

# Fishing activities on the Dogger Bank 2006-2011

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# 1 Introduction

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## 1.1 Motivation

In 2008, the Minister of Agriculture, Nature and Food Quality notified four proposed Sites of Community Interest (pSCIs) to the European Commission (for protection as Special Conservation Areas (SCAs) under the Habitats Directive). These areas are the Dogger Bank, Cleaver Bank, the Coastal Zone and the Vlakte van de Raan. The areas have been chosen, based on their specific habitats and ecological values (Bos et al., 2008). In addition, the Frisian Front will be designated as SPA (Special Protection Area) under the Bird Directive. Based on this decision a process has been executed during the last four years for the development of the provisions of this Directive in Dutch legislation and policy, namely the North Sea Natura 2000 project.

LEI facilitated this process by making an initial inventory of the fishing activities of both Dutch and foreign fleets in these areas (Van Oostenbrugge et al., 2010). The current status is that for the areas in the coastal zone, management measures have been finalised and implemented. In the Dutch exclusive economic zone the state of play is that for the Dogger Bank, Cleaver Bank and the Frisian Front management proposals are being prepared for decision making in the Common Fisheries Policy (CFP) context.

Designating these areas under national law requires the Nature Protection Act to enter into force in the Dutch EEZ. This has been discussed in parliament (on 13 June 2012). Some questions remain on the importance of these areas for the Dutch fisheries and the economic consequences of management measures. The consequences of the management regime for the Dogger Bank are estimated by ICES in the international process of the Dogger Bank Steering Group for the period 2007-2009. In addition the ministry of Economic Affairs has asked LEI to update the report from 2010 for this area and describe the trends in fishing activities for all fleets which are important to the Dutch fishing sector. Because a large part of the Belgian, UK and German flagged vessels are owned by Dutch companies, those fishing fleets are also taken into account in the current study.

## 1.2 Objectives

The objective of the current project is to give insight into the trends of the fishing activities of the Dutch and important foreign fleets (Belgian, German and UK) in the area of the Dogger Bank in the period 2006-2011. In the analyses attention is given to developments in effort, landings and economic value of the landings.

## 1.3 Results

This resulting memorandum describes the developments of Dutch and foreign fleets in the Dogger Bank. The developments are presented for different vessels sizes, based on their engine power (0-300 hp, 301-1,500 hp and >1,500 hp) and registered gear type in the logbook. As innovative gears with far lower bottom impact (pulse trawls) have recently been increasingly used by vessels and are treated differently in spatial management measures, these vessels are also distinguished. For each of the fisheries (combination of hp-class, gear type and country) an analysis of the coverage of the data is provided.

## **1.4 Contents**

This memorandum describes the time trends in the fishing activities in the Dogger Bank. Chapter 2 contains an explanation of the various sources of the data and the manner in which the data was processed. Chapter 3 reviews the importance of the various areas to the Dutch and non-Dutch fisheries. Chapter 4 discusses the methods and results, and is completed with the conclusions and recommendations.

## 2 Methods

The methods applied and the data used were similar to those used for the previous study (Van Oostenbrugge et al., 2010). In addition some extra data checks were included and another data processing platform was used for part of the analysis. Because of the large similarity in the method, this report contains a limited description focussing on small adjustments that have been made. A complete description can be found in Van Oostenbrugge et al., 2010.

### 2.1 Data sources

Several data sources were used in the evaluation. The data sources used were Vessel Monitoring System (VMS) data, catch data from VIRIS (Fish Registration and Information System), Fleet data from the NRV (Netherlands Register of Fishing Vessels), average monthly price data per species collected by the Productschap Vis (Netherlands Fish Product Board) and economic data (The LEI panel). The datasets used and the data coverage are described in more detail in appendix 1 and 2.

### 2.2 Processing of data for Dutch vessels

Several steps were needed to process the Dutch data for the analysis. First of all, the VMS data were processed and the patterns in fishing efforts were determined. To clean up the VMS data set, the R package VMS-tools was used (Hinzen et al., 2011). Duplicated points, points in harbour, points on land and points with impossible speed/location were removed.

Next, the fishing efforts were used to distribute the catches between the various points. The method used is illustrated by the example included in Table 2.1. First, the sailing speed was used to determine whether the vessel was fishing or sailing at each VMS point based on fixed speed thresholds derived from South *et al.* (2009).

DH1	Time	Speed	Duration	Catch
21-aug	14:00	0.2		
21-aug	15:00	5.6	1:00	0
21-aug	17:00	3.4	2:00	1,200
21-aug	18:00	3.2	1:00	600
21-aug	19:00	0	1:00	0
Total catch				1,800

Table 2.2 shows the thresholds per gear determining fishing and steaming activities. Any gears missing in this table were assigned the activity 'Unknown'.

In table 2.1 the speed of VMS point at time 14:00 is too low to be fishing. At the second VMS point (15:00) the speed is too high to be fishing. Therefore neither of these points gets catch attributed. The next two VMS points (17:00 and 18:00) have a speed that falls within the fishing speed range. These points get catch assigned. Next, the duration was determined for each position (the time interval between the current and previous position). The catch (kg) was distributed on the basis of the duration at the various positions at which the vessel was fishing.



<b>Gear</b>	<b>Fishing</b>	<b>Steaming</b>
Gill nets, Danish seines	speed<0.3	speed>=0.3
Scottish seine	speed<7	speed>=7
Beam trawl, shrimp trawl	Speed within 3 to 6	Speed<3 or speed>6
Otter board trawl 0-300hp	Speed within 3 to 5	Speed<3 or speed>5
Otter board trawl >300hp	Speed within 3 to 4	Speed<3 or speed>4
Twin trawl 0-300hp	Speed within 3 to 5	Speed<3 or speed>5
Twin trawl >300hp	Speed within 3 to 4	Speed<3 or speed>4

Source: South et al., 2009.

The example in table 2.1 discusses the ideal situation where a trip is comprised of a number of fishing and/or sailing VMS points and the day catch is available. This was not always the case. Several factors could complicate the distribution of catch over the VMS points. For example in a number of cases a vessel was sailing at all the available VMS positions on a day or data was lacking, for example on the fishing gear, HP and speed, which made it not possible to allocate an activity to a VMS point. To still be able to allocate catch to VMS locations a number of assumptions needed to be made in the case of missing data. The distribution methods used in these cases are summarised in Table 2.3.

<b>Day catch recorded for trip</b>	<b>Day catch recorded on day</b>	<b>Type of Activity</b>	<b>Distribution</b>
Yes	Yes	Fishing and other	Fishing time/fishing time on fishing day
Yes	Yes	Only steaming	Catch not distributed
Yes	Yes	Only unknown	Time unknown/time on fishing day unknown
Yes	Yes	Steaming and Unknown	Catch not distributed
Yes	No	All combinations	Catch not distributed
No	No	Fishing and other	Fishing time/fishing time on fishing day
No	No	Only steaming	Catch not distributed
No	No	Only unknown	Time unknown/time on trip unknown
No	No	Steaming an unknown	Catch not distributed

The VMS data does not provide full coverage. This is, in particular, due to vessels with a length less than 15 meters and which consequently do not have on-board VMS as well as an inability to fully distribute all the catches between VMS points. This was corrected by increasing the catches by a factor based on coverage percentages (see appendix 2 for coverage in VMS data per gear). So for example if for a certain gear type the coverage was 90%, the total catches with this gear type were multiplied by a factor (1/0.9). This approach provided for the distribution of all catches as found in the VIRIS logbook data.

The catches and average auction prices were used to determine the value of the catches at the various VMS points. Finally, the contribution to the gross value added was calculated on the basis of the average percentage of the gross value added's (GVA) contribution to the production value as known in LEI's Farm Accountancy Network.

This described method is in agreement with the methods used in earlier LEI reports on the determination of the value of fishing areas (such as Van Oostenbrugge et al., 2010).

### 2.3 Processing of data for foreign vessels

The foreign data were processed in a similar way to the data from the Dutch vessels. However there was one fundamental difference in the data that meant that the data needed to be processed slightly different-

ly. Namely the VMS data for the foreign vessels only covered the Dutch section of the continental shelf. The difference in attributing catches to VMS points for the foreign vessels is illustrated by an example in table 2.4.

First, similar as for the Dutch vessels the sailing speed was used to determine whether the vessel was fishing or sailing at each VMS point. Next, the duration was determined for each position (the time interval between the current and previous position). It was checked whether the time interval did not exceed 2 hours. In the example in table 2.4 at time 14:00 previous VMS points were clearly lacking. Therefore the time interval at this point is corrected to 2 hours instead of the calculated 12 hours.

Since the VMS points only cover the Dutch part of the continental shelf it is very likely that the VMS points do not cover the complete trip of a foreign vessel. Therefore a distribution of the total catch over the available VMS points will most likely lead to an overestimation of the catch at each of the VMS positions. Therefore the catch to be distributed between the VMS positions was calculated from the total catch on the basis of the share of the duration that was allocated to the VMS positions and the total duration of the trip. In the example 30% of the trip was covered by the VMS positions. Therefore, only 30% of the total catch is attributed to the VMS positions. The resultant catch (kg) at the VMS positions was distributed on the basis of the duration during which the vessel fished at the various positions.

<b>Table 2.4</b>		<b>Example of a calculation of the catch at the VMS positions during one trip for a foreign vessel of 300 hp using otter board trawl</b>		
<b>DH1</b>	<b>Time</b>	<b>Speed</b>	<b>Duration</b>	<b>Catch</b>
21-aug, leaves port	02:00			
21-aug	14:00	0.2	<del>12:00</del> 2:00*	
21-aug	15:00	5.6	1:00	0
21-aug	17:00	3.4	2:00	360
21-aug	18:00	3.2	1:00	180
21-aug arrives at port	22:00	0	1:00	0
Total duration of trip			20:00	
Total duration of VMS			6:00	
VMS share of total duration in trip (%)			30%	
Non-allocated catch				1,260
Total catch				1,800

\* Duration of period before first ping has been adjusted to two hours, assuming it has been out of the Dutch part of the North Sea.

The VIRIS data does not provide full-coverage for foreign vessels. Foreign vessels are only included in the VIRIS dataset if they actually land their fish in a Dutch harbour. Therefore catches were scaled up to the total quantity of VMS positions. If catches were not available for a VMS position, catches were estimated on the basis of Catch per Unit of Effort (CPUE) estimates. These CPUE estimates were calculated for each country, HP category and type of fishing gear on the basis of catches at VMS positions for which catch data was available.

The catches and average auction prices were used to determine the value of the catches at the various VMS points similar to the Dutch vessels. No gross value added was calculated for the foreign vessels.

## 2.4 Historical fishing trends in areas of interest

Landed catches, value of landed catches and GVA (for Dutch fleet only) were done for the Dutch and the foreign fleets separately. For the years 2006 to 2011, the effort, landed catch, value of landed catch in the areas were computed as the sum of the effort (landed catch/value of landed catch) of all pings of which the coordinates were in the area. For the Dutch fleet, the data was then scaled up to account for missing VMS data and the contribution to the production value was calculated.

