Fish and Fisheries

Baseline Reports regarding Fehmarnbelt

Final report

Commercial fisheries in Fehmarnbelt

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Fehmarn Belt Environment Consortium JV

In association with: IFM-GEOMAR

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PREFACE

The establishment of a Fehmarnbelt Fixed Link has been under consideration for several years and became more feasible during and after the planning and construction of the Øresund Fixed Link from 1991-2000.

From 1995 to 1999, a series of investigations including environmental effects of a fixed link across the Fehmarnbelt were carried out. In 2005 and 2006, an environmental consultation process was carried out, in which government agencies, stakeholders and the public commented on the environmental aspects.

On 3 September 2008, the Ministers of Transport of Denmark and Germany signed the state treaty on the Fehmarnbelt Fixed Link and the Danish Parliament approved a law for the planning of the fixed coast-to-coast section on March 26th 2009. In Germany, the law ratifying the state treaty was accepted by the Bundestag on 18 June 2009. On 10 July 2009, the Bundesrat also passed it, and the law took effect on 24 July 2009.

The Danish planning law enables comprehensive preliminary investigations of, among others, the environment. As part of these environmental investigations a consortium FeBEC JV, lead by Orbicon A/S and partners IfAÖ (Germany) and Fiskeøkologisk Laboratorium (Denmark), have made a number of baseline surveys on Fish and Fisheries for the Femern Bælt A/S, who is responsible for the planning, environmental investigations and assessments, and designs of the 19-kilometre long coast-to-coast section, planned as a combined four-lane motorway and a double-track electrified railway, between Denmark and Germany across the Fehmarnbelt.

The present baseline report has been prepared in accordance with the scope of work described in the Scoping Report identifying key issues to be investigated on fishery.

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Summary

The following document describes the baseline of the German and Danish commercial fisheries within areas deemed most relevant to assessing impacts from the proposed Fehmarnbelt Fixed Link over Fehmarnbelt between Denmark and Germany. Furthermore, the document describes experiences from fishermen and impacts to the fisheries from the establishment of two other fixed links in Denmark (The Great Belt and the Øresund Fixed link).

The smallest spatial unit that comprehensive commercial fisheries data from Fehmarm Belt is available is an ICES rectangle (30 x 30 nautical miles). This was therefore the primary unit of measurement used to present the fleet and fishery statistics in this report. ICES rectangles 38G1 and 37G1 were chosen to represent the areas where the near field fisheries of Fehmarnbelt are described. Because there is a risk of impacts to the fisheries extending beyond these ICES rectangles, the fleet statistics and fisheries were also described in the regional areas to the west (ICES 37G0 and 38G0) and east (ICES 37G2 and 38G2) of Fehmarnbelt.

Interviews with German and Danish vessel owners, fishermen and their representatives were undertaken to supplement official knowledge of the fisheries, fishery practices and economic data.

There is no data source that can accurately quantify commercial fishery in all its aspects. It is therefore important to understand that there will be biases in the data caused by a variety of known and unknown factors. For example, misreporting of data due to catches from a haul over two or three ICES rectangles being put into one ICES rectangle, or differences in estimated catches in logbooks versus weighted landings, or changes in reporting practices over the years, such as when catches from new length groups of vessels enter a statistical group, to name just a few. Thus, it is important to use reasonable judgement and have an understanding that the landings and values presented from the majority of the fishery statistics have sources of biases that should be acknowledged when interpreting and using the data.

For descriptions of the fisheries, one of the most common unit of measurements associated with official data was the fishing vessel. Furthermore, vessels were officially described within length groups i.e. 8-12 m, 12-15 m etc. and associated with gear use, or a specific fishery (trawl, gill/trammel nets, pound nets etc.). The vessel was therefore chosen as the unit of measurement in this report to give the best resolution of the data possible, particularly when describing the official economic statistics.

Danish and German commercial fisheries and fleet statistics for the ICES rectangles, landings in harbours, and vessel monitoring system data to use for fleet, gear and spatial distributions were obtained from the Danish Directorate for Fisheries (FD) in Denmark, and from the Bundesanstalt für Landwirtschaft und Ernährung (BLE) in Germany. Access to this data is limited by laws protecting personal information. Thus, obtained fishery data was made anonymous, pooled into groups or devoid of some information to hide the identity of individual vessels and fishermen.

Additional fleet statistic information on vessel lengths, gear use, home-based harbours and for the number of small vessels (<8 m) in the Western Baltic were obtained from the Fisheries EU registry.

For Denmark, official data of ICES rectangles does not include information on vessels less than 8 m (less than 10 m before 2005) because these vessels are not required to fill out logbooks. However, because vessels of these lengths primarily fish in the vicinity of their home harbour (basis harbour), fleet statistic and landings from local harbours in and near Fehmarnbelt were presented and considered to contain the essential data from this section of the fishing fleet.

Fisheries and access regulations

The fisheries in the Western Baltic and Belt Sea are subject to a number of rules that define how, and to which extent, the fisheries in Fehmarnbelt can be undertaken. Depending on the choice of the fixed link solution (tunnel or bridge), the establishment of a fixed link over Fehmarnbelt could possibly lead to further restrictions to the fisheries.

Management rules and regulations for the German and Danish Baltic Sea fisheries are set at various judicial levels, primarily at EU, but also national and federal state levels. Most stocks exploited by Baltic Sea fishermen (cod, herring, sprat, salmon, and plaice) are managed under the Common Fisheries Policy (CFP) by the European Commission.

Territorial waters are the coastal waters extending up to 12 nautical miles from the basisline of a coastal nation. This belt of water is regarded as the sovereign territory of that nation. If the 12 nautical mile zone overlaps with other states territorial waters, the border is normally taken as the median point between the basislines of the two states.

The basisline from which the territorial water is measured is normally the mean low-water line along the coast. Alternatively, the basisline can be defined by connecting fringing islands, across the mouth of a river, or with certain restrictions, across the mouth of bays.

Waters landward of the basisline are defined as internal national waters, over which the state or country has complete jurisdiction.

In the marine zone between the basisline and 12 nm/median line in the region of Fehmarnbelt, the coastal states have in principle exclusive fishing rights. However, German and Danish fishermen have an historical right to fish between 3 to 12 nautical miles of each others state.

The use of trawls is forbidden or strongly regulated within 3 nm from the low water line (basisline), however there are a vast number of exceptions. Vessels larger than 17 meters are not allowed to fish in the Western Baltic, unless they have historical rights in the area.

The use of beam trawls, drift nets and dredges is now prohibited in the Baltic Sea, except for the collection of mussels and the seaweed *Furcellaria lumbricalis*.

Fisheries compensation

The German Sea Fisheries law contains no provisions, which have the objective to compensate for the loss of fishing grounds.

The Danish fisheries law contains provisions which have the objective to protect the interest of the fisheries against ”measures and interventions that can cause inconvenience or deter the fisheries in saltwater areas, create bottom conditions unfit to carry out fisheries or effect the fauna and vegetation in a fishing area“. Permission for such an intervention will only be granted when negotiations regarding possible compensation have been started between those that undertake the measure or interventions (clients) and the commercial fishermen effected by the measures or intervention.

The characteristics and extent of the Danish and German fisheries

Denmark and Germany are, more or less, the only two countries that undertake their fisheries in Fehmarnbelt (38G1 and 37G1) and its regional area (ICES 37G0, 38G0, 37G2 and 38G2). From 1998 to 2008, Denmark has annually landed approximately 18,000 tons with a value of 14.7 million euro from this area. Over the same period, Germany has annually landed approximately 10,600 tons with a value of 10.5 million euro.

Characteristic for the distribution of the Danish and German fisheries in the Fehmarnbelt near field (ICES 38G1 and 37G1) according to ICES landings statistics, are that Denmark under-

take a comparatively greater amount of fishing in ICES 38G1, which is the ICES rectangle that contains the majority of Fehmarnbelt and the section of Fehmarnbelt where the Fehmarnbelt Fixed Link will be located. In contrast, Germany undertakes a comparatively greater amount of their fisheries in ICES 37G1, which contains the far eastern part of Fehmarnbelt.

In Fehmarnbelt where the fixed Link will be located (ICES 38G1), Denmark has landed an average of approximately 1,800 tons for a value of 1.3 million euro a year from 1998-2008. Over the same period, Germany has annually landed an average of approximately 259 tons for a value of 284,000 euro.

The Danish and German fisheries in Fehmarnbelt are represented by trawlers (both demersal and midwater), gill/trammel net fishermen, pound net fishermen and their associated fisheries with fyke nets and traps, and occasionally seine net fishermen.

In Fehmarnbelt (primarily ICES 38G1), the Danish and German fisheries and landings have been dominated by trawlers (both midwater and demersal). Over the last 5 years (2004-2008), an average of 43 Danish trawlers has landed 2,012 tons annually, and an average of 11 German trawlers has landed 281 tons annually.

During the same period (2004-2008) in Fehmarnbelt (ICES 38G1), 19 Danish and two German gill/trammel vessels (≥8 m) have annually landed 87 tons and 13.7 tons, respectively. Similarly, 6 Danish seine net fishermen have landed 25 tons annually. Seven Danish and one German fishermen with unknown gear have landed an average of 7 tons of fish annually.

The number of small (<8 m) Danish and German vessels fishing in ICES 38G1 is unknown because they do not all fill out logbooks, however there were on average 34 small vessels from the Danish harbours and 64 small vessels from the German harbours located in and near Fehmarnbelt over the last 5 years (2004-2008).

The primary catch in Fehmarnbelt (38G1) over the last decade (1998-2008) has been sprat by weight and cod by value. Denmark landed an annual average of slightly less than 1,000 tons of sprat (149,000 euro in value) and 429 tons of cod (833,000 euro in value). During the same period, Germany landed on average 21 tons of sprat (8,000 euro in value), all in the last 3 years, and an annual average of 146 tons of cod (219,000 euro in value).

Over the last 4 years (2005-2008) the annual landings of sprat in Fehmarnbelt (ICES 38G1) have increased (average of 1,831 tons by Danish fishermen) while annual landings of cod have decreased (average of 301 tons and 582,000 euro in value) in the Danish fisheries, and an average of 99 tons (160,000 euro in value) in the German fisheries. Other important commercial species landed from Fehmarnbelt are herring, several flatfish species (flounder, dab, plaice and turbot) and occasionally whiting.

Results of the distribution of the trawl fisheries in Fehmarnbelt suggest that trawling by both Denmark and Germany is undertaken throughout the middle of Fehmarnbelt and along a widening belt both towards the west and towards the east and southeast from Fehmarnbelt into other fishing areas in the more regional areas.

The German gill/trammel net fishermen in and near Fehmarnbelt fish along much of the coast of Fehmarn Island, where there is an area of high fish intensity along the north-eastern coast of Fehmarn Island, primarily after cod. Danish gill/trammel net fishermen primarily fish along the southern coast of Lolland and in an area along the western part of Fehmarnbelt that stretches across Fehmarnbelt from southern Lolland to an area of high fishing intensity immediately to the west of Fehmarn Island. Cod and several valuable flatfish species (plaice, turbot, brill and occasionally sole) are targeted in this fishery.

Seine fishing is only occasionally undertaken in the central part of Fehmarnbelt, otherwise these fisheries are undertaken more in the regional areas to the east of Fehmarnbelt.

The seasonal pattern of landings by both Danish and German fishermen using trawlers and gill/trammel nets show the fisheries for both countries are primarily undertaken in the colder months of the year (October to March). Total landings are most abundant during the winter months, predominately January-March where cod and sprat dominate the landings. In the autumn and early winter months (September-December), landings of sprat (in Fehmarnbelt, and to the west) and herring (east of Fehmarnbelt) dominate. During the summer months there are very few landings from fisheries in Fehmarnbelt, locally, these are primarily undertaken by gill/trammel net fishermen targeting both cod and more valuable flatfish species (plaice, turbot, brill and in more recent years sole) which become more abundant as the water becomes warmer. The seasonal pattern for the landings of the most abundant but less valuable flatfish species (flounder and dab) follow the landings of cod, most probably because these species are typically landed as a bycatch of the cod fisheries.

The Danish pound net fisheries in Fehmarnbelt are represented by 82 pound nets positions along the entire southern coast of Lolland, and the use of more than 300 fyke nets and occasionally gill nets in associated coastal fisheries.

Annual landings in the pound net and associated coastal fisheries were between 94-323 tons with a value of 221,000-569,000 euro from 2000-2009. The most important species economically is cod and European eel, which made up between 53-91% (117,000-518,000 euro) of the value of the overall landings over the last decade (2000-2009). Garfish (6.4-39 tons and 6,600-22,500 euro), diverse flatfish (flounder, dab, plaice and turbot) and more periodically the Baltic prawn (1-6 tons or 700-18,000 euro from 2000-2005) can also have considerable importance to these fisheries.

Seasonally, the Danish pound net fisheries are typically undertaken from September-November when migrating silver eels are targeted. Some pound net fisheries, however, also undertake their fisheries in the spring and continue into the summer and target garfish, herring, cod, lumpsuckers (male and female) and eventually flatfish. Similarly, the fisheries after Baltic prawns are undertaken from April-August.

The German pound net fisheries in Fehmarnbelt are represented by 13 pound nets located along the coastline of Fehmarn Island and the immediate mainland to the east. Limited landing data indicated an estimated average of 2,649 European eel (2,350 euro in value) was landed each year in 3-5 active pound nets over a 10 year period (1998-2008).

Danish vessels from a wide number of harbours (Rødbyhavn, Sønderborg, Kramnitse, Bagenkop, Langø, Bogense, Årø, Klintholm Havn etc.) and as far away as the west coast of Jutland (Hvide Sande) have participated in the fisheries in Fehmarnbelt (38G1) over the last decade (1998-2008). The vessels from these harbours have landed from 20-400 tons a year on average with the largest amounts being landed by vessels from Sønderborg and Rødbyhavn.

German vessels from the local harbour of Heiligenhafen account for most of the fisheries in Fehmarnbelt (38G1) and land on average 136 tons a year (1998-2008), while vessels from Burgstaaken and harbours in the western regional area of Fehmarnbelt (Maasholm, Kappeln, Arnis and Eckernförde) make up most of the remaining fisheries (landings of 20-27 tons annually). In contrast, the eastern part of Fehmarnbelt and south-eastern fishing area (ICES 37G1) is a much more important fishing area for German vessels from Burgstakken and Heiligenhafen (>1,100 tons annually), as well as other local harbours (Rerik, Timmendorf, Wismar, Niendorf, Travemünde and Grossenbrode) (>150 tons annually).

Economical baseline standards for vessels

Gill/trammel net fisheries

For Danish net fishermen, the estimated economic baseline was available for vessels 8 to below 12 m (8-<12 m) and 12 to below 15 m (12-<15 m).

Based on logbook data and official account statistics, the baseline annual average total output for the Danish net fishermen (predominantly gill/trammel nets) fishing in Fehmarnbelt and region (calculated for the period 2005-2008) was calculated at 64,000 euro for vessels of 8-<12 m, and 166,200 euro for vessels 12-<15 m.

Economic baseline income averages were primarily based on annual average landings of 20.6 tons for vessels of 8-<12 m, and 60.7 tons for vessels 12-<15 m of primarily cod (61-76% share of value) and the valuable flatfish plaice, turbot and sole (5-17% share of value), respectively.

The estimated annual net profits for Danish net fishing vessels was 19,500 euro for vessels 8-<12 m and 36,100 euro for vessels 12-<15 m.

For German net fishermen, the estimated economic baseline could only be compiled for vessels 8-<12 m).

The annual average total output for the German net fishermen fishing in Fehmarnbelt and region (calculated for the period 2005-2008) was 26,283 euro for vessels of 8-<12 m using gill/trammel nets and other passive gear. These were primarily based on landings of 17.8 tons (calculated from logbook records) of primarily cod (72% share of value) and European eel (16% share of value).

The baseline for the estimated annual net profits for German net fishing vessels was 10,776 euro for vessels 8-<12 m, after subtracting the estimated costs for fishing (fuel, maintenance, depreciation, wages etc.). Unpaid labour of the owner was not subtracted, but is compensated by the profit.

Trawl fisheries

For Danish trawling vessels, the estimated economic baseline was available for vessels 8 to below 12 m (8-<12m), 12 to below 15 (12-<15 m), 15 to below 18 (15-<18 m), 18 to below 24 m (18-<24 m), and 24 to below 40 m (24-<40 m) (the two larger segments not explicated in this summary.

The annual average total output for Danish trawlers (predominantly bottom trawlers (84-96%) and midwater trawlers (10-14%)) fishing in Fehmarnbelt and region was 79,000 euro for vessels of 8-<12 m, and 181,000 euro for vessels 12-<15 and 326,000 euro for vessels 15-<18 m.

The average incomes per vessel lengths were primarily based on annual average landings of 44 tons (share of value; 56% by cod and 12% by plaice) for trawlers 8-<12, landings of 242 tons (share of value; 45% by cod, 15% by sprat and 11% by plaice) for trawlers 12-<15 m and landings of 626 tons (share of value; 33% by cod, 17% by sprat and 8% herring) for vessels 15-<18 m .

The baseline for the estimated net profits for Danish trawling vessels of different lengths came to 21,900 euro for vessels 8-<12 m, 29,300 euro for vessels 12-<15 m, 59,300 euro for vessels 15-<18 m after subtracting the estimated costs for fishing (fuel, maintenance, depreciation, wages etc.).

For German trawling vessels, the logbook data to estimate economic baseline was only available for vessels 12-<15 m, 15-<18m and 18-<24 m.

The estimated annual total output for German trawlers (predominantly bottom (84-96%) and midwater (10-14%)) fishing in Fehmarnbelt and region from 2005-2008 was 100,000 euro for vessels of 12-<15 m, and 115.000 euro for vessels 15-<18 and 399,619 euro for vessels 18-<24 m.

These average incomes per vessel lengths were primarily based on average annual landings of 151 tons (78% share of value by cod and 7% share of value by herring) for trawlers 12-<15

m, landings of 161 tons (share of value; 63% by cod, 11% by plaice and 9% by herring) for trawlers 15-<18 m and landings of 583 tons (share of value; 39% by cod, 26% by saithe and 11-13% by sprat and herring, respectively) for vessels 18-<24 m.

The baseline for the estimated net profits for German trawling vessels of different lengths came to 25,022 euro for vessels 12-<15 m, 29,982 euro for vessels 15-<18 m and 95,909 euro for vessels 18-<24 m after subtracting the estimated costs for fishing (fuel, maintenance, depreciation, wages etc.).

Seine net fisheries

For Danish seine netting vessels, the estimated economic baseline was available for vessels of 15 to below 18 m (15-<18 m) and vessels 18 to below 24 (18-<24 m).

Economic baseline income (total output) averages were 235,800 euro for seiners 15-<18 m and 397,000 euro for seiners of 18-<24 m. These outputs were primarily based on annual average landings of 101 tons (share of value; 50% by plaice and 37% by cod) for vessels 15-<18 m, and 162 tons (share of value; cod 39% and plaice 33%) for vessels 18-<24 m.

The estimated net profits for Danish net fishing vessels was 69,400 euro for vessels 15-<18 m and 49,400 euro for vessels 18-<24 m.

There are only a few German seine fishing vessels in the six ICES rectangles and no specific information on economic performance was available.

Pound net fisheries

All vessels that produced the majority of their value of landings by pound nets were between 8 and 10 m in length. Their average catch was about 30 tons per year at a value of 78,900 euro.

Experiences from other fixed links

As a supplement to gathering baseline fishery statistics it was considered beneficial to include experiences from the establishment of other fixed links such as the bridges and tunnels over the Great Belt and Øresund (Øresund).

This was done by assessing the official fishery data that was available, undertaking interviews with fishermen in the affected areas, summarising results from documents investigating impacts to the fisheries in the respective areas and interpreting the vessel and fishing regulations associated with the introduced links.

In general, neither the official fishery nor fleet statistics are precise or consistent enough to have the desirable precision for assessing whether the Great Belt or Øresund fixed links had an impact on the fisheries.

The fishery statistics for the ICES rectangles representing the fishing areas around the two fixed link areas show landings of the most important commercial species varied considerably. This fact, together with insufficient and missing statistics especially for the period before 1994, made it very difficult to make valid conclusions about potential impacts to the fisheries by the establishment of the Great Belt and Øresund bridges or tunnels. Official fishery statistics indicate that landings have been decreasing since the mid 1990s in both the adjacent sea areas (Kattegat and the Baltic), with which the Great Belt and Øresund are linked, and within the ICES rectangles that represent the fishing areas around the fixed links. In Øresund, this includes a considerable decrease of landings of the economically most important species cod and eel.

The fleet statistics from both the Great Belt and Øresund show a large increase in the number of vessels that have registered landings after 1993. It is highly probable that this reflects more a change in how fishery statistics are gathered due to the implementation of new methods in 1994, rather than a real increase in the number of vessels. Overall in the Great Belt, the number of active fishing vessels has been decreasing since the turn of the century. In both the Great Belt and Øresund in 2005, statistics show a considerable increase in the number of smaller vessels, primarily net fishermen and vessels using unspecified gear. This correlates once again with a new implementation of rules that required smaller vessels between 8-10 m to register their catches in logbooks, and thus note their catch more specifically in ICES rectangles rather than just ICES subdivisions.

The fisheries in the Great Belt are regulated by a number of rules. One of the most relevant is that vessels that have motor power of more than 175 HP are not allowed to fish within 3 nautical miles from the coastline (measured as the water line at low tide), consequently larger fishing vessels, primarily trawlers, cannot fish in the waters between Funen and Zealand where the fixed link is established. Also, data from the so called vessel monitoring system (VMS), which registers the position of fishing vessels ≥15 m, clearly indicates that fishing vessels of this length and greater are seldom registered closer to the Great Belt Bridge than 3 km.

The fisheries in Øresund are almost exclusively undertaken by small vessels using gill nets, pound nets, fyke nets and hooks as official regulations prohibit trawling, and for the most part seine netting. Thus larger vessels ≥15 m, which are often trawlers, are seldom fishing in Øresund.

There is a considerable amount of recreational fisheries in both the Great Belt and Øresund, however in both cases, not much takes place around the alignment of the fixed links.

Interviews with fishermen (both commercial and hobby fishermen) on their experiences with their fisheries due to the establishment of the fixed links showed that there were periodic disturbances to the fisheries due to restricted access to areas, turbid water from sediment spills during land reclamation work and compensation dredging. Consequently, these disturbances led to reductions in their catches. Fishermen also reported destruction to some of their gear (nets and trawls) in connection with other vessels sailing over their gear during preliminary studies of the area, and construction debris lost or dumped on the sea bottom.

According to Swedish studies, the establishment of the Øresund fixed link had a negative effect on fish populations, especially those of cod and eel. After the establishment of the Øresund Bridge, Danish fishermen have experienced considerable disturbances to their fisheries primarily due to the large increase in the water currents through Drogden. This prevents fishing over a large part of the year, especially in the deeper waters (>7-8 m) on the east and south side of Amager and in Køge Bay. The loss to the fisheries due to the removal of bottom material on Kriegers Flak for use in land reclamation and construction of the Øresund Fixed Link was part of the detrimental impact to the fisheries that formed the case for compensation between fishermen and the Øresund Consortium.

Fishermen have indicated that the establishment of the Great Belt Bridge has had both positive and negative effects on the fisheries. Commercial and recreational fishermen have increased their fishing activities around the bridge pillars, where an increase in the presence and abundance of food (blue mussels, small fish etc.) and a greater number of protective hiding places have been established. The so-called “reef effect” around these structures, has led to a greater concentration of commercial and recreational species of interest - especially cod. In contrast, the restrictions to the fisheries in the traffic corridors under both bridges have resulted in a reduction in the area where it is now possible to fish. As an example, fishermen have lost the right to fish in the deep Østerrende in the Great Belt, which has been known and coveted for its fishery after large cod.

The rules for undertaking fisheries while passing under the East or West Bridges of the Great Belt Fixed Link limit the fisheries considerably. Fishing within the traffic corridors protecting the shipping lanes under both the East Bridge and West Bridge is not allowed. Furthermore, although fishing vessels are allowed to undertake their fisheries while sailing under the East and West Bridges, in reality this only applies to vessels less than 20 meters under the East Bridge because all vessels larger than 20 m have to sail through the specific shipping lanes under the East Bridge, where fishing is not allowed. Similarly, although vessels less than 20 meters can sail and fish while passing under the East Bridge outside the shipping lanes, vessels less than 20 m can only sail under the West Bridge if they are less than 1000 tons dead weight, and can only sail and fish under the West Bridge where fishing is allowed (outside the traffic corridors) if they are less than 50 GT. Moreover, the Great Belt A/S warns that if damage to surface protective material and anode fixtures on bridge pillars is sustained during fishing then fishermen will be brought to court and held responsible for economical compensation. Thus, to a certain extent, this hampers the undertaking of fisheries by these vessels that do not dare to run this risk. At present, damage to pillars has already been noted by bridge authorities on several occasions, however without consequences.

1. Introduction

Large infra-structure projects, like the Fehmarnbelt Fixed Link, will affect the environment during construction and operation phases. To minimize these effects and to have a reference for future impact assessments, key environmental issues have been identified and investigated.

The fisheries baseline study has been designed to provide the essential information on fleet and landings statistics and an economic overview of the fisheries in the near field and regional area of Fehmarnbelt. This information is considered a prerequisite for the subsequent environmental impact assessment and will be used as a point of reference in a future monitoring programme.

The present baseline report presents the results of the official fishery and economic data available for Fehmarnbelt and the Western Baltic and is supplemented with surveys of fishermen to reduce the gaps in knowledge from limited fishery distribution and individual economic data.

In the Environmental Impact Statement (EIS) framework, the environmental factors concerning the fisheries can be divided into several components as illustrated in Table 1.1. For each environmental component, the importance will be evaluated based upon the baseline data.

Table 1.1: List of environmental factors, sub-factors and components concerning the commercial fisheries.

Environmental factor	Environmental sub-factor	Environmental component
Human beings	Commercial Fisheries	Trawls
		Gill/trammel nets
		Seine nets
		Pound nets
		Flatfish
		Shallow water species
		Protected species
		Cod
		Sprat
		Herring
		Flatfish species - Dab, Flounder, Plaice
		Valuable flatfish species - Turbot, Brill, Sole
		European eel
		Whiting and Horse mackerel
		Salmon and Sea Trout

2. Background and objectives

Between 1995 and 1999 several preliminary environmental investigations were carried out to obtain data for the feasibility studies for the Fehmarnbelt Fixed Link. Further investigations followed in 2005 and 2006, aiming to identify the importance of spawning and fish nursery in Fehmarnbelt and to gather information on the distribution of commercially important fish species (Riber and Raschke, 1999; Dynesen and Zilling, 2006).

Additional to this previous knowledge, the objectives of this baseline report on the German and Danish fisheries in Fehmarnbelt and region was to gather comprehensive information on the recent development of the landings, distribution and effort (measured as number of vessels) of the fisheries, and the present economic situation of the fishing enterprises of full- and part-time fishing operations in the Fehmarnbelt and regional area.

More specifically, the information from the data collection, interviews and field studies is essential for the assessment of which sections of the commercial fisheries, fishing fleet and cost structures in the Fehmarnbelt are most likely to be directly and indirectly affected by temporary and permanent impacts to the fisheries due to the Fehmarnbelt Fixed Link.

This baseline report is a summary of the commercial fisheries in Fehmarnbelt and its regional area in the Western Baltic over the last decade (1998-2008), and was produced to provide a foundation and reference points for predicting and assessing possible changes to the fisheries in relation to impacts from the construction and operation of the Fehmarnbelt Fixed Link .

Furthermore, an investigation of the impacts to the fisheries experienced from other fixed links (The Great Belt and the Øresund Bridge Fixed Links) already established was undertaken to give some insight into which impacts might be important to focus attention during the process of assessing potential impacts to the fisheries during the establishment of the Fehmarnbelt Fixed Link.

A separate baseline report has made for the recreational fisheries in Fehmarnbelt (Carl et al. 2010).

2.1 History and overview on stocks in the Baltic Sea

The Baltic Sea is one of the largest brackish water areas of the world. It covers 415,000 km^2 and has a volume of approximately 20,000 km^3.

The Baltic Sea area is located in the northern temperate zone, embedded in the Northern atmospheric circulation system, with predominantly westerly winds. However, the region is not homogenous as two distinct climate types that effect the fisheries may be distinguished. The largest part of the central and the northern area belongs to the continental temperate climatic zone, characterised by long and cold winters. The southern area belongs to the oceanic climatic zone, characterised by persistent westerly winds and relatively mild, wet winters.

The bathymetry of the Baltic Sea is characterised by broad, shallow coastal areas and an array of deep basins. The connection between the Baltic Sea and the North Sea is by several shallow and narrow straits with Fehmarnbelt being the southernmost of them. Fehmarnbelt connects the Kiel Bight in the west with the Great Belt.

Fehmarnbelt has a key role in the water exchange system of the Baltic Sea. It is characterized by a high variability of the hydrodynamic parameters, especially salinity. Salinity levels change on a horizontal and vertical scale, and therefore different levels can be found in coastal and offshore areas. These salinity gradients are of great importance for fish communities and thereby the distribution of different commercial fisheries.

Historically, cod (*Gadus morhua*), herring (*Clupea* harengus) and sprat (*Sprattus sprattus*) have made up the vast majority of the catches in the commercial fisheries of the Baltic, including the Western Baltic and Belt Sea. Diverse flatfish species and European eel (*Anguilla anguilla*) have also been targeted. Originally, the fisheries were predominantly undertaken with small open boats, normally staying close to the shore; the fishing gear consisted of fish traps, gill nets and rods. Until sometime in the 19th century, there also existed a fishery on crabs and mussels in the Baltic.

The economical significance of fisheries was rather low until the 19th century. Since the middle ages, trade with fishery products were far more profitable than the fishery itself (Mehl & Tillmann, 1999). The wealth of several Hanseatic cities was established on the basis of the trade with herring. Fisheries in the Baltic were mainly undertaken for self-sustainment; fishing communities developed only in the vicinity of large cities where fish could be sold.

Fisheries experienced an upswing in the 19th century, when better vessels allowed the undertaking of longer and further reaching fishing trips, and when better processing technologies and increasing demands for food made commercial fishing more attractive. In the beginning of the 20th century, smokehouses and canning factories developed in the coastal towns, in many cases these became the most important local employers.

Coastal fisheries gradually lost a lot of its importance as offshore “high sea” fisheries developed. Overfishing in general and degradation of rivers and coastal areas have led to a decline of catches of the coastal fisheries. After the Second World War, fishing in the Western Baltic increased and fishermen from many countries came to the Western Baltic to fish. For example, in Kiel the number of fishing vessels after the war became twice as many, and fishermen from as far away as West Prussia came to Schleswig-Holstein with their own boats to fish.

2.1.1 Overview on recent fisheries and fishery economics

The landings from the fisheries in the Western Baltic, in ICES subdivisions 22, 23 and 24, average approximately 115,000 tons each year. The actual yearly landings vary on a wide scale and show different trends in each subdivision, as shown in Figure 2.1.

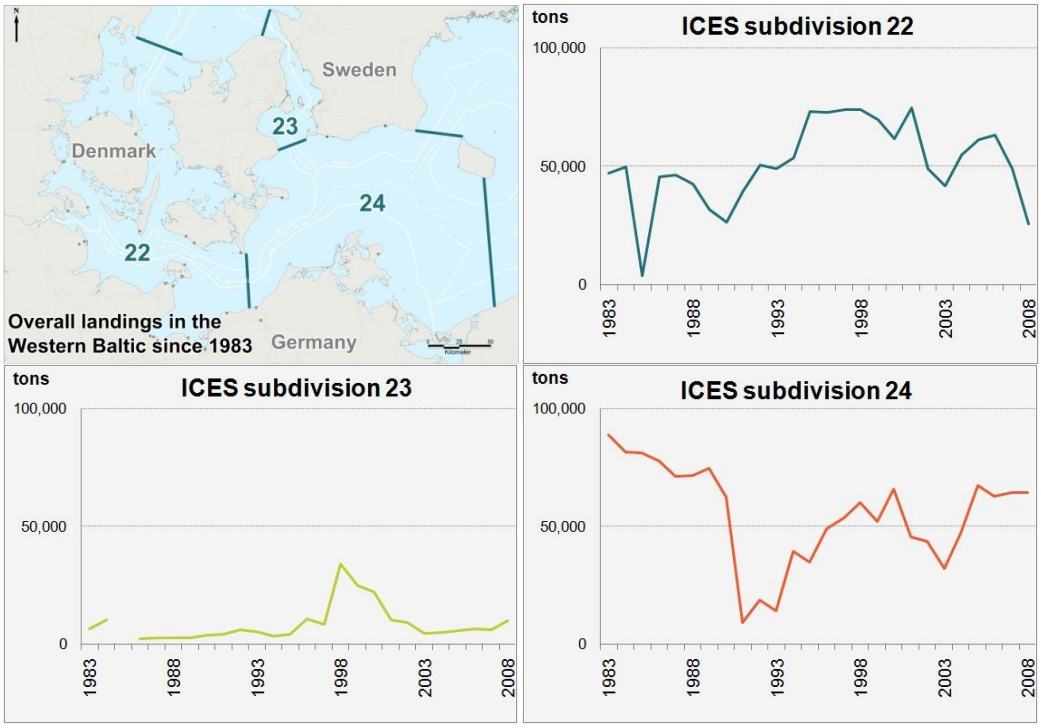

Figure 2.1: Development of the overall landings per year in the Western Baltic in the past 25 years (Source: Eurostat, 2010).

The gears used for the different fisheries in the Western Baltic and Belt region often depend on the target species. Pelagic trawlers dominate pelagic fisheries and typically catch a mixture of herring and sprat varying with area and season. Demersal trawls and gill nets are the gear that is predominately used in the fisheries for cod. The Danish seine fishery primarily targets flatfish (plaice (*Pleuronectes platessa*), flounder (*Platichthys flesus*) and dab (*Limanda limanda*)) but also catch a considerable amount of cod. Passive gears including gill nets, pound nets and fyke nets are used to target a variety of species in the fishery along the coast, that includes silver and yellow eel (*Anguilla anguilla*), flounder, turbot (*Psetta maxima*), cod, herring, garfish (*Belone belone*), salmon (*Salmo salar*) and sea trout (*Salmo trutta*) during their migration.

In the past 10 years, the overall landings of the Danish fisheries in the Baltic Sea have decreased from nearly 170,000 tons in the year 2000 to about 95,000 tons in the year 2009 (Figure 2.2). The proceeds from the landings showed a similar decreasing trend, however higher or lower landings do not always result in corresponding higher and lower proceeds due to the different and changing value of the individual species. The average price for fish from the Danish fisheries increased slightly up to 2008, after a period of being low in 2004 & 2005 (Figure 2.2). However, in 2009, the average fish price for Baltic landings in Denmark decreased again and reached an all-time low over the past 10 years.

Overall, the German landings in the Baltic have been considerably lower than the Danish landings in the past decade (Figure 2.2). The German landings have, however, increased from 25,000 tons in the year 2000 to 70,000 tons in the year 2008. In spite of the increase in landings however, the annual proceeds remained nearly constant, fluctuating between 23 and 31 million euro. The average fish price for German landings decreased rapidly from slightly more than 1 euro in 2000 to less than 0.45 euro in 2003 (Figure 2.2). The price remained at this low level until 2008.

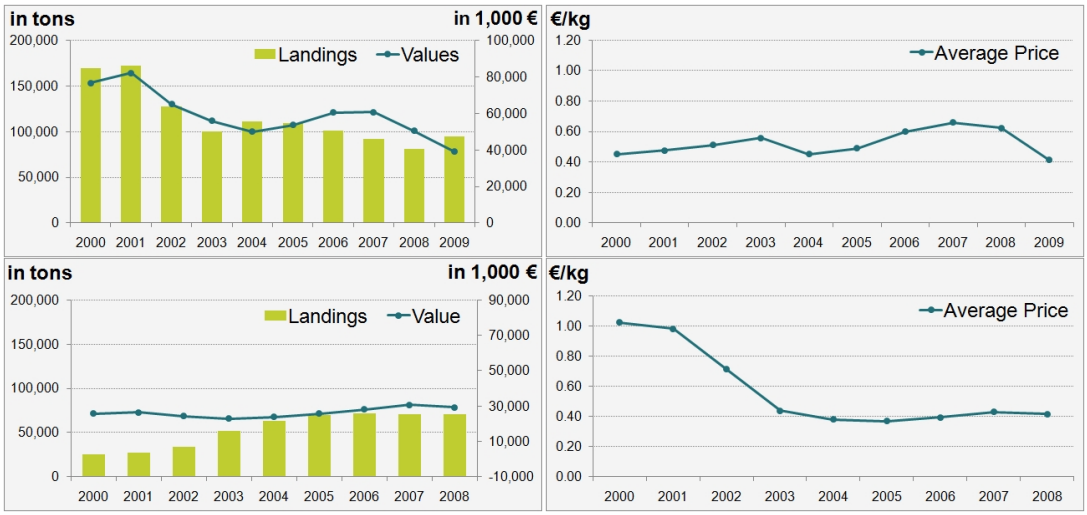

Figure 2.2. The development of landings (tons), values (1,000 euro (€)) and average prices (euro (€)/kg) in Danish fisheries from 2000 – 2009 and in German fisheries from 2000-2008. The Danish data for 2009 are only preliminary (Source: Danish Directorate of Fisheries 2010 and BLE 2010).

2.1.2 History of cod, sprat and herring fisheries

The cod catches were comparatively low in the early decades of the 20th century (Thurow, 1997). They increased shortly before the onset of World War II and reached catches of 80,000 t in 1943 (Feistel et al. 2008). The cod catches increased steadily until the late 1970s (

Figure **2.3**), yet it is not fully understood whether the steady increase of catches between the mid 1940s and the mid 1960s was due to good recruitment of the stock and hence increased biomass or simply to fleet expansion; the latter is suggested as being more likely (Feistel et al., 2008). Nevertheless, strong inflow events in the late 1940s and early 1950s probably contributed to the reproduction and geographic extension of the stock during most of the 1950s (Feistel et al., 2008).

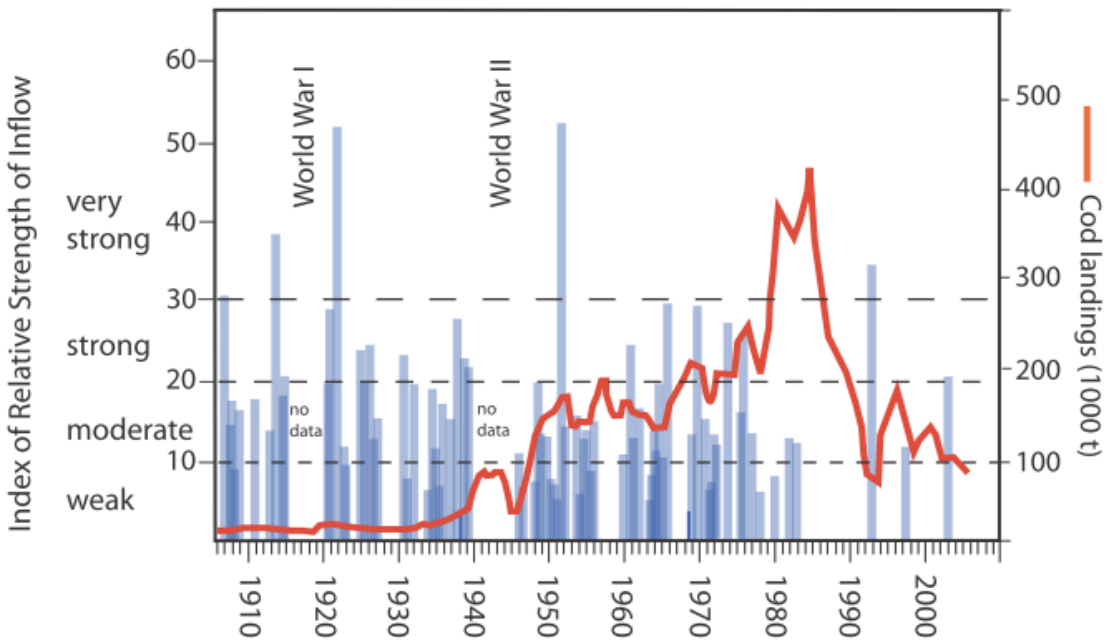

Figure 2.3: Cod catches in the Baltic Sea in relation to inflow events in the past 100 years (Feistel et al., 2008).

In recent years, catches of sprat have increased considerably and reached record amounts in the Baltic and Belt Sea, including the ICES subdivision 22 and the ICES rectangles 38G1 and 37G1 that are in the regional and near field areas of the planned fixed link (Figure 2.4).

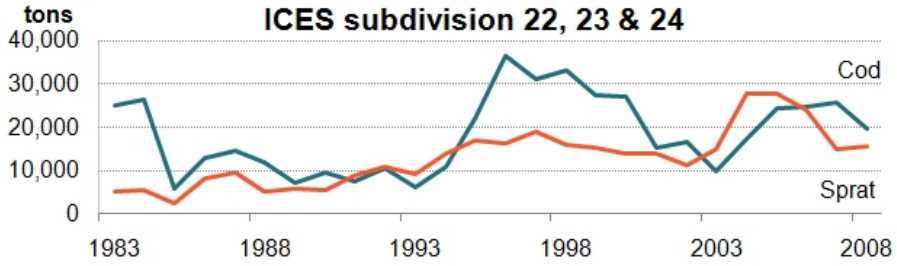

Figure 2.4: Development of cod and sprat landings in the Western Baltic in the past 26 years (Source: Eurostat, 2010).

However, the general trend in cod and sprat landings in the Western Baltic is not apparent on an equal scale in each subdivision (Figure 2.5).

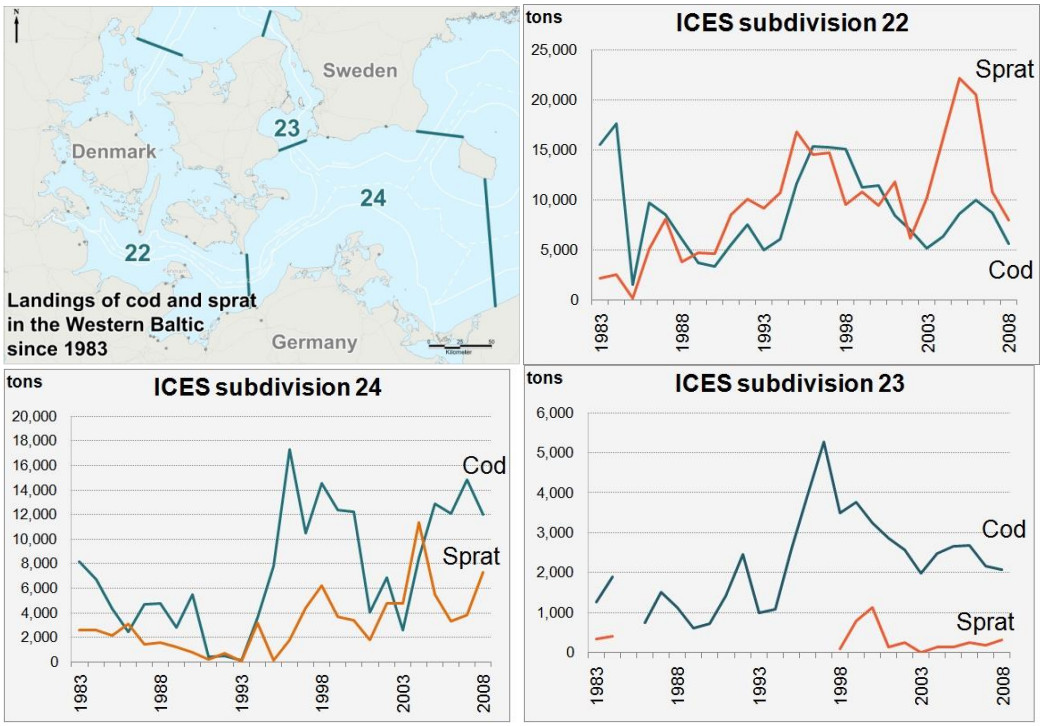

Figure 2.5: Development of cod and sprat landings in each ICES subdivision in the Western Baltic in the last 26 years (Source: Eurostat, 2010).

The herring fisheries, together with flatfish fisheries, were one of the two most important fisheries before World War II. Landings of herring in the best years in the late 1930´s, reached annual amounts of 100,000 tons in the Baltic Sea (Feistel et al., 2008).

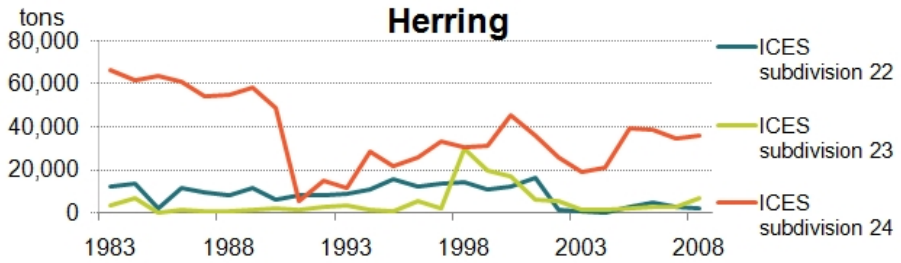

Figure 2.6: Development of herring landings in each ICES subdivision in the Western Baltic in the past 26 years (Source: Eurostat, 2010).

In the recent times, herring landings have developed differently in each of the three ICES subdivisions in the Western Baltic (Figure 2.6). In general, they are lower now than they were in phases at the end of the 1980s, end of the 1990s and turn of the century. While herring landings were primarily low in ICES subdivision 23 with some exceptions, since 2002 they have been at an all time low in ICES subdivision 22. In ICES subdivision 24 the herring landings have fluctuated around a similar level over the past 15 years. About 50,000 tons of herring have been caught annually in the Western Baltic over the past 15 years (Figure 2.6).

2.1.3 History of the flatfish fisheries and other species

Other species of commercial importance in the Western Baltic and Belt region are the flatfish species flounder, dab, plaice, turbot, brill (*Scophthalmus rhombus*) and in more recent years sole (*Solea solea*). The distribution of these species can vary greatly because they have different tolerances for salinity and temperature. Experimental evidence shows that reproduction by the three commercially most important species, flounder, plaice and dab, is limited by similar factors that effect the reproduction of cod, i.e. low salinity affects fertilisation and hatch success, and depending on buoyancy differences it can increase exposure of eggs of some of these species to low oxygen concentrations in spawning areas (Nissling et al., 2002).

As mentioned, the flatfish fishery, together with the herring fishery, was two of the most important fisheries in the Baltic Sea before World War II. The entire flatfish fishery in the Baltic prior to 1920 remained at a fairly constant level (Figure 2.7). Like the herring fishery, it reached a magnitude of around 100,000 t during its best years in the late 1930s (Feistel et al. 2008). Thereafter, the landings from the flatfish fishery rapidly declined and remained at a comparatively low level (Figure 2.7). During World War I, intense fishing effort targeting flatfish, especially by the German fleet in the Western Baltic Sea, reduced the stocks considerably (Feistel et al., 2008). The conditions for flatfish growth and reproduction (and/or immigration) were apparently more favourable again in the 1920s and 1930s (Feistel et al., 2008).

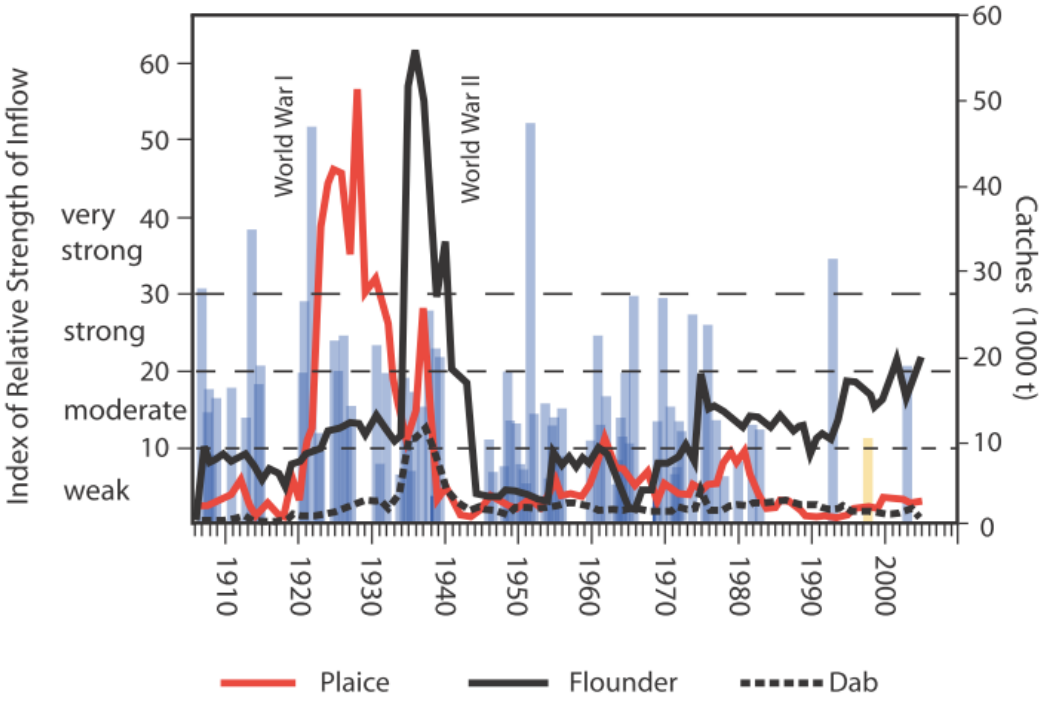

Figure 2.7: Flatfish catches in relation to inflow events in the past 100 years (Feistel et al. 2008).

The periods when the flatfish fisheries were greatest is characterised by two distinct phases. During the early 1920s the catches of plaice increased rapidly, which was apparently due to the discovery of a large unutilised resource in the Bornholm Basin. Shortly hereafter plaice catches declined and the fishery shifted to catching flounder instead (Feistel et al., 2008). The subsequent decline in flounder catches in the early 1940s is probably caused, at least to some degree, by less fishing effort during World War II. However, according to information in Feistel et al., (2008), approximately 17,000 to 27,000 t of flounder were caught during the war. Regardless of the reasons attributing to the peak of flatfish fisheries in the 1920s and 1930s, no

simple correlation between catches of flatfish and inflow events in the Baltic Sea are evident (Figure 2.7).

Flounder make up the greatest part of recent flatfish catches (Figure 2.8) in ICES sub divisions 22,23 and 24. There appear to be several distinct flounder stocks in the Baltic Sea. Flounder and dab are often caught in considerable amounts as bycatch in the cod fishery while there is often a more directed fishery after plaice, turbot and sole. Turbot, brill and particularly sole are generally caught in much lower amounts than flounder, dab and plaice (compare Figure 2.8 & Figure 2.9).

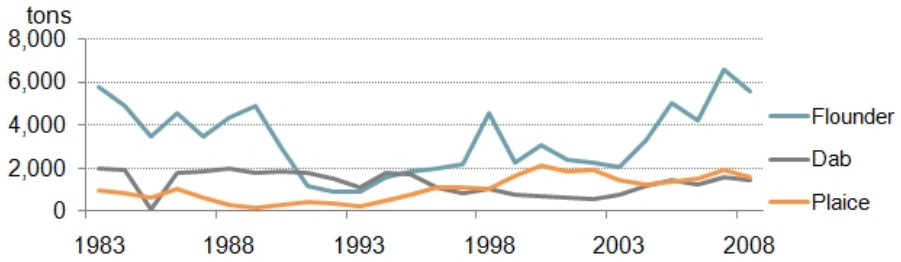

Figure 2.8: Development of the landings of flounder, plaice and dab in ICES subdivisions 22, 23 & 24 (Source: Eurostat, 2010).

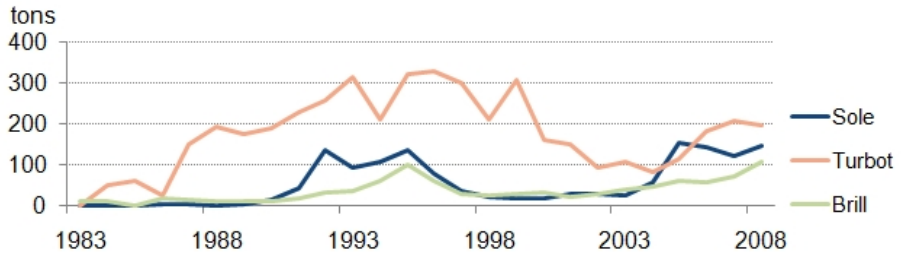

Figure 2.9: Development of the landings of turbot, brill and sole in the ICES subdivisions 22, 23 & 24 (Source: Eurostat, 2010).

Catches of whiting (*Merlangius merlangus*), horse mackerel (*Trachurus trachurus*), garfish and on occasion anchovies (*Engraulis encrasicolus*) can be quite large in the Western Baltic, yet vary considerably from year to year. Economically, cod is the most important commercial species, however, sprat and herring are also important due to the large quantity of their catches in the Western Baltic and Belt region. Similarly, the flatfish plaice and turbot as well as silver eel can be economically important to some of the local fishing communities in the Western Baltic and around the Fehmarnbelt area.

2.1.4 Description of the commercially most important fish stocks

This section gives an overview of the commercially most important fish stocks in the Baltic and Belt Sea.

Cod *(Gadus morhua)*

The Baltic cod fishery is one of the most economically important in the Baltic Sea and is supported by at least two main stocks; an eastern stock from the inner Baltic and a western stock distributed primarily in the Western Baltic and Belt area. These stocks have declined considerably during the last couple of decades which has led to the Baltic cod being included in the list of “threatened or declining species” (HELCOM, 2007). The eastern and western stocks overlap around Bornholm to the east of Fehmarn and so the catches from the majority of the

cod fisheries around Fehmarnbelt most likely come from the western stock (WWF, 2006). Historically, the Western Baltic stock has been much smaller than the Eastern Baltic stock, yet appears to be highly productive and has sustained a high level of fishing mortality (ICES, 2008a). Thus, the stock and the fishery appear to be highly dependent on the strength of incoming year-classes. In the Western Baltic and Belt area the major part of the commercial fishery fleet that target cod are trawlers followed by gill netters and to a small degree seine netters and other passive gear, such as pound nets closer to the shoreline.

Sprat *(Sprattus sprattus)*

A large increase in sprat stocks and consequently landings has been one consequence of the Baltic Sea ecosystem undergoing considerable changes in fish communities during the last two decades (ICES, 2008a). The sprat stocks in the Baltic were at one time considered to be composed of three groups, however, it is now assessed as a single stock and is considered to be a non-resident ever-migrating species where it is often found in large roaming schools. Historically, the sprat stock has fluctuated from highs in the mid 1990´s, lower stock numbers in the early 2000´s, and high abundances once again in recent times due to strong recruitment. Sprat is mainly caught in the mixed fishery for sprat and herring. This can create biased estimates of the catches as the separation of sprat and herring catches can be imprecise.

Baltic herring *(Clupea harengus)*

The herring fishery in the Baltic has historically been based on 2 major stocks in the Western Baltic and Belt area, a spring spawning stock and an autumn spawning stock along. Both stocks perform extensive annual migrations between feeding grounds in the Skagerrak and North Sea and spawning grounds in the Western Baltic (ICES 2007). Since the 1980s, however, the autumn spawning stock has decreased in abundance substantially, suggesting that the fishery in recent times is supported primarily by the spring spawning stock. In general the Baltic herring fishery has declined considerably over the last 2 decades.

Flounder *(Platichthys flesus)*

Flounder is regularly distributed throughout the majority of the Baltic Sea. There are several flounder stocks in the Baltic Sea with only limited migration between them. Although the stock structures are not completely clear, a genetic study indicates that there are three major different groups of flounder rather than a high number of small stocks 1) Skagerrak/Kattegat group 2) Southwest Baltic Sea group and Eastern Baltic Sea group (Florin and Högland, in press). There is generally no Danish fishery targeting flounder directly and so flounder are typically a bycatch of several other fisheries, particularly the trawl fishery after cod. On average about 15% of the flounder landed in the Baltic are reported from the Western Baltic and Belt Sea (ICES 2008).

Dab *(Limanda limanda)*

In the Baltic, there are several dab stocks that contribute to the fisheries. The highest landings of dab were observed in the Western Baltic and Belt Sea (ICES Subdivision 22), where the majority are taken by trawling and gill nets, typically as bycatch of directed cod fisheries. Dab live on sandy or soft bottoms and in recent years the landings have increased due to improving stocks.

Plaice *(Pleuronectes platessa)*

The landings of plaice in the Baltic over the last decades have varied considerably from highs in the seventies of more than 8,000 tons to lows in the beginning of the nineties of 400 tons. Landings in the last decade have fluctuated around 1,800-2,700 tons. These fluctuations are assumed to be caused by the occasional immigration of plaice from stocks in the Kattegat that

contribute to the fishery on local stocks. The ICES subdivision 22 including the Belt region is the main fishing area and Denmark is the main fishing country. In general, local plaice stocks are considered to be at low levels with only little recruitment observed (ICES 2008).

Turbot *(Psetta maxima)*

Turbot occurs mainly in the western and southern parts of the Baltic, and it is in these areas (ICES subdivisions 22-26) that landings are generally reported. However, since 2000 these landings have decreased as the stock in the Baltic Sea has also decreased. Gill nets are the main gear used in the fishery that targets this species. Turbot often prefer sandy, stony mixed bottoms habitats.

Sole *(Solea solea)*

Traditionally the fishery targeting sole and the primary part of the stocks are in the outer Baltic and Kattegat/Skagerrak areas. Here sole is taken in the mixed species trawl fishery and with gill /trammel nets. There has, however, been an increasing abundance of sole caught in the Baltic fisheries, particularly in ICES subdivision 22. In 2007, catches from the Western Baltic Sea and Belt area amounted to about 20% of the total catches of sole that included both Kattegat and Skagerrak.

Brill *(Scophthalmus rhombus)*

There is very little information on the stock structures of brill in the Baltic. This species has contributed between 19-56 tons to the landings over the last 5 years. More than 90% of the brill fishery is carried out by Denmark in the Western Baltic Sea (ICES subdivision 22) where brill is often a bycatch of fisheries targeting cod or gill net fisheries targeting plaice and turbot. The total reported landings from 1970-2005 have varied between 1-160 tons, however it is assumed there has been some species-misreporting in the landings of directed cod fishery and the high reported landings are overestimated.

Eel *(Anguilla anguilla)*

The European eel is a catadromous fish, and spends most of its lifetime in freshwater until almost maturity. They are present in and around most of the watercourses throughout the Baltic. If they become part of the local fisheries during this time they will be landed as yellow eels. In preparation for their spawning migration to the Sargasso Sea in the Atlantic, they change their morphology and become long and slender and silver. These are called silver eels and during their migration through the Baltic including the Belt Sea and Fehmarnbelt in the autumn they are often caught with pound nets, which is a fishery that has some significance around Fehmarnbelt. Over the last couple of decades the stocks of the European eel as well as elver stocks in the rivers have decreased dramatically.

Other stocks

Other stocks that appear periodically in the Western Baltic are whiting (*Merlangus merlangus*), horse mackerel, anchovies (*Engraulis encrasicolus*) and garfish (*Belone belone*). These stocks can on occasion contribute considerably to the fisheries in the Western Baltic and Belt Sea and will be mentioned when appropriate in later sections.

2.2 Legal background – EU Common Fisheries Policy

2.2.1 Management of the fisheries in the Western Baltic and Belt Sea

The fisheries in the Western Baltic and Belt Sea are subject to a number of rules that define how and to which extent, the fisheries in, for example Fehmarnbelt, can be undertaken. Depending on the chosen fixed link solution of a tunnel or bridge, the establishment of a fixed link over Fehmarnbelt will undoubtedly lead to further restrictions to the fisheries, such as those experienced from the establishment of a fixed link across the Great Belt and Øresund (see section in this report on the experiences to the fisheries from other fixed links).

Management rules and regulations for the German and Danish Baltic Sea fisheries are set on various judicial levels, primarily at EU, national and federal state levels.

The following section gives an overview of the EU Common Fisheries Policies, a summary of the most relevant EU regulations and the German and Danish national regulations for the Baltic Sea, especially for the Western Baltic and the area around the Fehmarnbelt Fixed Link.

2.2.2 EU Common Fisheries Policy

The general frame of conditions for the marine fisheries is determined by the European Union. Conservation of living aquatic resources, which is a major component of fisheries policy, is under the exclusive competence of the EU, which means that member states cannot adopt their own legislation within this area, unless that power has explicitly been given back to them. EU regulations in this field are binding and directly applicable at the member state level - and as such, these legislative acts do not need to be transposed into national legislation (cf. Hegland, 2009).

The principle of a Common Fisheries Policy (CFP), defined in Council Regulation (EC) No. 2371/2002 (EC, 2002) but specified in a vast number of other regulations, was already mentioned in the Treaty of Rome of 1957, which established the aims of the Common Agricultural Policy (CAP). The first common measures in the fishing sector of the European (then: Economic) Community date from 1970. They set rules for access to fishing grounds, markets and structures.

In 1976, all these measures became more significant when member states followed the international movement and agreed to extend their rights to marine resources from 12 to 200 miles from their coastlines. Member states also decided that the European Union was best adept to manage fisheries in the waters under their jurisdiction and to defend their interests in international negotiations. After years of difficult negotiations the CFP was born in 1983.

In the years 1992 and 2002, the CFP was reviewed, and at both times a decline in a number of fish stocks was noted, and the numbers of fish landed were decreasing. This led to the conclusion, that the instruments and measures to implement sustainable fishery objectives, while in their jurisdiction, had not changed, and thus had to be improved – particularly concerning the marine fisheries.

The last review led to the new Common Fisheries Policy (CFP) of 2002 (EC, 2009a), which is in force at present. The Common Fisheries Policy shall ensure sustainable economic, environmental and social conditions under the exploitation of living aquatic resources. For this purpose, the Community shall apply the precautionary approach in taking measures designed to protect and conserve living aquatic resources, to provide for their sustainable exploitation and to minimise the impact of fishing activities on marine eco-systems. It shall aim at a progressive implementation of an eco-system-based approach to fisheries management, and to contribute to efficient fishing activities within an economically viable and competitive fisheries and aquaculture industry, thus providing a fair standard of living for those who depend on fishing activities and taking into account the interests of consumers.

Common measures are agreed in the following main areas:

- Conservation and limitation of the environmental impact of fishing - to protect fish resources by regulating the amount of fish taken from the sea, by allowing young fish to reproduce, and by ensuring that measures are respected.
- Structures and fleet management - to help the fishing and aquaculture industries adapt their equipment and organisations to the constraints imposed by scarce resources and the market; measures aimed at creating a balance between fishing effort and available fish resources were also put in place.
- Markets - to maintain a common organisation of the market in fish products and to match supply and demand for the benefit of both producers and consumers.
- Relations with the outside world - to set up fisheries partnership agreements and to negotiate at the international level within regional and international fisheries organisations for common conservation measures in deep-sea fisheries.

As compared to the preceding fisheries policy, changes in the new CPF concerned mainly

- The adoption of a long-term approach
- A new policy for the fleet, in particular the phasing out of public aid for vessel construction and for vessel modernisation which might increase the capability of the vessel to catch fish
- Provisions for a better application of existing rules
- A stronger involvement of stakeholders

Presently, the CFP is under review again, and a first conclusion is that “the overall objective to achieve sustainable fisheries that was agreed on in 2002, has not been met (Green Paper, European Communities, 2009 (EC, 2009b).

Most stocks exploited by Baltic Sea fishermen (cod, herring, sprat, salmon, and plaice) are managed under the Common Fisheries Policy (CFP) by the European Commission.

Main instruments of fisheries management of the CFP are:

- Catch limits (quotas) that restrict the quantity of fish that can be taken from the sea before fishermen need to stop fishing.
- Fishing effort limitations that restrict the size of the fleet at sea and the amount of time it can spend fishing (days at sea, kW-days), in cases of passive (static) gear also its size and quantity.
- Technical measures that regulate how and where fishermen can fish (e.g. mesh sizes, gear types).

One of the oldest elements of the CFP is the principle of relative stability (distribution of quota´s to member countries according to catch levels and reference periods). Following the Hague Declaration of 1976, the Council defined the system of relative stability in 1980. The basic criteria were catches during the reference period 1973-1978. Relative stability was first applied in practice with the adoption of the CFP in 1983.

2.2.3 Access regulations

Territorial waters as defined by the 1982 UN Convention on the Law of the Sea is the coastal waters extending up to 12 nautical miles from the baseline (usually the mean low-water mark) of a coastal nation. It is regarded as the sovereign territory of the nation. If the 12 nautical mile zone overlaps with another states territorial waters, the border is normally taken as the median point between the states baselines.

The baseline from which the territorial water is measured is normally the mean low-water line along the coast. Alternatively, the baseline can be defined by connecting fringing islands, across the mouth of a river, or with certain restrictions across the mouth of bays.

Waters landward of the baseline are defined as internal national waters, over which the state has complete jurisdiction. Lake and streams are also considered internal waters.

In the region of Fehmarnbelt, in the zone between the baseline and 12 nm, the state of Mecklenburg-Vorpommern, Schleswig-Holstein and the country of Denmark have in principle exclusive fishing rights. However, according to Council regulation (EC) No 2371/2002 of December 2002, chapter IV, article 17 (EC, 2002) - Rules on access to waters and resources - German and Danish fishermen have a historical right to fish between 3 to 12 nautical miles of each others state. Danish fishermen are allowed to fish cod, plaice, herring, sprat, eel, whiting, and mackerel (*Scomber scombrus*) in the Baltic coastal waters of Germany. Similarly, German fishermen have the right to fish cod, herring, sprat, flatfish, eel, salmon, whiting, and mackerel in the Danish coastal waters of the Baltic Sea, including the Belt Seas, Øresund, and around the island of Bornholm.

The Council are to decide before 31 December 2012 on the provisions, which will follow these rules.

2.2.4 Catch limits

An important part of the management is the determination of the Total Allowable Catch (TAC) for each fish species managed with the help of this instrument. The Council of Fisheries Ministers sets most TACs on an annual basis. Determination of TACs should be based on scientific advise (considering the state of the stock etc.), but are in fact influenced by political agendas. The regulations for the Baltic Sea are generally the subject of a political agreements in October.

In detail, the process of setting TACs can be described as follows: Each country collects basic biological stock data, landings, and discards, which are then used by the International Council for the Exploration of the Sea (ICES) working groups to assess the state of the stocks (a short term forecast of spawning stock biomass and available catch).

Assessments made by the working group are considered by an Advisory Committee of ICES, which decides what the official ICES advice on the management of stocks will be.

Scheme of TAC setting:

Data Collection	Research institutes
Stock Assessment	ICES Working Groups (WGBFAS)(ICES, 2008a)
Scientific Advice	ICES Advisory Committee (ACOM)
Managers	European Commission
Council of Ministers	Representatives of the member states, Agreed TACs Allocation of Quota to Member States
Fishery operations	Fishermen

The Commission drafts its proposal for TACs for the following year using ICES advice and involving its own advisory body, the Scientific, Technical and Economic Committee on Fisheries (STECF, established in 1993), for guidance on the economic effects of the scientific advice.

The Commission has the unique responsibility to make a formal proposal about the coming TACs, however, it is the Council of Ministers which make the final decision.

TACs are then allocated to different member states in the form of quota´s, under a system known as 'relative stability', which keeps national quotas stable in relation to each other. Sharing follows a fixed allocation key based on historical catches.

2.2.5 Fishing effort limitations

Fishing effort is defined in the Council regulation (EC) No 2371/2002 of 20 December 2002 (EC, 2002), Article 3 (h) as fishing capacity times activity. The day-at-sea system was intended to reduce fishing effort in line with the reduction in TACs, in order to reduce discarding and remove illegal fishing. It was an essential part of a number of long-term plans (multiannual plans), including those for cod stocks in the Baltic Sea -Council Regulation (EC) No 1098/2007 of 18 September 2007 (EC, 2007a). However, the large number of derogations introduced at the request of Member States have neutralised the impact of the day-at-sea management on a significant reduction in fishing mortality.

Therefore, in 2009 a new system was introduced, based on effort limitations expressed in kilowatt-days. Kilowatt-days are calculated by multiplying the number of days fished by the sum of the engine power in kilowatt of the vessel. A vessel engine power affects e.g. the size of the net a vessel can use, and hence its catching capacity. The kilowatt-days approach would let Member States themselves decide on a balance between fleet capacity and fishing opportunities. The kilowatt-day limitations are included in an Annex to the TAC and Quota Regulation of the Council Regulations, for example Council Regulation (EC) No 1226/2009 of 20 November 2009 (EC, 2009c) fixing the fishing opportunities and associated conditions for certain fish stocks and groups of fish stocks applicable in the Baltic Sea for 2010.

2.2.6 Technical measures

The CFP also provides a qualitative framework to protect fish stocks and the ecosystem, by encouraging certain kinds of fishing practice (alternative fishing gears, cod pots), or banning others.

These rules are known as technical measures, for example:

- Minimum mesh sizes.
- Closed areas and seasons.
- Minimum landing sizes.
- Limits on bycatch as percentages of total catch.
- Incentives to develop specific gears to reduce bycatch or avoid catch of marine mammals and sea birds and to increase selectivity (Bacoma window).

All the technical measures currently applicable in the Baltic Sea are laid down in Council regulation (EC) No 2187/2005 of 21 December 2005 (EC, 2005) for the conservation of fishery resources through technical measures in the Baltic Sea, the Belts and Øresund.

Fishing gear

In general terms there are two types of gear that need to be considered:

- Active gear, which has to be moved by a boat, mainly bottom and pelagic trawls and Danish seines
- Passive gear, mostly gill nets, entangling nets, trammel nets, fyke nets or trap nets, long-lines, pots and drift nets

The use of dredges is prohibited in the Baltic Sea, except for the collection of mussels and the seaweed *Furcellaria lumbricalis*.

Table 2.1: Minumum mesh sizes for the Western Baltic and Sound (ICES 22 & 23) for trawls, seines and similar gear. *The International Baltic Sea Fisheries Committee (IBSFC) introduced in 2001 a Bacoma (Baltic Cod Management) cod end in the cod trawl fisheries with a 120 mm mesh size. This regulation was amended in October 2003 to a 110 mm Bacoma window. From January 1st 2010 in subdivision 22-24 and March 1st 2010 in subdivision 25-32, the Bacoma 120 mm cod end was re-introduced, along with an extension of the Bacoma window to 5.5 m

Mesh size (mm)	Target Species	Min percentage of target species	Remarks
0-15	Sandeel (*Ammodytidae*)	90	Bycatch of cod may not exceed 3% live weight.
16 -31	sandeel, sprat	90	Bycatch of cod may not exceed 3% by live weight. The catch retained on board may consist of up to 45% herring by live weight.
32-89	sandeel, sprat, herring	90	Bycatch of cod may not exceed 3% by live weight. The catch retained on board may consists of up to 40% whiting by live weight.
90-104	sandeel, sprat, herring, sole, plaice, whiting, brill, dab, flounder, lemon sole, turbot, cod	90	The use of beam trawl shall not be authorised.
105 and greater	sandeel, sprat, herring, sole, plaice, whiting, brill, dab, flounder, lemon sole (*Microstomus kitt*), turbot, cod	100	The use of beam trawl shall not be authorised. Only trawls, Danish seines and similar gears with Bacoma exit windows* or with T90 cod end and extension piece (Appendices I and II) shall be authorised.

Table 2.2: Minimum mesh sizes for the Western Baltic and Sound (ICES 22 & 23) for gill nets, entangling nets and trammel nets

Mesh size (mm)	Target species	Min percentage of target species	Remarks
32-109	sprat, herring	90	Bycatch of cod may not exceed 3% by live weight.
115 -156	sprat, herring, sole, plaice, whiting, brill, dab, flounder, lemon sole, turbot, cod	90	
157 and greater	sprat, herring, sole, plaice, whiting, brill, dab, flounder, lemon sole, turbot, cod, salmon	100	

Two main problems occur with the use of passive gear, a considerable fishing effort and a large volume of bycatch. To reduce fishing effort, the Commission decided to limit the length of gear and their immersion time. Vessels measuring up to and including 12 m in length may use nets of no more than 9 km in length, vessels measuring more than 12 m may use nets of no more than 21 km in length. The immersion time for all nets may not exceed 48 hours. The only exception is for fishing under ice, in which case immersion time is not limited. A Baltic Sea-wide ban on all drift nets was implemented on the 1st of January 2008.

Council regulation (EC) No 812/2004 of 26 April 2004 (EC, 2004) lays down measures aimed at mitigating incidental catches of cetaceans by fishing vessels operating in specific fisheries.

According to this regulation acoustic deterrent devices (pingers) are not mandatory in ICES area IIIc (Belt Sea). Under Annex III, Member States are required to design and implement independent at-sea observer schemes to monitor cetacean bycatch on board vessels with an overall length of 15 m or more. The monitoring schemes shall be designed to provide representative data of the fisheries concerned in ICES sub areas, III b, c, d. This monitoring concerns pelagic trawls (single and pair) and bottom-set gill nets or entangling nets using mesh sizes equal to, or greater than 80 mm. Starting date was the 1st of January 2006.

Minimum landing size of commercial species

In order to protect juvenile fish, the regulation (EC) No 2187/2005 gives the minimum length of fish allowable in the fisheries. All fish smaller than their respective minimum lengths (discards) must be immediately returned to the sea upon capture.

Table 2.3: Minimum allowable fish length in ICES 22 – 25. * national rules in territorial waters may differ. New regulations acc. to the EU Eel Management Plans.

Minimum allowable fish lengths – ICES Subdivisions 22-25	
Species	Minimum allowable length (cm)
Cod	38
Flounder	23
Plaice	25
Turbot	30
Brill	30
Eel	35*
Salmon	60
Sea trout	40

Selected restrictions related to certain areas, gear types and species according to Council Regulation (EC) No 2187/2005 (EC, 2005)

Protected areas and the temporary closure of certain fisheries are an integral part of fish resource management.

All fishing activity with any active gear is banned throughout the year, offshore from the mouth of the river Oder (the Oderbank area). The positions are determined according to the WGS84 coordinate system.

Eel fishing with any type of active gear is prohibited throughout the year.

The retention of salmon and sea trout on board vessels - in a fishery targeting salmon and/or sea trout - is prohibited from 1st June to 15th September in waters of ICES subdivisions 22 to 31. In the Gulf of Finland (subdivision 32), the dates are slightly different (15th of June to 30th of September). Salmon and sea trout may nevertheless be fished with trap-nets during this period. For these fisheries the area of prohibition during the closed season is outside the four nautical miles zone.

2.2.7 Maximum sustainable yield (MSY)

The year 2011 will be the first stage of the gradual transition that will bring Maximum Sustainable Yield (MSY) into general practice by 2015. This process will probably mean a decrease in fishing opportunities for currently overexploited fish stocks.

Application of MSY can imply a sizable reduction in TACs to help rebuild stocks. To avoid an abrupt change that will destabilise the fishing industry, the Commission proposes to introduce the MSY approach in increments over a period of four years. The idea is that clear and similar measures will apply to stocks in a similar state.

There are five categories (Fisheries and Aquaculture, 2010):

- Stocks already fished at MSY – TACs will be set to maintain this long-term yield and will not vary by more than 25% from the 2010 level
- Stocks not fished at MSY, but inside safe biological limits – TACs will be set to reduce overfishing by equal amounts in 2011, 2012, 2013, and 2014 in order to reach MSY in 2015, but without changing TACs by more than 25%
- Stocks outside safe biological limits - TACs will be set to reduce overfishing by equal amounts in 2011, 2012, 2013, and 2014 in order to reach MSY in 2015, but without changing TACs by more than 30%
- Stocks under a multi-annual plan (Baltic cod stocks) – TACs will be set according to the management plan. Long-term plans will gradually be adapted to the MSY objectives.
- Stocks of short-lived species – A provisional TAC will be set and revised as new data is made available during the year.

2.2.8 Monitoring, Control and Surveillance

Control rules are an integral part of the CFP. In June 2008 political agreement was reached in the European Union on combating illegal, unreported and unregulated fishing (IUU fishing). The current control rules are difficult to enforce, because they are spread over several Council regulations and cover a large, varied geographical area.

2.2.9 Specific Plans

Multiannual plan for the cod stocks in the Baltic Sea

For specific stocks and areas, EU has established multi-annual programs. One of the most important plans to be aware of in the Western Baltic and Fehmarnbelt is the multiannual plan for the cod stocks in the Baltic Sea and the fisheries exploiting those stocks, established by CR (EC) No 1098/2007 of 18 September 2007 (EC, 2007a). This plan combines different instruments of management and specifies them for the fisheries it relates to.

The plan shall ensure the sustainable exploitation of these stocks. The regulation involves decisions on the determination of TACs, fishing effort limitations, closed seasons from 1 to 30 April in ICES Subdivisions 22 and 24 and area restrictions. According to the regulation, the cod fishery in the Baltic Sea will require a special permit.

Logbooks are necessary for all fishing vessels with an overall length equal to or greater than 8 meters. All vessels equipped with a Vessel Monitoring System (VMS), vessels of an overall length equal to or greater than 15 meters have to report the information required in the logbook by electronic means. The information has to be transmitted to the Fisheries Monitoring Centres (FMC) of the flag Member States on a daily basis.

Eel Management Plans

Management advice from ICES indicates that the stock of European eel, is outside biological reference points across European waters. To preserve the stock and help the recovery of European eel, the Commission adopted Council Regulation (EC) No. 1100/2007 of the 18th of September 2007 (EC, 2007b) which requires Member States to develop management plans, with the aim to enable the escapement to the Sargasso Sea of at least 40% of the silver eel

biomass relative to the best assessment of escapement that would have existed if no man-made influences had effected the stock.

Germany has presented nine individual management plans for different management units. The Commission by spring 2010 has accepted these management plans. Measures will affect the eel fisheries in coastal waters, e.g. by increasing the minimum landing size.

The Danish Eel Management Plan (Ministry of Food, Agriculture and Fisheries, 2008) introduced a license system, which limits each fisherman and entity to a limited number of gear and/or fishing seasons, and thus a limited effort. The system includes a variety of elements, routine compulsory registration and reporting and tangible measures for strengthened control efficiency, providing managers and researchers with comprehensive and reliable data for monitoring, analysis and adequate management of both commercial and recreational eel fishing activities. By introducing a series of regulatory measures, Denmark aims at reducing effort in marine eel fisheries in the period 2009 – 2013 by at least 50% relative to the average effort deployed from 2004 to 2006.

2.2.10 Forthcoming regulations

The Commission has made a proposal for a new regulation (EC, 2010) amending Council Regulation (EC) No 2187/2005 concerning the prohibition of highgrading and restrictions on fishing for flounder and turbot in the Baltic Sea, the Belt Sea and Øresund. As a consequence of the Lisbon Treaty, the Commission is of the opinion to move the provisions regarding these technical measures out of the regulatory framework establishing annual fishing opportunities (e.g. Council regulation EC No. 1226/2009 (EC, 2009c)).

