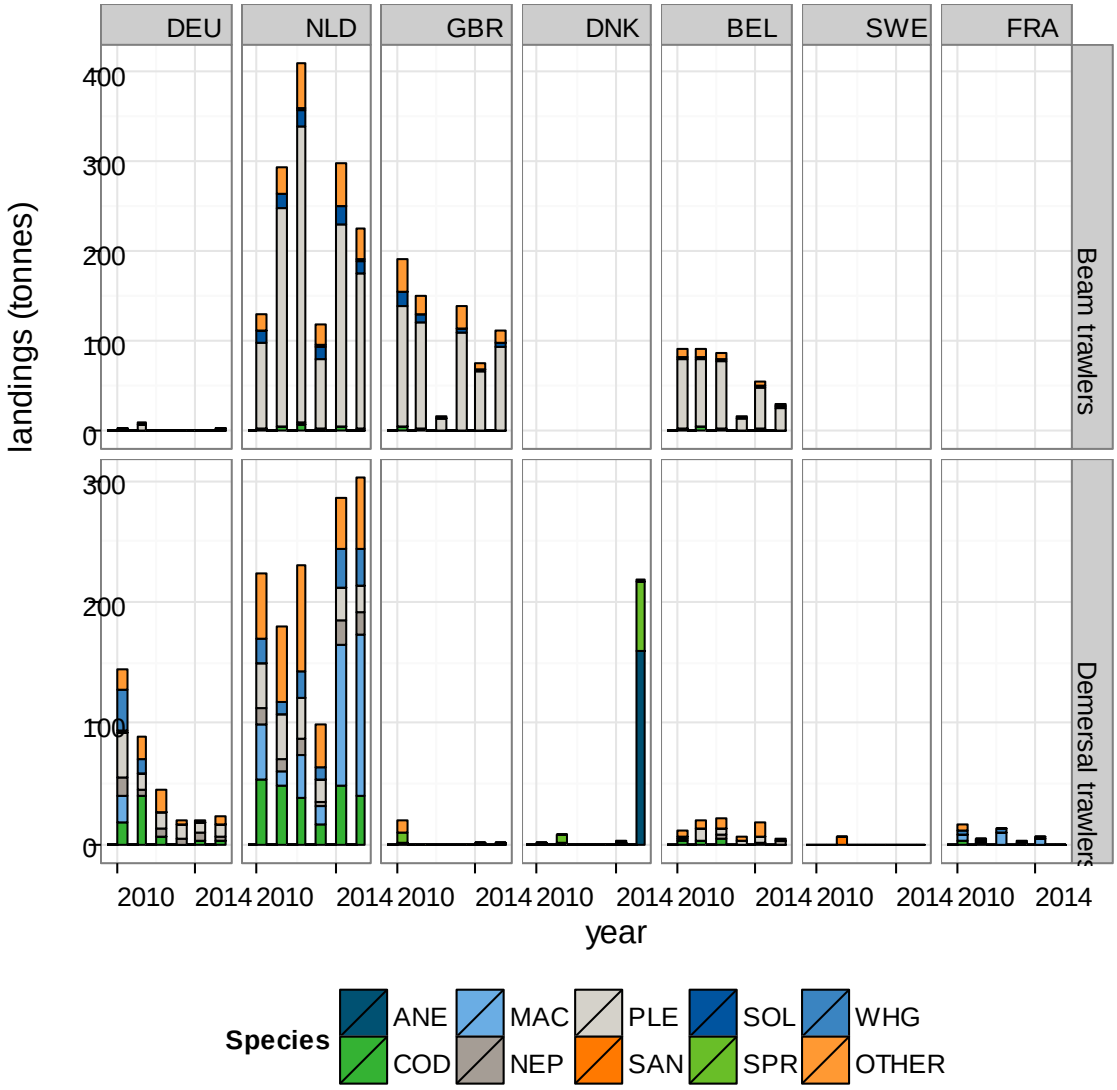

Figure 3.1 *Landings in tonnes for the top 5 species per country on the proposed closed areas of the Cleaver Bank for bottom-contact gears*
Source: Logbook data processed by Wageningen UR, CEFAS, TI,DTU, ILVO, SLU and IFREMER. ANE=anchovy, COD=cod, MAC=mackerel, NEP=nephrops, PLE=plaice, SAN=sandeel, SOL=sole, SPR=sprat, WHG=whiting.

3.1.3 Individual dependency on proposed closed areas

The dependency of the Dutch fleet on 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 3.14). The vessels from Holland (South and North Holland) represent most of the activity in the closed areas, followed by Urk. The activity of vessels from Zeeland and North (harbours of Friesland and Groningen) can be substantial in years but does not show a constant proportion. On average around 35 vessels had some revenue from the area but for most of them the revenue from the Cleaver Bank represented less than 10% of their total revenue (on average about 3 vessels had a dependency higher than 10% per year Figure 3.15). The number of vessels fishing in the proposed areas has increased over the years studied from 2008 to 2015 from on average 30 to on average 35 vessels (Figure 3.16).

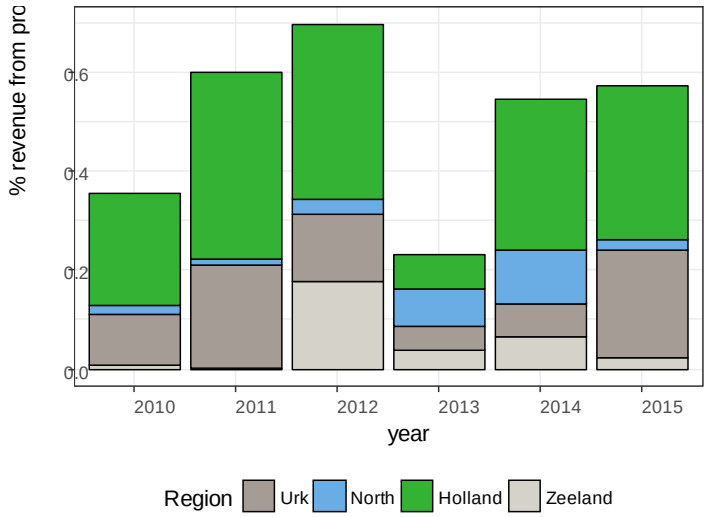

Figure 3.14 *Revenue per year and per region of origin in the proposed closed areas by bottom-contact gears as a percentage of the total revenue for the Dutch fleet using bottom-contact gears at least part of the year*

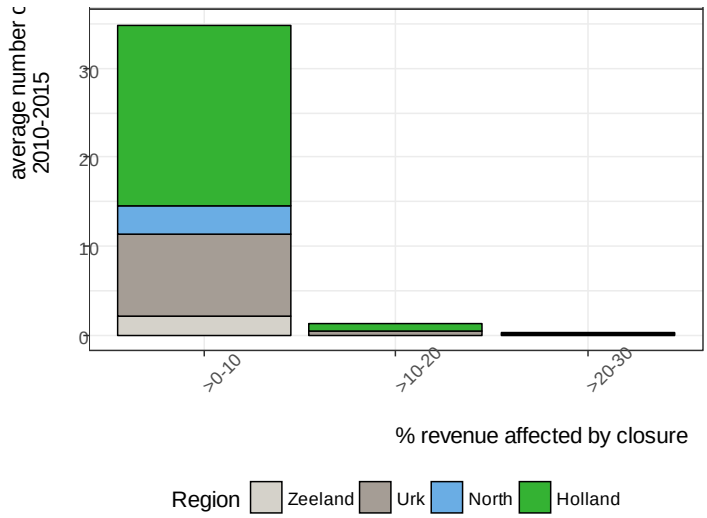

Figure 3.15 *Average stress profile of the Dutch bottom-contact gear fleet, 2010-2015*

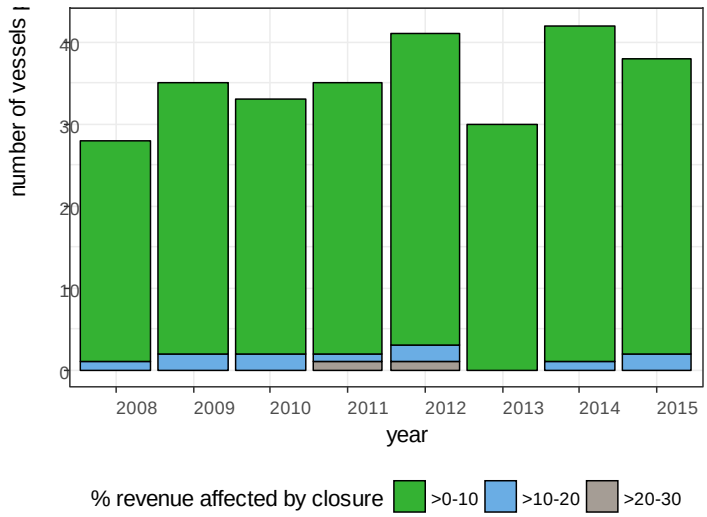

Figure 3.16 *Number of vessels active in the proposed closed areas per year and percentage of their revenue with bottom-contact gears in these areas*