## 3 Historic trends in fishing activities

In general, the fishing intensity in the area of the Dogger Bank and the resulting landings value are low for the Dutch fleet (on average 0.15 kEur/km<sup>2</sup>/year). Because of the large size of the area, the total value of the landings from the area for the Dutch and foreign fleets together adds up to between €1m and €3m per year. For the Dutch fleet, the fish taken from this area contributes to a GVA of between 90 and 536 kEur per year. This has been fluctuating considerably over the years and has increased considerably in 2011 because of a sharp rise in the fishing activities of the Dutch fleet by almost a factor 4. The trends for the Dutch and foreign fleets are discussed in more detail below.

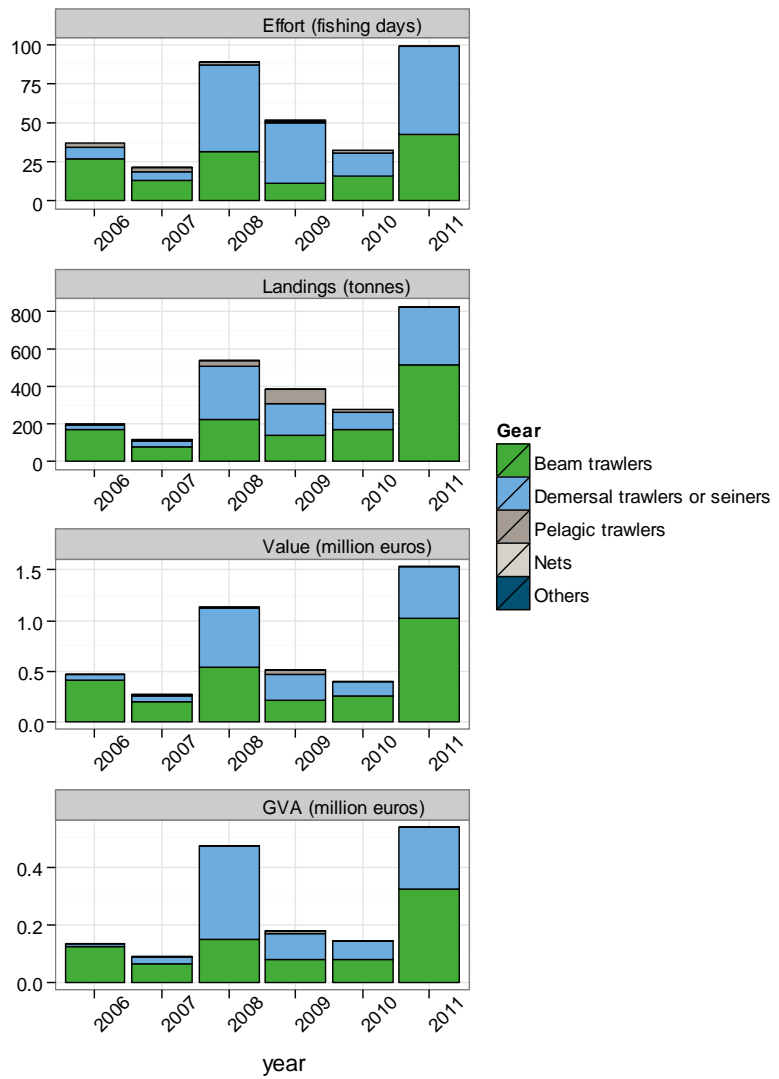
Areas	2006	2007	2008	2009	2010	2011
Dutch fishing fleet						
Landings (tonnes)	204	114	537	386	276	828
Value (kEur)	476	263	1,130	509	401	1,529
Gross value added (kEur)	133	90	473	180	146	536 a)
Landings value per km <sup>2</sup> (kEur per km <sup>2</sup> )	0.10	0.06	0.24	0.11	0.09	0.33
Foreign fishing fleets						
Landings (tonnes)	515	415	666	1,199	1,284	1,209
Value (kEur)	1,341	1,181	1,543	1,802	2,216	1,958

A): Provisional estimate.  
Source: Logbook data and VMS data, processed by LEI.

### 3.1 Dutch Fleet

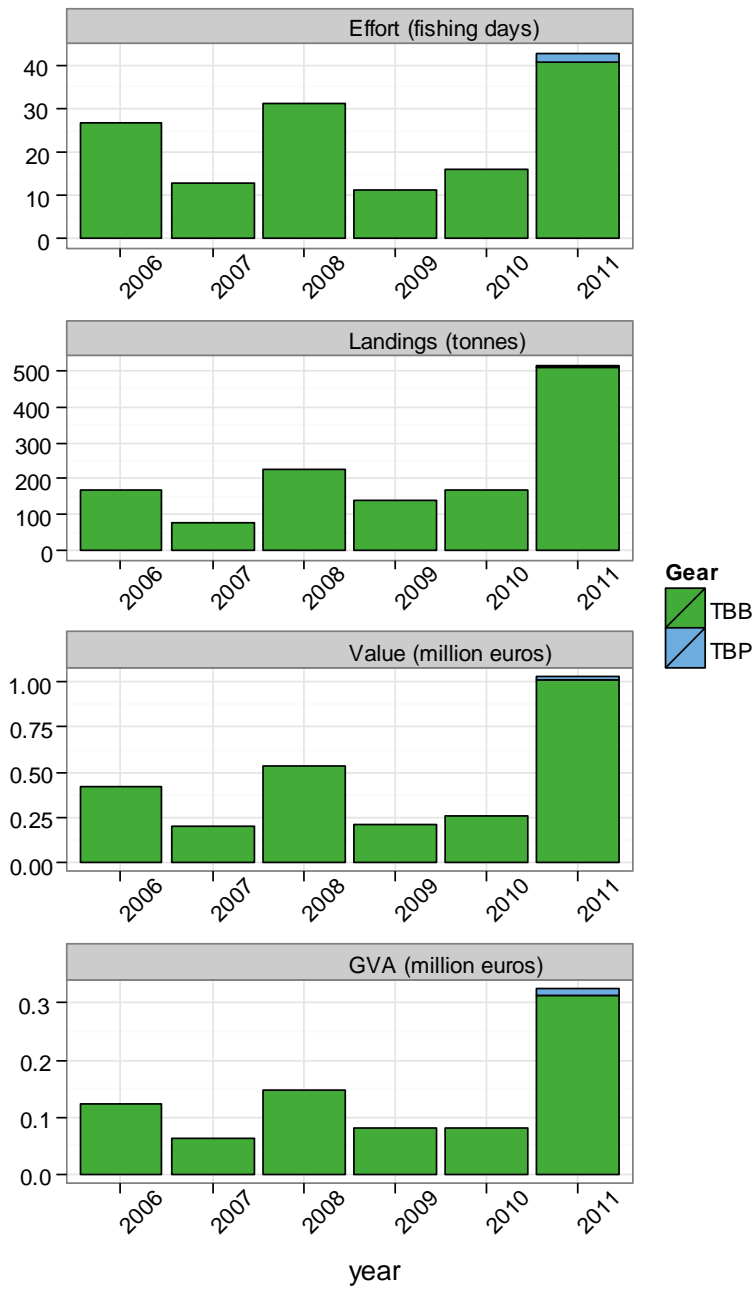
The effort of the Dutch fleet has been highly variable over the years with large increases from 2007-2008 and from 2010-2011 (figure 3.1). The fishery was almost completely dominated by two gear types, the traditional beam trawl (mainly operated by 2000 hp vessels in the area) and the otter board trawl fishery (mainly operated by euro cutters in the area). The patterns in landings, landings value and contribution to the GVA are quite similar, whereas the relative importance of the effort for otter board trawls is larger (figure 3.1). This is due to the fact that the beam trawl fishery in the area is mainly carried out by large beam trawlers obtaining larger catches per fishing day than the smaller euro cutters that operate the otter board trawl fishery. The effort of beam trawlers was between 10 and 30 fishing days per year for most of the period and increased sharply in 2011 (40 fishing days, figure 3.2). The fishing effort of otter board trawlers has varied a lot between 10 and 60 fishing days per year (figure 3.2), resulting in equally large variations in landings and the contribution to the GVA.

**Figure 3.1** Historical trends of the fishing activities in the Dogger Bank by the Dutch fleet. Effort, landings, value of landings and GVA are given by gears aggregated at the level of European codes



Source: Logbook data and VMS data, processed by LEI.

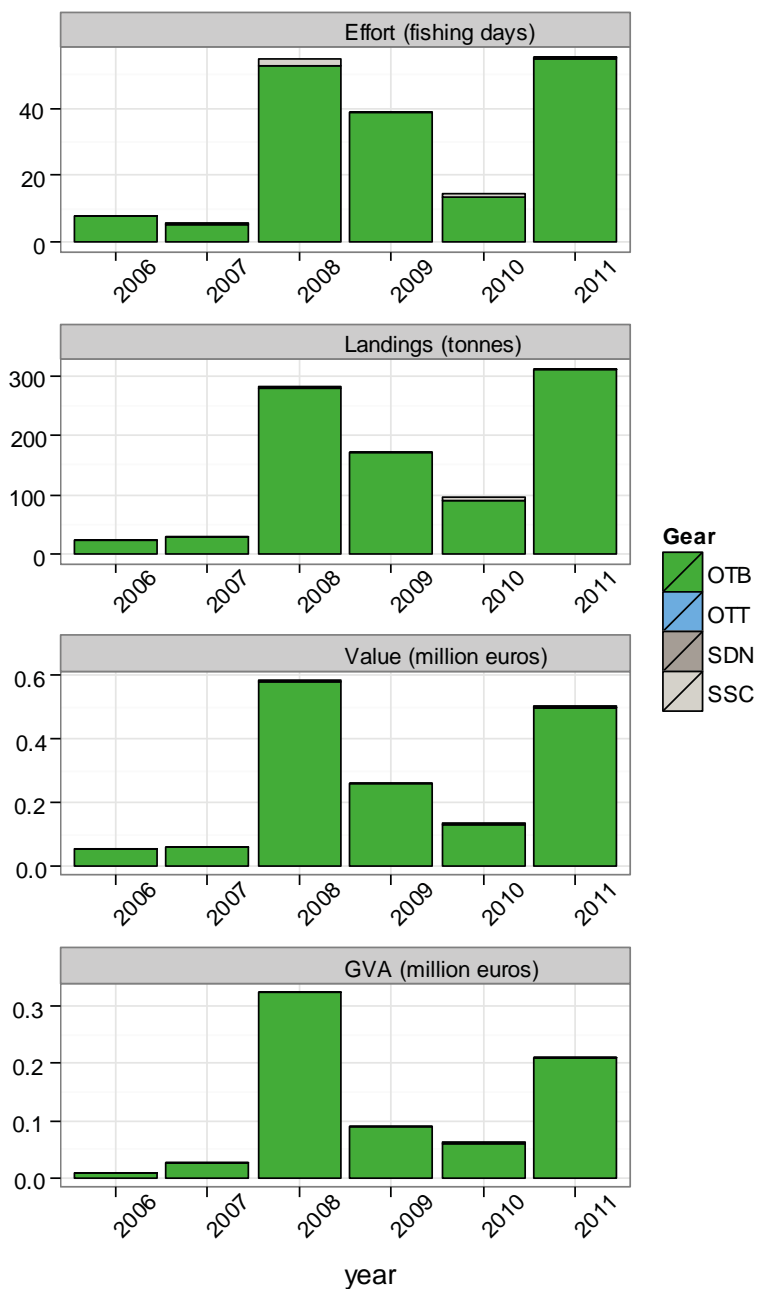
**Figure 3.2** Historical trends of the fishing activities in the Dogger Bank by the Dutch Beam trawlers. Effort, landings, value of landings and GVA are given for flatfish beam trawlers (TBB) and pulse trawlers (TBP)



Source: Logbook data and VMS data, processed by LEI.