2.3 Regulations in the territorial waters of Germany (3 nm & 12 nm)

The local governments of the state of Mecklenburg-Vorpommern and the state of Schleswig-Holstein are responsible for regulations concerning use and preservation of non-quoted fish populations in their territorial waters and in their internal waters within the so-called baseline.

The most important fishing regulations are described in the following:

On a national level:

- Regulations of the German federal law -*Seefischereigesetz*- (Bundesministerium der Justiz, 1998)

On Federal state level:

Mecklenburg Vorpommern:

- Fischereigesetz für das Land Mecklenburg-Vorpommern of 13 April 2005 (LFischG) (LALLF M-V, 2005)
- Verordnung zur Ausübung der Fischerei in den Küstengewässern (Küstenfischereiverordnung – LALLF M-V of the 28th of November 2006 (KüFVO) (LALLF M-V, 2006)

Schleswig-Holstein:

- Fischereigesetz für das Land Schleswig-Holstein of 10 February 1996 (MLUR, 2005)
- Landesverordnung Schleswig-Holstein über die Ausübung der Fischerei in den Küstengewässern (Küstenfischereiverordnung - KüFVO) of the 11th of November 2008 (LLUR, 2008)

In Germany the Federal Agency for Food and Agriculture (Bundesamt für Landwirtschaft und Ernährung BLE) allocates the national quota to the producer organisations (POs). These fishermen organisations decide independently how to divide the quota to individual fisherman. A small part of the quota will be given to those fishermen, which are not members of the POs.

Main legal regulations, relevant for fishing activities in the coastal waters of the states of Mecklenburg-Vorpommern and of Schleswig-Holstein including the area of the Fehmarnbelt Fixed Link are described in following:

- Ban of trawl fishery in the coastal areas with vessels with more than 221 kW (LLUR, 2008)
- Ban of trawling and seining within the 3 nm zone with the exception of the area west of “Schutzbereich” Marienleuchte” e.g. in the Fehmarnbelt area between the 15th of September and 15th of April in a zone between 2 and 3 nm from the coastline in water depths greater than 20 m (LLUR, 2008)(
- Figure 2.10).
- Other exceptions concern the use of trawls for bait fishing and tourist purposes in certain areas for vessels with less than 100 kW along the coastline of Mecklenburg-Vorpommern
- Ban of gill nets, including herring gill nets in a 200 m zone from the coastline (Flensburger Innenförde, 100 m).
- Distance regulations between different fishing gears.
- Ban on the use of anchorless drift nets.

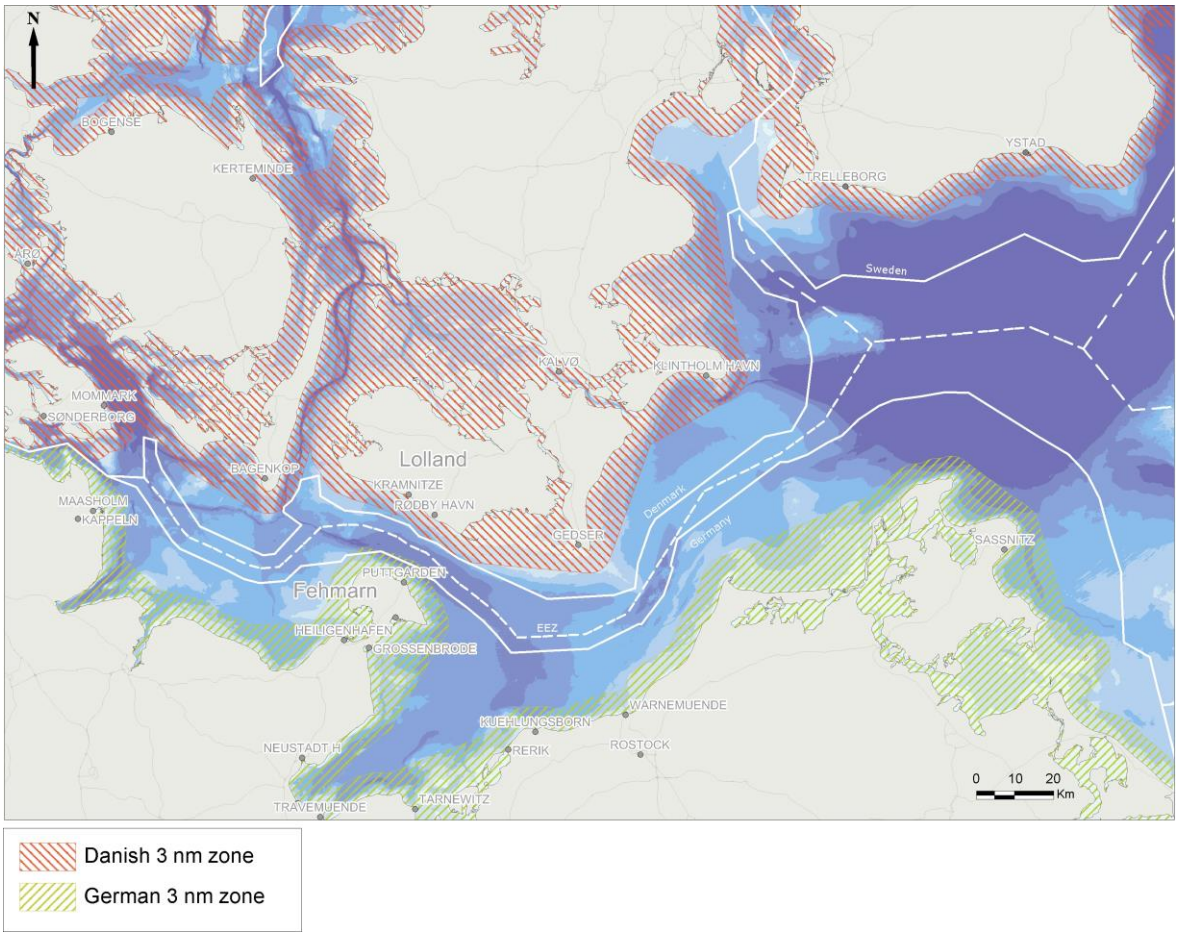

Figure 2.10: The 3 nm coastal areas of Germany and Denmark where trawling and seining is strongly limited by regulations. Denmark and Germany, however, may fish up to the 3 nm zone of each other's country due to historical rights.

Table 2.4: Minimum mesh sizes (mm) within the 12 nm zone. * All other species, except eel and bait fish: 32 mm (LLUR 2008)

		State	
Species	**Gear**	**Schleswig-Holstein (SH)**	**Mecklenburg-Vorpommern (MV)**
Cod	Gill nets	110	110
	Trawls	acc. EU	110
Salmon		acc. EU	157
Flatfish	Gill nets	120	120
Sea trout	All	110	120
Herring	Trawls	32	32
Eel	Nets	50	50
Perch (*Perca fluviatilis*)	Gill nets	*	70
Pike (*Esox lucius*)	Gill nets	*	100
Zander (*Stizostedion lucioperca*)	Gill nets	*	90

A special permit is needed for the use of staked set nets (trap nets, pound nets or similar) with a total length of more than 30 m. (LLRU, 2008).

The minimum mesh size for fyke nets, eel baskets, pots and pound nets in Mecklenburg-Vorpommern is 25 mm.

Seine netting (anchor seining, Danish seine) is allowed in some parts of the Baltic coast of Schleswig-Holstein. A list of accepted areas is available at the fishery office (Oberste Fischereibehörde).

In Schleswig-Holstein and Mecklenburg-Vorpommern eel fishing (targeting eel species) with any type of active gear is banned throughout the year.

A small area in the Mecklenburg Bay, north of the summer resort Nienhagen, west of Warnemünde is closed to the fisheries all the year round.

Table 2.5: Minimum fish lengths and closure times in Schleswig-Holstein and Mecklenburg-Vorpommern territorial waters, valid for vessels operating in these waters*

	Minimum lengths (cm)		**Closure times**	
Main species	SH	MV	SH	MV
Cod	38	38	as EU	as EU
Herring	11	as EU		
Eel	**50**	**50**		**outside 3 nm 1.10.-31.3.**
Salmon	60	60	Spawning stock 1.10-31.12	15.9-14.12
Sea trout	40	45		15.9-14.12
Turbot	30	30	11.6-31.7	1.6-31.7
Brill	30	30	11.6-31.7	
Plaice	25	25		
Flounder	25	25		
Dab	23	25		
Sole	24	no		
Whiting	23	no		
Sander	40	45		23.4-22.5
Pike	45	50	15.2-30.4	1.3-30.4
Baltic whitefish (*Coregonus*	40	40	1.12-28.2	

lavaretus)				

* National rules have to meet the requirements of the EU regulations.

Table 2.6:Species with a ban on fishing throughout the year. *Annex II protected species included in the EC Habitat Directive.

Schleswig-Holstein	Mecklenburg-Vorpommern
	* Atlantic sturgeon (*Acipenser oxyrinchus*)
* European sturgeon (*Acipenser sturio*)	* European sturgeon (*Acipenser sturio*)
* River lamprey (*Lampetra fluviatilis*)	* River lamprey (*Lampetra fluviatilis*)
* Sea lamprey (*Petromyzon marinus*)	* Sea lamprey (*Petromyzon marinus*)
* Houting (*Coregonus oxyrhynchus*)	* Houting (*Coregonus oxyrhynchus*)
* Shad (*Alosa alosa*)	* Shad (*Alosa alosa*)
Vimba bream (*Vimba vimba*)	Vimba bream (*Vimba vimba*)
	* Twaite shad (*Alosa fallax*)

Fishery activities in Schleswig-Holstein are generally free for all. Professional fishermen, anglers and part time (sideline) fishermen do not have to pay any fees for the use of their fishing gear. In Mecklenburg-Vorpommern, fees for the use of professional fishing gear are presented in the -Kostenverordnung für Amtshandlungen in der Land- und Ernährungswirtschaft. A permit for hobby fishermen cost 25 euro for two years in Schleswig Holstein and 30 euro per year in Mecklenburg-Vorpommern.

In general, rules for part-time (sideline) fishermen (Nebenerwerbsfischer), hobby fishermen and anglers do not differ from rules for commercial fishermen, except for the limited use of gear.

Fisheries compensation

The German Sea Fisheries law (Bundesministerium der Justiz, 1998) contains no provisions, which have the objective to compensate the loss of fishing grounds by different hydraulic engineering or other measures, because no one had a property right to the fish, until after the fish had been caught.

2.4 Regulations in the territorial waters of Denmark (3 nm & 12 nm)

The general conditions for undertaking commercial fisheries in Danish waters are presented in the law regulating fisheries and fish farming (LBK, 2007). The laws objective (§1) is to ensure the protection and rehabilitation of natural resources in salt- and freshwater, protect other animals and plant life, ensure a sustainable foundation of resources for commercial fisheries and their associated businesses, as well as the possibility to undertake recreational fisheries.

Those allowed to undertake fisheries in saltwater are divided into the following groups according to a series of complicated criteria, which is not presented here in its entirety.

- Commercial fishermen (minimum of 60% gross income from fisheries)
- Sideline fishermen (minimum 5% of gross income from fisheries)
- Hobby fishermen (fisheries with lightweight gear other than handheld gear, such as fykenets, gill nets, longlines or pots – only 6 in all of these types of gear can be used, of which a maximum of 3 can be gill nets.
- Anglers (fishermen with handheld gear – tackle)

Hobby and recreational fishermen may only fish for their own subsistence (own use) and may not sell fish or fish products.

During a thorough revision of the Danish fisheries regulations, rules for the allocation of quota´s were changed and were to be based on the historical fisheries of each fishing vessel (so-

called FKA´s) within the period 2003-2005. Commercial vessels with landings value under the minimum limit (224,000 DKK or approximately 30,000 euro in 2005) were not included, but were allowed to continue their fisheries for that part of the total Danish quota of the individual consume species that have already been targeted by that vessel group. To support the coastal fisheries, vessels less than 17 m, under certain circumstance, could sign up for a special coastal fisheries scheme, which allocated 10% extra quota of cod and sole – only cod in the Baltic.

As described in section 0 it is the exclusive rights of the EU to set the general conditions to undertake fisheries in the marine environment outside the 12 nm limits from the basisline (defined as the low water mark) for the individual countries. The general conditions for undertaking fisheries are outlined in more detail in section 0; this section only describes the fishing regulations which are of special relevance for the fisheries in and near Fehmarnbelt.

According to Council Regulation (EC) No 2371/2002 of December 2002, chapter IV, article 17) (EC, 2002), the Danish fishermen have the right to fish up to 3 nm of the German basisline and similarly, the German fishermen have that same right in Danish territorial waters. A member state can make non-discriminatory measures to conserve and manage fishery resources and to limit the effects of fisheries on the marine ecosystems as much as possible (Article 9). Management measures may not be less restrictive than EU regulations.

In the Danish fishing regulations Order (Ministry of Food, Agriculture and Fisheries, 1993) it is specified that vessels 17 m or longer or with motor power greater than 221 kW/300 HP are not allowed to fish commercially in the Western Baltic and Belt area unless they have an historical right i.e. they have been fishing in this area before this rule was implemented (§ 30).

The Danish law contains a general ban on fisheries with trawls and seine nets in ICES subdivision 22 from Friday 18 p.m. to Sunday 20 p.m. (§33 in Ministry of Food, Agriculture and Fisheries , 2009).

Gear-related limitations/regulations within 3 nm from the basisline:

It is not allowed to use gill nets at a distance of less than 100 m from the low water line (basis line) (§32, stk. 4 in LBK, 2007).

The use of trawls is, in principal, forbidden within 3 nm from the low water line (basisline) (§2, stk. 1 in Ministry of Food, Agriculture and Fisheries, 1993), however there are a number of exceptions:

- Small trawls, defined as gear with an opening of 2 m or less at the mouth and designed exclusively to catch baitfish, are allowed (§2, stk. 2 in Ministry of Food, Agriculture and Fisheries, 1993).
- The use of otter trawls within 3 nm of the basisline is allowed by vessels that have a maximum motor power of 175 HP and where each otter board is 160 kg or less. Furthermore, only gear with a minimum mesh size of 90 mm is allowed (§4 in Ministry of Food, Agriculture and Fisheries, 1993).
- Fisheries with dragging gear may only fish within 3 nm of the basisline from 2 hrs before sunrise to 1 hr after sunset (§4 in Ministry of Food, Agriculture and Fisheries, 1993).
- In a specific area off of east coast of Møn, north of Klintholm, trawling is allowed within 2 nm of the low water line by vessels with a motor power up to 370 HP (§5, stk. 1 in Ministry of Food, Agriculture and Fisheries, 1993).
- Trawling with a brisling otter trawl is allowed within the 3 nm of the basisline under the conditions that the mesh size is 18 mm or greater and the mouth width of the trawl is not greater than 40 meters. Furthermore, this fishery is only allowed from 1st October to 15th April and only from 1 hr before sunrise to 1 hr after sunset (§10 in Ministry of Food, Agriculture and Fisheries, 1993).

- Pair trawling (where the trawl is towed by 2 vessels) is allowed within 3 nm of the basisline only with gear that have a mesh size over 90 mm and only at depths greater than 9 meters.
- Midwater trawls may be used within 3 nm of the basisline when the largest mesh size of the gear is 40 mm and the smallest mesh size is 16 mm, respectively (§16 in Ministry of Food, Agriculture and Fisheries, 1993).

Special closed seasons for fish and shellfish in saltwater

The closed seasons for specific fish species in european waters is presented in regulation (EC) No 2187/2005 (EC, 2005). In addition, for Danish fishermen and foreign fishermen fishing in Danish territorial waters, there are special closed seasons for a number of species (Ministry of Food, Agriculture and Fisheries, 1992) – see Table 2.7.

Table 2.7: Closed seasons for fish species that are caught by Danish fishermen, or fishermen from other countries fishing in Danish territorial waters (Ministry of Food, Agriculture and Fisheries, 1992).

Species	Closed season
Female plaice	15. January – 30. April
Female flounder	15. January – 15. May
Salmon	16. November – 15. January
Sea trout	16. November – 15. January

In the Danish fisheries regulations, minimum lengths are given for a number of species not included in the Council regulation No. 2187/2005 (EC, 2005) (see section above). Here, it will only be mentioned that the minumum length for yellow eel will be increased from 37 cm at present to 40 cm in 2013, in an attempt to protect the decreasing eel stock (Ministry of Food, Agriculture and Fisheries, 2008a). For commercial and sideline fishermen, the new management measures also include limitations on the gear type and their numbers that can be used in the eel fishery, as well as the requirement of special permission to fish after eel from the Danish Directorate of Fisheries. There is also a ban on the use of fyke nets by hobby fishermen from 1 May to 30 September (Ministry of Food, Agriculture and Fisheries, 2008b) to reduce the fishing pressure on eel by this group.

Fisheries compensation

The Danish fisheries law (LBK, 2007) contains provisions which have the objective to protect the interest of the fisheries against ”measures and interventions that can cause inconvenience or deter the fisheries in saltwater areas, create bottom conditions unfit to carry out fisheries or effect the fauna and vegetation in a fishing area“ (§77). Permission for such an intervention will only be granted (§78, stk. 2) when:

1) A final decision is made on the question of compensation to commercial fishermen affected by the measures or intervention or
2) Negotiations regarding possible compensation have been started between those that undertake the measure or interventions (clients) and the commercial fishermen affected by the measures or intervention or
3) The decision on possible compensation to fishermen affected by the measures or intervention has been referred to a Board (established by the Minister of Food, Agriculture and Fisheries, who appoints 2 members who, in agreement, appoints a third member as chairman.

Most cases regarding possible compensation are solved by negotiations between those that create the measures or interventions and the affected fishermen, while in rare cases a Board

is formed. After the establishment of the fixed link over the Great Belt and Øresund, a settlement was reached and compensation was paid out to the fishermen affected.

It should be noted that material extraction from the marine environment can be undertaken without negotiations for compensation with the exception of material extraction for use in individual works where permission is given to the client (§78, stk. 2). Under this set of rules, negotiations for compensation have been undertaken between fishermen and the client in the case of material extraction at Kriegers Flak for use in establishing the Øresund Bridge.

3. Methodology

Many of the commercially important fish stocks (cod, sprat, herring etc.) in the Fehmarnbelt are the same stocks that migrate to and from other regions in the Western Baltic. Thus, the construction and operation of a fixed link across the Fehmarnbelt can potentially affect the fisheries on a local, regional and/or Western Baltic scale. The fisheries in the Baltic are divided by international fishery zones where national and international fishery regulations, requirements and quotas apply and catch data is separated. These zones (ICES subdivisions and ICES rectangles (approx. 30 x 30 nautical miles) are used to form the boundaries for the presentation of the official commercial fisheries data. Thus, data from the fisheries in the near field areas include ICES rectangles 37G1and 38G1, respectively. Data from the regional fields include the adjacent ICES rectangles 37G0, 38G0 to the west of Fehmarnbelt and ICES 38G2 and 37G2 to the east of Fehmarnbelt. All reference to near field and regional area refer to data within these ICES rectangles.

More specific baseline data and fisheries information not restricted by the the artificial boundaries of the ICES rectangles were obtained from interviews with fishermen and their representatives. This data was differentiated and combined with data within the ICES boundaries as best as possible, according to the resolution of the available data.

VMS (Vessel Monitoring System), is a satellite-based global positioning system (GPS) used in commercial fishing to monitor the location of fishing vessels, and as of 2005, the use of VMS applied to all vessels ≥15 m within European waters. By estimating the period of fishery activity according to vessel speed this data can be used as a proxy to indicate more specific distribution of the fisheries. This offers the potential to increase the spatial resolution of where the fisheries of vessels ≥15 m are actually being undertaken.

3.1 Data sources

A map of the Baltic and Belt Sea including the outlines of the ICES rectangles in the near (ICES 37G1 and 38G1) and regional field (ICES 37G0, 38G0, 37G2 and 38G2) of Fehmarnbelt and ICES subdivisions 22, 23 and 24 is shown in Figure 3.1.

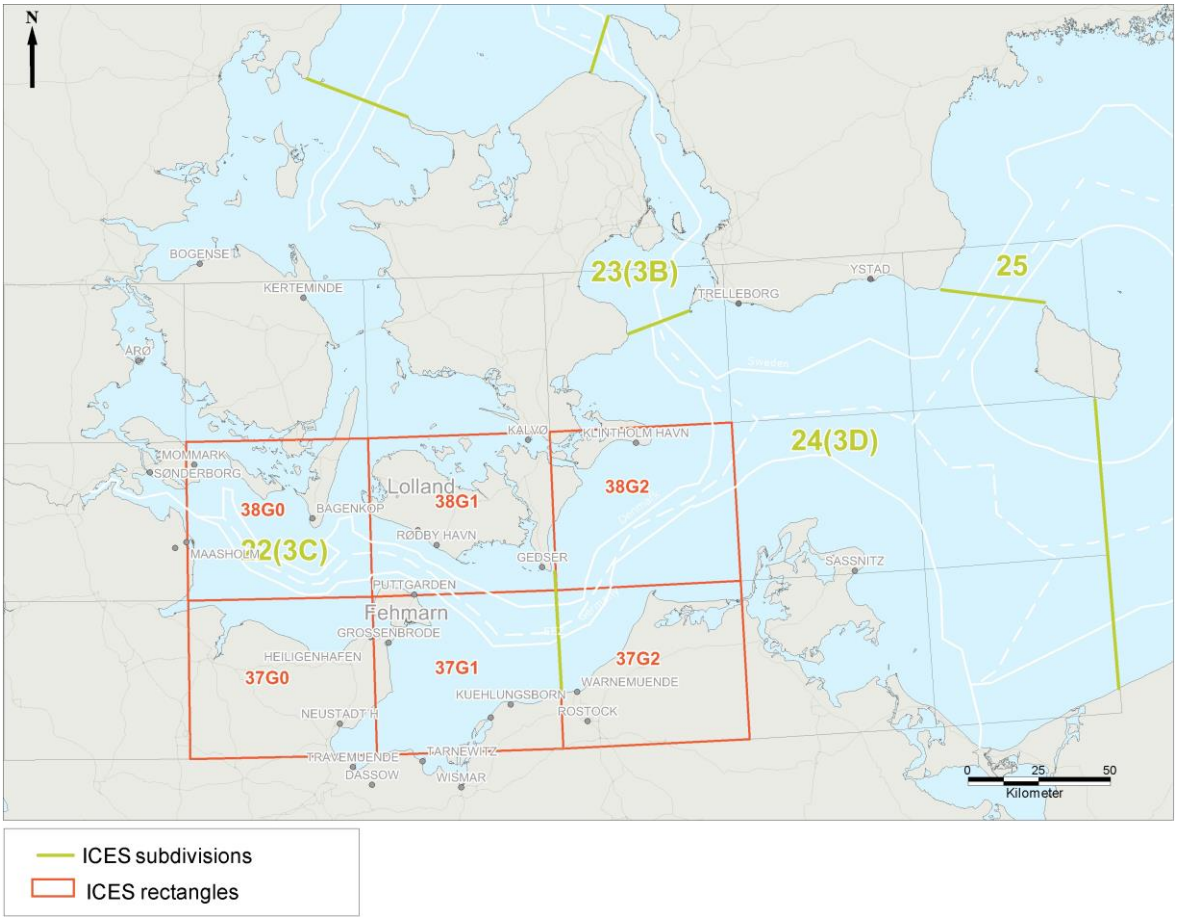

Figure 3.1: Map of the Western Baltic Sea including the outlines of ICES subdivisions (SD) 22, 23 and 24 and the near field (ICES 37G1 and 38G1) and regional field (ICES 37G0, 38G0, 37G2 and 38G2) of Fehmarnbelt.

3.1.1 Official data sources

The German and Danish commercial fisheries and fleet statistics for the ICES rectangles (38G0, 37G0, 38G1, 37G1, 38G2 and 37G2) and the harbours in the near field and regional area of Fehmarnbelt and the Western Baltic were obtained from the Danish Directorate for Fisheries (FD) in Denmark, and from the Bundesanstalt für Landwirtschaft und Ernährung (BLE) in Germany.

Additional fleet statistic information on vessel lengths, gear use, home-based harbours and for the number of small vessels (<8 m) in the Western Baltic were obtained from the Fisheries EU registry.

German and Danish vessel monitoring system (VMS) data was also obtained from Danish Directorate of Fisheries and the Bundesanstalt für Landwirtschaft und Ernährung (BLE), respectively. For the Danish data it was possible to link logbook data to VMS data by time, i.e. correlating the time and dates from fishing trips noted in logbook data with corresponding time and dates of VMS plots of the same vessel. This made it possible to associate and allocate the presence of specific species with corresponding VMS plots.

An overview of the German and Danish commercial fleet and fishery statistics for the ICES rectangles (37G0, 38G0, 37G1, 38G1, 37G2 and 38G2) and near field and regional harbours of Fehmarnbelt that were obtained from these institutes, is shown in Table 3.1.

Table 3.1: An overview of the German and Danish fisheries and fleet statistics obtained from the Danish Directorate of Fisheries, the Bundesanstalt für Landwirtschaft und Ernährung (BLE) in Germany and the Fisheries EU registry.

Area	ICES rectangles	Data
Near field	ICES rectangles 37G1, 38G1 (Fehmarnbelt) German and Danish harbours of importance in the area near Fehmarnbelt Distribution of the fisheries	Fleet statistics (numbers grouped by vessel length <8 m, 8-11.9 m, 12-14.9 m and ≥15 m) and primary gear (trawls, gill/trammel nets, seine nets and other gear (longline, handlines, rods and dredges)) Landings (tons and value) of the most important commercial species for each of the 6 ICES rectangles (ICES 38G1 and ICES 37G1 in the near field) + (ICES 37G0, 38G0, 37G2 and 38G2 in the regional area) Landings (tons and value) according to the basis harbours i.e. where vessels have their home harbour and landings harbour i.e where catches are landed.
Regional	ICES rectangles 37G0, 38G0, 37G2, 38G2 German and Danish harbours of importance in the regional area of Fehmarnbelt Distribution of the fisheries	Seasonal landings and value of the most important commercial species (cod, sprat and herring), and for flatfish (flounder, dab, plaice, turbot, sole and brill) Landings (tons and value) of the commercial fisheries in the most important German and Danish harbours of the near field and regional area of Fehmarnbelt (see Figure 4.14 & Figure 4.40). VMS (Vessel monitoring system) data to help derive the distribution of the fisheries according to season (quarterly), gear (G and DK) and most important commercial species (DK).

It is important to note, that both the Danish Directorate of Fisheries (FD) and the Bundesanstalt für Landwirtschaft und Ernährung (BLE) in Germany are bound by laws protecting personal rights that strongly limit what data and information they can make available that could possibly lead to exposing landings and associated incomes etc. of individual fisherman, vessels or their coops. This resulted in numerous limitations in presenting more detailed data at the individual/vessel level for the making of this baseline report. All official data was anonomised or of a character that did not divulge a fishing vessel or personal identity, thus, data was generally received in a format that allowed only an overview of the fisheries and incomes so as to not compromise this status.

3.1.2 Own surveys / interviews

To supplement official fishery statistics, which are bound by the spatial resolution of the ICES rectangles (30x30 nautical miles) and do not give a thorough description of the distribution of the fisheries, and to gather more specific income data, group and individual consultation meetings and surveys were held with both German and Danish vessel owners, fishermen and their representatives around Fehmarnbelt.

The surveys were undertaken both with the help of a questionnaire, which fishermen filled out on their own, and through interviews. Furthermore, the surveys undertaken with German fish-

ermen gathered information on other aspects of the impact to the fisheries and fishermen from establishing a fixed link across Fehmarnbelt, such as their opinion, concerns and anticipated consequences during the construction and operational phases.

Table 3.2: List of the characteristics of the German and Danish fisheries and organisations that were represented in the surveys to gather supplemental information on the fisheries in the near field and regional area of Fehmarnbelt.

	Gear	Type of fishery	No. of vessels /interviews
German fisheries			
Individual interviews and harbours			
Heiligenhafen Burgstaaken Grossenbrode Travemünde Wismar Kappeln	Trawls	consume / industry	14
	Gill/trammel nets	consume	10
	Trawl/gill nets	consume	3
	Pound nets	consume	2
Fishermen Associations			
Heiligenghafen and Burgstaaken	All	All	Group meeting - many
Danish fisheries			
Individual interviews and harbours			
Rødbyhavn Kramnitze Bagenkop Spodsbjerg Sønderborg Hvide sande	Trawls	consume/industry	7
	Gill/trammel nets	consume	4
	Seine nets	consume	1
	Pound nets	consume	3
Fishermen Associations			
Region East (Lolland-Falster, Møn and Zealand)	All	All	Chairman meeting
Region Belt (Funen, south-east Jutland)	All	All	Chairman meeting
Klintholm havn	All	All	Group meeting - many

3.1.3 Experiences in the fisheries from other fixed links

Experiences in changes in fisheries paterns from other fixed links are included in the discussion. Technical details of the fixed links across the Great Belt and Øresund are shown below.

The Great Belt

The construction work of the Great Belt Bridge took place from 1988 to 1998. The link consists of three major structures: A high level motorway bridge (East Bridge) and a bored railway tunnel across the eastern channel “Østerrenden”, both ending on the small island of Sprogø, and

a low level dual mode bridge (West Bridge) for railway and motorway across the western channel "Vesterrenden" ending on Funen (see Figure 3.2).

The East Bridge between Zealand (Halsskov) and Sprogø has a length of 6,750 meters. The suspension section is approx. 2,700 meters (between anchor blocks) and the distance between the two pylons is 1,624 meters. There are 19 bridge pillars in all, 12 between Zealand and the eastern anchor block and 7 between the western anchor block and the island of Sprogø. The eastern channel that the suspension bridge hangs across is in international waters. The height of the suspension bridge in the traffic lanes is 65 meters.

The West Bridge from Sprogø to Knudshoved is 6,611 meters long and consists of 62 pillars spanning 63 girder segments. The distance between bridge pillars is 82 meters (12 girder segments) and 110 meters (51 girder segments). The height of the bridge is 18 meters from the surface of the water.

The island of Sprogø in the middle of the Great Belt connects both ends of the bridges and the immersed railway tunnel in the east with the above water railway system in the west. The island has been enlarged during construction, so it is approximately 4 times larger today than before the Great Belt fixed link was built. On the reef to the east of Sprogø, dredging and the removal of 16 million m³ of sediment was undertaken to compensate for the reclaimed areas of Sprogø.

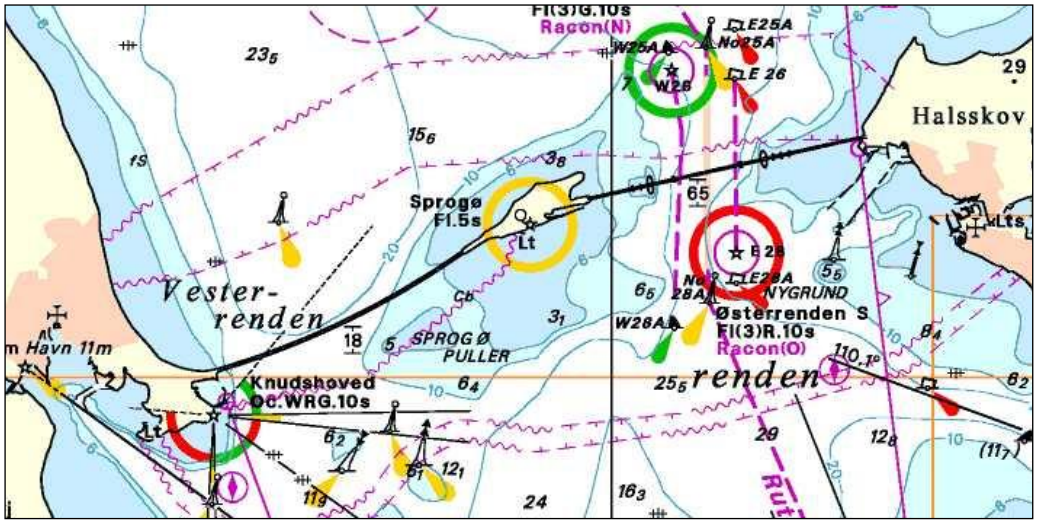

Figure 3.2: The outline of the Great Belt Bridge across the Great Belt. ©Geodatastyrelsen.

Øresund

The Øresund Fixed Link was established in 1995-2000. The link extends 16 km across Øresund between Copenhagen in Denmark and Malmö in Sweden. Its main elements consist of a tunnel under Drogden Navigation Channel between Amager and an artificial island (Peberholm) south of Saltholm, and a bridge between Peberholm and Sweden in the east (Figure 3.3).

The tunnel has an overall length of 4,050 meters and consists of a 3,510 meter immersed tube tunnel and two portal buildings each 270 meters long. The main elements of the 7,850 meters long bridge, between the 4 km long artificial island Peberholm and Lernacken in Skåne, Sweden are: A western approach bridge of 3,014 meters between the artificial island and the high bridge, a high, cable-stayed bridge totalling 1,092 meters across the Flinte Channel and a 3,739 meters eastern approach bridge between the high bridge and the Lernacken abutment.

The main span of the cable-stayed high bridge between the east and west pylons is 490 meters, with a passage height of 57 meters across the navigation channel.

Approximately 4.5 km² of the seabed in Øresund was directly affected by the fixed link construction, of this 2.2 km² of seabed or 1.3% of the total area with similar depths in Øresund was reclaimed for establishing Peberholm island and the Kastrup peninsula on Amager. As a result of the construction, more than 9 km of new coastline was formed and lined by large boulders and stones for erosion protection (DFU, 2002).

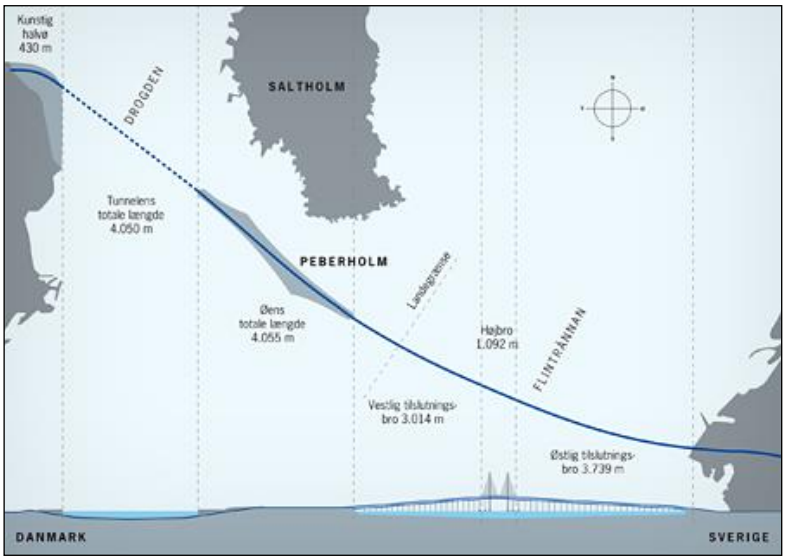

Figure 3.3: Outline of the fixed link over Øresund (Øresund). © www.sundogbaelt.dk.

3.2 Method of analysis and processing

3.2.1 Values on landings

The value of the landings of the individual species in Germany from 1998 to 2008 was given directly in the official ICES landings data by the German Directorate of Fisheries (BLE) in most cases. In cases where no proceeds were given or proceeds were lacking for a dataset of landings, the proceeds were calculated using the average landing value (euro per kilo) for the individual species in the given year from other sources.

The values of landings of Danish vessels were calculated on the basis of average quarterly prices per kilo for each species and year from 2005-2008. The value of the landings for each species prior to 2005 was derived from a four year average (2005-2008).

Data for vessels were obtained in three length groups (8-11.9 / 12-14.9 / ≥15 m) and according to gear types so they would correspond to standard length groups of economic data obtained from the Institute of Food and Resource Economics (FOI) in Denmark and vessel length groups that were used to present economic baseline data for vessels in this report.

3.2.2 Distribution of fisheries in Western Baltic and Fehmarnbelt

Estimating distribution of fishing activity from VMS data - trawling, seine netting and some gill/trammel netting

As of 2005, all fishing vessels ≥15 m within the Baltic Sea and most European waters are required to operate a satellite-based vessel monitoring system (VMS) which registers the position of each vessel at regular time intervals. For the Danish fleet, the position of the each vessel is registered approximately every hour. For the German fleet the position of each vessel is registered approximately every two hours. The VMS data included a vessel code, GPS position, time, main gear, speed and in harbour/at sea status. For the Danish fleet, it was possible to link logbook data to VMS data by time (VMS date and registered fishing trip) which allowed for distributing the presence of individual species on VMS points according to whether the species was caught (registered in logbook data) during the same time frame. Linking German VMS and logbook data was not possible because this data was not available by fishery authorities.

All Danish vessels were grouped according to the primary gear types (trawls, nets and seine nets). For the German fleet almost all vessels ≥15 m either used trawls or had trawl listed as their primary gear, and because it was not possible to determine the use of other gear, all the German VMS data was depicted and sorted to represent trawling activity.

To identify the speed ranges for the activity state of each vessel, speed frequency distributions were made for each gear type in the Danish fleet (Figure 3.4). These distributions were also used as a proxy for the German fleet. Fishing related activities were related to low speeds, while steaming and non-fishing activities were related to high speeds (Table 3.3). Supplemental information on the actual vessel speed used for different fishing activities was gathered from interviews with vessel owners and used to support these assumptions.

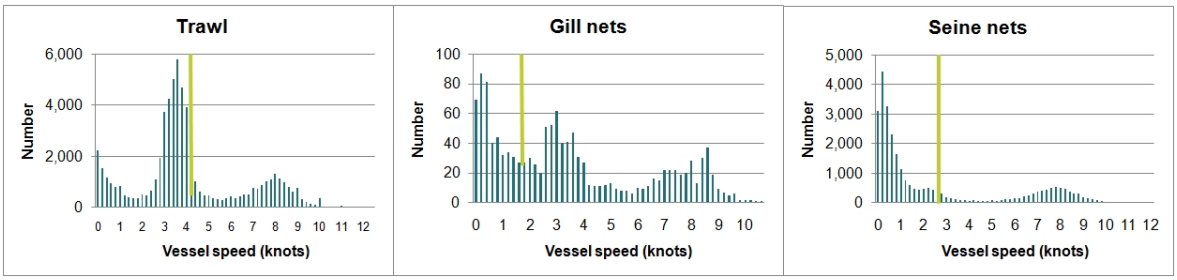

Figure 3.4: Speed frequency distributions of vessels using different gear (trawl, gill nets and seine nets) to identify and estimate vessel speeds during fishing activity and steaming or other non-fishing activities. Vessel speeds lower than 4.5 knots for trawls, 2 knots for gill netters and 3 knots for seine netters are considered to indicate speeds when fishing activities are taking place. Vessel speeds above these values are assumed to indicate vessels steaming or undertaking other non-fishing activities.

Table 3.3: Estimated speed (knots) when actively fishing with different gear. Derived from speed frequency distribution of VMS data according to gear (trawls, gill nets and seine nets).

Fishing gear	Estimated speed (knots) when actively fishing	Estimated speed (knots) when steaming / not fishing
Trawl	0 (at sea) – 4.5	> 4.5
Gill net	0 (at sea) – 2	> 2
Seine net	0 (at sea) – 3	> 3

Density maps showing a quantity per area measurement as a proxy for effort of the trawling, netting and seine netting were derived by summing the VMS points depicting active fishing activity for each gear type within a predetermined area (1nm^2). Similarly, to estimate the distribution of specific commercial species separately, density maps showing quantity of VMS plots per area measurements (1nm^2) of select species derived from linking logbook data to VMS data of the most important commercial species were made from the Danish VMS data.

Estimating distribution of fishing activity from fishermen surveys - trawling and gill/trammel netting

The distribution of the commercial trawling and net fisheries (gill/trammel nets) was derived from information obtained from individual interviews with vessel owners and fishermen that have their fisheries in Fehmarnbelt and its region. In contrast to distributions derived from VMS data, the information from interviews also includes the fisheries of vessels less than 15 m (<15 m) that do not carry VMS equipment. Furthermore, information on the distribution of the fisheries was supplemented and confirmed during group meetings with fishery associations and their members.

Because the distribution of trawling activity in smaller vessels <15 m derived from interviews corresponded with both the distribution of trawling activity by large vessels (≥15 m) from interviews and trawling activity derived from VMS data, it was assumed that the fishing activities of all trawlers distributed their fisheries in the same areas. Thus, the distribution of the active fisheries according to VMS data was used for trawling vessels of all lengths because of its more refined spatial resolution.

The results of the information on the distribution of both the trawl fisheries and net fisheries from interviews etc. were marked and presented on maps according to their respective gear and fisheries. As a proxy for fishing intensity, the fishing areas were shaded according to how much the respective fishing areas overlapped after the summation of all distribution data obtained from interviews.

The distribution of the pound net fisheries

The distribution of the German and Danish pound net fisheries in the Fehmarnbelt, which were considered to be the fisheries along the coastline of Fehmarn Island and the southern coastline of Lolland, were mapped according to the official location of their gear obtained from the respective fishing authorities. Furthermore, the distribution of supplemental fisheries with fyke nets and other traps, which are associated with the pound net fishery firms in Denmark, were also outlined. This data was obtained from individual interviews of pound net fishermen.

3.2.3 Economic performance of fisheries

Specific data sources

The economic analysis is in part based on the data mentioned in chapters 3.2.1 and 3.2.2, but additionally uses a number of other data and information.

Most important data sources are:

- *Logbook data of individual vessels:*
  - For DK, logbook data of the vessels that had fished in the 6 ICES rectangles 37G0, 37G1, 37G2, 38G0, 38G1 and 38G2 were available for those years of the period 2005 to 2008 in which the individual vessel had fished in at least one of these rectangles. All together, data of 411 vessels (by registration code - in some cases, the vessel behind the code was exchanged in the course of the reference period) were available. The data sets comprised species and (estimated) live

weight, gear used and a general size class of the vessel, but no value of the landings.
    - For DE, logbook data of 39 vessels for the period from 1998 to 2008 were available. Data included CFR (Community Fleet Register)-number of the vessel, vessel length, species, weight, basis and landing harbour. Some record sets contained information on the value of landings, others gear type. Weight was given mostly as landing weight, in some cases as estimated or calculated live weight; the different references of weight data lead to a certain, but minor bias.
- *Individual account data:*
    - Individual account data were available for 15 German vessels or for the fishing firms that operate them (where in some cases one company had two vessels). For Denmark, such data were available relating to 6 vessels, with a focus on pound net fisheries.
      It was generally found that fishing firms – for understandable reasons – were reluctant to disclose economic figures. A specific problem was that some fishing firms had agreed to disclose their annual accounts but later did not send copies or, in case of DK, their consent was not deemed a sufficient legal basis to disclose such data by Danish authorities. The situation improved somewhat after contacts between interviewers on the one side and fishermen and their organisations on the other side had been better established in the course of the work.
      Account data were obtained in different forms, e.g. as copies of annual accounts, as a data file that had been submitted to official account statistics (Danmarks Statistik, 2009; Institute of Food and Resource Economics (FOI)) or as information in specific questionnaires. In most cases only one year was covered (mainly 2008), in other cases up to 7 years. In consequence, the structure of the data was very diverse and had to be aggregated manually to standard forms (as best as possible).
- *Official data on the economic performance of the fishing fleet:*
    - For DK, detailed account statistics were available for the period 2000 to 2008. These are broken down by size-class and gear, or, alternatively, by region (unfortunately not by both at the same time). Less detailed are DK's contributions to the EU *Annual Economic Report on the European Fishing Fleet (AER)* published by the Scientific, Technical and Economic Committee for Fisheries (STECF, 2009).
    - In Germany, economic data on the fishing fleet are collected in the framework of the "Testbetriebsnetz" (fisheries accountancy data network) of the Federal Ministry for Food, Agriculture and Consumer Protection (BMELV). Due to the small sample size, these data are only broken down into shrimp trawlers (not relevant here) and "Frischfischfänger" (fresh fish vessels), the latter broken down into former German territory and Mecklenburg-Vorpommern (which is of little help in our case, as Fehmarnbelt and surroundings concern both areas).
      Germany also submits data for the AER, which are broken down by gear and size classes (0-12 m, 12-24 m, 24-40 m). Data were available for the period from 2002 to 2007. Data for 2008 have been repeatedly requested from vTI, but were not made available.

Other data and sources used for economic analyses were landing and value data by ICES rectangles and areas, the Community Fleet Register (CFR) and figures published by the Danish Fisheries Directorate and regional fisheries offices (Germany). Also qualitative information, e.g. from interviews, was considered.

Unit of analysis

Main unit of analysis of economic performance is the individual vessel. This has three major reasons:

- Many economic investigations and statistics on fisheries such as the Annual Economic Report on the European Fishing Fleet as well as Danish and German statistics use this unit of analysis (although sometimes also fishing firm or fisherman families are considered).
- Logbook and other data are broken down by vessel.
- The prevailing economic unit in Danish and German fisheries is the family business, where – at least as far as larger vessels are concerned – one enterprise owns one vessel.

While the choice of the individual vessel as the unit of analysis has several advantages, there are also problems involved:

- For boats and small vessels the equation between vessel and economic unit does not always apply: some fishermen/fishing enterprises own a number of small boats and economic data, e.g. from book-keeping, are not broken down to the individual boat.
- Even landings that officially have to be submitted per vessel are sometimes jointly reported for one vessel or boat, even if the others have also been involved in the fishing activity.
- In case of static gear such as pound nets the catch is not made by the vessel (as in case of trawling), but by the catching device. Which boat is used to empty the net is practically irrelevant.

As a consequence, the analysis in some cases also discusses economic units such as fishing firms and families or catching devices.

Economic data for firms with more than one vessel were broken down by the different vessel. In practice, however, some cost or income positions cannot clearly be allocated to one or another vessel, which may result in a small bias.

Vessels were segmented into different gear and size classes. This is a standard approach in fisheries economy and also practiced in European, Danish and German fisheries statistics.

- Gears have been classified into four groups, (gill net/trammel net or similar passive devices), trawl net, seine net and pound net. A small group of “Others” could not be analysed in detail.
- There are a number of standards for size classes of fishing vessels used in EU statistics, with dividing lines at 8, 12, 15, 18, 24 and 40 m. The division at 18 m is less used in recent times, but as Danish statistics are still broken down accordingly, it seemed useful to apply this here for economic analyses (different from other parts of this report).

In view of the structure of available data for these analyses, the following main gear-size-classes have been selected:

Table 3.4: Size-class - gear groups for which economic performance was investigated.

	Gill-net/trammel net	Trawl net	Seine net	Pound net
< 8 m	-	-	-	-
8 m - < 12 m	DE, DK	DK		DK
12 m - < 15 m	DE, DK	DE, DK		
15 m - < 18 m	-	DE, DK	DK	
18 - < 24 m	-	DE, DK	DK	
24 - < 40 m		DK		

Gill and trammel nets are used in both countries by vessels below 8 m, but insufficient data was available for any precise calculations. These vessels or boats are often either operated as one among more vessels of a fishing firm or for fishing as a sideline activity. While only active vessels (which had at least reported some landings) were considered, overall quantities for some of these vessels were very low, suggesting that they are not used full-time in professional fisheries.

A very small number of individual logbook records for vessels above 15 m using gill and trammel nets as main gear were available in Denmark, but again; they were not enough to base statistics on them. Similarly, for Germany not enough data were available on trawlers below 12 m. Only few seiners exist in German Baltic Sea fisheries and no data on their economic performance were available.

In the Danish and German fleet, a considerable number of vessels use more than one gear type (mixed gear). Nevertheless, for Germany only little data was available on this group. For Denmark, in almost all cases one gear type could be identified as the primary gear in terms of contribution to the overall outputs, so vessels were subsumed under that group. In fact, trawling is often the main fishing activity of these vessels, but they also use gill-nets or other gear types. It can be expected that the economic performance of such mixed vessels is largely influenced by the dominant gear; Danish account statistics for instance show that gross outputs of multipurpose vessels are in the magnitude of those of trawlers for most size classes, usually slightly lower.

Specific details are discussed in the context of the results in chapter 4.

Main determining factors of economic performance and approach for quantification

For the economic analysis, the following simplified output (income) and cost positions were taken into consideration:

Output

- Value of landings
- Other incomes, including particularly other turnover (e.g. from angling tours), subsidies, compensations

Costs

- Fuel and lubricants
- Maintenance (vessel, gear, etc.)
- Wages (incl. flexible shares of crew, excl. wage to owner)
- Other variable costs (ice, landing & sales costs, etc.)
- Insurances, administrative costs etc.
- Other fixed costs
- Depreciation (vessel, gear, etc.)
- Interests (income - expenditure)

The difference between output and cost positions (including interests) is regarded as profit or loss, before tax (tax is not considered).

Unpaid labour of the vessel owner and his family is not taken into consideration here (unlike some other economic statistics on fisheries, which calculate a shadow price for this); remuneration of this labour is included in the profit.

The following figure shows these cost and income positions as well as their data sources:

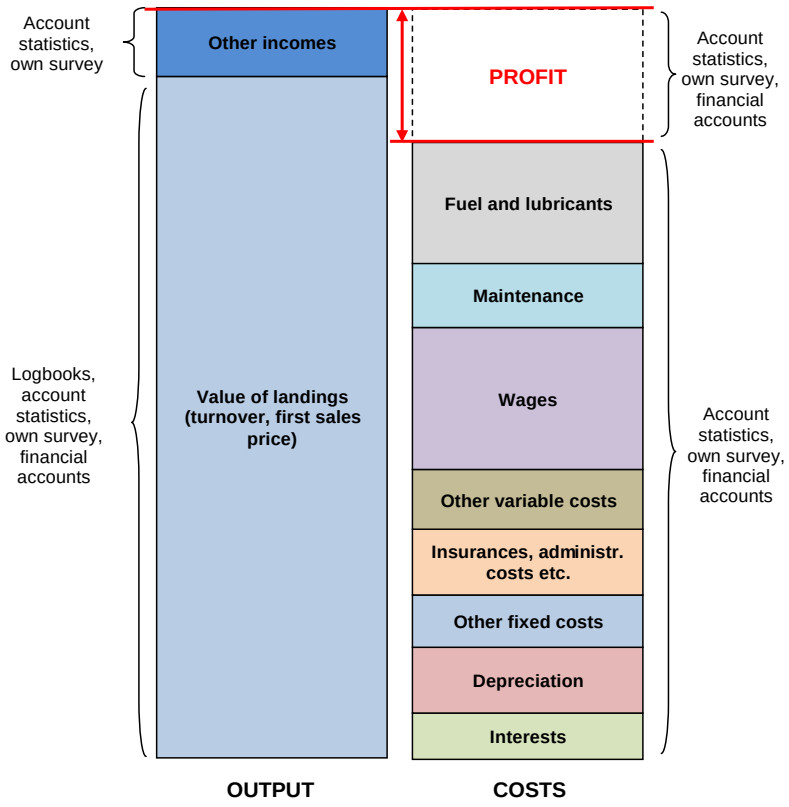

Figure 3.5: Main cost and output positions used in the economic analysis.

With this background, the economic analysis was carried out in three major steps:

1. The value of landings in *absolute figures* (euro) was calculated for each gear-size-class as discussed above. Main basis were logbook data, which were in a further step compared to data from account statistics or account data of individual firms and where necessary adjusted.
2. The *relative share* of the output and cost positions as well as of profit were calculated based on account statistics, individual account data and other information.
3. Both data were combined in a way that the absolute figures on landing data were used to calibrate the relative share of the different output, cost and profit positions and calculate a monetary value for them.

This general method was adapted to the data available for each country and fleet segment.

Calculation of output and cost data for Denmark

Landing data

The most solid empirical basis was available for the values of landings. In the case of DK, this was obtained from the logbook data described above. Values of the landings had been requested from the institutions in charge, but were not made available for reasons of data confidentiality and, presumably, of effort required to calculate them.

The following main steps have been undertaken to process the data on value of landings:

- Linking of logbook data to the Community Fleet Register via vessel registration number (per year, as registration numbers are sometimes used for different vessels in dif-

ferent years) in order to identify the exact vessel length and to group the vessels into more detailed length classes than given in the original data sets
- Multiplying of landing weight with average fish price for the specific species and year (calculated from landings and values of ICES subdivision 3C22 for the years 2005-2007 and taken from general prices statistics of the Danish Fisheries Directorate for 2008, where the before mentioned data were not available)
- Grouping of resulting data into the major gear groups gill/trammel net, trawl net, seine net, pound net and others. In the original data, catches were broken down by specific gear and species for each year. For this study, the specific gear was grouped into the above mentioned major gear classes and the value of landings per gear class and year was calculated. It turned out that 46% of the vessels had used only gear of one of these five gear groups, 41% of two, 12% of three and 1% of four gear groups. Every vessel was assigned to the gear group which had generated the highest value of landings (by year).

The resulting data were compared to the official Danish account statistics for the specific (or comparable) gear and length class. For bigger vessels (which presumably operate beyond the immediate region of investigation), both results matched very well, while for some smaller vessel classes, the value of landing calculated for the target area was considerably below the Danish average reported in the official statistics.

There are some reasons to assume that the value of landings in the 6 rectangles considered is below the Danish average. One is the regional breakdown of Danish account statistics, where the region Sjælland, Lolland, Falster and Møn has by far the lowest gross output per fishing firm. Unfortunately, these statistics are not broken down by vessel gear-size-class, so that no direct comparison has been possible. Another reason may be the limited quotas of cod, which is of high economic importance for fisheries in this area.

On the other hand, there are some factors that may have led to an underestimation of the value of landings in our calculations:

- The prices used for calculations were either average prices for the area (ICES subdivision 22) in 2005-2007 or for whole Denmark in 2008. Smaller vessels may, however, fetch a better price due to a higher product quality (e.g. gill net herring vs. trawl net herring) or to better marketing possibilities in local areas.
- While the landing data used were received as full data sets covering all landings of the vessels concerned, experience shows that data recorded from small scale fisheries may be affected by some shortcomings and might not be absolutely complete.

Moreover, the official account statistics may suffer from a certain bias as well. One problem may be that the sample covered entails more active and professionally operated vessels than fishermen primarily working on a sideline basis, since the latter may be less willing to submit their account details. As mentioned above, our analysis of all vessel data for the region suggests that some of the smaller vessels are not employed in full-time professional fisheries. Finally, it is possible that the categorisation of vessels into gear groups was undertaken following slightly different criteria.

As a precautionary approach and in order to avoid any possible underestimation of the value of landings of smaller vessels, it was decided to average out the value of landings calculated on the basis of our landing data and those reported by the official Danish account statistics. Chapter 4 presents the results of own calculations, official statistics and the calculated average of both data sets.

Data for other fisheries and non-fisheries incomes of fishing firms were taken from the official account statistics as a percentage of the value of landings.

Cost data

Main source of cost data were the official Danish account statistics. Only to a limited extend, own cost data could be established in interviews or through bookkeeping data provided by the fishing firms.

The absolute figures for the individual cost positions were scaled from the official figures at the relation determined before between the calculated average landings for a vessel group and the respective figures of the official statistics.

Profit/loss data

Main source for the calculation of profit and loss also were the official account statistics, again scaled by the factor calculated before. It may well be discussed if it is adequate to scale costs and profit in the same way as landings, as some fixed costs do accrue independently of the output. Nevertheless, this approximation seemed justified as fishermen will in most cases adjust at least some of their fixed costs to their output situation in the long run. In the few cases where independent data were available these seemed to support the general range of the profits calculated here. In addition, despite of considerable efforts, not better data on profits could be established.

Calculation of output and cost data for Germany

Landing and income data

For Germany, landing weight and value were calculated from the mentioned logbook data of 39 vessels. Some record sets contained values of landing. From these data, average prices per year and species were calculated. With these, the value of landing was calculated for the remaining records sets by multiplying weight and the price.

The resulting data on value of landing were compared to other sources, in particular to annual account data and to results of the AER. The general magnitude of the value of landings was confirmed by the other sources and/or those sources did not provide a sound basis to modify the own data.

Where landing values and annual accounts were available for one vessel, results in some cases exactly matched, while there was some difference in other cases, usually higher turnovers in annual accounts. These were calculated as additional incomes from fisheries. A reason for such differences may be that fishermen could sell a part of their catch to end consumers or other clients, who pay more than the first sales prices in the logbook data. Also other turnovers, e.g. from angling tours, processing of fish etc. may be the reason for a higher turnover in the accounts.

Cost data

Main source for the relative share of the individual cost positions was taken from the annual account, bookkeeping data and corresponding questionnaires. As the study could only built on voluntary cooperation of the sector and all together only data for 15 vessels/firms were available, these data were considered fully representative for the different fleets segments of the area.

Results were therefore compared to:

- Results of the German fisheries accountancy data network
- Results of the AER for the vessel group matching best (passive gear below 12 m in case of gill net fisheries and demersal trawl 12 to below 24 m in case of trawling.
- Danish account statistics, which are much more elaborated than all data available on the German fleet.

In Chapter 4, data from the different sources are presented for every gear-size-class as well as the resulting adjustment. As seen only minor modifications of the primary results of the own account data survey have been made, mainly in cases where the data in the sample were deemed not fully representative e.g. with respect to the share of family-own labour or age of the vessel.

Profit/loss data

Profit data were generated in the same was as cost data.

Overall evaluation of the data sources and confidence of the economic analysis

To generate data on the economic situation of the sector turned out to be a very sensitive issue. As participation was voluntary, only a limited empirical base could be established. In addition, also official data are often not specific enough for the regional situation and/or only of limited value for these analyses for other reasons.

As a result, the economic analysis was mainly based on empirical data, but, to a lesser extent, also had to be based on expert judgement and qualitative information gained during the work. Nevertheless, data from the different sources all together matched quite well and confirmed the general picture. For the purpose of this study, i.e. the evaluation of possible economic impacts of the Fehmarnbelt Fixed Link on fisheries, the reliability of the data appears sufficient and the data considerably well based.

3.2.4 Experiences from other fixed links

Over the past 20 years, the structure and regulations to the fisheries have undergone considerable changes. Similarly, gathering fishery statistics and the requirements for filling out logbooks etc. have also been changing during the same period. Because of this, the foundation of the fishery statistics is not comprehensive and precise enough to make assessments of such detail that it is possible to thoroughly quantify the impact to the fisheries from the establishment of the fixed links.

3.2.5 Data foundation

The description of the fisheries is largely based on catch data from logbook registrations and local water declarations from the Danish Directorate of Fisheries, and from official registration of landings during the period 1986 to 2008. VMS (Vessel Monitoring System) data showing movement of large commercial vessels (≥15 m) on an hourly basis, was also analysed for the years 2005 to 2009.

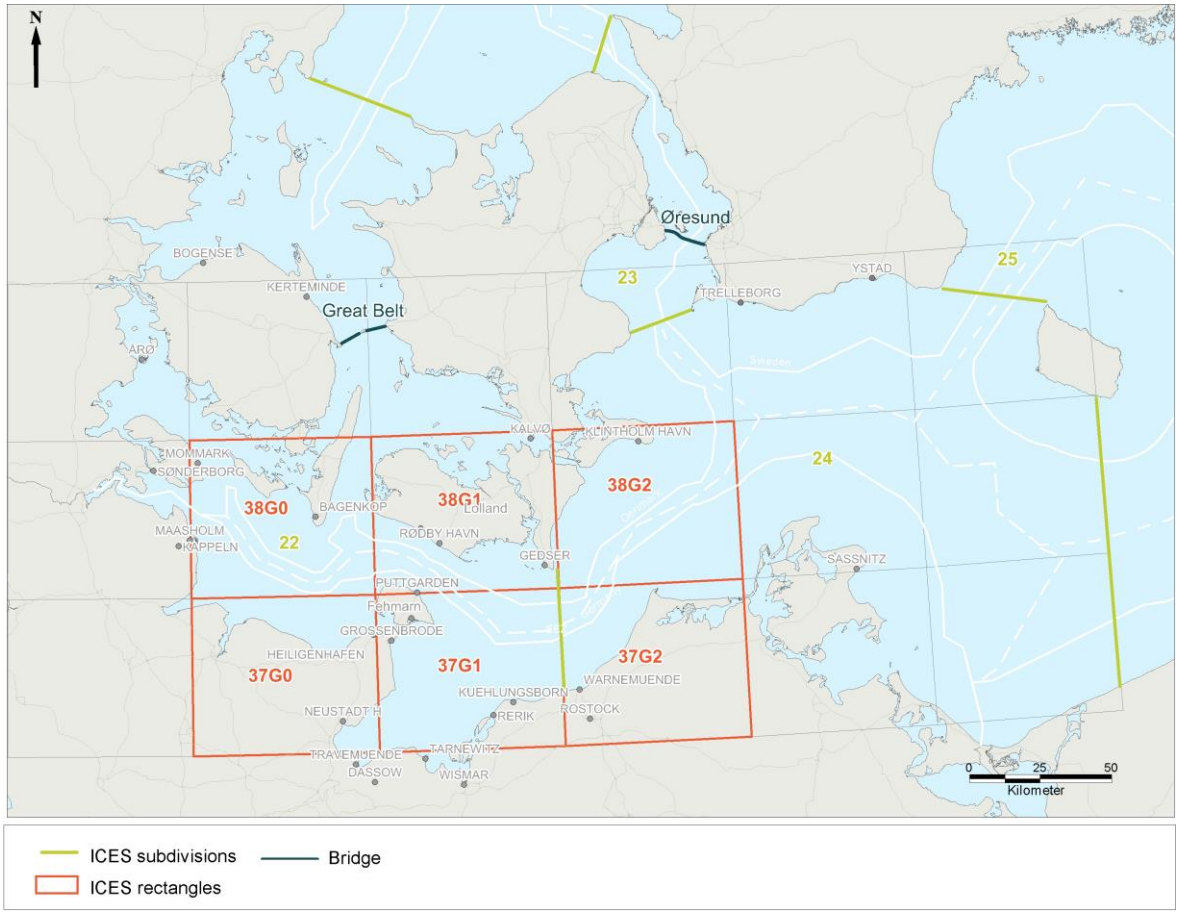

Figure 3.6: The ICES subdivisions and the ICES rectangles representing the area around the Great Belt Fixed Link (39G0 & 39G1) and the area around the Øresund Fixed Link (40G2).

Several conditions create difficulties for interpreting and using the official fishery statistics. One of the most prominent problems are that vessels less than 8 meters (<8 m) are not required to fill out logbooks, but only a coastal water declaration where the location of the catch is given in much larger areas (ICES subdivisions: Western Baltic and inner regional waters (ICES 22 (3C)) or Øresund (ICES 23 (3B)), see Figure 3.6. Thus, it is only possible to relate catches to particular ICES rectangles (30x30 nautical miles) from vessels that are equal to or larger than 8 meters (10 meters prior to 2005). An exception to this was in 1994-1996 when all commercial fishing vessels fishing in ICES 22, 23 and 24 were required to fill out logbooks regardless of their length. It should also be noted that vessels under the length required to fill out logbooks in certain instances chose to fill out logbooks anyway. Assuming that smaller vessels generally fish a short distance from their basis harbours, it is possible to approximate some catches to more local areas than the information given in the coastal water declarations.

Information on the impacts during the construction and operation of The Great Belt and Øresund fixed links was also gathered through interviews with commercial and recreational fishermen and their related organisations representing the fisheries in these areas. Interviews included questions regarding fishery related experiences before, during and after the construction and operation of the fixed links. This information was supplemented by a summary of results from relevant reports investigating the impacts to the fisheries. Representatives for the commercial and recreational fishermen that have some or all of their fisheries near the bridges in the Great Belt were interviewed (Appendix).

4. Results

4.1 Baseline – ICES and fleet statistics

This section gives and overview on harbours, fleet, landings and values and the geographical distribution of the fisheries in the near field and regional area of Fehmarnbelt.

4.1.1 Fleets, landings and values in the Western Baltic

An overview of the German and Danish harbours in the near field and regional area, covering ICES rectangles 38G0, 38G1, 38G2, 37G0, 37G1 and 37G2, of Fehmarnbelt, is given in Figure 4.1.

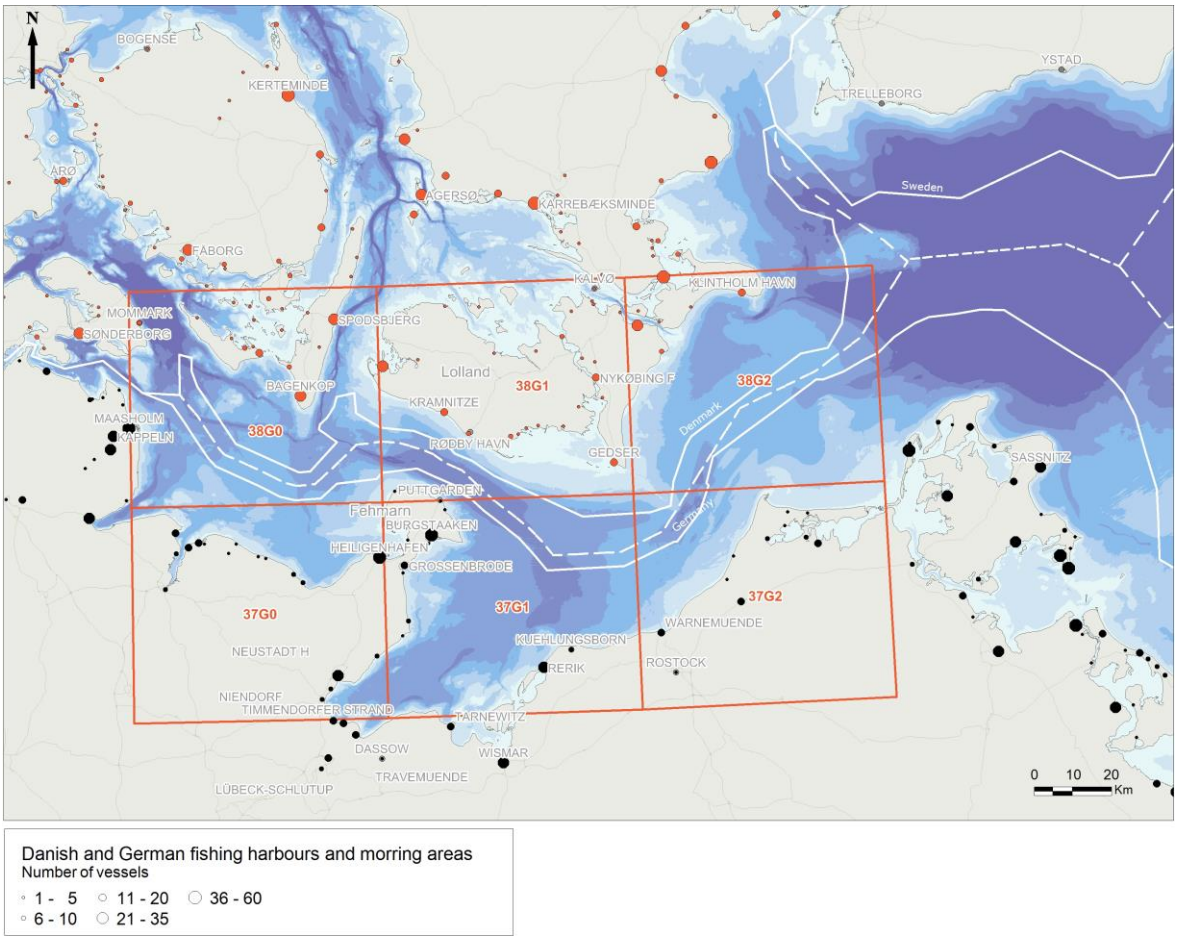

Figure 4.1: Map of the 6 ICES rectangles representing the near field (38G1 and 37G1) and regional area (38G0, 37G0, 38G2 and 37G2) of Fehmarnbelt and the location of the Danish and German harbours in the Western Baltic.

4.1.2 German fleet statistics

An overview of the number of German fishing vessels (≥8 m) that have fished (registered landings) from the near field of Fehmarnbelt (ICES 38G1 and 37G1) and its regional area (ICES 37G0, 38G0, 37G2 and 38G2) according to their gear use are given in the following section.

Near Fehmarnbelt - ICES 38G1 and 37G1

The development and number of vessels that fished (recorded landings) in the near field area of Fehmarnbelt (ICES 38G1 and 37G1) according to primary gear is given in Figure 4.2 and Table 4.1.

The largest number of German vessels fished in the ICES rectangle 37G1 (185-203 from 2005-2008), which is the area southeast of Fehmarnbelt. In comparison, the total number of German vessels that fished in the area closer to Fehmarnbelt (ICES 38G1) was between 14-25 (2005-2008).

In ICES 37G1, both trawling and gill/trammel net fishing was undertaken by approximately the same number of vessels (approximately 80-90 vessels) in recent years (2005-2008). Although there appears to be a large increase in gill netters from 2005, this increase is probably an artefact of a change in the rules for the fisheries, because as of 2005, smaller vessels (8-10 m), which are typically gill netters, were required to register their landings in logbooks. Consequently, more vessels (typically gill netters) registered their fisheries in ICES rectangle data. This assumption is supported by the large increase in vessels that use passive gear in the length group 8-11.9 m as of 2005.

In ICES 38G1, between 7-21 German trawlers annually fished in this area from 1998-2008. After the number increased from 10 to 17 from 2004-2006, this number once again decreased, and approximately 13 trawlers have fished in or near Fehmarnbelt in the most recent years (2007-2008).

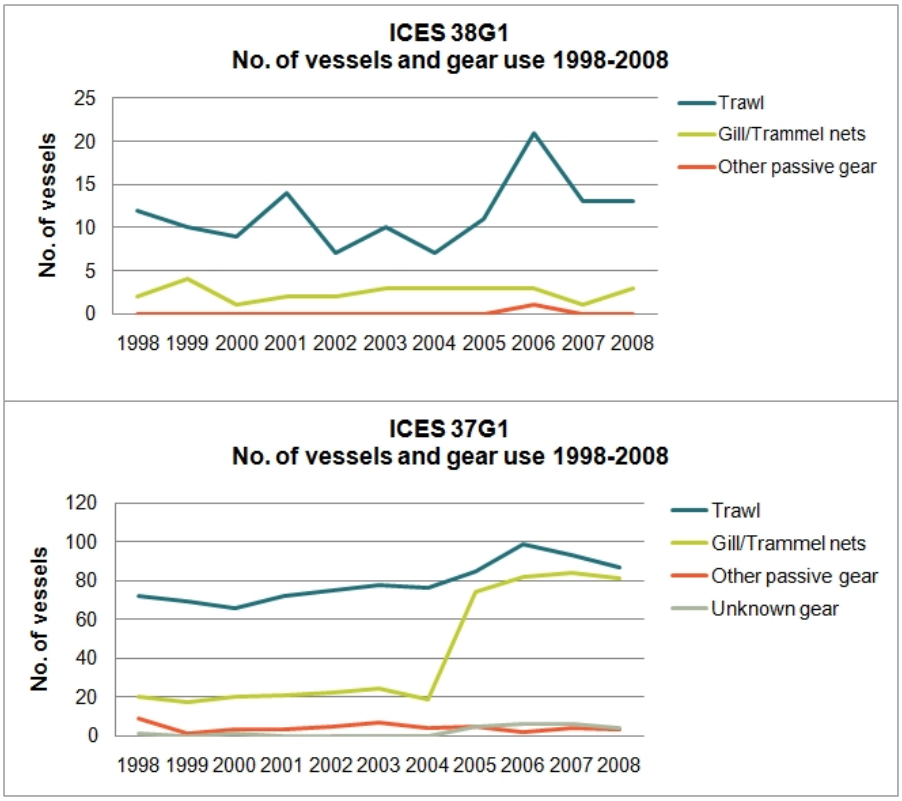

Figure 4.2: The development of the number of German vessels that fished (recorded landings) in the near field area of Fehmarnbelt (ICES 38G1 and 37G1) according to their primary gear use (trawl, gill nets, other passive gear (longlines, hand-lines, rods and dredges) and unknown gear) from 1998-2008. This data includes vessels ≥8 m (≥10 m before 2005).

Table 4.1: The number of German vessels in different length groups (8-<12 m, 12-14.9 and ≥15 m) and according to primary gear types (trawl, gill/trammel nets, seine nets and other passive gear) that have registered catches from ICES rectangles 38G1 and 37G1 in the near field of Fehmarnbelt

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1		14	14	10	16	9	13	10	14	25	14	16
8-11.9 m	**Trawl**	1	1			1	1	2	1	5	2	3
	Gill/Trammel nets	2	2	1	2	2	3	3	3	2	1	2
	Other passive gear									1		
12-14.9 m	**Trawl**						1		1	4	1	1
	Gill/Trammel nets									1		
≥15 m	**Trawl**	11	9	9	14	6	8	5	9	12	10	9
	Gill/Trammel nets		2									1

37G1		102	93	96	102	109	119	104	185	229	213	203
8-11.9 m	**Trawl**	6	4	6	5	6	7	8	16	18	13	16
	Gill/Trammel nets	18	14	18	20	20	20	17	71	80	80	77
	Other passive	7	7	7	6	9	12	7	18	41	29	29
	Unknown								4	5	5	4
12-14.9 m	**Trawl**	10	7	8	8	8	9	9	11	14	15	16
	Gill/Trammel nets		1	2	1	2	3	2	2	2	4	2
	Other passive gear			1	1		1			1	1	1
	Unknown	1		1					1	1	1	
≥15 m	**Trawl**	56	58	52	59	61	62	59	58	67	65	55
	Gill/Trammel nets	2	2				1		1			2
	Other passive gear	2		1	2	3	4	2	3			1

Another primary source of fishing with gill/trammel nets is the number of vessels with lengths less than 8 meters (≤8 m) (see Table 4.2). These vessels are not accounted for in the vessel data for the ICES rectangles because they are not required to register their landings in logbooks. The vessels are, however, part of the fishing fleet that undertake fishing activity in the Fehmarnbelt area, particularly those that have their basis harbour in the near vicinity.

The potential number of small vessels (<8 m) that fish in Fehmarnbelt is considered to be represented by the number of these vessels that have their basis harbours adjacent or relatively close to Fehmarnbelt, as vessels this small generally operate within a limited distance from their basis harbour. The total number of small vessels (<8 m) in German near field harbours adjacent Fehmarnbelt, that are registered as undertaking commercial fisheries, is given in Table 4.2.

Table 4.2: The number of small vessels (<8 m) in near field harbours adjacent Fehmarnbelt that are registered as undertaking full or part-time (sideline) commercial fisheries.

Number of small (<8 m) commercial and sideline fishing vessels in German harbours adjacent Fehmarn Belt

Harbour	Vessel <8 m	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Burgstaaken	commercial	19	19	21	23	23	23	24	24	23	22	22
Heiligenhafen	commercial	46	46	44	43	41	37	32	29	24	23	20
Großenbrode	commercial	11	11	11	11	11	11	9	9	9	8	8
Orth	commercial	9	9	10	8	8	6	6	6	5	5	5
Puttgarden	commercial	-	-	1	2	2	2	2	2	2	2	1
Total		85	85	87	87	85	79	73	70	63	60	56

Overall, there has been a decrease in the number of small vessels (<8 m) in the harbours around Fehmarnbelt from 87 as late as 2001 to 56 in 2008. The decline has primarily been observed in Heiligenhafen harbour, whereas the numbers of small vessels in the other harbours have only slightly declined over the last 5 years (Table 4.2).

Regional area of Fehmarnbelt - ICES 38G0, 37G0, 38G2 and 37G2

The development and number of German vessels fishing (recorded landings) in the regional area of Fehmarnbelt (ICES 38G0, 37G0, 38G2 and 37G2) according to their primary gear is given in Figure 4.3 and Table 4.3. This data includes vessels ≥8 m (≥10 m before 2005).

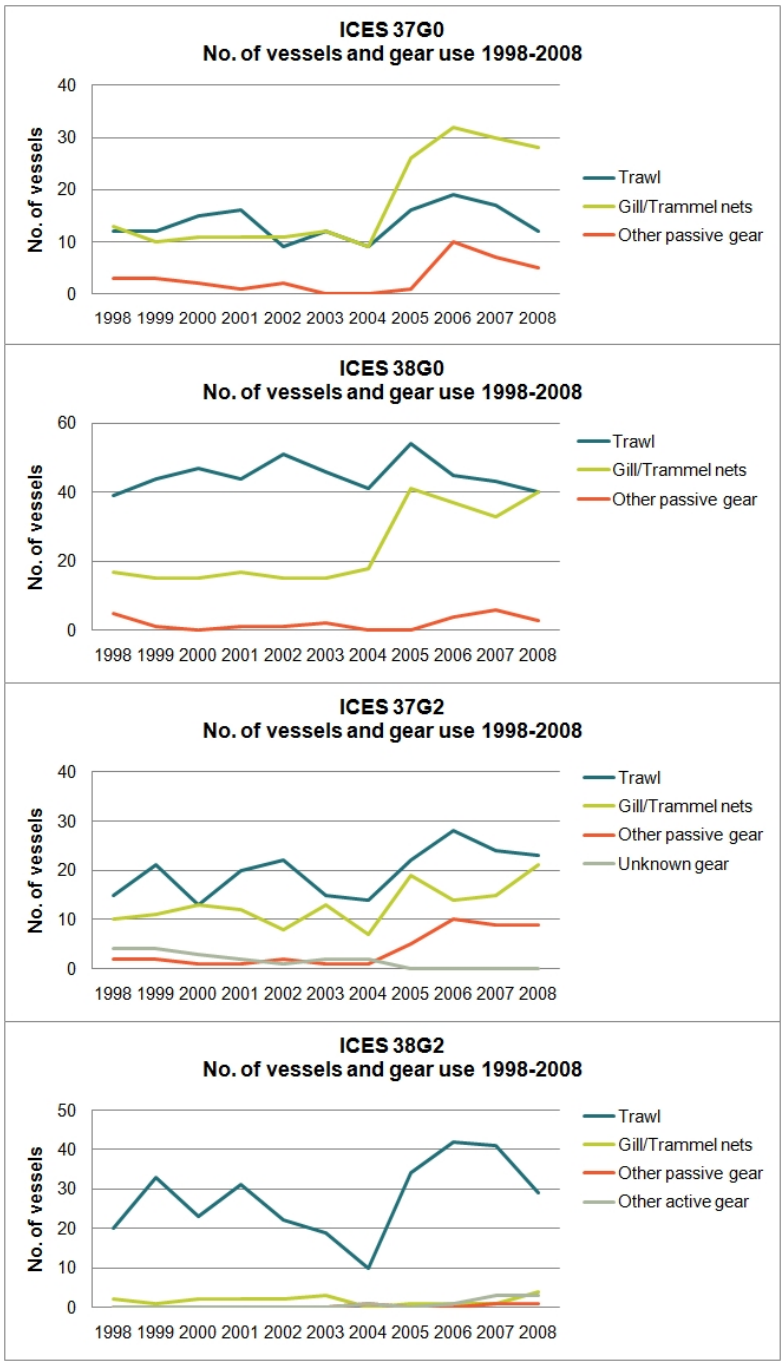

Figure 4.3: The development of the number of vessels and their gear use in the regional area of Fehmarnbelt (ICES 37G0, 38G0, 37G2 and 38G2) from 1998-2008. This data includes vessels ≥10 m before 2005 and vessels ≥8 m from 2005-2008.