3.2 Frisian Front

3.2.1 Fishing activity

Over the 2010-2015 period the amount of fishing activities of gillnetters in the period June-November on the Frisian Front has overall decreased (Table 3.2 and Figure 3.2). Despite the large uncertainty around the estimates, we see that the effort in the area has varied from year to year with different patterns for the different countries. Belgium, Sweden and France have not fished in the area with gillnets over the period. For the Dutch fleet, fishing activities effort seems to be declining while Danish and German activities are more variable without a clear trend. British activity is minor on the Frisian Front. Over the period, the Dutch effort was on average 8 days, while Danish, German and British activities amounted to 2, 1 and less than 1 days at sea respectively, about 8 to 4 times less. The resulting landings over the period were on average of 2 tonnes for the Netherlands, 1 tonne for Denmark, and less than a tonne for Great Britain and Germany representing a value of 14 k€ (Netherlands), 2 k€ (Denmark), 1 k€ (Great Britain), and less than 1 k€ (Germany), and a GVA of 7 k€ (Netherlands), 1 k€ (Great Britain), 1 k€ (Denmark), and less than 1 k€ (Germany).

Table 3.2 *Overview of effort, landings and values and gross value added of the gillnet fleets fishing during the proposed closed season off the Frisian Front*

Country	2010	2011	2012	2013	2014	2015[a]	Average
Effort (days at sea)							
Netherlands	10	20	8	4	2	1	8
Great Britain	0	1	0	0	1	0	0
Denmark	2	1	1	6	1	1	2
Germany	1	0	0	2	0	1	1
Belgium	-	-	-	-	-	-	-
Sweden	-	-	-	-	-	-	-
France	-	-	-	-	-	-	-
Total	**13**	**23**	**10**	**12**	**4**	**2**	**11**
Landings (tonnes)							
Netherlands	1	3	5	1	0	0	2
Great Britain	0	1	0	0	0	0	0
Denmark	1	0	0	2	0	1	1
Germany	0	0	0	1	0	0	0
Belgium	-	-	-	-	-	-	-
Sweden	-	-	-	-	-	-	-
France	-	-	-	-	-	-	-
Total	**2**	**4**	**6**	**4**	**1**	**1**	**3**
Value (1,000 euros)							
Netherlands	8	29	37	5	1	1	14
Great Britain	1	4	1	0	3	0	1
Denmark	1	1	1	5	0	1[a]	2
Germany	0	0	0	1	0	0	0
Belgium	-	-	-	-	-	-	-
Sweden	-	-	-	-	-	-	-
France	-	-	-	-	-	-	-
Total	**11**	**34**	**39**	**12**	**4**	**2**	**17**
Gross Value Added (1,000 euros)							
Netherlands	4	18	17	3	1	0	7
Great Britain	1	2	0	0	1	0	1
Denmark	1	0	1	3	0	1	1
Germany	0	0	0	1	0	0	0
Belgium	-	-	-	-	-	-	-
Sweden	-	-	-	-	-	-	-
France	-	-	-	-	-	-	-
Total	**5**	**20**	**18**	**7**	**2**	**1**	**9**

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

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

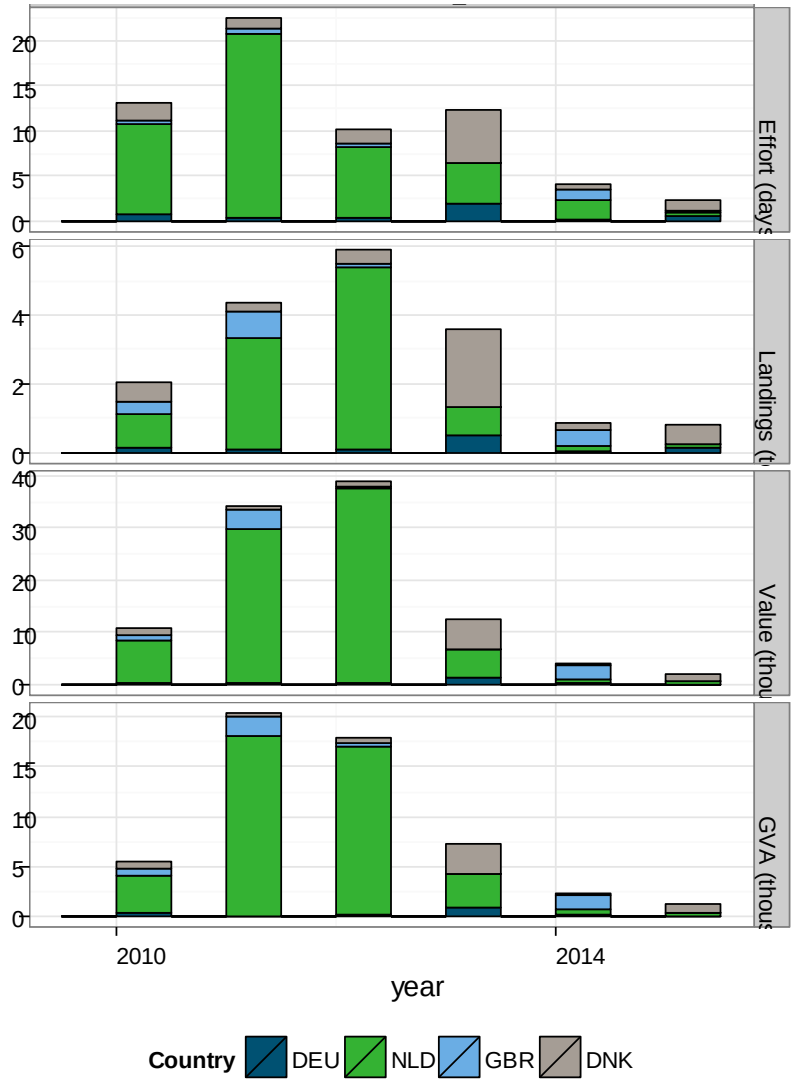

Figure 3.2 *Historical trend of the fishing activities by the gillnet fleets fishing during the proposed closed season off the Frisian Front. Effort, landings, value of landings and GVA are given by country. Source: Logbook data and data from the Annual Economic report (STECF 2016), processed by Wageningen UR, CEFAS, TI,DTU, ILVO, SLU and IFREMER.*

3.2.2 Species targeted

The main species targeted by the gillnetters on the Frisian Front are sole and cod. The other species caught are turbot, plaice and mullet. There is a strong variability in the catch combination between years (Figure 3.2).