Figure 3.3

Historical trends of the fishing activities in the Dogger Bank by the Dutch Demersal trawlers. Effort, landings, value of landings and GVA are given for otter board trawls (OTB) twin trawls (OTT) Danish seines (SDN) and Scottish seines (SSC)

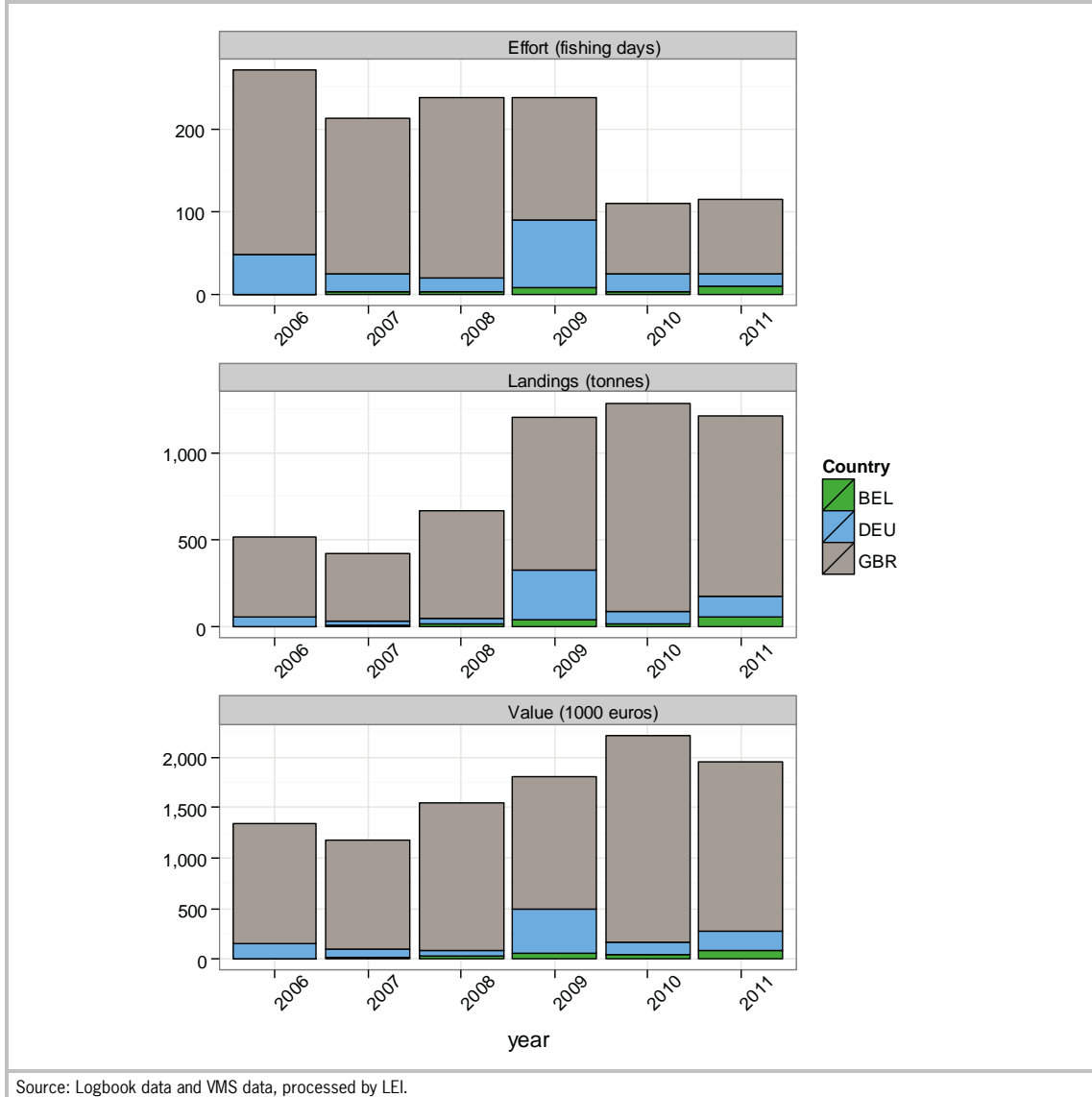


Source: Logbook data and VMS data, processed by LEI.

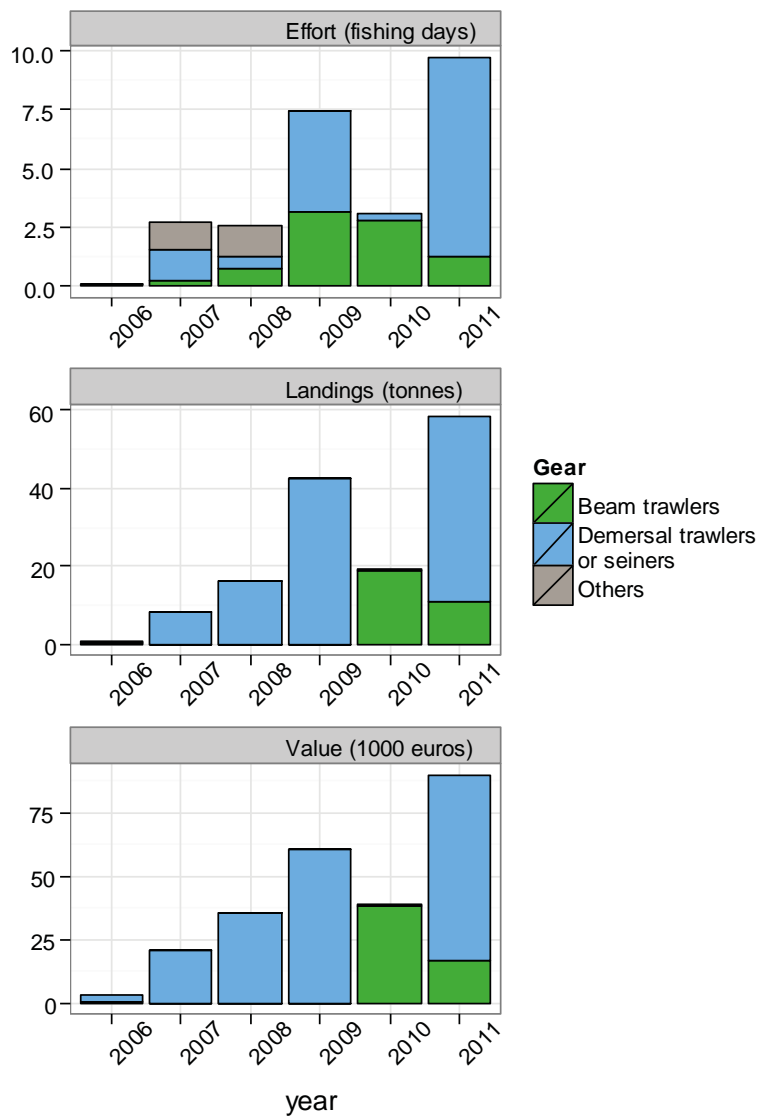
### 3.2 Foreign Fleets

The economic importance of the area to the Belgian, German and UK fleet was in most years much larger than that of the Dutch fleet and ranged from €1.2-2.2m per year (Figure 3.4). UK beam trawlers dominated the fishing activities in the area (Figure 3.4 and 3.7), and the effort and the resulting landings are considerable (€0.8-1.6m per year). The shifts in gear use in the Belgian fleet (Figure 3.5) might be caused by random variation as the activity levels for this fleet are very low and therefore the number of observations is low as well.

**Figure 3.4** Historical trends of the fishing activities in the Dogger Bank by the foreign fleets. Effort, landings and value of landings are given by country



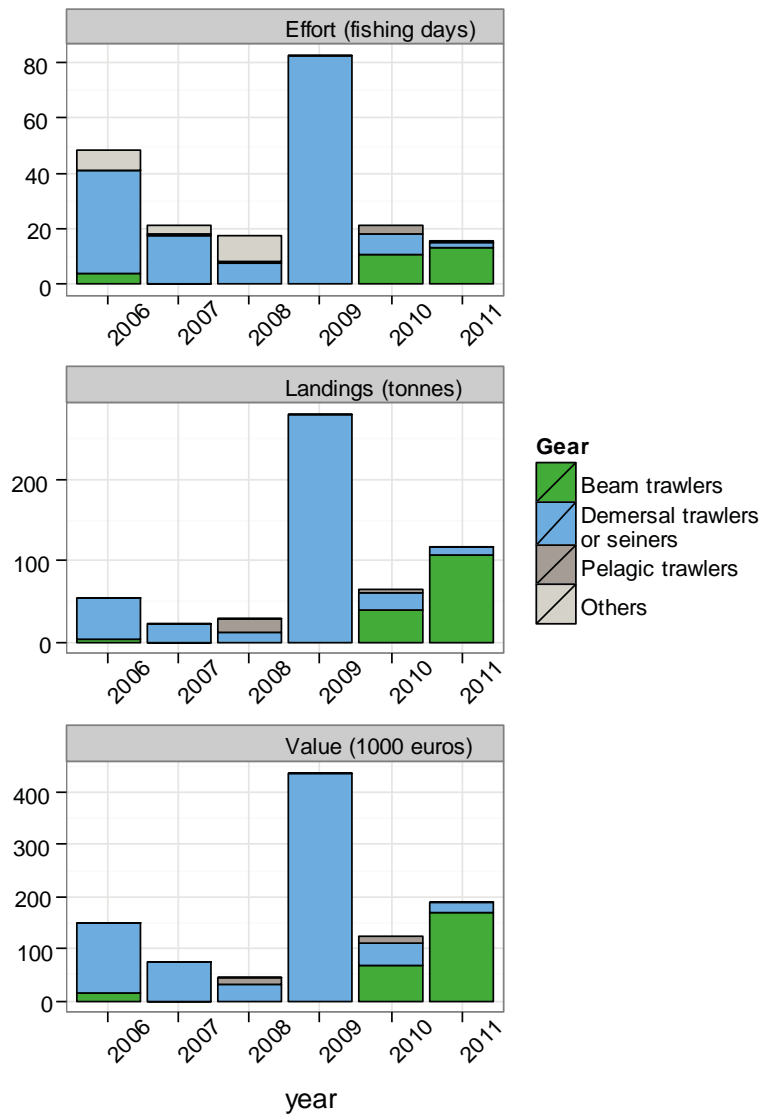
**Figure 3.5** Historical trends of the fishing activities in the Dogger Bank by the Belgian fleets. Effort, landings and value of landings are given by gear



Source: Logbook data and VMS data, processed by LEI.