Table 4.3: Number of German fishing vessels and their primary gear types fishing in ICES 37G0, 38G0, 37G2 and 38G2 from 1998-2008.

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0		28	25	28	28	22	24	31	43	61	54	45
8-11.9 m	**Trawl**	3	3	3	4	3	5	6	6	8	5	2
	Gill/Trammel nets	11	9	10	10	9	10	9	25	31	28	27
	Other passive gear	2	3	2		2			1	10	7	5
12-14.9 m	**Trawl**	2	1	1	1	1	2	3	2	5	5	4
	Gill/Trammel nets	2	1	1	1	2	2		1	1	2	1
	Other passive				1							
≥15 m	**Trawl**	7	8	11	11	5	5	13	8	6	7	6
	Other passive gear	1										
38G0		61	60	62	62	67	63	59	95	86	82	83
8-11.9 m	**Trawl**	7	7	10	11	11	10	9	12	10	8	11
	Gill/Trammel nets	13	13	13	14	12	13	15	38	34	31	39
	Other passive gear	2	1		1	1	2			1	1	1
12-14.9 m	**Trawl**	10	10	13	8	12	12	11	15	14	14	10
	Gill/Trammel nets	4	2	2	3	3	2	3	2	3	2	1
	Other gear	3								1	2	1
≥15 m	**Trawl**	22	27	24	25	28	24	21	27	21	21	19
	Gill/Trammel nets								1			
	Other gear									2	3	1

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G2		31	38	30	35	33	31	24	46	52	48	53
8-11.9 m	**Trawl**	1		1	2	2		1	5	5	3	4
	Gill/Trammel nets	8	9	11	10	5	11	6	17	13	14	18
	Other passive gear	2	2	1	1	2	1	1	5	10	9	8
	Unknown	4	4	3	2	1	2	2				
12-14.9 m	**Trawl**	2	3	4	3	4	3	3	5	5	2	3
	Gill/Trammel nets	2	2	2	2	3	2	1	2	1	1	3
≥15 m	**Trawl**	12	18	8	15	16	12	10	12	18	19	16
	Other active gear											1
38G2		22	34	25	33	24	22	12	35	44	46	37
8-11.9 m	**Trawl**		1		2	2	2	1	1		1	1
	Gill/Trammel nets	2	1	2	2	2	2		1	1	1	3
	Other passive gear										1	1
12-14.9 m	**Trawl**	2	3	1	2	2		1	4	1	4	1
	Gill/Trammel nets						1					
	Other passive gear							1				
≥15 m	**Trawl**	18	29	22	27	18	17	8	29	41	36	27
	Gill/Trammel nets											1
	Other active gear							1		1	3	3

In the regional area of Fehmarnbelt, more German vessels utilize the area to the west of Fehmarnbelt where 126-138 vessels have annually fished in ICES 37G0 and 38G0 since 2005, In comparison, 81-96 vessels have annually fished in the area to the east of Fehmarnbelt (ICES 37G2 and 38G2) during the same period. The number of German vessels fishing east of Fehmarnbelt have, however, been increasing in recent years (2005-2008). This is mainly attributed to an increasing number of trawlers.

Overall, German vessels using gill nets and other passive gear, as well as vessels using trawls are represented in the fisheries both to the east and west of Fehmarnbelt.

4.1.3 German near and regional field landings and value

The annual landings, landings according to basis harbours, and landings according to landing harbours in the near and regional field of Fehmarnbelt (6 ICES rectangles 37G0, 37G1, 37G2, 38G0, 38G1 and 38G2) are given in the following section.

The annual German landings (tons) and proceeds (euro) from the near field and regional area of Fehmarnbelt (6 ICES rectangles 37G0, 37G1, 37G2, 38G0, 38G1 and 38G2) from 1998-2008 are given in Table 4.4.

The combined landings and value of the German fisheries in the near field and regional area of Fehmarnbelt have ranged from 8,699-13,239 tons and 8-14 million euro over the past decade (1998-2008). Over the last couple of years (2007 and 2008) landings have decreased from a peak of 13,239 tons (10.4 million euro) to 9,315 tons (8.1 million euro).

Table 4.4: The total landings (tons) and value (1,000 euro) of the German fisheries in the near field of Fehmarnbelt and regional area of the Western Baltic (ICES rectangles 37G0, 38G0, 37G1, 38G1, 37G2 and 38G2).

Landings (tons)

ICES Rectangles	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	936	1,228	1,104	958	790	709	764	660	620	629	401
38G0	2,662	3,407	3,003	2,678	2,686	2,763	3,048	3,835	3,025	2,477	2,028
37G1	4,364	6,068	5,889	4,560	6,314	5,502	4,662	4,796	6,591	5,355	5,339
38G1	241	453	260	156	85	188	93	181	885	178	127
37G2	349	660	1429	594	558	711	812	438	683	647	612
38G2	148	521	198	221	390	453	68	652	1,434	1,785	808
	8,699	12,337	11,885	9,169	10,823	10,326	9,447	10,562	13,239	11,071	9,315

Value (1000 euro)

ICES Rectangles	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	1,194	1,586	1,621	1,550	1,364	1,085	1,175	903	862	938	640
38G0	2,749	4,175	3,811	3,952	2,913	2,481	2,571	2,541	2,490	2,360	1,652
37G1	4,761	6,809	6,531	5,697	5,336	4,027	3,816	4,794	5,480	5,550	4,538
38G1	319	655	392	240	158	236	122	110	478	218	197
37G2	504	559	626	662	603	693	676	485	520	625	585
38G2	193	306	202	187	220	118	35	371	919	883	476
	9,718	14,090	13,183	12,288	10,595	8,639	8,395	9,203	10,748	10,574	8,087

An overview of the annual average landings and the annual average value of the landings of the most important commercial species in the German fisheries according to the 6 ICES rectangles representing Fehmarnbelt and its region are given in Figure 4.4 and Figure 4.5.

Figure 4.4 and Figure 4.5 summarize the 11 year (1998-2008) annual average landings and value of the landings in the German fisheries for the most important commercial species in the ICES rectangles near Fehmarnbelt and the region according to logbooks.

The total annual average landings by German vessels in Fehmarnbelt (ICES 38G1) from 1998-2008 amounted to 261 tons. The total annual average of the landings in value in ICES 38G1 during the same period (1998-2008) amounted to 279.000 euros, where cod was by far the most important species. Overall in the region, cod is quantitatively the species which are landed the most in the 4 ICES rectangles (38G0, 37G0, 38G1 and 37G1) representing Fehmarnbelt and the region to the west, whereas landings of herring dominates in the landings of the German fisheries to the east of Fehmarnbelt (ICES 38G2 and 37G2). ICES 37G1 located to the southeast of Fehmarnbelt is the most important fishing area with respect to both landings (averaging landings of 5,400 tons a year) and value (annual average of 5.2 million euro).

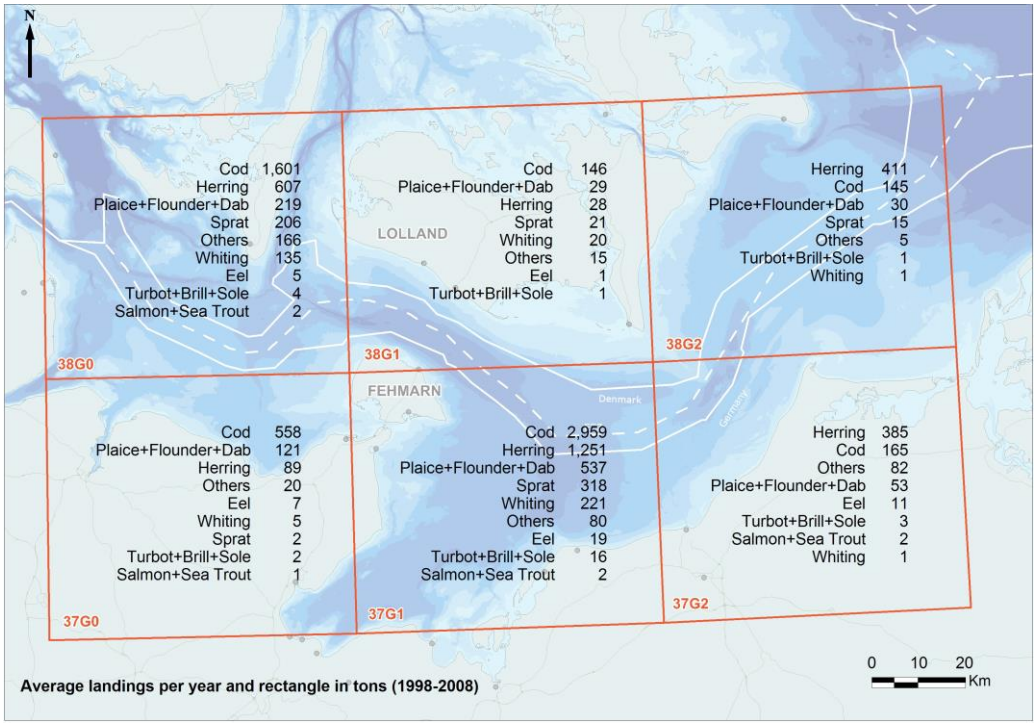

Figure 4.4: The average annual landings (tons) of the most important commercial species in the German fisheries in the near field of Fehmarnbelt and regional area of the Western Baltic (ICES rectangles 37G0, 38G0, 37G1, 38G1, 37G2 and 38G2).

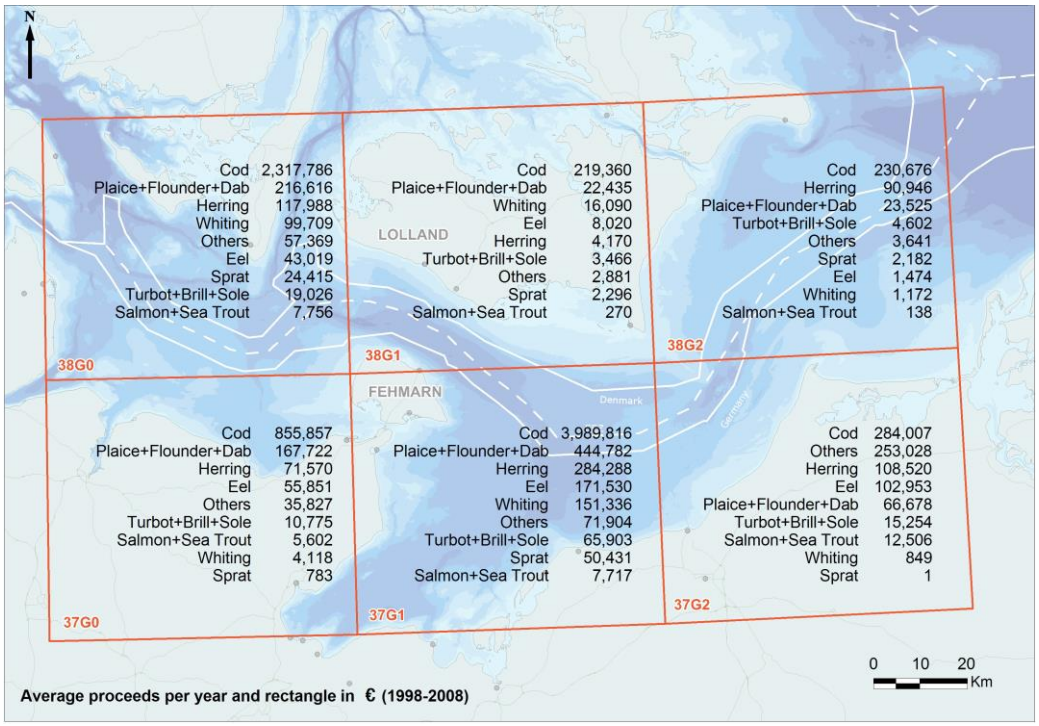

Figure 4.5: The annual average value (euro) of the landings of the most important commercial species in the German fisheries in the near field of Fehmarnbelt and regional area of the Western Baltic (ICES rectangles 37G0, 38G0, 37G1, 38G1, 37G2 and 38G2).

An overview of the annual average landings and the annual average value of the landings (proceeds) in vessel length groups, and annual average landings per gear group (active and passive) are given in Figure 4.6, Figure 4.7 and Figure 4.8.

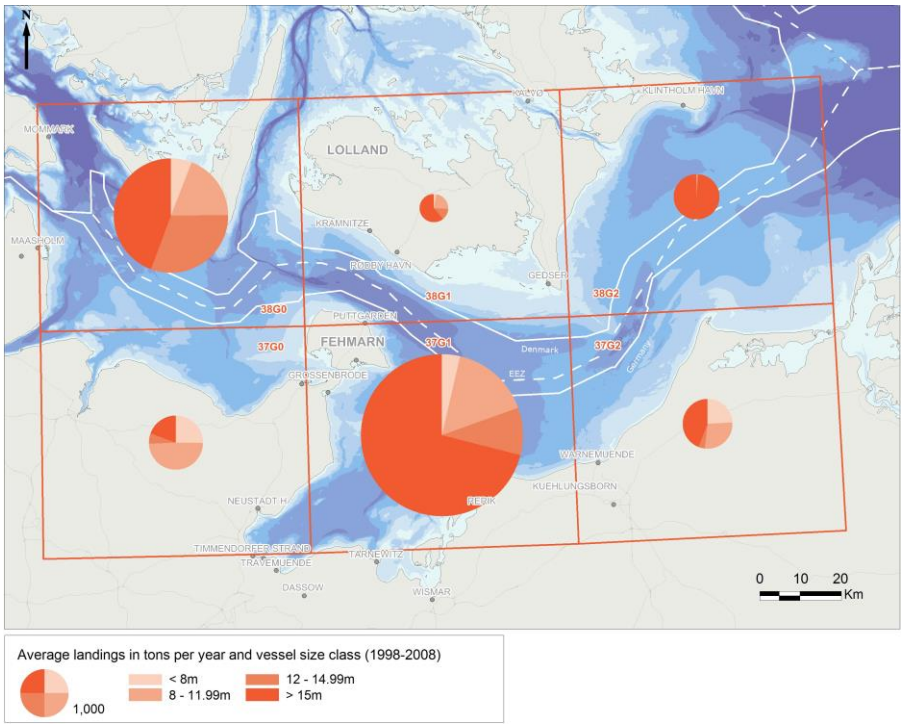

Figure 4.6: Annual average landings (tons) per year (1998-2008) in the German fisheries according to vessel size classes, in the near and regional field of Fehmarnbelt.

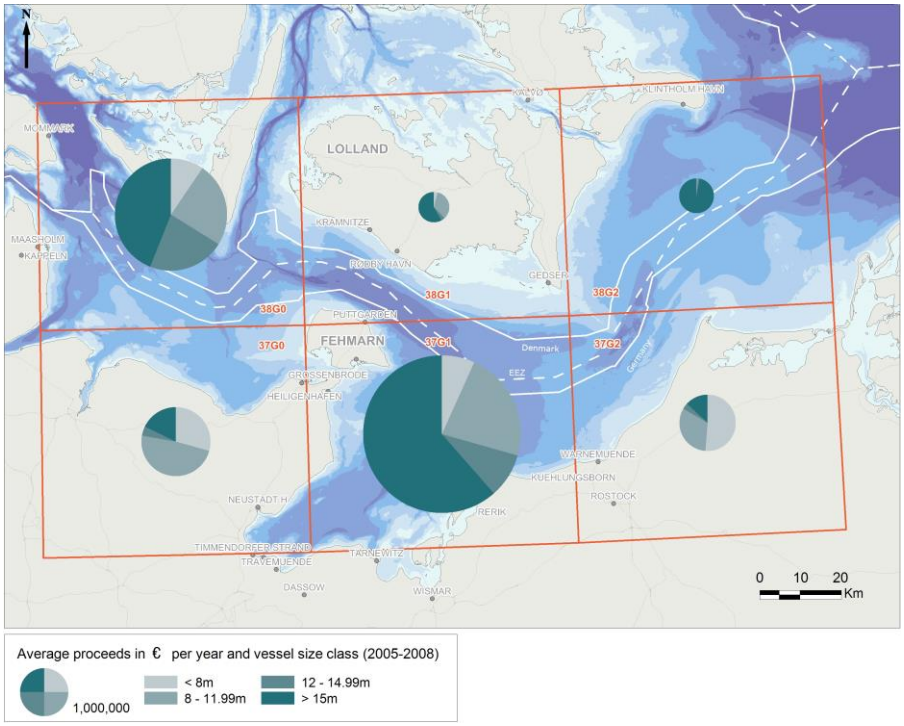

Figure 4.7: Annual average proceeds (euro) per year (1998-2008) in the German fisheries according to vessel size classes, in the near and regional field of Fehmarnbelt.

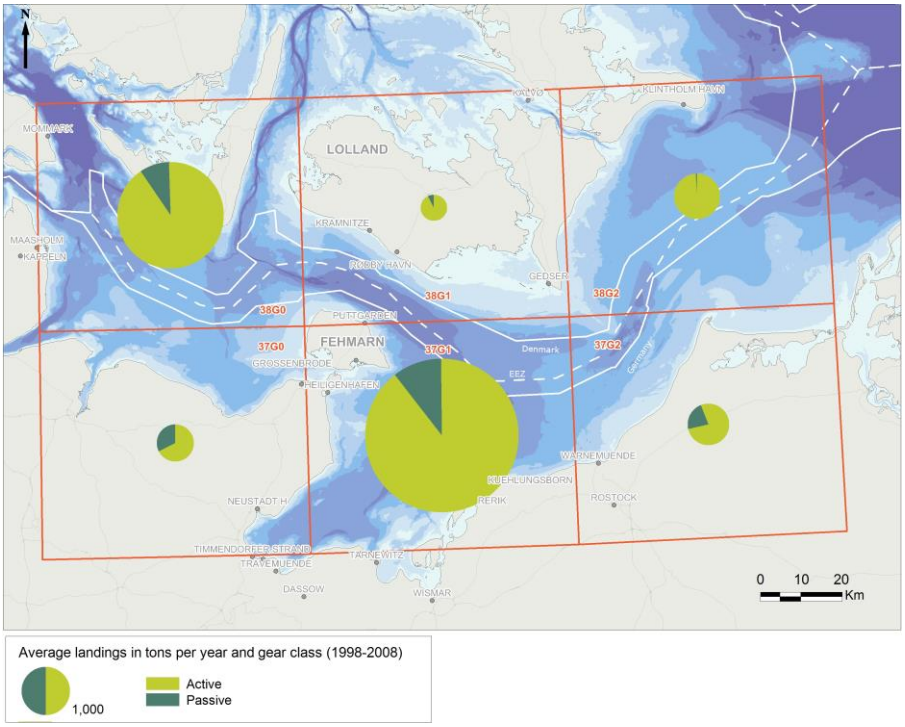

Figure 4.8: Annual average landings per year (1998-2008) in the German fisheries according to gear class groups (active and passive), in the near and regional field of Fehmarnbelt.

The annual average landings per year according to the basis harbours of the vessels fishing in the 6 ICES rectangles of the near and regional field of the Fehmarnbelt is shown in Figure 4.9.

Vessels from a number of German harbours undertake their fisheries in the Western Baltic region of Fehmarnbelt (Figure 4.9). Of the most important in terms of amount of landings, are vessels that have their basis harbour in Burgstaaken (landings of between 1,801-3,000 tons annually) and vessels from Heiligenhafen (landings of between 871-1,800 tons annually). In the far western part of the Western Baltic, vessels from the harbours of Kappeln, Maasholm and Amis all land between 450-870 tons from their fisheries in the region of Fehmarnbelt. Similarly there are numerous harbours (i.e. Niendorf, Gothmund and Travemünde) in the southern part of ICES 37G1 that have vessels that land on average more than 100-200 tons annually from fisheries in the region of Fehmarnbelt.

The average landings per year (1998-2008) according to the landing harbours of the vessels fishing in the 6 ICES rectangles of the near and regional field of the Fehmarnbelt is shown in Figure 4.10.

Landings from the regional area of Fehmarnbelt show that the greatest amount of landings from the fisheries in the region are landed in the harbours of Kappeln (between 1,700-1,850 tons annually) and Maasholm (301-560 tons) in the far west. Similarly, a comparatively large amount of landings from fisheries in the region are landed in the harbours of Burgstaaken and Heiligenhafen (landings between 561-1,700 tons annually in each harbour). The vast majority of the commercial species landed in these near field harbours are cod and flatfish (Table 4.5).

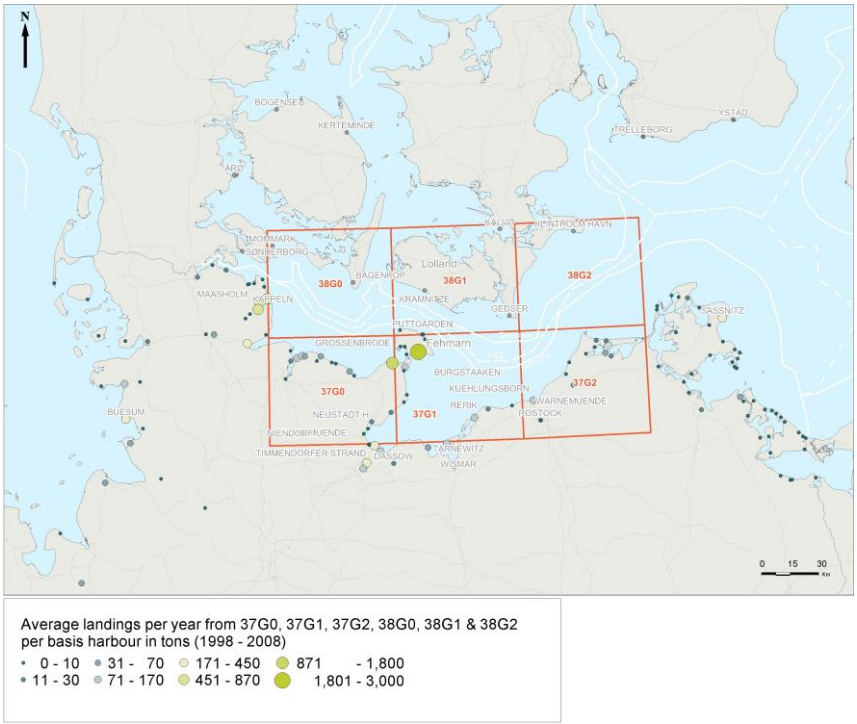

Figure 4.9: An overview of the average German landings (tons) per year from 6 ICES rectangles (37G0, 37G1, 37G2 , 38G0, 38G1 and 38G2) in the Western Baltic according to the basis harbours of the vessels. (BLE, 2010).

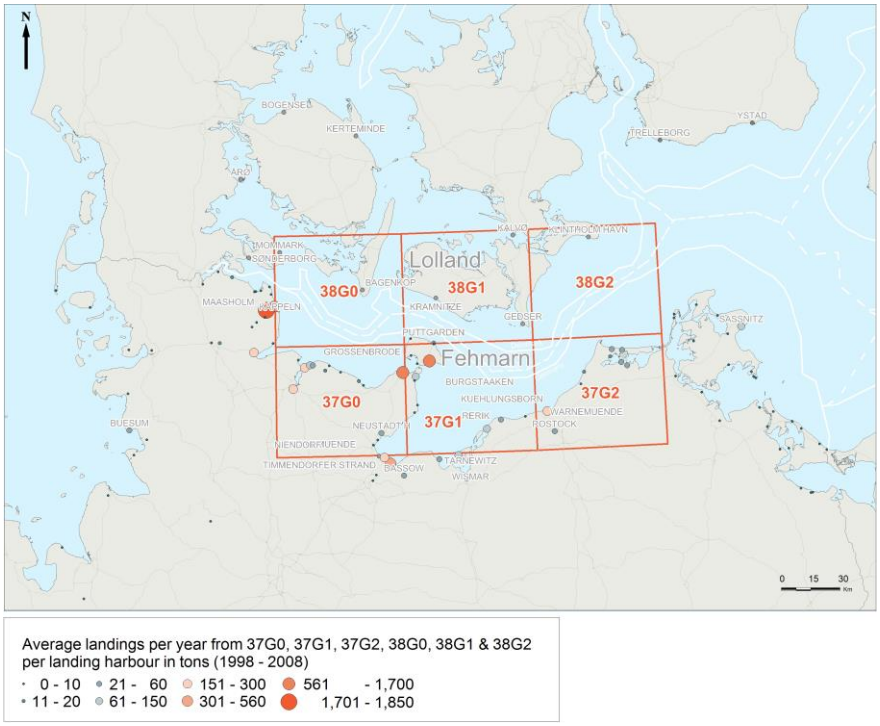

Figure 4.10: Annual average landings from German vessels fishing in 37G0, 37G1, 37G2, 38G0, 38G1 and 38G2 per landing harbour (1998-2008). (BLE, 2010).

A more thorough description of the German fisheries in the near field (ICES 37G1 and 38G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) of Fehmarnbelt are described in their respective sections.

An overview of the seasonal landings of the most important commercial species in the German fisheries (average monthly landings and value (euro) of landings) from the 6 ICES rectangles of the near and regional field of Fehmarnbelt is given in Figure 4.11.

Seasonal patterns in the monthly landings of cod show this important species is predominantly landed in the winter (peak in January) and early spring. Landings of cod decrease during the spring and summer months (March-July) and increase once again during autumn and on into winter (August-December) (Figure 4.11). In contrast, the landings of herring (predominantly landed from the area east of Fehmarnbelt), increased over the late winter and early spring months (peak in March) as the onset of the spawning migration commences. Thereafter, landings of herring decline again as spring progresses to summer. The seasonal landings of sprat follow the same pattern as herring (Figure 4.11) and are landed primarily from February-April. The overall seasonal value of the landings follows the landings of cod because of their greater value compared to herring and sprat, which are often landed in almost equal amounts quantitively.

The seasonal trend in the landings of diverse flatfish also shows that the most abundant species (flounder, dab and plaice) are primarily landed during the early spring (January-March) and again in the autumn and early winter (September-December). This pattern is primarily because a large number of flatfish are caught as bycatch in the demersal fisheries after cod. During the summer months the net fisheries often target the more valuable flatfish species turbot, brill and some sole, which is reflected in these species contributing a greater amount to the values in the summer fisheries, despite their relatively small amount of landings (Figure 4.8).


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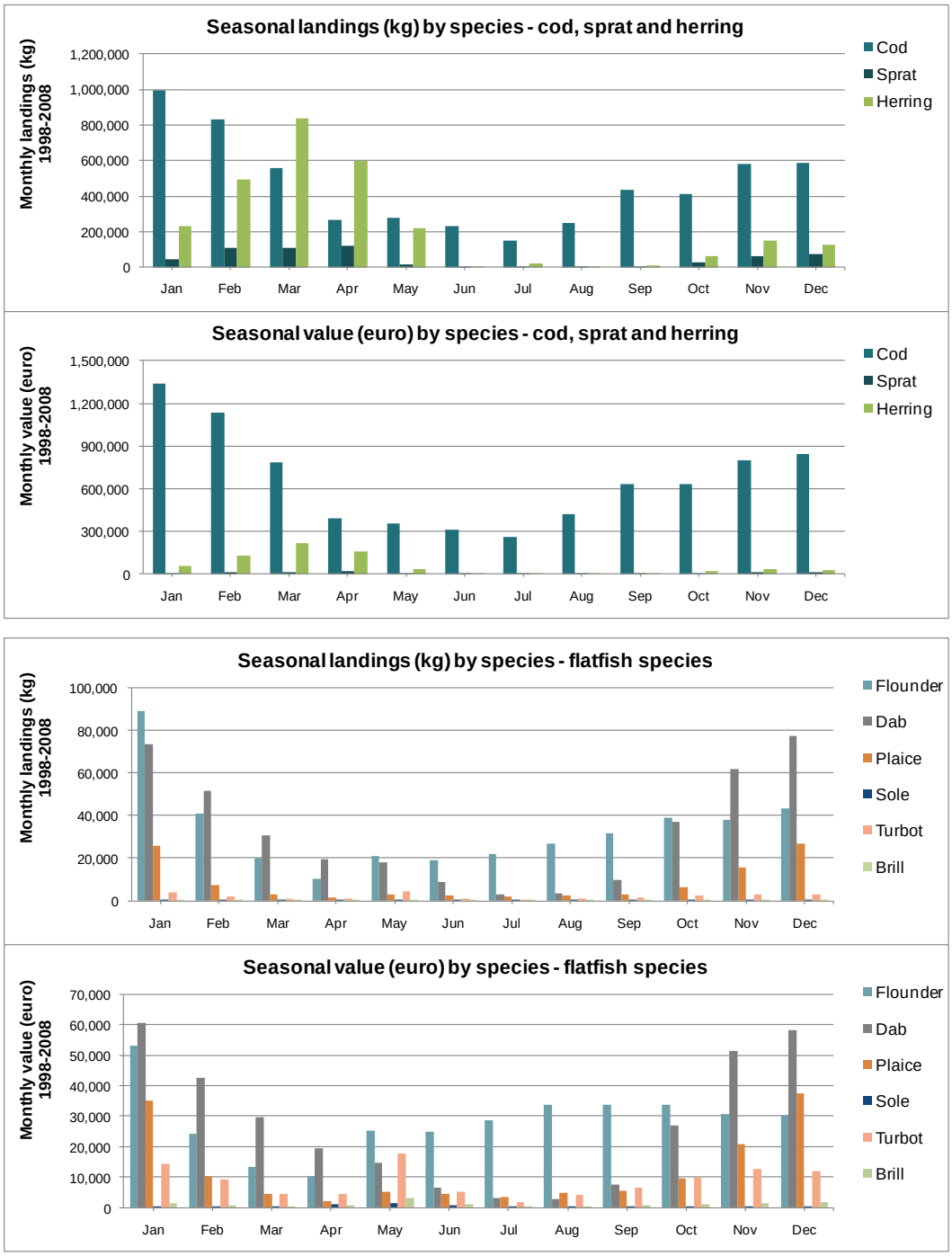


Figure 4.11: The monthly landings (kg) and value (euro) of the most important commercial species in the 6 ICES rectangles (ICES 37G0, 38G0, 37G1, 38G1, 37G2 and 38G2) in the near and regional field of Fehmarnbelt.¨

Near Fehmarnbelt - ICES 37G1 and 38G1

Logbook records of the landings and value from the ICES rectangles 37G1and 38G1 recorded from 1998-2008 by the Bundesanstalt für Landwirtschaft (BLE) in Hamburg are shown in Table 4.5.

ICES 37G0 and 38G0

Table 4.5: Landings (tons) and value (1000 euro) of the most commercially important species from the ICES rectangles 37G1 and 38G1 from 1998-2008. Derived from German logbook data.

37G1 - Landings (tons)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	3,588	4,783	4,029	3,323	2,690	2,184	1,900	2,665	2,887	2,586	1,913
Sprat	24	29	19	19	12	132	387	447	669	783	976
Baltic herring	191	168	937	553	3,084	2,517	1,233	636	1,867	1,200	1,377
Flounder	127	384	487	345	220	160	228	84	28	283	384
Dab	15	150	77	60	84	294	424	270	302	305	295
Plaice	152	149	68	29	24	16	30	31	32	42	31
Turbot	31	15	15	13	14	6.6	8.0	11.1	15.1	17.6	15.9
Brill	0.2	0.5	0.2	0.1	0.7	1.7	1.7	2.5	2.0	3.4	4.1
Sole	142	0	0	0	0	0	0	0	0	0	0
Flatfish unknown	41	43	52	46	51	28	34	0	0	0	0.1
Whiting	31	124	176	134	100	133	392	468	446	107	315
Horse mackerel	0	0	0	0	0	0	0	0	170	0	0
European eel	18	25	19	28	23	18	15	17	22	13	14
Salmon	0.1	0.2	0.4	0.8	1.6	0.2	0.2	0.2	0.2	0.2	0.2
Sea trout	< 0.1	0.0	< 0.1	0.7	0.4	0.5	0.7	0	0	0	2.7
Garfish	0.0	0.6	1.5	1.4	4.7	3.0	4.0	5.6	1.2	4.8	3.1
Unspecified	2.1	15.6	6.0	5.0	2.5	4.0	1.6	157	149	11	4.3
Diverse	0	180	2.4	3.2	1.7	2.7	2.5	< 0.1	0	0	3.6
Total (tons)	4,364	6,068	5,889	4,560	6,314	5,502	4,662	4,796	6,591	5,355	5,339

37G1 - Value (1,000 euro)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	3,941	5,413	5,458	4,701	3,890	2,787	2,498	3,756	4,042	4,253	3,147
Sprat	18	12	14	12	7.1	32	35	45	83	149	148
Baltic herring	77	59	158	166	741	542	252	152	429	276	276
Flounder	97	219	323	276	188	142	190	47	22	240	271
Dab	12	121	64	55	61	189	269	186	256	268	226
Plaice	183	227	92	41	32	24	39	44	47	55	38
Turbot	106	61	55	48	50	27	34	48	67	78	73
Brill	0.4	1.6	0.6	0.3	1.6	3.8	4.6	8.0	7.6	11	21
Sole	98		0	0	0	0	0	0	0	0	0
Flatfish unknown	41	36	61	54	64	44	49	0	0	0	0.2
Whiting	22	73	128	88	71	66	292	339	305	99	181
Horse mackerel	0	0	0	0	0	0	0	0	20	0	0
European eel	164	216	165	246	212	161	134	154	197	114	125
Salmon	1.5	1.7	5	4.4	4.0	3.2	4.4	3.5	2.4	1.7	1.4
Sea trout	0.1	0	0.1	2.5	1.9	2.0	2.6	0	0	0	15
Garfish	0	1.1	3.1	2.9	7.5	5.0	7.7	9.7	3.1	6.9	6.9
Unspecified	0	0	0	0	0	0	0	0	0	0	0
Diverse	0	367	4.9	0	2.9	0	4.8	< 0.1	0	0	9.8
Total	4,761	6,809	6,531	5,697	5,336	4,027	3,816	4,794	5,480	5,550	4,538

38G1 - Landings (tons)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	220	383	218	130	72	121	62	39	173	93	91
Sprat	0	0	0	0	0	0	0	0	196	27	3.8
Baltic herring	0.9	0.5	3.7	1.1	0.4	15.7	1.3	93	186	0	1.8
Flounder	3.0	8.7	9.6	11	4.0	8.3	3.9	0.5	0.0	11.1	13.8
Dab	2.5	21	11	7.3	3.0	38	22	10	47	41	13
Plaice	3.8	6.1	2.6	1.1	0.4	1.0	0.5	0.3	1.4	2.9	1.8
Turbot	1.5	1.4	0.5	0.4	0.3	0.5	0.3	0.2	0.6	0.6	0.6
Brill	< 0.1	0.1	0.1	0	0.2	0.2	0.1	0.2	0.2	0.3	0.7
Sole	6.2	0	0	0	0	0	0	0	0	0	< 0.1
Flatfish unknown	0.2	< 0.1	0.3	2.3	< 0.1	0	0	0	0	0	0
Whiting	2.8	3.3	12	1.4	0.5	0.5	2.7	37	158	2.4	0.6
Horse mackerel	0	0	0	0	0	0	0	0	115	0.0	0.0
European eel	0.4	1.1	1.8	1.3	3.6	2.3	0.4	0	< 0.1	0	0
Salmon	< 0.1	0	0	0	< 0.1	0	0	0	0	0	< 0.1
Sea trout	0	0	0	< 0.1	< 0.1	< 0.1	< 0.1	0	0	0	< 0.1
Garfish	0	0	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0	0	0	0
Unspecified	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0	1.2	7.3	< 0.1	0.1
Diverse	0	29	0	0	0	0	0	0	0	0	0
Total (tons)	241	453	260	156	85	188	93	181	885	178	127

38G1 - Value (1,000 euro)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	291	535	340	211	121	177	96	59	250	164	169
Sprat	0	0	0	0	0	0	0	0	21	3.9	0.5
Baltic herring	0.5	0.2	2.8	0.5	0.2	2.1	0.8	15	23	0	0.5
Flounder	1.6	4.1	6	6	2.1	4.5	2.1	0.2	0	6.5	6.2
Dab	2.1	18	10	7	2.7	30	15	7.2	35	34	12
Plaice	6	9	3.6	1.4	0.8	1.7	0.8	0.5	2.1	4.1	2.4
Turbot	6	6	2.1	1.6	1.6	2.5	1.5	1.2	3.0	2.3	2.5
Brill	0.1	0.4	0.3	0.0	0.6	0.7	0.3	0.5	0.5	1.0	3.2
Sole	5		0	0	0	0	0	0	0	0	< 0.1
Flatfish unknown	0.1	0.0	0.6	1.1	< 0.1	0.0	0.0	0	0	0	0
Whiting	2.7	3.1	12	1.1	0.3	0.6	1.8	26	127	1.8	0.4
Horse mackerel	0	0	0	0	0	0	0	0	16	0	0
European eel	3.8	11	16	9	29	16	3.4	0.0	0.3	0	0
Salmon	<1	0	0	0	< 0.1	0	0	0	0	0	0.2
Sea trout	0	0	0	0.1	< 0.1	0.2	0.2	0	0	0	0.2
Garfish	0	0	0.1	0.0	< 0.1	< 0.1	< 0.1	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0	0	0
Diverse	0	68	0	0	0	0	0	0	0	0	0
Total	319	655	392	240	158	236	122	110	478	218	197

The total amount of landings in ICES 37G1 have fluctuated between 4,364-6,591 tons from 1998-2008 (Figure 4.12). This amounted to corresponding values in euro of between 3.8-13.3 million (Table 4.5).

Figure 4.12: The development of the landings in ICES 37G1 and 38G1 from 1998-2008. Data derived from German logbooks.

In ICES 37G1 the most important species for the commercial fisheries were Atlantic cod, Baltic herring and sprat. Together they made up between 92-99% of the landings by weight from 1998-2008. Landings of cod peaked at 4,783 tons in 1999, but over the last 5 years have been lower and fluctuated between 1,900-2,887 tons. The landings of cod in 2008 were 1,913 tons.

Landings of Baltic herring were generally lower from 1998-2001 (168-937 tons) then increased considerably in 2002 (3,084 tons). Since then, landings have generally decreased, but have remained between 1,200-1,800 tons over the last 3 years (2006-2008). Landings of herring amounted to 1,377 tons in 2008. The flatfish species flounder and dab have consistently made up the majority (by weight) of the landings of flatfish. Landings of whiting have also contributed significantly to the total landings over the years (100-446 tons from 1998-2008). Silver and yellow eel have contributed to the landings with 13-22 tons a year over the last 5 years (2004-2008).

In ICES 38G1, the total amount of landings from the German commercial fisheries has fluctuated between 85-886 tons over the last 11 years (Figure 4.13). The highest recorded catch was in 2006 and is attributable to an increase in landings of cod, herring and sprat as well as an unusually greater catch of whiting and horse mackerel that year. In general, Atlantic cod (390-173 tons from 2004-2008) along with bycatch of different flatfish species (primarily dab and flounder) make up the majority of the landings from this area.

In ICES 37G1 and 38G1, trawling accounted for the large majority (>80 %) of the landings and revenue from fisheries in both of these areas (Figure 4.13). Landings have been much greater in ICES 37G1, where landings from trawlers have amounted to 3,727-5,652 tons (2.7-4.1 million euro) over the last 5 years (2004-2008). The net fisheries (gill/trammel nets) in ICES 37G1 have been relatively stable and have annually fluctuated between 724-872 tons (717,000 to 932,000 euro) over the last 4 years (2005-2008). Landings from fishing in ICES 38G1 are considerably less than ICES 37G1. Landings from the trawling fisheries have amounted to 74-872 tons (90,000-461,000 euro) over the last 5 years (2004-2008). Landings from gill/trammel net fisheries In ICES 38G1 have decreased from approximately 52-95 tons (85,000-148,000 euro) from 1998-2002 to around 10-32 tons (12,000-52,000 euro) in recent years (2007-2008).

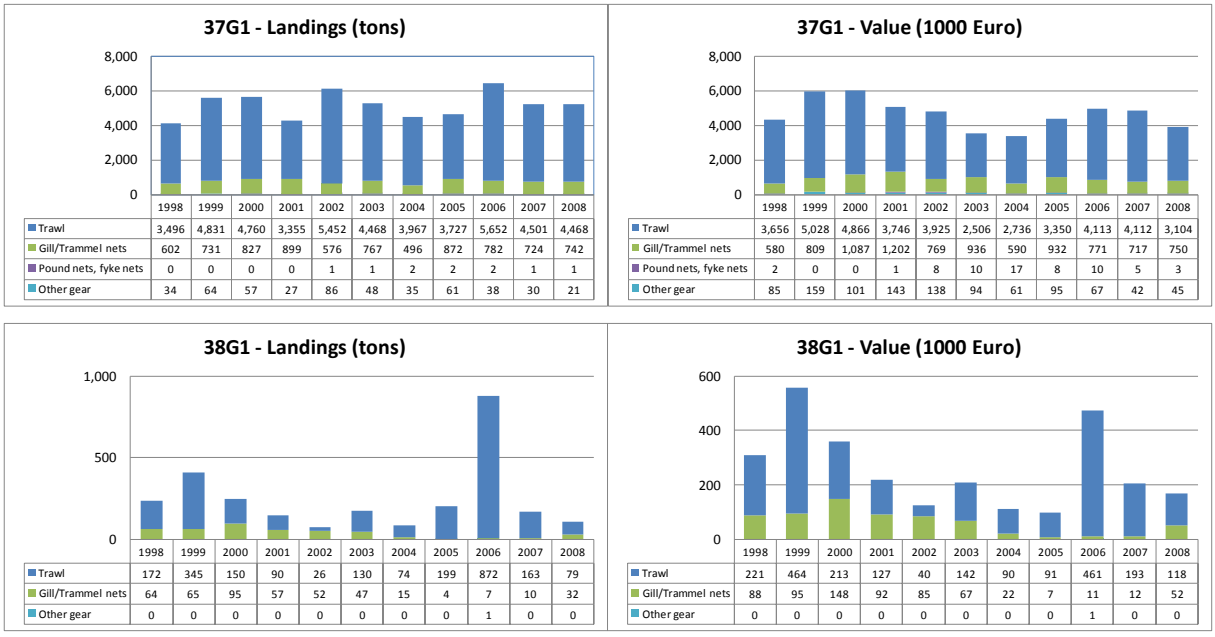


Figure 4.13: Average annual landings and proceeds per gear type (trawl, gill/trammel nets and other gear (longlines, hand-lines, fishing rod and dredges)) from the near field ICES rectangles (37G1 and 38G1).

The average annual landings in tons (1998-2008) from the near field ICES rectangles 37G1 and 38G1 according to the basis harbours of the vessels, and according to which harbours the catches were being landed are shown in Figure 4.14 and Figure 4.16, respectively.

German fishing vessels from the near field harbours of Burgstaaken (912-2,606 tons annually), Heiligenhafen (331-911 tons annually) and Grossenbrode (71-115 tons annually) undertake the greatest amount of the fisheries in ICES 37G1 and 38G1.The German fisheries in ICES 37G1 and 38G1 are also undertaken to a certain extent (annually average from 6-330 tons) by vessels that come from several harbours in the southern part of ICES 37G1 (Niendorf, Travemünde, Timmendorf and Wismar etc.). Similarly, vessels from the harbours of Kappeln, Maasholm and Arnis in the far western part of the Baltic also land 71-225 tons annually (Figure 4.14). The importance of the ICES rectangle 38G1, where Fehmarnbelt is located, to the local harbours of Heiliginhafen and Burgstaaken and some harbours to the far west of Fehmarnbelt is apparent when only illustrating the landings from Fehmarnbelt (Figure 4.12).

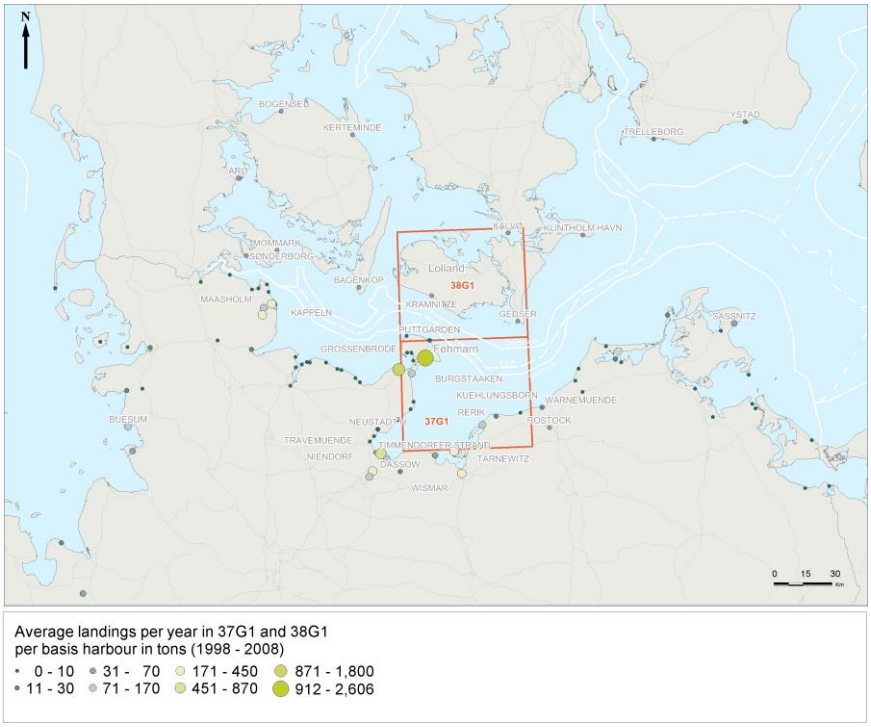


Figure 4.14: Average annual landings in tons (1998-2008) from the near field ICES rectangles 37G1 and 38G1 according to the vessels basis harbours.

The catches from the German fisheries in the near field of Fehmarnbelt (ICES 37G1 and 38G1) are predominantly landed in the harbours that are in its near vicinity indicating the importance of these harbours as landing bases. Landings at Burgstaaken and Heiligenhafen have annually averaged more than 1,500 tons and 1,120 tons, respectively from 1998-2008. Other harbours where the fisheries from ICES 37G1 and 38G1 are landed include Grossenbrode (50-150 tons annually), Niendorf (150-270 tons annually), Travemünde (540 tons annually) as well as Kappeln (150-270 tons annually) to the far west (Figure 4.15).

The average monthly landings and value of landings (1998-2008) for the most important commercial species for ICES rectangles 37G1 and 38G1 in the near field of Fehmarnbelt are given in Figure 4.17 and Figure 4.18.

Monthly landings of cod in both ICES 37G1 and ICES 38G1 show the cod fisheries are most active during the winter months and predominately in the first 3 months of the year (January-March), where after cod landings are comparatively low over the summer months and increase again during the autumn and over the winter Figure 4.17. The seasonal landings of

herring and sprat show that both are caught in both areas over a period from January-April. Landings of both of the pelagic species peak in March. There are also a few landings of these 2 species from October-December.

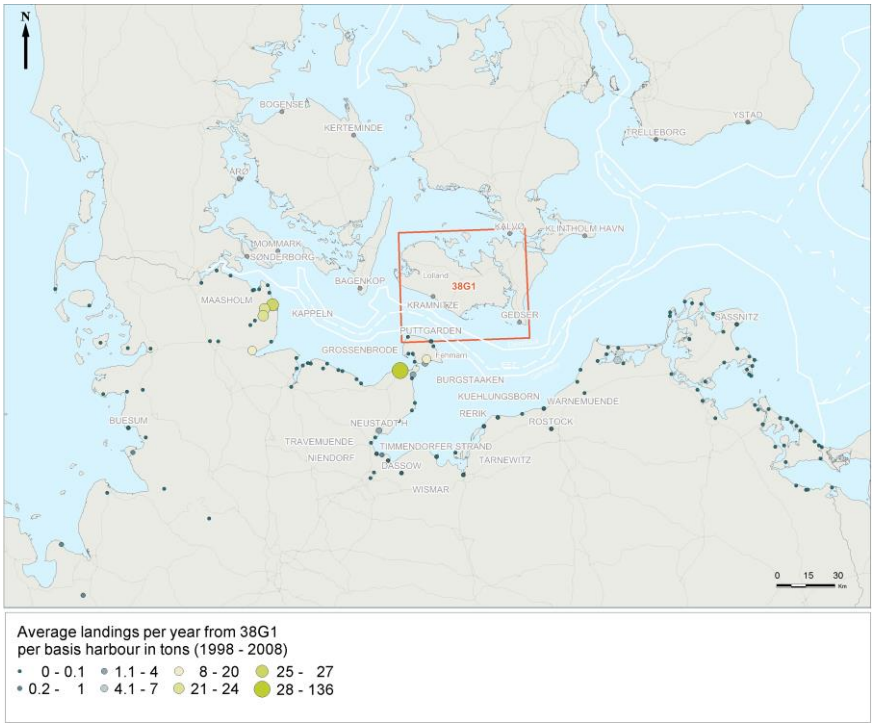


Figure 4.15: Average annual landings in tons (1998-2008) from the near field ICES rectangle 38G1 according to the vessels basis harbours.

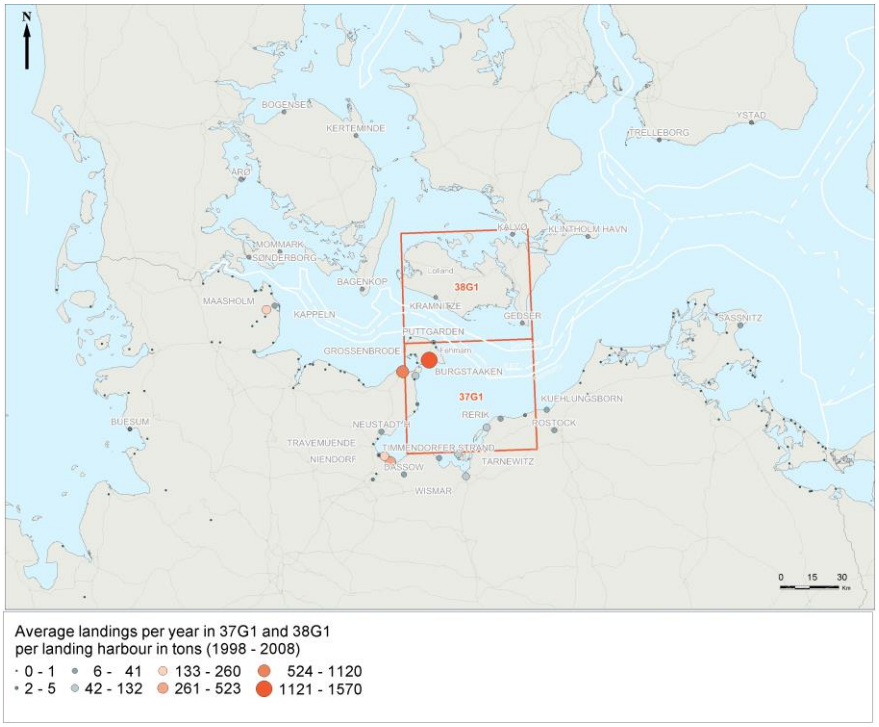


Figure 4.16: Average annual landings in tons (1998-2008) from the near field ICES rectangles 37G1 and 38G1 according to the landing harbours.

The seasonal pattern for the landings of the most abundant flatfish species flounder and dab, follow the landings of cod, as these species are typically a bycatch in the cod fisheries. In ICES 37G1, the seasonal landing of flatfish species is more continual throughout the year, as this ICES rectangle is primarily where the German fishermen allocate their efforts and thus fish more consistently during the year.

In general, the overall monthly value of the landings are strongly influenced by the greater value of cod, however some valuable flatfish species (plaice, turbot , sole and brill) contribute considerably to the value of the landings, especially during the months when landings of cod are very low (April-September) (Figure 4.18).

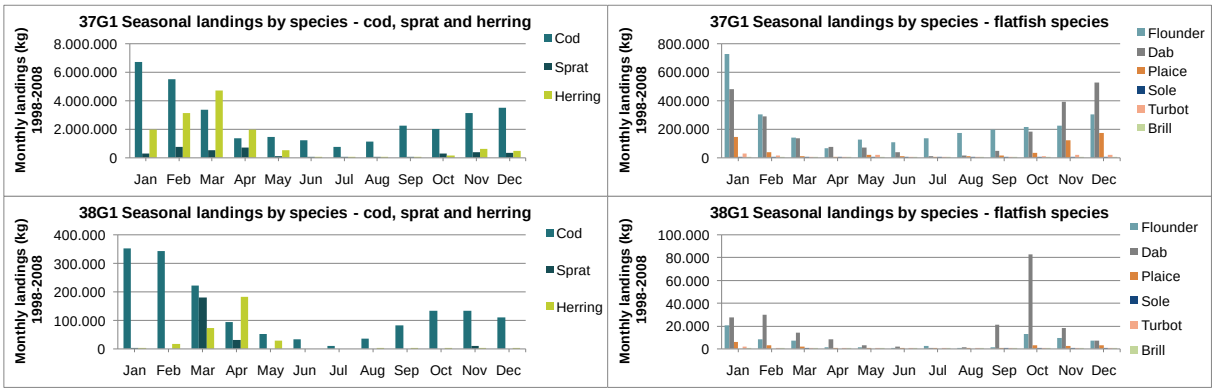


Figure 4.17: Monthly landings (1998-2008) of the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G1 and 38G1 in the near field of Fehmarnbelt.

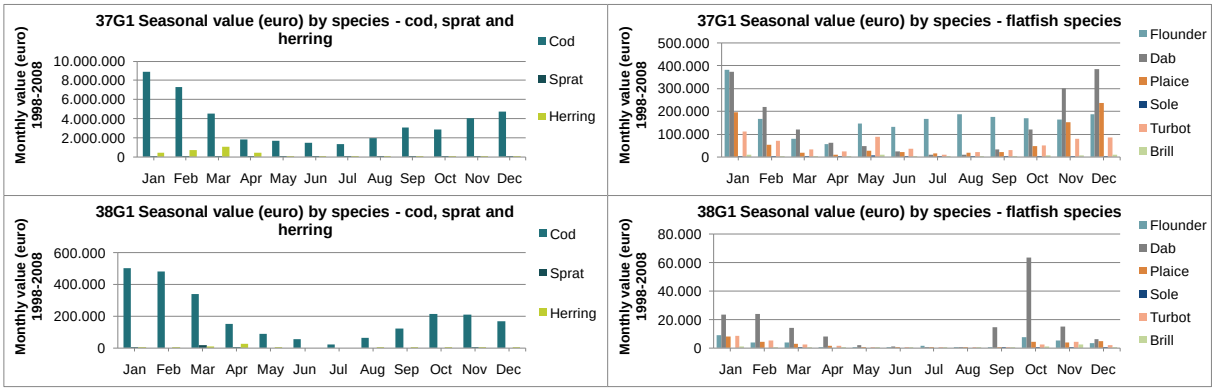


Figure 4.18: Monthly value (euro) of the German landings (1998-2008) of the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G1 and 38G1 in the near field of Fehmarnbelt.

Regional area of Fehmarnbelt - ICES 37G0, 38G0, 37G2 and 38G2

Logbook records of the landings and value from the ICES rectangles 37G0 and 38G0 recorded from 1998-2008 by the BLE are shown in Table 4.6.

Table 4.6: Landings (tons) and value (euro) of the most commercially important species from the ICES rectangles 37G0 and 38G0 from 1998-2008. Derived from German logbook data.

37G0 - Landings (tons)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	685	997	830	717	544	464	455	464	424	351	204
Sprat	0.7	0.5	2.6	0.1	0	0.2	0	0	0.9	21	< 0.1
Baltic herring	113	88	108	90	115	109	114	70	69	75	28
Flounder	19	38	50	39	32	34	44	1.3	0	73	85
Dab	7	34	31	30	25	54	86	54	62	89	60
Plaice	14.2	11.2	8.2	4.8	4.6	2.7	4.5	3.6	1.2	3.2	3.5
Turbot	1.8	1.3	2.8	1.5	1.9	0.9	1.4	1.0	1.1	2.8	2.3
Brill	< 0.1	< 0.1	0.1	< 0.1	0.1	0.4	0.4	0.3	0.1	0.6	1.9
Sole	35.1	< 0.1	0	0	0	0	0	0	0	0.2	0.3
Flatfish unknown	47	47	57	47	48	31	46	0	0	0	< 0.1
Whiting	2.6	1.3	4.5	5.4	8.2	0.7	5.2	6.6	3.5	6.2	5.7
Horse mackerel	0	0	0	0	0	0	0	0	0	0	0
European eel	5.7	7.1	8.9	12	9.1	8.8	5.7	4.0	4.8	3.0	3.5
Salmon	0.4	0.1	0.3	0.5	0.3	0.1	0.2	0.1	0.1	< 0.1	1.2
Sea trout	0.1	0	0	0.5	0.4	0.3	0.3	0	0	0	0.9
Garfish	0	0	0.1	0.1	< 0.1	0.2	< 0.1	0.1	0.1	< 0.1	< 0.1
Unspecified	3.9	3.0	0.7	0.2	1.0	2.7	1.1	55	53	3.8	3.4
Diverse	0	0.1	0	11	0	< 0.1	0	< 0.1	0	0	1.1
Total (tons)	936	1,228	1,104	958	790	709	764	660	620	629	401

37G0 - Value (1,000 euro)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	898	1,311	1,237	1,162	928	701	716	735	697	649	379
Sprat	0.8	0.5	2.7	0.2	0	0.2	0	0	0.7	3.5	< 0.1
Baltic herring	70	53	69	73	117	114	117	59	50	44	24
Flounder	21	33	59	53	51	52	78	1.2	0	102	101
Dab	7	31	30	33	28	47	73	51	62	86	58
Plaice	24	18	16	14	14	6.5	10	6.5	1.9	4.8	5.5
Turbot	7	5	11	7	9.4	5.1	8.3	5.6	6.0	12.9	10.7
Brill	0.0	0.1	0.4	0.0	0.3	1.1	1.0	1.5	0.3	2.5	10.2
Sole	31		0	0	0	0	0	0	0	0.1	0.3
Flatfish unknown	78	74	114	99	115	77	111	0	0	0	< 0.1
Whiting	2.4	1.1	3.5	4.9	8.7	0.6	4.4	5.2	4.1	6.9	3.5
Horse mackerel	0	0	0	0	0	0	0	0	0	0	0
European eel	49	59	77	96	84	75	50	33	38	25	29
Salmon	7	1.4	2.1	4.9	5.8	3.4	3.9	4.1	1.8	0.8	12
Sea trout	0.4	0	0	2.3	2.3	1.7	1.4	0	0	0	5.2
Garfish	0.0	0.0	0.1	0.1	< 0.1	1.0	< 0.1	0.2	0.1	0.1	< 0.1
Unspecified	0	0	0	0	0	0	0	0	0	0	0
Diverse	0	0.3	0	0	0	< 0.1	0	< 0.1	0	0	2.5
Total	1,194	1,586	1,621	1,550	1,364	1,085	1,175	903	862	938	640

38G0 - Landings (tons)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	2,034	2,862	2,318	2,273	1,564	1,507	1,404	1,111	1,136	955	445
Sprat	6.0	< 0.1	0.1	0	15	24	457	766	314	330	349
Baltic herring	389	116	265	68	840	852	700	1,035	982	776	660
Flounder	5.7	58	87	53	44	30	32	4.0	0.1	66.4	123.4
Dab	17	129	91	91	59	103	207	132	78	110	131
Plaice	41	76	60	23	15	14	24	15	9.3	21	47
Turbot	8.4	3.7	3.7	3.9	2.3	1.3	1.7	1.3	1.5	2.8	4.1
Brill	0.2	0.3	0.2	0.2	0.6	0.8	0.5	0.6	1.0	1.9	3.3
Sole	92.1	0	0	0	0	0	0	0	0	< 0.1	0.0
Flatfish unknown	30	73	101	62	43	41	66	0	0	0	0
Whiting	26	41	69	91	86	41	145	343	257	183	198
Horse mackerel	6.6	0	0	0	0	131	0	328	179	22	0
European eel	2.6	4.3	3.5	6.9	6.0	8.0	7.2	6.3	5.0	2.1	2.4
Salmon	0.4	1.1	3.1	3.1	4.0	0.5	0.2	0.3	0.1	0.1	0.2
Sea trout	0.1	0	< 0.1	0.7	0.6	0.4	0.4	0	0	0	2.5
Garfish	0	0.0	< 0.1	0.1	0.1	0	0	0	0.1	0	< 0.1
Unspecified	2.5	1.5	1.8	1.7	5.0	6.6	2.7	94	62	6.1	1.5
Diverse	0	41	0	0.4	2.3	2.8	< 0.1	0	0	0	61
Total (tons)	2,662	3,407	3,003	2,678	2,686	2,763	3,048	3,835	3,025	2,477	2,028

38G0 - Value (1,000 euro)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	2,420	3,607	3,316	3,512	2,428	1,990	1,940	1,757	1,933	1,740	851
Sprat	0.8	<1	0.1	0.0	2.8	2.9	47	82	36	47	50
Baltic herring	77	44	59	39	157	151	104	238	138	171	120
Flounder	4.5	41	63	44	40	36	28	1.4	0.1	67	111
Dab	14	106	84	104	59	85	161	100	69	107	111
Plaice	52	121	89	34	21	24	35	19	12	30	58
Turbot	32	19	15	14	9.2	6.0	8.0	6.1	7.1	13	20
Brill	0.7	0.9	0.7	0.7	2.2	2.7	1.4	2.5	5.5	7.6	15.8
Sole	71		0	0	0	0	0	0	0	0	0
Flatfish unknown	26	68	88	60	66	63	80	0	0	0	0
Whiting	22	31	60	74	67	26	98	238	217	155	109
Horse mackerel	0.8	0	0	0	0	15	0	35	24	3.5	0
European eel	23	38	28	60	52	67	62	58	46	18	21
Salmon	4.8	4.8	8	7	8.1	4.5	3.8	4.6	1.7	0.7	1.7
Sea trout	0.3	0	0.0	2.7	2.1	1.9	1.6	0	0	0	12.6
Garfish	0	0	<1	0.1	0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Unspecified	0	0	0	0	0	0	0	0	0	0	0
Diverse	0	93	0	0	0	5.9	0.2	0	0	0	171
Total	2,749	4,175	3,811	3,952	2,913	2,481	2,571	2,541	2,490	2,360	1,652

In ICES 37G0, the total landings of the German commercial fisheries have fluctuated between 402-1,230 tons (0.6-1.6 million euro) over the last 10 years (1998-2008). Since landings peaked in 1999 there has been a steady decline, and the total catch over the last 5 years has been between 402-770 ton, with the lowest catch in 2008 (Figure 4.19). The majority of the catch during this time was made up of Atlantic cod (204-464 tons), followed by herring and bycatch of dab and flounder (combining for between 69-158 tons from 2004-2008). Landings of other valuable flatfish such as turbot and brill have fluctuated between 1-3 tons for each species in recent years. Similarly, the catch of silver and yellow eel has been between 3-5.7 tons (25,000-38,000 euro) over the last 5 years.

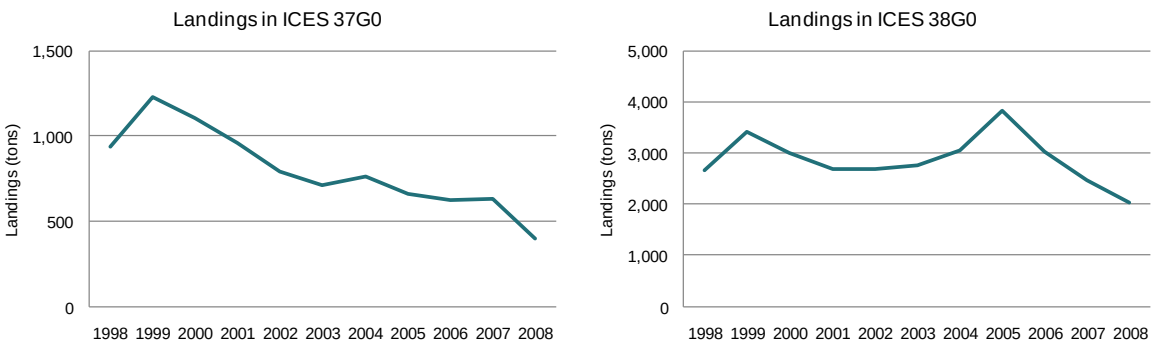
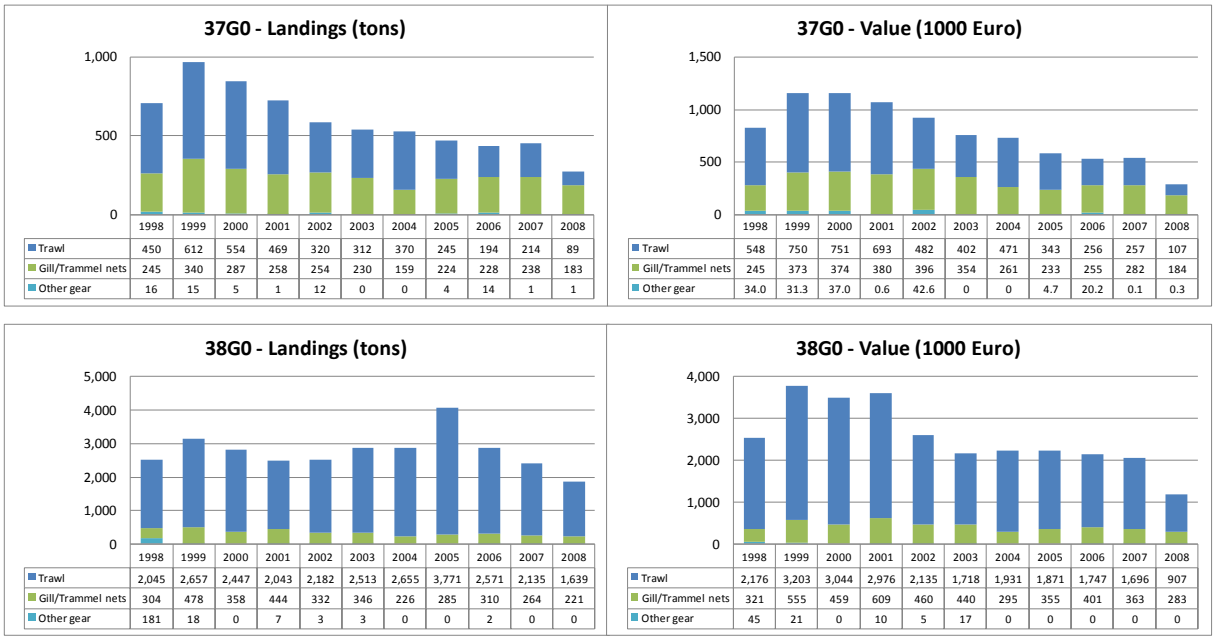


Figure 4.19: The development of the landings in ICES 37G0 and ICES 38G0 from 1998-2008. Derived from German logbook data.

The landings in ICES 38G0 have fluctuated between 2,030-4,280 tons from 1998-2008 with peaks in 1999 and 2005 (Table 4.6 and Figure 4.20). Cod has traditionally been a predominant part of the landings in this ICES area fluctuating between 1,000-3,000 tons from 1998-2006 (Table 4.6), however these have decreased considerably over the last 2 years and landings of cod was only 445 tons in 2008. Landings of herring (660-1,035 tons), and more recently sprat (314-766 tons) and whiting (145-343 tons), have contributed significantly to the total landings in this ICES rectangle over the last 5 years. Similarly, horse mackerel and anchovies are occasionally caught in large quantities, and large abundances of these species were responsible for the peak in total landings in 2005. Other important commercial species in the landings include a diverse group of flatfish species (flounder, dab, plaice, turbot, brill and sole) both targeted and caught as bycatch (Table 4.6).

The German fisheries according to gear type show that landings in ICES 37G0 were predominantly from trawling from 1998-2004. However, in the more recent years a greater amount of landings have come from the net fisheries (Figure 4.20). In contrast, the landings from ICES 38G0 have predominantly come from trawling (1998-2008). There are only marginal landings registered from other gear (longlines, hand-lines, fishing rods and dredges) in both areas.



37G0 - Landings (tons)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	450	612	554	469	320	312	370	245	194	214	89
Gill/Trammel nets	245	340	287	258	254	230	159	224	228	238	183
Other gear	16	15	5	1	12	0	0	4	14	1	1

37G0 - Value (1000 Euro)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	548	750	751	693	482	402	471	343	256	257	107
Gill/Trammel nets	245	373	374	380	396	354	261	233	255	282	184
Other gear	34.0	31.3	37.0	0.6	42.6	0	0	4.7	20.2	0.1	0.3

38G0 - Landings (tons)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	2,045	2,657	2,447	2,043	2,182	2,513	2,655	3,771	2,571	2,135	1,639
Gill/Trammel nets	304	478	358	444	332	346	226	285	310	264	221
Other gear	181	18	0	7	3	3	0	0	2	0	0

38G0 - Value (1000 Euro)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	2,176	3,203	3,044	2,976	2,135	1,718	1,931	1,871	1,747	1,696	907
Gill/Trammel nets	321	555	459	609	460	440	295	355	401	363	283
Other gear	45	21	0	10	5	17	0	0	0	0	0

Figure 4.20: Average annual German landings and proceeds per gear type (trawls, gill/trammel nets and other gear (longlines, hand-lines, fishing rod and dredges)) from ICES rectangles 37G0 and 38G0.

The seasonality of the landings and value by the most important commercial species in the ICES rectangles 37G0 and 38G0 in the regional field of Fehmarnbelt are given in Figure 4.21 and Figure 4.22.

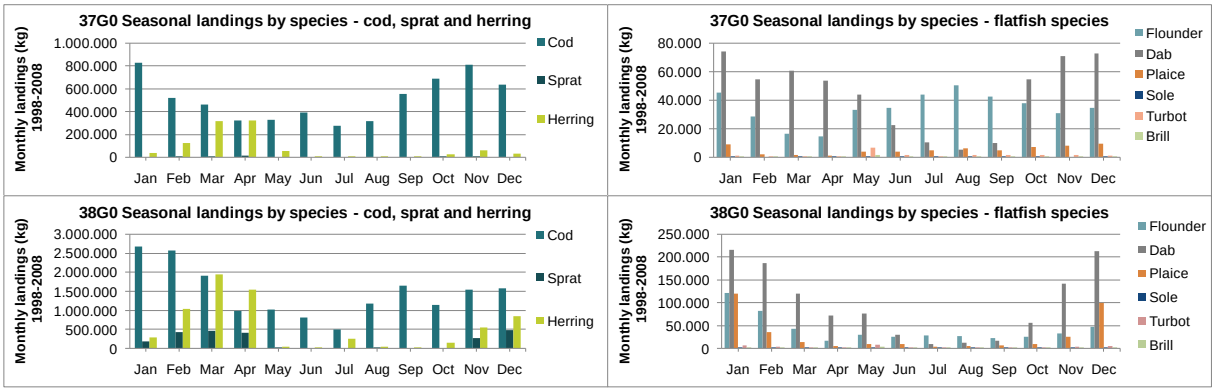


Figure 4.21: Monthly landings (1998-2008) of the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G0 and 38G0 in the regional area of Fehmarnbelt.

The seasonal landings of cod in both ICES rectangles 37G0 and 38G0 show peaks in January for both areas, lower landings during the summer months, and an increase in landings of cod again from August through to December. Herring is predominantly landed from February to April in both areas, however there are also some landings of herring in ICES 38G0 from October-December. Sprat are landed in ICES 38G0 from January-April and again from October to December, at the same time as herring. Landings of flatfish in ICES 37G0, more or less co-nitinue throughout the year. In contrast there is a musch stronger seasonal signal ICES 38G0, with the German fisheries after flatfish peaking in the colder months of the year (December-February). The seasonal value in the landing follow the patterns of the most valuable species (cod and flatfish species), although the species herring contributes to a certain extent in March-April, due to the large amount of landings (Figure 4.19).

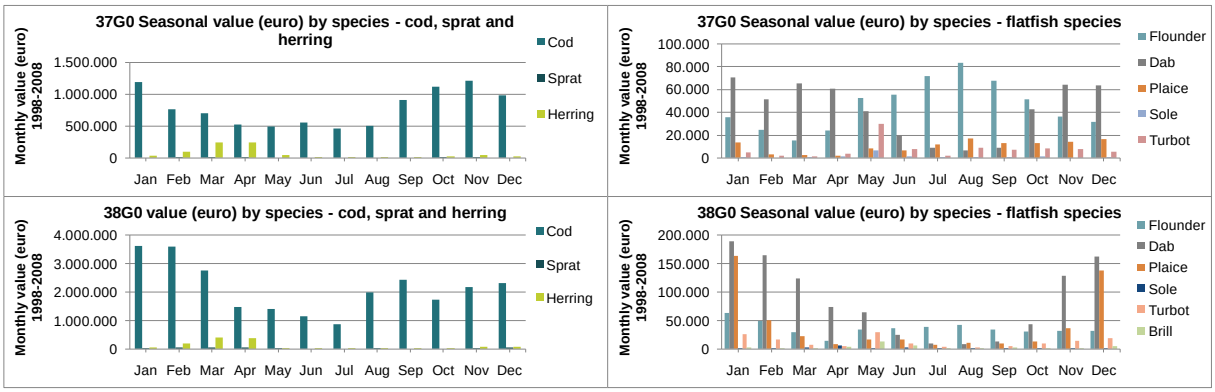


Figure 4.22: Monthly value (euro) of the landings (1998-2008) of the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G0 and 38G0 in the regional area of Fehmarnbelt.

ICES 37G2 and 38G2

Logbook records of the landings and value from the ICES rectangles 37G2 and 38G2 recorded from 1998-2008 by the BLE are shown in Table 4.7 and Figure 4.23 and Figure 4.24.

Table 4.7: Landings (tons) and value (1000 euro) of the most commercially important species from the ICES rectangles 37G2 and 38G2 from 1998-2008. Derived from German logbook data.

37G2- Landings (tons)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	134	206	155	230	141	192	125	146	156	177	156
Sprat	0.0	0	< 0.1	0	0	0	0	0.1	0	0	0
Baltic herring	153	305	1,137	260	286	406	576	171	385	278	283
Flounder	36	43	57	47	50	39	44	28	28	61	57
Dab	0.3	3.7	2.7	4.0	5.3	5.4	8.4	15.3	9.4	10.9	10.7
Plaice	1.6	2.4	0.8	0.4	2.0	1.2	2.5	4.2	2.6	2.4	2.2
Turbot	3.1	3.0	3.7	1.9	4.4	2.5	3.2	4.1	2.2	2.7	2.9
Brill	< 0.1	< 0.1	< 0.1	0.0	< 0.1	0.1	0.4	0.7	0.2	0.5	0.2
Sole	4.0	0	0	0	0	0	0	0	0	0	0
Flatfish unknown	0.0	0.8	0.0	0.1	0.2	< 0.1	0.1	0.0	0.0	0.0	0.0
Whiting	0.2	< 0.1	0.1	0.9	1.0	1.1	1.9	1.0	0.1	0.7	1.4
Horse mackerel	0	0	0	0	0	0	0	0	0	0	0
European eel	14	14	12	12	12	11	12	9.7	10	9.6	7.2
Salmon	1.0	0.8	1.4	0.7	0.8	0.4	0.5	0.3	0.2	0.1	0.2
Sea trout	0.3	0	0.3	1.2	0.9	0.6	0.5	0	0	0	2.8
Garfish	0.0	0.5	0.8	1.9	2.0	2.0	2.3	1.6	1.7	2.8	1.1
Unspecified	1.7	81	59	35	53	50	36	57	89	101	87
Diverse	0	0	0	0	0	0	0	0	0	0	0
Total (tons)	349	660	1429	594	558	711	812	438	683	647	612

37G2 - Value (1,000 euro)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	210	285	256	370	253	339	263	258	258	332	299
Sprat	0	0	0	0	0	0	0	< 0.1	0.0	0.0	0.0
Baltic herring	83	69	155	84	103	130	156	68	117	106	122
Flounder	46	49	68	66	77	73	81	16	18	66	56
Dab	0.3	3.8	3.1	4.8	5.5	5.7	9.8	13.9	9.0	10.2	12.2
Plaice	2.2	3.6	1.1	0.6	3.5	3.2	7.2	7.0	3.9	3.8	3.3
Turbot	11	11	13	8	23	15	18	19	11	14	15
Brill	<1	0	0	0	0	0.2	2.0	2.6	1.1	1.6	0.9
Sole	2.8		0	0	0	0	0	0	0	0	0
Flatfish unknown	0.0	0.9	0	0.1	0.1	< 0.1	0	0	0	0	0
Whiting	0.1	0.0	0.0	0.8	0.9	2.1	2.1	1.1	0.2	0.6	1.4
Horse mackerel	0	0	0	0	0	0	0	0	0	0	0
European eel	129	121	107	110	115	110	118	91	96	83	54
Salmon	18	15	20	11	15	8.2	12	5.3	3.6	2.2	3.3
Sea trout	1.2	0	1.5	5	4.2	3.3	3.0	0	0	0	15.4
Garfish	0.0	0.3	0.8	2.0	2.5	3.4	3.6	3.3	2.8	4.1	2.6
Unspecified	0	0	0	0	0	0	0	0	0	0	0
Diverse	0	0	0	0	0	0	0	0	0	1.4	0
Total	504	559	626	662	603	693	676	485	520	625	585

38G2 - Landings (tons)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	135	216	103	93	106	44	12	174	373	218	124
Sprat	0	5.4	0	0	0	0	7.5	0	0	156.4	0
Baltic herring	0.1	269	74	95	248	405	39	417	1,006	1,341	623
Flounder	5.3	17	16	30	26	3.6	2.9	0.6	7.9	45	37
Dab	0.3	1.9	0.9	1.5	1.2	0.2	2.0	34	17	8.0	15
Plaice	1.9	2.8	1.0	0.4	1.8	0.1	1.1	9.2	11	7.0	5.4
Turbot	1.1	0.5	1.1	0.4	1.5	0.1	0.1	1.6	1.5	1.7	1.7
Brill	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.0	< 0.1	0.4	< 0.1	1.1	0.3
Sole	2.9	0	0	0	0	0	0	0	0	0	0
Flatfish unknown	0.1	6.3	1.6	0.3	4.9	0.0	2.6	0	0	0	0
Whiting	0.7	1.8	1.7	0.6	1.2	0.1	0.3	0.7	1.9	2.7	0.9
Horse mackerel	0	0	0	0	0	0	0	0	0	0	0
European eel	1.0	< 0.1	0.4	0	< 0.1	0.1	0	0	0	0.1	0.2
Salmon	0	< 0.1	0	0	< 0.1	0	0.3	< 0.1	0	0	< 0.1
Sea trout	0	0	0	0	0.2	0	0	0	0	0	< 0.1
Garfish	0	0	0	0	0	0	0	0	0	0.1	0.1
Unspecified	0	0.1	0	0	0.1	0.2	0	15	16	3.5	< 0.1
Diverse	0	0	0	0	0	0	0	0	0	0	0
Total (tons)	148	521	198	221	390	453	68	652	1,434	1,785	808

38G2 - Value (1,000 euro)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	172	265	169	146	164	57	17	235	637	447	228
Sprat	0	0.5	0	0	0	0	0.6	0	0	23	0
Baltic herring	0.0	20	9	19	31	57	4.8	74	230	351	203
Flounder	2.3	8	11	18	11	1.5	1.8	0.2	5.3	29	13
Dab	0.2	1.6	1.0	1.5	0.8	0.2	1.7	37	20	8.2	13
Plaice	2.6	3.8	1.4	0.5	2.6	0.2	1.4	15	18	10	7.2
Turbot	3.8	1.6	4.5	1.5	6.3	0.4	0.3	6.4	6.2	7.7	7.3
Brill	<1	0.1	<1	0.0	0.1	0.0	< 0.1	1.2	0.1	1.6	1.3
Sole	2.0		0	0	0	0	0	0	0	0	0
Flatfish unknown	0.1	3.6	0.7	0.1	2.1	0	1.5	0	0	0	0
Whiting	0.4	0.9	1.7	0.6	1.4	< 0.1	0.3	0.6	2.3	3.6	1.1
Horse mackerel	0	0	0	0	0	0	0	0	0	0	0
European eel	9	0.3	3.1	0.1	0.1	1.1	0	0	0	0.9	1.8
Salmon	0	0.2	0	0	0.1	0	5.4	0.1	0	0	< 0.1
Sea trout	0	0	0	0	0.9	0	0	0	0	0	0.1
Garfish	0	0	0	0	0	0	0.0	0	0	0.1	0.1
Unspecified	0	0	0	0	0	0	0	0	0	0	0
Diverse	0	0	0	0	0	0	0	0	0	0	0
Total	193	306	202	187	220	118	35	371	919	883	476

In ICES 37G2, total landings peaked around 1,429 tons (626,000 euro) in 2000, primarily because of large catches of herring which were the dominant fisheries (by weight) in this ICES rectangle during this time. Total landings have fluctuated between approximately 450-800 tons (520,000-693,000 euro) since.