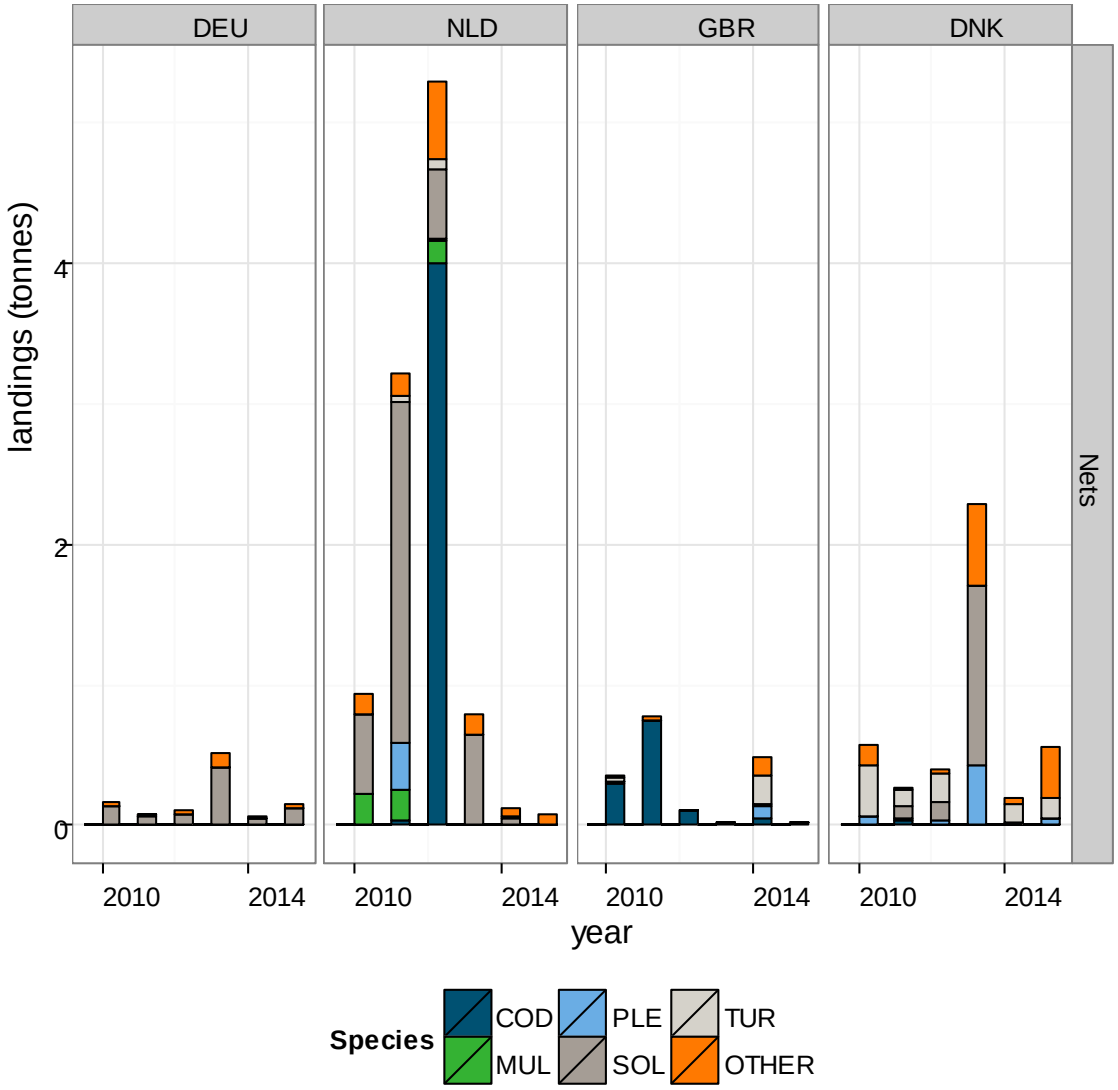

Figure 3.2 *Landings in tonnes for the top 5 species per country during the proposed seasonal closure of the Frisian Front for gillnets*
Source: Logbook data processed by Wageningen UR, CEFAS, TI,DTU, ILVO, SLU and IFREMER. COD=cod, MUL=mullet, PLE=plaice, SOL=sole, TUR=turbot.

3.2.3 Individual dependency on proposed closed areas

The dependency of the Dutch fleet on the seasonal closure of the Frisian Front to gillnets is low at the fleet level (around 1% of the revenue of the Dutch vessels operating at least part of the year with gillnets, see Figure 3.2). The vessels from Urk represent most of the activity in the closed areas, followed by North (harbours of Groningen and Friesland) and Holland (South and North Holland) in 2012. On average around 17-18 vessels had some revenue from the area but for most of them the revenue from the Cleaver Bank represented less than 10% of their total revenue (only one vessel, one year had a dependency higher than 10% Figure 3.2). The number of vessels fishing in the proposed areas has decreased over the years studied from 2008 to 2015 from on average 22 to on average 12 vessels (Figure 3.16).

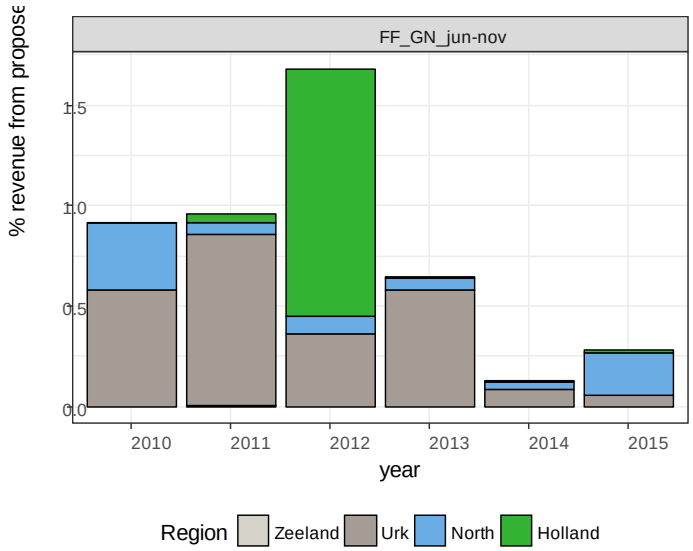

Figure 3.2 *Revenue per year and per region of origin in the proposed closed areas by gillnetters as a percentage of the total revenue for the Dutch fleet using gillnets at least part of the year*

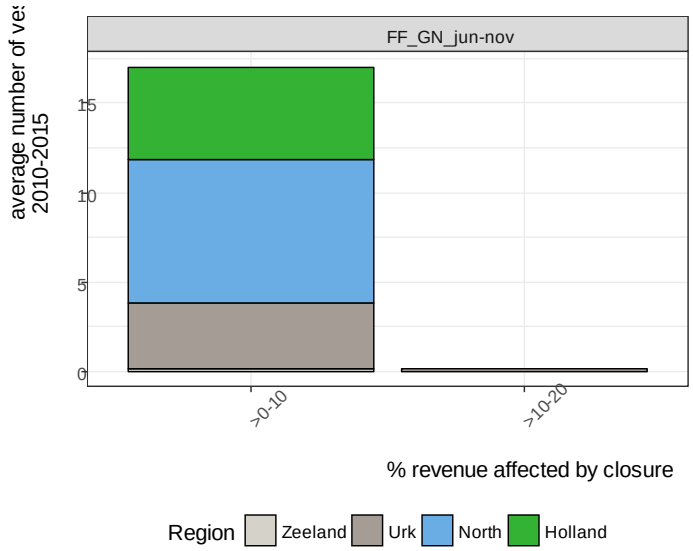

Figure 3.2 *Average stress profile of the Dutch gillnet fleet, 2010-2015*

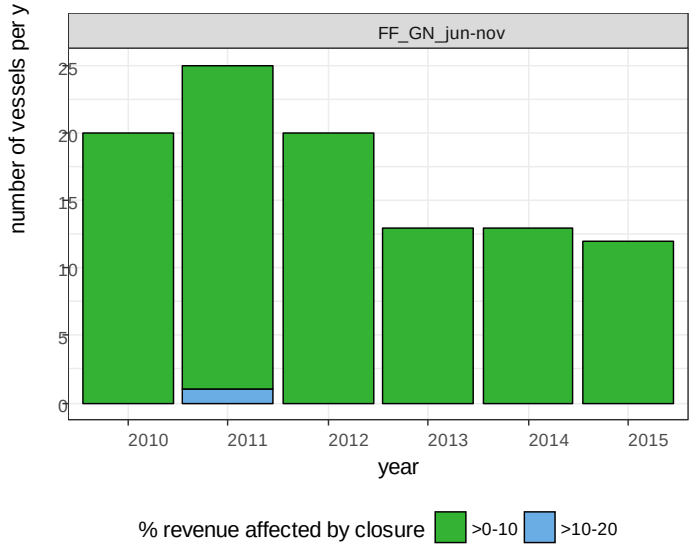

Figure 3.2 *Number of vessels active in the proposed closed areas per year and percentage of their revenue with gillnets in these areas*

4 Discussion and conclusion

The fishing intensity in the proposed closed areas on the Cleaver Bank has overall declined over the 2010-2015 period. The Netherlands has the highest fishing activity in the area, followed by Germany Great Britain and Belgium. France, Sweden and Denmark have very limited effort and landings from the areas studied. This is probably due to the interest in target species in the area, which is especially plaice, one of the main target species for the Dutch beam trawl fleet. Other demersal fisheries catch mixtures of round fish such as cod and whiting in the area with especially mackerel catches being around 50% of the catch composition. The expansion of the mackerel stock over the past few years may have caused an increase in North Sea catches as well.

Although total effort seems to have gone down over the years, the value and especially GVA in the area has gone up for the Dutch fleet. The British and Belgian fleet shows a declining trend in nearly all of the indicators. The total value of landings has remained relatively stable on the Cleaver Bank ranging from about €0.7m in 2013 up to €2m in 2011.

The Dutch fishery overall catches a minor part of their total landings inside the proposed areas (i.e. less than 1%). Most of the vessels fishing in the area have a low dependency on the area with the majority of the vessels having a dependency <10%. There is one vessel however that has a relatively high dependency on the area catches between 20-30% of its entire yearly landings in the area.

The fishing activities reported by gillnetters on the Frisian Front during the proposed closure (June to November) are very low. The Dutch gillnet fleet is the most active there with an average of 8 days at sea, 2 tonnes of landings and 14 k€ of revenue from the area. Other gillnet fleets active in the area are the Danish, British and German fleets with an average annual revenue from the area/season of 2, 1 and less than 1 k€ respectively. In recent years there seem to a declining trend for the Dutch gillnet activity on the Frisian Front. While up to 25 vessels used to have some activity there in the June-November period, the number of vessels active in the area decreased down to 12 vessels in 2015 and over the period no vessel has shown a great dependency to the area (one vessel had 10-20% of its revenue from the area/season in 2011, otherwise all vessels get less than 10% of the revenue from the area/season).