**Figure 3.6** Historical trends of the fishing activities in the Dogger Bank by the German fleets. Effort, landings and value of landings are given by gear



Source: Logbook data and VMS data, processed by LEI.

**Figure 3.7** Historical trends of the fishing activities in the Dogger Bank by the British fleets. Effort, landings and value of landings are given by gear



Source: Logbook data and VMS data, processed by LEI.

## 4 Discussion and conclusions

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### 4.1 Discussion

This memorandum gives an overview of the historic fishing activities in the area of the Dogger Bank. As can be seen from the results the area is of limited importance for the Dutch fishing fleet. Despite its large surface area (8% of the total Dutch part of the continental shelf), the value of the landings obtained from the area are less than 1% of the total landings value of the Dutch cutter fleet for the period up to 2010 (Taal et al., in prep). Herewith, the level of fishing activity in this area is comparable of that in the Central Oyster Grounds. The Frisian Front and Cleaver Bank have shown higher levels of fishing activity than the Dogger Bank (Van Oostenbrugge et al., 2010, Harmon et al., 2013).

The general low exploitation pattern for this area by the Dutch fleet has most probably been caused by the northerly position (causing considerable time and fuel needed to go up there), and the fact that the plaice TAC has been relatively low, so that most plaice could be caught in the mixed fishery with sole in the southern part of the north sea. The higher plaice TAC in 2011 and the higher CPUE's for plaice could potentially have triggered the large increase in both effort and landings from the area that is well known for its high plaice catches. This also shows that the potential of an area is hard to quantify from these time series and depends highly on the circumstances, both biological, economic and management.

Several factors affect the reliability of the results. First, the fishing effort, landings and value of individual pings are estimated based on assumptions about the speed at which fishing occurs and the equal allocation of landings to the fishing pings. Those values usually relate to pings that are emitted every two hours during which the vessels can sail more than 15 nm but the values are allocated to a single point. Fixed speed thresholds were used to decide whether a vessel was fishing or not. Recently, the method to make that distinction has been refined by basing the thresholds on actual speed frequency distributions of individual vessels for individual years. In this way individual preferences for fishing speeds and possible changes in fishing speeds caused by e.g. high fuel prices can be taken into account and the nature of the operation at every ping can be determined with a lower uncertainty. In order to be consistent with the previous study these new techniques were not applied here, but this increases the statistical uncertainty of the outcome. Secondly, the method of effort allocation based on vessel speed is less appropriate for static gears such as nets. The coverage of those vessels is already lower than for active gears primarily due to the size of the vessels (see Appendix 1). In addition, as the amount of vessels using this gear is low, the uncertainty of the estimate is large. Therefore any conclusion on the activity of the netters will be highly uncertain. Thirdly, there is no speed threshold agreed for the pelagic trawlers while they are by definition very mobile. This means that every ping collected for these large trawlers will be assigned part of the large landings volume which can result in artificially high landings for these vessels in an area. As these vessels catch relatively large amounts of low-value fish, compared to other fishing fleets, this only comes up in the landings figures. Currently, LEI and IMARES, together with the industry are working on an improved method to estimate the value of fishing grounds. This method will probably become available early 2013 and will take care of some of the concerns mentioned above.

For the foreign data there is an additional problem influencing the quality of the results: the quality of the foreign data. To estimate the value of the areas three data sets need to be combined: logbook data, fleet data and VMS data. To combine the datasets the vessel name is used. However the vessel name is in many cases not consistent between data sets. E.g. in many cases the vessel name in the VMS data set does not match vessel names in either the fleet registry or the logbook data. The vessel name in the VMS data set in some cases seems to be the radio name but in other cases could not be matched at all. These data errors are complicating the data processing for the foreign fleets and the results for those fleets would be far more reliable if the datasets were checked and made more consistent by the ministry. Until these problems have been solved, data processing is very time consuming and the results of the analyses can only be regarded as indicative.

## 4.2 Conclusions

From this study the following can be concluded:

- The area of the Dogger Bank represents limited value for both the Dutch and foreign fishing fleets with total value of landings between €1-3m per year for the Dutch and foreign fleets combined. For the Dutch fishery, the value of the landings per year from the area represent on average less than 1% of the total landings value for this period.
- The fishing intensity in the area has been highly variable and has increased substantially during 2011 by the Dutch fleet.
- These historical values cannot be used as an indication of the potential value of the area for the fleets, because the analysed patterns are results of the historical context, which will change in the future.
- Results for analysis for foreign fleets could be enhanced considerably in case consistency and quality of the basic data (logbook, VMS, fleet) for these fleets would be increased.

# Literature

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# Appendix 1

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## Data sources

### *VIRIS data*

The catch data originates from the VIRIS (Fish Registration and Information System) database that contains records of all landings by vessels sailing under the Dutch flag and all landings by vessels sailing under a non-Dutch flag landing fish at ports in the Netherlands. These records are based on the logbooks kept by the fishers. The catches of each species controlled by quotas must be entered in this logbook per sailing day and ICES quadrant. Records of the catches of species not controlled by quotas are kept per trip.

### *Fleet data*

The catch data for the various types of fisheries was calculated using the technical data listed in the NRV (Netherlands Register of Fishing Vessels). The combination of NRV data and VIRIS data yielded information about the technical specifications of the vessel on each trip. Not all the technical specifications of non-Dutch vessels are known.

### *VMS data*

Since 1 January 2000, an increasingly large proportion of fishing vessels are under the obligation to operate an onboard VMS system (Vessel Monitoring System) within the context of the European inspection policy. This VMS system transmits the position of the vessel, vessel identification code and the vessel's sailing speed to a central computer about once every two hours. The computer stores these data (EU Regulation 2244/2003). The vessel's sailing speed can be used to make a distinction between the various activities (fishing, sailing and at anchor). Although this distinction cannot be made completely, the potential error is small relative to the total number of records. Information about the presence of non-Dutch vessels in the Dutch section of the North Sea is also available.

### *Price data*

The value of the catches was determined using the average monthly price data per species collected by the Productschap Vis (Netherlands Fish Product Board). Price data are not collected for all the species listed in VIRIS. When specific price data was not available for fish species then the value of the catches was determined using the average price of less specific market categories (for example, 'other seafood'). Appendix 2 lists the classification of fish species. In addition, prices from other sources were used for a number of fish species (in particular, sprat and herring, grey mullet and smelt) (requested from fishers and collected from the accounts of the high-sea fisheries) since these species are rarely traded on the fish auctions and the auction prices are not representative of the actual prices paid for the fish. The average auction price of catches by vessels with fixed fishing gear were increased by 15%: an analysis of a limited dataset with price data for the fisheries with fixed fishing gear and discussions with fishers revealed that these fisheries' catches are, in general, traded at higher auction prices due to a different market grading (in general, larger sole) and quality (fresh fish with less damage as compared to fish caught with beam trawls).

### *Economic data*

The LEI panel has economic data for the various fisheries over the entire period of the study. The data contains the total annual proceeds of the Dutch cutter fisheries in the various fisheries and the relationships between the total proceeds and the gross value added. However, these data are not classified by fishing area. Consequently, the economic data needs to be combined with catch data to arrive at an estimate of the contribution each fishing area makes to the economy.

## Appendix 2

### Quality of the data

This Section begins with a discussion of the quality of the data from each source and continues with a presentation of an analysis of the effects on the quality of the estimates.

#### Data used for Dutch vessels

##### *VIRIS data*

The VIRIS data covers the entire Dutch fleet. It is possible that some of the catches are not recorded in the VIRIS database since vessels with a length of more than 10 metres do not need to keep records of catches of less than 50 kg per species. This was examined for a number of vessels: this revealed that the differences between actual and registered landings are small. However, it is possible that these differences are of relevance for some other vessels. Nevertheless, it may be assumed that this underestimation is negligible. A small fraction of the catches were allocated retrospectively to the trip catch on the basis of the auction data and then distributed between the fishing days. Although this distribution results in additional uncertainty this error, in view of the small quantities involved, will also be very small.

##### *VMS data*

Table 1 lists the coverage percentages of the VMS data on the basis of the total distributed catches. The coverage is good for most types of fishing gear used by the cutter fleet. The VMS coverage is high for the most common forms of fishing gear such as beam trawl. The coverage is low to very low for a number of types of fishing gear that are not used frequently, such as angling lines. However, the catches made with these types of fishing gear are also limited.

Fleet	Gear a)	HP category	2006	2007	2008	2009	2010	2011	Mean total catch 2006-2011 (* 1000 kg)
cutter	AG	301-1,500					100	100	9
cutter	BTF	>1,500					100		10
cutter	DRB	301-1,500	97	92	91	99	96	91	1869
cutter	FPO	0-300	1	0	0	0	0	40	41
cutter	FPO	unknown					0		7
cutter	FYK	0-300						0	1
cutter	GN	0-300	65	53	65	29	61	0	6
cutter	GND	0-300	0				0		2
cutter	GNS	0-300	31	34	24	39	36	38	341
cutter	GNS	301-1,500	7	0	0	59	55	75	37
cutter	GNS	unknown	0	0	0	0	0		3
cutter	GTR	0-300	0	0	0	6	4	15	41
cutter	GTR	301-1,500				100	100	77	28
cutter	HMD	301-1,500				87	80	78	864
cutter	LHM	0-300					100	58	2
cutter	LHM	301-1,500			100	100			12
cutter	LHP	0-300	0	0	0	0	0	0	96
cutter	LHP	301-1,500	0	0	0	0	0	0	28