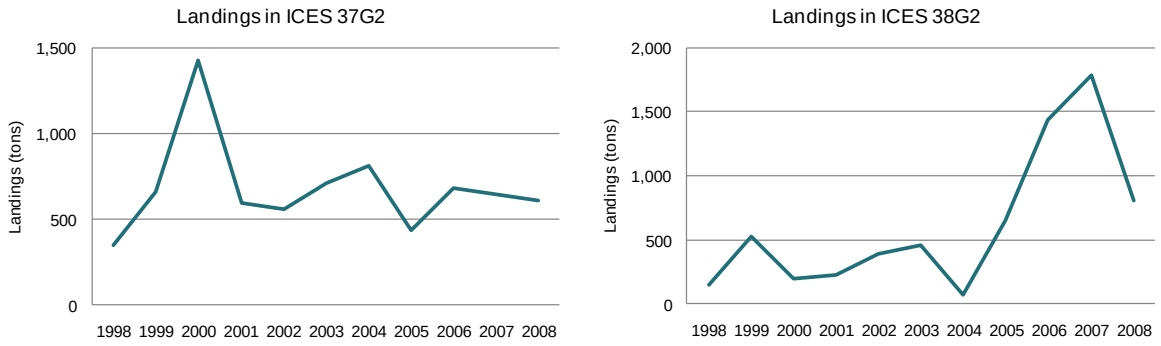


Figure 4.23: The development of the landings in ICES 37G2 and ICES 38G2 from 1998-2008. Data derived from German logbooks.

The most important species for the commercial fisheries by weight in the most recent 5 years have been Atlantic cod (125-177 tons) and Baltic herring (171-576 tons). Other important species in the landings include flatfish such as dab and flounder typically caught as bycatch, as well as silver and yellow eel (approx. 7-12 tons and 54,000-115,000 euro per year since 2000). There is also a considerable amount of landings in the category diverse (60-135 tons over the last 5 years). These represent a variety of species (sea trout, zander, perch, smelt (*Osmerus eperlanus*) etc.) which include many typical freshwater species which are occasionally abundant in the low saline waters of the Western Baltic.

In ICES 38G2, the total landings have fluctuated between 178-1,789 tons from 1998-2008. Landings have peaked in recent years (2006 and 2007), primarily due to a large increase in the landings of Baltic herring (1,006-1,341 tons in 2006 and 2007) (Table 4.7 and Figure 4.24). Atlantic cod and some bycatch of flatfish (flounder and dab) are also species that have some importance to landings in this ICES area (124-373 tons).

The German landings in ICES 37G2, according to gear type, show that landings from trawls fluctuate considerably from year to year whereas landings from the net fisheries are relatively stable. There was also a considerable amount of landings from other gear from 1998-2004. In ICES 38G2 the landings come predominantly from trawling. In more recent years the landings from trawl has increased considerably due to the large landings of herring, which are usually caught with pelagic trawls, during this time (Table 4.7). Also, a greater amount of landings (79-82 tons) have come from seine netters in recent years (Figure 4.24).

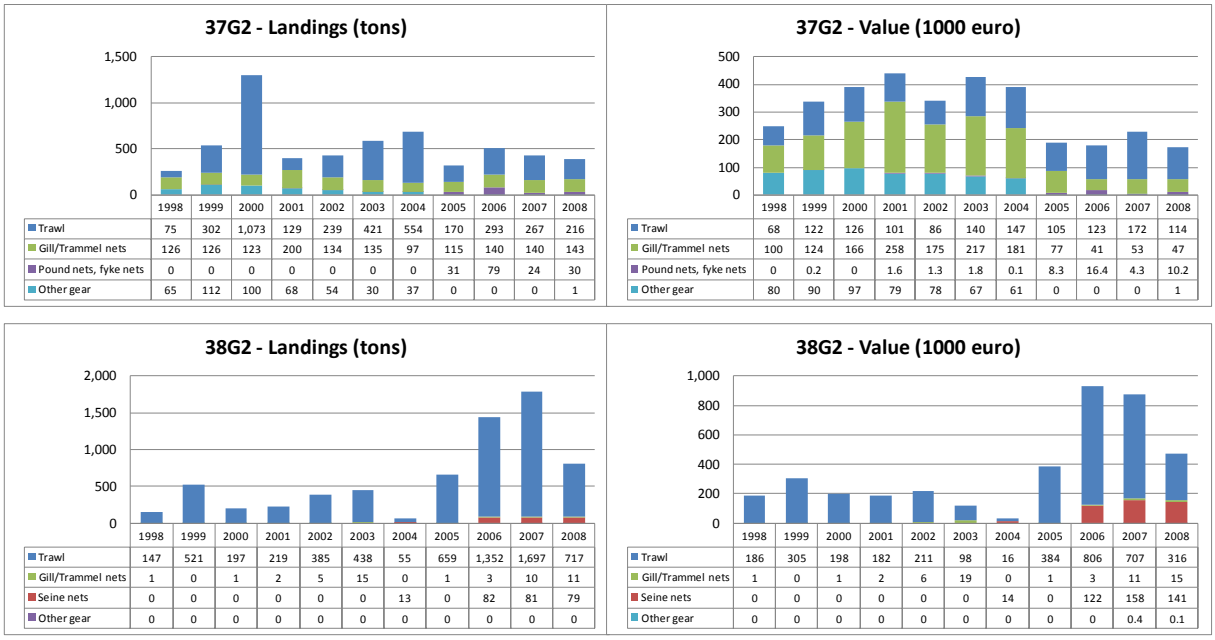


Figure 4.24: Average annual landings and proceeds per gear type (trawl, gill/trammel nets, seine nets and other gear (longlines, hand-lines, fishing rod and dredges) from ICES rectangles 37G2 and 38G2.

The average monthly landings and value of landings (1998-2008) for the most important German commercial species for ICES rectangles 37G2 and 38G2 in the regional area of Fehmarnbelt are given in Figure 4.25 and Figure 4.26.

The seasonal fisheries for Germany in both ICES 37G2 and 38G2, east of Fehmarnbelt, show that the average monthly cod landings are at relatively low but stable levels during the first months of the year (January-May). Cod landings decrease over the summer months (June-

August), and increase during the autumn to a peak in November. The catches of herring are predominantly during the spring from February to May, peaking in April as the Spring migration is greatest. There are almost no landings of sprat from the German fisheries in these two ICES rectangles, and when they are landed it is more or less only only in the Spring (April), from ICES 38G2.

In the ICES 37G2, landings of flatfish species (primarily flounder) appear to be year round, probably because the net fisheries in this area, which can target flatfish species more directly, are more prominent. The period with lowest landings, however, are from February to April. Hereafter landings of flatfish in ICES 37G2 increase to a stable level over the summer (May-August), and increase once again to a peak in October-November, as autumn progresses. In contrast, the landings of flatfish in ICES 38G2 are almost entirely from September-December. This fishery is supported by the seine net fisheries, which are undertaken in the latter part of the year, primarily targeting these species. The targeting of diverse flatfish in the fisheries is also reflected in the increased value of the landings for a number of the more valuable flatfish (turbot and plaice) (Figure 4.26).

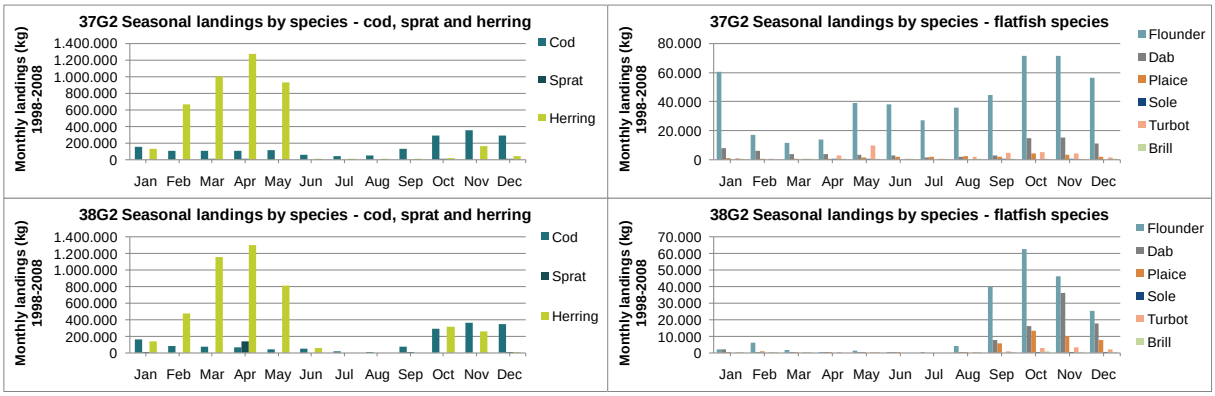


Figure 4.25. Monthly landings (1998-2008) for the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G2 and 38G2 in the regional area of Fehmarnbelt.

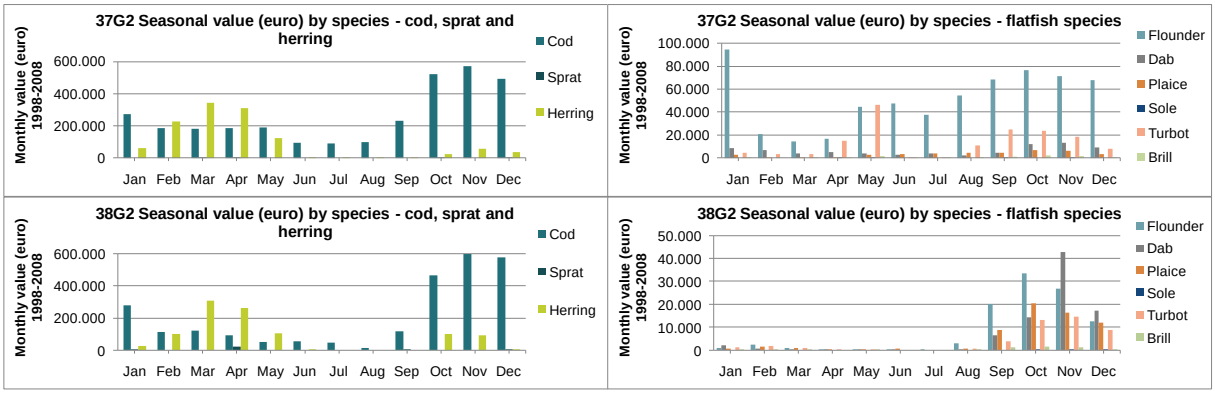


Figure 4.26: Monthly value (euro) of the landings (1998-2008) for the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G2 and 38G2 in the regional area of Fehmarnbelt.

4.1.4 Danish fleet statistics

An overview of the number of Danish fishing vessels that have fished (registered catches) from the near field of Fehmarnbelt (ICES 38G1 and 37G1) and the regional area (ICES 37G0, 38G0, 37G2 and 38G2) according to their gear use, are given in the following section.

Near Fehmarnbelt - ICES 38G1 and 37G1

The development and number of vessels that fished (recorded landings) in the near field area of Fehmarnbelt (ICES 38G1 and 37G1) according to which primary gear they used is given in Table 4.8 and Figure 4.27.

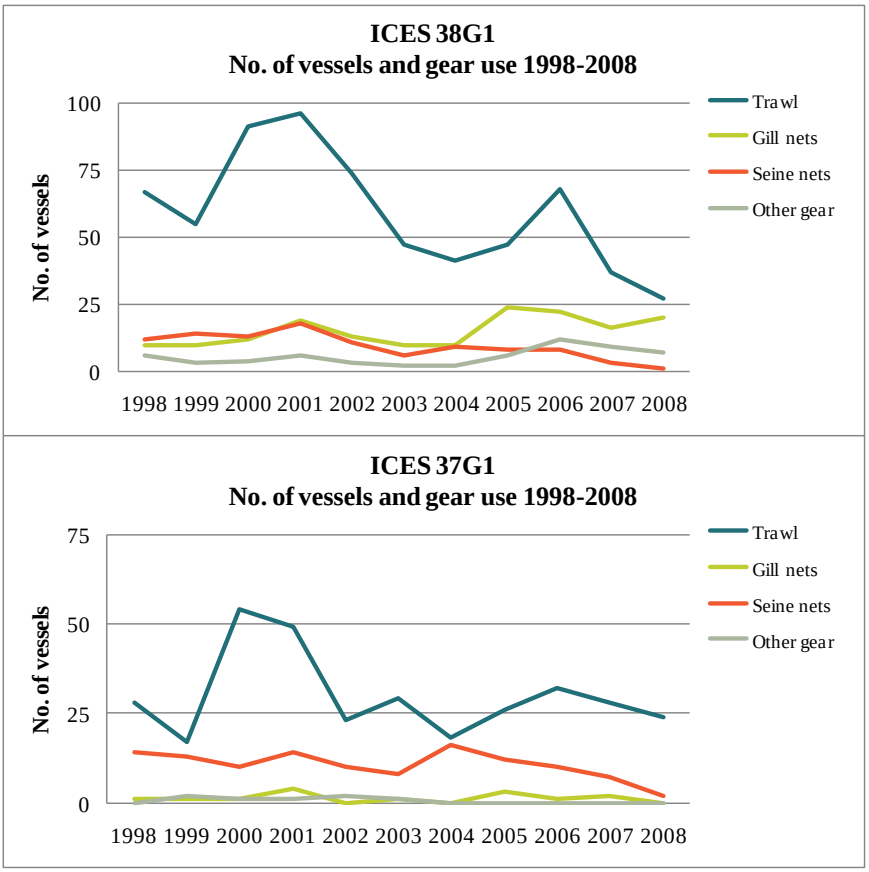


Figure 4.27: The development of the number of vessels that fished (recorded landings) in the near field area of Fehmarnbelt (ICES 38G1 and 37G1) according to their primary gear use (trawl, gill nets, seine nets and other gear (longlines, hand-lines, rods and dredges)) from 1998-2008. This data includes vessels ≥8 m (≥10 m before 2005).

Overall, there was a greater number of fishing vessels that used trawls than other gear in both near field ICES rectangles (38G1 and 37G1). The number of trawlers fishing in ICES 38G1, which is the ICES rectangle that contains most of Fehmarnbelt, was generally about twice as many in comparison to the more southerly ICES 37G1. The number of vessels fishing using gill nets in ICES 38G1 was from 10-19 vessels from 1998-2004 and from 16 to 24 since 2005. In contrast, the number of vessels using gill nets in ICES 37G1 has been generally low over the years (only 1 to 4 vessels). Data indicated an increase in the number of vessels fishing with gill nets after 2004. This is probably an artefact of vessels between 8-10 m in length first being required to fill in logbooks as of 2005. Vessels of this length almost exclusively use gill

nets as their primary gear. This assumption is supported by data from 2005 showing an increase from 6 to 19 vessels that use gill nets in the smallest length group 8-11.9 m (Table 4.8). Another primary source of fishing with gill nets is the number of vessels less than 8 m, which are not accounted for in this data. The number of vessels using seine nets in their fisheries has generally been declining, from peaks of 18 (ICES 38G1 in 2001) and 16 (ICES 37G1 in 2004) to only 1 and 2 in these respective ICES rectangles in 2008 (Table 4.8).

Table 4.8: The number of vessels in different length groups (8-11.9 m, 12-14.9 and ≥15 m) and according to primary gear types (trawl, gill/trammel nets, seine nets and other gear) that have registered catches from ICES rectangles 38G1 and 37G1 in the near field.

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1		85	75	112	129	95	62	58	76	103	60	50
8-11.9 m	**Trawl**	5	6	9	7	1	1	1	5	6	3	3
	Gill/Trammel	7	6	8	10	5	4	6	19	20	15	17
	Other gear	3	2	3	2	1			6	11	7	7
12-14.9 m	**Trawl**	31	21	40	34	26	12	17	20	27	16	14
	Gill/Trammel	1	2	4	4	7	5	4	3	1	1	2
	Seine nets		1									
	Other gear			1	2	2	2	1			2	
≥15 m	**Trawl**	31	28	42	55	47	34	23	22	35	18	10
	Gill/Trammel	2	2		5	1	1		2	1		1
	Seine nets	12	13	13	18	11	6	9	8	8	3	1
	Other gear	3	1		2			1		1		
37G1		43	32	65	65	33	38	34	40	43	36	26
8-11.9 m	**Trawl**	2	1	1	1		1			2		
	Gill/Trammel	1	1	1	2				2	1	1	
12-14.9 m	**Trawl**	9	5	9	11	7	4	5	7	9	10	6
	Seine nets				1							
≥15 m	**Trawl**	17	11	44	37	16	24	13	19	21	18	18
	Gill/Trammel				2		1		1		1	
	Seine nets	14	13	10	13	10	8	16	12	10	7	2
	Other gear		2	1	1	2	1					

As mentioned, because smaller vessels (<8 m) generally have less range when sailing from their basis harbours, it was assumed that the potential number of small vessels that fish in Fehmarnbelt would be limited to the number of vessels that have their basis harbours adjacent Fehmarnbelt. The total number of vessels less than 8 m (<8 m) in the near field harbours adjacent Fehmarnbelt that are registered as undertaking commercial or sideline fisheries is given in Table 4.9.

The overall number of small vessels from harbours on Lolland (Rødbyhavn, Kramnitze, Errindlev, Nysted and Langø) which runs adjacent Fehmarnbelt has continually decreased from 46 in 1998 to 26 in 2008 (Table 4.9). This declining trend has been observed in all the harbours suggesting a decline in the more local fisheries with passive gear.

Table 4.9: The number of vessels (<8 m) in near field harbours adjacent Fehmarnbelt that are registered as undertaking commercial or sideline fisheries.

Number of small (<8 m) commercial and sideline fishing vessels in Danish harbours adjacent Fehmarn Belt

Harbour	Vessel <8 m	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Rødby havn	commercial	5	5	5	5	3	3	2	2	2	2	2
	sideline	1	1						1	1	1	2
Kramnitze	commercial	5	5	5	5	5	5	5	4	4	4	4
	sideline											
Errindlev	commercial	5	5	5	5	3	3	2	2	2	2	2
	sideline	1	1						1	1	1	2
Nysted	commercial	1	2	1	1	1	1	1	1	1	1	1
	sideline	5	5	4	4	3	3	3	3	3	3	3
Langø	commercial	18	16	15	15	14	14	13	11	12	8	8
	sideline	5	4	4	3	3	3	2	2	2	2	2
Gedser	commercial	11	9	5	5	5	5	7	5	5	5	4
	sideline	4	4	4	4	4	5	3	4	4	3	4
Bagenkop	commercial	16	10	9	8	9	9	9	9	9	9	9
	sideline	8	7	7	6	6	6	6	5	5	5	4
Total	commercial	61	52	45	44	40	40	39	34	35	31	30
	sideline	24	22	19	17	16	17	14	16	16	15	17

Regional area of Fehmarnbelt - ICES 38G0, 37G0, 38G2 and 37G2

The development and number of vessels fishing (recorded landings) in the regional area of Fehmarnbelt (ICES 38G0, 37G0, 38G2 and 37G2) according to their primary gear is given in Figure 4.28 and Table 4.10.

The ICES rectangles in the regional area of Fehmarnbelt where the greatest number of Danish fishing vessels (from 102-166 vessels over the last decade) undertake some fisheries is ICES 38G0, to the west of Fehmarnbelt, and ICES 38G2 (from 108-204 vessels over the last decade) to the east of Fehmarnbelt. In contrast, only a few Danish vessels fished in the ICES rectangles near the German coastline (3-20 vessels in ICES 37G0 from 1998-2008 and 10-44 vessels in ICES 37G2, respectively).

Overall, the total number of vessels for all regional areas has been declining over the last decade. This is most prominent in the decline of trawlers and seine netters over the last several years, especially those fishing to the east of Fehmarnbelt in ICES 37G2 and 38G2.

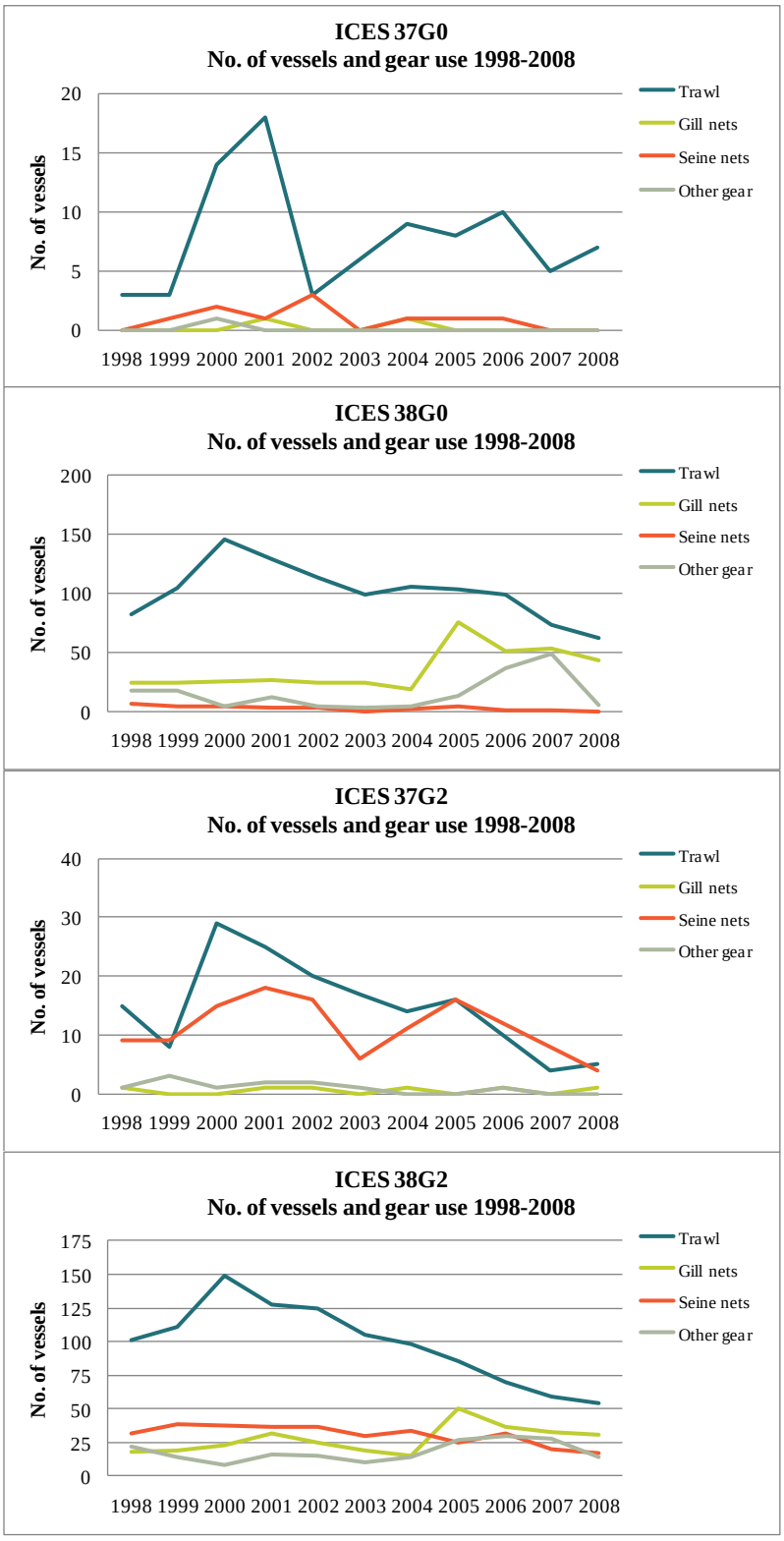


Figure 4.28: The development of the number of vessels and their gear use in ICES 37G0, 38G0, 37G2 and 38G2 from 1998-2008 in the regional area of Fehmarnbelt. This data includes vessels ≥10 m before 2005 and vessels ≥8 m from 2005-2008.

Table 4.10: The number of Danish vessels in different length groups (8-11.9 m, 12-14.9 and ≥15 m) and according to the primary gear types (trawl, gill/trammel nets, seine nets and other gear) that have registered catches from ICES rectangles 37G0, 38G0, 37G2 and 38G2 in the regional area of Fehmarnbelt. This data includes vessels ≥8 m (≥10 m before 2005).

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0		3	4	17	20	6	6	11	9	11	5	7
8-11.9 m	**Trawl**		1	2								1
	Gill/Trammel							1				
12-14.9 m	**Trawl**	2		4	3	1	2	2	2	4	2	1
	Gill/Trammel				1							
	Seine nets							1				
≥15 m	**Trawl**	1	2	8	15	2	4	7	6	6	3	5
	Seine nets		1	2	1	3			1	1		
	Other gear			1								
38G0		102	123	166	151	134	117	124	161	152	129	103
8-11.9 m	**Trawl**	8	12	21	15	14	12	17	19	17	13	11
	Gill/Trammel	15	15	18	20	16	15	13	57	42	49	37
	Seine nets	2	1	2				1	2		1	
	Other gear	9	4	3	6	1	1	1	12	36	44	4
12-14.9 m	**Trawl**	45	55	64	52	51	44	41	41	39	31	22
	Gill/Trammel	7	6	5	5	7	7	4	16	8	4	4
	Seine nets		1			1			1			
	Other gear	5	10	2	3	1	2	2	1	1	2	1
≥15 m	**Trawl**	29	38	61	62	48	43	48	43	43	30	29
	Gill/Trammel	2	3	3	2	2	2	2	3	1		2
	Seine nets	5	3	2	3	2		1	2	1		
	Other gear	4	4		3	2		2			3	1

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G2		25	18	44	43	37	24	26	31	24	12	10
8-11.9 m	**Trawl**			1					2			
	Gill/Trammel									1		1
	Other gear									1		
12-14.9 m	**Trawl**	4	2	7	5	6	6	4	5		1	1
	Gill/Trammel	1				1		1				
≥15 m	**Trawl**	11	6	21	20	14	11	10	9	10	3	4
	Gill/Trammel				1							
	Seine nets	9	9	15	18	16	6	11	16	12	8	4
	Other gear	1	3	1	2	2	1					
38G2		144	160	204	191	185	151	140	157	148	118	108
8-11.9 m	**Trawl**	9	7	8	7	7	6	5	6	7	8	3
	Gill/Trammel	10	12	15	15	15	12	10	38	36	33	30
	Seine nets		2							1		
	Other gear	4	3		3	6	5	2	22	28	25	14
12-14.9 m	**Trawl**	39	42	60	46	47	37	31	39	29	22	18
	Gill/Trammel	5	2	6	7	7	4	2	6			
	Seine nets	3	3	1		2		1		3		
	Other gear	5	5	5	4	4	1	8	3	1	2	
≥15 m	**Trawl**	53	62	81	74	71	62	62	40	34	29	33
	Gill/Trammel	3	5	2	10	3	3	3	6	1		1
	Seine nets	29	34	37	37	35	30	33	25	28	20	17
	Other gear	13	6	3	9	5	4	4	2	1	1	

The number of fishing trips taken by vessels of different lengths and primary gear type in the near field (ICES 38G1 and 37G1) and regional area (ICES 37G0, 38G0, 37G2 and 38G2) of Fehmarnbelt is given in Table 4.11.

Table 4.11: The number of fishing trips taken by vessels of different length groups (8-9.9, 10-11.9, 12-14.9 and ≥15 m) and their primary gear types in the near field (ICES 38G1 and 37G1) and regional area (ICES 38G0, 37G0, 38G2 and 37G2) of Fehmarnbelt. Source: Danish Directorate of fisheries

ICES	Vessel length (m)	Gear	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	8-9.9	Trawl	0	0	0	0	0	0	0	2	10	0	0
		Gill/trammel nets	0	0	0	0	0	0	0	247	187	104	104
		Other gear	0	0	0	0	0	0	0	99	89	43	64
	10-11.9	Trawl	11	10	23	8	1	0	2	4	18	8	8
		Gill/trammel nets	88	112	203	219	138	9	115	167	119	106	119
		Other gear	6	10	3	2	1	0	0	0	17	2	0
	12-14.9	Trawl	305	256	447	344	150	185	297	212	239	253	214
		Gill/trammel nets	9	3	149	129	128	117	102	115	84	65	21
		Seine nets	0	9	0	0	0	0	0	0	0	0	0
		Other gear	0	0	1	3	6	2	2	0	0	4	0
	≥15	Trawl	321	333	419	498	327	188	64	74	203	80	54
		Gill/trammel nets	3	4	0	29	8	1	0	10	1	0	1
		Seine nets	20	59	61	56	21	14	25	14	12	3	1
		Other gear	4	8	0	2	0	0	2	0	1	0	0
38G1 Total			767	804	1,306	1,290	780	516	609	944	980	668	586
37G1	8-9.9	Gill/trammel nets	0	0	0	0	0	0	0	2	0	1	0
	10-11.9	Trawl	1	3	4	15	0	1	0	0	3	0	0
		Gill/trammel nets	2	1	1	1	0	0	0	0	1	0	0
	12-14.9	Trawl	52	25	47	59	20	8	43	20	59	72	20
		Gill/trammel nets	0	0	0	3	0	0	0	0	0	0	0
		Seine nets	0	0	0	1	0	0	0	0	0	0	0
	≥15	Trawl	148	64	245	177	113	77	81	85	122	112	75
		Gill/trammel nets	0	0	0	4	0	1	0	2	0	1	0
		Seine nets	27	37	56	64	46	24	50	38	32	23	6
		Other gear	0	2	8	7	4	1	0	0	0	0	0
37G1 Total			230	132	361	331	183	112	174	147	217	209	101

ICES	Vessel length (m)	GEAR	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	10-11.9	Trawl	0	2	2	0	0	0	0	0	0	0	4
		Gill/trammel nets	0	0	0	0	0	0	1	0	0	0	0
	12-14.9	Trawl	38	0	4	11	1	3	2	3	7	5	4
		Gill/trammel nets	0	0	0	1	0	0	0	0	0	0	0
		Seine nets	0	0	0	0	0	0	1	0	0	0	0
	≥15	Trawl	1	3	28	45	4	16	14	26	16	22	9
		Seine nets	0	1	5	1	4	0	0	1	1	0	0
		Other gear	0	0	1	0	0	0	0	0	0	0	0
37G0 Total			39	6	40	58	9	19	18	30	24	27	17
38G0	8-9.9	Trawl	0	0	0	0	0	0	0	167	176	157	51
		Gill/trammel nets	0	0	0	0	0	0	0	2,246	1,717	1,646	1,283
		Seine nets	0	0	0	0	0	0	0	3	0	0	0
		Other gear	0	0	0	0	0	0	0	330	466	473	183
	10-11.9	Trawl	46	28	164	193	270	256	358	231	241	243	77
		Gill/trammel nets	1,155	1,153	1,167	999	811	935	1,062	1,208	1,113	1,409	1,510
		Seine nets	5	4	5	0	0	0	1	0	0	1	0
		Other gear	72	24	17	26	0	1	1	2	168	293	2
	12-14.9	Trawl	2,391	2,618	2,785	2,587	2,096	1,668	1,637	1,309	1,020	718	553
		Gill/trammel nets	354	344	400	557	510	558	499	830	403	180	205
		Seine nets	0	8	0	0	0	0	0	1	0	0	0
		Other gear	13	16	3	11	26	12	6	1	2	9	1
	≥15	Trawl	949	1,416	1,608	1,864	1,214	942	1,036	841	656	671	594
		Gill/trammel nets	18	6	5	39	22	19	5	33	1	0	13
		Seine nets	29	30	18	21	3	0	6	3	1	0	0
		Other gear	7	8	0	4	4	0	2	0	0	5	1
38G0 Total			5,039	5,655	6,182	6,301	4,956	4,391	4,613	7,205	5,964	5,805	4,473
37G2	8-9.9	Gill/trammel nets	0	0	0	0	0	0	0	0	1	0	1
		Other gear	0	0	0	0	0	0	0	0	2	0	0
	10-11.9	Trawl	0	0	0	0	0	0	0	22	0	0	0
	12-14.9	Trawl	5	2	17	9	16	15	10	33	0	1	3
		Gill/trammel nets	1	0	0	0	1	0	2	0	0	0	0
	≥15	Trawl	47	33	50	74	49	20	41	14	27	4	5
		Gill/trammel nets	0	0	0	1	0	0	0	0	0	0	0
		Seine nets	19	37	54	82	56	24	63	56	58	31	21
		Other gear	1	3	2	4	7	1	0	0	0	0	0
37G2 Total			73	75	123	170	129	60	116	125	88	36	30
38G2	8-9.9	Trawl	0	0	0	0	0	0	0	39	60	56	12
		Gill/trammel nets	0	0	0	0	0	0	0	1,336	1,185	1,033	1,097
		Seine nets	0	0	0	0	0	0	0	0	1	0	0
		Other gear	0	0	0	0	0	0	0	527	633	605	234
	10-11.9	Trawl	203	146	152	177	84	23	5	3	39	9	44
		Gill/trammel nets	166	212	79	111	197	316	235	73	26	24	13
		Seine nets	0	2	0	0	0	0	0	0	0	0	0
		Other gear	14	43	0	3	14	16	18	1	5	0	0
	12-14,9	Trawl	1,390	1,506	1,513	1,448	1,129	1,233	951	1,091	585	270	281
		Gill/trammel nets	45	18	25	62	45	6	11	149	0	0	0
		Seine nets	23	12	1	0	1	0	5	0	12	0	0
		Other gear	8	6	20	7	6	7	66	23	15	4	0
	≥15	Trawl	1,243	1,441	1,399	1,401	978	856	836	828	608	484	338
		Gill/trammel nets	3	9	2	24	5	4	4	26	1	0	2
		Seine nets	175	228	290	375	309	284	260	160	173	170	140
		Other gear	20	10	5	18	7	4	23	18	7	1	0
38G2 Total			3,290	3,633	3,486	3,626	2,775	2,749	2,414	4,274	3,350	2,656	2,161

Although a fishing trip can represent from one to several days of fishing for the different vessels, it can be used as a proxy for the amount of effort used for the different fisheries in the ICES rectangles.

The total number of fishing trips registered annually in the ICES rectangles near Fehmarnbelt (ICES 38G1 and 37G1) have fluctuated between 516-1,306 in ICES 38G1 and 101-361 in ICES 37G1 over the last decade (1998-2008). In primarily Fehmarnbelt (ICES 38G1), the total number of fishing trips peaked in 2000 (1,306 trips) but amounted to less than half that amount (only 586 trips) in 2008. The number of registered trips by trawlers in ICES 38G1 peaked at 889 in 2000 but only amounted to 276 trips in 2008. The number of registered trips of fishermen using gill/trammel nets was at a peak of 539 in 2005, when all gill net fishers with vessels down to 8 m in length registered their trips in ICES rectangles. Since 2005, however, the number of fishing trips by gill netters near Fehmarnbelt has decreased from 539 to 245. Similarly, the number of registered fishing trips by seine netters near Fehmarnbelt has declined from a peak of 61 in 2000, to only 1 in 2008.

The fisheries in the ICES 37G1, southeast of Fehmarnbelt, are almost entirely undertaken by trawlers and seine netters. Over the last 5 years trawlers have registered between 95-184 fishing trips while seine netters have registered between 6-50 fishing trips (Table 4.11).

The total number of registered fishing trips in the 4 ICES rectangles representing the regional area of Fehmarnbelt show that the northern ICES areas (38G0 to the west of Fehmarnbelt) and 38G2 (to the east of Fehmarnbelt) in comparison to (ICES 37G0 and 37G2) are clearly the areas where Danish fishermen allocate the majority of their effort (Table 4.11). To the west of Fehmarnbelt (ICES 38G0) the annual number of registered fishing trips by fishermen amounted to between 4,473-7,205 trips per year from 1998-2008. The primary gears used on these trips were trawls and gill/trammel nets. Seine netters only fished from 0-7 times on an annual basis over the last 7 years (since 2002).

In contrast, the seine net fishing as measured by the number of fishing trips was much more prevalent in the fishing areas east of Fehmarnbelt (ICES 38G2 and 37G2). Trawling, gill netting and seine netting were all comparatively high in ICES 38G2 while the number of seine net fishing appeared to be the dominant form of fishing by Danish fishermen fishing in ICES 37G2 (Table 4.11).

4.1.5 Danish near and regional field landings and value (euro)

Average annual landings in the 6 ICES rectangles representing the near field (ICES 38G1 and 37G1) and regional area (37G0, 38G0, 37G2 and 38G2) of Fehmarnbelt along with landings from these areas according to landings harbours and basis harbours are given in the following sections.

The average annual Danish landings (tons) and value (euro) from the near and regional field of Fehmarnbelt from 1998-2008 are given in Table 4.12.

The combined landings and value of the Danish fisheries in the near field and regional area of Fehmarnbelt, measured as the 6 ICES rectangles (see Table 4.12) in the region, have ranged from 10,429-26,776 tons and 10.5-20.5 million euro during the period 1998-2008. In general, these values have been decreasing in recent years (since 2006) with the lowest amount of landings and value being recorded in 2008.

Table 4.12: The total landings (tons) and value (1,000 euro) of the Danish fisheries in the near field of Fehmarnbelt (ICES 38G1 and 37G1) and regional area of the Western Baltic (ICES 37G0, 38G0, 37G2 and 38G2).

Landings (tons)

ICES Rectangles	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	20	27	330	374	12	25	24	129	433	99	63
38G0	7,624	7,984	8,510	9,078	3,904	6,955	6,160	8,896	7,376	4,354	3,087
37G1	2,826	1,174	1,806	2,701	863	491	1,043	658	3,574	2,495	1,739
38G1	1,551	1,260	1,540	2,859	1,121	975	671	1,702	4,160	2,071	2,092
37G2	434	629	496	706	270	122	935	247	508	142	117
38G2	8,101	8,514	9,619	11,058	7,929	5,732	8,635	6,867	5,392	3,684	3,330

Value (1000 euro)

ICES Rectangles	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	39	16	105	184	22	45	32	46	85	72	66
38G0	5,546	7,850	8,227	7,226	5,037	4,609	5,611	5,179	5,700	6,200	4,279
37G1	938	615	1,629	1,147	561	299	705	401	1,139	1,364	730
38G1	1,187	1,489	2,076	1,838	1,096	618	707	875	2,031	1,087	781
37G2	318	400	636	706	481	206	542	314	542	313	252
38G2	7,074	9,169	7,786	8,494	5,575	5,051	4,650	5,497	5,727	5,366	4,383
	15,102	19,539	20,458	19,595	12,772	10,828	12,246	12,312	15,224	14,402	10,493

Figure 4.29 and Figure 4.30 summarize the 11 year (1998-2008) average annual landings and value of the landings in the Danish fisheries for the most important commercial species in the ICES rectangles near Fehmarnbelt and the region according to logbooks. The species sprat, herring and cod make up the greatest amount of the landings for all 6 ICES rectangles, with landings of sprat dominating in the area west of Fehmarnbelt and landings of herring dominating in in the area the east. Economically, the landings of cod have been the most valuable in all 6 ICES rectangles. Comparisons between the ICES rectangles show landings (and their value) are greatest in the rectangles 38G0, 38G1 and 38G2, which are those closest to the Danish coast.

The average annual landings (1998-2008) according to the basis harbours of the vessels fishing in the 6 ICES rectangles of the near and regional field of the Fehmarnbelt are given in Figure 4.34.

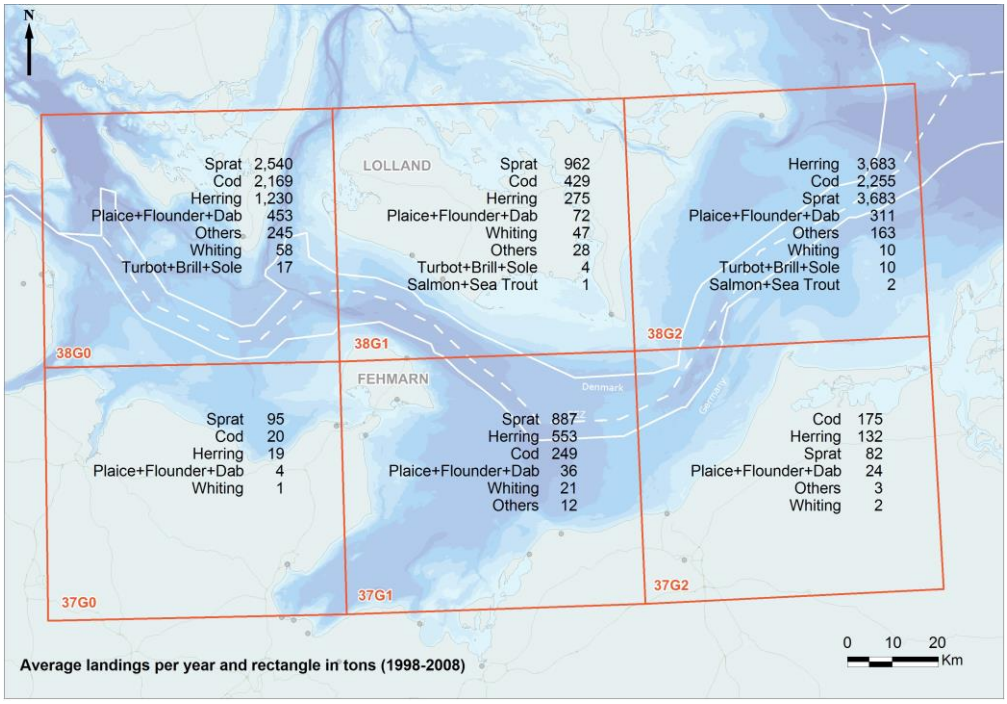


Figure 4.29: The average annual landings (tons) from 1998-2008 of the most important commercial species in the Danish fisheries, in the near field of Fehmarnbelt and regional area of the Western Baltic (ICES rectangles 37G0, 38G0, 37G1, 38G1, 37G2 and 38G2).

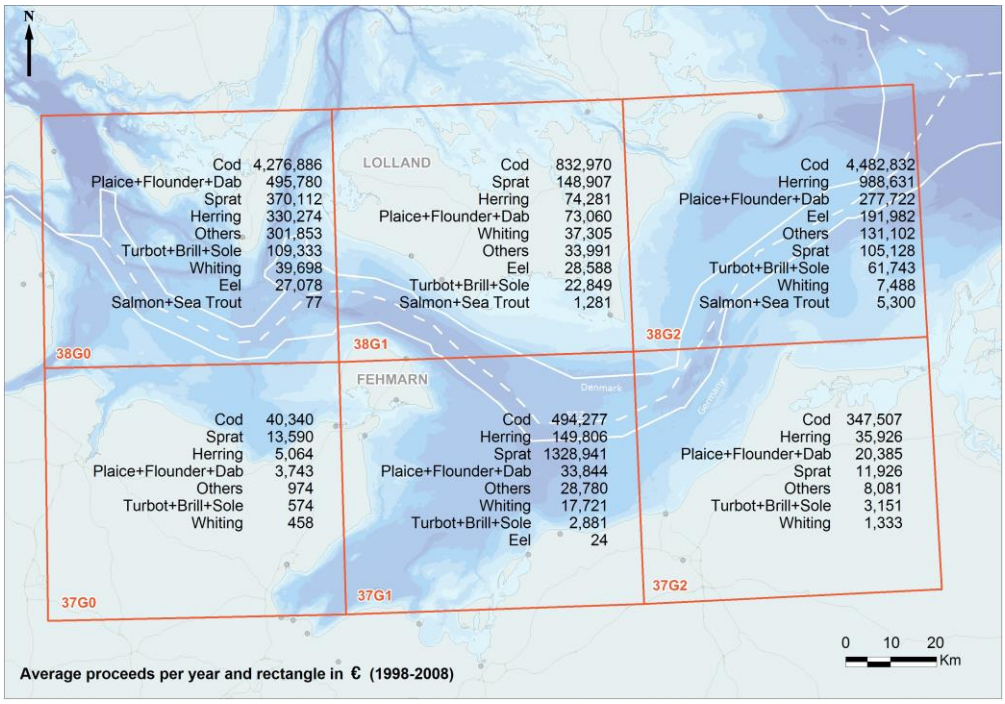


Figure 4.30: The average annual value (euro (€) from 1998-2008 of the most important commercial species in the Danish fisheries, in the near field of Fehmarnbelt and regional area of the Western Baltic (ICES rectangles 37G0, 38G0, 37G1, 38G1, 37G2 and 38G2).

An overview of the average annual landings, value of the landings (proceeds) in vessel length groups, and average annual landings per gear group (active and passive) are given in Figure 4.31, Figure 4.32 and Figure 4.33.

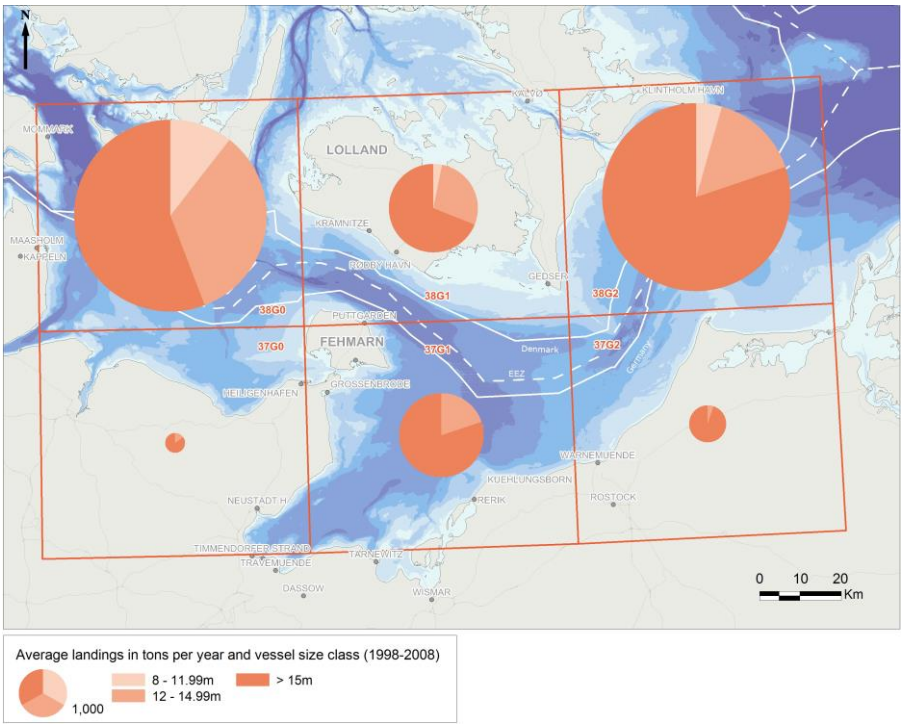


Figure 4.31: Annual average landings (tons) per year (1998-2008) in the Danish fisheries according to vessel size classes, in the near and regional field of Fehmarnbelt.

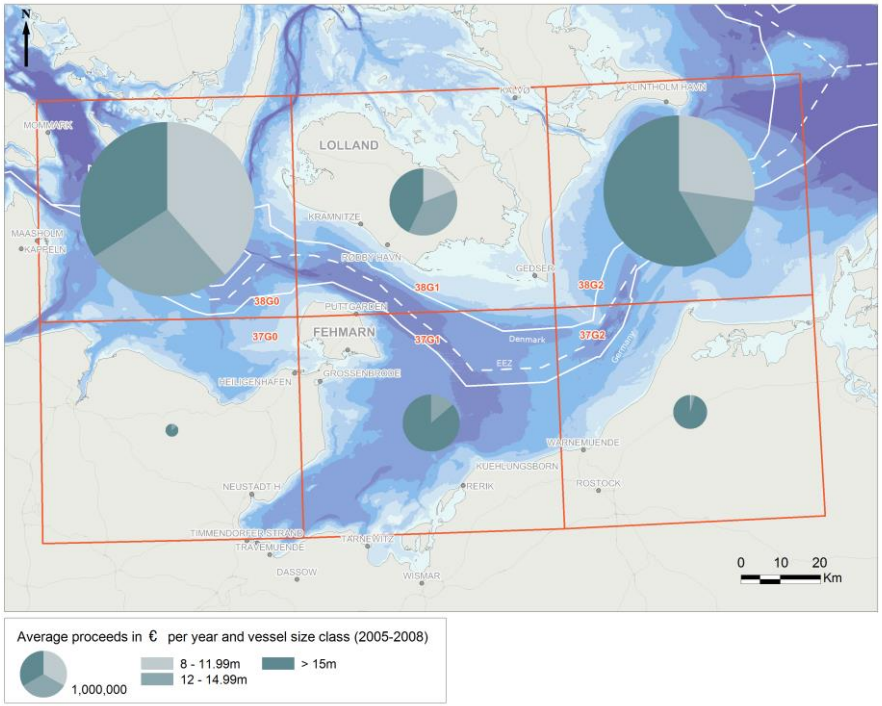


Figure 4.32: Annual average value of landings (proceeds in euro) per year (1998-2008) according to vessel size classes, in the near and regional field of Fehmarnbelt.

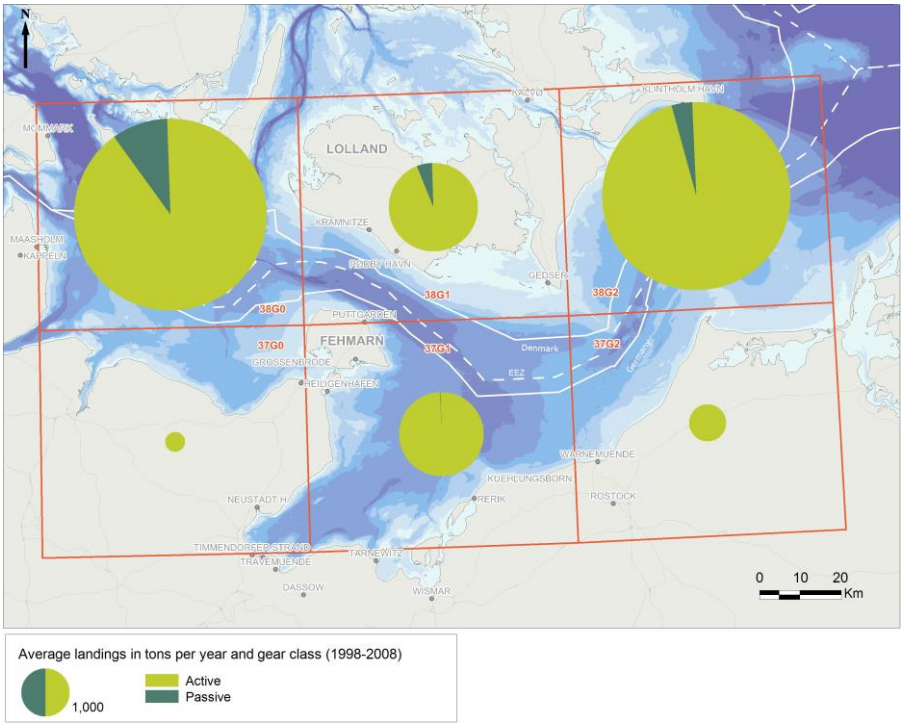


Figure 4.33: Annual average landings (tons) per year (1998-2008) in the Danish fisheries according to gear class, in the near and regional field of Fehmarnbelt.

Vessels from many different harbours undertake fisheries in the region of Fehmarnbelt (Figure 4.34). Some of the most important harbours where vessels come from are Klintholm Havn (average landings of 3,500 tons per year) to the east of Fehmarnbelt and Bagenkop (average landings more than 1,100 tons per year) and Sønderborg (average landings greater than 2,500 tons per year) to the west of Fehmarnbelt. Vessels from these harbours, along with other harbours within the near region of Fehmarnbelt (ICES 37G0, 37G1, 37G2, 38G0, 37G1 and 37G2) have annually (1998-2008) accounted for 27-46% of the total landings from the regional field of Fehmarnbelt (Table 4.13). Two of the most important distant harbours where vessels come from to fish in the region of Fehmarnbelt are Hvide Sande (average landings of more than 1,100 tons per year) and Thyborøn (average landings of more than 700 tons per year) (see Figure 4.34). These vessels, from harbours on the west coast of Denmark (North Sea area), account annually for approximately 11-19% of the landings (primarily cod and sprat) from the regional area of Fehmarnbelt (Table 4.13).

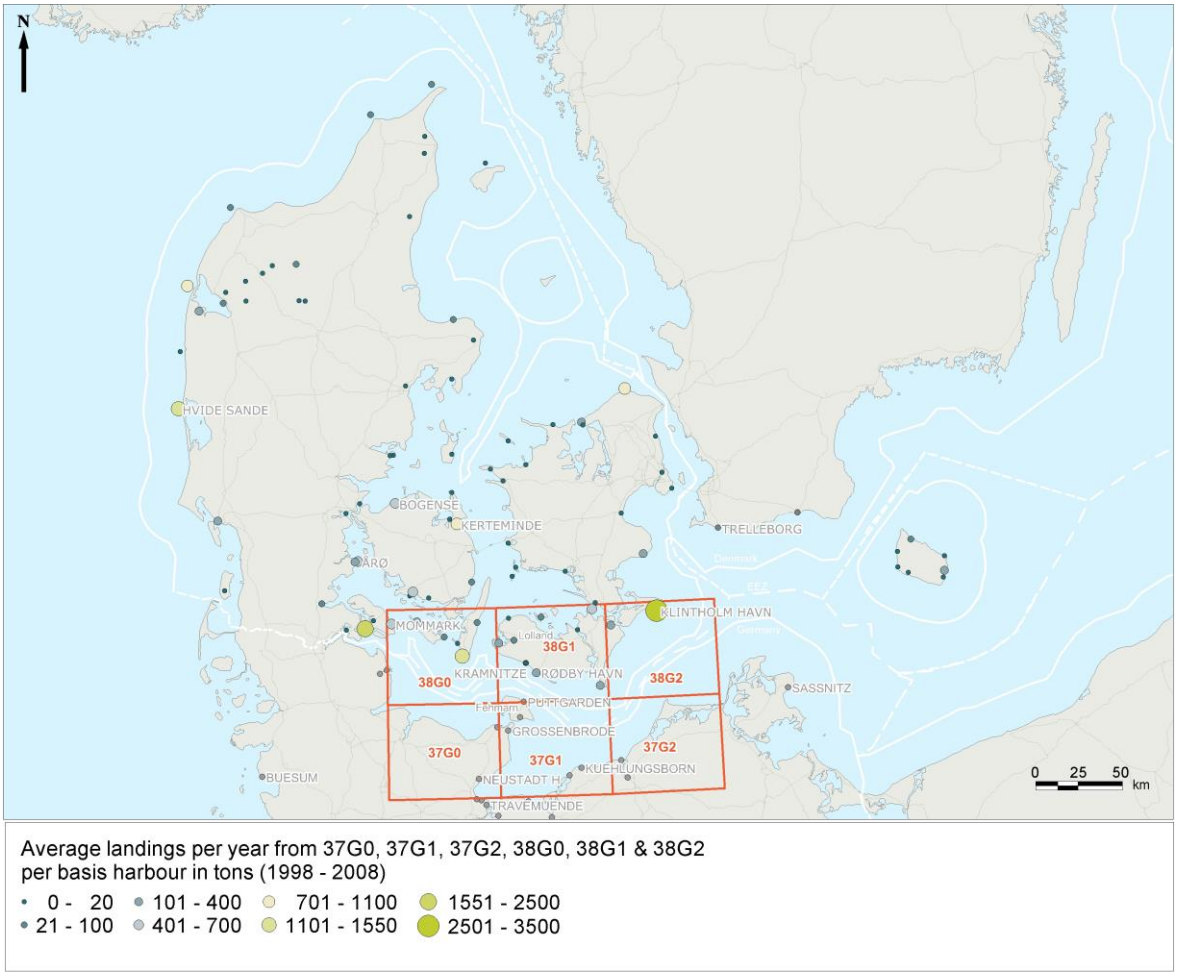


Figure 4.34: An overview of the average Danish landings (tons) per year from 6 ICES rectangles (37G0, 37G1, 37G2 , 38G0, 38G1 and 38G2) in the Western Baltic according to the basis harbours of the vessels that have registered catches in the 6 ICES rectangles.

Vessels from the harbours adjacent Fehmarnbelt (Rødbyhavn, Kramnitze, Langø and Gedser), annually land from 101-400 tons in each harbour, or approximately 3-5% of the total landings from the fisheries in the entire Fehmarnbelt region (Figure 4.34 and Table 4.13).


BUR 27
BUR 26

Table 4.13: Landings (tons) and percentage of total landings (%) of the 3 most important commercial species (sprat, herring and cod), flatfish species, other industrial species and unspecified species from the fisheries in ICES 38G0, 37G0, 38G1, 37G1, 38G2 and 37G2 from 1998-2008 according to the location of the basis harbours of the vessels (Near Fehmarnbelt - basis harbours in ICES 38G1 (southern Lolland + Gedser), (Regional Field - basis harbours in ICES 38G0, 37G0, 37G1, 38G2 and 37G2), ICES subdivisions 22 (not in regional area), ICES subdivision 23 , ICES subdivision 24, Kattegat, Limfjord, Skagerrak and North Sea. Data derived from logbooks which include vessels ≥8 m (vessels ≥10 m before 2005).

Location of Basis harbours	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Near Fehmarn Belt (Lolland + Gedser)	**764 (4%)**	**917 (5%)**	**694 (3%)**	**1,388 (5%)**	**444 (3%)**	**484 (3%)**	**621 (4%)**	**714 (4%)**	**903 (5%)**	**510 (4%)**	**431 (5%)**
Sprat	41.5	0	0	571	0	74	44	9.9	58	0	0
Herring	42	0	0	278	5	11.8	154	251	330	0	0
Cod	568	755	559	429	336	308	331	347	382	366	285
Flatfish species	92	134	111	88	78	62	58	68	89	111	116
Other industrial species	0	1.2	1.5	0.6	3.2	2.1	3.5	1.5	8.3	0.5	0
Unspecified	20.7	26.2	22	21.8	21.5	25.6	30.2	36.8	35.9	32.7	30.6
Regional area of Fehmarn Belt (6 ICES)	**8,003 (39%)**	**8,955 (46%)**	**8,495 (38%)**	**9,133 (34%)**	**5,721 (41%)**	**4,378 (31%)**	**4,744 (27%)**	**5,668 (33%)**	**5,624 (28%)**	**3,440 (29%)**	**2,973 (31%)**
Sprat	1,284	1,542	1,420	892	312	343	611	2,176	3,273	809	544
Herring	3,725	3,293	3,823	5,423	3,361	2,245	2,399	1,733	820	869	1,040
Cod	2,556	3,620	2,832	2,437	1,720	1,430	1,364	1,387	1,198	1,318	902
Flatfish species	351	366	328	309	267	323	340	337	278	397	455
Other industrial species	10.3	56	22.9	20.3	35.9	16.3	11.9	13.9	14.2	8.7	6
Diverse og unspecified	76	77	69	52	25	21	18	22	42	39	26
ICES 22 (other harbours than in regional area)	**6,392 (31%)**	**4,758 (24%)**	**6,186 (28%)**	**8,833 (33%)**	**3,510 (25%)**	**6,440 (45%)**	**7,083 (41%)**	**7,941 (46%)**	**8,171 (41%)**	**4,687 (40%)**	**3,688 (39%)**
Sprat	1,740	1,276	2,553	3,402	1,074	3,576	5,582	5,894	6,030	3,677	3,254
Herring	3,852	2,275	2,113	4,093	1,460	947	722	882	939	101	20
Cod	675	1,026	1,242	1,080	751	528	596	541	785	366	162
Flatfish species	115	136	231	203	137	97	157	100	90	132	114
Other industrial species	2.1	9.2	9.1	10.8	12.5	1,266	7.2	517	320	389	128
Diverse (shellfish, skates and s	8	36	38	45	75	26	20	8	8	23	11
ICES 23 (The Sound)	**0,4 (<1%)**	**21 (<1%)**	**44 (<1%)**	**9,4 (<1%)**	**16,1 (<1%)**	**24 (<1%)**	**0 (0%)**	**0 (0%)**	**0 (0%)**	**0 (0%)**	**0 (0%)**
Sprat	0	0	0	0	0	0	0	0	0	0	0
Herring	0	1	0	0	0	0	0	0	0	0	0
Cod	0.3	19	37	7	15	19	0	0	0	0	0
Flatfish species	0.1	0.3	4.9	1.8	0.2	0.3	0	0	0	0	0
Other industrial species	0	0	0	0	0	0	0	0	0	0	0
Diverse og unspecified	0	0.7	2.6	0.2	1.3	3.9	0	0	0	0	0
ICES 24	**502 (2%)**	**476 (2%)**	**411 (2%)**	**183 (1%)**	**183 (1%)**	**232 (2%)**	**206 (1%)**	**87 (<1%)**	**631 (3%)**	**172 (1%)**	**258 (3%)**
Sprat	0	0	50	8	18	20	23	15	381.5	71	196
Herring	106	0	96	67	108	134	159	39	78	0	0
Cod	369	450	198	99	53	50	18	24	152	75	52
Flatfish species	19.8	17.1	65.1	8.9	4.5	25.9	6.2	8.2	17.8	17.6	9.2
Other industrial species (horse	0.3	0.1	0.9	0.9	0.1	0.1	0.3	0	1.7	8.2	0.7
Diverse og unspecified	7.2	8.1	1.4	0	0.4	2.4	0.1	0	0.1	0.2	0.2
Kattegat	**1,739 (8%)**	**1,216 (6%)**	**3,470 (16%)**	**3,549 (13%)**	**1,717 (12%)**	**683 (5%)**	**1,383 (8%)**	**725 (4%)**	**1,117 (6%)**	**552 (5%)**	**236 (2%)**
Sprat	89	0	0	124.5	0	7.5	295	77.5	284.1	53.5	152
Herring	1464.3	715	2782	2994	1494.5	431	704	469.5	585	345	14
Cod	159.5	472.6	614.6	382.4	191.1	202.4	308.9	148.3	207	120.6	37.3
Flatfish species	25.2	25.5	64	30	23.8	34	63.6	26.3	18.1	32	6.7
Other industrial species	0.2	0.3	1.6	1.1	3.5	1.2	3.6	1.4	17.9	0.5	25.1
Diverse og unspecified	1.2	2.8	8.1	16.5	4	6.5	7.5	2.3	4.5	0.3	0.5
Limfjord	**21 (>1%)**	**36 (>1%)**	**100 (>1%)**	**55 (>1%)**	**31 (>1%)**	**30 (>1%)**	**72 (>1%)**	**0 (0%)**	**18 (>1%)**	**132 (1%)**	**51 (1%)**
Sprat	0	0	0	0	0	0	0	0	0	0	0
Herring	0	0	0	0	0	0	0	0	0	0	0
Cod	18	29	74	39	21	24	59	0	17	104	48
Flatfish species	0.6	4.1	12.0	13.6	9	3.3	10.8	0	0.5	28	3
Other industrial species	0	0	2.9	0.3	0	0.8	0.6	0	0.1	0.2	0.0
Diverse og unspecified	2.2	2.4	11.0	1.9	1.1	1.3	1.3	0	0	0	0
Skagarrak	**269 (1%)**	**328 (2%)**	**337 (2%)**	**365 (1%)**	**372 (3%)**	**77 (<1%)**	**133 (<1%)**	**73 (<1%)**	**145 (<1%)**	**107 (<1%)**	**58 (<1%)**
Sprat	0	0	0	0	0	0	0	0	0	0	0
Herring	0	45	0	102	182	0	0	0	0	0	0
Cod	244	254	312	236	167	65	110	59	122	94	57
Flatfish species	19.7	20.2	12.6	21.9	20.6	10.3	19.3	13.5	21.5	11.8	0.8
Other industrial species	0	0.1	0	0	0	0	0	0.1	0.3	0	0
Diverse og unspecified	5.6	9	11.8	5.5	2.4	1.8	3.3	0.3	1.1	0.9	0.6
North Sea	**2,853 (14%)**	**2,819 (14%)**	**2,552 (11%)**	**3,214 (12%)**	**2,027 (14%)**	**1,913 (13%)**	**3,172 (18%)**	**2,037 (12%)**	**3,320 (17%)**	**2,035 (12%)**	**1,850 (19%)**
Sprat	49	35	0	146	57	228	1147	847	1,080	413	380
Herring	1,980	1,325	0	276	20	0.1	35.3	20	491	0	0
Cod	710	1,271	2,232	2,284	1,546	1,192	1,590	909	1,424	1,356	1,276
Flatfish species	85	145	238	429	309	210	339	226	296	246	174
Other industrial species	0.8	1	9.1	27.6	24.8	252	39	20	11.1	3.2	5.6
Diverse og unspecified	29.2	42.5	72.6	52	70.4	32.1	22.6	15.1	18.2	16.7	13.9
Total Landings (tons)	**20,544**	**19,525**	**22,289**	**26,729**	**14,020**	**14,259**	**17,413**	**17,244**	**19,929**	**11,681**	**9,544**

An overview of the average annual landings per year according to the landing harbours of the vessels fishing in the 6 ICES rectangles of the near and regional field of the Fehmarnbelt are given in Figure 4.35.

Results show the vessels fishing in the regional area of Fehmarnbelt land their catch in many harbours throughout the region. The harbour with the most landings quantitatively is Klintholm Havn, where more than 4,150 tons are landed annually. This is mainly due to the large landings of herring, cod and occasionally sprat from the fisheries in ICES 38G2 (see Figure 4.35 and Table 4.13)

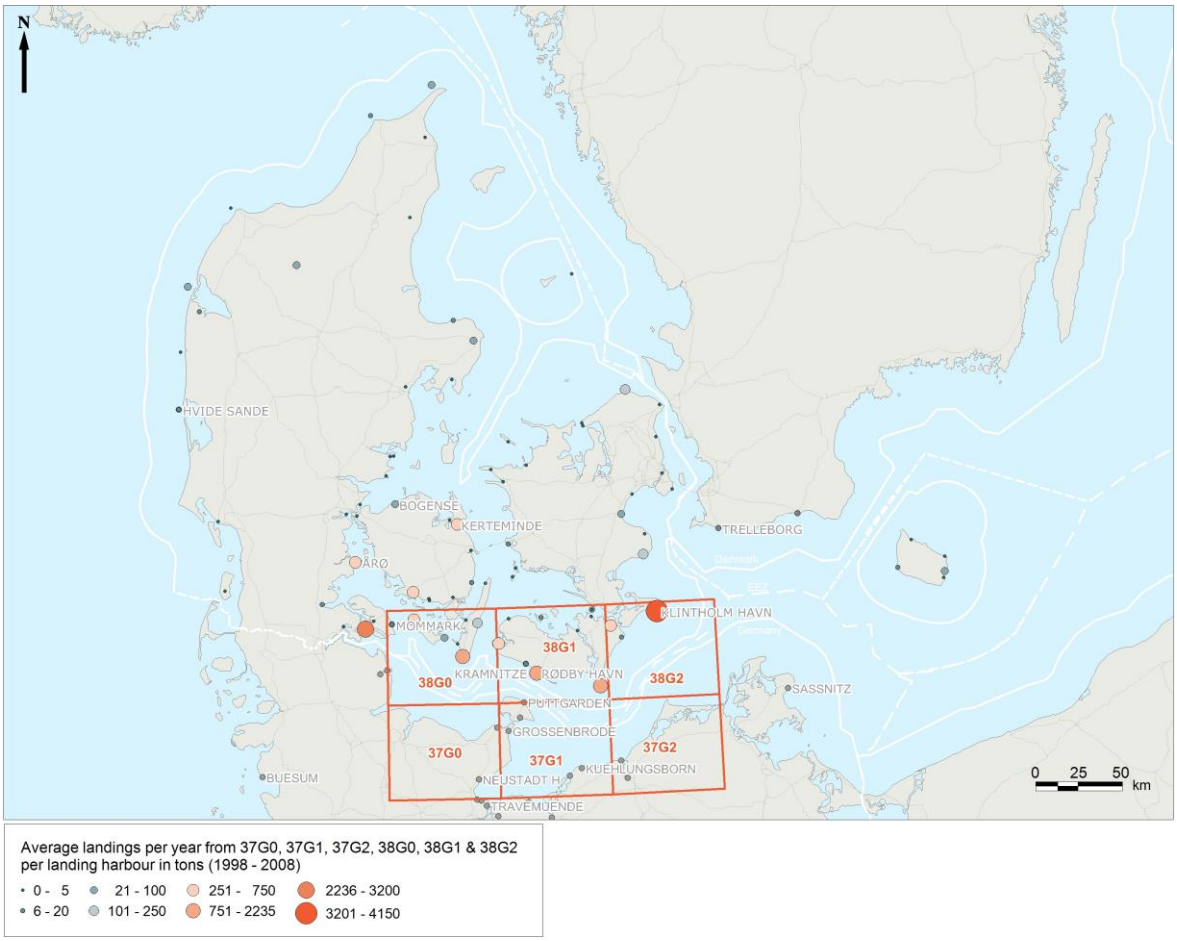


Figure 4.35: The average annual landings per year (1998-2008) according to the landing harbours of the vessels fishing in the 6 ICES rectangles (37G0, 37G1, 37G2, 38G0, 38G1 and 38G2) of the near and regional field of the Fehmarnbelt.

Other harbours where landings are comparatively high are Sønderborg to the far west in the Western Baltic (more than 3,200 tons annually), and Bagenkop, Rødbyhavn and Gedser near Fehmarnbelt (average annual landings from 750-2,235 tons) (Figure 4.35). Similarly, there is a large number of Danish harbours throughout the Western Baltic and Belt Sea where average annual landings exceed 100 tons (Figure 4.35). A seasonal overview of the most important commercial species in the Danish fisheries (monthly landings and value (euro) of landings) from the 6 ICES rectangles of the near and regional field of Fehmarnbelt is given in Figure 4.36.

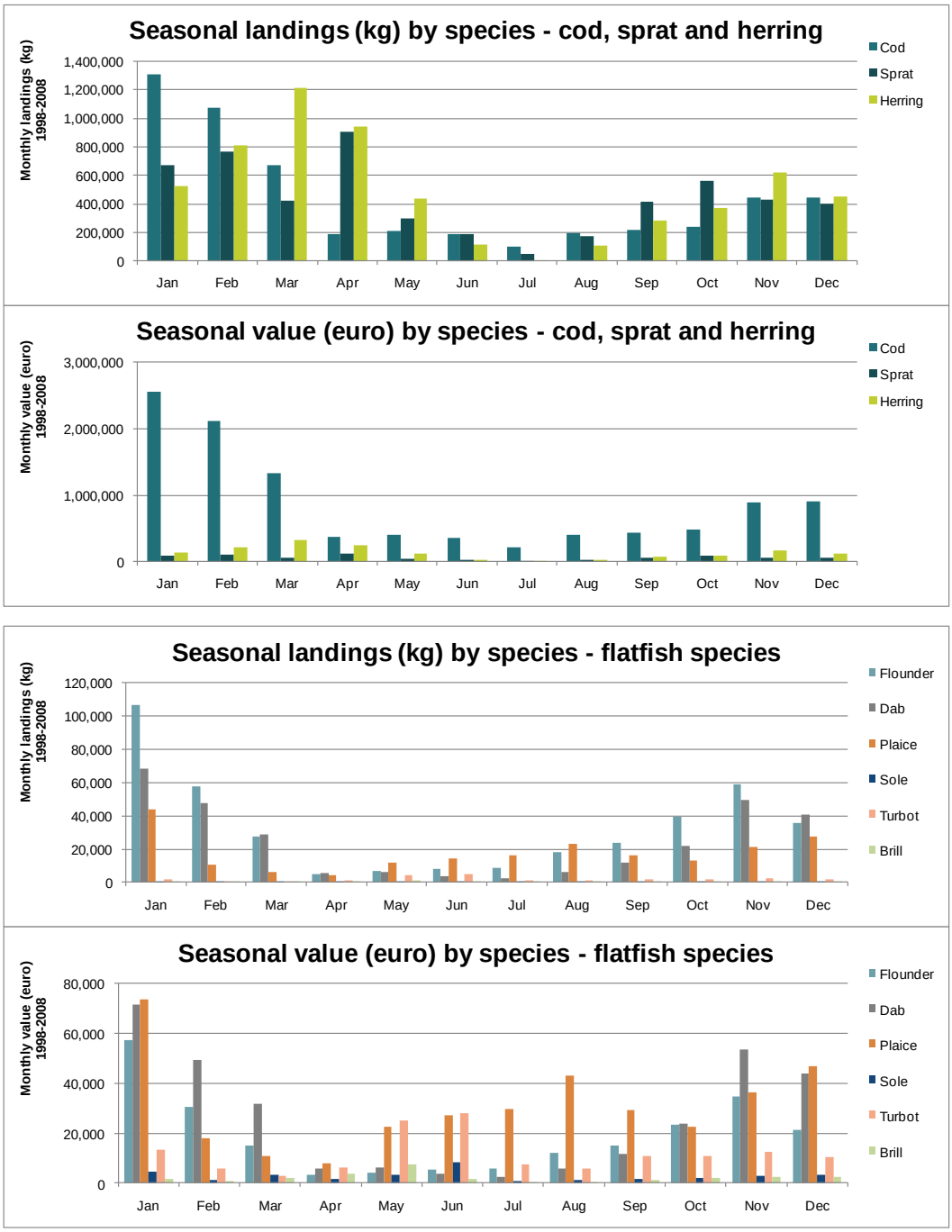


Figure 4.36: The monthly landings (kg) and value (euro) of the most important commercial species in the 6 ICES rectangles (37G0, 38G0, 37G1, 38G1, 37G2 and 38G2) in the near and regional field of Fehmarnbelt.

Results show that the fisheries of the 3 most landed species (cod, herring and sprat) predominantly occur in the colder months of the year (particularly from January-April and once again from October-December). For cod, there is a large decrease in landings after March, whereas the season lasts a little longer for the pelagic species herring and sprat, as monthly landings peak from February to April (Figure 4.36). The seasonal value of the landings is strongly influenced by landings of cod because this species has a much greater value than herring and sprat, which are often landed in almost equal amounts to cod.

The seasonal trend in the landings of diverse flatfish also shows they are also primarily landed during the early spring (January-March) and again in the autumn and early winter (October-December). This pattern is primarily because a large number of flatfish are caught as bycatch in the demersal fisheries after cod. During the summer months the net fisheries often target the more valuable flatfish species turbot, brill and plaice, which is reflected in the comparatively greater contribution to the value of the landings these species contribute to during the summer fisheries, despite relatively small landings.

The seasonal landings and value by the primary gear types in the 6 ICES rectangles in the near and regional field of Fehmarnbelt is given in Figure 4.37.

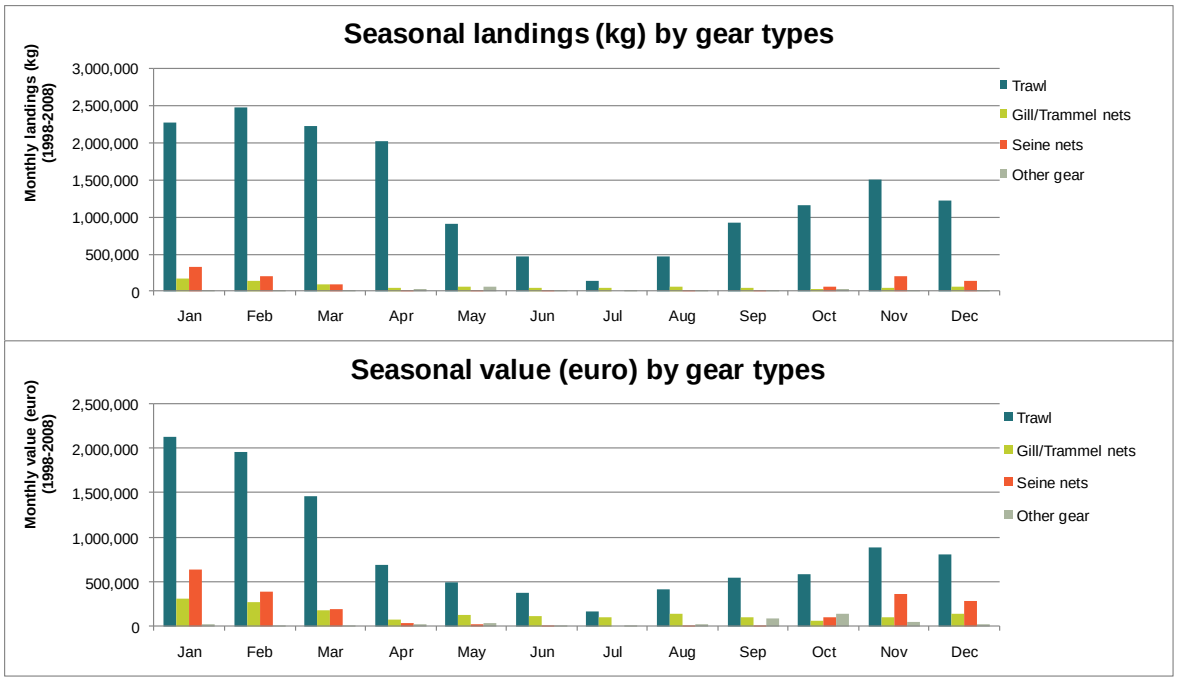


Figure 4.37: Monthly landings (kg) and value (euro) by primary gear types (Trawl, gill/trammel nets, seine nets and other (longlines, hand-lines, fishing rod and dredges) in the 6 ICES rectangles (37G0, 38G0, 37G1, 38G1, 37G2 and 38G2) in the near and regional field of Fehmarnbelt.