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. Although attempts have been made (Oostenbrugge et al. 2015) research in the field of displacement remains 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 the Cleaver Bank of all countries

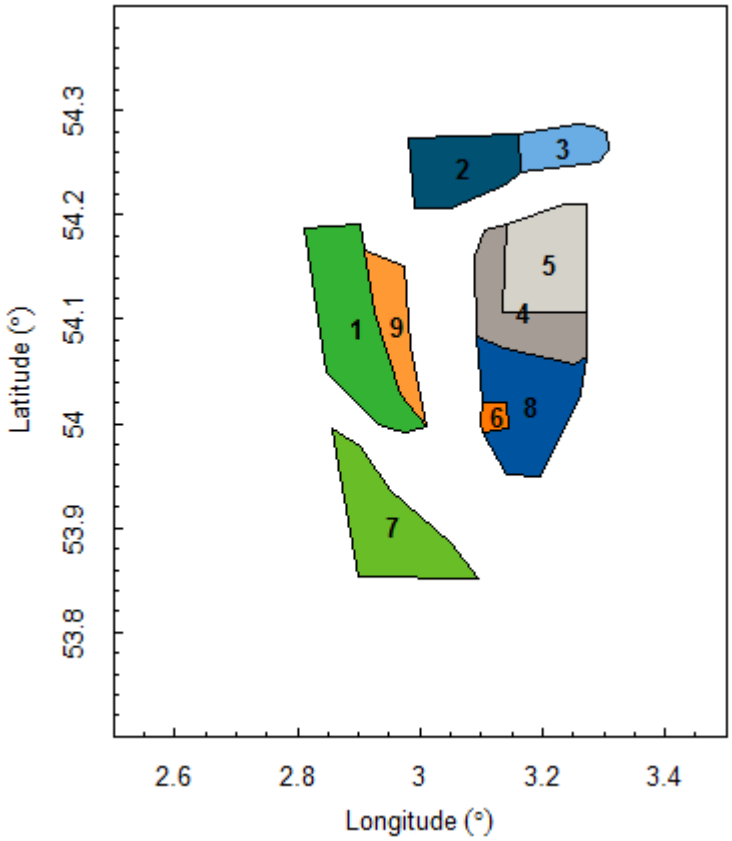

Figure A1.1 *Map of the proposed closed areas of the Cleaver Bank areas*

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	1	1	845	CB_prop1.Rdata-tacsatEflalo
BEL	2010	OTB	7	6	3,329	CB_prop1.Rdata-tacsatEflalo
BEL	2010	SSC	1	2	1,348	CB_prop1.Rdata-tacsatEflalo
BEL	2010	SSC	2	1	2,021	CB_prop1.Rdata-tacsatEflalo
BEL	2010	SSC	4	1	1,668	CB_prop1.Rdata-tacsatEflalo
BEL	2010	SSC	5	0	827	CB_prop1.Rdata-tacsatEflalo
BEL	2010	SSC	8	1	2,029	CB_prop1.Rdata-tacsatEflalo
BEL	2010	TBB	1	15	30,589	CB_prop1.Rdata-tacsatEflalo
BEL	2010	TBB	2	0	173	CB_prop1.Rdata-tacsatEflalo
BEL	2010	TBB	3	4	6,146	CB_prop1.Rdata-tacsatEflalo
BEL	2010	TBB	4	1	2,643	CB_prop1.Rdata-tacsatEflalo
BEL	2010	TBB	5	6	10,928	CB_prop1.Rdata-tacsatEflalo
BEL	2010	TBB	7	17	18,029	CB_prop1.Rdata-tacsatEflalo
BEL	2010	TBB	8	3	5,801	CB_prop1.Rdata-tacsatEflalo
BEL	2010	TBB	9	16	17,435	CB_prop1.Rdata-tacsatEflalo
BEL	2011	OTB	1	4	1,897	CB_prop1.Rdata-tacsatEflalo
BEL	2011	OTB	7	4	1,863	CB_prop1.Rdata-tacsatEflalo
BEL	2011	SSC	1	1	745	CB_prop1.Rdata-tacsatEflalo
BEL	2011	SSC	2	1	497	CB_prop1.Rdata-tacsatEflalo
BEL	2011	SSC	4	2	4,813	CB_prop1.Rdata-tacsatEflalo
BEL	2011	SSC	5	1	3,963	CB_prop1.Rdata-tacsatEflalo
BEL	2011	SSC	6	0	733	CB_prop1.Rdata-tacsatEflalo
BEL	2011	SSC	8	2	5,891	CB_prop1.Rdata-tacsatEflalo
BEL	2011	TBB	1	13	11,192	CB_prop1.Rdata-tacsatEflalo
BEL	2011	TBB	3	1	1,886	CB_prop1.Rdata-tacsatEflalo
BEL	2011	TBB	4	6	13,450	CB_prop1.Rdata-tacsatEflalo
BEL	2011	TBB	5	11	24,537	CB_prop1.Rdata-tacsatEflalo
BEL	2011	TBB	6	0	1,425	CB_prop1.Rdata-tacsatEflalo
BEL	2011	TBB	7	7	19,185	CB_prop1.Rdata-tacsatEflalo
BEL	2011	TBB	8	4	5,900	CB_prop1.Rdata-tacsatEflalo
BEL	2011	TBB	9	14	13,300	CB_prop1.Rdata-tacsatEflalo
BEL	2012	OTB	1	6	3,532	CB_prop1.Rdata-tacsatEflalo
BEL	2012	OTB	7	8	5,253	CB_prop1.Rdata-tacsatEflalo
BEL	2012	SSC	1	0	422	CB_prop1.Rdata-tacsatEflalo
BEL	2012	SSC	2	4	1,442	CB_prop1.Rdata-tacsatEflalo
BEL	2012	SSC	4	1	1,022	CB_prop1.Rdata-tacsatEflalo
BEL	2012	SSC	5	4	7,482	CB_prop1.Rdata-tacsatEflalo
BEL	2012	SSC	8	1	1,895	CB_prop1.Rdata-tacsatEflalo
BEL	2012	TBB	1	11	29,009	CB_prop1.Rdata-tacsatEflalo
BEL	2012	TBB	3	1	2,978	CB_prop1.Rdata-tacsatEflalo
BEL	2012	TBB	4	3	4,237	CB_prop1.Rdata-tacsatEflalo
BEL	2012	TBB	5	3	7,541	CB_prop1.Rdata-tacsatEflalo
BEL	2012	TBB	6	0	165	CB_prop1.Rdata-tacsatEflalo
BEL	2012	TBB	7	10	18,511	CB_prop1.Rdata-tacsatEflalo
BEL	2012	TBB	8	2	6,347	CB_prop1.Rdata-tacsatEflalo
BEL	2012	TBB	9	6	18,565	CB_prop1.Rdata-tacsatEflalo
BEL	2013	OTB	1	1	377	CB_prop1.Rdata-tacsatEflalo
BEL	2013	OTB	7	1	1,632	CB_prop1.Rdata-tacsatEflalo
BEL	2013	SSC	1	1	3,212	CB_prop1.Rdata-tacsatEflalo
BEL	2013	SSC	7	1	400	CB_prop1.Rdata-tacsatEflalo
BEL	2013	TBB	3	0	770	CB_prop1.Rdata-tacsatEflalo
BEL	2013	TBB	4	4	2,690	CB_prop1.Rdata-tacsatEflalo
BEL	2013	TBB	5	1	2,129	CB_prop1.Rdata-tacsatEflalo
BEL	2013	TBB	6	4	6,953	CB_prop1.Rdata-tacsatEflalo
BEL	2013	TBB	7	1	1,638	CB_prop1.Rdata-tacsatEflalo
BEL	2013	TBB	8	2	1,910	CB_prop1.Rdata-tacsatEflalo
BEL	2013	TBB	9	0	320	CB_prop1.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
BEL	2014	OTB	1	4	4,611	CB_prop1.Rdata-tacsatEflalo
BEL	2014	OTB	7	1	1,098	CB_prop1.Rdata-tacsatEflalo
BEL	2014	SSC	5	0	219	CB_prop1.Rdata-tacsatEflalo
BEL	2014	SSC	7	1	11,319	CB_prop1.Rdata-tacsatEflalo
BEL	2014	TBB	1	9	18,657	CB_prop1.Rdata-tacsatEflalo
BEL	2014	TBB	3	1	970	CB_prop1.Rdata-tacsatEflalo
BEL	2014	TBB	4	1	1,373	CB_prop1.Rdata-tacsatEflalo
BEL	2014	TBB	5	2	2,299	CB_prop1.Rdata-tacsatEflalo
BEL	2014	TBB	7	15	21,820	CB_prop1.Rdata-tacsatEflalo
BEL	2014	TBB	8	1	1,379	CB_prop1.Rdata-tacsatEflalo
BEL	2014	TBB	9	3	8,376	CB_prop1.Rdata-tacsatEflalo
BEL	2015	OTB	1	1	1,080	CB_prop1.Rdata-tacsatEflalo
BEL	2015	OTB	7	2	2,744	CB_prop1.Rdata-tacsatEflalo
BEL	2015	TBB	1	9	6,805	CB_prop1.Rdata-tacsatEflalo
BEL	2015	TBB	3	1	1,414	CB_prop1.Rdata-tacsatEflalo
BEL	2015	TBB	4	1	1,011	CB_prop1.Rdata-tacsatEflalo
BEL	2015	TBB	5	3	4,150	CB_prop1.Rdata-tacsatEflalo
BEL	2015	TBB	7	6	10,515	CB_prop1.Rdata-tacsatEflalo
BEL	2015	TBB	9	10	6,448	CB_prop1.Rdata-tacsatEflalo
DEU	2010	OTB	1	6	9,752	CB_prop1.Rdata-tacsatEflalo
DEU	2010	OTB	2	13	57,390	CB_prop1.Rdata-tacsatEflalo
DEU	2010	OTB	3	2	5,531	CB_prop1.Rdata-tacsatEflalo
DEU	2010	OTB	4	1	1,909	CB_prop1.Rdata-tacsatEflalo
DEU	2010	OTB	5	5	16,241	CB_prop1.Rdata-tacsatEflalo
DEU	2010	OTB	7	40	49,529	CB_prop1.Rdata-tacsatEflalo
DEU	2010	OTB	8	2	4,414	CB_prop1.Rdata-tacsatEflalo
DEU	2010	TBB	2	0	70	CB_prop1.Rdata-tacsatEflalo
DEU	2010	TBB	4	0	126	CB_prop1.Rdata-tacsatEflalo
DEU	2010	TBB	5	1	321	CB_prop1.Rdata-tacsatEflalo
DEU	2010	TBB	7	2	2,725	CB_prop1.Rdata-tacsatEflalo
DEU	2010	TBB	8	0	180	CB_prop1.Rdata-tacsatEflalo
DEU	2011	OTB	1	10	16,792	CB_prop1.Rdata-tacsatEflalo
DEU	2011	OTB	2	21	43,310	CB_prop1.Rdata-tacsatEflalo
DEU	2011	OTB	3	1	1,480	CB_prop1.Rdata-tacsatEflalo
DEU	2011	OTB	4	1	1,728	CB_prop1.Rdata-tacsatEflalo
DEU	2011	OTB	5	3	4,793	CB_prop1.Rdata-tacsatEflalo
DEU	2011	OTB	7	13	16,017	CB_prop1.Rdata-tacsatEflalo
DEU	2011	OTB	8	3	3,107	CB_prop1.Rdata-tacsatEflalo
DEU	2011	OTB	9	0	768	CB_prop1.Rdata-tacsatEflalo
DEU	2011	TBB	2	1	1,003	CB_prop1.Rdata-tacsatEflalo
DEU	2011	TBB	3	1	1,726	CB_prop1.Rdata-tacsatEflalo
DEU	2011	TBB	4	0	901	CB_prop1.Rdata-tacsatEflalo
DEU	2011	TBB	5	0	362	CB_prop1.Rdata-tacsatEflalo
DEU	2011	TBB	6	1	2,083	CB_prop1.Rdata-tacsatEflalo
DEU	2011	TBB	7	1	2,691	CB_prop1.Rdata-tacsatEflalo
DEU	2011	TBB	9	0	293	CB_prop1.Rdata-tacsatEflalo
DEU	2012	OTB	1	18	11,837	CB_prop1.Rdata-tacsatEflalo
DEU	2012	OTB	2	3	6,848	CB_prop1.Rdata-tacsatEflalo
DEU	2012	OTB	3	1	2,838	CB_prop1.Rdata-tacsatEflalo
DEU	2012	OTB	4	0	524	CB_prop1.Rdata-tacsatEflalo
DEU	2012	OTB	7	12	19,671	CB_prop1.Rdata-tacsatEflalo
DEU	2012	OTB	8	1	633	CB_prop1.Rdata-tacsatEflalo
DEU	2012	OTB	9	2	2,426	CB_prop1.Rdata-tacsatEflalo
DEU	2013	OTB	1	1	1,891	CB_prop1.Rdata-tacsatEflalo
DEU	2013	OTB	7	7	17,133	CB_prop1.Rdata-tacsatEflalo
DEU	2013	TBB	7	0	258	CB_prop1.Rdata-tacsatEflalo
DEU	2014	OTB	1	4	6,027	CB_prop1.Rdata-tacsatEflalo
DEU	2014	OTB	5	0	323	CB_prop1.Rdata-tacsatEflalo
DEU	2014	OTB	7	5	12,132	CB_prop1.Rdata-tacsatEflalo
DEU	2014	OTB	8	1	1,175	CB_prop1.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
DEU	2014	OTB	9	0	151	CB_prop1.Rdata-tacsatEflalo
DEU	2015	OTB	1	4	7,323	CB_prop1.Rdata-tacsatEflalo