cutter	LHP	unknown					0	0		4
cutter	MIS	0-300	7	26	4	2	0	0		119
cutter	MIS	301-1,500	99	99	98	99	100			508
cutter	MIS	>1,500	100	100						181
cutter	NK	0-300					0			24
cutter	NKN	0-300					100			4
cutter	OFG	0-300					39			4
cutter	OTB	0-300	97	97	93	94	94	95		2,554
cutter	OTB	301-1,500	100	98	99	100	84	98		955
cutter	OTB	>1,500	77	99	98	100	95	98		1,025
cutter	OTG	0-300			100					2
cutter	OTM	0-300	28	71	21	16	9	30		192
cutter	OTM	301-1,500	100	100	100					796
cutter	OTM	>1,500	98	88		59	100	100		2,249
cutter	OTM	unknown		100						12,830
cutter	OTT	0-300	95	98	100	98	100	99		614
cutter	OTT	301-1,500			86	99	99	96		177
cutter	OTT	>1,500	100	100	100	100				122
cutter	PS	0-300	34	51	23	6	2	1		47
cutter	PTB	0-300	94	100		93	100	93		22
cutter	PTB	301-1,500		86						10
cutter	PTM	0-300	0	0	0	0	0			3
cutter	PTM	>1,500				0				144
cutter	SDN	301-1,500		100	99		96	100		308
cutter	SSC	0-300	0			100	96	100		190
cutter	SSC	301-1,500	97	97	96	98	98	99		3,489
cutter	TBB	0-300	97	97	97	97	94	96		4,069
cutter	TBB	301-1,500	100	100	95	100	99	98		864
cutter	TBB	>1,500	98	99	99	99	97	98		38,292
cutter	TBB	unknown	89				0			1
cutter	TBP	0-300						96		794
cutter	TBP	301-1,500					92	100		200
cutter	TBP	>1,500					97	98		2,514
cutter	TBS	0-300	93	92	90	94	89	90		16,708
cutter	TBS	301-1,500	100	95		100	100			46
cutter	TGB	>1,500			100					11
cutter	UKN	0-300	8	68	13	88	79			64
cutter	UKN	301-1,500	97	100	92	100	92			389
cutter	UKN	>1,500	0	100	100	100	100			7,376
cutter	UKN	unknown	0	31						146,58
highseas	OTB	>1,500				100		100		1672
highseas	OTM	>1,500	100	100	99	100	99	99		242,807
highseas	OTM	unknown			100	100	95	100		24,744
highseas	PTM	>1,500	100	100	100	98	100	100		17,540
highseas	UKN	>1,500		100	100	100	100			5,805
highseas	UKN	unknown			11	100				32,562
a) Fishing gear codes are included in Appendix 4.										
Source: Logbook data and VMS data, processed by LEI.										



Tables 2 to 7 for 2006 to 2011 show how the VMS catches were distributed between the three categories, whereby a distinction was made in terms of the availability of day catch figures (see also Table 2.2). It was readily feasible to determine the VMS points where vessels fitted with the most important types of fishing gear, such as beam trawl (TBB) and bottom otter trawl (OTB) fishing gear had fished. Shrimp vessels (shrimp trawl [TBS], <300 HP) are not under the obligation to report day catches: consequently, trip catches were used for these vessels instead of day catches. However, it was possible to allocate catches to the VMS points in practically all instances.

<b>Table A2.2 Share of the VMS catches distributed in the various manners (see also Table 2.2) per HP category and type of fishing gear in 2006</b>						
Gear a)	HP category	VMS catch (tonnes)	With catch day		Without catch day	
			Normal day	Only unknown	Normal trip	Only unknown
<i>Cutter fleet</i>						
DRB	301-1,500	1379	0	100	0	0
FPO	0-300	0	0	100	0	0
GN	0-300	1	94	0	6	0
GNS	0-300	99	99	0	2	0
GNS	301-1,500	1	100	0	0	0
MIS	0-300	11	0	100	0	0
MIS	301-1,500	646	0	100	0	0
MIS	>1,500	255	0	100	0	0
OTB	0-300	1,979	99	0	1	0
OTB	301-1,500	688	99	0	1	0
OTB	>1,500	142	100	0	0	0
OTM	0-300	52	0	100	0	0
OTM	301-1,500	1,344	0	100	0	0
OTM	>1,500	5,268	0	96	0	4
OTT	0-300	672	99	0	1	0
OTT	>1,500	49	100	0	0	0
PS	0-300	8	0	98	0	2
PTB	0-300	72	0	98	0	2
SSC	301-1,500	1,659	99	0	0	0
TBB	0-300	4,076	100	0	1	0
TBB	301-1,500	1,071	100	0	0	0
TBB	>1,500	41,241	100	0	0	0
TBB	unknown	1	0	100	0	0
TBS	0-300	14,676	0	0	100	0
TBS	301-1,500	10	0	0	100	0
UKN	0-300	3	0	0	0	100
UKN	301-1,500	606	0	0	0	100
UKN	>1,500	53	0	0	0	100
<i>High Seas fleet</i>						
OTM	>1,500	318,459	0	99	0	1
PTM	>1,500	22,213	0	100	0	0
a) Fishing gear codes are included in Appendix 4.						
Source: Logbook data and VMS data, processed by LEI.						

**Table A2.3 Share of the VMS catches distributed in the various manners (see also Table 2.2) per HP category and type of fishing gear in 2007**

Gear a)	HP category	VMS catch (tonnes)	With catch day		Without catch day	
			Normal day	Only unknown	normal trip	Only unknown
<i>Cutter fleet</i>						
DRB	301-1,500	1726	0	100	0	0
GN	0-300	3	100	0	0	0
GNS	0-300	101	100	0	0	0
MIS	0-300	59	0	100	0	0
MIS	301-1,500	714	0	100	0	0
MIS	>1,500	107	0	100	0	0
OTB	0-300	2,396	100	0	1	0
OTB	301-1,500	934	100	0	1	0
OTB	>1,500	460	99	0	0	0
OTM	0-300	56	0	100	0	0
OTM	301-1,500	1,035	0	100	0	0
OTM	>1,500	1,360	0	100	0	0
OTM	unknown	12,830	0	10	0	90
OTT	0-300	449	99	0	1	0
OTT	>1,500	16	99	0	1	0
PS	0-300	11	0	100	0	0
PTB	0-300	6	0	100	0	0
PTB	301-1,500	8	0	100	0	0
SDN	301-1,500	104	99	0	1	0
SSC	301-1,500	2,546	99	0	1	0
TBB	0-300	3,587	98	0	2	0
TBB	301-1,500	858	100	0	0	0
TBB	>1,500	43,527	99	0	0	0
TBS	0-300	14,945	0	0	100	0
TBS	301-1,500	113	0	0	100	0
UKN	0-300	16	0	0	0	100
UKN	301-1,500	485	0	0	0	100
UKN	>1,500	45	0	0	0	100
UKN	unknown	9,094	0	0	0	100
<i>High Seas fleet</i>						
OTM	>1,500	319,014	0	100	0	0
PTM	>1,500	18,404	0	100	0	0
UKN	>1,500	4,518	0	0	0	100

a) Fishing gear codes are included in Appendix 4.  
Source: Logbook data and VMS data, processed by LEI.

**Table A2.4 Share of the VMS catches distributed in the various manners (see also Table 2.2) per HP category and type of fishing gear in 2008**

Gear a)	HP category	VMS catch (tonnes)	With catch day		Without catch day	
			Normal day	Only unknown	Normal trip	Only unknown
<i>Cutter fleet</i>						
DRB	301-1,500	1637	0	100	0	0
GN	0-300	3	100	0	0	0
GNS	0-300	88	99	0	1	0
LHM	301-1,500	4	0	100	0	0
MIS	0-300	7	0	100	0	0
MIS	301-1,500	665	0	100	0	0
OTB	0-300	2,603	99	0	1	0
OTB	301-1,500	1,009	99	0	1	0
OTB	>1,500	1,759	100	0	0	0
OTG	0-300	2	0	100	0	0
OTM	0-300	32	0	100	0	0
OTM	301-1,500	10	0	98	0	2
OTT	0-300	409	100	0	0	0
OTT	301-1,500	58	99	0	1	0
OTT	>1,500	109	100	0	0	0
PS	0-300	15	0	100	0	0
SDN	301-1,500	569	100	0	0	0
SSC	301-1,500	2,613	100	0	0	0
TBB	0-300	3,994	99	0	1	0
TBB	301-1,500	877	100	0	0	0
TBB	>1,500	33,641	100	0	0	0
TBS	0-300	14,028	0	0	100	0
TGB	>1,500	11	0	97	0	3
UKN	0-300	2	0	0	0	100
UKN	301-1,500	496	0	0	0	100
UKN	>1,500	79	0	0	0	100
<i>High Seas fleet</i>						
OTM	>1,500	256,274	0	98	0	2
OTM	unknown	12,084	0	94	0	6
PTM	>1,500	15,131	0	100	0	0
UKN	>1,500	4,047	0	0	0	100
UKN	unknown	3,500	0	0	0	100

a) Fishing gear codes are included in Appendix 4.

Source: Logbook data and VMS data, processed by LEI.

**Table A2.5** Share of the VMS catches distributed in the various manners (see also Table 2.2) per HP category and type of fishing gear in 2009

Gear a)	HP category	VMS catch (tonnes)	With catch day		Without catch day	
			Normal day	Only unknown	Normal trip	Only unknown
<i>Cutter fleet</i>						
DRB	301-1,500	1,148	0	100	0	0
FPO	0-300	0	0	100	0	0
GN	0-300	2	100	0	0	0
GNS	0-300	163	100	0	0	0
GNS	301-1,500	34	100	0	0	0
GTR	0-300	7	0	99	0	1
GTR	301-1,500	13	0	100	0	0
HMD	301-1,500	945	0	100	0	0
LHM	301-1,500	19	0	100	0	0
MIS	0-300	3	0	100	0	0
MIS	301-1,500	480	0	100	0	0
OTB	0-300	2,332	97	0	4	0
OTB	301-1,500	975	100	0	1	0
OTB	>1,500	783	100	0	0	0
OTM	0-300	44	0	93	0	7
OTM	>1,500	855	0	100	0	0
OTT	0-300	528	99	0	1	0
OTT	301-1,500	207	94	0	6	0
OTT	>1,500	313	100	0	0	0
PS	0-300	3	0	100	0	0
PTB	0-300	6	0	100	0	0
SSC	0-300	0	100	0	0	0
SSC	301-1,500	3,611	94	0	5	0
TBB	0-300	4,311	98	0	2	0
TBB	301-1,500	983	98	0	2	0
TBB	>1,500	36,089	97	0	3	0
TBS	0-300	18,047	0	0	100	0
TBS	301-1,500	52	0	0	100	0
UKN	0-300	193	0	0	0	100
UKN	301-1,500	283	0	0	0	100
UKN	>1,500	178	0	0	0	100
<i>High Seas fleet</i>						
OTB	>1,500	1424	100	0	0	0
OTM	>1,500	189,699	0	100	0	0
OTM	unknown	12,211	0	97	0	3
PTM	>1,500	15,603	0	96	0	4
UKN	>1,500	9,913	0	0	0	100
UKN	unknown	34,307	0	0	0	100

a) Fishing gear codes are included in Appendix 4.  
Source: Logbook data and VMS data, processed by LEI.