Results show that landings from the trawl fisheries (demersal and pelagic) account for a large majority of both the total landings of fish and their value. This is because the species herring and sprat, which make up considerable amount of the landings (by weight), are almost exclusively caught by trawling. Similarly, the great majority of cod, and flatfish as bycatch, are caught by demersal trawlers. The net fisheries also typically target cod and different flatfish species, but overall, landings per effort is lower and net fishermen target a wider variety of other consume species.

Near Field Fehmarnbelt - ICES 37G1 and 38G1

The development of the landings and the specific landings and value of the most important commercial species from the fisheries in the ICES rectangles 37G1and 38G1 in the near field of Fehmarnbelt are shown in Figure 4.38 and Table 4.14.

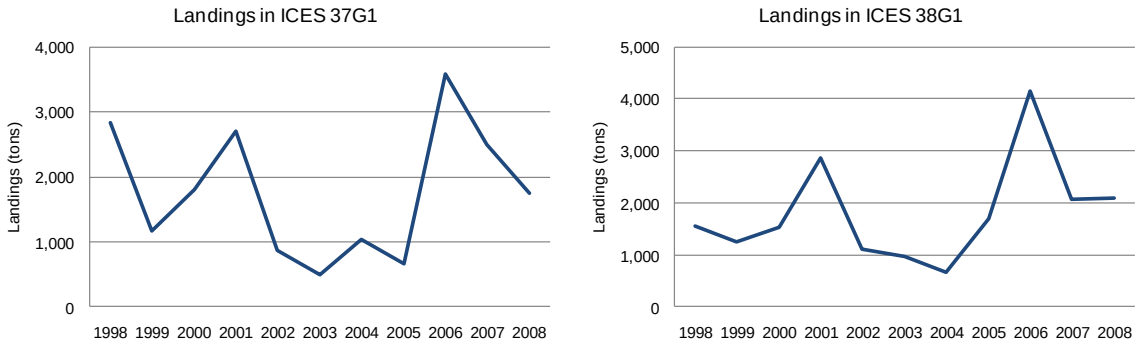


Figure 4.38: The development of the landings in ICES 37G1 and 38G1 from 1998-2008. Data from logbooks, which include vessels ≥10 m before 2005 and vessels ≥8 m from 2005-2008.

In ICES 38G1, which is the fishing area representing the majority of Fehmarnbelt, the development of total annual landings for the commercial fisheries over the last decade (1998-2008) fluctuated from a low of 671 tons in 2004 to a peak of 4,160 tons in 2006. This amounted to a fluctuations in the value of the landings from 618,000 to 2.1 million euro .

The highest recorded landings in ICES 38G1 over the last decade in 2006 were mainly attributable to the large landings of sprat (2,843 tons) and cod (587 tons). In general, Atlantic cod, Baltic herring and sprat have made up between 85-94% of the total landings by weight in this area from 1998-2008 (Table 4.14). The landings of cod have varied between 153-587 tons in recent years (2003-2008), which are generally lower than the landings from 1998-2002 (434-925 tons). Similarly, the landings of herring were generally lower in recent years than before 2002. In contrast, the landings of sprat have been abundant over the last 3 years, peaking in 2006. In recent years, the landings of whiting, silver eel and in particular horse mackerel (101 tons in 2007) have also increased. There is also a relatively stable fishery after the flatfish species dab, flounder, plaice and occasionally turbot.

In ICES 37G1, which is the main fishing area southeast of Fehmarnbelt, the total landings have fluctuated between 491-3,574 tons from 1998-2008. After a few years of comparatively low landings (1,000 tons or less from 2002-2005), landings increased considerably in 2006 and have been comparatively high the last 3 years (2006-2008). The large fluctuations in landings from this area are primarily correlated with variations in the landings of the pelagic species sprat and herring, while landings of most of the other commercial species are relatively stable (Table 4.14).

The most abundant and economically important species for the commercial fisheries in ICES 37G1 were Atlantic cod, Baltic herring and sprat. Together these species made up between 92-99% of the landings by weight and 77-97% of the value of the landings from 1998-2008. Landings of cod peaked at 677 tons in 2000 and have since been lower between 114-317 tons. The landings of cod in 2008 were 176 tons. Similarly, landings of Baltic herring were generally higher from 1998-2002 (478-2,007 tons) than in more recent years 0-774 tons (2003-2008), with no landings being registered in 2008. The flatfish species flounder and dab have consistently been in the landings with the abundance of dab increasing in recent years. Landings of whiting have also contributed significantly in recent years (11-86 tons from 2004-2008).

Table 4.14: Landings (tons) and value (euro) of the most commercially important species from the ICES rectangles 37G1 and 38G1 from 1998-2008. Data derived from logbooks which include vessels ≥8 m (vessels ≥10 m before 2005).

37G1 - Landings (tons)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	136	161	677	299	192	114	266	156	247	317	176
Sprat	658	88	574	1,093	153	349	675	375	2,478	1,858	1,460
Baltic herring	2,007	891	478	1,247	486	8	15	78	774	95	0
Flounder	5	12	37	25	13	9	18	10	2	11	1
Dab	7	5	6	8	4	6	37	24	18	90	14
Plaice	3.8	7.8	6.6	4.4	1.5	1.2	2.9	2.2	1.7	2.2	0.7
Turbot	0.8	0.2	0.7	0.8	0.1	0.6	0.5	0.3	0.3	0.2	0.2
Brill	0	0	0	0	0	0	0	0	0	0	0
Sole	0	0	0	0.2	0	0	0	0	0	0	0
Whiting	0.5	0.8	2.7	16	10	1.3	26	11	51	25	86
Silver Eel	0	0	0	0	0	0	0	0	0	0	0
Salmon	0	0	0	0	0	0	0	0	0	0	0
Horse mackerel	0	0	0	0	0	0	0	0	0	77	0
Unspecified	4	8	22	6	4	2	2	2	2	1	2
Total (tons)	2,826	1,174	1,806	2,701	863	491	1,043	658	3,574	2,495	1,739

37G1 - Value (1,000 euro)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	264	314	1,315	581	373	221	518	295	461	687	409
Sprat	98	13	86	164	23	52	101	50	388	328	224
Baltic herring	545	242	130	339	132	2.0	4.1	17	211	27	0
Flounder	3.1	6.7	21.2	14.4	7.7	5.1	10.1	3.5	1.5	6.2	0.4
Dab	7.2	5.5	6.6	8.0	4.0	6.4	38.5	19.2	21.1	102.0	14.7
Plaice	6.4	13.2	11.2	7.5	2.5	2.1	5.0	3.7	2.9	3.8	1.1
Turbot	4.6	1.2	4.1	4.8	0.4	3.4	2.8	2.3	2.0	1.6	2.0
Brill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Sole	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.2	0.0	0.1	0.0
Whiting	0.4	0.6	2.1	12.4	7.5	1.0	20.0	5.7	48.3	21.2	75.7
Silver Eel	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Horse mackerel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.2	0.0
Unspecified	9.4	19.4	52.5	14.7	10.4	5.6	6.0	5.0	3.2	173.2	3.0
Total	938	615	1,629	1,147	561	299	705	401	1,139	1,364	730

38G1 - Landings (tons)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	434	613	925	618	432	205	289	219	587	244	153
Sprat	309	230	285	1,212	372	554	298	1,153	2,843	1,542	1,787
Baltic herring	744	318	185	863	218	131	0	92	431	28	20
Flounder	18	12	69	84	43	9	12	11	8	7	12
Dab	19	35	27	29	12	13	47	32	34	54	46
Plaice	12	21	23	22	18	14	9	11	11	10	10
Turbot	3.0	2.3	4.7	2.7	1.2	1.2	1.1	1.9	1.9	3.7	5.6
Brill	0	0	1.4	3.1	3.6	0.2	0.7	0.2	0.2	0.1	0.1
Sole	0	0	0	0.2	0.6	0.0	0.1	0.0	0.8	0.1	0.1
Whiting	1	2	6	3	9	3	10	169	196	65	49
Silver eel	0	0	0	0	0	0	0.0	10	15	6.1	3.6
Yellow eel	0	0	0	0	0	0	0	0	1.4	0.2	0.2
Salmon	<1	0	0	<1	0	0	0	0	0	0	0
Sea trout	2.6	1.6	0	0	1.6	0	0	0	0	0	0
Horse mackerel	0	0	0	0	0	30	0	0	20	101	0
Unspecified	8	25	15	21	10	15	3.6	2.7	11	9.2	6
Total (tons)	1,551	1,260	1,540	2,859	1,121	975	671	1,702	4,160	2,071	2,092

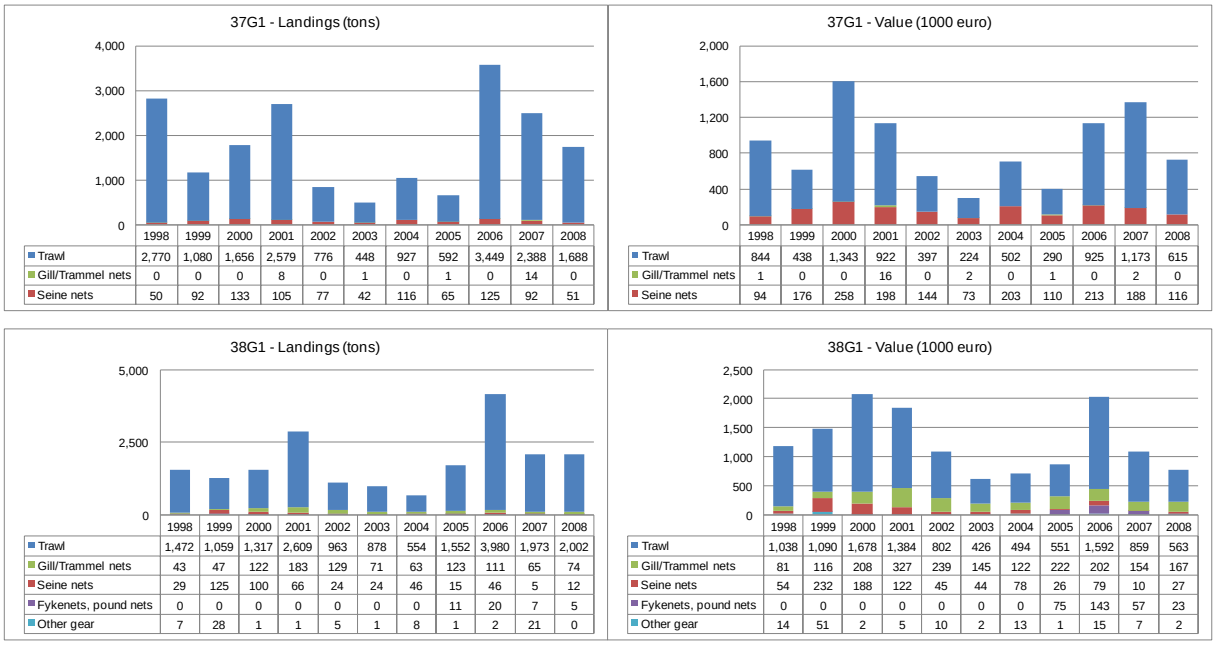
38G1 - Value (1,000 euro)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	844.4	1,191	1,797	1,201	839.2	398.5	562.6	414.7	1,040	527.0	346.5
Sprat	46.3	34.5	42.6	181.6	55.7	82.9	44.6	152.3	440.8	283.8	272.9
Baltic herring	202.0	86.4	50.1	234.5	59.2	35.6	0.0	19.5	117.4	7.9	4.4
Flounder	10.4	7.0	39.4	48.1	24.3	5.1	7.1	5.3	4.1	3.8	5.6
Dab	20.1	36.2	28.0	30.5	12.9	13.3	48.9	28.1	40.0	62.8	47.8
Plaice	19.9	35.8	38.2	36.5	30.0	24.1	14.6	21.2	19.8	19.0	15.7
Turbot	17.1	13.4	27.1	15.5	7.0	7.1	6.6	11.1	12.2	23.0	30.0
Brill	0.0	0.2	8.7	18.7	22.0	1.2	4.2	1.2	1.0	0.9	0.4
Sole	0.2	0.4	0.0	2.4	8.1	0.2	0.6	0.5	8.8	0.9	0.8
Whiting	1.0	1.3	4.7	2.7	7.0	2.2	7.5	124.6	175.7	60.5	23.0
Silver eel	0.0	0.0	0.0	0.0	0.0	0.0	0.3	90.7	135.3	54.9	20.1
Yellow eel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	10.2	1.4	1.6
Salmon	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Sea trout	6.3	3.8	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
Horse mackerel	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0	3.8	18.6	0.0
Unspecified	19.5	79.1	39.8	66.0	26.8	41.9	9.6	6.1	21.4	22.8	12.6
Total	1,187	1,489	2,076	1,838	1,096	618	707	875	2,031	1,087	781

The amount and value of the landings from ICES 37G1 and 38G1 according to the primary gear are shown in Figure 4.39.

In ICES 37G1 and 38G1, the trawl fisheries (both pelagic and demersal) account for the majority of the landings and revenue (value of the landings) from fisheries in both of these areas. Seine netting is a little more prominent in ICES 37G1, whereas the gill/trammel net fisheries and use of other gear is more prominent in ICES 38G1. The large increase in landings by gill nets, fyke nets and pound nets from 2005 is more and artefact of smaller vessels (8-10 m) entering the statistical data as vessel of these lengths (primarily net fishers) first registered their landings in ICES rectangles as of 2005.

The average annual landings in tons from the 2 ICES rectangles 37G1 and 38G1 are shown according to the basis harbours in Figure 4.40 and according to which harbour catches were landed Figure 4.42.



37G1 - Landings (tons)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	2,770	1,080	1,656	2,579	776	448	927	592	3,449	2,388	1,688
Gill/Trammel nets	0	0	0	8	0	1	0	1	0	14	0
Seine nets	50	92	133	105	77	42	116	65	125	92	51

37G1 - Value (1000 euro)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	844	438	1,343	922	397	224	502	290	925	1,173	615
Gill/Trammel nets	1	0	0	16	0	2	0	1	0	2	0
Seine nets	94	176	258	198	144	73	203	110	213	188	116

38G1 - Landings (tons)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	1,472	1,059	1,317	2,609	963	878	554	1,552	3,980	1,973	2,002
Gill/Trammel nets	43	47	122	183	129	71	63	123	111	65	74
Seine nets	29	125	100	66	24	24	46	15	46	5	12
Fykenets, pound nets	0	0	0	0	0	0	0	11	20	7	5
Other gear	7	28	1	1	5	1	8	1	2	21	0

38G1 - Value (1000 euro)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	1,038	1,090	1,678	1,384	802	426	494	551	1,592	859	563
Gill/Trammel nets	81	116	208	327	239	145	122	222	202	154	167
Seine nets	54	232	188	122	45	44	78	26	79	10	27
Fykenets, pound nets	0	0	0	0	0	0	0	75	143	57	23
Other gear	14	51	2	5	10	2	13	1	15	7	2

Figure 4.39: The landings (tons) and value (euro) according to primary gear types (trawl, gill/trammel nets, seine nets, fyke nets, pound nets, and other gear (longlines, handlines, bottom dredges and fishing rods) for the ICES rectangles 37G1 and 38G1 in the near field area of Fehmarnbelt. Overall landings and their value in the ICES rectangles are probably slightly underestimated in the category gill/trammel nets because vessels in these fisheries are typically small and vessels less than ≤8 m (≤10 m before 2005) are not represented because they are not required to declare their landings in ICES rectangles. Similarly landings from fyke/pound nets and other gear are often landed by vessels less than 8 m and not represented in their entirety in these landings.

Characteristic for the Danish fisheries in the near field of Fehmarnbelt ICES 37G1 and 38G1 are that vessels from a wide range of Danish harbours, including some as far away as the west coast of Jutland, participate in the fisheries in these two ICES rectangles. Vessels from Sønderborg land on average, more than 760 tons of the catches from the fisheries in ICES 37G1 and 38G1 every year. Similarly, the vessels from the west coast of Jutland (Hvide Sande and Thyborøn) land on average, 585 tons and 130 tons from the near field of Fehmarnbelt, respectively. Vessels from the harbours within and bordering Fehmarnbelt (Bagenkop (61-130 tons), Kramnitze (21-60 tons) and Rødbyhavn (131-330 tons) also participate in the fisheries in ICES 37G1 and 38G1 (Figure 4.40). These patterns do not change much when the basis harbours of the vessels fishing only in ICES 38G1 are presented (Figure 4.41). This is because the majority of the landings by vessels fishing in this area is in ICES 38G1, which is closest to Denmark.

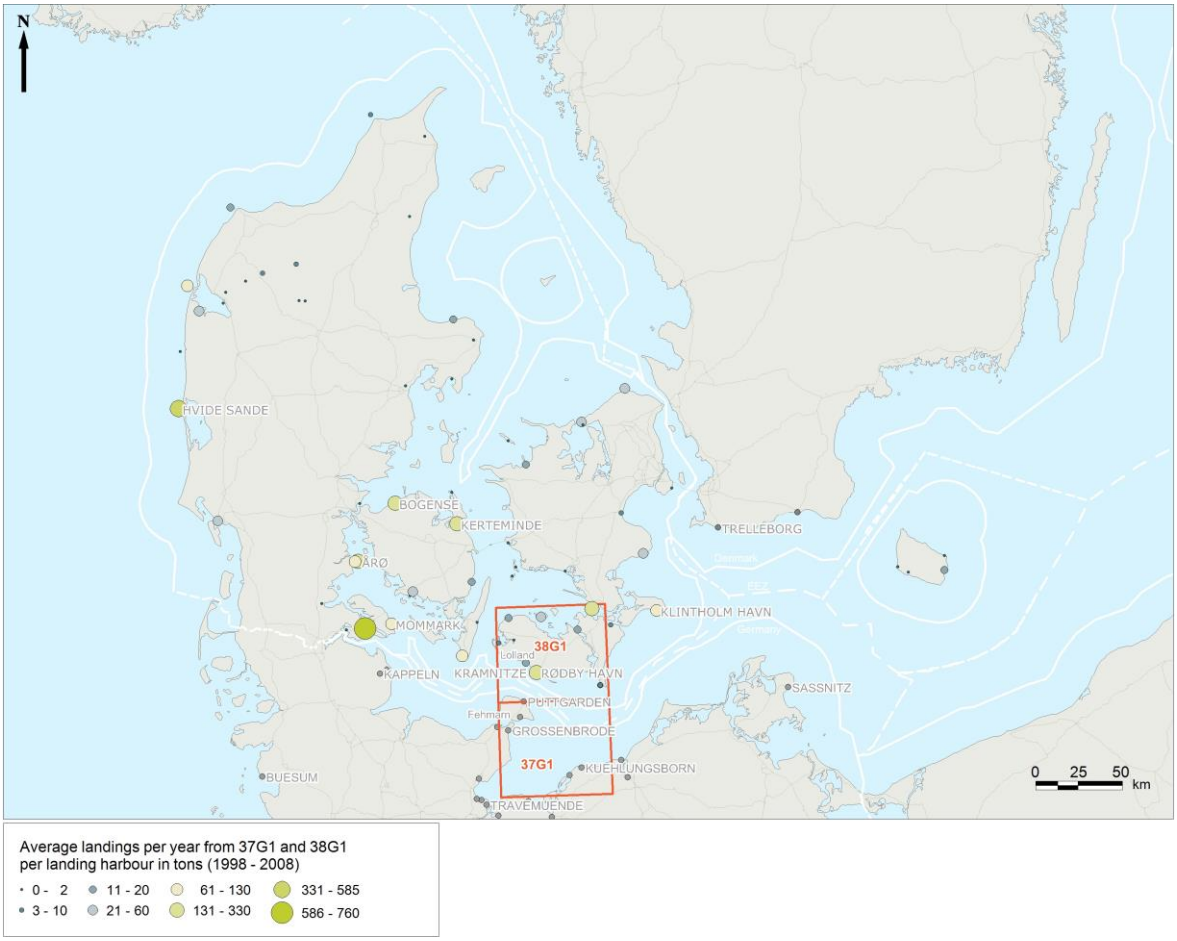


Figure 4.40: The average annual landings in tons from the fisheries near Fehmarnbelt (ICES rectangles 37G1 and 38G1) according to the basis harbours of the vessels (1998-2008).

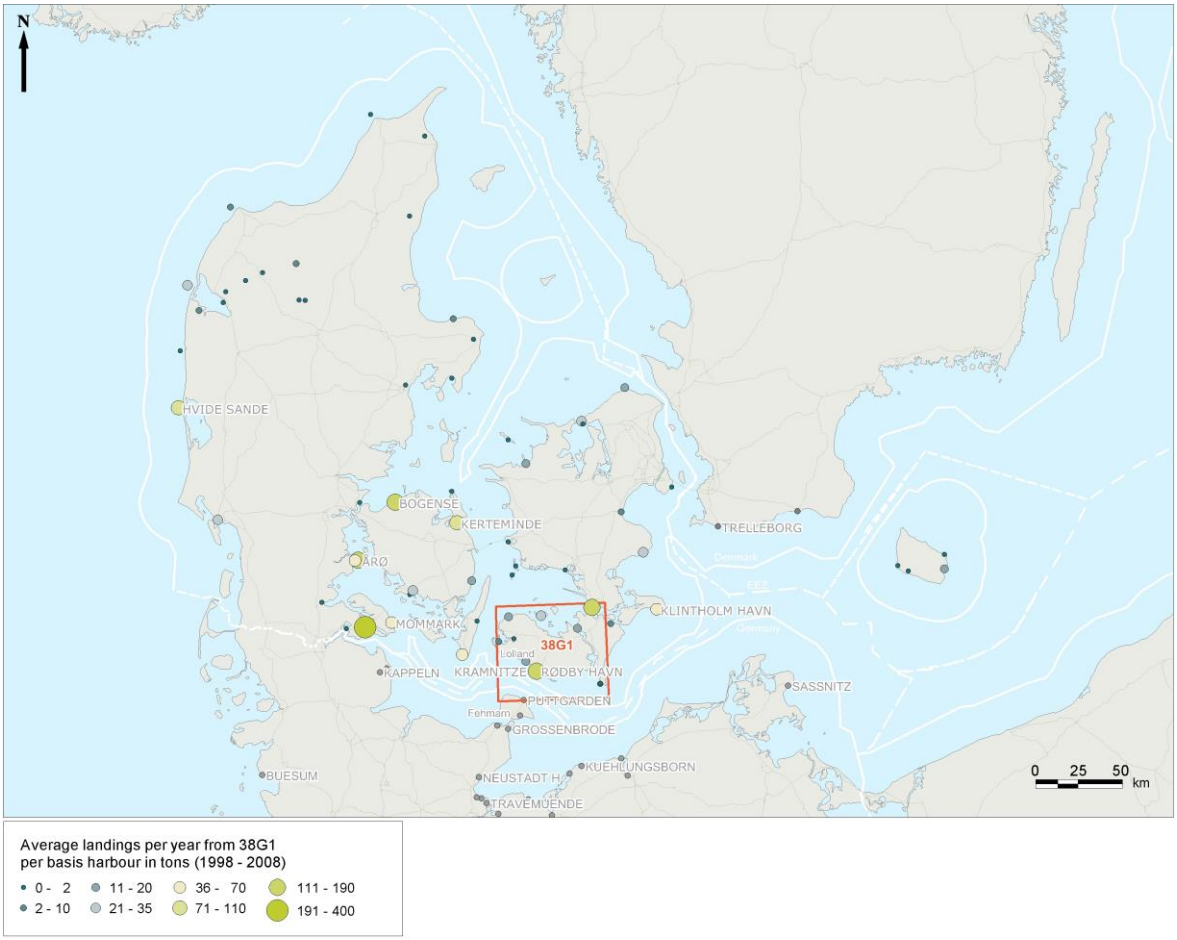


Figure 4.41: The average annual landings in tons from the fisheries near Fehmarnbelt (ICES rectangle 38G1) according to the basis harbours of the vessels (1998-2008).

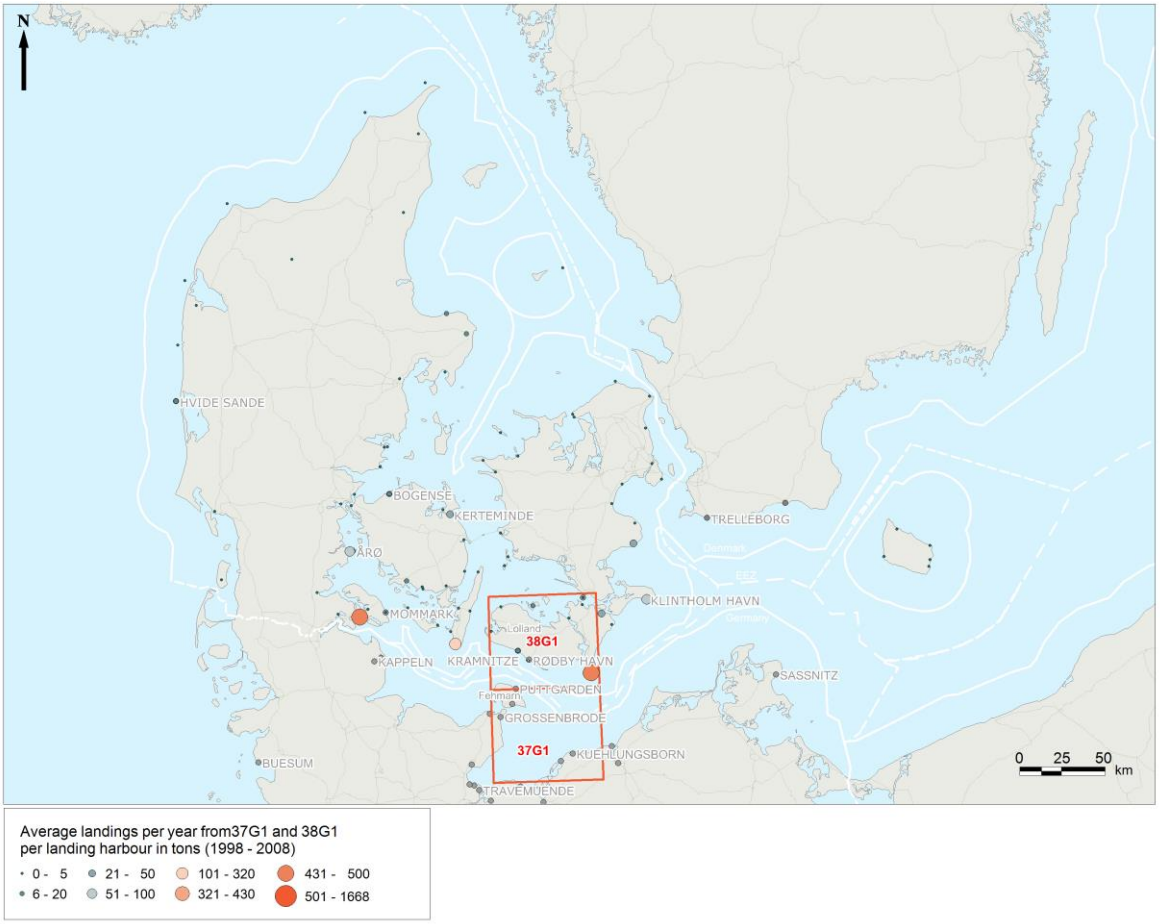


Figure 4.42: The average annual landings in tons from the fisheries near Fehmarnbelt (ICES rectangles 37G1 and 38G1) according to the landing harbours (1998-2008).

The catches from the fisheries in the near field of Fehmarnbelt are predominantly landed in the harbours that are in its near vicinity. In Rødbyhavn, landings have averaged more than 1,600 tons a year since 1998. Other important landing harbours for the fisheries in this area are Gedser and Sønderborg where more than 500 tons on average are landed every year. Similarly, an average of more than 300 tons of the fish caught in ICES 37G1 and ICES 38G1 has been landed in the harbour of Bagenkop from 1998-2008 (Figure 4.42).

The average monthly landings and value of landings (1998-2008) for the most important commercial species for ICES rectangles 37G1 and 38G1 in the near field of Fehmarnbelt are given in Figure 4.43 and Figure 4.44.

The overall pattern in the seasonality of the fisheries in both areas shows landings are most abundant during the winter months and predominately in the first 3 months of the year. The figures show that cod is caught in both areas almost exclusively from January-March while herring and sprat are also caught in relatively high abundances during much of the year, except for the late spring and summer months (May-August). The seasonal pattern for the landings of the flatfish species flounder and dab follow the landings of cod, most probably because these species are typically a bycatch of the cod fisheries. In ICES 38G1, other flatfish species (plaice, sole, turbot and brill) are caught in varying amounts during most of the year as these species are more directly targeted, especially from the warmer summer months and into the autumn/winter.

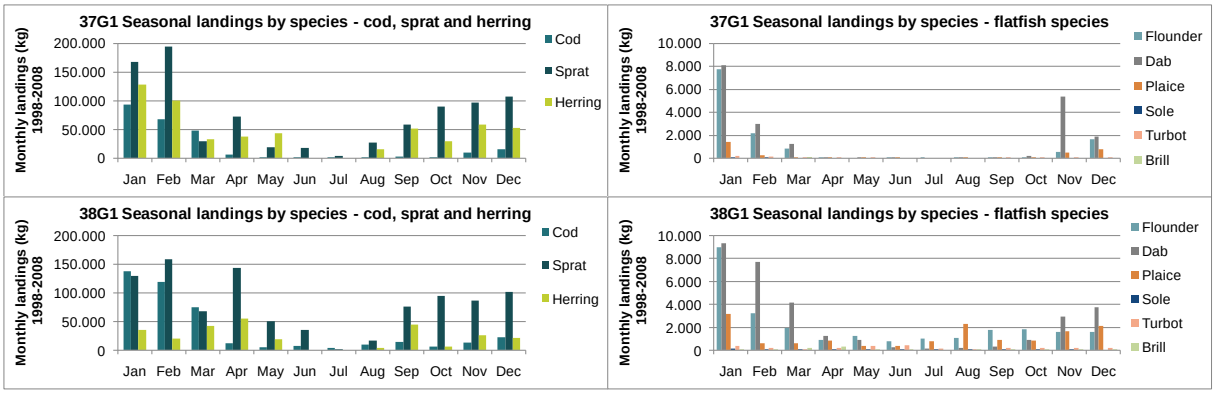


Figure 4.43: Monthly landings (1998-2008) for the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G1 and 38G1 in the near field of Fehmarnbelt.

In general, the monthly value of the landings are strongly influenced by the greater value of cod and some flatfish species (plaice, turbot, sole and brill), and thus the overall seasonal development of the values follow the seasonal patterns in their landings (Figure 4.43). This is clearly evident by large monthly landings of sprat and herring not being reflected in the values as much as other species (Figure 4.44).

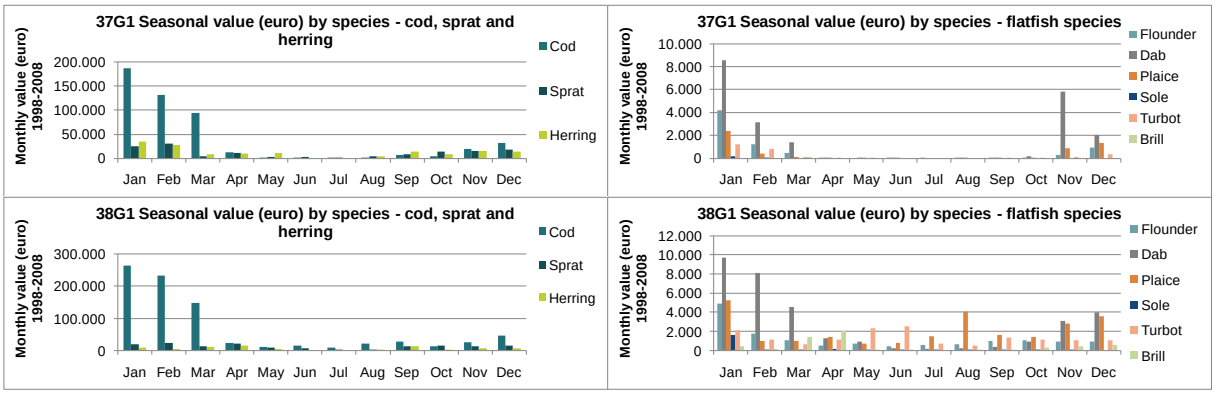


Figure 4.44: Monthly values (euro) of the landings (1998-2008) for the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G1 and 38G1 in the near field of Fehmarnbelt.

The seasonal landings and value of landings according to primary gear types (trawls, gill/trammel nets, seine nets and other gear) shown in Figure 4.45, indicate the large importance of trawling (both pelagic and demersal trawls) to the revenue of the fisheries in both 37G1 and 38G1. The Danish seine fisheries, which most often target flatfish and cod, have more importance in the more southern ICES 37G1, whereas the gill/trammel fisheries are comparatively more important in the more northern ICES 38G1.

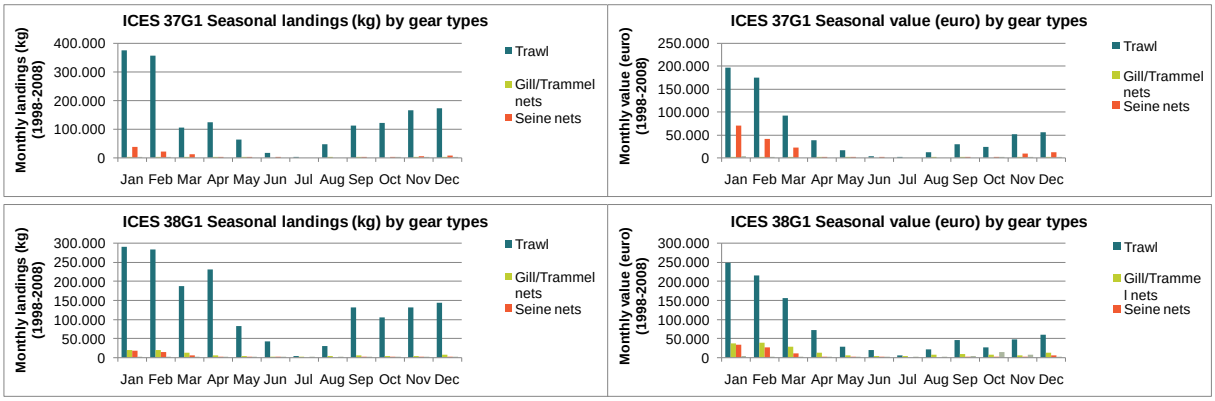


Figure 4.45: The monthly landings (1998-2008) and value (euro) of the landings according to the primary gear types (trawl, gill/trammel nets, seine nets and other gear (longlines, bottom dredges and fishing rods)) for the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G1 and 38G1 in the near field of Fehmarnbelt.

Regional area Fehmarnbelt - ICES 37G0, 38G0, 37G2 and 38G2

The Danish fisheries in the more regional areas of Fehmarnbelt are presented as data from the ICES rectangles 37G0 and 38G0 to the west of Fehmarn and 37G2 and 38G2 to the east of Fehmarnbelt.

37G0 and 38G0

Logbook records of the landings and value of the fisheries in ICES rectangles 37G0 and 38G0, west of Fehmarnbelt are shown in Table 4.15. Source: Danish Directorate for Fisheries.

In ICES 37G0, to the southwest of Fehmarnbelt, the landings of the commercial fisheries have fluctuated between 12-433 tons (16,000-105,000 euro) over the last 10 years with peaks in 2001 (374 tons) and 2006 (433 tons) (Figure 4.46). These peaks were typically followed by a large decrease in landings the following year. Sprat and cod made up the majority of the catch by weight. The large differences between the total landings from year to year are primarily attributed to the fluctuations in the abundance of sprat in the catch.

In ICES 38G0, the annual landings have fluctuated between 3,087-9,078 tons (4.3-8.2 million euro) from 1998-2007 with peaks in 2001 and 2005 (Figure 4.46). Cod has consistently been a predominant part of the landings in this area fluctuating between 1,477-3,272 tons from 1998-2007 (Table 4.15). Sprat and Baltic herring have also been caught in large abundances in this area. However, while herring landings have decreased in recent years and have only contributed 4-8% of the catch by weight since 2005, the contribution of sprat to the total weight of landings has increased from 20% to 43-62%. Several flatfish species contribute consistently to fisheries, in particular, the species flounder, dab and plaice, and in more recent years the valuable species turbot, brill and sole. Other commercial species that contribute to the landings are whiting which peaked at 327 tons in 2005, horse mackerel (peak of 1,139 tons), and garfish and silver eel (Table 4.15).

Table 4.15: Landings (tons) and value (1000 euro) of the most commercially important species from the ICES rectangles 37G0 and 38G0 from 1998-2008. Data derived from logbooks which include vessels ≥8 m (vessels ≥10 m before 2005).

37G0 - Landings (tons)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	19,6	6,1	23,9	54,5	10,5	18,6	13,5	14,5	12,4	23,1	24,4
Sprat	0,0	20,0	221,5	186,1	0,0	0,0	7,0	110,0	413,0	51,5	35,0
Baltic herring	0,0	0,0	83,0	117,0	0,0	0,0	0,0	0,0	6,0	0,0	0,0
Flounder	0,0	0,4	0,2	9,2	0,5	2,5	0,2	1,7	0,0	3,9	0,7
Dab	0,0	0,3	0,9	1,8	0,0	1,1	2,1	2,2	1,3	5,3	2,3
Plaice	0,1	0,2	0,6	3,1	0,2	0,6	0,7	0,4	0,1	1,0	0,4
Turbot	0,0	0,0	0,0	0,1	0,0	0,7	0,0	0,0	0,0	0,0	0,0
Brill	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Sole	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,0	0,0	0,0
Whiting	0,0	0,0	0,0	0,2	0,0	1,6	0,1	0,0	0,0	14,0	0,2
Silver eel	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Salmon	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Sea trout	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Unspecified	0,1	0,0	0,3	1,7	0,3	0,2	0,4	0,4	0,0	0,1	0,3
Total (tons)	20	27	330	374	12	25	24	129	433	99	63

37G0 - Value (1,000 euro)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	38,1	11,9	46,5	106,0	20,4	36,1	26,2	27,7	25,2	49,2	56,4
Sprat	0,0	3,0	33,2	27,9	0,0	0,0	1,0	13,5	56,5	9,0	5,4
Baltic herring	0,0	0,0	22,4	31,7	0,0	0,0	0,0	0,0	1,6	0,0	0,0
Flounder	0,0	0,2	0,1	5,3	0,3	1,4	0,1	0,5	0,0	2,1	0,3
Dab	0,0	0,3	0,9	1,8	0,0	1,1	2,1	1,7	1,6	6,4	2,4
Plaice	0,2	0,3	1,0	5,3	0,3	0,9	1,2	0,7	0,2	1,7	0,7
Turbot	0,0	0,2	0,0	0,8	0,0	3,8	0,1	0,0	0,0	0,0	0,3
Brill	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Sole	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1,1	0,0	0,0	0,0
Whiting	0,0	0,0	0,0	0,1	0,0	1,3	0,1	0,0	0,0	3,3	0,2
Silver eel	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Salmon	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Sea trout	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Unspecified	0,2	0,0	0,7	5,6	0,8	0,4	1,4	0,8	0,0	0,3	0,5
Total	39	16	105	184	22	45	32	46	85	72	66

38G0 - Landings (tons)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	1.914	3.029	3.270	2.631	2.052	1.474	2.210	1.728	2.231	2.052	1.265
Sprat	1.878	1.706	2.743	2.504	730	3.002	3.155	5.531	4.290	1.381	1.026
Baltic herring	3.423	2.582	1.762	3.306	575	605	217	743	280	42	0
Anchovy	0,0	0,0	0,0	0,1	0,0	155,0	0,0	0,0	0,0	48,2	0,0
Flounder	146,1	155,4	289,8	252,7	159,6	83,7	109,8	101,4	91,0	113,5	177,4
Dab	66,5	105,0	70,1	87,9	71,4	137,8	276,0	216,8	156,4	325,9	259,0
Plaice	87,3	230,0	216,1	150,9	119,8	79,3	91,9	101,8	97,4	194,2	159,8
Turbot	15,4	9,4	5,3	8,6	5,3	4,8	11,9	12,6	12,4	16,1	31,5
Brill	0,5	0,5	0,4	0,7	0,6	2,1	1,9	5,5	3,9	6,1	11,1
Sole	0,6	0,5	0,4	0,8	0,2	0,1	1,0	2,2	2,0	1,8	8,0
Whiting	8,2	28,2	24,3	23,8	42,3	66,8	17,1	341,5	20,8	48,0	21,3
Silver eel	2,0	0,0	0,0	1,0	0,0	0,0	0,0	7,7	8,4	10,6	9,4
Yellow eel	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,4	0,1	0,2
Salmon	0,0	0,1	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Sea trout	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,3	0,0	0,0
Horse mackerel	0,0	0,0	0,0	0,0	0,0	1.139	0,0	0,0	77,0	20,0	0,0
Garfish	0,0	0,0	0,0	0,0	0,0	0,0	0,0	14,7	20,0	6,0	22,7
Unspecified	84,6	137,9	129,7	108,6	147,5	104,5	66,9	88,6	88,9	101,4	90,1
Total (tons)	7.624	7.984	8.510	9.078	3.904	6.955	6.160	8.896	7.376	4.354	3.087

38G0 - Value (1,000 euro)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	3.720	5.887	6.354	5.114	3.989	2.864	4.295	3.304	4.125	4.559	2.836
Sprat	281,4	255,6	410,9	375,0	109,3	449,6	472,6	658,0	657,2	245,4	156,3
Baltic herring	930,1	701,4	478,6	898,1	156,1	164,5	58,9	157,2	76,3	12,0	0,0
Anchovy	0,0	0,0	0,0	0,0	0,0	29,6	0,0	0,0	0,0	9,1	0,0
Flounder	83,3	88,6	165,2	144,0	90,9	47,7	62,6	44,8	52,8	67,2	85,4
Dab	68,8	108,6	72,5	91,0	73,8	142,6	285,6	196,2	178,6	371,3	266,6
Plaice	147,9	389,7	366,0	255,6	203,0	134,3	155,7	197,0	184,3	377,3	255,0
Turbot	89,2	54,4	30,7	50,0	30,9	27,7	69,2	68,6	73,9	99,2	173,8
Brill	3,1	2,9	2,5	4,2	3,7	13,1	11,8	36,8	29,2	38,6	60,3
Sole	7,7	5,9	4,6	10,5	2,1	1,4	12,3	24,7	27,3	27,5	104,8
Whiting	6,4	22,1	19,0	18,6	33,2	52,4	13,4	211,9	16,0	34,8	8,7
Silver eel	0,0	0,0	0,0	0,0	0,0	0,0	0,0	67,0	76,6	95,8	53,0
Yellow eel	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,7	2,6	0,9	1,2
Salmon	0,0	0,6	0,4	0,0	0,0	0,0	0,0	0,0	0,1	0,0	0,0
Sea trout	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,7	0,1	0,0
Horse mackerel	0,0	0,0	0,0	0,0	0,0	213,3	0,0	0,0	14,7	3,7	0,0
Garfish	0,0	0,0	0,0	0,0	0,0	0,0	0,0	7,9	9,4	3,7	22,5
Unspecified	207,8	333,6	322,5	265,1	345,2	469,3	173,2	203,5	174,4	254,5	256,1
Total	5.546	7.850	8.227	7.226	5.037	4.609	5.611	5.179	5.700	6.200	4.279

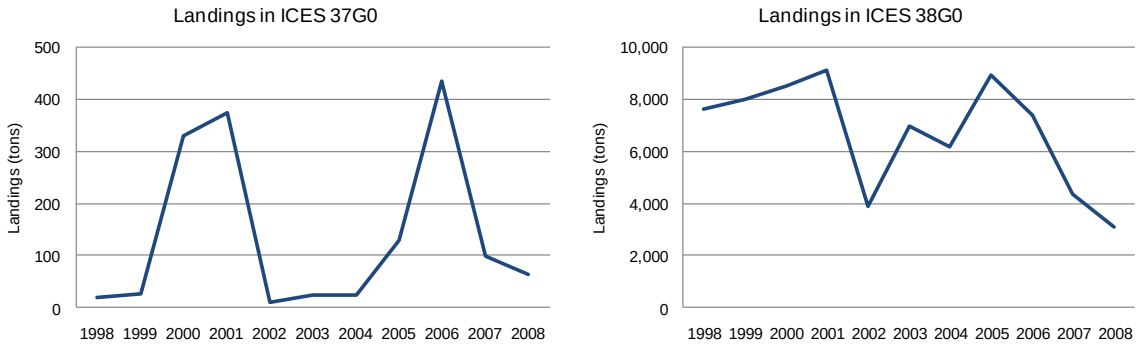
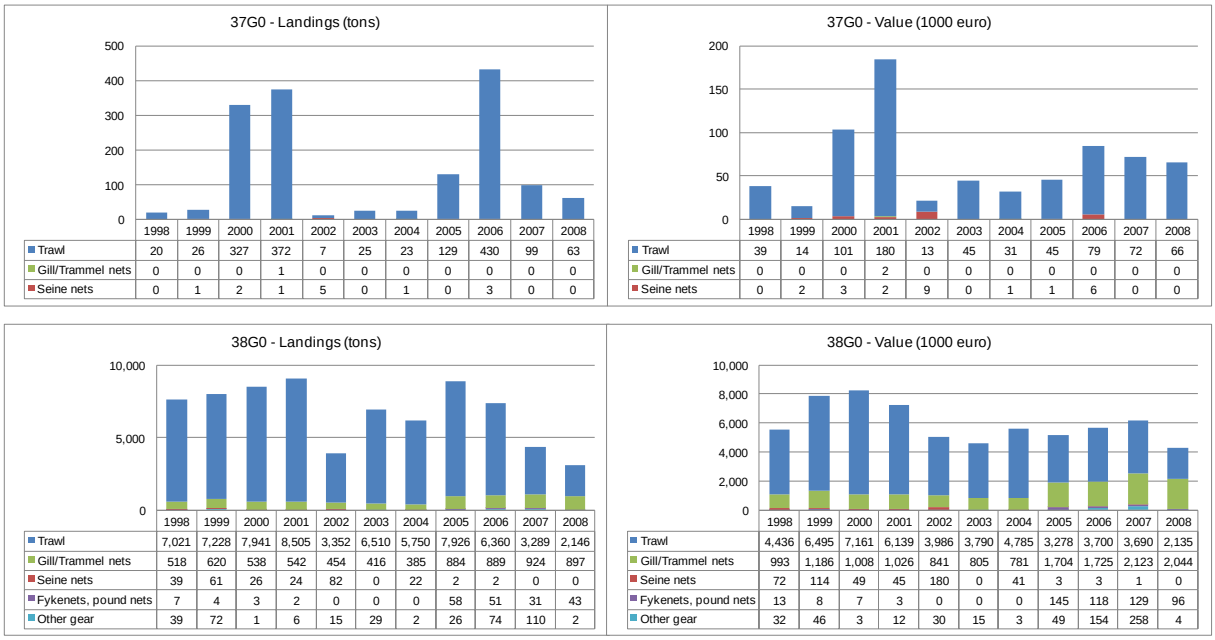


Figure 4.46: The development of the landings in ICES 37G0 and 38G0 from 1998-2008. Data derived from logbooks which include vessels ≥8 m (vessels ≥10 m before 2005).

The landings according to gear (Figure 4.47), shows that the trawl fisheries are by far the most prominent in ICES 37G0, and represent more than 99% of landings. Similarly, the trawl fisheries also dominate in ICES 38G0 (> 80% of landings), however the fisheries here, are also represented by a considerable amount of gill/trammel net fisheries as well seining and some fisheries with “other gear” (longlines, handlines, dredges and rods), which are primarily used near the coast.



37G0 - Landings (tons)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	20	26	327	372	7	25	23	129	430	99	63
Gill/Trammel nets	0	0	0	1	0	0	0	0	0	0	0
Seine nets	0	1	2	1	5	0	1	0	3	0	0

37G0 - Value (1000 euro)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	39	14	101	180	13	45	31	45	79	72	66
Gill/Trammel nets	0	0	0	2	0	0	0	0	0	0	0
Seine nets	0	2	3	2	9	0	1	1	6	0	0

38G0 - Landings (tons)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	7,021	7,228	7,941	8,505	3,352	6,510	5,750	7,926	6,360	3,289	2,146
Gill/Trammel nets	518	620	538	542	454	416	385	884	889	924	897
Seine nets	39	61	26	24	82	0	22	2	2	0	0
Fykenets, pound nets	7	4	3	2	0	0	0	58	51	31	43
Other gear	39	72	1	6	15	29	2	26	74	110	2

38G0 - Value (1000 euro)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	4,436	6,495	7,161	6,139	3,986	3,790	4,785	3,278	3,700	3,690	2,135
Gill/Trammel nets	993	1,186	1,008	1,026	841	805	781	1,704	1,725	2,123	2,044
Seine nets	72	114	49	45	180	0	41	3	3	1	0
Fykenets, pound nets	13	8	7	3	0	0	0	145	118	129	96
Other gear	32	46	3	12	30	15	3	49	154	258	4

Figure 4.47: The development of the landings and value (euro) by primary gear types (trawl, gill/trammel nets, seine nets, fyke- and pound nets and other gear (longlines, hand-lines, dredges and rods) in ICES 37G0 and 38G0 from 1998-2008. Data derived from logbooks which include vessels ≥8 m (vessels ≥10 m before 2005).

The seasonality of the landings and value by the most important commercial species in the ICES rectangles 37G0 and 38G0 in the regional field of Fehmarnbelt are given in Figure 4.48 and Figure 4.49.

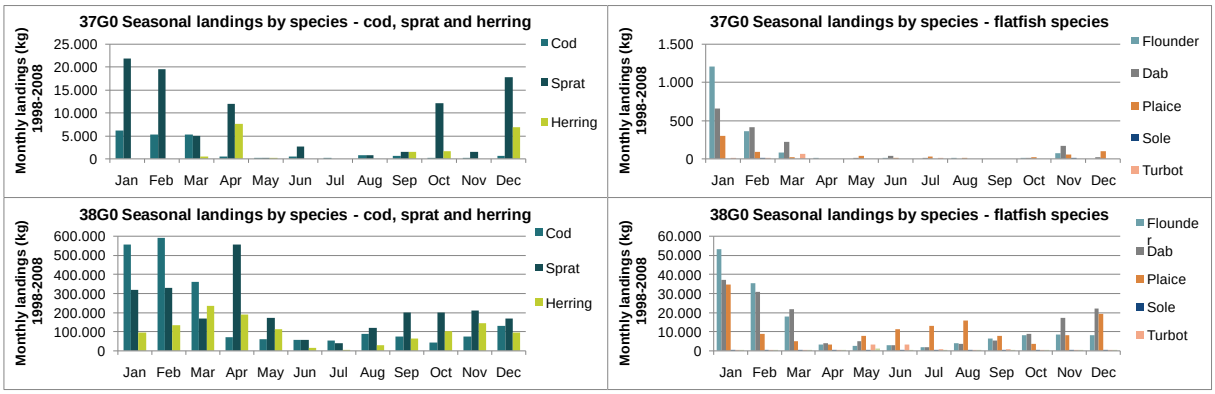


Figure 4.48: Monthly landings (kg) for the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G0 and 38G0 in the regional field of Fehmarnbelt.

The seasonality of the landings and value of the fisheries in both ICES 37G0 and ICES 38G0 show the majority of the fisheries are most prominent in the early part of the year. Landings then decrease considerably over the summer and increase again during the autumn. In ICES 38G0, there is greater continuation in the fisheries over the summer and into autumn. This is only apparent for the fisheries after sprat and herring in ICES 37G0. In both ICES rectangles, the landings of cod are predominantly in the winter months, which are also reflected in the seasonality of their income. In contrast to cod, the fisheries after sprat and herring increase

once again in the late autumn. Landings of flatfish in ICES 37G0 are almost exclusively from January-March, whereas landings in ICES 38G0 continue throughout the rest of the year albeit with the main peak also from January-March.

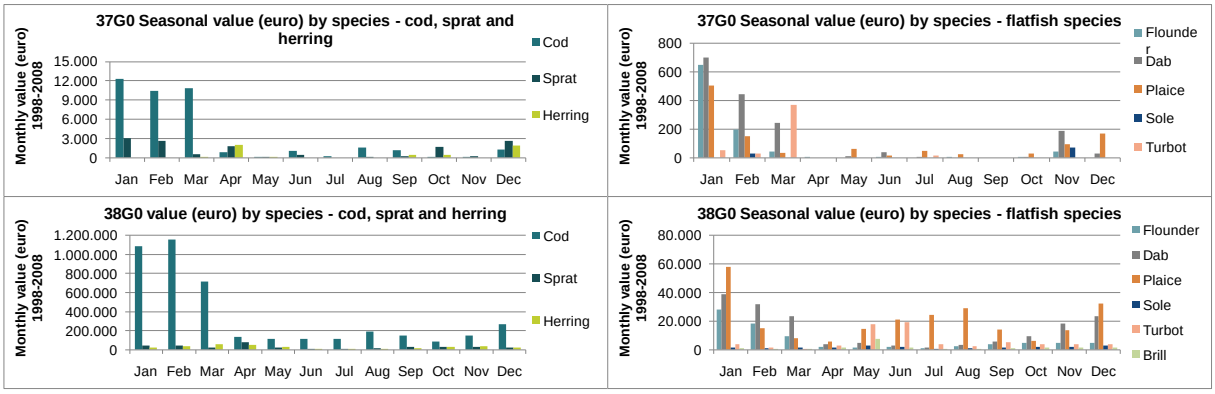


Figure 4.49: Monthly value (euro) for the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G0 and 38G0 in the regional field of Fehmarnbelt.

The seasonal pattern in the landings and value to the fisheries according to gear types clearly shows the dominance of the trawling fisheries. In both ICES rectangles, landings by trawlers are greatest in the colder months of the year (December to April) and again during the autumn. The seasonal fishery pattern of the net fisheries shows they also have most of their landings in the beginning of the year (January-March), however, net fishermen continue to have moderate landings through the summer (primarily flatfish species) and throughout the remainder of the year.

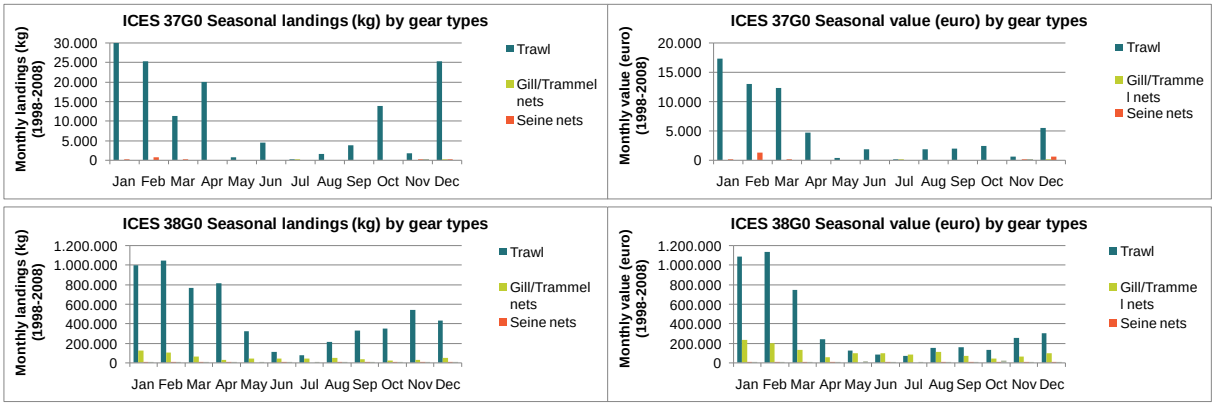


Figure 4.50: The monthly landings (kg) and value (euro) according to primary gear types (trawl, gill/trammel nets, seine nets and other gear (longlines, fyke nets, fishing rods and bottom dredges)) for the ICES rectangles 37G0 and 38G0 in the regional area of Fehmarnbelt.

ICES 37G2 and 38G2

Logbook records of the Danish landings from the ICES rectangles 37G2 and 38G2, which represent the regional fisheries to the east of Fehmarnbelt, are shown in Table 4.16.

Table 4.16: Landings (tons) and value (1,000 euro) of the most commercially important species from the ICES rectangles 37G2 and 38G2 from 1998-2008. Data derived from logbooks which include vessels ≥10 m before 2005 and vessels ≥8 m from 2005-2008.

37G2 - Landings (tons)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	115	129	268	279	225	97	203	145	226	131	111
Sprat	33	0	15	9	0	0	670	67	108	0	0
Baltic herring	277	486	145	363	0	10	25	6	144	0	0
Flounder	2.8	4.7	45	35	28	7.6	8.7	5.4	8.6	1.3	0.3
Dab	4.8	3.5	2.7	6.1	4.6	5.5	21	13	17	7.8	5.3
Plaice	1.4	3.8	2.5	2.4	2.6	0.5	1	5.6	2.2	0.6	0.4
Turbot	0.5	0.1	0.9	0.7	0.4	0.3	0.1	0.3	0.2	0.2	0
Brill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sole	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whiting	0.0	0.0	2.8	4.5	5.3	0.3	3.2	3.0	0.2	0.1	0.2
Silver eel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow eel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Garfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unspecified	0.8	2.1	12.9	5.2	5.0	1.2	3.2	1.9	2.1	0.7	0.6
Total (tons)	434	629	496	706	270	122	935	247	508	142	117

37G2 - Value (1,000 euro)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	224	250	522	543	437	188	395	271	451	299	244
Sprat	4.9	0.0	2.2	1.3	0.0	0.0	100.4	7.6	14.8	0.0	0.0
Baltic herring	75.1	132.0	39.4	98.6	0.0	2.7	6.8	1.3	39.2	0.0	0.0
Flounder	1.6	2.6	25.8	19.8	15.8	4.3	4.9	3.5	6.1	0.7	0.2
Dab	5.0	3.6	2.8	6.4	4.9	5.7	21.6	13.1	20.4	9.1	5.4
Plaice	2.3	6.4	4.3	4.1	4.5	0.8	1.8	11.1	4.1	1.1	0.6
Turbot	3.3	0.4	5.1	4.0	2.1	1.8	0.7	1.8	1.2	1.4	0.3
Brill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sole	0.0	0.0	0.0	12.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whiting	0.0	0.0	2.2	3.5	4.2	0.2	2.5	1.6	0.2	0.0	0.2
Silver eel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow eel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Garfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unspecified	1.9	5.1	33.1	13.0	13.1	3.0	8.0	3.6	5.0	1.8	1.2
Total	318	400	636	706	481	206	542	314	542	313	252

38G2 - Landings (tons)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	2,679	3,959	2,937	3,109	1,887	1,910	1,393	1,886	1,795	1,705	1,548
Sprat	325	809	185	139	221	349	2,897	1,783	974	192	218
Baltic herring	4,720	3,378	6,162	7,337	5,351	3,020	3,915	2,556	1,709	1,231	1,133
Flounder	203	138	210	303	282	208	175	130	193	124	125
Dab	55.6	33.1	14.8	34.7	22.1	117.6	132.1	114.4	111.6	78.7	62.0
Plaice	36.8	56.9	23.0	19.8	45.2	50.7	23.4	68.4	128.7	60.7	36.1
Turbot	12.7	8.6	7.8	5.7	4.6	5.9	5.9	12.7	8.4	8.0	12.6
Brill	0.1	0.8	0.3	0.0	0.1	0.1	0.0	1.5	0.2	0.4	0.7
Sole	5.7	0.0	0.0	0.1	1.2	0.2	0.5	0.7	0.4	0.0	0.3
Whiting	3.7	2.4	11.8	10.9	9.0	3.7	10.1	29.6	8.9	11.7	9.9
Silver eel	0.7	0.0	0.1	1.6	3.0	1.0	0.7	65.1	69.0	54.4	41.9
Yellow eel	3.8	1.4	0.0	0.3	0.3	1.6	0.4	2.3	2.1	2.7	0.5
Salmon	0.0	0.0	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.1	0.0
Sea trout	0.1	8.0	0.0	0.0	0.0	0.0	0.0	0.3	10.0	2.9	5.2
Garfish	0.0	0.0	0.1	0.0	0.0	0.0	0.0	174.2	148.1	134.3	62.2
Unspecified	55.3	120.4	67.1	96.7	101.5	64.5	82.0	42.5	235.2	78.6	74.7
Total (tons)	8,101	8,514	9,619	11,058	7,929	5,732	8,635	6,867	5,392	3,684	3,330

38G2 - Value (1,000 euro)

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic cod	5,206	7,693	5,707	6,043	3,667	3,711	2,707	3,524	3,694	3,960	3,399
Sprat	49	121	28	21	33	52	434	208	143	34	33
Baltic herring	1,282	918	1,674	1,993	1,454	820	1,064	574	467	331	298
Flounder	115.4	78.4	119.9	172.6	160.9	118.6	99.9	81.2	141.7	76.9	72.8
Dab	57.5	34.3	15.2	35.9	22.9	121.7	136.7	125.6	132.0	86.2	61.4
Plaice	62.3	96.3	38.9	33.6	76.6	85.8	39.7	137.8	250.2	110.2	55.9
Turbot	73.3	49.7	45.1	33.1	26.5	34.6	34.1	69.6	52.0	51.5	71.0
Brill	0.7	5.3	1.8	0.5	0.3	0.7	0.4	7.9	1.1	2.0	3.6
Sole	71.8	0.6	0.3	1.3	14.6	2.5	6.0	7.9	4.9	0.1	4.2
Whiting	2.9	1.9	9.3	8.5	7.0	2.9	7.9	18.5	6.7	8.6	8.1
Silver eel	5.0	0.0	0.7	11.8	23.2	7.5	5.1	569.2	632.5	495.2	248.2
Yellow eel	27.8	10.4	0.0	2.4	2.0	11.6	3.4	15.4	15.3	21.3	3.9
Salmon	0.0	0.0	0.6	0.5	1.2	0.0	0.0	0.0	0.0	0.6	0.0
Sea trout	0.3	19.4	0.0	0.0	0.0	0.0	0.0	0.9	21.9	5.6	10.0
Garfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	97.6	78.7	83.6	63.2
Unspecified	120.1	141.1	145.2	136.7	85.7	80.8	112.3	59.0	86.2	97.6	51.3
Total	7,074	9,169	7,786	8,494	5,575	5,051	4,650	5,497	5,727	5,366	4,383

The landings by Danish fishermen in the region east of Fehmarnbelt are much greater in ICES 38G2 than in the more southern ICES 37G2. The fisheries in ICES 38G2 are dominated by landings of herring (1,133-7,337 tons from 1998-2008), cod (1,548-3,959 tons from 1998-2008) and sprat (192-2,897 tons from 1998-2008). Cod is by far the commercial species that is the most valuable to the fisheries in both areas. Landings of cod reach peaks as high as 7.7 million euro in 1999, but has been around 2.7-3.9 million euro since 2002 (2002-2008).

In ICES 37G2, the development of the landings has fluctuated considerably from year to year (117-935 tons and 206,000-706,000 euro from 1998-2008) and has been comparatively low the last couple of years (142 tons (313,000 euro) and 117 tons (252,000 euro) in 2007 and 2008, respectively) (Figure 4.51). In ICES 38G2 total landings reached a peak of 11,058 tons (8.5 million euro) in 2001 and has been gradually decreasing since and was 3,330 tons (4.4 million euro) in 2008.

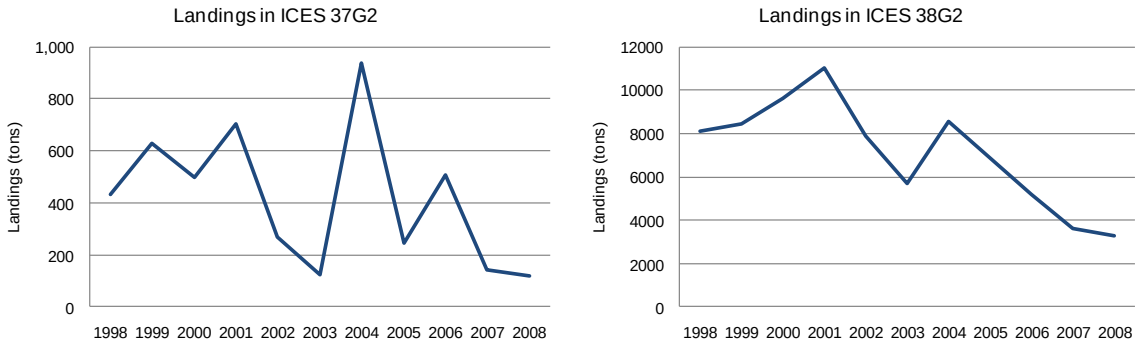
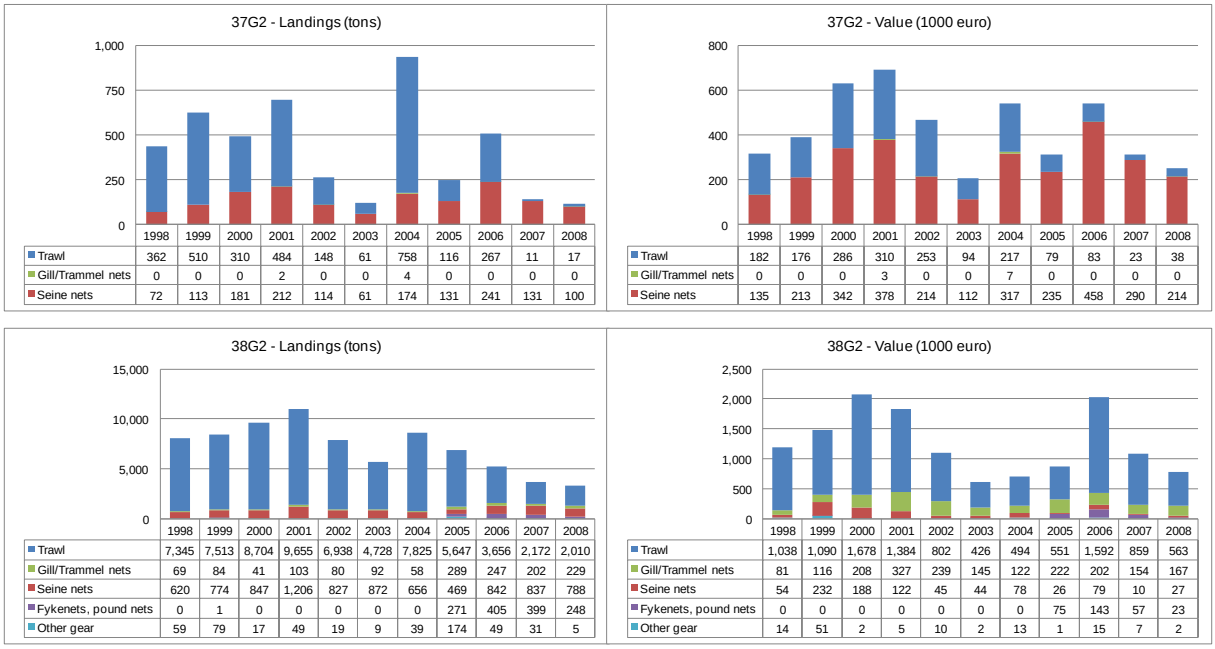


Figure 4.51: The development of the annual landings in ICES 37G2 and ICES 38G2 from 1998-2008. Data derived from logbooks which include vessels ≥8 m (vessels ≥10 m before 2005).

The landings and value in ICES 37G2 and 38G2 according to gear are shown in Figure 4.52.



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	362	510	310	484	148	61	758	116	267	11	17
Gill/Trammel nets	0	0	0	2	0	0	4	0	0	0	0
Seine nets	72	113	181	212	114	61	174	131	241	131	100

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	182	176	286	310	253	94	217	79	83	23	38
Gill/Trammel nets	0	0	0	3	0	0	7	0	0	0	0
Seine nets	135	213	342	378	214	112	317	235	458	290	214

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	7,345	7,513	8,704	9,655	6,938	4,728	7,825	5,647	3,656	2,172	2,010
Gill/Trammel nets	69	84	41	103	80	92	58	289	247	202	229
Seine nets	620	774	847	1,206	827	872	656	469	842	837	788
Fykenets, pound nets	0	1	0	0	0	0	0	271	405	399	248
Other gear	59	79	17	49	19	9	39	174	49	31	5

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	1,038	1,090	1,678	1,384	802	426	494	551	1,592	859	563
Gill/Trammel nets	81	116	208	327	239	145	122	222	202	154	167
Seine nets	54	232	188	122	45	44	78	26	79	10	27
Fykenets, pound nets	0	0	0	0	0	0	0	75	143	57	23
Other gear	14	51	2	5	10	2	13	1	15	7	2

Figure 4.52: Landings (tons) and value (1000 euro) of the landings according to gear in ICES rectangles 37G2 and 38G2.

Results in ICES 37G2, show that landings by trawlers have fluctuated considerably over the years (1998-2008) from being the most prominent form of fishery according to landings from 1998-2001, to almost stopping in 2007 and 2008 (11 and 17 tons in 2007 and 2008, respectively). Similarly, the landings by seine fishermen In ICES 37G2 have also fluctuated over the years (61-241 tons and 112,000-448,000 euro, respectively). In ICES 37G2, the Danish seine fisheries have accounted for the majority of the value of the landings over the years.

In ICES 38G2, the trawl fisheries are responsible for the both the majority of landings and the value of the landings (Figure 65). Seine and gill net fisheries have also accounted for some of the fisheries in ICES 38G2. The value of the gill net fisheries is also proportionally high in this area, because the gill net fisheries target more valuable commercial species (cod and valuable

flatfish species) in comparison the trawlers who also target the less valuable (per kg) industry species sprat and herring.

Similar to the general fishing pattern of other fishing areas of the Baltic, most of the seasonal landings (by weight) and value (euro) from ICES 37G2 and 38G2 are from the fisheries in the early and late part of the year (January-March and October-December) (Figure 4.53 & Figure 4.54). This includes cod, which peak in landings in January and decreases quickly over the early spring months. Landings of cod gradually increase once again, as summer progresses into autumn and winter (August-December). In both ICES 37G2 and 38G2, landings of herring and sprat peak in March, decrease towards the late spring and early summer (primarily ICES 38G2) and increase again during the late summer and autumn. The landings of most abundant flatfish species (dab and flounder) in both ICES 37G2 and 38G2 follow the landings of cod closely as they are generally a bycatch in the demersal fisheries for cod.

In ICES 38G2 where the fisheries are greater and the use of different types of gear is more prominent (Figure 4.53), the fisheries (landings and value of the landings) are extended over a greater part of the year (Figure 4.54).

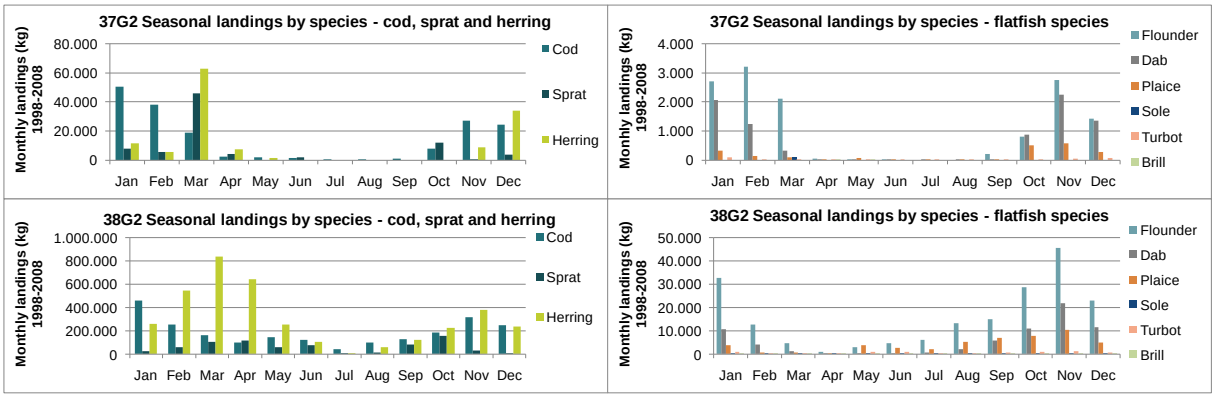


Figure 4.53. Monthly landings (kg) for the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G2 and 38G2, in the regional field of Fehmarnbelt.

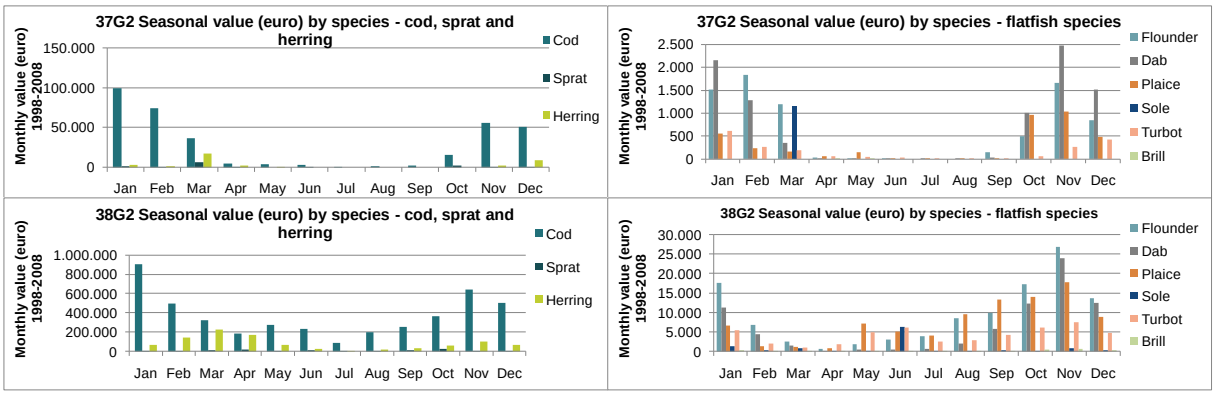


Figure 4.54: Monthly value (euro) for the most important commercial species (cod, sprat and herring) and flatfish species (flounder, dab, plaice, sole, turbot and brill) in ICES rectangles 37G2 and 38G2 in the regional field of Fehmarnbelt.

The seasonality of the different fisheries in ICES 37G2 and ICES 38G2, according to primary gear types, are shown in Figure 4.55. In ICES 37G2, the trawl and seine fisheries appear to be undertaken during the same times of the year (the colder months of the year). In ICES 38G2, the trawl fisheries appear to extend their activity more towards the summer months than the seine fisheries, and again start a little earlier in the autumn.

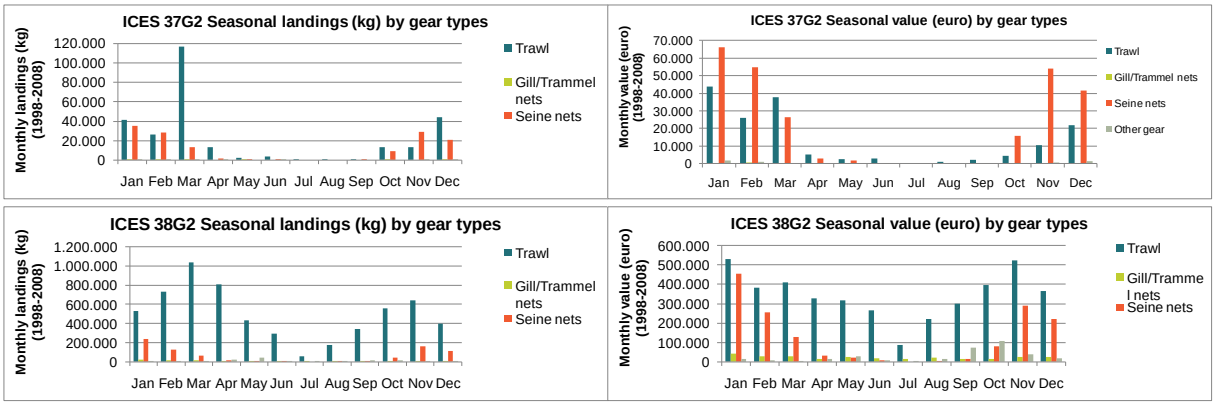


Figure 4.55: The monthly landings (tons) and value (euro) of the landings in ICES 37G2 and 38G2 according to primary gear types (trawls, gill/trammel nets, seine nets and other gear (longlines, handlines, fishing rods and dredges).

Foreign landings in Fehmarnbelt

The data for landings by foreign vessels was presented for the ICES subdivision 22, however, theoretically vessels, other than Danish and German, do not have fishery rights in the Fehmarnbelt and Western Baltic as distances between Denmark and German are so short that it does not allow for international waters and/or fishing rights for other countries (Figure 4.56).

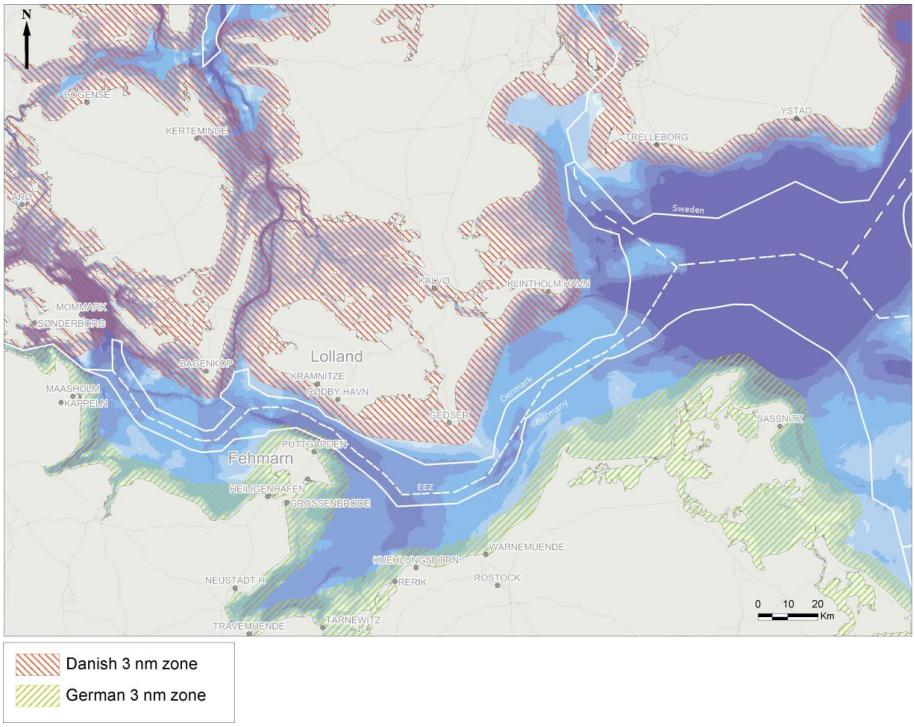


Figure 4.56: German and Danish coastal zones (3 nm from basis line), and the dividing line between their fishing territories (international border) in the Western Baltic. *Denmark and Germany have an agreement in the Western Baltic, which allows vessels from each nation to fish up to the basis line of each other's countries.