DEU	2015	OTB	2	2	3,553	CB_prop1.Rdata-tacsatEflalo
DEU	2015	OTB	3	0	143	CB_prop1.Rdata-tacsatEflalo
DEU	2015	OTB	7	8	11,975	CB_prop1.Rdata-tacsatEflalo
DEU	2015	OTB	9	0	331	CB_prop1.Rdata-tacsatEflalo
DEU	2015	TBB	4	1	1,587	CB_prop1.Rdata-tacsatEflalo
DNK	2010	OTB	5	0	179	CB_prop1.Rdata-tacsatEflalo
DNK	2010	OTB	7	1	1,100	CB_prop1.Rdata-tacsatEflalo
DNK	2010	OTB	8	0	112	CB_prop1.Rdata-tacsatEflalo
DNK	2011	OTB	3	0	169	CB_prop1.Rdata-tacsatEflalo
DNK	2011	OTB	4	2	1,538	CB_prop1.Rdata-tacsatEflalo
DNK	2011	OTB	5	0	163	CB_prop1.Rdata-tacsatEflalo
DNK	2011	OTB	7	0	5,568	CB_prop1.Rdata-tacsatEflalo
DNK	2011	OTB	8	0	169	CB_prop1.Rdata-tacsatEflalo
DNK	2012	OTB	4	1	0	CB_prop1.Rdata-tacsatEflalo
DNK	2012	OTB	8	1	0	CB_prop1.Rdata-tacsatEflalo
DNK	2013	OTB	7	0	15	CB_prop1.Rdata-tacsatEflalo
DNK	2014	OTB	1	0	57	CB_prop1.Rdata-tacsatEflalo
DNK	2014	OTB	7	1	2,038	CB_prop1.Rdata-tacsatEflalo
DNK	2014	OTB	8	1	162	CB_prop1.Rdata-tacsatEflalo
DNK	2015	OTB	1	1	123,518	CB_prop1.Rdata-tacsatEflalo
DNK	2015	OTB	2	0	0	CB_prop1.Rdata-tacsatEflalo
DNK	2015	OTB	5	0	13,800	CB_prop1.Rdata-tacsatEflalo
DNK	2015	OTB	7	1	80,535	CB_prop1.Rdata-tacsatEflalo
FRA	2010	OTB	1	0	58	CB_prop1.Rdata-tacsatEflalo
FRA	2010	OTB	7	2	2,312	CB_prop1.Rdata-tacsatEflalo
FRA	2010	SDN	1	2	4,862	CB_prop1.Rdata-tacsatEflalo
FRA	2010	SDN	2	1	2,402	CB_prop1.Rdata-tacsatEflalo
FRA	2010	SDN	4	0	475	CB_prop1.Rdata-tacsatEflalo
FRA	2010	SDN	5	1	1,881	CB_prop1.Rdata-tacsatEflalo
FRA	2010	SDN	7	2	1,647	CB_prop1.Rdata-tacsatEflalo
FRA	2010	SDN	8	3	1,147	CB_prop1.Rdata-tacsatEflalo
FRA	2010	SDN	9	0	1,006	CB_prop1.Rdata-tacsatEflalo
FRA	2011	OTB	7	1	3,752	CB_prop1.Rdata-tacsatEflalo
FRA	2011	SDN	7	0	948	CB_prop1.Rdata-tacsatEflalo
FRA	2012	OTB	7	2	12,970	CB_prop1.Rdata-tacsatEflalo
FRA	2013	OTB	7	2	2,500	CB_prop1.Rdata-tacsatEflalo
FRA	2014	OTB	7	2	5,260	CB_prop1.Rdata-tacsatEflalo
FRA	2014	SDN	1	0	193	CB_prop1.Rdata-tacsatEflalo
FRA	2014	SDN	2	0	340	CB_prop1.Rdata-tacsatEflalo
FRA	2015	SDN	1	0	156	CB_prop1.Rdata-tacsatEflalo
FRA	2015	SDN	7	1	85	CB_prop1.Rdata-tacsatEflalo
GBR	2010	OTB	1	0	339	CB_prop1.Rdata-tacsatEflalo
GBR	2010	OTB	2	1	7,235	CB_prop1.Rdata-tacsatEflalo
GBR	2010	OTB	3	0	191	CB_prop1.Rdata-tacsatEflalo
GBR	2010	OTB	5	0	191	CB_prop1.Rdata-tacsatEflalo
GBR	2010	PTB	1	1	367	CB_prop1.Rdata-tacsatEflalo
GBR	2010	SSC	7	6	12,053	CB_prop1.Rdata-tacsatEflalo
GBR	2010	TBB	1	5	10,460	CB_prop1.Rdata-tacsatEflalo
GBR	2010	TBB	2	2	8,254	CB_prop1.Rdata-tacsatEflalo
GBR	2010	TBB	3	4	12,855	CB_prop1.Rdata-tacsatEflalo
GBR	2010	TBB	4	12	45,716	CB_prop1.Rdata-tacsatEflalo
GBR	2010	TBB	5	8	26,627	CB_prop1.Rdata-tacsatEflalo
GBR	2010	TBB	6	1	2,329	CB_prop1.Rdata-tacsatEflalo
GBR	2010	TBB	7	6	21,773	CB_prop1.Rdata-tacsatEflalo
GBR	2010	TBB	8	15	55,608	CB_prop1.Rdata-tacsatEflalo
GBR	2010	TBB	9	4	7,096	CB_prop1.Rdata-tacsatEflalo
GBR	2011	OTB	1	0	191	CB_prop1.Rdata-tacsatEflalo
GBR	2011	OTB	5	0	97	CB_prop1.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
GBR	2011	TBB	1	2	11,232	CB_prop1.Rdata-tacsatEflalo
GBR	2011	TBB	2	0	930	CB_prop1.Rdata-tacsatEflalo
GBR	2011	TBB	3	1	2,470	CB_prop1.Rdata-tacsatEflalo
GBR	2011	TBB	4	7	30,790	CB_prop1.Rdata-tacsatEflalo
GBR	2011	TBB	5	6	19,693	CB_prop1.Rdata-tacsatEflalo
GBR	2011	TBB	6	1	1,226	CB_prop1.Rdata-tacsatEflalo
GBR	2011	TBB	7	7	21,850	CB_prop1.Rdata-tacsatEflalo
GBR	2011	TBB	8	9	40,080	CB_prop1.Rdata-tacsatEflalo
GBR	2011	TBB	9	4	21,718	CB_prop1.Rdata-tacsatEflalo
GBR	2012	TBB	3	1	2,753	CB_prop1.Rdata-tacsatEflalo
GBR	2012	TBB	4	3	8,757	CB_prop1.Rdata-tacsatEflalo
GBR	2012	TBB	5	0	1,362	CB_prop1.Rdata-tacsatEflalo
GBR	2012	TBB	8	1	2,654	CB_prop1.Rdata-tacsatEflalo
GBR	2012	TBB	9	1	1,511	CB_prop1.Rdata-tacsatEflalo
GBR	2013	OTB	4	0	6	CB_prop1.Rdata-tacsatEflalo
GBR	2013	OTT	7	0	40	CB_prop1.Rdata-tacsatEflalo
GBR	2013	TBB	1	1	7,847	CB_prop1.Rdata-tacsatEflalo
GBR	2013	TBB	2	0	1,675	CB_prop1.Rdata-tacsatEflalo
GBR	2013	TBB	3	1	6,415	CB_prop1.Rdata-tacsatEflalo
GBR	2013	TBB	4	10	44,287	CB_prop1.Rdata-tacsatEflalo
GBR	2013	TBB	5	5	28,716	CB_prop1.Rdata-tacsatEflalo
GBR	2013	TBB	6	0	263	CB_prop1.Rdata-tacsatEflalo
GBR	2013	TBB	7	3	10,230	CB_prop1.Rdata-tacsatEflalo
GBR	2013	TBB	8	7	26,447	CB_prop1.Rdata-tacsatEflalo
GBR	2013	TBB	9	2	14,149	CB_prop1.Rdata-tacsatEflalo
GBR	2014	OTT	1	0	610	CB_prop1.Rdata-tacsatEflalo
GBR	2014	TBB	2	1	5,337	CB_prop1.Rdata-tacsatEflalo
GBR	2014	TBB	3	2	7,750	CB_prop1.Rdata-tacsatEflalo
GBR	2014	TBB	4	2	9,655	CB_prop1.Rdata-tacsatEflalo
GBR	2014	TBB	5	3	9,271	CB_prop1.Rdata-tacsatEflalo
GBR	2014	TBB	6	0	1,189	CB_prop1.Rdata-tacsatEflalo
GBR	2014	TBB	7	1	1,967	CB_prop1.Rdata-tacsatEflalo
GBR	2014	TBB	8	7	39,728	CB_prop1.Rdata-tacsatEflalo
GBR	2014	TBB	9	0	1,388	CB_prop1.Rdata-tacsatEflalo
GBR	2015	OTB	1	0	281	CB_prop1.Rdata-tacsatEflalo
GBR	2015	OTB	7	0	99	CB_prop1.Rdata-tacsatEflalo
GBR	2015	OTT	1	0	444	CB_prop1.Rdata-tacsatEflalo
GBR	2015	OTT	7	0	19	CB_prop1.Rdata-tacsatEflalo
GBR	2015	TBB	1	2	10,126	CB_prop1.Rdata-tacsatEflalo
GBR	2015	TBB	2	0	550	CB_prop1.Rdata-tacsatEflalo
GBR	2015	TBB	3	0	896	CB_prop1.Rdata-tacsatEflalo
GBR	2015	TBB	4	4	21,635	CB_prop1.Rdata-tacsatEflalo
GBR	2015	TBB	5	2	9,089	CB_prop1.Rdata-tacsatEflalo
GBR	2015	TBB	6	0	2,897	CB_prop1.Rdata-tacsatEflalo
GBR	2015	TBB	7	1	1,827	CB_prop1.Rdata-tacsatEflalo
GBR	2015	TBB	8	10	56,336	CB_prop1.Rdata-tacsatEflalo
GBR	2015	TBB	9	1	9,316	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTB	1	2	2,408	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTB	2	6	8,650	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTB	3	4	8,243	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTB	4	1	2,175	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTB	5	7	13,945	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTB	7	21	20,084	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTB	8	2	4,167	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTB	9	0	3	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTT	1	3	2,979	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTT	4	0	94	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTT	5	0	95	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTT	7	16	15,762	CB_prop1.Rdata-tacsatEflalo
NLD	2010	OTT	8	0	94	CB_prop1.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