**Table A2.6** Share of the VMS catches distributed in the various manners (see also Table 2.2) per HP category and type of fishing gear in 2010

Gear a)	HP category	VMS catch (tonnes)	With catch day		Without catch day	
			Normal day	Only unknown	Normal trip	Only unknown
<i>Cutter fleet</i>						
AG	301-1,500	5	0	100	0	0
BTF	>1,500	10	0	100	0	0
DRB	301-1,500	2,360	0	100	0	0
GN	0-300	8	98	0	2	0
GNS	0-300	128	100	0	1	0
GNS	301-1,500	28	92	0	9	0
GTR	0-300	4	0	99	0	1
GTR	301-1,500	32	0	99	0	1
HMD	301-1,500	354	0	100	0	0
LHM	0-300	0	0	100	0	0
MIS	301-1,500	6	0	100	0	0
OFG	0-300	3	0	100	0	0
OTB	0-300	2,924	98	0	2	0
OTB	301-1,500	783	99	0	1	0
OTB	>1,500	1,622	100	0	0	0
OTM	0-300	52	0	100	0	0
OTM	>1,500	1,362	0	100	0	0
OTT	0-300	610	99	0	0	0
OTT	301-1,500	239	98	0	2	0
PS	0-300	2	0	100	0	0
PTB	0-300	4	0	96	0	4
SDN	301-1,500	191	100	0	0	0
SSC	0-300	383	99	0	1	0
SSC	301-1,500	4,655	100	0	1	0
TBB	0-300	3,855	92	0	9	0
TBB	301-1,500	784	100	0	1	0
TBB	>1,500	38,354	100	0	1	0
TBP	301-1,500	182	100	0	0	0
TBP	>1,500	1,195	99	0	0	0
TBS	0-300	15,748	0	0	100	0
TBS	301-1,500	3	0	0	100	0
UKN	0-300	27	0	0	0	100
UKN	301-1,500	11	0	0	0	100
UKN	>1,500	22	0	0	0	100
<i>High Seas fleet</i>						
OTM	>1,500	224,514	0	100	0	0
OTM	unknown	49,007	0	100	0	0
PTM	>1,500	17,823	0	100	0	0
UKN	>1,500	4,742	0	0	0	100

a) Fishing gear codes are included in Appendix 4.  
Source: Logbook data and VMS data, processed by LEI.

**Table A2.7** Share of the VMS catches distributed in the various manners (see also Table 2.2) per HP category and type of fishing gear in 2011

Gear a)	HP category	VMS catch (tonnes)	With catch day		Without catch day	
			Normal day	Only unknown	Normal trip	Only unknown
<i>Cutter fleet</i>						
AG	301-1,500	13	0	100	0	0
DRB	301-1,500	2,270	0	100	0	0
FPO	0-300	48	0	100	0	0
GNS	0-300	112	100	0	0	0
GNS	301-1,500	45	100	0	0	0
GTR	0-300	5	0	100	0	0
GTR	301-1,500	30	0	100	0	0
HMD	301-1,500	825	0	100	0	0
LHM	0-300	3	0	100	0	0
LHP	0-300	0	0	100	0	0
OTB	0-300	2,295	100	0	0	0
OTB	301-1,500	1,129	100	0	0	0
OTB	>1,500	1,201	100	0	0	0
OTM	0-300	31	0	100	0	0
OTM	>1,500	1,524	0	100	0	0
OTT	0-300	951	82	0	18	0
OTT	301-1,500	183	100	0	0	0
PS	0-300	0	0	100	0	0
PTB	0-300	15	0	100	0	0
SDN	301-1,500	356	100	0	0	0
SSC	0-300	358	100	0	0	0
SSC	301-1,500	5,381	100	0	0	0
TBB	0-300	3,722	96	0	4	0
TBB	301-1,500	538	100	0	0	0
TBB	>1,500	33,044	100	0	0	0
TBP	0-300	759	90	0	11	0
TBP	301-1,500	202	100	0	0	0
TBP	>1,500	3,713	100	0	0	0
TBS	0-300	14,214	0	0	100	0
<i>High Seas fleet</i>						
OTB	>1,500	1,921	100	0	0	0
OTM	>1,500	143,650	0	100	0	0
OTM	unknown	22,821	0	100	0	0
PTM	>1,500	15,613	0	100	0	0

a) Fishing gear codes are included in Appendix 4.  
Source: Logbook data and VMS data, processed by LEI.

#### Price data

The price data cover all landings of species controlled by quotas in the Netherlands. Landings outside the Netherlands are not included in these data. However, the quantities of most species are relatively small. The coverage for the catches of shrimps is somewhat lower since much of the catch is sold directly to the processing industry. However, it is assumed that the prices are indicative.

#### *Economic data*

The economic data cover the major segments and types of fishing gear. The average ratio of the landing value to the gross value added for various types of fishing gear is used for the other types of fishing gear.

#### **Data used for non-Dutch vessels**

##### *VIRIS data*

The VIRIS data cover trips of non-Dutch vessels that land in the Netherlands. Consequently, no catch are available for some VMS points. Non-Dutch vessels, in analogy with Dutch vessels, with a length of more than 10 metres do not need to keep records of catches of less than 50 kg per species. As indicated earlier, this can be of relevance to specific vessels. However, it is safe to assume that this underestimation is relatively small. Table 3.5 lists the coverage percentages of the VIRIS data on the basis of the duration at the VMS points. The coverage is reasonably good for most types of fishing gear, although much lower than for the Dutch segments.

**Table A2.8 Fishing effort in VMS data for foreign fleets, VIRIS catch allocated to VMS pings and coverage percentages of VMS effort in VIRIS for 2006**

<b>Fleet</b>	<b>Gear a)</b>	<b>HP category</b>	<b>Fishing effort in VMS (fishing days)</b>	<b>Viris catch allocated to VMS pings (tonnes)</b>	<b>Percentage of VMS effort linked to Viris</b>
BEL	OTB	0-300	57	87	94
BEL	OTB	301-1,500	2	10	44
BEL	TBB	0-300	109	41	88
BEL	TBB	301-1,500	14	32	38
BEL	TBS	0-300	153	144	96
BEL	UKN	unknown	7	0	0
BEL	UKN	0-300	117	0	0
BEL	UKN	301-1,500	127	0	1
DEU	GN	0-300	3	17	39
DEU	GNS	0-300	10	17	58
DEU	OTB	0-300	302	410	93
DEU	OTB	301-1,500	81	125	98
DEU	OTM	>1,500	13	202	12
DEU	OTT	0-300	0	2	100
DEU	PTB	0-300	29	21	68
DEU	PTB	301-1,500	3	0	46
DEU	SPR	0-300	13	4	39
DEU	TBB	0-300	383	259	87
DEU	TBB	301-1,500	637	1035	94
DEU	TBS	0-300	81	38	52
DEU	UKN	unknown	10	0	0
DEU	UKN	0-300	131	0	1
DEU	UKN	301-1,500	45	0	0
DEU	UKN	>1,500	4	0	0
GBR	FPO	301-1,500	40	1	1
GBR	GN	0-300	31	122	5
GBR	OTB	301-1,500	12	49	100
GBR	OTM	>1,500	16	870	31
GBR	OTT	301-1,500	53	135	87
GBR	PTM	>1,500	21	760	32
GBR	SSC	301-1,500	10	1	10
GBR	TBB	unknown	26	47	78
GBR	TBB	0-300	3	1	88
GBR	TBB	301-1,500	893	1,996	79
GBR	TBB	>1,500	141	390	79
GBR	UKN	unknown	140	0	0
GBR	UKN	0-300	573	0	0
GBR	UKN	301-1,500	350	0	0
GBR	UKN	>1,500	5	0	0

a) Fishing gear codes are included in Appendix 4.  
Source: Logbook data and VMS data, processed by LEI.



**Table A2.9 Fishing effort in VMS data for foreign fleets, VIRIS catch allocated to VMS pings and coverage percentages of VMS effort in VIRIS for 2007**

Fleet	Gear a)	HP category	Fishing effort in VMS (fishing days)	Viris catch allocated to VMS pings (tonnes)	Percentage of VMS effort linked to Viris
BEL	OTB	0-300	8	161	100
BEL	OTB	301-1,500	8	43	41
BEL	TBB	0-300	273	254	88
BEL	TBB	301-1,500	89	370	81
BEL	TBS	0-300	177	117	97
BEL	UKN	unknown	34	0	0
BEL	UKN	0-300	313	0	0
BEL	UKN	301-1,500	1,257	0	0
DEU	GN	unknown	5	4	10
DEU	GN	0-300	2	5	52
DEU	GNS	0-300	13	6	11
DEU	MIS	0-300	5	1	44
DEU	OTB	unknown	5	2	70
DEU	OTB	0-300	273	417	99
DEU	OTB	301-1,500	84	136	88
DEU	OTM	>1,500	13	91	1
DEU	PTB	0-300	9	6	89
DEU	TBB	unknown	62	41	90
DEU	TBB	0-300	120	96	100
DEU	TBB	301-1,500	615	1,048	95
DEU	TBS	0-300	111	26	26
DEU	UKN	unknown	112	0	0
DEU	UKN	0-300	4,619	0	0
DEU	UKN	301-1,500	664	0	0
DEU	UKN	>1,500	83	0	0
GBR	FPO	0-300	2	5	80
GBR	FPO	301-1,500	79	324	100
GBR	GN	0-300	16	62	12
GBR	OTB	301-1,500	30	156	100
GBR	OTM	>1,500	8	8	1
GBR	OTT	301-1,500	52	172	91
GBR	OTT	>1,500	7	40	100
GBR	PTM	>1,500	18	471	24
GBR	SSC	301-1,500	25	19	30
GBR	SSC	>1,500	1	0	0
GBR	TBB	0-300	12	159	75
GBR	TBB	301-1,500	1,116	3,188	90
GBR	TBB	>1,500	218	719	89
GBR	TBS	301-1,500	12	1	1
GBR	UKN	unknown	3,042	0	0
GBR	UKN	0-300	4,305	0	0
GBR	UKN	301-1,500	6,435	0	0
GBR	UKN	>1,500	300	36	1

a) Fishing gear codes are included in Appendix 4.

Source: Logbook data and VMS data, processed by LEI.