Although in theory, there are no fishing rights from countries other than Germany and Denmark in ICES subdivision 22, which includes the far Western Baltic and Fehmarnbelt, results from official statistics show some foreign landings. The foreign landings in ICES subdivision 22 are given in Table 4.17 and show that only Sweden has had significant catches in ICES subdivision 22, and only in 2007. Except for comparatively large landings (1,439 tons) by Sweden in 2007, the total annual landings by foreign vessels ranged between 0-72 tons, which were primarily landed in 1999 (72 tons) and 2001 (33 tons). Latvia was the only other foreign country to register landings in ICES subdivision 22, when they landed 7 tons of cod in 2006. In 2007, the landings by Sweden were comprised of a number of species where cod, herring, some flatfish species (flounder and plaice), lumpsucker (*Cyclopterus lumpus*) and European eel were the dominant species by weight. Except for the landings in 2007, the small amounts of annual landings registered in the other years were primarily comprised of herring, sprat and cod.

Table 4.17: The landings (tons) of diverse commercial species by foreign vessels (all vessels not from Germany or Denmark) in ICES subdivision 22 (1998-2008), which includes the Western Baltic.

Country	Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Latvia	Cod									7		
Sweden	Cod		5		2	2	6		1	1	575	
	Sprat		15		15						20	
	Herring		50		15						594	
	Flounder						<0.5				26	
	Plaice		1								69	
	Dab										1	
	Turbot						<0.5					
	Lemon sole				<0.5							
	European eel										58	
	Lumpsucker		1								95	
	Whiting										1	
	Haddock				<0.5					1		
	Norway lobster				1			1				
	Pollack						<0.5			<0.5		
	Saithe						<0.5		1	1		
	Wolffish									<0.5		
	Total	0	72	0	33	2	6	1	2	10	1,439	0

Landings in the ICES subdivision 24 to the east of Fehmarnbelt are not shown in this report, as the area available for access to foreign vessels to fish in the regional area of Fehmarnbelt (ICES 37G2 and 38G2) is not very large.

Shellfish fisheries in Fehmarnbelt

According to members the Danish Fishermen's Association that represent the Danish fisheries in the Western Baltic as well as sources in the Danish Directorate of Fisheries, there are no consistent commercial shellfish fisheries undertaken in the Fehmarnbelt and region (Western Baltic).

Except for 81 tons of blue mussel landed from ICES 38G0 in 2002, logbook data from 1998-2008 showed that oysters and blue mussels were only occasionaly landed in small amounts (60-300 kg) primarily from ICES 38G0 (Table 4.18).

Table 4.18: The Danish landings (kg) of shellfish (oysters and blue mussels) in Fehmarnbelt and region (ICES 37G0, 38G0, 37G1, 38G1, 37G2 and 38G2) from 1998-2008 according to logbook data. Source: Danish Directorate of Fisheries.

	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
38G1	**0**	**0**	**0**	**60**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Oysters	0	0	0	60	0	0	0	0	0	0	0
38G0	**300**	**65**	**200**	**0**	**81.000**	**0**	**0**	**0**	**0**	**0**	**34**
Blue mussels	0	0	0	0	81.000	0	0	0	0	0	0
Oysters	300	65	200	0	0	0	0	0	0	0	34
38G2	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**
Oysters	0	0	1	0	2	0	0	0	0	0	0
Total (kg)	**300**	**65**	**201**	**60**	**81.002**	**0**	**0**	**0**	**0**	**0**	**34**

Although there are some sporadic reportings of oyster and blue mussel landings in logbook data from the fisheries in the Western Baltic, the amounts are generally very small and not consistent for any particular area of the Western Baltic from year to year. Consequently, this fishery is not undertaken on a regular basis and subsequently not considered to represent a consistent targeted fishery in the Fehmarnbelt and its region.

4.1.6 Distribution of fisheries in Fehmarnbelt and Western Baltic

The distribution of the different types of fisheries according to their primary gear type was characterised by analysing VMS (Vessel monitoring system) data available for vessels ≥15 m and from interviews of fishermen that have their fisheries in the Western Baltic and Fehmarnbelt area.

4.1.7 Distribution of fisheries with active gear (exclusively trawls and seine nets)

An overview of the distribution of both the German and Danish vessels ≥15 m while undertaking their fisheries with active gear (primarily trawls and seine nets), as derived from all VMS position plots (points) of each vessel, and the fisheries with passive gear (gill/trammel nets, pound nets etc) as derived from interviews with Danish and German fishermen in the near field and regional area of Fehmarnbelt is given in Figure 4.57 and Figure 4.58.

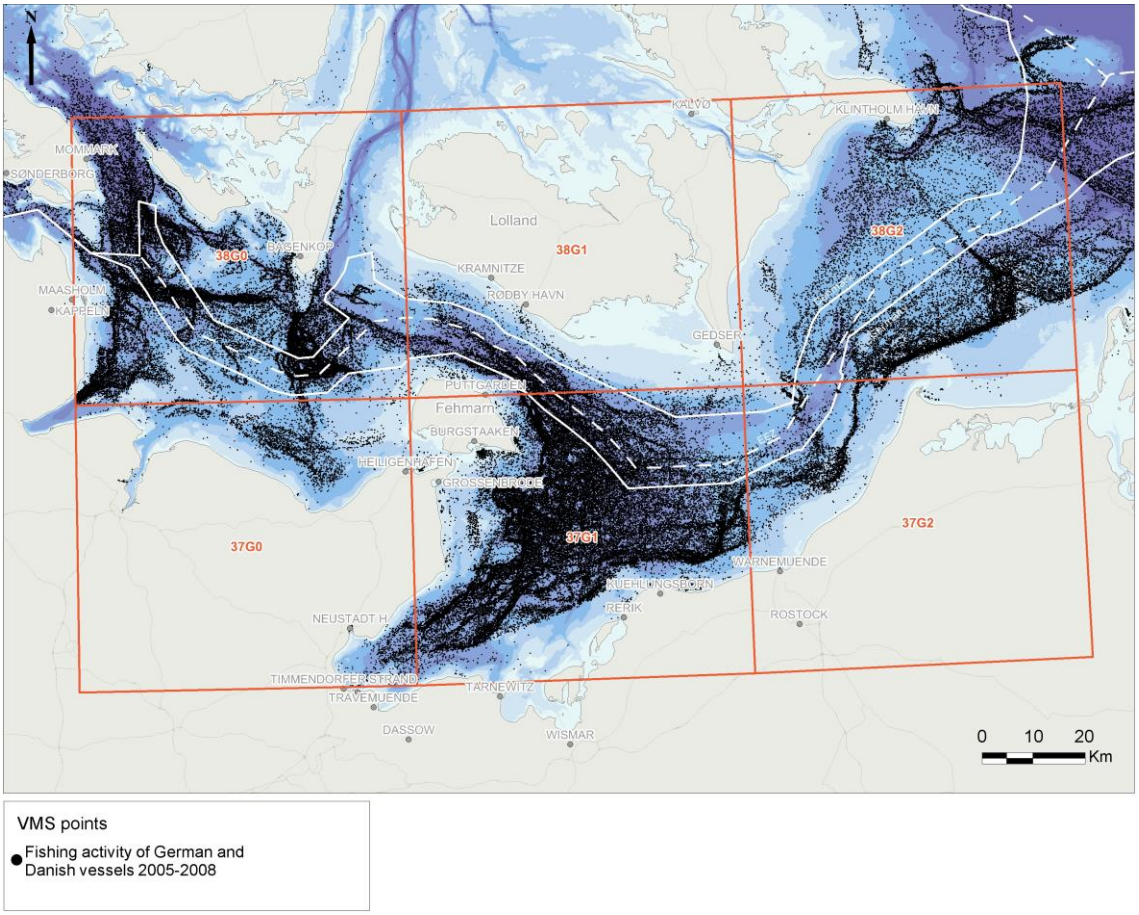


Figure 4.57: The overall distribution of the German and Danish fisheries with active gear (trawls and seine nets) in Fehmarnbelt and the regional area of the Western Baltic as derived from VMS data from 2005-2008. A 1 km and 1-10 km zone across Fehmarnbelt signifies the anticipated 1 and 10 km boundaries of the fixed link transect.

The overall pattern of the trawl and seine fisheries according to VMS data indicate a considerable amount of fishing within the central part of Fehmarnbelt. Furthermore, there is a considerable amount of fishing activity by trawlers southeast of Fehmarnbelt in ICES 37G1 where the distribution of the VMS plots indicate fishing activity throughout much of this ICES area. Similarly, the fisheries with active gears appears to follow the deep channel through Fehmarnbelt and west into primarily ICES 38G0, where relative densities of individual plots appear to show more specific areas where the fisheries are concentrated.

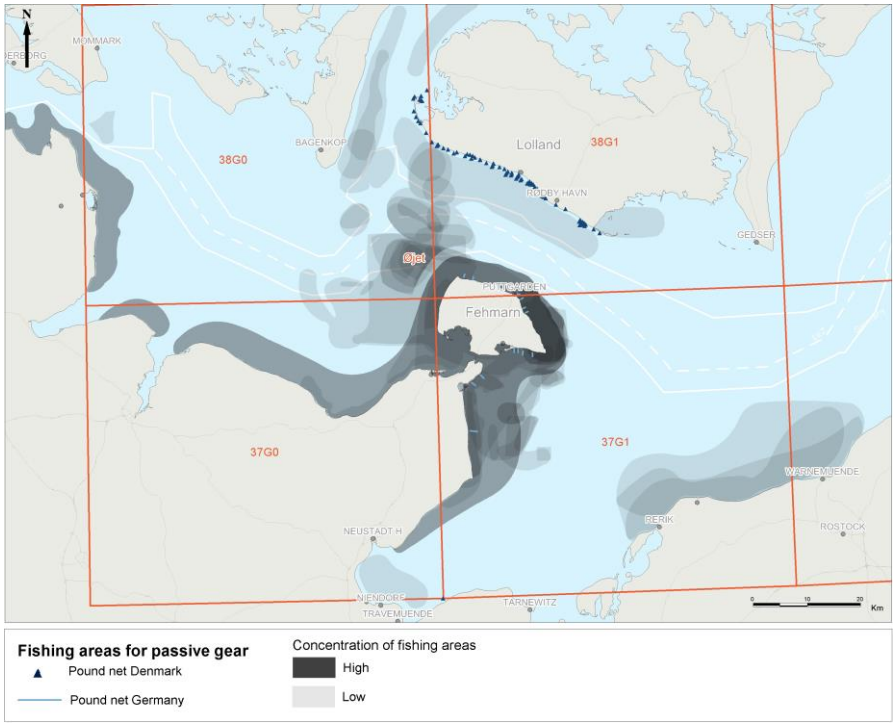


Figure 4.58: The estimated distribution of the German and Danish fisheries that use passive gear (primarily gill/trammel nets and pound nets (black dots along the Danish and German coast) in Fehmarnbelt and regional area. Data derived from interviews with Danish and German fishermen. The shaded fishing area in Nysted Nor, on the southeast coast of Lolland, represents the area where a considerable amount of eel and shrimp fisheries are periodically undertaken with fyke- and shrimp nets.

The majority of the fishing activity with passive gear (primarily gill/trammel nets) summarized from information from interviews with German and Danish fishermen, show that much of the area along the coast of Fehmarn Island in Germany and southern Lolland in Denmark is utilized in this fishery. The fishing areas for the net fisheries appear to be much more prominent in the western part of Fehmarnbelt, as there are a number of important fishing grounds that stretch across Fehmarnbelt from southern Lolland to an area of high fishing intensity immediately to the west of Fehmarn Island. This includes a well known area slightly northwest of Fehmarn called “Øjet” by Danish fishermen. The net fisheries primarily target cod and valuable flatfish species such as plaice, brill, turbot and in more recent years sole. Another area of high net fishing intensity, especially for the German net fishermen is along the northeastern coast of Fehmarn Island. The main species targeted in this area is cod.

Germany

German trawl fisheries

The distribution of the German fisheries were derived from interviews with German fishermen from the Western Baltic and their organisations, as well as VMS data from the larger (≥15 m) German vessels. Because a number of German trawlers are less than 15 m, and not included in VMS data, results from the distribution of trawlers derived from interviews were compared to the distribution of trawlers derived from VMS data to identify potential discrepancies or size-related differences. Results shown in Figure 4.59, show fishing areas of the trawlers who were interviewed corresponded very well with the estimated distribution of the trawling fisheries according to VMS data. Because of the strong correlation between these distributions, the distribution derived from VMS data were chosen to represent trawling areas by German ves-

sels regardless of vessel length to simplify distributing landing and value of landing data onto these distributions in later sections of this report.

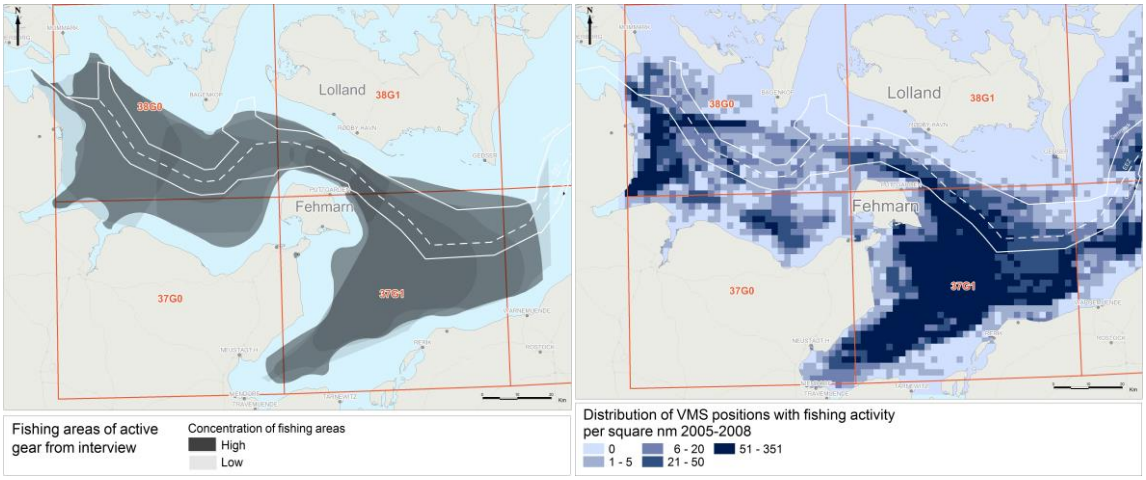


Figure 4.59: Comparison between the German trawling areas in the Western Baltic as derived from interviews of fishermen (left) and trawling areas according to the relative plot density derived from VMS data from trawlers ≥15 m (right).

VMS data from an annual average of 58 vessels that registered landings in the Western Baltic and more particularly in the 6 ICES rectangles was used to derive the VMS distribution of the German trawling fisheries, in the near field and regional area of Fehmarnbelt (Table 4.19).

Almost all the German fisheries in the Fehmarnbelt and Western Baltic represented by the VMS data were bottom and mid-water trawlers i.e. there was almost no vessels undertaking seine or gill net fisheries.

Table 4.19: The total number of German trawling vessels ≥15 m that registered landings from ICES rectangles 37G1 or 38G1 in the near field area of Fehmarnbelt from 2005-2008 and the average annual number of vessels that registered landings from 1 or more of the 6 ICES rectangles (37G0, 37G1, 37G2, 38G0, 38G1 and 38G2) in the regional area of Fehmarnbelt (Western Baltic). Data derived from VMS data depicting the vessels actively fishing in the ICES rectangles. The same vessel can be fishing in more than 1 ICES rectangle and therefore the total number of vessels will generally be lower than depicted if the number of vessels fishing in each ICES rectangle is summed.

ICES rectangle	Primary gear	2005	2006	2007	2008
37G1	Trawl	36	39	42	40
38G1	Trawl	21	29	24	17
37G0, 37G1, 37G2, 38G0, 38G1, 38G2	Trawl		58		

The seasonal distribution of the fishing activity of German trawlers, as derived from VMS data is shown in Figure 4.60.

The density of the VMS plots suggests that the winter (January-March) and late autumn (October-December) are the periods with the greatest fishing activity. This corresponds well with the peaks in landings of the trawl fisheries. In contrast, there is considerably less trawling in late Spring to the end of Summer. During the winter months, there appears to be a considerable amount of trawling activity within Fehmarnbelt, off the German coast in ICES 38G1, and in

most of the ICES rectangle 37G1. In Fehmarnbelt (ICES 38G1) The German landings by trawlers during this time is dominated by cod (January-February) and includes sprat and herring in March and April). Similarly, in the winter and spring months there also appears to be some trawling activity to the East of Fehmarnbelt in ICES 37G2 and 38G2, as well as the far western part of ICES 38G0, West of Fehmarnbelt. In the late autumn months (October-December) the German trawlers appear to fish closer to the German coast, both south of Fehmarnbelt in the southern part of ICES 37G1 and even more so in ICES 37G2 to the east, and the southern part of ICES 38G2 (Figure 4.60).

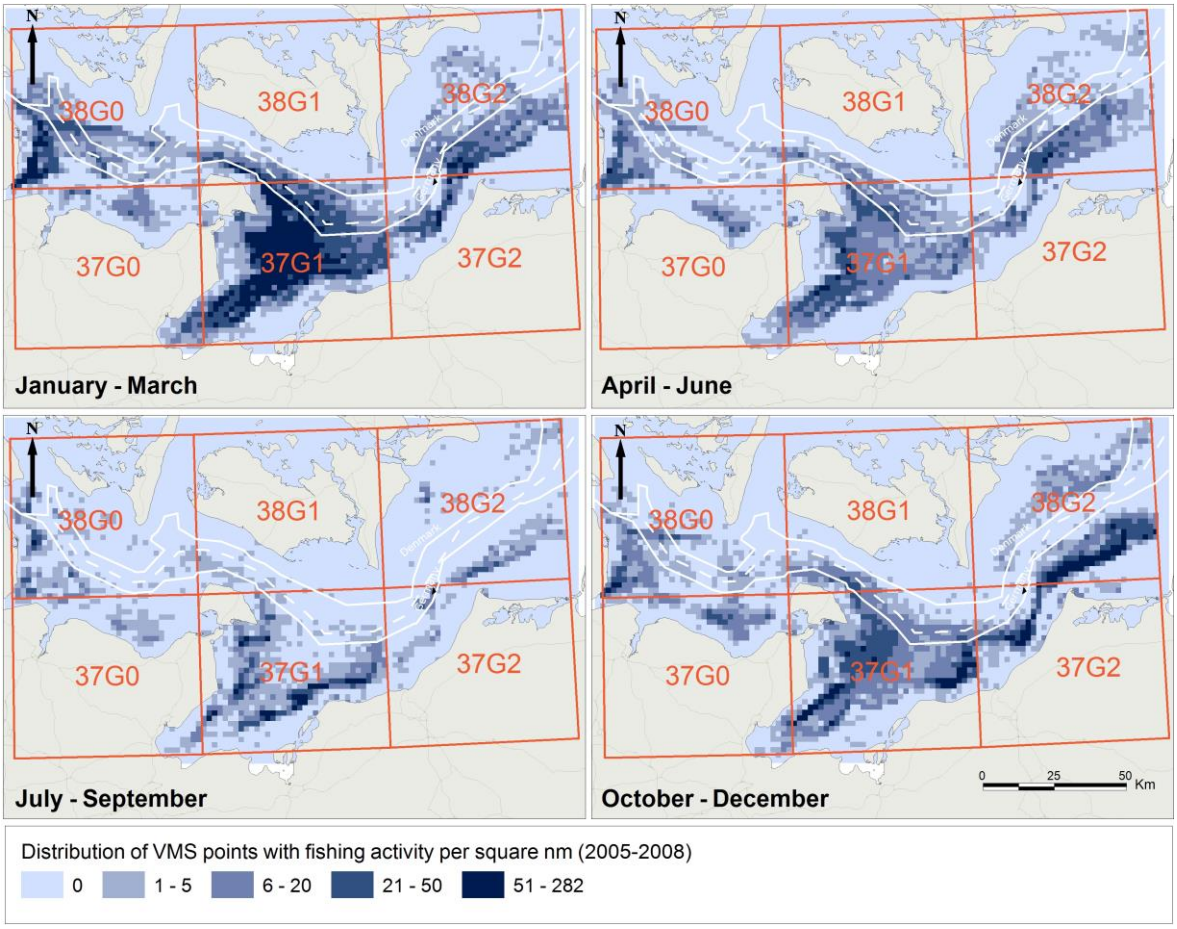


Figure 4.60: The seasonal distribution of the fishing activity of German trawlers in 6 ICES rectangles (38G0, 38G1, 38G2, 37G0, 37G1 and 37G2) as derived from VMS data. The number of individual position plots for each vessel actively fishing was summed into 1 nm^2 quadrants to depict relative plot densities as a proxy for fishing intensity.

German gill/trammel net fisheries and other passive gear

The distribution of the German gill/trammel net fisheries was derived from interviews of German fishermen with their fisheries in the Western Baltic (Figure 4.61). Results indicate gill/trammel fisheries distribute effort along most of the shoreline of Fehmarn Island and much of the coastline of Schleswig-Holstein. Areas of high net fishery intensity appear to be along the northeastern coast of Fehmarn Island, to the southeast of Fehmarnbelt. Here cod is the main target species. Similarly, there is a comparatively high concentration of net fisheries at other various locations along the coast of Fehmarn Island, as well as in the area immediately to the west of Fehmarn Island. In this area valuable flatfish such as plaice, turbot and brill are the main species targeted. The tendency for the German net fisheries to primarily undertake

their fisheries close to their coastline is also supported by the high number of net fishermen registering their landings in the ICES rectangles nearest the German coastline. Furthermore, the large harbours of Heiligenhafen, Burgstaaken and Grossenbrode in the near vicinity of Fehmarnbelt support a large number of net fishers, which, in general, undoubtedly fish in this area.

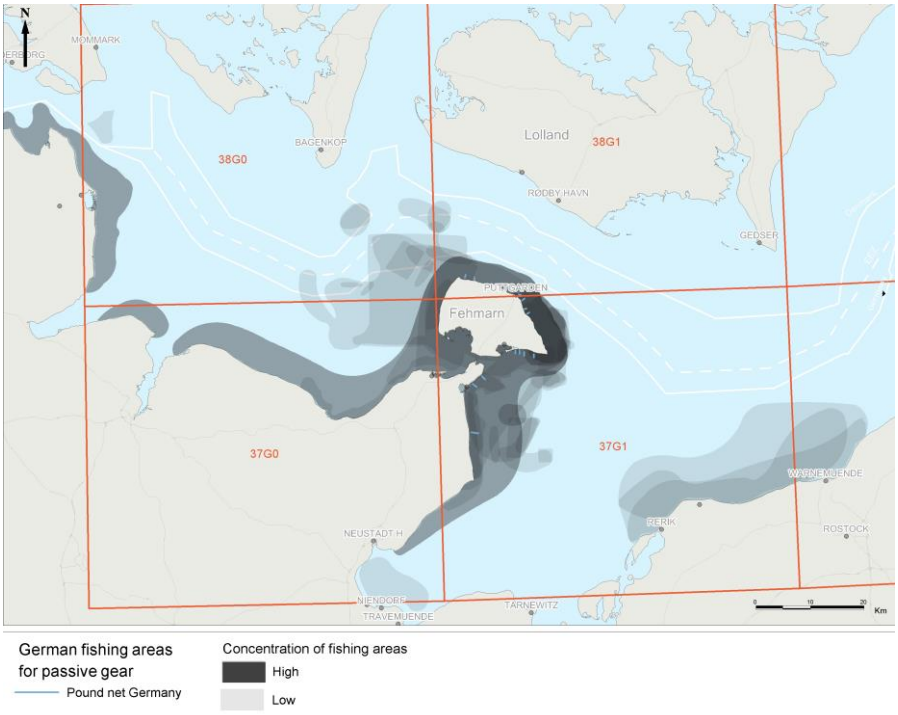


Figure 4.61: Passive fishing areas in Fehmarnbelt and regional area as derived from interviews with fishermen in 2009 and 2010.

The other primary fishery with passive gear is the German pound net fisheries along the coast of Fehmarn. This includes approximately 13 pound net positions.

Denmark

The distributions of the Danish fisheries in the near field and regional area of Fehmarnbelt were derived from independent interviews with 13 fishermen together with representatives of fishery organisations, and VMS data from larger vessels (≥15 m) who fish in the Western Baltic and Fehmarnbelt region.

Table 4.20: The total number of vessels and their primary gear that registered landings from ICES rectangles 37G1 or 38G1 in the near field area of Fehmarnbelt and within 1 or more of the 6 ICES rectangles (37G0, 37G1, 37G2, 38G0, 38G1 and 38G2) in the regional area of Fehmarnbelt (Western Baltic).

ICES rectangle	Primary gear	2005	2006	2007	2008
37G1	Trawl	32	52	33	22
	Seine	19	11	6	7
	Gill/trammel nets	2	1	0	0
38G1	Trawl	30	41	28	20
	Seine	6	4	2	1
	Gill/trammel nets	1	1	0	0
37G0, 37G1, 37G2, 38G0, 38G1, 38G2	Trawl	88	81	68	54
	Seine	29	31	20	17
	Gill/trammel nets	7	2	1	2

The VMS data came from a total of 124 individual vessels that registered landings from the Western Baltic, and more specifically from at least one of the 6 ICES rectangles since 2005. The number of vessels fishing in the near field (ICES 37G1 and ICES 38G1) and/or regional area of Fehmarnbelt from which VMS distribution data was derived, is shown in Table 4.20.

Trawling

The distribution of the trawling fisheries derived from interviews were compared to the distribution of trawlers derived from VMS data to identify potential discrepancies or size-related differences as the smaller trawlers (<15 m) are not represented in the VMS data (Figure 4.62). Although, the distribution of the trawling fisheries derived from VMS data was broader and covered more area than the distribution according to interviews, the location of the major fishing areas in Fehmarnbelt and the Western Baltic corresponded relatively well. Because of this correlation, the distribution patterns of the trawling fisheries derived from VMS data will be used to represent the trawling fisheries in Fehmarnbelt and the Western Baltic region as they represent a greater resolution of the distribution of these fisheries.

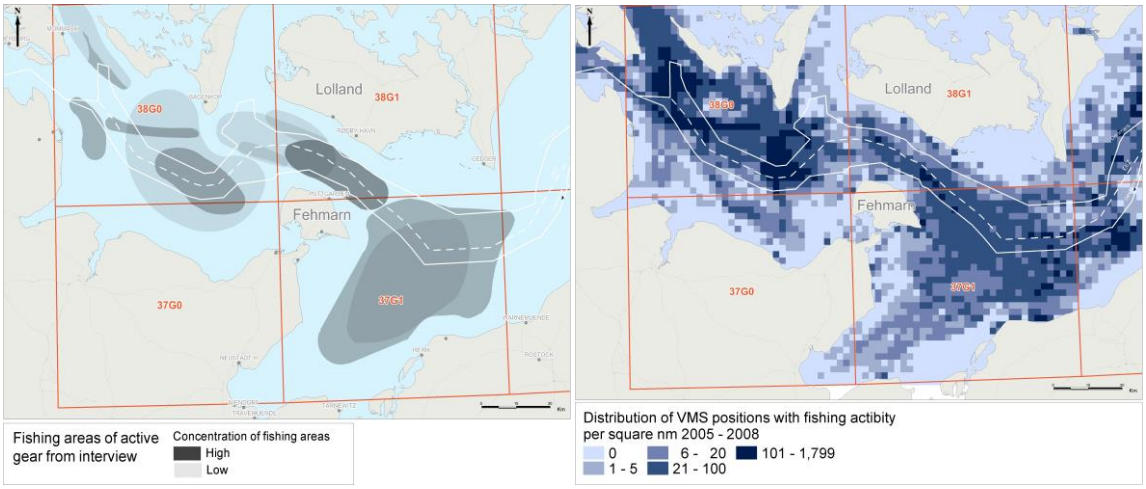


Figure 4.62: Comparison between the Danish trawling areas in the Western Baltic as outlined from interviews of fishermen (left) and trawling areas according to the relative plot density derived from VMS data for trawlers ≥15 m (right).

The seasonal distribution of Danish trawling activity according to VMS density plots suggests the greatest activity is in the colder months of the year (January-March). As Spring progresses, there is a noticeable decline in trawling activity from April-June and even more so from July-September (Figure 4.63). The distribution and concentration of the VMS plots show there is a high amount of trawling in the middle of Fehmarnbelt from January-March and to the west in the southern part of ICES 38G0. Similarly, there is a moderate amount of trawling in the same two areas the following months (April-June). Trawling for cod in the Western Baltic is banned in April as there is a moratorium on fishing for cod in this month, so almost all of this activity in April is from midwater trawlers, or from a broader range of trawlers in May and June. The least amount of trawling in Fehmarnbelt was from July-September. In the regional area of Fehmarnbelt, trawling activity was observed to be very high in specific locations in ICES 38G0 to the west of Fehmarnbelt. Similarly, there is a moderate amount of trawling activity throughout much of ICES 37G1 to the southeast of Fehmarnbelt and further east in ICES 38G2, especially in the colder months of the year (October-March). It is appears that the areas to the west of Fehmarn, where the net fishermen allocate most of their effort, are areas where trawling activity appears to be low.

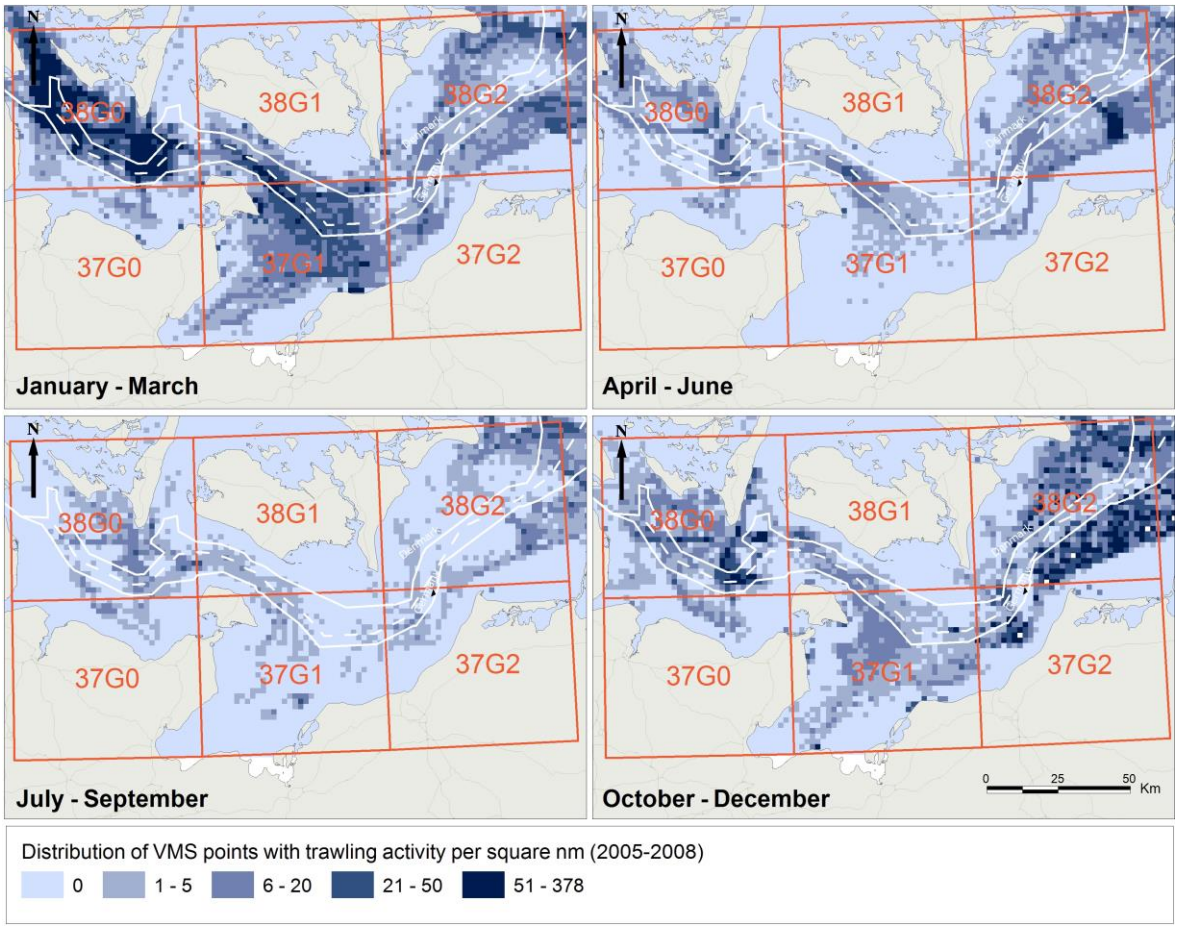


Figure 4.63: The seasonal distribution of the fishing activity of Danish trawlers in 6 ICES rectangles (38G0, 38G1, 38G2, 37G0, 37G1 and 37G2) according to the relative plot density derived from VMS data for trawlers ≥15 m.

Seine netting

The seasonal distribution of seine fishing activity according to VMS density plots shows the greatest activity is, similar to trawling activity, also in the colder months of the year (October-March). The plots suggest that the location of this fishing activity is primarily to the east of Fehmarnbelt in ICES 37G1, 37G2 and 38G2, however VMS plots also suggest that some seining activity is directly in Fehmarnbelt from January-March. These plots, however, originate from a few vessels (1-3) fishing here in 2005 and 2006 and not in more recent years. Except for a little seining activity in the east (ICES 38G2) there appears to be almost no seine fisheries in Fehmarnbelt and its regional area from April-September.

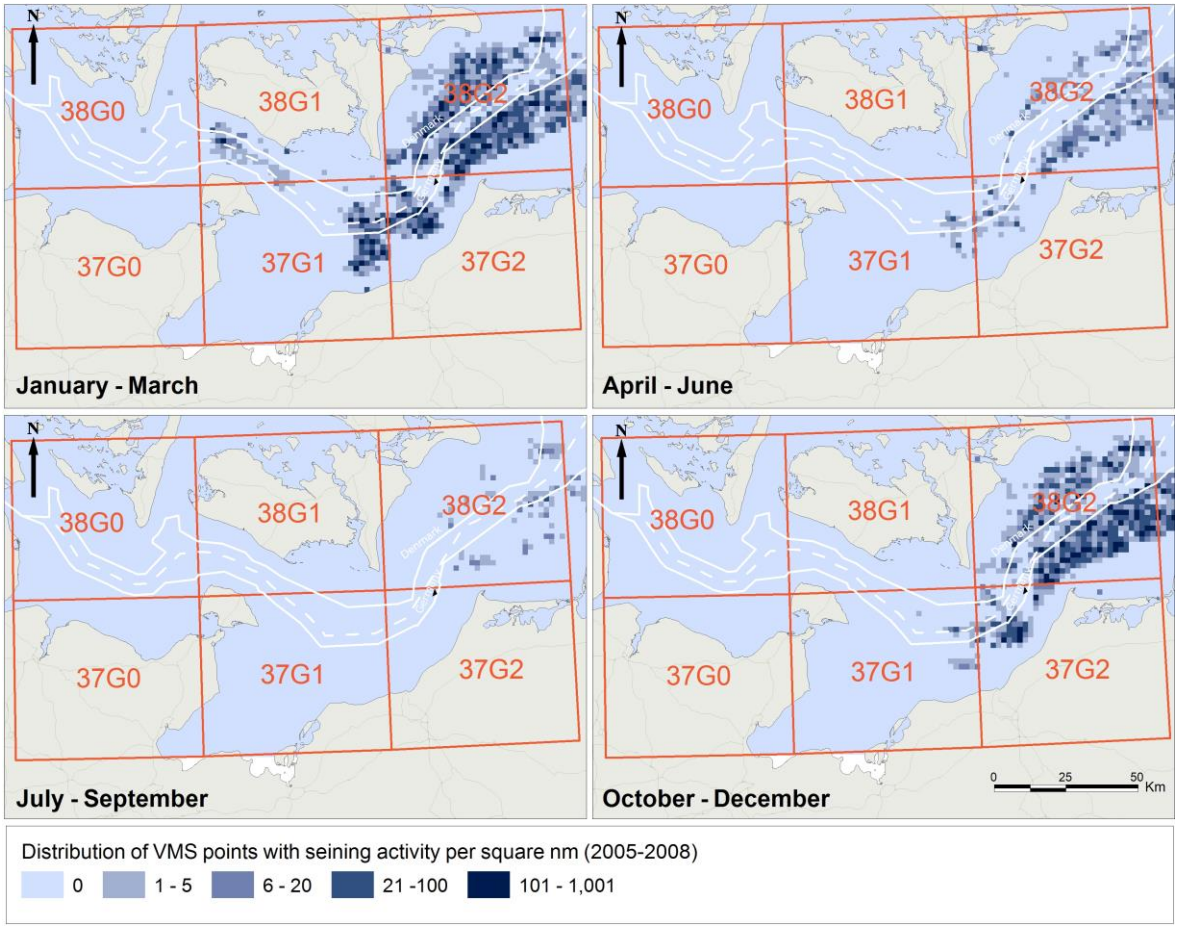


Figure 4.64: The seasonal distribution of the fishing activity of Danish seine netter in 6 ICES rectangles (38G0, 38G1, 38G2, 37G0, 37G1 and 37G2) according to the relative plot density derived from VMS data for seine netters ≥15 m (2005-2008).

Gill/trammel nets and other passive gear

Results from interviews of Danish fishermen with their fisheries in the Western Baltic and local fishery organisations indicate the location and greatest intensity of the Danish gill/trammel fisheries in Fehmarnbelt and region appear to be mostly along an area that stretches across the western part of Fehmarnbelt from the southwestern part of Lolland to the western coast of Fehmarn. This includes an area of high fishing intensity in the western part of Fehmarnbelt channel where cod is the primary species targeted. Furthermore, the western part of Fehmarnbelt including an area commonly called “Øjet”, and the area immediately to the west of Fehmarn Island are heavily fished by gill and trammel net fishermen. The primary species

targeted in these areas are cod and valuable flatfish species such as plaice, turbot, brill and sole. The flatfish species are primarily targeted from spring to autumn. There is also a moderate amount of gill/trammel net fisheries along the southern coast of Lolland and along the eastern coast of Langeland, which is to the northwest of Fehmarnbelt.

The other major Danish fishery with passive gear is the pound net fisheries, which include approximately 60-80 pound net positions along the southern coast of Lolland, as well as a fishery with fyke nets in the western and southeastern part of Lolland, Nakskov fjord and Nysted Nor, respectively.

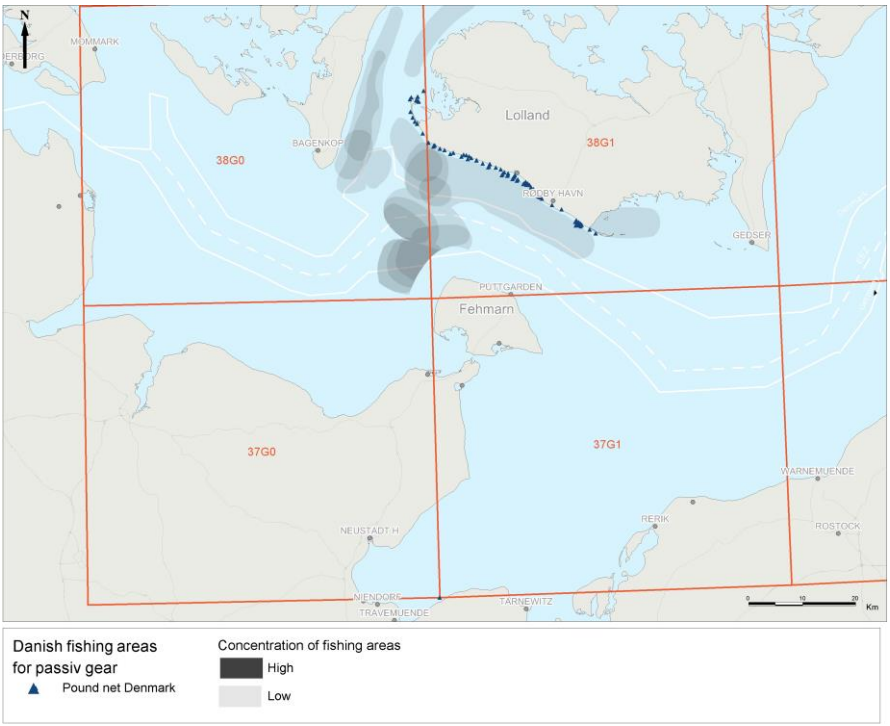


Figure 4.65: A map outlining the Danish fishing areas for passive gear (gill/trammel nets and pound net fishery) in Fehmarnbelt (depicted by grey shading). The locations of the offshore fishing areas and activity levels (high or low concentration) were derived from interviews with fishermen and local fishing organisations. The high activity of passive gear fisheries along the southern coastline of Lolland (marked in dark grey), primarily represents the pound net fisheries and the position of their nets.

Some gill net fisheries have also been derived from VMS data from larger vessels (≥15 m) that have occasionally undertaken net fishing in the Western Baltic (Figure 4.66). Characteristic for this information is that there are not many vessels larger than 15 m that fish with gill/trammel nets and so the data available for deriving the distribution of this fishery from VMS data is very sparse. Results suggest, that there may be some net fishing locations along the eastern and southern area of Langeland to the west of Fehmarnbelt, in Fehmarnbelt and to the southeast in ICES 37G1, as well as further east in ICES 33G2 and 38G2. The suggested distribution of the net fisheries along Langelands eastern and southern coast derived from VMS data indicate some overlap with the distribution of the net fisheries as derived from interviews, however in general the VMS data is to sparse to make any concrete conclusions.

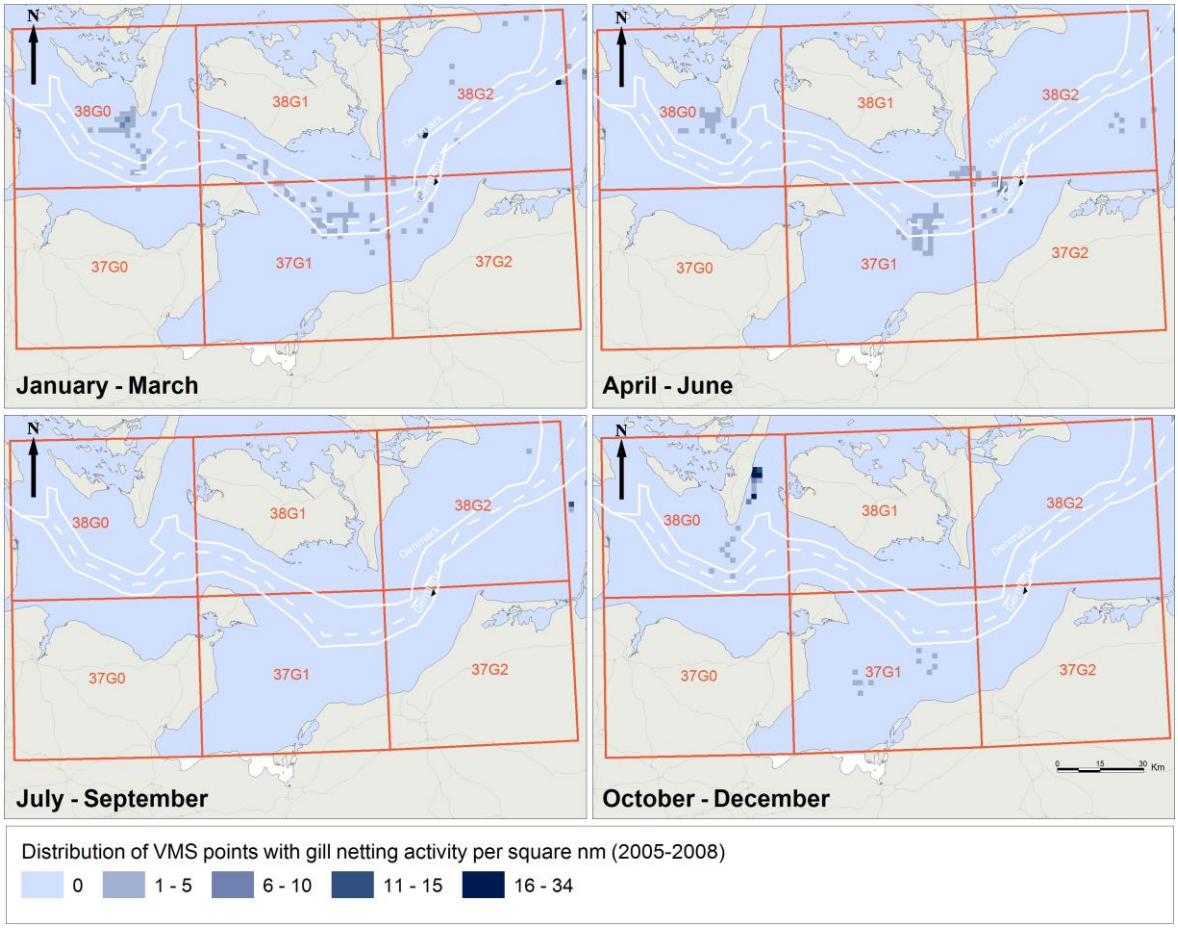


Figure 4.66: The distribution of gill net fishing activity in Fehmarnbelt and region as derived from VMS data (2005-2008). The seasonal distribution of the fishing activity of Danish gill/trammel net fisheries in 6 ICES rectangles (38G0, 38G1, 38G2, 37G0, 37G1 and 37G2) according to the relative plot density derived from VMS data for gill netters ≥15 m.

Distribution of trawling for some commercially important species

Cod

The density of the VMS plots suggest the fisheries after cod by trawlers was undertaken throughout much of the Western Baltic, as well as in Fehmarnbelt (Figure 4.67). Density plots suggest that there is a relatively moderate fishery after cod in Fehmarnbelt but it appears the primary areas where cod was caught were to the west (ICES 38G0) and east (ICES 38G2) of Fehmarnbelt. This agrees with landings data showing that landings of cod are greatest from these areas (see section 4.1.5). Fishing effort appears to be the greatest from January-March, however there still appears to be some effort in Fehmarnbelt and to the east in ICES 38G2 during the spring (April-June). This effort is primarily from May-June because there is a ban on fishing for cod in the Western Baltic in April. After a period of very little trawling for cod during the summer (July-September), trawling for cod once again increases during the autumn and early winter (October-December), with the greatest effort in the eastern region of Fehmarnbelt (ICES 37G2 and 38G2) and in an area to the west of Fehmarnbelt (ICES 38G0).

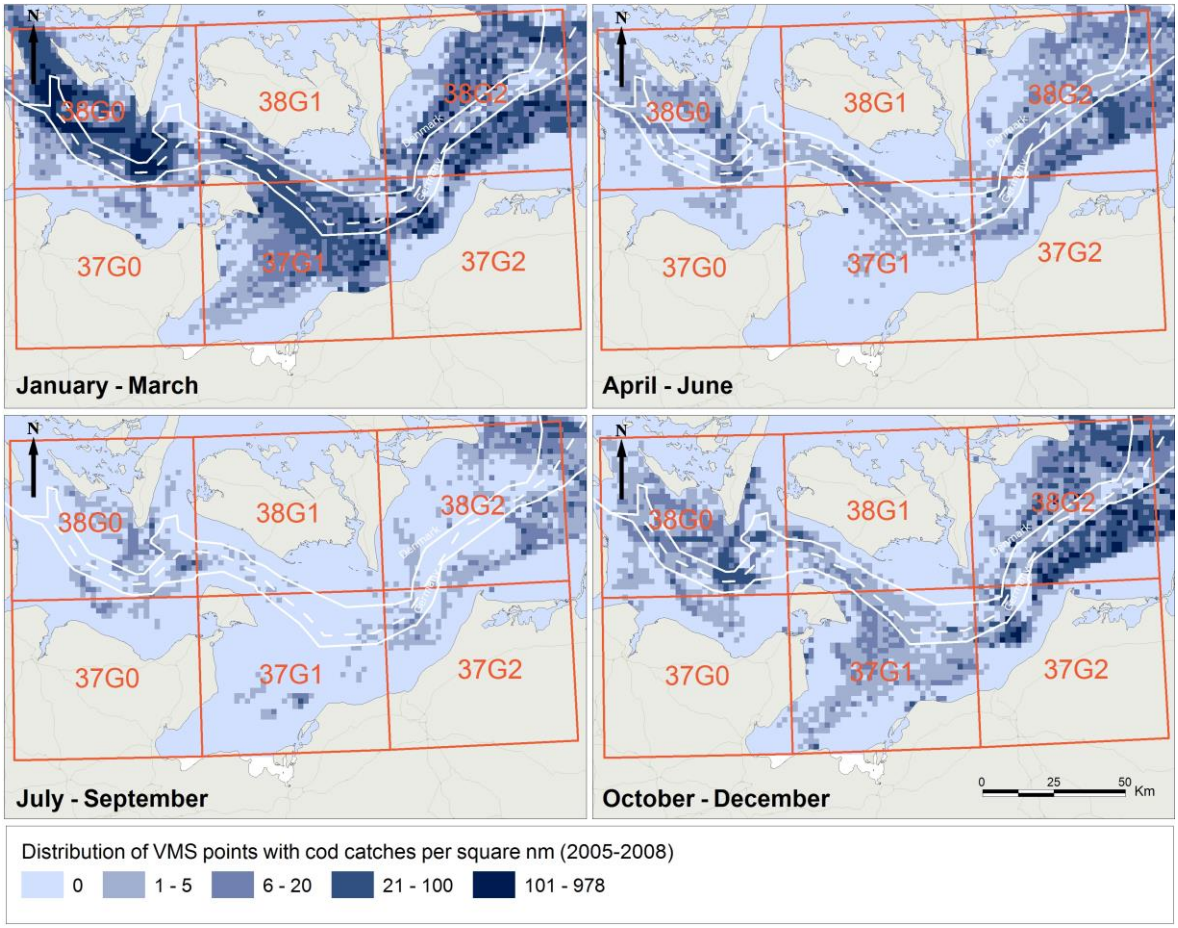


Figure 4.67: The seasonal distribution of cod catches in 6 ICES rectangles (38G0, 38G1, 38G2, 37G0, 37G1 and 37G2) according to the relative plot density derived from VMS data (2005-2008) for all vessels ≥15 m.

Herring

Data from VMS plots suggest that the areas where the pelagic species herring were primarily caught was west of Fehmarnbelt in the ICES rectangle 38G2 (Figure 4.68). This is supported by the landings of herring from this ICES rectangle, which is on average more than 5 times greater than any other ICES rectangles in this part of the Western Baltic. VMS plots do however, show some herring fisheries in the area southeast of Fehmarnbelt in the southern part of ICES 37G1, and in the western part of ICES 38G0. The seasonal patterns suggest that the greatest activity for this fishery was in the winter and early spring (January-March), with some fisheries from April-June in ICES 38G2. It is important to note that the fisheries after herring is often in a mixed fishery with sprat, and that only the dominant species is named in the landings if 20% or less of the other species is present in the catches.

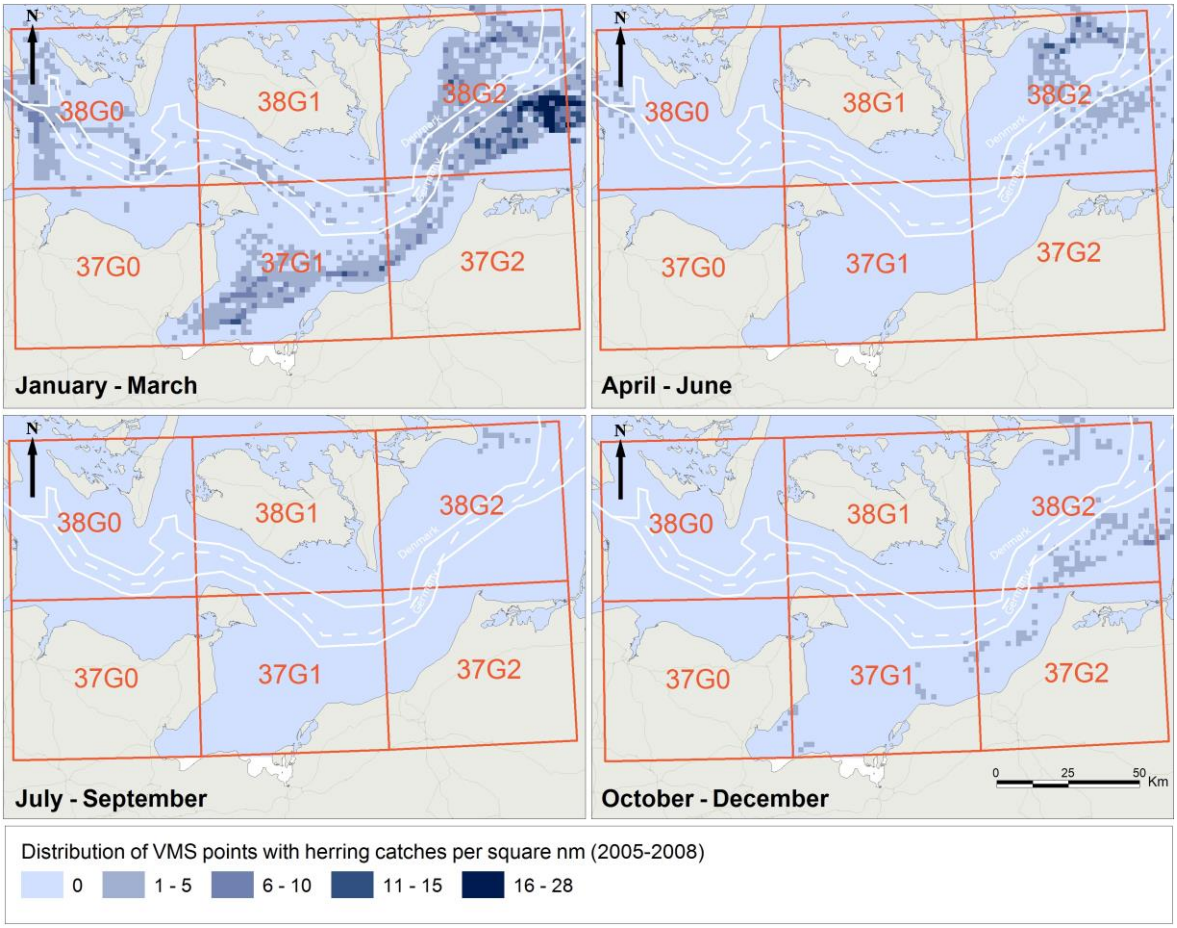


Figure 4.68: The seasonal distribution of herring catches in 6 ICES rectangles (38G0, 38G1, 38G2, 37G0, 37G1 and 37G2) according to the relative plot density derived from VMS data for all vessels ≥15 m

Sprat

The distribution of the landings of the pelagic species sprat by trawlers according to VMS data, suggests that this species is primarily caught in the western part of the Western Baltic (Figure 4.69). This also includes a considerable amount of effort in Fehmarnbelt and to the west in ICES 38G0 and to the southeast in ICES 37G1. Seasonally, the VMS plots suggest that the sprat fisheries is greatest during the first 6 months of the year (January-June), but plots suggest this fishery is also undertaken in the autumn (October-December) months. The area around Fehmarnbelt appears to be a consistent area where the fisheries for sprat are undertaken on a regular basis, generally following the aforementioned seasonal patterns. As mentioned, the species sprat is often caught in a mixed fishery with herring, and is the only species mentioned in the landings if herring is present in less than 40% of the catch. Thus, clear differences in the distribution of these two species from landings data is not possible when it is only required to name dominant species (more than 60%) in logbooks. However, the general distribution patterns according to VMS plots showing catches of sprat are primarily in the far western area of the Western Baltic (ICES 38G0 and 38G1) and catches of herring are primarily in the easterly areas of the Western Baltic (ICES 38G2), fit well with the reported landings data from these ICES rectangles.

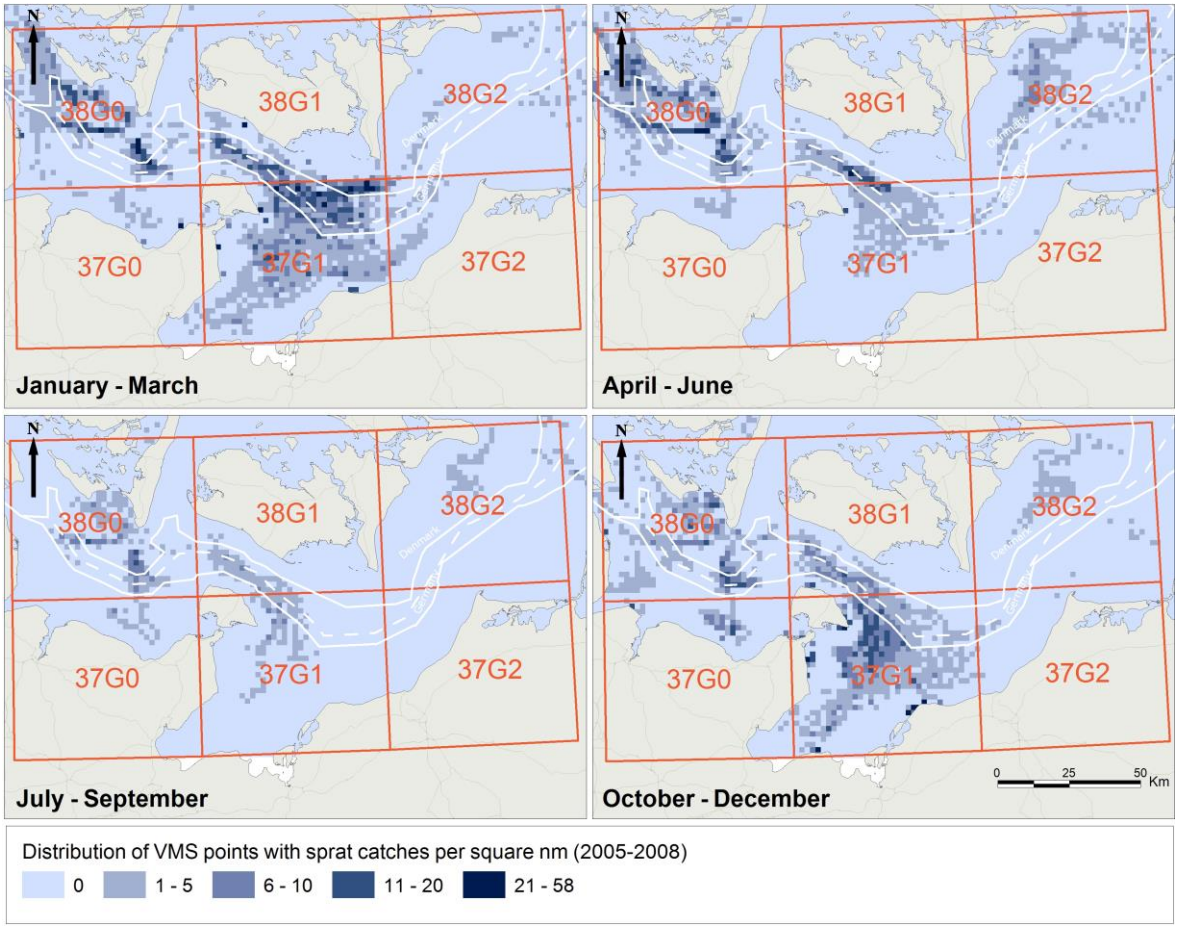


Figure 4.69: The seasonal distribution of sprat catches in 6 ICES rectangles (38G0, 38G1, 38G2, 37G0, 37G1 and 37G2) according to the relative plot density derived from VMS data for all vessels ≥15 m.

Flounder, dab and plaice

Landings of these flatfish species are often a result of them being a bycatch in the demersal trawling fisheries after cod. According to VMS density plots the majority of these flatfish species were landed by trawlers from areas south and east of Fehmarnbelt (ICES 37G1, 37G2 and 38G2). These species were, however, also in some of the trawl landings around Fehmarnbelt and to the far west of the western ICES 38G0 rectangle. The plots suggest that these flatfish species were primarily present in the trawl catches from the early part of the year (January-March) where the majority of trawling is undertaken.

Because flatfish species are more directly targeted in other fisheries (such as the net fisheries), the distribution of these species according to VMS plots only represent where these species have been caught by trawlers. These flatfish species are also caught in the net fisheries which distribution around Fehmarnbelt is shown in Figure 4.70.

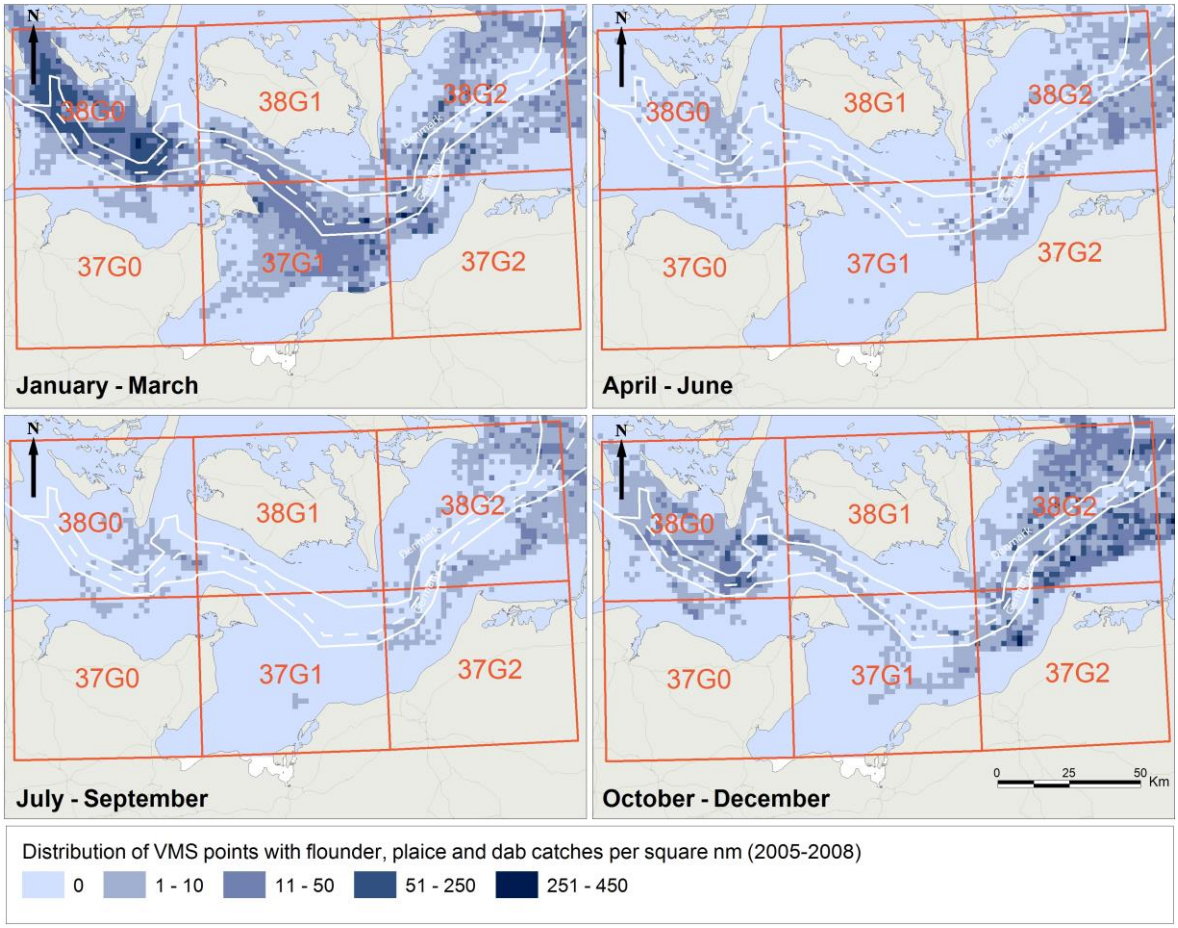


Figure 4.70: The seasonal distribution of the flatfish flounder, plaice and dab in 6 ICES rectangles (38G0, 38G1, 38G2, 37G0, 37G1 and 37G2) according to the relative plot density derived from VMS data for all vessels ≥15 m.

Turbot, brill and sole

The distribution of these valuable flatfish species according to VMS density plots indicate this species are landed sporadically by trawlers and seine netters in several different areas of the Western Baltic. In general, these valuable flatfish species are primarily targeted by net fishermen (Figure 4.71), which typically use smaller vessels (≤15 m) that are not registered in VMS data because they are not required to have VMS equipment onboard. Consequently, the use of VMS plots, which primarily represent trawling and seine net fishing, does not give a very thorough indication of the distribution of the fisheries for these species. A more complete picture is depicted in the distribution of the net fisheries in Figure 4.61 and Figure 4.65.

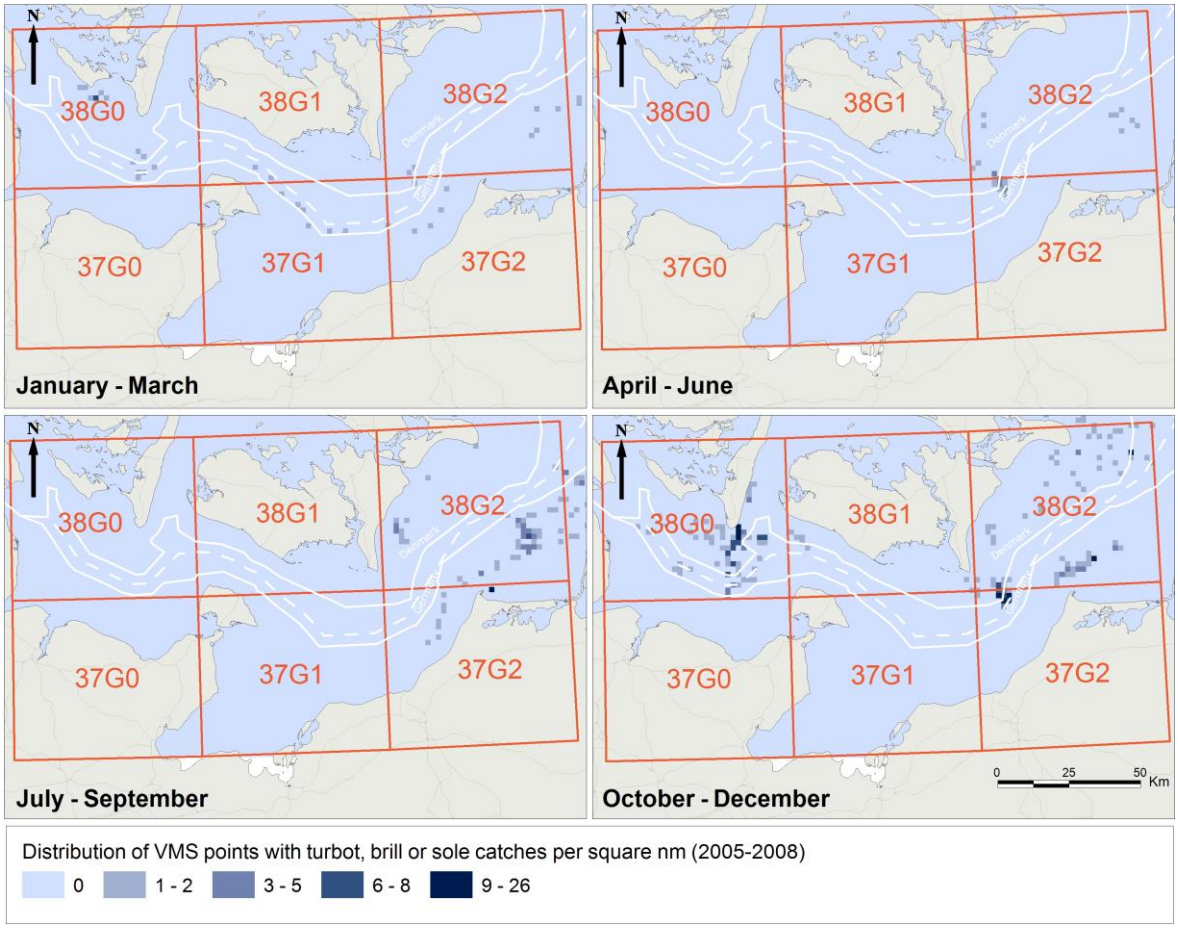


Figure 4.71: The seasonal distribution of turbot, sole and brill in 6 ICES rectangles (38G0, 38G1, 38G2, 37G0, 37G1 and 37G2) according to the relative plot density derived from VMS data for all vessels ≥15 m.

Whiting

Whiting fisheries take place prevailingly in the first part of the year from Fehmarnbelt and southwest into ICES rectangle 37G1 (Figure 4.72). There are also some catches in the far western (ICES 38G0) and eastern part (ICES 38G2) parts of the regional area around Fehmarnbelt. Whiting is caught as a bycatch in the cod fisheries, but also in the industrial fisheries using pelagic or midwater trawls. When abundant, this commercial species is specifically targeted, which can result in a considerable amount of landings in some years.

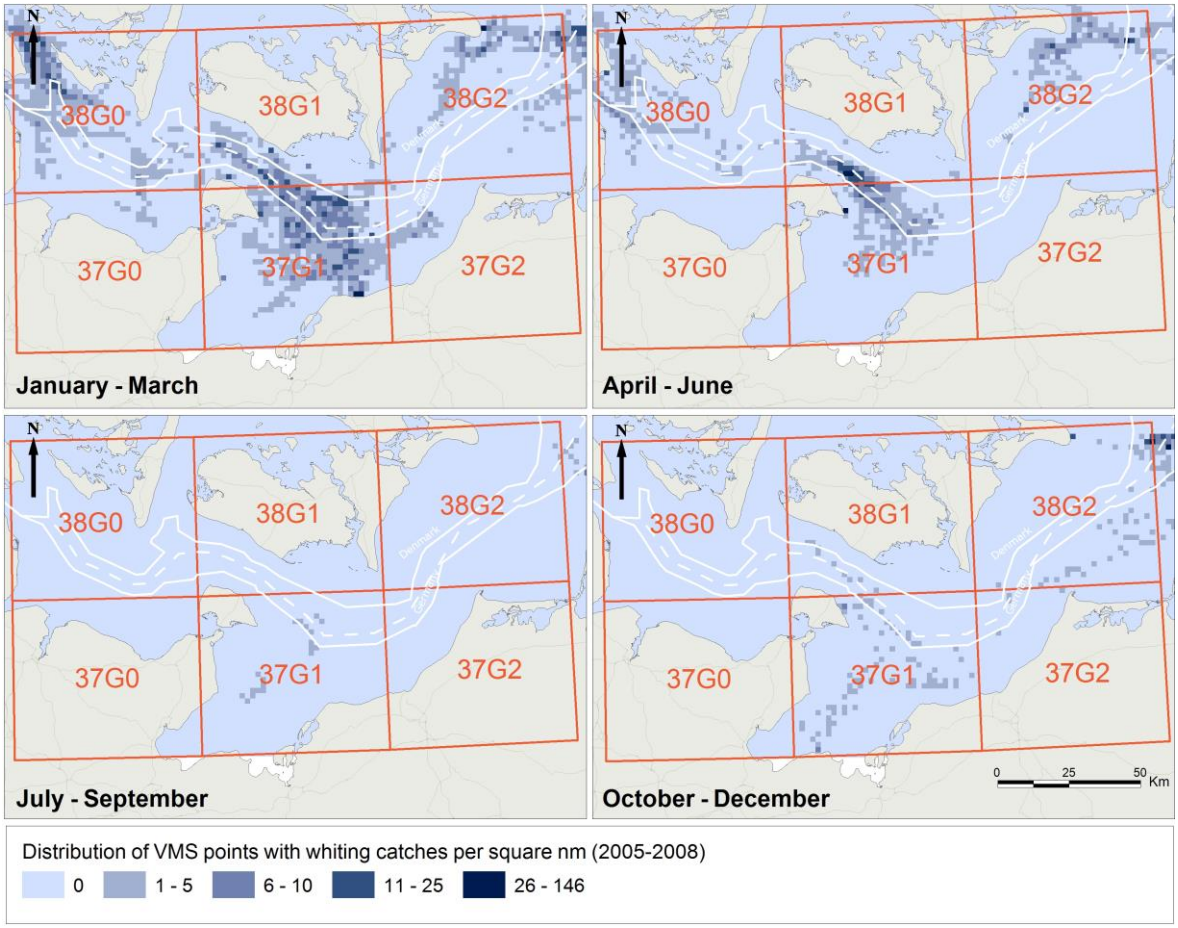


Figure 4.72: The seasonal distribution of whiting in 6 ICES rectangles (38G0, 38G1, 38G2, 37G0, 37G1 and 37G2) according to the relative plot density derived from VMS data for all vessels ≥15 m.

4.1.8 Pound net fisheries

German pound net fisheries

The data from the German pound net fisheries is limited and estimates of the annual average landings and value over the last 10 years are based on landings data from approximately 3-5 pound nets, along the northern and south-eastern coast of Fehmarn Island (see Figure 4.73). The total number of pound nets representing the fisheries in Fehmarnbelt and region is approximately 13, if the pound nets along a short section of the eastern coast of the mainland, across from Fehmarn Island are also taken into consideration.

The number of eels landed in 3-5 pound nets from 1998-2008 was used to make an estimate of the annual average landings (kg) and landing value (euro) of European eel for each pound net. This estimate was derived from multiplying the number of eel annually landed in 3-5 pound nets by the standard weight (422 gr.) of the eels of minimum allowable length (35 cm).

The annual number of eels caught in 3-5 pound nets, and estimated weight of landings along the Fehmarn northern coast is given in Table 4.21.

Results showed that the minimum amount of eel landed by weight in each pound net was estimated to be 223 kg per year. This amounted to an estimated annual value of 2,350 euro per pound net per year from 1998-2008.

The development in the number of European eel landed over the last 3 years shows a decrease by around 40%, with the lowest landings in 2008.

Table 4.21: The number of European eels caught, estimate weight and average estimated weight per pound net derived from the landings of eel from 3-5 pound nets on the northern coast of Fehmarn

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Ø 1998-2008
Annual number of eels caught	1627	2058	2740	3588	3983	3982	2816	2545	2525	1805	1470	2649
Estimated weight of landings (kg)	686	868	1,155	1,513	1,680	1,679	1,188	1,073	1,065	761	620	1117
Estimated weight (kg) per pound net	172	289	231	504	420	420	297	268	266	190	207	297

Overall, it appears that the pound net fisheries along the coast of Fehmarn are undertaken annually.

Data on other commercial species in the landings of German pound nets was not available and therefore it was not possible to give baseline data on what other important commercial species was landed in this fishery.

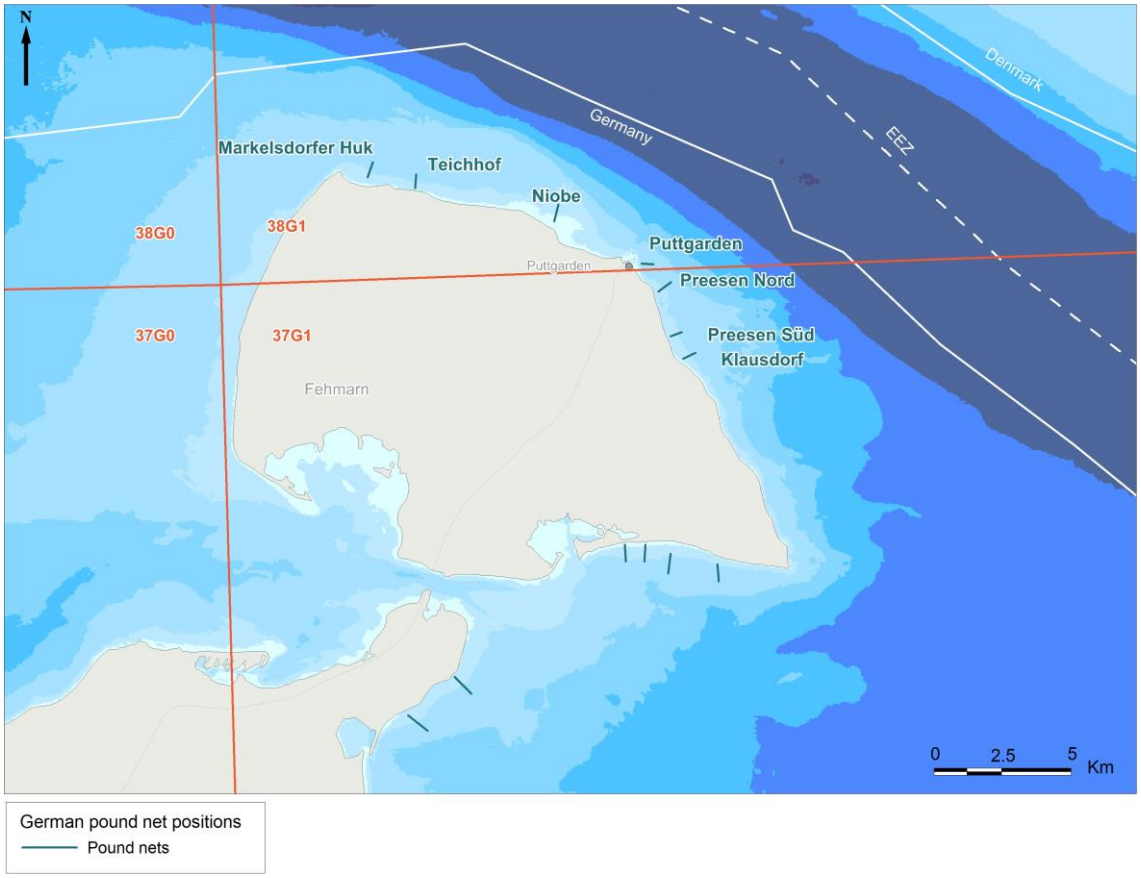


Figure 4.73: The distribution of the German pound net fisheries represented by 13 pound nets positioned along the coast of Fehmarn, and the eastern coast of the mainland just south of Fehmarn.