NLD	2010	PTB	7	1	800	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SDN	2	2	4,671	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SDN	4	1	968	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SDN	5	3	3,908	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SDN	6	1	2,420	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SDN	7	1	489	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SDN	8	6	10,639	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SSC	1	14	33,576	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SSC	2	16	16,988	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SSC	3	6	10,199	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SSC	4	2	3,145	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SSC	5	12	20,185	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SSC	7	11	27,975	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SSC	8	4	4,669	CB_prop1.Rdata-tacsatEflalo
NLD	2010	SSC	9	2	3,528	CB_prop1.Rdata-tacsatEflalo
NLD	2010	TBB	1	5	10,105	CB_prop1.Rdata-tacsatEflalo
NLD	2010	TBB	2	2	6,957	CB_prop1.Rdata-tacsatEflalo
NLD	2010	TBB	3	4	15,282	CB_prop1.Rdata-tacsatEflalo
NLD	2010	TBB	4	6	19,733	CB_prop1.Rdata-tacsatEflalo
NLD	2010	TBB	5	4	9,367	CB_prop1.Rdata-tacsatEflalo
NLD	2010	TBB	6	3	10,937	CB_prop1.Rdata-tacsatEflalo
NLD	2010	TBB	7	5	13,405	CB_prop1.Rdata-tacsatEflalo
NLD	2010	TBB	8	8	34,255	CB_prop1.Rdata-tacsatEflalo
NLD	2010	TBB	9	5	10,648	CB_prop1.Rdata-tacsatEflalo
NLD	2011	OTB	1	5	3,184	CB_prop1.Rdata-tacsatEflalo
NLD	2011	OTB	2	4	3,826	CB_prop1.Rdata-tacsatEflalo
NLD	2011	OTB	3	0	116	CB_prop1.Rdata-tacsatEflalo
NLD	2011	OTB	4	1	647	CB_prop1.Rdata-tacsatEflalo
NLD	2011	OTB	5	3	2,627	CB_prop1.Rdata-tacsatEflalo
NLD	2011	OTB	6	0	55	CB_prop1.Rdata-tacsatEflalo
NLD	2011	OTB	7	6	7,399	CB_prop1.Rdata-tacsatEflalo
NLD	2011	OTB	8	1	1,444	CB_prop1.Rdata-tacsatEflalo
NLD	2011	OTB	9	0	356	CB_prop1.Rdata-tacsatEflalo
NLD	2011	OTT	1	7	7,594	CB_prop1.Rdata-tacsatEflalo
NLD	2011	OTT	7	14	16,309	CB_prop1.Rdata-tacsatEflalo
NLD	2011	SDN	5	1	2,426	CB_prop1.Rdata-tacsatEflalo
NLD	2011	SDN	8	6	8,359	CB_prop1.Rdata-tacsatEflalo
NLD	2011	SSC	1	17	27,854	CB_prop1.Rdata-tacsatEflalo
NLD	2011	SSC	2	16	31,252	CB_prop1.Rdata-tacsatEflalo
NLD	2011	SSC	3	2	7,957	CB_prop1.Rdata-tacsatEflalo
NLD	2011	SSC	4	0	767	CB_prop1.Rdata-tacsatEflalo
NLD	2011	SSC	5	7	12,224	CB_prop1.Rdata-tacsatEflalo
NLD	2011	SSC	7	11	32,777	CB_prop1.Rdata-tacsatEflalo
NLD	2011	SSC	8	3	8,061	CB_prop1.Rdata-tacsatEflalo
NLD	2011	SSC	9	3	5,122	CB_prop1.Rdata-tacsatEflalo
NLD	2011	TBB	1	19	42,558	CB_prop1.Rdata-tacsatEflalo
NLD	2011	TBB	2	9	26,354	CB_prop1.Rdata-tacsatEflalo
NLD	2011	TBB	3	8	32,110	CB_prop1.Rdata-tacsatEflalo
NLD	2011	TBB	4	17	55,706	CB_prop1.Rdata-tacsatEflalo
NLD	2011	TBB	5	13	60,451	CB_prop1.Rdata-tacsatEflalo
NLD	2011	TBB	6	0	800	CB_prop1.Rdata-tacsatEflalo
NLD	2011	TBB	7	8	16,444	CB_prop1.Rdata-tacsatEflalo
NLD	2011	TBB	8	15	47,115	CB_prop1.Rdata-tacsatEflalo
NLD	2011	TBB	9	7	12,488	CB_prop1.Rdata-tacsatEflalo
NLD	2012	OTB	1	6	9,072	CB_prop1.Rdata-tacsatEflalo
NLD	2012	OTB	2	3	3,193	CB_prop1.Rdata-tacsatEflalo
NLD	2012	OTB	3	0	68	CB_prop1.Rdata-tacsatEflalo
NLD	2012	OTB	5	2	3,213	CB_prop1.Rdata-tacsatEflalo
NLD	2012	OTB	7	1	667	CB_prop1.Rdata-tacsatEflalo
NLD	2012	OTB	9	1	1,485	CB_prop1.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
NLD	2012	OTT	1	7	8,640	CB_prop1.Rdata-tacsatEflalo
NLD	2012	OTT	2	1	785	CB_prop1.Rdata-tacsatEflalo
NLD	2012	OTT	7	27	22,049	CB_prop1.Rdata-tacsatEflalo
NLD	2012	OTT	9	0	106	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SDN	1	0	2,645	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SDN	4	1	1,191	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SDN	5	1	965	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SDN	7	1	1,042	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SDN	8	1	4,267	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SDN	9	0	473	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SSC	1	19	52,208	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SSC	2	15	33,126	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SSC	3	2	2,478	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SSC	4	2	4,961	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SSC	5	13	29,298	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SSC	7	12	32,860	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SSC	8	5	12,195	CB_prop1.Rdata-tacsatEflalo
NLD	2012	SSC	9	2	2,641	CB_prop1.Rdata-tacsatEflalo
NLD	2012	TBB	1	4	17,088	CB_prop1.Rdata-tacsatEflalo
NLD	2012	TBB	2	9	42,726	CB_prop1.Rdata-tacsatEflalo
NLD	2012	TBB	3	12	47,633	CB_prop1.Rdata-tacsatEflalo
NLD	2012	TBB	4	22	64,090	CB_prop1.Rdata-tacsatEflalo
NLD	2012	TBB	5	21	51,213	CB_prop1.Rdata-tacsatEflalo
NLD	2012	TBB	6	3	3,564	CB_prop1.Rdata-tacsatEflalo
NLD	2012	TBB	7	17	46,599	CB_prop1.Rdata-tacsatEflalo
NLD	2012	TBB	8	34	110,097	CB_prop1.Rdata-tacsatEflalo
NLD	2012	TBB	9	7	26,294	CB_prop1.Rdata-tacsatEflalo
NLD	2013	OTB	1	0	53	CB_prop1.Rdata-tacsatEflalo
NLD	2013	OTB	7	1	5,950	CB_prop1.Rdata-tacsatEflalo
NLD	2013	OTT	1	8	5,643	CB_prop1.Rdata-tacsatEflalo
NLD	2013	OTT	2	0	62	CB_prop1.Rdata-tacsatEflalo
NLD	2013	OTT	7	5	5,661	CB_prop1.Rdata-tacsatEflalo
NLD	2013	OTT	9	1	316	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SDN	1	1	513	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SDN	2	3	3,018	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SDN	3	0	350	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SDN	6	0	382	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SDN	7	1	2,624	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SDN	8	1	1,490	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SDN	9	0	642	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SSC	1	11	27,455	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SSC	2	6	15,572	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SSC	3	1	1,906	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SSC	4	1	635	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SSC	5	1	1,737	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SSC	7	8	24,127	CB_prop1.Rdata-tacsatEflalo
NLD	2013	SSC	8	1	850	CB_prop1.Rdata-tacsatEflalo
NLD	2013	TBB	1	8	12,064	CB_prop1.Rdata-tacsatEflalo
NLD	2013	TBB	2	1	4,524	CB_prop1.Rdata-tacsatEflalo
NLD	2013	TBB	3	1	2,494	CB_prop1.Rdata-tacsatEflalo
NLD	2013	TBB	4	7	21,236	CB_prop1.Rdata-tacsatEflalo
NLD	2013	TBB	5	4	11,865	CB_prop1.Rdata-tacsatEflalo
NLD	2013	TBB	6	1	421	CB_prop1.Rdata-tacsatEflalo
NLD	2013	TBB	7	9	26,422	CB_prop1.Rdata-tacsatEflalo
NLD	2013	TBB	8	10	29,538	CB_prop1.Rdata-tacsatEflalo
NLD	2013	TBB	9	5	9,109	CB_prop1.Rdata-tacsatEflalo
NLD	2014	OTB	1	0	775	CB_prop1.Rdata-tacsatEflalo
NLD	2014	OTB	2	1	2,350	CB_prop1.Rdata-tacsatEflalo
NLD	2014	OTB	5	0	1,214	CB_prop1.Rdata-tacsatEflalo
NLD	2014	OTB	7	2	3,647	CB_prop1.Rdata-tacsatEflalo