**Table A2.10 Fishing effort in VMS data for foreign fleets, VIRIS catch allocated to VMS pings and coverage percentages of VMS effort in VIRIS for 2008**

Fleet	Gear a)	HP category	Fishing effort in VMS (fishing days)	Viris catch allocated to VMS pings (tonnes)	Percentage of VMS effort linked to Viris
BEL	OTB	0-300	8	34	100
BEL	OTB	301-1,500	3	47	10
BEL	TBB	0-300	183	159	97
BEL	TBB	301-1,500	39	45	66
BEL	TBS	0-300	209	227	98
BEL	UKN	unknown	28	0	0
BEL	UKN	0-300	441	0	0
BEL	UKN	301-1,500	1,441	0	0
DEU	GN	0-300	13	22	43
DEU	GNS	0-300	30	24	21
DEU	OTB	0-300	214	364	88
DEU	OTB	301-1,500	72	183	92
DEU	OTM	>1,500	23	1,964	47
DEU	TBB	unknown	6	4	100
DEU	TBB	0-300	109	69	88
DEU	TBB	301-1,500	550	955	92
DEU	TBS	unknown	7	6	100
DEU	TBS	0-300	84	64	56
DEU	UKN	unknown	42	0	0
DEU	UKN	0-300	4,181	0	0
DEU	UKN	301-1,500	769	0	0
DEU	UKN	>1,500	69	0	0
GBR	FPO	301-1,500	248	558	90
GBR	GN	0-300	45	158	2
GBR	OTB	301-1,500	195	654	87
GBR	OTB	>1,500	47	153	100
GBR	OTM	>1,500	23	841	27
GBR	OTT	301-1,500	140	571	98
GBR	OTT	>1,500	14	56	96
GBR	PTB	301-1,500	5	13	100
GBR	PTM	>1,500	27	393	13
GBR	SSC	301-1,500	22	46	62
GBR	TBB	unknown	28	141	97
GBR	TBB	0-300	8	46	96
GBR	TBB	301-1,500	1,196	4,711	91
GBR	TBB	>1,500	213	823	86
GBR	UKN	unknown	1,083	0	0
GBR	UKN	0-300	8,787	0	0
GBR	UKN	301-1,500	8,434	0	0
GBR	UKN	>1,500	932	0	0
GBR	SDN	0-300	3	5	50

a) Fishing gear codes are included in Appendix 4.  
Source: Logbook data and VMS data, processed by LEI.

**Table A2.11 Fishing effort in VMS data for foreign fleets, VIRIS catch allocated to VMS pings and coverage percentages of VMS effort in VIRIS for 2009**

Fleet	Gear a)	HP category	Fishing effort in VMS (fishing days)	Viris catch allocated to VMS pings (tonnes)	Percentage of VMS effort linked to Viris
BEL	OTB	0-300	49	63	100
BEL	OTB	301-1,500	7	14	91
BEL	OTT	0-300	0	1	-
BEL	TBB	unknown	0	23	-
BEL	TBB	0-300	277	80	95
BEL	TBB	301-1,500	234	114	73
BEL	TBS	0-300	244	318	99
DEU	GN	0-300	4	4	100
DEU	GNS	0-300	172	25	48
DEU	GTR	0-300	47	10	79
DEU	OTB	0-300	483	187	95
DEU	OTB	301-1,500	147	141	94
DEU	OTM	>1,500	723	86	11
DEU	OTT	0-300	51	0	2
DEU	PTB	0-300	44	8	71
DEU	TBB	0-300	201	60	86
DEU	TBB	301-1,500	570	771	93
DEU	TBS	0-300	91	54	60
GBR	FPO	0-300	7	7	99
GBR	FPO	301-1,500	192	387	88
GBR	GN	0-300	20	100	62
GBR	GNS	0-300	21	12	3
GBR	MIS	0-300	3	3	100
GBR	OTB	0-300	40	114	100
GBR	OTB	301-1,500	320	1436	95
GBR	OTB	>1,500	0	1	100
GBR	OTM	>1,500	255	28,029	77
GBR	OTT	>1,500	24	129	81
GBR	PTM	>1,500	124	4,770	61
GBR	SDN	0-300	6	13	68
GBR	SSC	301-1,500	59	101	75
GBR	TBB	0-300	160	6	70
GBR	TBB	301-1,500	1,115	5,224	88

a) Fishing gear codes are included in Appendix 4.

Source: Logbook data and VMS data, processed by LEI.

**Table A2.12 Fishing effort in VMS data for foreign fleets, VIRIS catch allocated to VMS pings and coverage percentages of VMS effort in VIRIS for 2010**

Fleet	Gear a)	HP category	Fishing effort in VMS (fishing days)	Viris catch allocated to VMS pings (tonnes)	Percentage of VMS effort linked to Viris
BEL	GNS	0-300	0	0	0
BEL	GNS	301-1,500	3	0	0
BEL	OTB	301-1,500	34	27	35
BEL	TBB	0-300	532	305	44
BEL	TBB	301-1,500	444	206	11
DEU	DRB	0-300	2	0	0
DEU	DRB	301-1,500	63	0	0
DEU	GNS	0-300	155	111	83
DEU	OTB	0-300	67	0	0
DEU	OTB	301-1,500	207	514	61
DEU	OTB	>1,500	32	0	0
DEU	OTM	301-1,500	24	0	0
DEU	OTM	>1,500	12	0	0
DEU	SDN	0-300	5	0	0
DEU	TBB	0-300	972	593	34
DEU	TBB	301-1,500	377	1,093	96
GBR	DRB	0-300	278	0	0
GBR	DRB	301-1,500	494	0	0
GBR	FPO	0-300	249	0	0
GBR	FPO	301-1,500	202	205	67
GBR	GNS	0-300	176	0	0
GBR	GNS	301-1,500	4	0	0
GBR	HMD	0-300	69	0	0
GBR	HMD	301-1,500	643	0	0
GBR	LLD	301-1,500	0	0	0
GBR	LLS	301-1,500	39	0	0
GBR	OTB	0-300	556	0	0
GBR	OTB	301-1,500	1,437	633	8
GBR	OTB	>1,500	180	0	0
GBR	OTM	0-300	8	0	0
GBR	OTM	301-1,500	34	0	0
GBR	OTM	>1,500	357	17,876	48
GBR	OTT	0-300	111	31	23
GBR	OTT	301-1,500	255	0	0
GBR	OTT	>1,500	90	220	22
GBR	PTB	301-1,500	581	0	0
GBR	PTM	301-1,500	41	0	0
GBR	PTM	>1,500	390	0	0
GBR	SDN	0-300	58	0	0
GBR	SSC	0-300	12	0	0
GBR	SSC	301-1,500	183	0	0
GBR	TBB	0-300	101	224	45
GBR	TBB	301-1,500	664	3,548	49

a) Fishing gear codes are included in Appendix 4.

Source: Logbook data and VMS data, processed by LEI.

**Table A2.13 Fishing effort in VMS data for foreign fleets, VIRIS catch allocated to VMS pings and coverage percentages of VMS effort in VIRIS for 2011**

Fleet	Gear a)	HP category	Fishing effort in VMS (fishing days)	Viris catch allocated to VMS pings (tonnes)	Percentage of VMS effort linked to Viris
BEL	GNS	301-1,500	14	0	0
BEL	OTB	301-1,500	72	57	23
BEL	SSC	301-1,500	86	116	37
BEL	TBB	0-300	1,876	648	24
BEL	TBB	301-1,500	1,348	487	8
DEU	DRB	0-300	35	0	0
DEU	DRB	301-1,500	280	0	0
DEU	FPO	301-1,500	3	0	0
DEU	GNS	0-300	171	45	44
DEU	GNS	301-1,500	2	0	0
DEU	LLS	301-1,500	14	0	0
DEU	OTB	0-300	102	0	0
DEU	OTB	301-1,500	533	613	24
DEU	OTB	>1,500	98	2,091	13
DEU	OTM	301-1,500	67	0	0
DEU	OTM	>1,500	109	8,368	58
DEU	TBB	0-300	2,777	1,180	14
DEU	TBB	301-1,500	237	1,031	96
GBR	DRB	0-300	115	0	0
GBR	DRB	301-1,500	545	0	0
GBR	FPO	0-300	482	0	0
GBR	FPO	301-1,500	403	460	47
GBR	GNS	0-300	388	130	29
GBR	GNS	301-1,500	91	0	0
GBR	HMD	0-300	35	0	0
GBR	HMD	301-1,500	1,148	0	0
GBR	LLS	301-1,500	3	0	0
GBR	OTB	0-300	788	0	0
GBR	OTB	301-1,500	1,903	232	2
GBR	OTB	>1,500	333	22,691	29
GBR	OTM	0-300	56	0	0
GBR	OTM	301-1,500	48	0	0
GBR	OTM	>1,500	343	861	2
GBR	OTT	0-300	199	239	19
GBR	OTT	301-1,500	421	0	0
GBR	OTT	>1,500	94	423	41
GBR	PTB	0-300	116	0	0
GBR	PTB	301-1,500	933	0	0
GBR	PTM	301-1,500	28	0	0
GBR	PTM	>1,500	346	3,270	27
GBR	SDN	0-300	243	0	0
GBR	SSC	0-300	111	0	0
GBR	SSC	301-1,500	770	1,753	38
GBR	TBB	0-300	119	0	0
GBR	TBB	301-1,500	610	6,693	80

a) Fishing gear codes are included in Appendix 4.

Source: Logbook data and VMS data, processed by LEI.

*VMS data*

The Netherlands is responsible for the control of fishing vessels in the Dutch section of the continental shelf and, consequently, has all VMS data relating to the area at its disposal. However, this is often only part of the VMS information about the trip since these vessels spend only part of the time of their trip in the Dutch section of the continental shelf. Vessels with a length of 15 metres are not governed by the VMS obligation. It is assumed that the number of non-Dutch vessels of a length of less than 15 metres that fish in the Dutch section of the continental shelf is negligible.

*Price data*

The price data covers all landings of species controlled by quotas in the Netherlands. Since the large majority of the catches are landed in the Netherlands, it has been decided that these prices will also be used for non-Dutch vessels.

## Appendix 3

### Fishing trends in the areas

This section contains the historical trends of fishing activities of the Dutch and foreign Fleets in the Dogger Bank. The data are aggregated by Fleet, horsepower categories and gear type. Years covered are 2006 to 2011.

#### *Dutch Fleet*

**Table A3.1 Effort of each fleet segment in the Dogger Bank area (days at sea) and the proportion of the time spent fishing**

Fleet	HP category	Gear a)	Effort (days at sea)						Time spent fishing
			2006	2007	2008	2009	2010	2011	
cutter	0-300	GNS		1					0.00
cutter	0-300	OTB	3	2	12	15	4	52	0.78
cutter	301-1,500	OTB	6	2	4	4	5	17	0.55
cutter	301-1,500	SDN						0	0.74
cutter	301-1,500	SSC	0	0	3		2	1	0.59
cutter	301-1,500	TBB	0						0.51
cutter	301-1,500	UKN				0			1.00
cutter	>1,500	OTB	2	6	54	32	11	9	0.72
cutter	>1,500	OTT				0			0.00
cutter	>1,500	TBB	59	27	57	30	36	98	0.45
cutter	>1,500	TBP						2	0.92
cutter	>1,500	UKN			0				1.00
highseas	>1,500	OTM	1	1	1	0	1	0	1.00
highseas	>1,500	PTM	1	1	1	1	1	0	1.00

a) Fishing gear codes are included in Appendix 4.