Danish pound net fisheries

The Danish pound net fisheries in the Fehmarnbelt area of southern Lolland are represented by 7 fishermen who have licenses (BBD numbers representing their firms) to fish at 82 pound net positions distributed along the southern and southwestern coast of Lolland (Figure 4.74) and in the local coastal areas with other passive gear (gill nets and fyke nets). Fishing licenses (BBD numbers) give fishing rights to typically 10-12 pound net locations. To retain these rights, fishermen need to renew these licences approximately every 6 years.

Landings from the pound net fisheries (or firms) registered under the specific BBD number include landings from primarily pound nets, but also other passive gear such as fyke nets, traps and gill nets. It is therefore, not entirely possible to distinguish which commercial species are specifically landed by pound nets and which species are landed by other gear in these fisheries. It is, however, assumed that European eel (silver and yellow) is caught in pound nets and to a certain extent in fyke nets due to the inability to catch this species in gill nets.

Of the approximately 82 pound net positions adjacent Fehmarnbelt, there are only a varying number of pound nets that are in use from year to year. Over the last two years (2008-2009) approximately 58-62 pound nets of varying lengths have been in use along southern Lolland, in the Fehmarnbelt (personal comm.). Furthermore, there are a number of fyke nets used by fishermen to catch eel and common prawns primarily in the bays of Nysted Nor (Figure 4.74), on the southeastern coast of Lolland and in Nakskov Fjord on the west coast of Lolland.

Table 4.22: The approximate number of Danish pound nets, and other coastal gear (nets and traps) used by 7 fishermen along the southern and southwestern coast of Lolland in Fehmarnbelt (see Figure 4.74). The actual number and type of net and fyke net gear used in the fisheries varies from year to year. Source: Danish Directorate of Fisheries and individual interviews.

Pound nets and other gear used along the coast of southern Lolland (Fehmarn Belt)	
Gear	approx. nr.
Pound nets	82
Other coastal gear (nets and traps)	300

The development of the landings, and the amount of landings and their value in the Danish pound net fisheries along the southern coast of Lolland, adjacent to Fehmarnbelt, are given in Figure 4.75 and Table 4.22.

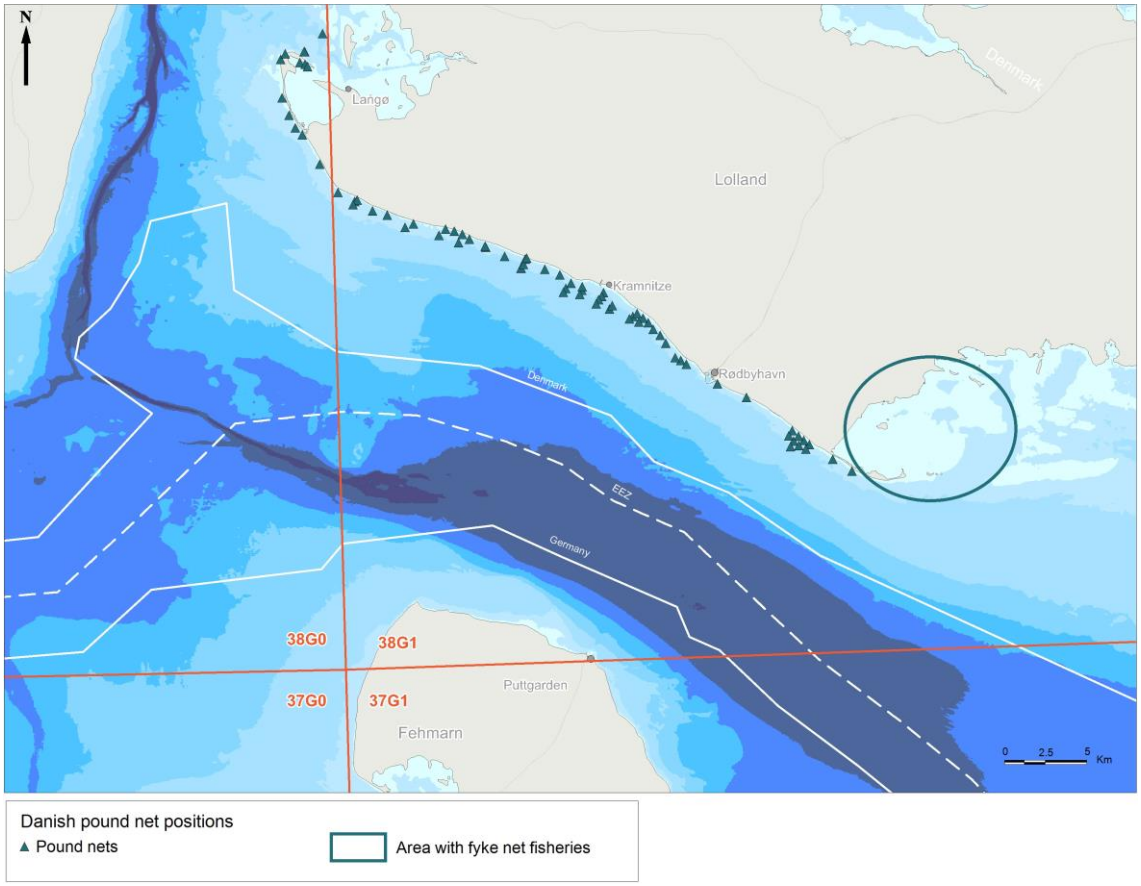


Figure 4.74: The distribution of the Danish pound net positions (82 positions) representing 7 pound net fishing firms (BBD numbers) and the general area of their fisheries along the southern coast of Lolland - in Fehmarnbelt. The circle in the southeast area of Lolland represents the area in Nysted Nor where a considerable amount of eel and shrimp fisheries are undertaken with the use of fyke nets and traps. A similar fishery has been undertaken northeast of Langø (in Nakskov Fjord) in earlier years.

The average annual landings and value of landings in the Danish pound net fisheries varied between 94-323 tons and 221,000-569,000 euro from 2000-2009 (Figure 4.75). This data represents the total landings and value of the overall pound net fisheries along the southern Lolland coast during this time.

The development of the landings showed that cod was caught in comparatively large amounts from 2000-2002, whereas landings since have averaged approximately 50-60 tons (91,000-157,000 euro in value). Other abundant species landed over the last decade (2000-2009) in relatively large amounts were garfish (6.4-39 tons and 6,400-22,500 euro), flatfish species (13-33 tons and 20,000-82,000 euro) and European eel (4.8-23 tons and 31,000-322,000 euro) Figure 4.75 and Table 4.24.

The most important species according to value are cod and European eel (typically European eel in pound nets). Together they made up between 53-91% (117,000-518,000 euro) of the value of the overall landings over the last decade. In recent years, valuable flatfish species such as turbot and brill are being landed in greater numbers and have represented a greater proportion of the value of the landings (Table 4.24).

Landings of common prawns (“Baltic prawns”, *Palaemon adspersus)*, also registered in the pound net fisheries (caught in special fyke nets), were comparatively high (<1-6 tons or 700-18,600 euro) from 2000-2005. Traditionally, the fishery after common prawns in Nysted Nor as

well as in the waters around Nakskov (West Lolland) are undertaken with special fyke nets, and have in some years supplemented the pound net fisheries as well as other local fisheries, considerably. This is supported by the substantial landings that occasionally have occurred in some of the smaller harbours (Errindlev – in Nysted Nor (3.7-23.6 tons per year in the period 2002-2006) and Langø in Nakskov Fjord (3-4 tons per year in the period 2001-2004). In recent years these fisheries have not been undertaken due to a disease ("black spot" - bacterial shell disease) strongly affecting the prawn stocks (Pedersen, 2006). Although stocks have only slightly recovered, a few fishermen have started this fishery again in 2010 (see Table 4.39).

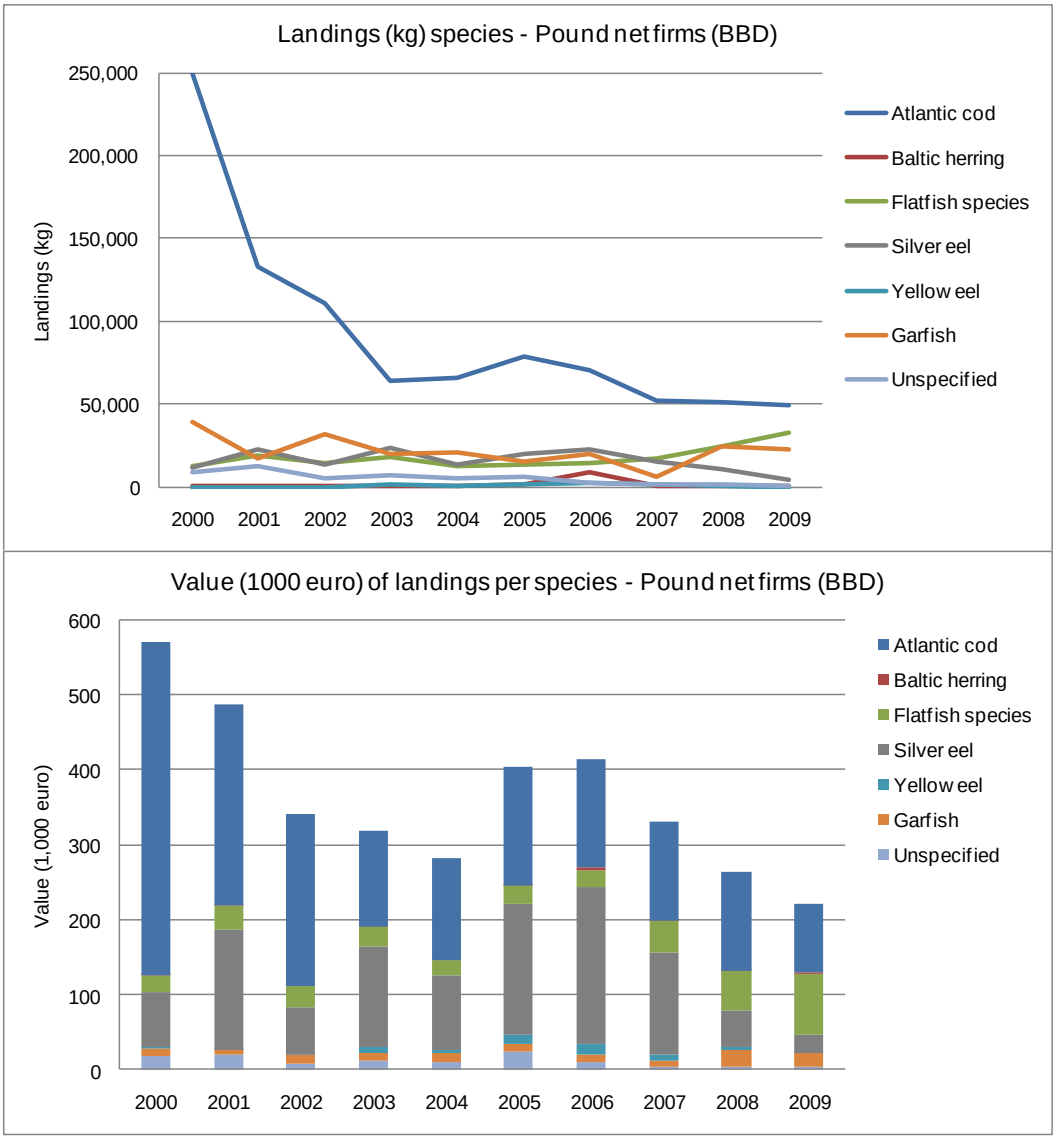


Figure 4.75: The landings (kg) and value (1,000 euro) of the most abundant and valuable commercial species and groups of species (flatfish) from the Danish pound net fishing firms (BBD) (2000-2009) in the Fehmarnbelt along the southern and southwest coast of Lolland. Data based on landings and value from 7 pound net fishermen firms. Source: Danish Directorate of fisheries.

Seasonally, the pound net fisheries are usually undertaken over the second half of the year (typically September-December), when silver eels, which are often the main target species, are migrating. However, some of the fisheries start in the spring, primarily after garfish, her-

ring, lumpsuckers (male and female) and cod, and continue over the summer eventually including flatfish. Similarly, the fisheries after yellow eel and common prawns in Nysted Nor, on the south-eastern part of Lolland, is undertaken from April-August depending on the abundance of shrimp from year to year.

Table 4.23: Seasonal trends in the catch of the most important commercial species in the Danish pound net fisheries near Fehmarnbelt.

Pound nets - seasonal trends in the fisheries

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Silver eel								■	■	■	■	
Yellow eel						■	■	■	■			
Garfish					■	■						
Herring				■	■							
Cod				■	■	■	■	■	■	■	■	
Common prawn				■	■	■	■					
Flatfish species						■	■	■	■			
Lumpsucker				■	■							

Table 4.24: The annual landings (kg) and value of landings (1,000 euro) in the Danish pound net fisheries along the south and south-western coast of Lolland (2000-2009). The data represents the pound net fisheries of 7 fishermen that have approximately 82 pound net positions located in Fehmarnbelt along the southern and south-western coast of Lolland. Source: Danish Directorate of Fisheries

Pound net firms (BBD) - Landings (kg)

Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Atlantic cod	249,179	133,227	111,252	64,115	65,614	78,353	70,186	52,024	51,600	49,332
Baltic herring	852	589	484	507	368	1,620	8,589	397	267	551
Flounder	8,582	8,427	6,351	11,614	7,297	6,846	8,602	6,468	8,148	9,959
Dab	1,163	2,060	957	3,524	3,443	4,003	3,890	5,155	7,390	7,211
Plaice	646	8,248	6,486	1,682	1,118	990	1,031	1,410	2,856	3,525
Turbot	2,262	709	731	1,062	869	1,421	844	3,969	3,530	9,575
Brill	186	26	118	212	298	340	208	191	1,998	2,374
Sole	6	7	21	14	10	62	90	56	247	365
Lemon sole	0	19	2	1	5	2	1	0	1	1
Silver eel	11,480	23,061	13,881	23,416	13,116	20,111	23,166	15,107	10,948	4,761
Yellow eel	100	135	120	1,347	895	1,936	2,192	1,167	597	127
Sea trout	191	267	113	89	347	195	601	421	166	225
Garfish	39,585	17,443	31,521	19,543	20,709	15,686	19,681	6,396	24,846	22,591
Lumpsucker_female	499	2,828	1,271	2,201	804	193	148	227	311	117
Lumpsucker_male	709	4,359	2,295	3,050	1,751	420	322	739	428	245
Mullet	85	119	149	295	497	559	512	152	245	281
Eelpout	33	0	15	54	555	466	461	99	26	48
Perch	1,300	1,255	573	307	563	299	402	179	89	114
Common prawn	6,246	3,750	1,017	871	257	4,148	88	0	0	0
Unspecified species	143	109	67	20	163	1	253	9	22	17
Total	323,247	206,638	177,424	133,924	118,679	137,651	141,267	94,166	113,715	111,419

Pound nets firms (BBD) - Value (1000 euro)

Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Atlantic cod	442.9	267.7	230.5	127.5	135.4	157.7	144.2	133.1	132.7	91.4
Baltic herring	0.5	0.3	0.3	0.2	0.2	0.6	4.4	0.3	0.2	0.4
Flounder	7.2	7.4	5.8	9.5	6.4	6.2	7.8	7.3	6.6	5.0
Dab	1.1	2.4	0.9	3.3	3.4	4.1	4.9	6.3	6.9	7.8
Plaice	1.2	18.5	15.0	4.0	2.2	2.2	1.5	2.7	4.9	5.0
Turbot	11.5	4.4	4.7	7.2	6.3	8.6	5.5	23.2	18.7	46.6
Brill	0.7	0.2	0.7	1.2	1.8	2.1	1.3	1.0	11.2	12.9
Sole	0.0	0.0	0.2	0.1	0.1	0.7	1.2	0.9	4.0	4.6
Lemon sole	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Silver eel	74.2	158.7	63.4	134.0	99.1	173.4	208.7	136.1	49.6	24.3
Yellow eel	0.9	1.1	0.6	7.2	5.6	12.5	15.2	8.4	4.0	0.9
Sea trout	0.5	0.8	0.3	0.2	0.7	0.5	1.6	1.3	0.5	0.8
Garfish	10.4	6.6	11.6	11.3	10.4	9.8	10.0	7.9	22.5	17.6
Lumpsucker_female	0.8	5.0	3.0	6.1	3.2	1.1	1.4	0.7	0.8	1.3
Lumpsucker_male	0.3	1.7	0.8	0.7	1.3	0.4	0.5	0.5	0.2	0.3
Mullet	0.4	0.6	0.7	1.5	1.9	2.6	3.2	1.0	1.2	1.4
Eelpout	0.2	0.0	0.0	0.1	1.4	1.1	1.4	0.3	0.1	0.1
Perch	2.9	2.2	0.7	0.4	1.1	0.7	0.8	0.3	0.2	0.2
Common prawn	13.3	8.8	2.5	2.8	0.8	18.6	0.7	0.0	0.0	0.0
Unspecified species	0.4	0.2	0.2	0.0	0.6	0.0	0.2	0.0	0.0	0.0
Total	569	487	342	318	282	403	415	331	264	221

4.1.9 German local & regional harbours – fleets, landings & values

The locations of the main German fishing harbours in the Western Baltic and their approximate number of fishing vessels are shown in Figure 4.76.

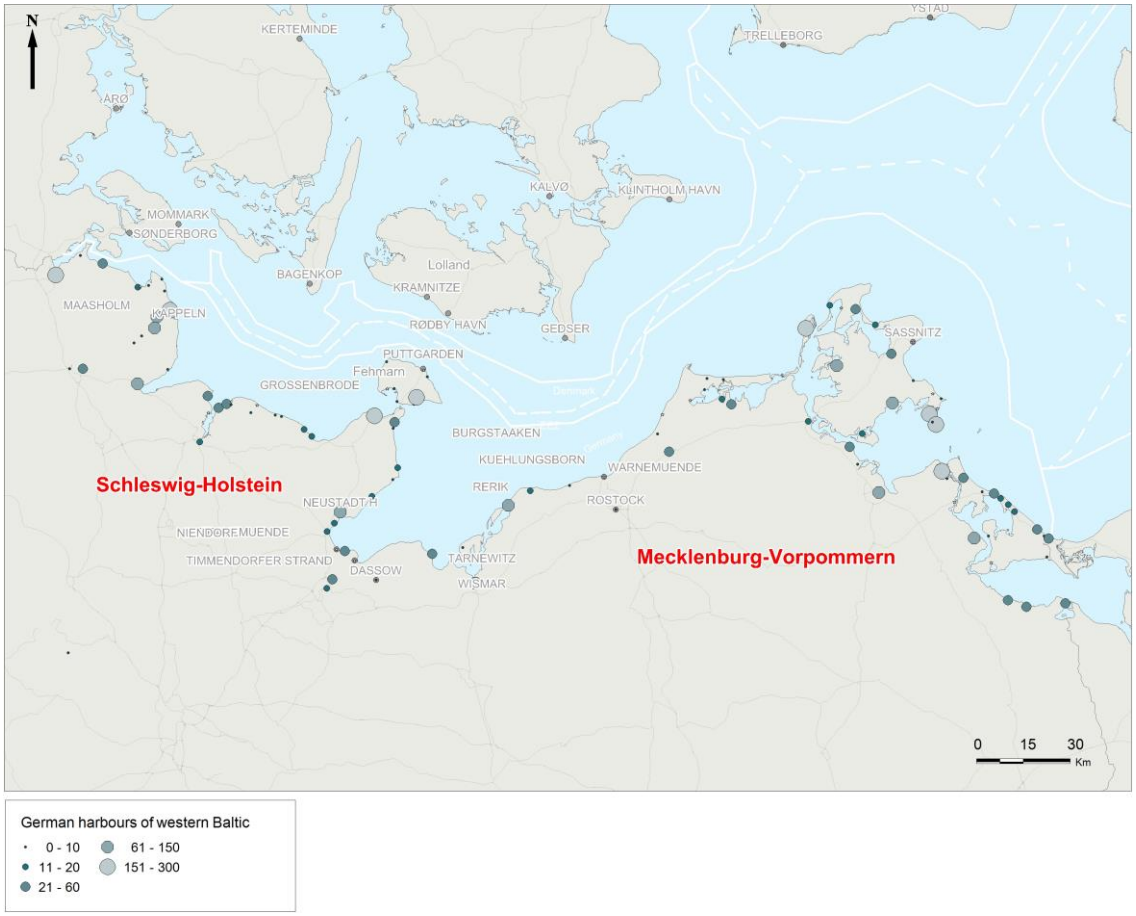


Figure 4.76: The locations of the main German fishing harbours in the Western Baltic and their approximate number of registered commercial fishing vessels. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

The total landings (tons) and their value (euro) in the German near field harbours (Burgstaaken, Heiligenhafen, Großenbrode, Puttgarden and Orth) from 1998-2008 are given in Table 4.25 and Table 4.26, respectively.

The largest and most important German harbours near Fehmarnbelt according to landings and their value are those at Burgstaaken (850-3,101 tons and 1.2-6.5 million euro) and Heiligenhafen (1,062-2,364 tons and 1.5-6.7 million euro). Other nearby harbours that represent a smaller proportion of the total landings and value of the fisheries near Fehmarnbelt area are Großenbrode (44-107 tons and 121-327 thousand euro) and two very small fishing harbours Orth (0-2.5 tons and 0-8,000 euro) and Puttgarden (0-0.4 tons and 0-3,600 euro).

Overall, cod is the most important commercial species according to landing and value in all German harbours near Fehmarnbelt (ICES 38G1 and 37G1). This trend is followed by diverse flatfish species primarily flounder, dab and plaice, as well the more valuable species turbot and brill. In the two larger harbours (Burgstaaken and Heiligenhafen), whiting is also occasionally landed in large amounts. Comparatively, there are very few landings of the more pelagic species herring and sprat in these harbours. These species often make up the majority of the industry fisheries. European eel is also landed in varying amounts in all the harbours as well as the occasional salmon and sea trout.

Table 4.25: Landings (tons) of the most important commercial species in the German harbours that are nearest Fehmarnbelt. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Burgstaaken	2,278	3,101	2,210	1,836	1,345	1,267	1,264	1,451	1,439	1,187	850
Cod	2,010	2,670	1,865	1,582	1,128	898	734	961	1,009	890	556
Baltic herring	16	4	7	5	25	15	12	20	65	10	26
Sprat	6	1	5	2	0	14	0.1	24	0.1	33	0.5
Whiting	12	55	86	53	41	56	249	287	213	8	25
Flounder	14	133	138	115	70	58	64	16	0	66	77
Dab	9	97	51	37	55	202	182	98	93	146	143
Plaice	79	80	32	15	11	10	13	9	10	17	9
Turbot	21	9	5	7	5	4	4	3	5	7	6
Brill	0.1	0.3	0.1	0.1	0	1	1	1	1	2	1
Sole	99	<0.1	0	0	0	0	0	0	0	0	0
Flatfish- uknown	9	17	15	12	0.1	3	1	0	0	0	<0.1
European eel	4	6	6	8	8	9	5	6	7	4	6
Sea trout	0	0	0	0	0	0	0	0	0	0	0
Salmon	0	0	0	0	0.1	0	<0.1	<0.1	<0.1	<0.1	<0.1
Unspecified	0	29	0	0	0	0	0.1	26	37	2	0
Heiligenhafen	1,659	2,364	2,309	1,654	1,511	1,062	1,403	1,684	1,975	1,506	1,395
Cod	1,458	2,039	1,886	1,346	1,267	772	919	1,277	1,569	1,074	891
Baltic herring	15	13	46	27	20	33	25	8	20	14	6
Sprat	0	0	2	0	0	0.1	0	0	0	0	2
Whiting	10	21	55	46	27	7	24	73	40	12	70
Flounder	20	114	187	116	97	56	96	13	0	141	222
Dab	10	88	57	63	47	163	301	213	238	223	160
Plaice	36	49	30	11	10	6	13	22	18	23	27
Turbot	12	7	7	5	5	3	5	6	7	9	10
Brill	0.3	0.3	0.3	0.1	1	1	1	2	1	3	6
Sole	72	0	0	0	0	0	0	0	0	0	0
Flatfish- uknown	22	26	34	35	32	14	16	0	0	0	0.1
European eel	4.4	5.7	5.2	4.4	3.8	4.0	2.3	2.0	1.9	0.6	0.7
Sea trout	0	0	0	0.3	0.2	0.2	0.2	0	0	0	0.3
Salmon	0	0.1	0.0	0.2	1	0.1	<0.1	<0.1	0	0	0.1
Unspecified	1	0	1	0	0	3	0	67	79	7	1
Großenbrode	44	44	105	94	71	84	75	103	103	98	107
Cod	44	44	96	91	68	83	72	97	95	91	98
Baltic herring	0	0	0.2	0.2	0.4	0.1	0.1	<0.1	0	0	0.5
Sprat	0	0	0	0	0	0	0	0	0	0	0
Whiting	0	0.1	0.2	0.2	0	0	0.2	<0.1	0	0	0.6
Flounder	0	0.1	4.7	0.8	1.1	0.4	0.3	0.2	0	2.1	2.3
Dab	0	0.1	1.6	0.3	0.3	0.4	1.0	2.2	4.4	3.3	3.5
Plaice	0	0	0.2	0	0	0	0	0.5	0.3	0.6	0.8
Turbot	0	0	1.8	0.2	0.1	0.2	0.1	0.6	0.6	0.9	0.6
Brill	0	0	0	0	0	0	0	<0.1	0	0.1	0.1
Sole	0.1	0	0	0	0	0	0	0	0	0	0
Flatfish-unknown	0	0	0.3	0.2	0.1	0.2	0.2	0	0	0	0
European eel	0.3	0.3	0.3	1.2	0.6	0.4	0.2	0.3	0.2	0.2	0.2
Sea trout	0	0	0	0.1	0	0.2	0.3	0	0	0	0.3
Salmon	0	0	0	0	0	0	0	0	0	0	0
Unspecified	0.01	0.01	0	0	0	0.01	0	2.8	1.8	0.2	0.1
Puttgarden	0	0	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0
Cod	0	0	0.1	0.1	0	0.1	0	<0.1	0	0	0
Baltic herring	0	0	0.1	0	0	0	0	0	0	0	0
Plaice	0	0	<0.1	<0.1	0	0	0	0	0	0	0
Flatfish-unknown	0	0	0	<0.1	<0.1	0	0	0	0	0	0
European eel	0	0	0.2	0.2	0.1	0.1	0	0.1	0.1	0.1	0.0
Unspecified	0	0	0	0	0	0	0	<0.1	0	0	0
Orth	0	0	2.5	1.6	0	0	0.1	0	0.2	0.2	0.3
Cod	0	0	0.8	0.3	0	0	0	0	0	0	0
Baltic herring	0	0	0	0.2	0	0	0	0	0	0	0
Flounder	0	0	0	0	0	0	0	0	0	0	<0.1
Plaice	0	0	0	0	0	0	0.1	0	0	0	0
Flatfish-unknown	0	0	1.5	1.0	0	0	0	0	0	0	0
European eel	0	0	0.1	0.2	0	0	0	0	0.2	0.2	0.3
Salmon	0	0	<0.1	0	0	0	0	0	0	0	0
Unspecified	0	0	<0.1	0	0	0	0	0	0	0	0

Table 4.26: Value (1,000 euro) of the landings in the German harbours nearest Fehmarnbelt. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Burgstaaken	2,428	3,311	2,691	2,325	1,717	1,365	1,377	1,674	1,845	1,882	1,237
Cod	2,123	2,886	2,378	2,075	1,513	1,067	960	1,290	1,489	1,586	981
Baltic herring	3	1	2	2	7	5	3	5	15	3	6
Sprat	4	1	3	2	<0.1	11	<0.1	2	<0.1	15	0
Whiting	10	31	62	30	24	25	194	215	128	12	17
Flounder	8	67	80	75	35	33	39	5	0	46	47
Dab	7	76	40	32	37	130	107	59	85	123	97
Plaice	100	126	43	18	14	13	16	12	14	22	9
Turbot	65	36	19	24	19	15	14	11	19	30	25
Brill	0.2	1.1	0.3	0.2	1.0	1.4	2.8	2.6	3.6	7.1	6.1
Sole	66.2	<0.1	0	0	0	0	0	0	0	0	0
Flatfish- uknown	4.1	9.0	9.4	6.9	0.2	1.6	0.2	0	0	0	<0.1
European eel	36	51	53	60	67	62	42	52	59	35	49
Sea trout	0	0	0	0.1	<0.1	0	0	0	0	0	0
Salmon	<0.1	0.0	0.2	<0.1	0.1	<0.1	0.2	<0.1	<0.1	<0.1	0.1
Unspecified	0.2	25	0.1	0.0	0.0	0.0	0.4	21	33	3.0	0.1
Heiligenhafen	2,244	3,215	3,408	2,609	2,449	1,507	1,834	2,434	2,740	2,323	2,093
Cod	1,964	2,859	2,998	2,278	2,162	1,194	1,386	2,032	2,351	1,897	1,634
Baltic herring	10	8	16	20	24	38	26	9	9	8	2
Sprat	0	0	2	0	0	0	0	0	0	0	0
Whiting	10	19	50	37	29	5	19	65	38	15	54
Flounder	18	63	113	88	70	46	73	6	0	100	132
Dab	9	76	55	64	44	122	223	183	202	208	151
Plaice	56	78	42	16	16	11	20	35	27	33	37
Turbot	50	32	29	20	22	13	24	27	33	41	44
Brill	1	1	1	0	2	3	3	7	4	8	30
Sole	58	0	0	0	0	0	0	0	0	0	<0.1
Flatfish- uknown	32	33	55	47	45	29	35	0	0	0	0.2
European eel	34	44	43	34	32	34	20	17	15	5	6
Sea trout	0.1	0.0	<0.1	1.5	0.9	1.1	1.0	0	0	0	1.3
Salmon	0.7	0.9	0.8	1.3	2.4	0.7	1.2	1.9	0.1	0	0.1
Unspecified	1.9	0.9	1.8	0.3	0.3	9	0.7	51	60	9.1	2.2
Großenbrode	65	68	167	165	124	126	121	172	167	183	211
Cod	62	64	150	153	116	120	116	160	156	172	198
Baltic herring	0	0	0.1	0.2	0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.2
Sprat	0	0	0	0	0	0	0	0	0	0	0
Whiting	0	0.0	0.2	0.1	0.1	0	0.2	0.1	<0.1	0	0.5
Flounder	0	0.0	4.5	0.9	1.9	0.4	0.3	0.1	0	2.1	1.5
Dab	0	0.5	1.7	0.3	0.3	0.3	0.8	1.7	3.7	3.0	3.3
Plaice	0	<0.1	0.5	<0.1	<0.1	<0.1	0.1	0.7	0.5	0.8	1.1
Turbot	0.2	0.1	6.8	1.0	0.4	0.7	0.5	3.0	2.8	3.9	2.6
Brill	0	0	0	0	0.2	<0.1	<0.1	0.2	0.1	0.2	0.5
Sole	0.1	0	0	0	0	0	0	0	0	0	0
Flatfish-unknown	0	0	0.4	0.2	0.2	0.4	0.4	0	0	0	<0.1
European eel	2.2	2.7	2.6	9.7	5.1	3.7	1.1	2.8	1.6	1.3	1.8
Sea trout	0	0	0.1	0.3	0.1	0.6	1.1	0	0	0	1.4
Salmon	0	0	0.1	<0.1	0.1	0	0	0	0	0	<0.1
Unspecified	<0.1	0	0	0	0	0	0	0	0	0	0
Puttgarden	0	0	1.8	1.4	1.1	0.7	0.4	1.1	1.0	0.6	0
Cod	0	0	0.1	0.1	0.1	0.1	0.1	<0.1	0	0	0
Baltic herring	0	0	0.1	0	0	0	0	0	0	0	0
Plaice	0	0	<0.1	0.0	0	0	0	0	0	0	0
Flatfish-unknown	0	0	0	<0.1	<0.1	0	0	0	0	0	0
European eel	0	0	1.6	1.3	1.0	0.6	0.4	1.1	1.0	0.6	<0.1
Unspecified	0	0	0	0	0	0	0	<0.1	0	0	0
Orth	0	0	4.2	3.8	0	0	0.5	0.1	1.5	2.1	0
Cod	0	0	1.0	0.4	0	0	0	0	0	0	0
Baltic herring	0	0	0	0.3	0	0	0	0	0	0	0
Flounder	0	0	0	0	0	0	0	0	0	0	<0.1
Plaice	0	0	0.1	0	0	0	0.2	0	0	<0.1	<0.1
Flatfish-unknown	0	0	1.9	1.3	0	0	0	0	0	0	0
European eel	0	0	1.1	1.9	0	0	0.3	0.1	1.5	2.1	<0.1
Salmon	0	0	0.0	0	0	0	0	0	0	0	0
Unspecified	0	0	<0.1	0	0	0	0	0	0	0	0

Burgstaaken

Table 4.27: The number of registered commercial vessels and their length (<8 m, 8-11.9 m, 12-14.9 m and ≥15 m) in Burgstaaken harbour from 1998-2008. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

Burgstaaken harbour - number of commercial vessels

Vessel length (m)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<8	commercial	19	19	21	23	23	23	24	24	23	22	22
8-11.9	commercial	8	8	8	9	8	8	8	7	7	7	7
12-14.9	commercial	3	3	3	3	3	3	3	3	3	3	3
≥15	commercial	14	16	16	16	16	14	14	14	14	14	14
Total		44	46	48	51	50	48	49	48	47	46	46

Since 1998, the total number of commercial vessels has been relatively stable and has fluctuated annually from 44-51 during this time (Table 4.27). There have been 14 large (≥15 m) vessels since 2003 and 10 small vessels (8-15 m) since 2005. The fishing fleet in Burgstaaken is also made up a considerable number of small vessels (<8 m) which have numbered 22-24 since 2001.

Landings at Burgstaaken over the last decade reached a peak of 3,100 tons in 1999 and have since decreased to around 1,000 tons the last couple of years (2007 and 2008), which are the lowest recorded over the past 11 years. The decrease in landings can primarily be attributed a decrease in cod landings from 2,670 tons in 1999 to 556 tons in 2008. Similarly, the total value of the landings in Burgstaaken has also decreased from 6.5 million euro in 1999 to 1.2 million euro in 2008 primarily due to loss in revenue from lower cod landings (Table 4.25 and Table 4.26).

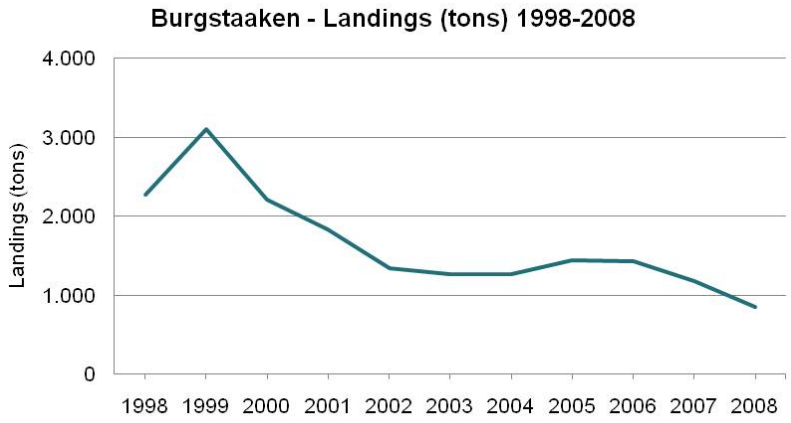


Figure 4.77: The development of total landings (tons) at Burgstaaken from 1998-2008. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

The annual landings and value of the fisheries in the near field area around Fehmarnbelt (ICES 38G1 and 37G1) and the regional area (ICES 38G0, 37G0, 38G2 and 37G2) to vessels with their basis harbour in Burgstaaken are shown in Table 4.28.

Since 1998, approximately 32-64% (42-57% from 2004-2008) of the German total landings from the near field area of Fehmarnbelt (ICES 38G1 and 37G1) have been landed by vessels registered in the harbour of Burgstaaken. The primary commercial species landed by these

vessels is cod supplemented by the pelagic species herring and sprat (often more than 50% of the catches of these species from this area) and a variety of flatfish species. Because landings of herring and sprat are low in the harbour of Burgstaaken, vessels from Burgstaaken must land the vast majority of these catches in other harbours. Over the last 5 years (2004-2008), the value of the landings from the near field area of Fehmarnbelt (ICES 37G1 and 38G1) has amounted to 1.3-1.8 million euro or approximately 28-36% of the value of the total landings from the Fehmarnbelt region.

Table 4.28: Annual landings (tons) and value (1000 euro) from the fisheries near Fehmarnbelt (ICES 38G1 and 37G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) by vessels with their basis harbour in Burgstaaken. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

	Landings (tons)										
Burgstaaken	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	45	35	30	25	15	20	21	6.4	4.6	5.6	4.2
Cod	37	28	25	20	12	15	17	6.1	4.4	4.7	3.1
Herring	2.1	1.3	1.1	0.7	0.7	0.4	0.2	0.0	0.0	0.5	0.3
Dab	0.0	0.1	0.4	0.4	0.2	0.2	1.5	0.0	0.0	0.2	0.1
Flounder	0.0	0.9	0.9	1.2	0.9	1.5	1.2	0.0	0.0	0.1	0.6
Plaice	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Turbot	0.2	0.1	0.1	0.04	0.1	0.0	0.1	0.0	0.0	0.0	0.0
Brill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.05	0.03
Flatfish (uknown)	4.0	4.5	0.8	0.2	0.1	0.0	0.1	0.2	0.0	0.0	0.0
European eel	0.9	0.5	1.5	2.5	1.4	1.9	1.6	0.1	0.2	0.02	0.1
Sea trout	0.05	0.11	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unspecified	1.6	0.04	0.06	0.1	0.04	0.12	0.0	0.0	0.0	0.0	0.1
37G1	2,016	2,568	1,903	2,008	4,085	3,514	2,652	2,227	2,909	2,252	2,333
Cod	1,770	2,223	1,577	1,345	1,047	760	658	853	860	773	481
Sprat	5.7	1.5	4.9	2.4	0.0	113	381	414	466	388	728
Herring	16	6.9	10	437	2,850	2,313	1,099	530	1,214	849	874
Dab	8	79	46	34	52	189	175	88	86	132	133
Flounder	13	122	143	112	65	54	62	15	0.0	62	70
Plaice	75	68	29	15	11	8.8	12.2	7.6	8.3	15	7.3
Turbot	19	7.7	5.0	6.0	5.3	3.6	3.2	2.5	4.3	6.9	5.3
Brill	0.0	0.2	0.1	0.1	0.4	0.5	0.7	0.7	0.6	1.7	1.2
Flatfish (uknown)	4.0	6.9	5.2	2.6	4.3	2.9	4.9	28	38	12	0.3
European eel	2.3	4.3	3.0	3.5	4.7	3.7	2.2	6.7	8.2	4.1	6.0
Salmon	0.0	0.0	0	0.0	0.02	0.01	0.02	0.01	0.0	0.0	0.0
Sea trout	0.0	0.0	0.0	0.02	0.0	0.04	0.04	0.1	0.1	0.2	0.0
Whiting	10	47	79	50	43	64	251	282	221	7	26
Lumpsucker	0.0	0.0	0.0	0.0	0.1	0.1	0.02	0.1	1.1	0.2	0.0
Unspecified	93	0.1	0.1	1.3	1.7	0.6	2.1	0.2	0.3	1.9	0.3
37G2	21	46	1.1	61	106	290	272	51	103	115	140
Cod	19	45	0.9	28	15	27	21	7	22	39	26
Herring	0.0	0.1	0.0	31	84	259	246	43	77	66	112
Dab	0.0	0.3	0.0	0.1	1.8	2.1	1.7	1.1	0.8	3.6	1.0
Flounder	0.0	0.4	0.1	2.0	3.6	1.1	1.8	0.0	0.0	4.4	0.6
Plaice	0.2	0.4	0.1	0.1	0.6	0.2	0.3	0.3	0.3	0.4	0.0
Turbot	0.2	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.0
Flatfish (uknown)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.7	0.3	0.0
Whiting	0.0	0.0	0.0	0.0	0.3	0.3	0.8	0.1	0.0	0.1	0.1
Unspecified	1.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38G0	34	22	27	25	11	17	40	4.2	2.1	2.3	2.9
Cod	32.4	19.5	24.5	15.8	9.9	13.4	37.4	3.9	2.0	2.3	1.3
Herring	0.4	0.4	0.9	5.7	0.2	0.1	0.3	0.0	0.0	0.0	0.5
Dab	0.0	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0
Flounder	0.0	0.6	0.5	0.9	0.4	0.6	0.5	0.0	0.0	0.1	1.0
Plaice	0.1	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turbot	0.2	0.02	0.04	0.04	0.0	0.01	0.03	0.0	0.03	0.0	0.0
Flatfish (uknown)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
European eel	0.8	1.3	0.4	2.2	0.3	2.4	1.8	0.0	0.0	0.0	0.02
Unspecified	0.5	0.2	0.1	0.2	0.04	0.03	0.04	0.0	0.0	0.0	0.1
38G1	28	17	22	25	16	15	6	48	5	14	3
Cod	26	15	18	19	11	11	5	7	3	6	0
Herring	0.4	0.4	1.1	0.8	0.4	0.2	0.5	39.5	0.0	0.0	0.3
Dab	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.8	0.9	4.5	1.6
Flounder	0.0	0.4	1.0	3.2	0.7	0.5	0.3	0.1	0.0	2.4	0.8
Plaice	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.2
Turbot	0.03	0.0	0.1	0.04	0.0	0.0	0.03	0.02	0.01	0.1	0.03
Brill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Flatfish (uknown)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0
European eel	0.4	1.1	1.8	1.3	3.6	2.3	0.4	0.0	0.04	0.0	0.0
Whiting	0.1	0.0	0.1	0.1	0.3	0.0	0.0	0.8	0.0	0.0	0.0
Unspecified	1.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38G2	16	64	5.4	145	132	220	28	178	616	755	372
Cod	15	57	4	27	14	1.7	4.6	6.9	27	17	32
Sprat	0.0	0.0	0.0	0.0	0.0	0.0	7.5	0.0	0.0	156	0.0
Herring	0.0	0.0	0.0	95	115	218	15	169	587	579	339
Dab	0.0	0.3	0.0	0.2	0.0	0.0	0.1	0.5	0.7	0.1	0.4
Flounder	0.0	4.3	1.3	22	2.3	0.0	0.3	0.0	0.0	0.4	0.9
Plaice	0.1	1.4	0.0	0.2	0.4	0.0	0.0	0.2	0.2	0.4	0.1
Turbot	0.1	0.2	0.1	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.0
Flatfish (uknown)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.6	1.0	0.0	0.0
European eel	0.3	0.0	0.4	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whiting	0.1	0.0	0.0	0.2	0.0	0.1	0.2	0.1	0.1	1.7	0.3
Unspecified	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (tons)	2,161	2,752	1,989	2,289	4,365	4,075	3,019	2,516	3,639	3,144	2,855

	Value (1000 euro)										
Burgstaaken	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	56	40	49	48	31	35	43	9.0	7.5	9.7	7.6
Cod	41	29	34	27	18	18	28	8.3	6.6	8.7	5.5
Herring	1.5	1.1	0.7	0.3	0.3	0.1	0.2	0.0	0.0	0.3	0.0
Dab	0.0	0.1	0.3	0.3	0.1	0.1	0.9	0.0	0.0	0.2	0.2
Flounder	0.0	0.4	0.5	0.8	0.6	2.3	0.8	0.0	0.0	0.1	1.2
Plaice	0.0	0.2	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Turbot	0.7	0.4	0.3	0.2	0.3	0.0	0.2	0.0	0.0	0.0	0.0
Brill	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.1
Flatfish (uknown)	3.7	4.4	0.8	0.3	0.2	0.0	0.2	0.3	0.0	0.0	0.0
European eel	7.4	4.0	12.0	19.0	10.5	13.2	12.4	0.4	0.7	0.2	0.5
Sea trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unspecified	0.2	0.5	0.2	0.0	0.1	1.0	0.0	0.0	0.0	0.0	0.1
37G1	2,086	2,670	2,218	2,014	2,189	1,586	1,425	1,611	1,850	1,811	1,303
Cod	1,827	2,359	1,975	1,746	1,402	889	827	1,132	1,239	1,334	817
Sprat	4.2	1.0	3.4	1.7	0	20	32	36	56	59	98
Herring	2.2	0.7	0.9	84	625	440	176	101	250	195	189
Dab	7	60	36	28	35	120	103	49	75	106	88
Flounder	7	61	74	66	31	30	38	4.8	0.0	30	31
Plaice	94	105	37	16	13	12	15	9.0	10.9	16.1	6.9
Turbot	57	28	17	21	18	13	12	8.6	10.0	14.0	13.4
Brill	0.1	0.7	0.2	0.2	0.9	1.2	2.1	1.8	2.1	4.9	4.6
Flatfish (uknown)	0.1	0.5	1.9	1.8	3.1	2.5	3.7	9.1	15.8	7.0	0.2
European eel	16	27	16	19	31	26	18	50	55	29	37
Salmon	0.0	0.0	0.0	0.0	0.3	0.5	0.6	0.1	0.0	0.0	0.0
Sea trout	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.5	0.0	0.9	0.0
Whiting	8.7	26.0	56	27	25	29	193	208	135	9.7	16.8
Lumpsucker	0.0	0.0	0.0	0.0	0.2	0.4	0.1	0.3	0.1	0.5	0.0
Unspecified	62	0.1	0.1	2.7	3.4	1.7	4.1	0.3	0.6	4.8	0.1
37G2	22.6	46.9	1.3	37.5	35.7	75.5	73.7	17.5	60	99.7	79.4
Cod	21.1	45.5	1.1	31.3	21.3	32.4	29.6	7.7	38.2	76.5	55.8
Herring	0.0	0.0	0.0	4.2	10.5	39.4	40.1	7.4	18.3	14.9	22.1
Dab	0.0	0.2	0.0	0.1	1.3	1.4	1.1	0.9	0.7	2.9	0.8
Flounder	0.0	0.3	0.0	1.3	0.9	0.9	0.9	0.0	0.0	2.7	0.3
Plaice	0.2	0.6	0.1	0.1	0.7	0.3	0.4	0.5	0.5	0.5	0.0
Turbot	0.5	0.3	0.1	0.4	0.9	0.9	0.8	0.5	0.7	1.2	0.2
Flatfish (uknown)	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	1.6	0.8	0.1
Whiting	0.0	0.0	0.0	0.0	0.1	0.1	0.5	0.1	0.0	0.1	0.2
Unspecified	0.7	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38G0	41	34	38	42	17	35	79	5.6	3.3	4.3	4.9
Cod	32.9	21.4	32.8	21.2	14.1	15.7	63.4	5.5	3.2	4.3	2.4
Herring	0.1	0.2	0.3	1.1	0.1	0.1	0.2	0.0	0.0	0.0	0.3
Dab	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Flounder	0.0	0.3	0.3	0.5	0.2	2.0	0.3	0.0	0.0	0.0	1.9
Plaice	0.1	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turbot	0.7	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0
Flatfish (uknown)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
European eel	6.7	11.1	3.5	18.4	2.8	17.0	14.5	0.0	0.0	0.0	0.1
Unspecified	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2
38G1	35	27	41	36	45	30	11	17	6	20	2.6
Cod	30	16	25	24	16	13	7	9	5	13	0.9
Herring	0.2	0.1	0.3	0.3	0.2	0.1	0.3	6.3	0	0	0.1
Dab	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.4	0.8	3.6	1.0
Flounder	0.0	0.1	0.6	1.6	0.3	0.2	0.2	0.0	0.0	1.4	0.2
Plaice	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.4	0.2
Turbot	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.5	0.1
Brill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Flatfish (uknown)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0
European eel	3.8	10.9	15.3	9.1	28.6	16.1	3.4	0.0	0.3	0.0	0.0
Whiting	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.7	0.0	0.0	0.0
Unspecified	1.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38G2	20	61	9	70	33	33	8.0	39	179	191	134
Cod	16	56	4	37	17	2	5	8	43	24	60
Sprat	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	22.9	0.0
Herring	0.0	0.0	0.0	18.9	14.1	30.5	1.9	29.7	133.7	141.4	73.3
Dab	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.4	0.7	0.0	0.2
Flounder	0.0	2.0	0.9	12.2	0.7	0.0	0.1	0.0	0.0	0.2	0.3
Plaice	0.2	1.8	0.0	0.3	0.5	0.0	0.0	0.3	0.3	0.4	0.1
Turbot	0.4	0.6	0.3	0.8	0.3	0.0	0.1	0.2	0.6	0.1	0.1
Flatfish (uknown)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.7	0.6	0.0	0.0
European eel	2.9	0.0	3.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whiting	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.1	1.9	0.3
Unspecified	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Value	2,261	2,879	2,355	2,247	2,351	1,794	1,640	1,699	2,107	2,135	1,531

Heiligenhafen

The number of vessels and amount of landings in the harbour of Heiligenhafen is comparable to that of Burgstaaken.

The development of the fishing fleet in Heiligenhafen is shown in Table 4.29. Since 1998, the total number of registered commercial vessels has decreased from 81 to 49 (in 2008). This is primarily attributed to a decrease in the number of smaller vessels (vessels <8 m, from 46 to 20) and vessels 8-11.9 m (from 18 to 13). In contrast, the number of large vessels (≥15 m) has remained at 14 since 2003.

Table 4.29: The number of registered commercial vessels and their length (<8 m, 8-11.9 m, 12-14.9 m and ≥15 m) in Heiligenhafen harbour from 1998-2008. Source: Bundesanstalt für Landwirtschaft und Ernährung – BLE.

Heiligenhafen harbour - number of commercial vessels

Vessel length (m)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<8	commercial	46	46	44	43	41	37	32	29	24	23	20
8-11.9	commercial	18	18	17	17	16	17	16	14	17	15	13
12-14.9	commercial	1	1	1	1	1	1	1	1	1	1	1
≥15	commercial	16	15	14	14	15	14	14	15	15	15	15
Total		81	80	76	75	73	69	63	59	57	54	49

The development of the landings in Heiligenhafen harbour from 1998-2008 is shown in Figure 4.78. The landings and their values are given in Table 4.30. Annual landings and their value in Heiligenhafen have fluctuated between a high of 2,364 tons in 1999 to approximately 1,400 tons the past couple of years (2007-2008). The value of the annual landings has varied between 1.5-3.4 million euro over the last decade (1998-2008) and has typically been dominated by cod which for example, has made up 78-82% of the total value over the past 2 years. Other important commercial species are flatfish (flounder, plaice, dab, turbot and brill) making up the vast majority of the rest of the landings and value (Table 4.30).

As much as 4.4-6 tons (32,000-44,000 euro) of European eel was landed in the years 1998-2003, but landings of this species have decreased considerably in recent years and have amounted to less than 1 ton (6-700 kg and 5-6,000 euro) in 2007-2008.

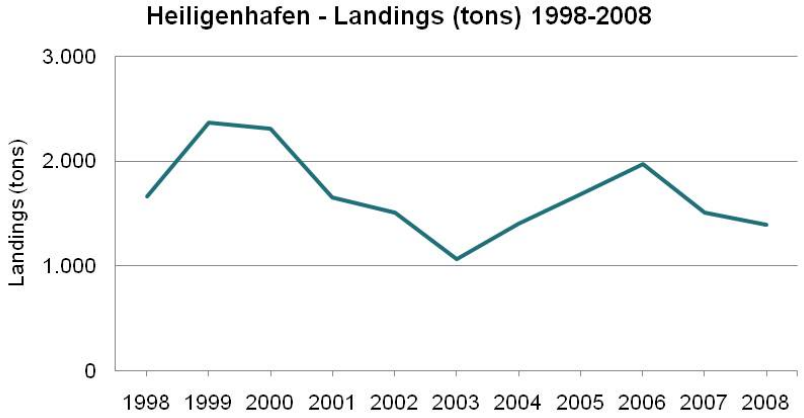


Figure 4.78: The development of the total landings (tons) at Heiligenhafen from 1998-2008. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

Over the last 5 years (2004-2008), approximately 14-20% (787-1,203 tons) of the total German landings by weight from the near field area of Fehmarnbelt (ICES 38G1 and 37G1) have been landed by vessels from Heiligenhafen (Figure 4.78). This amounts to approximately 19-29% (1.1 -1.4 million euro) of the value of the landings from this area. The primary commercial species landed by Heiligenhafen vessels was cod supplemented primarily by the flatfish species dab, flounder and plaice. There are very few landings of the pelagic species herring and sprat by vessels from Heiligenhafen (0,5-24,6 tons over the last 10 years) suggesting that the pelagic (industrial) fisheries are not very important to the fishermen from this harbour.

Table 4.30: Annual landings (tons) and value (1,000 euro) from the fisheries near Fehmarnbelt (ICES 38G1 and 37G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) by vessels that have their basis harbour in Heiligenhafen. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

	Landings (tons)										
Heiligenhafen	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	288	393	311	247	226	184	162	158	132	209	94
Cod	243	350	269	215	196	133	109	134	105	116	52
Sprat	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	14.0	0.0
Herring	3.9	3.4	4.0	1.1	2.3	1.0	0.4	0.1	0.5	10.6	1.0
Dab	3.2	16.1	12.2	14.6	10.6	36.6	39.6	14.9	18.5	47.8	16.3
Flounder	3.8	16.0	17.8	9.8	10.5	10.8	8.8	0.3	0.0	13.5	17.8
Plaice	9.4	3.9	2.9	0.5	0.8	1.0	1.0	0.8	0.4	1.9	1.6
Turbot	0.7	0.5	0.5	0.3	0.3	0.3	0.6	0.4	0.3	1.3	0.8
Brill	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.2	0.1	0.3	1.7
Sole	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
Flatfish (uknown)	2.7	2.3	1.3	3.2	1.2	0.8	1.2	2.9	6.0	0.4	0.0
European eel	0.1	0.0	0.2	0.4	0.4	0.4	0.1	0.2	0.1	0.0	0.1
Sea trout	0.4	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.04	0.0	0.02
Whiting	0.6	0.1	1.4	0.8	3.0	0.2	0.5	2.9	0.2	1.9	2.3
Garfish	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Lumpsucker	0.0	0.9	0.0	0.4	0.0	0.2	0.3	0.1	0.3	0.2	0.1
Unspecified	20.4	0.1	0.1	1.1	0.6	0.2	0.2	1.5	0.3	0.2	0.0
37G1	588	875	1,438	638	645	354	635	956	985	671	735
Cod	520	694	833	506	556	260	408	742	581	479	451
Sprat	1.2	9.1	0.0	0.0	0.0	0.0	0.0	0.0	11.6	0.0	25.2
Herring	2.0	23	394	2.2	1.4	0.3	0.6	0.4	130	25	6.4
Dab	3.3	29	15	13	13	57	141	104	99	79	91
Flounder	6.0	68	134	74	47	23	60	11	0.0	60	114
Plaice	17	29	19	4.8	4.9	2.9	7.8	9.6	8.5	10	12
Turbot	6.0	3.8	3.1	2.5	1.8	1.3	2.6	2.7	3.2	3.7	4.5
Brill	0.1	0.1	0.1	0.0	0.2	0.2	0.5	0.6	0.6	0.8	2.1
Sole	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
Flatfish (uknown)	0.4	1.6	6.9	2.2	1.7	2.4	0.9	34.2	45.3	5.6	0.0
European eel	0.3	0.3	0.7	0.3	0.5	0.5	0.3	0.2	0.2	0.0	0.1
Salmon	0.0	0.0	0.0	0.01	0.01	0.0	0.01	0.0	0.0	0.0	0.0
Sea trout	0.0	0.1	0.1	0.2	0.1	0.4	0.0	0.5	0.1	0.2	0.1
Whiting	2.9	16	33	33	18	5	14	50	50	6.5	28
Horse mackerel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.8	0.0	0.0
Unspecified	28.3	0.1	0.1	0.3	0.2	0.4	0.2	0.4	0.2	0.3	0.3
37G2	21	117	518	9.0	11.8	6.8	8.5	24	13	31	5.4
Cod	18	24	5.4	8.4	9.3	6.1	0.6	21	0.1	0.3	0.7
Herring	0.0	89	510	0.0	0.0	0.0	5.3	0.0	13	30	0.0
Dab	0.1	1.1	0.5	0.0	0.3	0.1	1.8	2.0	0.0	0.4	3.0
Flounder	0.6	1.7	1.1	0.6	1.2	0.6	0.6	0.0	0.0	0.4	1.4
Plaice	0.7	0.8	0.0	0.0	0.1	0.1	0.1	0.3	0.0	0.0	0.3
Turbot	0.2	0.2	0.2	0.0	0.2	0.0	0.1	0.2	0.0	0.0	0.1
Flatfish (uknown)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0
Unspecified	1.1	0.0	0.0	0.0	0.6	0.0	0.0	0.1	0.0	0.0	0.0
38G0	360	535	447	380	569	470	457	429	362	487	396
Cod	320	488	322	330	255	289	319	160	85	110	72
Sprat	0.0	0.0	0.0	0.0	5.4	0.0	0.0	30	46	95	52
Herring	12.5	0.2	70	0.1	270	123	2.8	18.1	133	186	172
Dab	1.8	22	16	24	16	42	76	30	9.6	15.3	9.3
Flounder	0.4	8.6	13	11	10	8.3	11.4	1.1	0.0	3.7	10.0
Plaice	5.4	8.2	4.7	4.0	1.2	2.6	4.3	2.0	0.6	2.0	3.5
Turbot	1.8	0.9	1.2	0.9	0.4	0.4	0.6	0.4	0.1	0.8	0.9
Brill	0.1	0.1	0.0	0.0	0.1	0.3	0.2	0.2	0.1	0.7	1.0
Sole	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.2
Anchovy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90	0.0	16.1	0.0
Flatfish (uknown)	1.5	4.1	6.0	4.4	0.3	1.8	7.2	4.1	3.4	0.4	0.0
European eel	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Salmon	0.01	0.0	0.0	0.01	0.0	0.02	0.02	0.0	0.0	0.0	0.0
Sea trout	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Whiting	2.8	1.9	12.7	5.1	8.9	2.8	34.4	92.1	61.8	54.4	74.8
Horse mackerel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.9	2.6	0.0
Unspecified	14.2	0.3	0.3	0.2	0.6	0.2	0.1	0.2	1.6	0.4	0.1
38G1	143.2	319.7	186.6	108.8	59.6	131.7	72.6	39.1	218.2	115.6	96.1
Cod	126.6	282.7	152.5	89.7	52.9	90.9	50.3	18.6	139.0	67.9	71.9
Sprat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2	0.0	0.0
Herring	0.5	0.1	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Dab	2.4	19.3	10.5	6.9	2.3	31.2	17.1	6.7	44.3	35.5	9.7
Flounder	3.0	7.5	7.8	7.2	3.1	7.3	2.6	0.4	0.0	7.5	11.4
Plaice	3.0	5.8	2.5	1.0	0.4	0.9	0.4	0.2	1.3	2.5	1.5
Turbot	1.3	1.3	0.5	0.3	0.3	0.4	0.3	0.2	0.6	0.2	0.5
Brill	0.0	0.1	0.1	0.0	0.2	0.2	0.1	0.1	0.1	0.2	0.6
Flatfish (uknown)	0.0	0.0	0.1	2.3	0.0	0.0	0.0	0.6	7.0	0.4	0.0
Sea trout	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Whiting	2.3	2.9	12.3	1.3	0.2	0.5	1.7	12.2	12.5	1.4	0.4
Unspecified	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
38G2	36	206	97	38	88	13	14	194	262	204	98
Cod	33	59	48	31	61	11	6	89	215	136	45
Herring	0.0	135	37	0.0	1.3	0.0	0.0	62	0.0	7.6	0.0
Dab	0.2	1.1	0.7	0.8	0.6	0.0	1.9	20	14.9	6.9	11.1
Flounder	0.6	7.4	8.8	4.5	22	2.0	2.6	0.0	7.8	41.6	34.9
Plaice	0.9	0.9	0.6	0.1	1.3	0.0	0.9	6.1	8.8	5.7	4.7
Turbot	0.3	0.1	0.8	0.1	1.3	0.1	0.1	1.1	0.9	1.5	1.5
Flatfish (uknown)	0.0	0.0	0.0	0.3	0.1	0.0	2.6	15.5	13.2	3.7	0.3
Whiting	0.0	0.9	1.0	0.5	0.1	0.0	0.1	0.4	0.9	0.6	0.0
Unspecified	1.5	2.8	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.1	0.0
Total (tons)	1,436	2,445	2,998	1,421	1,599	1,160	1,349	1,800	1,971	1,717	1,425

	Value (1000 euro)										
Heiligenhafen	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	374	499	451	393	346	0	224	234	195	287	153
Cod	328	466	413	357	318	0	175	209	171	215	99
Sprat	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0
Herring	1.4	1.4	1.9	1.8	3.5	0.0	0.7	0.1	0.9	5.4	0.7
Dab	2.9	13.4	11.7	14.3	9.9	0.0	29.8	11.8	14.8	42.8	16.0
Flounder	1.2	5.5	10.0	5.9	5.7	0.0	7.6	0.3	0.0	9.5	12.2
Plaice	16.2	5.5	4.1	0.8	1.4	0.0	1.7	1.4	0.7	2.3	2.2
Turbot	2.6	2.2	2.0	1.5	1.3	0.0	2.8	2.1	1.3	5.6	3.7
Brill	0.0	0.0	0.2	0.0	0.1	0.0	0.6	1.0	0.2	0.9	9.1
Sole	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	7.3
Flatfish (uknown)	4.0	3.8	2.5	5.4	0.0	0.0	2.1	2.0	4.3	0.2	0.0
European eel	0.6	0.2	1.1	3.1	0.0	0.0	0.9	0.6	1.1	0.2	0.8
Sea trout	0.1	0.1	0.3	0.2	0.5	0.0	0.8	1.5	0.2	0.0	0.1
Whiting	0.7	0.1	1.2	0.6	3.3	0.0	0.5	2.2	0.2	1.8	1.2
Garfish	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Lumpsucker	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.3	0.2	0.2
Unspecified	16.6	0.1	0.4	2.0	1.8	0.0	0.8	1.8	0.9	0.7	0.0
37G1	755	1,106	1,507	948	1,028	473	761	1,358	1,067	966	1,024
Cod	672	963	1,302	836	941	399	591	1,177	866	805	787
Sprat	0.9	2.2	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	3.3
Herring	1.5	3.2	46	3.0	2.5	0.5	0.5	0.4	25	4.7	1.6
Dab	2.7	25	12	13	13	39	100	85	83	72	87
Flounder	3.2	32	68	48	32	13	32	5.0	0.0	36	70
Plaice	25	46	25	6	6.8	4.4	12	14	12	15	15
Turbot	24	16	13	11	8.5	5.9	11	13	13	16	20
Brill	0.3	0.4	0.2	0.0	0.5	0.6	1.3	2.0	1.7	2.5	11.1
Sole	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	1.5	6.3
Flatfish (uknown)	0.5	2.0	4.8	2.5	2.5	0.8	0.5	13.6	21.2	3.5	0.0
European eel	0.6	1.1	4.3	1.1	2.6	3.6	1.1	1.1	1.0	0.3	0.4
Salmon	0.0	0.1	0.0	0.2	0.1	0.1	0.0	0.2	0.0	0.0	0.0
Sea trout	0.0	0.6	0.4	0.7	0.7	1.5	0.1	1.7	0.7	1.0	0.5
Whiting	2.8	15	30	26	18	3.4	12	45	35	7.7	20
Horse mackerel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.0	0.0
Unspecified	22	0.3	0.5	0.2	0.2	1.6	0.2	0.5	0.5	0.7	0.5
37G2	28	42	61	12	16	13	3.2	38.2	1.7	7.5	5.2
Cod	24	33	10	12	13	12	0.9	33.7	0.0	0.5	1.0
Herring	0.0	6	49	0.0	0.0	0.0	0.6	0.0	1.6	6.3	0.0
Dab	0.1	1.0	0.6	0.0	0.3	0.1	1.0	2.0	0.0	0.4	2.7
Flounder	0.3	0.8	0.9	0.4	0.5	0.2	0.3	0.0	0.0	0.3	0.6
Plaice	1.0	1.1	0.0	0.0	0.2	0.1	0.1	0.6	0.0	0.0	0.3
Turbot	1.1	1.0	0.6	0.0	0.8	0.1	0.2	0.7	0.0	0.0	0.5
Flatfish (uknown)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Unspecified	0.9	0.0	0.1	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0
38G0	448	701	569	587	488	462	576	358	223	318	242
Cod	415	655	503	538	417	392	464	253	140	197	143
Sprat	0.0	0.0	0.0	0.0	0.6	0.0	0.0	3.4	5.2	13.1	6.3
Herring	1.6	0.1	11.4	0.0	37	17	0.4	2.1	15	32	23
Dab	1.5	19	15	23	14	33	59	22	7.2	13.5	8.1
Flounder	0.2	4.7	11.2	7.9	5.2	8.6	5.8	0.5	0.0	2.1	6.1
Plaice	7	13	7	6.0	1.8	5.9	7.8	2.6	1.0	2.9	5.0
Turbot	7.4	4.2	4.9	3.9	1.9	1.7	3.3	1.9	0.4	3.5	4.0
Brill	0.3	0.2	0.1	0.1	0.2	0.8	0.6	0.8	0.5	2.4	5.0
Sole	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.2	0.1	2.1	2.5
Anchovy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	0.0	2.1	0.0
Flatfish (uknown)	0.6	2.3	3.9	2.5	0.1	0.8	10.7	1.8	1.6	0.3	0.0
European eel	0.0	0.0	0.5	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Salmon	0.1	0.0	0.0	0.1	0.0	0.1	0.7	0.1	0.0	0.0	0.0
Sea trout	0.0	0.2	0.4	0.7	0.2	0.2	0.5	0.2	0.0	0.1	0.1
Whiting	2.8	1.6	11.3	4.1	7.7	1.8	22.8	61.6	50.3	46.5	38.1
Horse mackerel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.3	0.0
Unspecified	11.6	0.4	0.3	0.3	0.9	0.2	0.3	0.2	0.3	0.7	0.1
38G1	189.4	0.0	0.0	0.0	98.9	172.4	95.5	48.3	248.2	159.9	155.7
Cod	169.8	0.0	0.0	0.0	91.3	138.4	78.2	30.9	192.9	119.6	133.9
Sprat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0
Herring	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dab	2.1	0.0	0.0	0.0	2.2	24.4	11.9	5.3	32.9	29.5	9.7
Flounder	1.6	0.0	0.0	0.0	1.7	4.0	1.4	0.1	0.0	4.1	4.6
Plaice	4.7	0.0	0.0	0.0	0.7	1.5	0.6	0.4	1.9	3.6	2.0
Turbot	5.2	0.0	0.0	0.0	1.4	2.3	1.3	0.9	2.8	0.9	2.0
Brill	0.1	0.0	0.0	0.0	0.6	0.7	0.3	0.4	0.5	0.5	2.8
Flatfish (uknown)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.7	0.2	0.0
Sea trout	0.0	0.0	0.0	0.0	0.6	0.4	0.6	0.3	0.1	0.0	0.0
Whiting	2.3	0.0	0.0	0.0	0.2	0.6	1.1	9.7	11.5	1.4	0.2
Unspecified	3.3	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.3	0.1	0.3
38G2	47	99	99	65	0.0	15.9	16.3	187	451	365	117
Cod	43	82	82	59	0.0	14.7	10.1	129	397	310	81
Herring	0.0	10.1	4.7	0.0	0.0	0.0	0.0	11.1	0.0	1.7	0.0
Dab	0.2	0.9	0.9	0.9	0.0	0.0	1.6	20.9	18.1	7.3	9.1
Flounder	0.3	3.4	6.3	3.1	0.0	0.8	1.6	0.0	5.2	25.9	12.1
Plaice	1.4	1.1	0.8	0.2	0.0	0.0	1.3	10.5	15.6	8.8	6.2
Turbot	1.1	0.6	3.3	0.4	0.0	0.2	0.2	4.3	4.0	6.6	6.6
Flatfish (uknown)	0.0	0.0	0.0	0.1	0.0	0.0	1.5	10.4	9.0	3.4	1.3
Whiting	0.0	0.5	1.0	0.5	0.0	0.0	0.1	0.4	1.4	1.2	0.0
Unspecified	1.0	0.3	0.0	0.0	0.0	0.1	0.0	0.4	0.2	0.3	0.0
Value	1,842	2,447	2,687	2,005	1,977	1,136	1,675	2,225	2,187	2,104	1,696

Großenbrode

Großenbrode is a little harbour located just on the mainland from Fehmarn Island. All of the 11-15 registered fishing vessels in Großenbrode since 1998 have been small (<12 m), with the majority less than 8 m in length (Table 4.31).

Table 4.31: The number of registered commercial vessels and their length (<8 m, 8-11.9 m, 12-14.9 m and ≥15 m) in Großenbrode harbour from 1998-2008. Source: Bundesanstalt für Landwirtschaft und Ernährung – BLE.

Großenbrode harbour - number of commercial vessels

Vessel length (m)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<8	commercial	11	11	11	11	11	11	9	9	9	8	8
8-11.9	commercial	2	2	3	4	4	4	4	4	4	3	3
12-14.9	commercial											
≥15	commercial											
Total		13	13	14	15	15	15	13	13	13	11	11

The total landings since 1998 have fluctuated between 44-107 tons (value of 121,000-211,000 euro) and have been relatively stable since 2000. Landings have consistently been dominated by cod (>90 % of landings and value) since 1998. Landings of different flatfish species (primarily flounder and dab) and European eel have primarily made up the remainder of the commercial species landed in this harbour (Table 4.32).

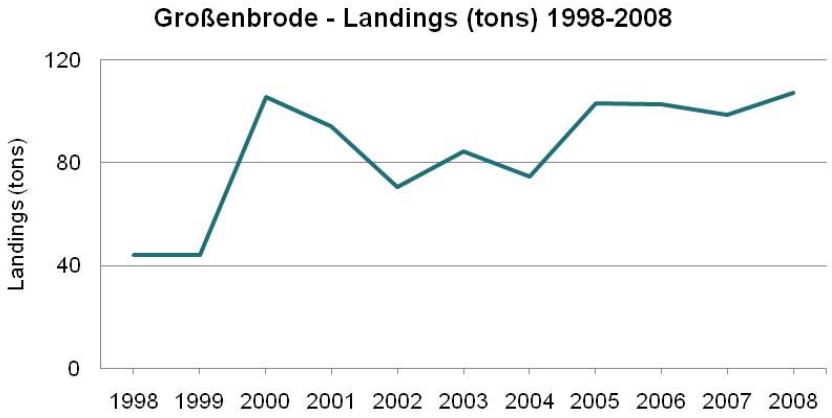


Figure 4.79: The development of the total landings (tons) at Großenbrode from 1998-2008. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

Vessels from Grossenbrode have landed between (92-114 tons) over the last 5 years from fishing near Fehmarnbelt (ICES 38G1 and 37G1). The majority of these landings come from fishing in ICES 37G1 which is the southern part of the Fehmarnbelt area. These landings amounted to a value of approximately 159,000-176,000 euro. Once again cod made up the majority of the landings and value by these vessels with a wide variety of other commercial species being landed in small amounts (Table 4.32).

Table 4.32: Annual landings (tons) and value (1,000 euro) from near Fehmarnbelt (ICES 38G1 and 37G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) by vessels that have their basis harbour in Großenbrode. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

	Landings (tons)										
Grossenbrode	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	20	23	4.0	3.4	3.9	5.9	2.7	5.5	5.7	1.9	1.5
Cod	17	20	4.0	3.1	3.7	5.7	2.6	4.8	4.4	1.7	1.2
Herring	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0
Dab	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0
Flounder	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2
Turbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03	0.2	0.0	0.0
Brill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.0	0.0	0.0
Flatfish (uknown)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.5	1.0	0.0	0.0
European eel	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Sea trout	0.0	0.0	0.01	0.01	0.01	0.0	0.03	0.03	0.02	0.1	0.0
Unspecified	3.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37G1	67	67	129	118	88	99	91	111	108	103	97
Cod	63	63	114	109	81	93	84	102	99	93	88
Herring	0.9	0.6	0.4	0.5	0.7	0.2	0.5	0.3	0.3	0.3	0.7
Dab	0.1	0.3	1.9	0.5	0.8	0.7	1.6	2.5	4.5	3.7	3.3
Flounder	0.6	1.1	7.2	4.6	3.3	2.0	1.7	0.2	0.0	2.5	2.1
Plaice	0.0	0.4	0.5	0.2	0.1	0.1	0.1	0.5	0.3	0.6	0.8
Turbot	0.3	0.2	2.0	0.4	0.4	0.3	0.6	0.7	0.7	0.9	0.5
Brill	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.1	0.1
Flatfish (uknown)	0.6	0.9	2.2	0.8	0.7	0.7	0.7	3.7	2.8	0.6	1.1
European eel	0.4	0.6	0.3	1.3	0.8	0.5	0.2	0.4	0.2	0.2	0.2
Sea trout	0.0	0.0	0.2	0.1	0.2	0.2	0.4	0.2	0.2	0.2	0.2
Whiting	0.0	0.1	0.2	0.2	0.0	0.0	0.2	0.1	0.0	0.0	0.0
Lumpsucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.0	0.3
Unspecified	0.9	0.0	0.1	0.0	0.1	0.0	0.4	0.1	0.1	0.1	0.1
38G0	4.7	6.9	2.8	3.2	1.3	5.1	1.7	3.7	3.0	0.9	1.6
Cod	4.7	6.8	2.8	3.2	1.3	4.8	1.6	3.5	2.9	0.9	1.3
Dab	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Flounder	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2
Sea trout	0.0	0.0	0.0	0.0	0.0	0.03	0.03	0.0	0.0	0.01	0.0
Unspecified	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
38G1	4.1	7.7	2.7	1.4	0.8	1.8	1.4	2.7	2.6	0.6	1.8
Cod	4.1	7.7	2.7	1.4	0.8	1.8	1.3	2.6	2.6	0.6	1.7
Dab	0.0	0.04	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Sea trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.04
Total (tons)	96	105	139	126	94	112	96	122	120	106	102

	Value (1000 euro)										
Grossenbrode	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	20.3	29.4	6.7	5.9	7.7	9.6	4.9	10.8	12.8	3.5	3.4
Cod	17.0	24.3	6.6	5.4	7.3	9.1	4.7	8.9	8.4	2.9	2.4
Herring	0.0	0.0	0.0	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.1
Dab	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.0
Flounder	0.3	0.01	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.4
Turbot	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.3	0.0	0.0
Brill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Flatfish (uknown)	0.0	0.01	0.0	0.0	0.0	0.0	0.0	1.5	2.8	0.0	0.0
European eel	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Sea trout	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.2	0.1	0.3	0.1
Unspecified	3.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37G1	88	86	205	210	160	155	156	170	157	165	173
Cod	84	82	182	188	144	143	140	162	152	158	164
Herring	0.6	0.4	0.3	0.5	0.4	0.2	0.7	0.3	0.4	0.4	0.5
Dab	0.1	0.5	1.9	0.4	1.0	0.7	2.2	1.4	0.7	1.5	1.5
Flounder	0.6	0.6	7.6	9.3	8.0	4.0	3.3	0.1	0.0	1.4	1.7
Plaice	0.0	0.4	0.9	0.8	0.3	0.4	0.3	0.1	0.0	0.2	0.6
Turbot	0.9	0.4	7.8	1.7	1.4	1.5	4.5	0.8	1.0	1.6	0.5
Brill	0.0	0.0	0.0	0.0	0.2	1.7	0.0	0.2	0.1	0.2	0.5
Flatfish (uknown)	0.9	1.0	3.6	1.3	1.2	1.0	1.1	3.4	1.6	0.1	1.7
European eel	0.8	0.8	0.2	7.0	2.1	1.2	0.6	0.6	0.6	0.5	0.4
Sea trout	0.0	0.0	1.0	0.5	0.8	1.0	1.8	1.0	0.9	0.8	1.0
Whiting	0.0	0.0	0.2	0.1	0.1	0.0	0.2	0.1	0.0	0.0	0.0
Lumpsucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.04	0.0	0.3
Unspecified	0.9	0.1	0.3	0.1	0.7	0.2	1.1	0.3	0.2	0.3	0.2
38G0	6.2	9.4	4.9	5.2	2.2	8.5	3.1	6.1	5.5	1.6	2.6
Cod	6.1	9.4	4.9	5.2	2.2	7.9	2.9	5.9	5.4	1.5	2.2
Dab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Flounder	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.4
Sea trout	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0
Unspecified	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
38G1	5.1	10.9	4.2	2.4	1.5	2.5	2.7	4.4	4.4	0.9	3.7
Cod	5.1	10.9	4.2	2.4	1.5	2.4	2.6	4.3	4.4	0.9	3.5
Dab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.04	0.0	0.0	0.0
Sea trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Value	120	136	221	223	171	176	167	192	180	171	182

Puttgarden

Puttgarden has very little function as a fishing harbour with only 1-2 registered fishing vessels less than 8 m over the last 9 years. Similarly, the development of the landings in this harbour (Figure 4.80) shows that the total landings have been around 100 kg with a value of approximately 1,000 euro over the past 6 years (Table 4.34).

Table 4.33: The number of different size commercial vessels, (<8 m, 8-11,9 m, 12-14,9 m and ≥15 m) in Puttgarden harbour from 1998-2008. Source: Bundesanstalt für Landwirtschaft und Ernährung – BLE.