Country	Year	Gear	Sub-area	Effort (days at sea)	Landings (kg)	Type of data
NLD	2014	OTB	8	0	113	CB_prop1.Rdata-tacsatEflalo
NLD	2014	OTT	1	25	21,166	CB_prop1.Rdata-tacsatEflalo
NLD	2014	OTT	7	17	16,612	CB_prop1.Rdata-tacsatEflalo
NLD	2014	OTT	9	0	47	CB_prop1.Rdata-tacsatEflalo
NLD	2014	SSC	1	21	104,841	CB_prop1.Rdata-tacsatEflalo
NLD	2014	SSC	2	15	49,553	CB_prop1.Rdata-tacsatEflalo
NLD	2014	SSC	3	1	6,338	CB_prop1.Rdata-tacsatEflalo
NLD	2014	SSC	4	0	1,106	CB_prop1.Rdata-tacsatEflalo
NLD	2014	SSC	5	1	3,374	CB_prop1.Rdata-tacsatEflalo
NLD	2014	SSC	7	12	61,502	CB_prop1.Rdata-tacsatEflalo
NLD	2014	SSC	8	3	5,205	CB_prop1.Rdata-tacsatEflalo
NLD	2014	SSC	9	3	8,815	CB_prop1.Rdata-tacsatEflalo
NLD	2014	TBB	1	8	39,131	CB_prop1.Rdata-tacsatEflalo
NLD	2014	TBB	2	4	22,764	CB_prop1.Rdata-tacsatEflalo
NLD	2014	TBB	3	7	33,706	CB_prop1.Rdata-tacsatEflalo
NLD	2014	TBB	4	15	45,212	CB_prop1.Rdata-tacsatEflalo
NLD	2014	TBB	5	17	49,883	CB_prop1.Rdata-tacsatEflalo
NLD	2014	TBB	6	2	8,014	CB_prop1.Rdata-tacsatEflalo
NLD	2014	TBB	7	11	26,658	CB_prop1.Rdata-tacsatEflalo
NLD	2014	TBB	8	12	34,416	CB_prop1.Rdata-tacsatEflalo
NLD	2014	TBB	9	13	37,760	CB_prop1.Rdata-tacsatEflalo
NLD	2015	OTB	2	1	4,797	CB_prop1.Rdata-tacsatEflalo
NLD	2015	OTB	3	0	91	CB_prop1.Rdata-tacsatEflalo
NLD	2015	OTB	4	1	1,795	CB_prop1.Rdata-tacsatEflalo
NLD	2015	OTB	5	0	1,914	CB_prop1.Rdata-tacsatEflalo
NLD	2015	OTB	7	3	3,909	CB_prop1.Rdata-tacsatEflalo
NLD	2015	OTB	8	1	3,814	CB_prop1.Rdata-tacsatEflalo
NLD	2015	OTT	1	11	11,502	CB_prop1.Rdata-tacsatEflalo
NLD	2015	OTT	7	20	18,692	CB_prop1.Rdata-tacsatEflalo
NLD	2015	SSC	1	36	165,663	CB_prop1.Rdata-tacsatEflalo
NLD	2015	SSC	2	16	28,511	CB_prop1.Rdata-tacsatEflalo
NLD	2015	SSC	3	1	2,595	CB_prop1.Rdata-tacsatEflalo
NLD	2015	SSC	4	3	13,898	CB_prop1.Rdata-tacsatEflalo
NLD	2015	SSC	5	2	5,593	CB_prop1.Rdata-tacsatEflalo
NLD	2015	SSC	7	5	21,786	CB_prop1.Rdata-tacsatEflalo
NLD	2015	SSC	8	2	7,149	CB_prop1.Rdata-tacsatEflalo
NLD	2015	SSC	9	2	11,427	CB_prop1.Rdata-tacsatEflalo
NLD	2015	TBB	1	2	7,715	CB_prop1.Rdata-tacsatEflalo
NLD	2015	TBB	2	6	38,299	CB_prop1.Rdata-tacsatEflalo
NLD	2015	TBB	3	4	23,640	CB_prop1.Rdata-tacsatEflalo
NLD	2015	TBB	4	11	43,295	CB_prop1.Rdata-tacsatEflalo
NLD	2015	TBB	5	14	55,859	CB_prop1.Rdata-tacsatEflalo
NLD	2015	TBB	6	1	3,057	CB_prop1.Rdata-tacsatEflalo
NLD	2015	TBB	7	5	9,163	CB_prop1.Rdata-tacsatEflalo
NLD	2015	TBB	8	11	35,234	CB_prop1.Rdata-tacsatEflalo
NLD	2015	TBB	9	3	8,442	CB_prop1.Rdata-tacsatEflalo
SWE	2011	OTB	7	0	5,551	CB_prop1.Rdata-tacsatEflalo