Source: Logbook data and VMS data, processed by LEI.

**Table A3.2 Landings of each fleet segment in the Dogger Bank area (tonnes)**

Fleet	HP category	Gear a)	Landings (tons)					
			2006	2007	2008	2009	2010	2011
cutter	0-300	GNS		0				
cutter	0-300	OTB	7	6	36	42	12	209
cutter	301-1,500	OTB	15	0	8	8	14	69
cutter	301-1,500	SDN						1
cutter	301-1,500	SSC	0	1	1		6	1
cutter	301-1,500	TBB	0					
cutter	301-1,500	UKN				0		
cutter	>1,500	OTB	2	22	235	121	65	32
cutter	>1,500	OTT				0		
cutter	>1,500	TBB	170	80	228	139	169	510
cutter	>1,500	TBP						7
cutter	>1,500	UKN			1			
highseas	>1,500	OTM	0	1	0	75	0	0
highseas	>1,500	PTM	9	4	28	0	11	0

a) Fishing gear codes are included in Appendix 4.

Source: Logbook data and VMS data, processed by LEI.

**Table A3.3 Value of landed catches of each fleet segment in the Dogger Bank area (€1,000)**

Fleet	HP category	Gear a)	Value (€1,000)					
			2006	2007	2008	2009	2010	2011
cutter	0-300	GNS						
cutter	0-300	OTB	19	12	77	66	18	334
cutter	301-1,500	OTB	30	1	15	12	18	114
cutter	301-1,500	SDN						1
cutter	301-1,500	SSC		1	2		6	2
cutter	301-1,500	TBB	1					
cutter	301-1,500	UKN				0		
cutter	>1,500	OTB	5	46	488	183	93	51
cutter	>1,500	OTT				0		
cutter	>1,500	TBB	419	202	537	210	261	1,008
cutter	>1,500	TBP						19
cutter	>1,500	UKN			2			
highseas	>1,500	OTM	0	0	0	39	0	0
highseas	>1,500	PTM	2	1	7	0	4	0

a) Fishing gear codes are included in Appendix 4.

Source: Logbook data and VMS data, processed by LEI.



**Table A3.4** Gross value added (GVA) of landed catches of each fleet segment in the Dogger Bank area (€1,000)

Fleet	HP category	Gear a)	GVA (€1,000)					
			2006	2007	2008	2009	2010	2011 b)
cutter	0-300	GNS						
cutter	0-300	OTB	7	7	43	32	7	130
cutter	301-1,500	OTB	0	0	9	2	9	55
cutter	301-1,500	SDN						0
cutter	301-1,500	SSC		0	0		2	1
cutter	301-1,500	TBB	0					
cutter	301-1,500	UKN				1		
cutter	>1,500	OTB	1	18	273	55	45	25
cutter	>1,500	OTT				0		
cutter	>1,500	TBB	124	64	146	80	81	314
cutter	>1,500	TBP						10
cutter	>1,500	UKN						
highseas	>1,500	OTM	0	0	0	10	0	0
highseas	>1,500	PTM	0	0	2	0	1	0

a) Fishing gear codes are included in Appendix 4.

Source: Logbook data and VMS data, processed by LEI.

Foreign Fleet

**Table A3.5 Effort of each foreign fleet segment in the Dogger Bank area (days at sea) and the proportion of the time spent fishing**

Fleet	HP category	Gear a)	Effort (days at sea)						Time spent fishing
			2006	2007	2008	2009	2010	2011	
BEL	0-300	TBB						2	0.52
BEL	301-1,500	OTB	0	6	7	29	0	0	0.15
BEL	301-1,500	SSC						9	0.94
BEL	301-1,500	TBB	0	0	1	3	5		0.78
BEL	301-1,500	UKN		1	1	0			1
DEU	unknown	UKN	0						1
DEU	0-300	OTB	42	21	10	123			0.71
DEU	0-300	PTB	1						1
DEU	0-300	SDN					5		0.27
DEU	0-300	TBB	0				13	24	0.59
DEU	0-300	TBS		0					1
DEU	0-300	UKN	0		1	0			1
DEU	301-1,500	OTB	5	0	1	1	9	3	0.67
DEU	301-1,500	OTM					3	1	1
DEU	301-1,500	TBB	4				2	1	0.73
DEU	301-1,500	UKN	7	3	9	0			1
DEU	>1,500	OTB					0	0	1
DEU	>1,500	OTM	0	0	0		0		1
DEU	>1,500	UKN	0						1
GBR	unknown	TBB	2						1
GBR	unknown	UKN		5	0	0			1
GBR	0-300	GN	3	3	5	2			0.19
GBR	0-300	GNS				0	3	6	0.87
GBR	0-300	OTB				3			0.6
GBR	0-300	OTT						4	0.55
GBR	0-300	SDN			0		1		0.44
GBR	0-300	TBB					8		0.59
GBR	0-300	UKN	2	6	11	0			1
GBR	301-1,500	OTB	1	11	25	99	29	1	0.59
GBR	301-1,500	OTT	8	18	28				0.58
GBR	301-1,500	SSC	0	1	2	0	6	46	0.93
GBR	301-1,500	TBB	204	160	177	115	121	83	0.74
GBR	301-1,500	UKN	0	1	0	0			1
GBR	>1,500	OTB			0		0	0	0.62
GBR	>1,500	OTM						1	1
GBR	>1,500	OTT		1		0	6	1	0.44
GBR	>1,500	PTM	0	0	0		0	0	1
GBR	>1,500	TBB	48	23	27				0.76
GBR	>1,500	UKN	0	1	1	0			1

a) Fishing gear codes are included in Appendix 4.  
Source: Logbook data and VMS data, processed by LEI.

**Table A3.6 Landings of each foreign fleet segment in the Dogger Bank area (tonnes)**

Fleet	HP category	Gear a)	Landings (tons)					
			2006	2007	2008	2009	2010	2011
BEL	unknown	TBB				0		
BEL	0-300	TBB						11
BEL	301-1,500	OTB	1	8	16	42	0	0
BEL	301-1,500	SSC						47
BEL	301-1,500	TBB	0	0	0	0	19	
BEL	301-1,500	UKN		0	0	0		
DEU	unknown	UKN	0					
DEU	0-300	OTB	45	22	11	280		
DEU	0-300	PTB	1					
DEU	0-300	SDN					0	
DEU	0-300	TBB	0				33	98
DEU	0-300	TBS		0				
DEU	0-300	UKN	0		0	0		
DEU	301-1,500	OTB	4	0	1	1	21	11
DEU	301-1,500	OTM					5	0
DEU	301-1,500	TBB	4				7	10
DEU	301-1,500	UKN	0	0	0	0		
DEU	>1,500	OTB					0	0
DEU	>1,500	OTM	0	1	17		0	
DEU	>1,500	UKN	0					
GBR	unknown	TBB	0					
GBR	unknown	UKN		0	0	0		
GBR	0-300	GN	4	6	5	1		
GBR	0-300	GNS				0	0	5
GBR	0-300	OTB				5		
GBR	0-300	OTT						21
GBR	0-300	SDN			0		0	
GBR	0-300	TBB					46	
GBR	0-300	UKN	0	0	0	0		
GBR	301-1,500	OTB	1	4	15	306	149	4
GBR	301-1,500	OTT	10	7	24			
GBR	301-1,500	SSC	0	0	3	0	34	259
GBR	301-1,500	TBB	358	325	519	564	928	654
GBR	301-1,500	UKN	0	0	0	0		
GBR	>1,500	OTB			0		2	0
GBR	>1,500	OTM						81
GBR	>1,500	OTT		1		0	41	3
GBR	>1,500	PTM	6	0	0		0	7
GBR	>1,500	TBB	81	41	55			
GBR	>1,500	UKN	0	0	0	0		

a) Fishing gear codes are included in Appendix 4.

Source: Logbook data and VMS data, processed by LEI.

**Table A3.7 Value of landed catches of each foreign fleet segment in Central Oyster Grounds area (€1,000)**

Fleet	HP category	Gear a)	Value (€1,000)					
			2006	2007	2008	2009	2010	2011
BEL	unknown	TBB				0		
BEL	0-300	TBB						16
BEL	301-1,500	OTB	3	21	36	60	0	0
BEL	301-1,500	SSC						74
BEL	301-1,500	TBB	0	0	0	0	38	
BEL	301-1,500	UKN		0	0	0		
DEU	unknown	UKN	0					
DEU	0-300	OTB	119	74	30	437		
DEU	0-300	PTB	5					
DEU	0-300	SDN					0	
DEU	0-300	TBB	0				55	155
DEU	0-300	TBS		0				
DEU	0-300	UKN	0		0	0		
DEU	301-1,500	OTB	10	0	2	1	43	18
DEU	301-1,500	OTM					11	0
DEU	301-1,500	TBB	15				14	16
DEU	301-1,500	UKN	0	0	0	0		
DEU	>1,500	OTB					0	0
DEU	>1,500	OTM	0	1	13		0	
DEU	>1,500	UKN	0					
GBR	unknown	TBB	0					
GBR	unknown	UKN		0	0	0		
GBR	0-300	GN	11	19	16	3		
GBR	0-300	GNS				0	0	16
GBR	0-300	OTB				7		
GBR	0-300	OTT						29
GBR	0-300	SDN			0		0	
GBR	0-300	TBB					71	
GBR	0-300	UKN	0	0	0	0		
GBR	301-1,500	OTB	2	13	32	452	241	6
GBR	301-1,500	OTT	21	16	49			
GBR	301-1,500	SSC	0	0	8	0	85	396
GBR	301-1,500	TBB	934	925	1,227	842	1,585	1,064
GBR	301-1,500	UKN	0	0	0	0		
GBR	>1,500	OTB			0		5	0
GBR	>1,500	OTM						163
GBR	>1,500	OTT		3		0	67	5
GBR	>1,500	PTM	5	0	0		0	1
GBR	>1,500	TBB	216	110	129			
GBR	>1,500	UKN	0	0	0	0		

a) Fishing gear codes are included in Appendix 4.  
Source: Logbook data and VMS data, processed by LEI.

# Appendix 4

## Gear codes

<b>Gear code</b>	<b>Gear type</b>
FPO	Pots
GN	Gillnets (not specified)
GNC	Encircling gillnets
GND	Drift nets
GNS	Set gillnets (anchored)
GTN	Combined gillnets-Trammel nets
GTR	Trammel nets
LHP	Hand-lines and pole-lines (hand operated)
LL	Longlines (not specified)
LLD	Drifting longlines
LLS	Set lines (longlines set)
LN	Lift nets (not specified)
MIS	MISCELLANEOUS GEAR
OTB	Otter trawls bottom
OTM	Otter trawls midwater
OTT	Otter twin trawls
PTB	Pair trawls bottom
PTM	Pair trawls mid-water
SDN	Danish seines
SSC	Scottish seines
TBB	Beam trawls
TBS	Shrimp trawls