Source: Logbook data and VMS data and data from the Annual Economic report (STECF 2016), processed by Wageningen UR, 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	TBB	18-24	2.26	0.57
DEU	2010	TBB	>24	3.04	0.35
DEU	2011	OTB	18-24	2.51	0.53
DEU	2011	OTB	>24	0.39	0.51
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	2013	OTB	18-24	1.8	0.7
DEU	2013	OTB	>24	0.37	0.52
DEU	2013	TBB	18-24	3.82	0.63
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	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	OTT	18-24	2.52	0.35
NLD	2010	OTT	>24	2.89	0.4
NLD	2010	PTB	>24	2.18	0.35
NLD	2010	SDN	>24	1.8	0.4
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	OTT	18-24	4.05	0.46
NLD	2011	OTT	>24	3.87	0.4
NLD	2011	SDN	>24	1.8	0.4
NLD	2011	SSC	>24	1.77	0.4
NLD	2011	TBB	18-24	1.69	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	OTT	18-24	4.24	0.4
NLD	2012	OTT	>24	4.2	0.38
NLD	2012	SDN	>24	1.28	0.38

Country	Year	Gear	Vessel length class	Value factor	GVA factor
NLD	2012	SSC	>24	1.78	0.38
NLD	2012	TBB	18-24	3.32	0.53
NLD	2012	TBB	>24	2.35	0.34
NLD	2013	OTB	18-24	2	0.47
NLD	2013	OTT	18-24	3.26	0.48
NLD	2013	OTT	>24	3.3	0.37
NLD	2013	SDN	>24	1.7	0.37
NLD	2013	SSC	>24	1.57	0.37
NLD	2013	TBB	18-24	3.91	0.51
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	OTT	>24	3.57	0.43
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	OTT	18-24	2.89	0.57
NLD	2015	OTT	>24	3.97	0.43
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	dec-18	2.06	0.39
GBR	2010	OTB	18-24	2.22	0.36
GBR	2010	OTB	>24	1.06	0.36
GBR	2010	PTB	dec-18	1.72	0.39
GBR	2010	PTB	18-24	1.58	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	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	TBB	>24	2.01	0.21
GBR	2013	OTB	18-24	2.36	0.41
GBR	2013	OTT	18-24	2.62	0.41
GBR	2013	TBB	>24	1.63	0.15
GBR	2014	OTT	18-24	3.28	0.4
GBR	2014	OTT	>24	1.56	0.3
GBR	2014	TBB	>24	1.76	0.22
GBR	2015	OTB	dec-18	3.26	0.43
GBR	2015	OTB	18-24	3.38	0.4
GBR	2015	OTT	18-24	3.42	0.4
GBR	2015	TBB	>24	2.22	0.22
DNK	2010	OTB	>24	0.25	0.73
DNK	2011	OTB	18-24	0.6	0.56
DNK	2011	OTB	>24	0.28	0.7
DNK	2012	OTB	>24	0.51	0.64
DNK	2013	OTB	>24	0.35	0.75
DNK	2014	OTB	>24	0.28	0.57
DNK	2015	OTB	>24	0.28	0.57
BEL	2010	OTB	18-24	2.9	0.43
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	SSC	>24	2.31	0.45

Country	Year	Gear	Vessel length class	Value factor	GVA factor
BEL	2011	TBB	>24	2.39	0.49
BEL	2012	OTB	18-24	2.83	0.36
BEL	2012	SSC	>24	1.7	0.38
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	>24	1.87	0.39
BEL	2014	OTB	18-24	2.65	0.3
BEL	2014	SSC	>24	1.31	0.3
BEL	2014	TBB	18-24	4.07	0.3
BEL	2014	TBB	>24	2.13	0.48
BEL	2015	OTB	18-24	3.28	0.3
BEL	2015	TBB	>24	2.82	0.48
SWE	2011	OTB	>24	0.22	0.49
FRA	2010	OTB	dec-18	0.6	0.51
FRA	2010	OTB	18-24	1.01	0
FRA	2010	OTB	>24	2.01	0
FRA	2010	SDN	>24	2.01	0
FRA	2011	OTB	18-24	1.33	0.41
FRA	2011	OTB	>24	0.8	0
FRA	2011	SDN	>24	0.8	0
FRA	2012	OTB	18-24	1.19	0.34
FRA	2013	OTB	18-24	1.32	0.38
FRA	2013	OTB	>24	1.28	0.34
FRA	2014	OTB	18-24	1.28	0.39
FRA	2014	SDN	>24	0.77	0.37
FRA	2015	OTB	18-24	1.28	0.39
FRA	2015	SDN	>24	0.77	0.37

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	98	96	96	98	99	94	97
NLD	Effort	98	98	97	99	99	97	98
GBR	Effort	98	95	81	89	97	99	94
DNK	Effort	100	100	100	100	100	100	100
BEL	Effort	91	97	94	100	97	94	95
SWE	Effort	100	100		100	100	100	100
FRA	Effort	100	100	100	100	100	100	100
DEU	Landings	97	94	95	97	99	96	96
NLD	Landings	97	97	98	100	99	98	98
GBR	Landings	98	99	74	97	99	100	95
DNK	Landings	100	100	100	100	100	100	100
BEL	Landings	92	97	98	100	99	95	97
SWE	Landings	100	100		100	100	100	100
FRA	Landings	100	100	100	100	100	100	100

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MEMORANDUM
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