Puttgarden harbour - number of commercial vessels

Vessel length (m)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<8	commercial			1	2	2	2	2	2	2	2	1
8-11.9	commercial											
12-14.9	commercial											
≥15	commercial											
Total		0	0	1	2	2	2	2	2	2	2	1

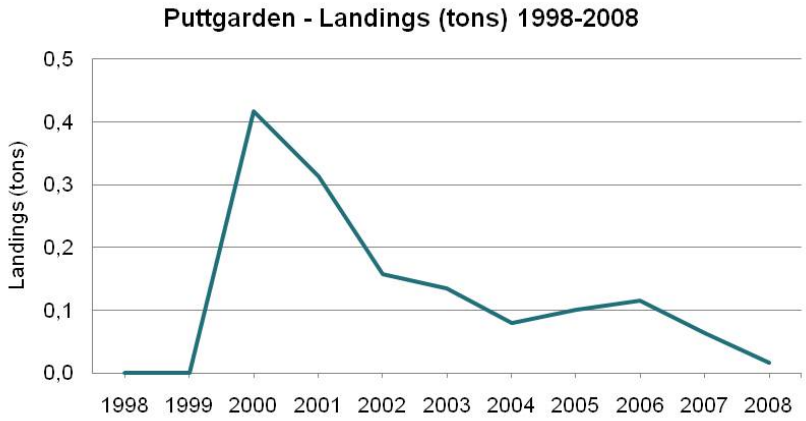


Figure 4.80: The development of the total landings (tons) at Puttgarden from 1998-2008. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

Table 4.34: Annual landings (tons) and value (1,000 euro) from near Fehmarnbelt (ICES 38G1 and 37G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) by vessels that have their basis harbour in Puttgarden. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

								Landings (tons)			
Puttgarden	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	0.0	0.0	0.1	0.7	0.6	0.4	0.1	0.2	0.0	0.3	0.4
Cod	0.0	0.0	0.0	0.6	0.4	0.4	0.0	0.1	0.0	0.2	0.0
Herring	0.0	0.0	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flounder	0.0	0.0	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
European eel	0.0	0.0	0.03	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.4
37G1	1.1	1.1	1.3	1.2	1.0	0.7	1.2	1.1	1.4	0.5	0.5
Cod	0.4	0.4	0.5	0.5	0.6	0.4	0.8	0.6	0.4	0.3	0.3
Herring	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.4	0.0	0.0
Flounder	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Flatfish (uknown)	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0
European eel	0.4	0.4	0.5	0.5	0.4	0.2	0.4	0.4	0.5	0.2	0.1
38G0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Cod	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
European eel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.04	0.0
38G1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.09
Cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.09
European eel	0.0	0.0	0.0	0.0	0.0	0.02	0.0	0.0	0.0	0.0	0.0
Total (tons)	1.1	1.1	1.5	1.9	1.6	1.2	1.3	1.2	1.4	0.9	1.0

								Value (1000 euro)			
Puttgarden	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	0.0	0.0	0.4	0.7	1.2	0.6	0.1	0.3	0.2	0.9	3.0
Cod	0.0	0.0	0.0	0.3	0.4	0.5	0.0	0.1	0.0	0.4	0.0
Herring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flounder	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
European eel	0.0	0.0	0.2	0.3	0.8	0.1	0.1	0.2	0.2	0.5	2.9
37G1	1.2	1.7	2.7	3.0	2.4	1.7	3.5	2.9	3.8	1.2	1.2
Cod	0.1	0.3	0.4	0.3	0.4	0.4	0.8	0.8	0.3	0.6	0.5
Herring	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Flounder	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Flatfish (uknown)	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.0	0.0
European eel	1.0	1.1	1.9	2.4	1.9	1.2	2.6	2.0	3.3	0.5	0.6
38G0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Cod	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
European eel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
38G1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2
Cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
European eel	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Value (1000 euro)	1.2	1.7	3.1	3.6	3.6	2.4	3.6	3.2	4.0	2.7	4.4

The 1-2 commercial vessels from Puttgarden appear to do the majority of their fisheries in ICES 37G1 and 37G0 to the south and east of Fehmarnbelt. However, because the length of the vessels in this harbour have historically been less than 8 m, and vessels of this length are only required to note the location of their catches in the ICES subdivision not the smaller ICES rectangle, therefore total landings and the location of the fisheries from Puttgarden is uncertain.

Orth

The number of registered fishing vessels in the harbour of Orth has decreased from 10-12 vessels in 1998-2002 to approx. 5-7 vessels since 2002 (Table 4.35). All fishing vessels were less than 12 m, and most recently (2008) only 5 vessels, all less than <8 m, were registered in this harbour.

Table 4.35: The number of registered commercial vessels and their length (<8 m, 8-11,9 m, 12-14,9 m and ≥15 m) in Orth harbour from 1998-2008. Source: Bundesanstalt für Landwirtschaft und Ernährung – BLE.

Orth harbour - number of commercial vessels

Vessel length (m)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<8	commercial	9	9	10	8	8	6	6	6	5	5	5
8-11.9	commercial	2	2	2	2	2	1	1	1	1	1	
12-14.9	commercial											
≥15	commercial											
Total		11	11	12	10	10	7	7	7	6	6	5

The development of the landings in this harbour from 1998-2008 is shown in Figure 4.81. The landings and value peaked at 2.5 tons cod and flatfish and 4,200 euro in 2000, primarily due to landings of 800 kg of cod and 1.5 tons of flatfish. Landings in this harbour have been between 2-300 kg (and approximately 2000 euro) in the most recent years (2006-2008) and have been made up of European eel.

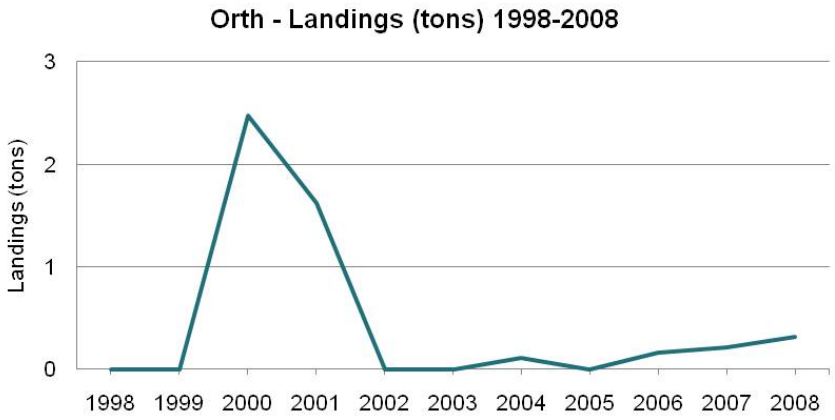


Figure 4.81: The development of the total landings (tons) at Orth from 1998-2008. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

From 2003-2007 only one vessel from Orth was required to register which ICES rectangle their landings come from, as the majority of the vessels were less than 8 m in length. Thus, data showing catches of mostly European eel (Table 4.36) in ICES 37G1 from vessels with their basis harbour in Orth, may not represent a complete picture of landings from the vessels in this harbour.

Table 4.36: Annual landings (tons) and value (1,000 euro) from the near field of Fehmarnbelt (ICES 38G1 and 37G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) by vessels that have their basis harbour in Orth. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

									Landings (tons)			
Orth	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	0.03	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1
Cod	0.03	0.0	0.05	0.0	0.04	0.0	0.0	0.0	0.0	0.0	0.0
Herring	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
European eel	0.0	0.0	0.04	0.0	0.03	0.0	0.01	0.0	0.0	0.04	0.1
37G1	0.1	0.4	0.3	0.7	0.6	0.4	0.2	0.1	0.2	0.3	0.2
Cod	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Plaice	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Flatfish (uknown)	0.02	0.03	0.0	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0
European eel	0.0	0.3	0.3	0.5	0.5	0.3	0.1	0.1	0.2	0.2	0.2
Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.01
38G0	0.0	0.0	0.0	0.0	0.0	0.03	0.0	0.0	0.0	0.0	0.0
Cod	0.0	0.0	0.0	0.0	0.0	0.03	0.0	0.0	0.0	0.0	0.0
Total (tons)	0.2	0.4	0.4	0.8	0.6	0.5	0.2	0.1	0.2	0.4	0.3

									Value (1000 euro)		
Orth	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
37G0	0.1	0.0	0.3	0.3	0.3	0.0	0.1	0.0	0.0	0.3	1.3
Cod	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Herring	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.01	0.0
European eel	0.0	0.0	0.2	0.0	0.2	0.0	0.1	0.0	0.0	0.3	1.3
37G1	0.4	1.2	1.6	4.8	5.1	3.6	1.5	0.3	1.5	2.3	1.6
Cod	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Plaice	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0
Flatfish (uknown)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
European eel	0.3	1.0	1.5	4.7	5.0	3.4	1.4	0.2	1.5	2.2	1.6
Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.01
38G0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Cod	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Value (1000 euro)	0.5	1.2	1.8	5.1	5.3	3.6	1.6	0.3	1.5	2.6	3.0

German regional harbour landing statistics

The landings and value of the landings from the German fisheries in the 6 ICES rectangles (ICES 37G0, 38G0, 37G1, 38G1, 37G2 and 38G2) according to the basis harbours of the vessels from harbours not in the near field of Fehmarnbelt (regional harbours) is given in Table 4.37. Other important German harbours with vessels that undertake some of their fisheries (annual average between 71-225 tons since 1998) in the near field of Fehmarnbelt are Rerik, Wismar, Timmendorf, Niendorf, Travemünde, Gothmund and Luebeck-Schlutup in the southern part of ICES 37G1, as well as Kappeln, Maasholm and Arnis (annual average of 70-225 tons since 1998) in the west near ICES 38G0 (see Figure 4.15). Characteristic for their German fisheries near Fehmarnbelt is that it they are primarily undertaken in ICES 37G1, to the south-east of Fehmarnbelt. Vessels from the western harbours of Kappeln, Maasholm and Arnis are those that fish most often in the area around Fehmarnbelt (ICES 38G1), however annual landings vary considerably (annual average from 0.4-219 tons over the last 3 years) (Table 4.37).

Table 4.37: Annual landings (tons) and value (1000 euro) from the fisheries near Fehmarnbelt (ICES 38G1 and 37G1) and in the regional areas (ICES 38G0, 37G0, 38G2 and 37G2) by vessels that have their basis harbour in the respective harbours. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

Basis harbour landings (tons) and value (1000 euro)													Landings (kg)											Value of landings (euro)
Harbours	**ICES**	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	**ICES**	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
	37G1	48.0	66.2	47.1	27.7	23.9	6.2	0.5	1.9	0.0	0.0	0.0	37G1	56.7	108.9	90.6	70.0	55.3	20.4	1.3	2.0	0.0	0.0	0.0
WARNE-	38G1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MUENDE	38G0	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G0	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	37G2	111.3	107.1	128.4	240.6	129.9	122.7	116.3	98.1	113.0	122.8	127.0	37G2	193.7	196.0	244.4	277.4	250.4	285.6	273.8	161.7	160.7	186.8	206.4
	38G2	0.0	0.0	1.1	2.2	1.3	0.0	0.0	0.0	0.0	1.2	2.0	38G2	0.0	0.0	1.1	2.8	1.7	0.0	0.0	0.0	0.0	1.9	4.5
Totals	(tons)	159.4	173.5	176.7	270.7	155.1	128.9	116.8	100.0	113.0	124.0	129.0	(1000 euro)	250.7	305.2	336.4	350.6	307.4	306.0	275.1	163.8	160.7	188.8	210.9
	37G1	56.5	74.3	101.7	117.7	72.0	102.6	62.7	97.0	99.7	100.3	85.1	37G1	114.7	144.4	171.7	231.7	130.6	179.5	131.1	151.5	153.2	171.3	135.0
RERIK	37G0	3.4	0.0	4.0	3.8	3.9	2.3	1.7	0.0	0.0	0.0	0.0	37G0	3.8	0.0	5.0	4.8	5.7	3.3	2.6	0.0	0.0	0.0	0.0
	37G2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	37G2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0
Totals	(tons)	59.9	74.3	105.7	121.5	75.9	105.0	64.4	97.0	99.7	100.3	85.1	(1000 euro)	118.5	144.4	176.8	236.5	136.4	183.1	133.7	151.6	153.2	171.3	135.0
	37G1	223.8	270.4	196.7	154.3	99.0	127.1	90.2	111.9	93.7	126.7	83.6	37G1	246.8	301.7	242.1	239.6	165.3	198.4	117.8	161.2	139.3	170.9	121.8
WISMAR	37G0	0.0	0.0	1.0	0.9	1.0	1.3	1.0	1.3	0.5	0.0	0.0	37G0	0.0	0.0	2.0	1.8	2.3	3.2	2.4	3.2	1.1	0.0	0.0
	37G2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.1	0.0	37G2	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.5	0.0	0.3	0.0
	38G2	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G2	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	(tons)	223.8	270.8	197.7	155.3	100.1	128.4	91.3	113.5	94.2	126.8	83.6	(1000 euro)	246.8	302.4	244.1	241.4	167.6	201.5	120.9	164.8	140.4	171.2	121.8
	37G1	130.3	189.3	175.0	199.2	112.9	178.1	112.5	125.3	103.1	81.7	78.9	37G1	152.9	245.3	239.4	303.5	165.8	234.9	148.0	186.9	144.1	119.2	116.4
	37G0	1.8	2.9	8.2	8.7	7.6	8.3	9.1	11.1	11.1	8.3	9.3	37G0	2.4	2.7	20.4	26.6	22.3	23.1	27.0	12.0	10.0	8.7	11.0
TIMMENDORF	38G0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	38G0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4
	37G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	7.4	37G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	14.4
	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0
Totals	(tons)	132.2	192.2	183.2	208.0	120.5	186.4	121.6	136.4	114.2	94.9	95.9	(1000 euro)	155.3	248.0	259.8	330.3	188.1	258.1	175.0	198.9	154.1	136.6	142.2
	37G1	287.7	425.1	365.4	313.0	293.1	294.9	269.5	317.8	411.8	361.2	252.7	37G1	228.7	346.8	357.6	321.7	304.7	246.0	213.5	267.5	371.6	390.9	200.7
	38G1	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G1	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NIENDORF	37G0	14.3	19.5	44.6	50.0	46.7	47.8	50.1	23.0	19.0	22.7	17.2	37G0	15.8	20.0	93.9	105.2	106.9	105.0	117.7	46.8	22.6	33.2	23.7
	38G0	0.0	0.0	0.3	0.1	0.6	1.6	0.1	0.0	0.0	0.0	1.6	38G0	0.0	0.0	0.7	0.1	1.7	2.4	0.1	0.1	0.0	0.0	3.7
	37G2	0.2	6.3	1.7	1.9	4.0	2.4	0.0	1.5	6.7	0.0	0.0	37G2	0.1	6.3	1.7	2.3	3.8	1.7	0.0	1.1	8.8	0.0	0.0
	38G2	0.8	0.0	0.8	2.6	4.2	0.0	0.0	3.7	0.0	0.0	0.0	38G2	6.2	0.3	0.7	2.6	4.9	0.0	0.0	0.7	0.0	0.0	0.1
Totals	(tons)	302.9	451.1	415.6	367.7	348.6	346.8	319.7	346.0	437.5	383.9	271.6	(1000 euro)	250.8	373.4	458.0	431.9	421.9	355.0	331.3	316.3	403.0	424.1	228.1
	37G1	75.0	72.3	73.5	120.5	119.8	117.6	90.3	147.0	167.6	126.8	144.7	37G1	69.2	54.8	99.3	135.4	149.0	127.8	113.3	148.3	177.1	149.5	171.3
	38G1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	38G1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
TRAVE-	37G0	27.4	52.6	61.5	42.2	37.7	23.1	27.7	13.4	15.7	16.0	12.3	37G0	38.6	71.1	103.7	85.9	78.4	51.9	45.8	28.4	28.8	32.2	26.4
MUENDE	38G0	0.6	0.0	0.1	0.1	0.2	0.5	0.2	0.0	0.3	0.0	0.5	38G0	0.6	0.0	0.2	0.1	0.5	1.7	0.1	0.0	0.6	0.0	1.5
	37G2	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37G2	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	38G2	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G2	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	(tons)	102.9	124.9	136.1	162.8	157.8	141.2	118.8	160.4	183.7	142.8	157.5	(1000 euro)	108.4	125.9	204.6	221.4	227.9	181.3	159.6	176.7	206.6	181.7	199.3
	37G1	223.9	331.6	244.8	187.4	167.1	173.3	190.1	188.5	247.0	205.8	169.1	37G1	183.6	307.0	237.9	230.1	185.3	168.4	162.9	188.9	192.8	228.7	151.7
GOTHMUND	38G1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	38G1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
	37G0	0.0	0.4	0.7	1.3	0.7	1.6	4.0	13.9	0.0	0.0	0.0	37G0	0.0	1.4	3.2	4.0	2.8	4.4	3.2	10.4	0.4	0.0	0.0
	38G0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	(tons)	223.9	332.1	245.5	188.8	167.8	175.0	194.0	202.4	247.0	205.8	169.9	(1000 euro)	183.6	308.6	241.1	234.2	188.0	172.8	166.1	199.3	193.2	228.7	152.6
	37G1	139.5	183.5	152.0	93.0	77.2	45.9	28.3	53.3	45.4	42.4	48.2	37G1	108.9	176.8	171.2	120.8	97.3	67.3	44.8	71.8	66.4	52.2	62.4
LUEBECK-	37G0	0.0	0.0	16.5	20.7	11.5	14.1	12.0	7.1	1.5	0.4	0.0	37G0	0.0	0.0	15.2	16.2	4.0	13.2	22.1	13.6	4.4	0.4	0.0
SCHLUTUP	38G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	38G0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0
	37G2	0.0	2.0	2.3	3.8	0.0	0.0	4.3	6.5	0.0	0.0	0.0	37G2	0.0	2.8	3.7	4.9	0.0	0.0	7.0	10.3	0.0	0.0	0.0
	38G2	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G2	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	(tons)	139.5	185.6	170.9	120.7	88.7	60.0	44.5	66.9	46.9	43.0	48.2	(1000 euro)	108.9	179.5	190.1	145.9	101.3	80.6	73.8	95.7	70.7	52.7	62.4
	37G1	2.3	0.0	0.1	1.2	0.2	0.2	0.0	0.0	0.1	11.8	61.5	37G1	2.9	0.1	0.1	2.7	0.3	0.2	0.0	0.0	0.0	16.6	24.4
	38G1	0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.0	210.2	0.0	0.0	38G1	0.4	0.0	0.0	0.6	0.0	0.0	0.0	0.0	56.9	0.0	0.0
ECKERN-	37G0	79.6	90.9	59.6	73.8	78.7	72.2	60.0	19.3	19.6	23.3	15.6	37G0	107.8	122.8	92.4	126.9	144.2	107.3	103.5	32.7	36.1	35.8	28.5
FOERDE	38G0	365.7	455.8	421.8	320.5	256.9	239.5	278.2	493.7	425.6	335.5	321.0	38G0	454.5	575.4	600.0	497.5	395.9	289.4	345.9	535.5	513.8	399.9	230.0
	37G2	0.0	0.0	0.0	1.5	0.7	0.0	0.0	0.3	0.0	0.0	0.0	37G2	0.0	0.0	0.0	3.6	2.0	0.0	0.0	0.3	0.0	0.0	0.0
	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0
Totals	(tons)	447.9	546.7	481.5	397.4	336.5	311.8	338.2	517.0	655.4	370.6	398.2	(1000 euro)	565.6	698.3	692.6	631.4	542.4	396.8	449.4	573.2	606.8	452.2	282.9
	37G1	37.6	136.3	75.5	68.8	66.7	66.7	69.7	77.8	194.0	365.6	429.6	37G1	36.8	124.2	78.1	86.9	80.9	67.4	59.9	40.8	63.4	130.2	186.9
	38G1	0.3	0.0	0.0	0.0	0.0	7.8	0.0	29.6	184.8	20.1	8.3	38G1	0.2	0.0	0.0	0.0	0.0	1.1	0.0	10.5	55.4	13.5	7.4
ARNIS	37G0	0.0	0.0	0.0	0.0	0.1	0.3	6.1	24.2	7.3	0.0	0.1	37G0	0.0	0.0	0.0	0.0	0.2	0.1	0.8	44.2	11.8	0.0	0.3
	38G0	426.0	448.4	393.9	297.5	262.4	685.7	743.4	1,041.5	700.2	401.9	236.5	38G0	395.3	559.1	489.9	465.8	262.4	311.9	288.5	325.6	372.5	368.1	189.8
	37G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.1	0.0	0.0	37G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.2	0.0	0.0
	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.6	0.0	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.8	0.0
Totals	(tons)	463.9	584.8	469.3	366.3	329.2	760.5	819.2	1,181.7	1,086.3	788.2	674.5	(1000 euro)	432.4	683.3	568.1	552.8	343.5	380.6	349.3	432.1	503.3	512.6	384.4
	37G1	111.7	138.4	122.9	131.2	200.5	157.2	58.5	100.0	220.8	130.0	170.0	37G1	134.9	161.1	160.0	180.3	184.0	114.0	68.3	130.3	189.8	234.2	214.5
	38G1	55.0	59.2	27.0	3.5	5.4	16.9	10.6	65.5	40.0	0.6	4.5	38G1	75.1	82.6	42.9	5.3	8.3	20.5	9.9	22.3	33.3	0.8	7.6
MAASHOLM	37G0	11.6	25.7	36.1	39.8	28.8	22.9	36.7	17.3	18.1	0.3	4.4	37G0	16.9	37.4	59.9	65.4	50.7	34.1	46.8	27.5	29.6	0.4	6.4
	38G0	426.3	547.4	418.5	443.4	593.2	428.8	310.7	1,006.7	677.0	571.1	437.1	38G0	373.2	645.8	478.5	592.1	466.0	377.2	379.4	545.7	478.4	438.1	277.0
	37G2	9.9	12.7	2.8	38.9	86.4	115.9	260.3	48.3	31.6	37.8	30.1	37G2	10.6	12.5	3.7	54.9	21.4	53.3	69.3	14.1	8.1	24.5	10.9
	38G2	17.2	18.5	0.0	3.2	124.6	185.0	25.5	149.7	207.7	110.1	46.8	38G2	18.7	18.5	0.0	4.0	16.4	27.1	4.7	33.2	65.7	33.0	17.7
Totals	(tons)	631.7	801.9	607.4	660.0	1,038.8	926.7	702.3	1,387.6	1,195.2	849.9	692.9	(1000 euro)	629.4	957.9	745.0	901.9	746.8	626.2	578.5	773.1	804.9	731.0	534.1
	37G1	0.0	0.0	0.1	9.9	4.0	6.9	10.2	7.7	127.5	339.1	368.2	37G1	0.0	0.0	0.2	17.5	6.4	10.9	1.3	12.4	45.0	126.9	153.1
	38G1	0.0	0.0	0.0	1.1	0.0	7.8	0.0	27.4	219.1	0.4	2.0	38G1	0.0	0.0	0.0	1.6	0.0	1.1	0.0	8.8	68.1	0.6	4.0
KAPPELN	37G0	17.4	14.2	22.5	6.9	18.6	32.5	23.3	22.8	8.9	0.7	3.7	37G0	7.3	7.2	11.3	7.1	17.0	33.8	18.6	40.9	14.6	1.1	7.6
	38G0	373.3	424.4	387.2	363.2	409.8	575.5	582.9	1,011.7	579.6	508.3	414.2	38G0	282.1	465.8	446.0	480.9	395.7	392.3	394.4	480.4	514.7	489.1	283.9
	37G2	0.0	0.0	0.0	0.0	0.0	3.9	1.7	5.4	0.1	0.0	3.0	37G2	0.0	0.0	0.0	0.0	0.0	5.2	3.5	6.7	0.2	0.0	4.2
	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.6	0.0	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.8	0.0
Totals	(tons)	390.7	438.6	409.8	381.2	432.5	626.8	618.1	1,078.1	935.2	849.1	791.2	(1000 euro)	289.4	473.1	457.5	507.1	419.1	443.1	417.8	553.4	642.6	618.5	452.7
	37G1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	37G1	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.3
FLENSBURG	37G0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	1.0	0.4	0.2	0.5	37G0	0.0	0.3	0.0	0.0	0.1	0.0	0.3	2.8	1.1	0.7	1.9
	38G0	22.4	35.0	33.0	27.9	24.2	10.3	8.5	12.6	10.5	6.0	4.6	38G0	29.4	52.1	44.6	45.2	40.0	25.2	21.5	25.2	22.6	14.1	13.3
Totals	(tons)	22.4	35.1	33.1	28.1	24.2	10.3	8.6	13.7	10.9	6.3	5.2	(1000 euro)	29.4	52.4	44.6	45.4	40.2	25.2	21.9	28.1	23.7	14.8	15.5

The landings and value of the landings from the German fisheries in the 6 ICES rectangles (ICES 37G0, 38G0, 37G1, 38G1, 37G2 and 38G2) according to regional and distant landing harbours is given in Table 4.38.

Besides the harbours Burgstaaken, Heiligenhafen and Grossenbrode, the main harbours where landings from the fisheries in ICES 38G1 and 37G1) near Fehmarnbelt are Rerik, Timmendorf, Wismar, Niendorf, and Travemünde (see Figure 4.15). Landings in these harbours primarily come from the fisheries undertaken in the nearby ICES 37G0, with only a few landings coming from the fisheries in ICES rectangle 38G1, which is the fishing area closest Fehmarnbelt.

Table 4.38: Annual landings (tons) and value (1000 euro) from the fisheries near Fehmarnbelt (ICES 38G1 and 37G1) and in the regional areas (ICES 38G0, 37G0, 38G2 and 37G2) in the regional harbours. Source: Bundesanstalt für Landwirtschaft und Ernährung - BLE.

Landings (tons) and value (1000 euro)														Landings (tons)											
Harbours	**ICES**	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	**ICES**	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
WARNE-MUENDE	37G1	58.0	45.0	47.5	39.4	38.4	38.7	20.0	14.1	79.5	22.3	9.2	37G1	57.2	51.7	77.8	83.1	54.3	57.3	22.3	14.7	47.7	30.0	11.8
	38G1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	37G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	38G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0
	37G2	125.7	121.5	145.7	268.6	164.6	141.8	131.0	101.5	111.3	120.1	133.4	37G2	233.6	229.0	287.4	336.8	315.7	335.0	331.6	170.6	142.6	182.1	214.4
	38G2	0.0	0.0	1.1	2.2	1.3	0.0	0.0	0.0	0.0	0.0	1.3	38G2	0.0	0.0	1.1	2.8	1.7	0.0	0.0	0.0	0.0	0.0	2.6
Totals	(tons)	183.8	166.6	194.2	310.2	204.3	180.5	151.0	116.0	190.8	142.4	143.9	(1000 euro)	290.8	280.7	366.3	422.7	371.7	392.2	354.0	186.0	190.4	212.1	228.7
RERIK	37G1	79.8	97.3	118.9	138.1	89.2	135.0	84.1	119.3	79.6	102.9	55.3	37G1	151.9	181.0	201.9	268.2	163.1	238.7	166.6	202.0	161.3	189.8	105.3
	37G2	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	37G2	0.0	0.0	0.0	0.0	0.0	0.2	0.7	0.1	0.0	0.3	0.0
Totals	(tons)	79.8	97.3	118.9	138.1	89.2	135.0	84.2	119.4	79.6	103.0	55.3	(1000 euro)	151.9	181.0	201.9	268.2	163.1	239.0	167.3	202.1	161.3	190.1	105.3
WISMAR	37G1	209.0	260.3	191.9	139.9	96.7	101.8	93.1	84.0	77.6	104.6	71.6	37G1	221.0	285.2	230.1	220.7	170.3	162.2	124.5	113.3	104.4	134.6	96.4
	37G2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.0	0.0	0.0	37G2	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0	0.0	0.0
	38G2	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G2	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	(tons)	209.0	260.8	191.9	139.9	96.7	102.0	93.1	84.3	77.6	104.6	71.6	(1000 euro)	221.0	285.8	230.1	220.7	170.3	162.7	124.5	113.8	104.4	134.6	96.4
TIMMENDORF	37G1	116.0	166.8	142.0	175.8	101.7	170.6	112.6	144.0	121.2	97.6	102.8	37G1	137.8	213.5	191.0	271.5	148.8	230.5	146.5	205.0	165.3	152.3	151.9
	37G0	0.0	0.0	3.9	4.0	0.7	0.0	1.3	0.7	0.2	0.0	0.4	37G0	0.0	0.0	8.8	9.7	1.0	0.0	3.1	2.3	0.2	0.0	0.7
	38G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	38G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4
	37G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	3.5	0.8	37G2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.2	6.4	0.8
Totals	(tons)	116.0	166.8	145.9	179.8	102.4	170.6	114.0	144.9	121.7	101.0	104.3	(1000 euro)	137.8	213.5	199.9	281.1	149.7	230.5	149.8	208.1	166.7	158.7	153.8
NIENDORF	37G1	208.6	284.1	279.6	218.4	226.3	206.7	199.3	215.7	266.9	366.9	205.5	37G1	163.8	227.7	273.3	214.3	233.6	161.0	162.8	196.0	293.5	400.0	181.0
	37G0	11.5	16.7	27.3	32.2	29.5	26.7	38.1	30.4	26.5	25.9	26.1	37G0	10.0	13.6	51.5	60.2	55.4	55.9	82.0	49.1	27.4	31.3	35.8
	38G0	0.0	0.0	0.0	0.0	0.6	1.8	0.0	0.0	0.0	0.0	1.6	38G0	0.0	0.0	0.0	0.0	1.7	2.8	0.0	0.0	0.0	0.0	4.4
	37G2	0.2	6.2	1.7	1.9	2.1	2.4	0.0	0.0	6.7	0.0	0.0	37G2	0.1	6.1	1.7	2.3	2.1	1.7	0.0	0.0	8.8	0.0	0.0
	38G2	0.8	0.0	0.8	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G2	6.2	0.1	0.7	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Totals	(tons)	221.0	307.0	309.3	255.1	258.5	237.6	237.4	246.1	300.1	392.8	233.3	(1000 euro)	180.1	247.4	327.3	279.4	292.8	221.4	244.8	245.1	329.7	431.2	221.3
TRAVE-MUENDE	37G1	552.9	867.7	623.4	557.7	438.5	453.8	381.0	474.8	421.6	505.5	468.5	37G1	448.1	763.3	622.9	643.3	492.9	434.0	356.6	459.5	433.4	444.8	400.7
	38G1	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	38G1	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
	37G0	0.0	1.0	52.4	54.2	47.8	27.7	29.3	21.6	14.3	19.9	24.7	37G0	0.0	2.6	87.9	116.9	104.4	64.5	51.0	31.4	27.1	42.7	44.2
	38G0	0.0	0.1	0.3	0.4	0.1	0.5	0.1	0.0	0.1	0.0	2.4	38G0	0.0	0.1	0.7	0.5	0.2	1.7	0.1	0.0	0.4	0.0	3.9
	37G2	0.0	0.2	0.1	0.0	2.4	0.0	0.0	0.0	0.0	7.1	0.0	37G2	0.0	0.2	0.1	0.0	2.4	0.0	0.0	0.0	0.0	1.3	0.0
	38G2	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	38G2	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0
Totals	(tons)	552.9	869.0	679.0	612.4	491.2	482.0	410.4	496.4	436.0	532.5	496.4	(1000 euro)	448.1	766.1	714.9	760.7	602.3	500.2	407.6	490.9	460.9	488.8	449.7
GOTHMUND	37G1	0.0	0.0	0.3	2.3	2.6	1.0	0.0	0.0	0.3	0.1	1.3	37G1	0.0	0.0	0.6	4.0	4.9	2.8	0.0	0.0	0.4	0.1	1.0
	37G0	0.0	0.0	0.6	1.3	0.1	1.2	0.8	0.6	0.0	0.0	0.0	37G0	0.0	0.0	3.1	4.0	0.9	4.1	2.3	2.8	0.0	0.0	0.0
Totals	(tons)	0.0	0.0	0.9	3.5	2.7	2.2	0.8	0.6	0.3	0.1	1.3	(1000 euro)	0.0	0.0	3.7	8.0	5.8	7.0	2.3	2.8	0.4	0.1	1.0
LUEBECK-SCHLUTUP	37G1	0.0	0.0	0.1	0.4	19.3	12.2	0.0	7.3	1.4	0.7	0.0	37G1	0.0	0.0	0.1	0.4	25.4	15.1	0.0	7.3	2.4	1.2	0.0
	37G0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	2.2	1.1	0.0	0.0	37G0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	6.3	3.5	0.0	0.0
	38G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	(tons)	0.0	0.0	0.1	0.4	19.3	12.2	4.1	9.6	2.5	0.7	0.0	(1000 euro)	0.0	0.0	0.1	0.4	25.4	15.1	10.8	13.6	5.9	1.2	0.0
ECKERN-FOERDE	37G1	0.0	0.0	0.1	0.7	0.2	0.0	0.0	0.0	0.0	5.8	9.5	37G1	0.0	0.0	0.1	1.9	0.3	0.0	0.0	0.0	0.0	8.1	12.6
	38G1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.8	0.0	0.0	38G1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
	37G0	0.7	0.6	13.6	10.6	17.9	5.9	19.4	11.2	12.1	17.4	14.2	37G0	0.9	0.7	15.8	17.9	38.6	11.3	38.8	22.2	21.1	24.3	26.4
	38G0	378.0	363.1	421.0	338.0	228.9	127.9	260.2	234.9	237.7	252.7	172.3	38G0	458.3	451.1	560.3	485.7	333.1	179.8	299.2	289.0	335.9	408.9	221.1
	37G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	37G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0
Totals	(tons)	378.6	363.7	434.7	349.2	247.0	133.8	279.6	250.1	268.6	275.8	196.0	(1000 euro)	459.2	451.8	576.2	505.5	372.0	191.1	338.1	316.2	359.9	441.2	260.2
ARNIS	37G0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	37G0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0
	38G0	0.0	1.4	0.6	3.1	3.3	2.9	3.5	10.9	3.6	0.3	0.0	38G0	0.0	1.3	1.6	6.5	6.7	6.4	7.0	17.2	7.6	0.3	0.0
Totals	(tons)	0.0	1.4	0.6	3.1	3.4	3.2	3.5	10.9	3.6	0.3	0.0	(1000 euro)	0.0	1.3	1.6	6.5	6.9	6.5	7.1	17.2	7.6	0.3	0.0
MAASHOLM	37G1	0.2	10.0	9.9	17.8	15.0	29.4	10.2	8.9	4.0	43.9	46.3	37G1	0.2	9.4	10.5	25.7	19.7	37.0	14.8	12.2	6.3	82.0	55.1
	38G1	0.0	0.5	0.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	3.9	38G1	0.0	0.5	0.1	1.6	0.0	0.0	0.0	0.0	0.0	0.0	6.0
	37G0	0.0	0.0	0.5	0.2	0.4	5.7	0.0	0.0	0.1	0.0	4.5	37G0	0.0	0.0	0.6	0.3	0.6	6.0	0.1	0.0	0.1	0.0	6.6
	38G0	530.5	729.9	659.5	654.2	455.5	284.5	214.3	725.5	75.8	161.7	321.3	38G0	414.1	751.3	754.8	812.1	579.1	309.6	307.5	390.5	94.5	200.7	233.8
	37G2	0.0	0.0	1.7	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	37G2	0.0	0.0	2.2	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0
Totals	(tons)	530.7	740.3	671.6	673.3	470.8	322.5	224.5	734.4	79.8	205.6	376.0	(1000 euro)	414.4	761.2	768.1	839.6	599.5	356.0	322.4	402.7	100.8	282.8	301.5
KAPPELN	37G1	0.2	1.4	0.0	7.9	10.1	6.6	20.0	67.8	559.5	651.6	790.0	37G1	0.2	1.6	0.0	13.7	14.1	9.7	2.1	36.1	191.7	289.7	212.9
	38G1	0.3	0.1	0.0	0.0	0.0	15.6	0.0	54.3	644.9	20.1	6.0	38G1	0.2	0.1	0.0	0.0	0.0	2.1	0.0	17.7	205.6	13.5	3.5
	37G0	0.0	0.1	3.3	0.8	1.8	0.0	12.1	47.3	15.6	26.3	2.4	37G0	0.2	0.3	1.1	1.2	1.3	0.0	1.4	85.6	25.5	12.5	4.8
	38G0	823.4	1,263.6	995.7	820.8	1,041.5	1,941.4	1,937.1	2,824.9	2,305.0	1,802.8	1,208.8	38G0	862.7	1,574.5	1,136.6	1,247.2	910.3	1,070.1	1,101.3	1,272.4	1,424.2	1,350.1	572.0
	37G2	0.0	0.0	0.0	0.0	0.0	0.4	1.6	10.9	0.2	0.0	0.0	37G2	0.0	0.0	0.0	0.0	0.0	0.7	3.2	13.4	0.4	0.0	0.0
	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	0.0	1.1	0.0	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	0.0	1.6	0.0
Totals	(tons)	823.9	1,265.3	999.0	829.5	1,053.4	1,964.0	1,970.8	3,011.6	3,525.2	2,502.0	2,007.2	(1000 euro)	863.4	1,576.6	1,137.7	1,262.1	925.8	1,082.6	1,108.0	1,433.8	1,847.4	1,667.4	793.3
FLENSBURG	37G1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	37G1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
	37G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	37G0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.8
	38G0	0.0	2.0	17.5	17.3	19.9	8.2	7.6	8.5	8.0	5.7	4.9	38G0	0.0	3.8	25.3	34.9	41.7	21.9	20.8	17.5	17.9	13.6	14.2
Totals	(tons)	0.0	2.0	17.5	17.3	19.9	8.2	7.6	8.7	8.0	5.7	5.2	(1000 euro)	0.0	3.8	25.3	34.9	41.9	21.9	20.8	17.7	17.9	13.6	15.3

4.1.10 Danish local & regional harbours – fleet, landings & values

The locations of the main Danish fishing harbours in the Western Baltic and their approximate number of fishing vessels are shown in Figure 4.82.

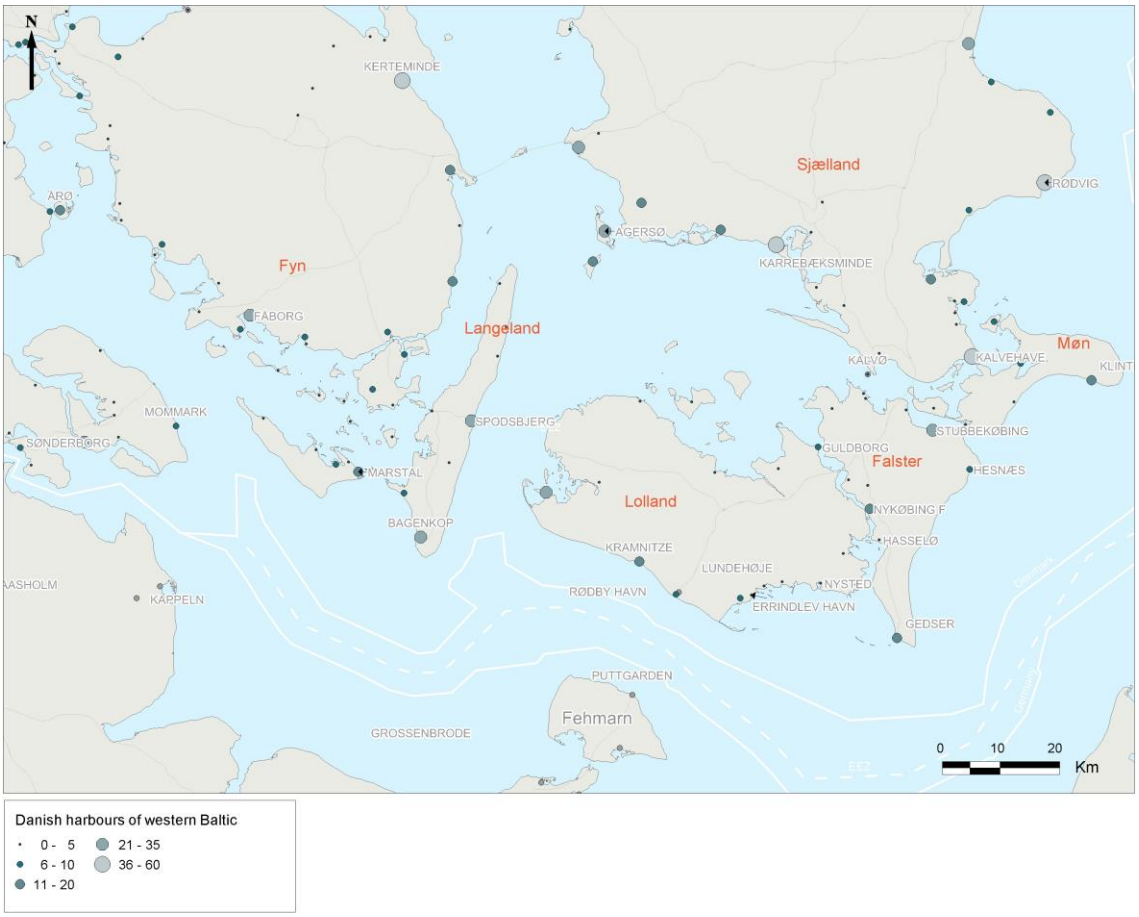


Figure 4.82: The locations of the Danish fishing harbours in the Western Baltic and the approximate number of fishing vessels.

The total landings (tons) and value (euro) in the harbours near Fehmarnbelt from 1998-2008 are given in Table 4.39 and Table 4.40, respectively.

The largest and most important Danish harbours in the Western Baltic near the Fehmarnbelt according to landings and their value are those at Rødbyhavn (1,179-5,487 tons and 574,000-2.6 million euro), Kramnitze (56-176 tons and 180,000-365,000 euro) and Langø (455-809 tons and 892,000-1.6 million euro) on southern Lolland. To the east of Fehmarnbelt on the southern tip of Falster is the harbour of Gedser (435-4,913 tons and 518,000-2.1 million euro) and to the west on the southern tip of Langeland is Bagenkop (1,397-5,105 tons and 1.8-3.6 million euro). Other small nearby harbours adjacent Fehmarnbelt are Errindlev havn (3-9 tons and 14,000-139,000 euro) and Nysted (0-3 ton and up to 14,900 euro) located in Nysted Nor on the south-eastern part of Lolland. A more thorough description of the fleet and fishery statistics for each of these harbours and their association to the fisheries near Fehmarnbelt (ICES 37G1 and 38G1) and its regional area (ICES 37G0, 38G0, 37G2 and 38G2) are given in the following section.

Table 4.39: Landings (tons) of the most important commercial species in Danish harbours near Fehmarnbelt (1998-2008).

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Rødbyhavn	2,721	1,293	3,089	5,487	1,973	1,430	2,214	1,179	3,681	2,771	2,462
Cod	776	869	1,485	789	642	257	396	191	576	436	98
Baltic herring	961	158	765	2,677	282	127	0	104	388	32	0
Sprat	895	143	693	1,876	950	979	1,700	816	2,621	2,000	2278
Whiting	3	3	7	9	25	4	14	5	24	10	30
Flounder	28	26	66	62	39	17	27	13	13	22	8
Dab	31	49	32	34	19	18	59	32	38	85	40
Plaice	15	27	19	14	6	12	8	3	8	12	6
Turbot	4	3	4	3	2	1	2	2	2	2	1
Brill	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sole	0	0	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver eel	5	9	8	16	5	9	5	10	9	3	1
Yellow eel	<1	<1	<1	<1	<1	2	1	2	2	1	0
Sea trout	<1	0	<1	<1	0	0	0	0	<1	0	0
Salmon	0	0	0	<1	<1	0	0	0	0	0	0
Unspecified	3	6	10	7	3	4	2	1	<1	168	<1
Kramnitze	125	145	176	138	103	84	73	85	66	56	72
Cod	110	129	161	110	85	55	56	66	46	37	46
Baltic herring	0	0	0	<1	<1	0	0	0	0	0	0
Whiting	0	0	0	0	0	0	0	0	<1	0	0
Flounder	2	2	2	7	4	5	3	3	3	2	4
Dab	1	1	1	2	1	4	3	4	3	5	7
Plaice	<1	<1	<1	1	2	2	1	1	1	1	3
Turbot	1	<1	2	1	1	1	1	2	1	4	3
Brill	0	<1	<1	<1	<1	<1	<1	<1	<1	<1	2
Sole	0	0	0	<1	<1	0	<1	<1	<1	<1	<1
Silver eel	11	10	9	12	8	11	6	7	12	6	6
Yellow eel	<1	<1	0	<1	<1	<1	<1	1	<1	<1	<1
Sea trout	<1	<1	<1	<1	<1	0	0	0	<1	0	0
Unspecified	<1	3	1	5	2	6	3	1	<1	1	1
Errindlev havn	22	42	29	25	20	14	12	11	4	9	3
Cod	<1	0	0	0	<1	<1	0	0	0	0	0
Flounder	<1	0	1	0	1	<1	0	0	0	0	0
Dab	<1	0	<1	0	<1	0	0	0	0	0	0
Plaice	<1	0	0	0	<1	<1	0	0	0	0	0
Turbot	<1	0	0	0	<1	0	0	0	0	0	0
Silver eel	1	2	2	2	1	6	3	2	1	5	2
Yellow eel	5	13	2	11	4	4	5	2	2	4	1
Balric prawn	16	27	24	12	14	4	4	6	1	0	0
Unspecified	0	0	0	0	0	0	0	1	0	0	0
Nysted	1	3	1	2	1	0	0	0	1	0	0
Baltic herring	0	0	0	0	0	0	0	0	0	0	0
Flounder	0	<1	0	0	0	0	0	0	0	0	0
Silver eel	<1	<1	0	0	0	0	<1	<1	0	0	0
Yellow eel	1	2	<1	<1	<1	<1	<1	<1	<1	0	0
Baltic prawn	0	<1	1	2	1	0	0	0	0	0	0
Unspecified	<1	1	0	0	<1	0	0	0	1	0	0
Langø	552	766	809	638	693	570	492	467	455	475	464
Cod	391	498	473	393	454	391	334	313	273	321	304
Baltic herring	4	4	1	1	<1	<1	<1	2	9	<1	<1
Whiting	0	0	0	0	0	0	0	0	1	0	0
Flounder	53	50	72	61	63	45	27	23	50	20	26
Dab	6	9	11	10	14	19	23	25	24	23	20
Plaice	18	112	143	95	98	61	48	47	41	73	51
Turbot	11	9	10	8	8	6	10	13	8	8	12
Brill	<1	1	2	2	1	3	4	7	6	6	11
Sole	<1	<1	<1	<1	<1	<1	<1	1	1	2	5
Silver eel	3	3	4	5	3	5	3	6	7	6	4
Yellow eel	<1	1	<1	<1	0	<1	<1	1	1	1	<1
Sea trout	<1	<1	1	1	<1	<1	<1	<1	1	<1	<1
Garfish	53	47	70	38	32	19	21	16	20	6	25
Unspecified	13	32	22	24	20	21	22	13	13	9	5.185
Gedser	3,757	2,316	3,737	4,913	3,330	1,383	1,505	1,004	1,872	572	435
Cod	672	791	975	751	501	436	383	380	291	235	235
Baltic herring	2,941	1,456	2,684	3,878	2,496	746	653	366	1,054	240	0
Sprat	90	0	10	199	274	148	398	197	450	62	174
Whiting	1	0	3	7	8	1	2	5	48	3	2
Flounder	22	25	40	56	30	29	27	19	8	11	1
Dab	18	19	10	12	10	18	35	23	14	14	13
Plaice	6	15	7	5	7	2	4	6	4	5	5
Turbot	6	6	5	3	2	2	2	4	3	2	4
Brill	<1	<1	<1	<1	<1	<1	0	1	<1	<1	<1
Sole	0	0	<1	0	0	0	0	<1	<1	<1	<1
Silver eel	1	2	2	2	1	1	0	3	<1	<1	<1
Yellow eel	<1	<1	<1	<1	<1	<1	0	0	0	0	0
Sea trout	<1	<1	<1	<1	<1	<1	0	<1	<1	<1	<1
Salmon	0	0	<1	<1	<1	0	0	0	<1	0	0
Unspecified	<1	2	1	<1	1	<1	1	<1	<1	<1	<1
Bagenkop	1,778	3,340	3,151	2,609	1,963	1,397	1,679	4,158	5,105	2,742	1,857
Cod	1,520	2,207	2,126	1,859	1,378	1,158	1,234	939	1,149	753	495
Baltic herring	1	410	593	255	91	0	0	0	0	0	
Sprat	0	370	116	232	293	0	157	2,999	3,791	1,674	1,047
Whiting	8	14	12	7	10	8	9	4	7	19	2
Flounder	85	98	128	100	59	59	57	30	26	40	51
Dab	74	93	74	75	68	118	167	138	91	181	178
Plaice	70	137	94	73	57	45	44	38	30	56	58
Turbot	17	8	6	5	4	3	6	4	3	7	9
Brill	1	2	1	1	2	6	5	5	7	7	11
Sole	<1	<1	<1	<1	<1	<1	<1	1	1	3	3
Silver eel	2	1	1	2	1	0	0	<1	<1	2	1
Yellow eel	<1	<1	0	0	0	0	<1	<1	<1	<1	<1
Sea trout	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Unspecified	2	7	4	7	3	6	3	3	3	17	2

Table 4.40: Value (1,000 euro) of the most important commercial species landed in Danish harbours near Fehmarnbelt (1998-2008).

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Rødbyhavn	1,417	1,376	2,628	2,178	1,441	708	916	574	1,518	1,480	608
Cod	1,048	1,158	2,302	1,512	1,209	443	567	312	855	919	200
Baltic herring	123.4	13.4	69.2	252.5	32.1	25.4	0.0	18.3	83.4	7.2	0.0
Sprat	114.8	12.1	61.5	176.3	94.8	112.2	185.8	95.1	396.2	342.0	348.1
Whiting	1.6	1.8	5.3	7.2	16.3	5.2	9.6	5.9	13.6	11.8	7.1
Flounder	12.8	12.8	31.8	30.9	20.5	9.9	15.5	4.1	5.9	13.5	2.5
Dab	26.7	47.5	27.7	31.5	14.6	12.8	48.6	20.6	40.4	84.6	28.6
Plaice	21.7	41.2	33.3	19.5	7.9	10.7	11.7	5.7	11.5	15.9	6.6
Turbot	21.3	15.7	23.8	20.8	12.1	8.3	15.4	9.0	10.2	17.7	6.9
Brill	0.2	0.4	0.4	0.1	0.5	2.1	1.1	1.4	1.8	1.6	1.7
Sole	0.0	0.0	0.1	0.1	0.1	0.7	0.2	0.6	2.6	1.9	0.5
Silver eel	36.9	61.2	50.9	111.6	24.6	51.2	45.1	82.6	82.8	28.6	3.8
Yellow eel	0.7	0.6	1.0	0.9	1.3	9.8	6.8	9.8	13.9	3.5	2.0
Sea trout	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Salmon	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Unspecified	8.5	10.9	21.7	13.9	7.0	16.8	9.6	9.5	0.8	32.4	0.1
Kramnitze	268.4	284.5	365.2	323.3	232.3	211.7	185.8	223.9	230.9	179.8	196.4
Cod	174.6	211.0	288.8	223.7	180.0	115.5	118.5	135.4	107.8	91.1	120.0
Baltic herring	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Whiting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Flounder	1.8	1.6	1.5	4.9	3.0	3.5	1.4	1.8	2.0	1.2	1.9
Dab	0.6	0.7	1.1	2.9	0.7	3.3	3.4	4.0	4.2	6.2	6.6
Plaice	0.1	0.2	0.6	2.3	3.4	3.5	2.3	2.0	1.4	2.5	4.8
Turbot	2.3	1.7	12.4	4.5	3.6	7.4	7.0	9.6	4.6	22.6	18.2
Brill	0.0	0.1	0.6	0.1	0.3	1.1	1.8	1.9	1.1	0.9	11.0
Sole	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.5	0.5	0.8	3.7
Silver eel	86.9	64.0	56.2	79.0	38.2	66.2	45.5	62.2	106.4	52.5	27.6
Yellow eel	1.3	1.9	0.0	0.1	0.4	2.1	0.1	3.9	0.9	0.6	0.9
Sea trout	0.1	0.1	0.2	0.6	0.3	0.0	0.0	0.0	0.1	0.0	0.0
Unspecified	0.7	3.2	3.7	5.1	2.2	9.1	5.5	2.4	1.8	1.3	1.6
Errindlev havn	86.3	139.5	78.2	113.9	76.1	71.1	64.5	74.6	28.9	68.4	14.1
Cod	0.5	0.0	0.0	0.0	1.0	0.1	0.0	0.0	0.0	0.0	0.0
Flounder	0.4	0.0	1.1	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0
Dab	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Plaice	0.3	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Turbot	0.1	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0
Silver eel	10.3	10.3	10.5	15.4	5.4	36.2	20.6	21.3	10.4	42.0	7.7
Yellow eel	29.0	73.6	11.3	66.7	19.9	20.0	29.9	14.6	14.7	26.2	6.3
Baltic prawn	45.6	54.7	54.6	30.5	46.8	14.1	13.1	37.1	2.9	0.0	0.0
Unspecified	0.0	0.8	0.4	1.3	0.8	0.5	0.9	1.5	0.9	0.3	0.1
Nysted	5.9	14.9	5.7	6.1	5.7	1.1	1.6	4.4	2.2	0.0	0.1
Baltic herring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flounder	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Silver eel	0.4	0.9	0.0	0.0	0.0	0.0	0.5	2.3	0.0	0.0	0.0
Yellow eel	4.6	11.9	2.4	0.9	1.0	1.1	1.0	2.1	0.3	0.0	0.0
Baltic prawn	0.0	0.3	3.3	5.3	4.7	0.0	0.0	0.0	0.0	0.0	0.0
Unspecified	0.8	1.6	0.0	0.0	0.1	0.0	0.0	0.0	1.9	0.0	0.0
Langø	892	1,372	1,557	1,414	1,535	1,300	1,080	1,164	1,059	1,326	1,209
Cod	654	866	979	965	1,095	930	732	727	662	888	778
Baltic herring	1.2	1.0	0.8	0.6	0.3	0.2	0.2	0.6	4.4	0.3	0.2
Whiting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0
Flounder	56.5	56.5	66.2	58.0	61.4	44.6	24.1	23.0	33.6	22.7	23.6
Dab	7.7	11.0	11.7	14.9	16.8	21.7	23.7	33.8	31.3	28.3	20.7
Plaice	39.4	272.6	346.0	226.9	248.6	159.6	127.7	122.8	95.6	172.6	112.9
Turbot	59.5	49.8	49.4	47.9	45.4	42.3	58.4	78.9	50.5	48.1	70.7
Brill	3.3	6.9	10.2	12.5	7.1	21.1	31.3	53.3	46.2	39.9	62.6
Sole	0.4	0.2	0.3	0.3	0.6	1.3	2.9	9.6	10.7	30.6	85.9
Silver eel	26.2	22.6	26.5	34.5	14.0	26.0	22.0	56.6	63.6	56.6	18.0
Yellow eel	2.7	4.6	1.9	0.7	0.0	1.3	2.7	5.4	7.7	7.4	1.7
Sea trout	1.4	1.2	1.8	1.6	0.5	0.3	0.7	0.7	2.4	1.5	0.5
Garfish	16.5	22.6	17.9	14.6	11.6	11.1	10.4	9.8	10.0	7.9	22.3
Unspecified	23.1	56.9	45.1	36.1	33.3	40.2	43.9	42.3	39.2	21.8	12.4
Gedser	1,517	1,442	2,052	2,126	1,528	873	754	723	813	606	518
Cod	907	1,106	1,554	1,277	891	647	535	558	430	484	446
Baltic herring	524.6	242.0	418.2	743.1	543.3	155.6	119.4	82.3	262.3	72.5	0.0
Sprat	11.3	0.0	0.6	16.4	26.4	16.7	37.1	19.9	51.9	7.8	23.8
Whiting	0.4	0.6	2.2	5.3	5.2	0.6	1.3	4.3	20.5	3.1	3.0
Flounder	11.4	13.1	21.9	30.3	13.9	12.0	10.9	8.1	3.7	5.6	0.7
Dab	16.1	18.0	8.9	11.0	9.9	14.1	25.6	16.0	12.0	15.1	15.3
Plaice	8.0	24.2	9.1	6.7	11.7	5.1	6.2	10.3	8.4	5.5	6.7
Turbot	26.0	24.7	23.4	23.6	17.7	13.5	13.6	18.2	16.3	10.0	20.5
Brill	0.0	0.0	0.0	0.0	0.1	0.1	0.1	2.2	0.3	0.8	0.7
Sole	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Silver eel	7.6	10.0	9.6	9.7	5.2	3.5	2.4	3.3	7.1	0.9	0.5
Yellow eel	1.2	1.0	0.8	0.6	2.0	2.1	0.0	0.0	0.0	0.0	0.0
Sea trout	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0
Salmon	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unspecified	2.4	1.5	2.8	2.1	1.7	2.2	1.9	0.1	0.3	0.1	0.1
Bagenkop	2,118	3,293	3,458	3,668	2,779	2,168	1,992	2,306	2,698	2,412	1,841
Cod	1,783	2,796	3,082	3,310	2,474	1,891	1,682	1,660	1,842	1,661	1,206
Baltic herring	0.4	38.1	33.4	28.1	13.0	0.0	0.1	0.1	0.0	0.2	0.0
Sprat	0.0	34.5	9.7	25.5	34.6	0.0	14.6	372.2	607.3	293.1	163.9
Whiting	4.2	8.7	6.7	3.8	5.7	4.1	5.5	2.7	6.0	4.0	1.8
Flounder	63.1	56.7	67.6	57.3	34.6	37.6	36.0	20.2	17.6	24.3	22.5
Dab	66.7	84.6	68.2	72.6	60.1	97.2	118.6	105.6	86.0	186.5	174.4
Plaice	92.9	211.8	143.1	112.1	101.3	81.5	69.2	69.5	48.6	96.2	94.9
Turbot	80.6	44.0	30.3	29.7	24.1	17.3	28.4	22.6	21.4	46.3	57.2
Brill	4.9	6.9	5.7	4.8	11.6	20.2	21.6	23.4	41.0	32.9	58.6
Sole	0.1	0.1	0.1	0.3	1.7	0.5	4.9	14.7	11.8	33.4	51.6
Silver eel	19.1	4.2	5.0	12.9	5.5	1.3	0.0	0.0	2.4	16.4	5.2
Yellow eel	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.1	0.1
Sea trout	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.0
Unspecified	2.8	7.2	5.8	10.2	12.6	17.0	10.9	14.8	13.8	17.7	4.9

Rødbyhavn

The total number of fishing vessels (both commercial and sideline) in Rødbyhavn increased from 13 to a peak of 19 from 1999 to 2001 due to an increase in the numbers of larger vessels (≥8 m)(Table 4.41). This coincided with an increase in landings of herring and sprat in this harbour by vessels from this harbour, suggesting these vessels could have been targeting these species. Since 2001, however, the number of vessels of all sizes has declined. In 2008, there were a total of 9 vessels (all <15 m) in Rødbyhavn (8 commercial and 1 sideline).

Table 4.41: The number of registered commercial and sideline vessels and their lengths (<8 m, 8-11.9 m, 12-14.9 m, ≥15 m and ≥20 m) in Rødbyhavn harbour from 1998-2008.

Rødbyhavn harbour - number of commercial and sideline vessels

Vessel length (m)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<8	commercial	3	2	2	1	1	1	1	2	1	1	1
	sideline	2	2	2	2	1	1	1	1	1	1	1
8-11.9	commercial	6	6	8	9	10	9	7	6	5	5	4
	sideline											
12-14.9	commercial	1	1	2	3	3	5	3	3	3	3	3
	sideline											
≥15	commercial	2	2	2	3	2						
	sideline											
>20	commercial				1							
	sideline											
Total		14	13	16	19	17	16	12	12	10	10	9

Total annual landings in Rødbyhavn harbour peaked in 2001 and have varied from 1,179-5,487 tons over the last 11 years (1998-2008) (Figure 4.83). Landings of cod peaked at 1,485 tons (2.3 million euro) in 2000 and have since fluctuated between 98-789 tons (200,000-1.5 million euro) from 2001-2008. The most recent landings of cod (98 tons in 2008) have been the lowest recorded. Similarly, the landings of herring have declined from a peak of 2,677 tons (252,000 euro) in 2001 to annual landings of between 0-388 tons (0-83,000 euro) from 2002-2008. In contrast, the landings of sprat have generally increased over the past decade and have been greater than 2,000 tons (342,000-396,000 euro) over the last 3 years (2006-2008). Several flatfish species are also landed in abundance every year with flounder, dab, plaice and turbot the most important quantitatively and according to value (Table 4.42 and Table 4.43). Similarly, European eel (silver and yellow eel) have been consistently landed in this harbour every year (1-16 tons and 3,800-112,000 euro), however landings in 2008 were the lowest recorded. Because European eel is primarily landed in pound nets and only registered in logbooks when retrieved by vessels greater than ≥8 m, landings of this species is better represented in the landings data from the pound net fisheries (section 4.2.4).

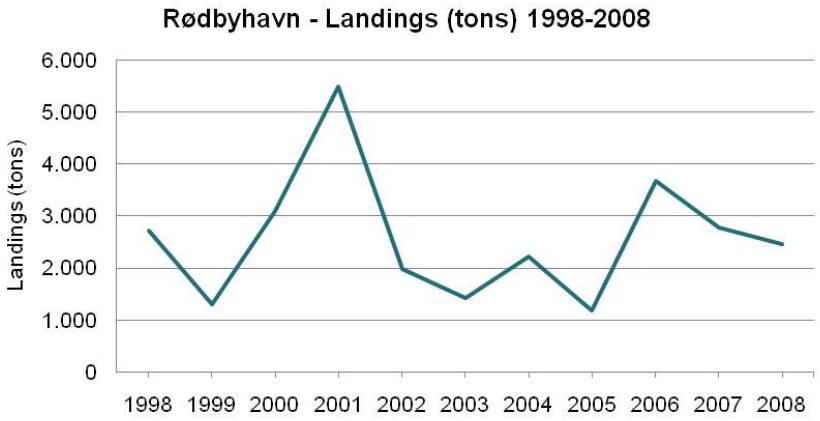


Figure 4.83: The development of the landings (tons) at Rødbyhavn from 1998-2008. Source: The Danish Directorate of Fisheries.

The landings of commercial species in the harbour of Rødbyhavn from vessels fishing in or near Fehmarnbelt (ICES 38G1 and 37G1) and its regional area in the Western Baltic (ICES rectangles 37G0, 37G0, 38G2 and 37G2) are given in Table 4.42.

Since 2001, the vast majority (82-96%) of the landings in Rødbyhavn are from catches in the Western Baltic near Fehmarnbelt (ICES) and its regional area (38G1, 37G1, 38G0, 37G0, 38G2 and 37G2). Over the last three years (2006-2008) approximately 73-88% of the landings in Rødbyhavn by weight are from vessels fishing near Fehmarnbelt in the ICES rectangles (38G1 and 37G1). The majority of these landings have been made up of sprat (1,813-1,997 tons) and cod (90-312 tons) (Table 4.42).


Nordia

Table 4.42: Annual landings (tons) in Rødbyhavn harbour of the most important commercial species from vessels ≥8 m (≥10 m before 2005) fishing near Fehmarnbelt (ICES 38G1, 37G1) and the regional area (ICES 38G0, 37G0, 38G2 and 37G2). Source: Danish Directorate of Fisheries - data obtained from logbooks.

Rødbyhavn	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	661	618	925	1,797	636	680	388	419	1,240	1,073	1,235
Cod	306	411	628	331	268	116	167	95	249	165	49
Baltic herring	233	76	85	446	120	76	0	57	146	0	0
Sprat	88	77	153	961	214	462	174	238	804	752	1,136
Whiting	0.5	1.2	3.6	1.3	6	2.2	4.7	2.3	8.6	0.8	1.3
Flounder	8	7.4	24	25	13	3.2	4.4	3.5	2.7	3.6	6.5
Dab	13	25	15	18	7.5	8.2	32	19	20	45	34
Plaice	7.2	12	10	6.3	2.1	6.8	2.9	1.5	2.9	5.2	5.4
Turbot	1.8	0.9	2.6	1	0.5	0.6	0.9	0.7	0.5	0.2	0.1
Sole	0	0	0	0.1	0.6	0	0	0	0	0	0
Brill	0	0	0.1	0.3	0.3	0.1	0.3	0.1	0	0	0
Horse mackerel	0	0	0	0	0	0	0	0	0	94	0
Unspecified	4.6	7.1	5.6	6.9	5.6	5.8	2.6	0.9	7.7	8	2.9
37G1	977	155	809	1,446	610	326	406	167	1,465	1,385	933
Cod	37	31	139	23	51	15	37	29	63	144	41
Baltic herring	595	72	307	683	399	5	0	44	210	30	0
Sprat	341	43	354	736	153	304	358	80	1,187	1,061	861
Whiting	0.2	0.5	0.2	1.5	5	0.1	2.3	1.4	0.5	0.9	28.3
Flounder	0.7	0.7	4.5	1.6	0.4	0.6	3.3	4.5	0.7	10.4	0.3
Dab	1.3	1.4	1.7	0.5	0.2	0.5	4.4	6.5	3.1	68.9	2.2
Plaice	0.7	1.8	0.9	0.3	0.1	0.1	0.6	1	0.3	1	0.1
Turbot	0	0	0.1	0	0	0	0.1	0	0	0.1	0.1
Horse mackerel	0	0	0	0	0	0	0	0	0	68	0
Unspecified	1.2	4.7	2	0.9	2.1	1.1	0.5	0.5	0.3	0.7	0.1
38G0	325	85	289	881	177	62	116	136	475	98	136
Cod	60	74	62	71	45	13	50	5	32	41	1
Baltic herring	143	0.5	90	264	64	0.5	0	15	61	0	0
Sprat	108	0	123	534	62	47	56	116	380	37	74
Whiting	0.7	0.2	0.1	0.4	1	0	1	0	0.5	0.1	0
Flounder	2.1	1.8	4.9	4.6	2.7	0.7	1.2	0.3	0.5	1.3	60.1
Dab	3.2	3.3	1.8	2.6	1.2	0.4	6.1	0.4	0.5	8.6	0.2
Plaice	2.6	1.4	3.5	2.3	0.7	0.3	0.7	0.1	0	0.9	0.1
Turbot	0.1	0.1	0.2	0.1	0	0.1	0.1	0	0	0	0
Horse mackerel	0	0	0	0	0	0	0	0	0	8	0
Unspecified	5.7	3	2.9	3.5	0.7	0.2	0.9	0.3	0.8	0.5	0
37G0	0.6	0	201	229	2.8	0	0	20	10	1.8	1.3
Cod	0.5	0	13	11	2.7	0	0	0.1	0	1.6	1.2
Baltic herring	0	0	26	74	0	0	0	0	0	0	0
Sprat	0	0	162	143	0	0	0	20	10	0	0
Flounder	0	0	0.1	0.5	0.1	0	0	0	0	0	0
Dab	0	0	0.8	0.1	0	0	0	0	0	0.2	0.1
Unspecified	0.1	0	0	0.3	0	0	0	0	0	0	0
38G2	144	122	127	161	178	124	676	234	295	12	32
Cod	100	103	111	89	116	29	14	4	23	10	1
Baltic herring	0	0	0	35	0	80	0.1	0	0	0	0
Sprat	30	0	0	23	44	7.9	658	229	270	0	30
Whiting	0.1	0.1	0.1	0.6	1.1	0.2	0.8	0.3	0	0	0
Flounder	2.1	4.9	6.5	9.4	9	1.6	0.7	0.1	0.6	0.3	0.1
Dab	3.4	3.9	2.7	1.7	2.4	3.4	1.9	0.6	0.9	1	0.6
Plaice	2.6	6.4	3	1.2	1.2	0.9	0.2	0.1	0.1	0.2	0.1
Turbot	0.3	0.3	0.3	0.3	0.2	0.1	0	0	0.1	0.1	0
Unspecified	5.2	2.5	2.7	0.9	3.3	0.4	0.1	0.2	0	0.1	0
37G2	3.7	7.1	32	26	7.8	2.7	352	59	39	8.1	0.4
Cod	3.5	5.7	31	23	6.2	2.4	17	9.6	15	6.3	0.3
Sprat	0	0	0	0	0	0	332	47	21	0	0
Whiting	0	0	0	0	0.1	0	0.2	0	0	0	0
Flounder	0	0.5	0.3	2.2	0.9	0	0.5	0.5	0.3	0.5	0
Dab	0.2	0.6	0.3	0.6	0.4	0.3	1	1.7	2.4	1	0.1
Plaice	0	0.3	0	0.1	0	0	0.2	0.3	0.2	0.1	0
Unspecified	0	0	0.5	0.2	0.2	0	0.3	0	0.1	0.2	0
Total (tons)	2,110	986	2,381	4,539	1,611	1,194	1,938	1,035	3,524	2,577	2,337

The annual landings from the near field (ICES 37G1 and 38G1) and region (ICES 38G0, 37G0, 38G2 and 37G2) of Fehmarnbelt by vessels that have their basis harbour in Rødbyhavn are given in Table 4.43.

Table 4.43: Annual landings (tons) and value (1,000 euro) from near Fehmarnbelt (ICES 38G1 and 37G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) by vessels that have their basis harbour in Rødbyhavn.

	Landings (tons)										
Rødbyhavn	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	229	267	241	599	130	157	104	58	113	119	59
Cod	129	248	224	159	116	65	81	45	90	78	23
Herring	42	0	0	113	0	0	0	0	0	0	0
Sprat	42	0	0	306	0	74	0	0	0	0	0
Whiting	0	0.8	1.3	0.5	3.1	2.1	3.3	1.1	0.5	0.5	0
Flounder	0.6	1.6	4.1	8.2	4.2	1.9	1.8	0.2	1	0.8	2.7
Dab	9.2	11.2	7.6	8.6	4.4	6.5	15.7	9.4	11.2	29	25.3
Plaice	5.4	5.2	2.7	2.5	1.3	6.2	1.4	0.7	2.2	3.8	5
Turbot	1.1	0.7	0.8	0.8	0.4	0.5	0.7	0.3	0.3	0	0.1
Sole	0	0	0	0.1	0	0	0	0	0	0	0
Unspecified	0.2	0	0.1	0.4	0.3	0.7	1	0.6	7.6	7.5	2.8
37G1	2.8	3.6	7.5	106	0	2.2	0	0	1.2	0	0
Cod	2.8	3	7.4	1.1	0	2	0	0	0.8	0	0
Herring	0	0	0	95	0	0	0	0	0	0	0
Sprat	0	0	0	10	0	0	0	0	0	0	0
Whiting	0	0	0	0	0	0	0	0	0.1	0	0
Flounder	0	0	0	0	0	0.1	0	0	0	0	0
Dab	0	0.4	0.1	0	0	0.1	0	0	0.2	0	0
Plaice	0	0.2	0	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0.1	0	0
38G0	0	0	1.6	329	0.3	6.3	26.9	0.1	0	0.9	0
Cod	0	0	1.6	3.2	0.1	6.2	1.8	0.1	0	0.5	0
Herring	0	0	0	70	0	0	0	0	0	0	0
Sprat	0	0	0	255	0	0	25	0	0	0	0
Flounder	0	0	0	0	0.1	0	0	0	0	0	0
Dab	0	0	0	0.1	0.1	0	0	0	0	0.3	0
Plaice	0	0	0	0.4	0	0.1	0	0	0	0	0
Turbot	0	0	0	0	0	0	0.1	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0	0.1	0
38G2	23.1	26.5	18.2	26.4	31.1	40.1	5.8	20.9	2.4	14.1	2
Cod	20.5	24.7	14.9	24.2	25.3	36.7	4.1	18	1.5	9.9	1.2
Herring	0	0	0	0	5	0	0	0	0	0	0
Whiting	0	0.1	0.1	0.1	0.1	0	0.1	0.2	0	0	0
Flounder	0.7	0.1	0.6	1.1	0.3	0.8	0.1	0.9	0.1	1.9	0.1
Dab	1.4	1	1	0.6	0.2	1.1	0.8	0.8	0.6	1.1	0.6
Plaice	0.4	0.5	1.6	0.3	0.1	0.6	0.1	0.3	0.2	0.5	0.1
Turbot	0.1	0	0	0.1	0.1	0.3	0	0.2	0	0	0
Unspecified	0	0.1	0	0	0	0.6	0.6	0.5	0	0.7	0
37G2	0	0	0	0	0.4	0	0	3.9	0	0.8	0
Cod	0	0	0	0	0.4	0	0	3.5	0	0.5	0
Flounder	0	0	0	0	0	0	0	0.1	0	0.1	0
Dab	0	0	0	0	0	0	0	0.2	0	0.2	0
Plaice	0	0	0	0	0	0	0	0.1	0	0	0
Total (tons)	255	297	268	1,060	162	206	137	83	117	135	61

	Value (1000 euro)										
Rødbyhavn	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	294	507.4	456.4	410.6	240.9	162.0	185.2	103.2	212.5	207.2	87.7
Cod	250.5	481.4	435.7	309.0	226.2	126.3	156.4	88.0	175.5	151.2	43.9
Herring	11.4	0.0	0.0	30.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sprat	6.2	0.0	0.0	45.8	0.0	11.1	0.0	0.0	0.0	0.0	0.0
Whiting	0.0	0.6	1.0	0.4	2.4	1.6	2.6	0.9	0.4	0.4	0.0
Flounder	0.3	0.9	2.3	4.7	2.4	1.1	1.0	0.1	0.6	0.5	1.5
Dab	9.5	11.6	7.9	8.9	4.6	6.7	16.2	9.7	11.6	30.0	26.2
Plaice	9.1	8.8	4.6	4.2	2.2	10.5	2.4	1.2	3.7	6.4	8.5
Turbot	6.4	4.1	4.6	4.6	2.3	2.9	4.1	1.7	1.7	0.0	0.6
Sole	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unspecified	0.5	0.0	0.3	1.0	0.8	1.8	2.5	1.5	19.0	18.8	7.0
37G1	5.4	6.6	14.5	29.4	0	4.0	0.0	0.0	2.1	0.0	0.0
Cod	5.4	5.8	14.4	2.1	0.0	3.9	0.0	0.0	1.6	0.0	0.0
Herring	0.0	0.0	0.0	25.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sprat	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whiting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Flounder	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Dab	0.0	0.4	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0
Plaice	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
38G0	0.0	0.0	3.1	64.2	0.4	12.2	7.8	0.2	0.0	1.5	0.0
Cod	0.0	0.0	3.1	6.2	0.2	12.0	3.5	0.2	0.0	1.0	0.0
Herring	0.0	0.0	0.0	19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sprat	0.0	0.0	0.0	38.2	0.0	0.0	3.7	0.0	0.0	0.0	0.0
Flounder	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Dab	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.0
Plaice	0.0	0.0	0.0	0.7	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Turbot	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
38G2	42.9	50.3	33.1	49.4	51.7	77.2	10.6	39.4	3.9	24.1	3.2
Cod	39.8	48.0	29.0	47.0	49.2	71.3	8.0	35.0	2.9	19.2	2.3
Herring	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0
Whiting	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.0	0.0	0.0
Flounder	0.4	0.1	0.3	0.6	0.2	0.5	0.1	0.5	0.1	1.1	0.1
Dab	1.4	1.0	1.0	0.6	0.2	1.1	0.8	0.8	0.6	1.1	0.6
Plaice	0.7	0.8	2.7	0.5	0.2	1.0	0.2	0.5	0.3	0.8	0.2
Turbot	0.6	0.0	0.0	0.6	0.6	1.7	0.0	1.2	0.0	0.0	0.0
Unspecified	0.0	0.3	0.0	0.0	0.0	1.5	1.5	1.3	0.0	1.8	0.0
37G2	0.0	0.0	0.0	0.0	0.8	0.0	0.0	7.2	0.0	1.2	0.0
Cod	0.0	0.0	0.0	0.0	0.8	0.0	0.0	6.8	0.0	1.0	0.0
Flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Dab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0
Plaice	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total (value)	342	564	507	554	294	255	204	150	219	234	91

Over the last decade, vessels from Rødbyhavn have predominantly targeted and landed cod (23-224 tons and 44,000- 481,000 euro) from the Fehmarnbelt area (ICES 38G1). Over the last 5 years, landings of cod have amounted to less than 100 tons (175,000 euro or less). Other species landed by commercial vessels from Rødbyhavn in much smaller amounts are the flatfish dab, flounder and plaice and occasionally whiting. After a peak in landings of herring and sprat in 2001, there have been almost no landings of these pelagic species since 2005. In general, the fisheries after these industrial species in the Western Baltic are not undertaken by vessels from this harbour.

Kramnitze

The harbour of Kramnitze lies approximately 15 km to the west of Rødbyhavn (Figure 4.74). The number of vessels in Kramnitze has been relatively stable around 4-15 vessels (primarily commercial vessels) since 1998 (Table 4.44). This number is comparable to the nearby harbour of Rødbyhavn to the east. However, the majority of the vessels (10 vessels) are of smaller size (size range 8-10 meters) with 4 vessels being less than 8 meters. In 2008, there were a total of 14 vessels (1 sideline vessel) in Kramnitze.

Table 4.44: The number of registered commercial and sideline vessels and their lengths (<8 m, 8-11,9 m, 12-14,9 m and ≥15 m) in Kramnitze harbour from 1998-2008.

Kramnitze harbour - number of commercial and sideline vessels

Vessel length (m)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<8	commercial	5	5	5	5	5	5	5	4	4	4	4
	sideline											
8-11.9	commercial	9	9	10	10	10	10	10	10	10	10	10
	sideline	1	1									
12-14.9	commercial											
	sideline											
≥15	commercial											
	sideline											
Total		15	15	15	15	15	15	15	14	14	14	14

The total annual landings at Kramnitze are considerably less than its neighbouring harbour Rødbyhavn to the east and have varied between 56-176 tons (180,000-365,000 euro) from 1998-2008 (Figure 4.84).

Over the past 5 years the annual landings have been comparatively lower (56-85 tons) than the 5 years previous (103-176 tons) (Table 4.45). This primarily reflects the decline in landings of cod, which was the dominant commercial species landed in the harbour over the same period. Although landings of several flatfish species have fluctuated considerably from year to year, this group of commercial species have consistently been represented in the landings. Silver eel has also been consistently landed at this harbour for many years (6-12 tons from 1998-2008). Landings of European eel from Fehmarnbelt are more fully represented in the section on the pound net fisheries (Section 4.2.4).

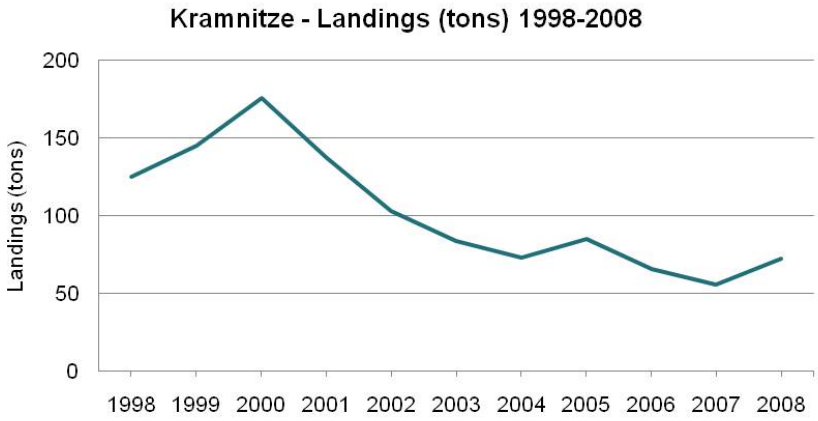


Figure 4.84: The development of the landings (tons) at Kramnitze from 1998-2008. Source: Danish Directorate of Fisheries.

The landings in Kramnitze harbour from vessels ≥8 m (≥10 m before 2005) fishing in the 6 ICES rectangles of the Western Baltic that represent the near field and regional area of Fehmarnbelt are given in Table 4.45.

It appears that the landings at Kramnitze come from vessels fishing in or near Fehmarnbelt, almost exclusively in the ICES rectangle 38G1 or in other areas outside the regional area of Fehmarnbelt. The majority of the landings from vessels fishing in Fehmarnbelt are made up of cod (23-33 tons per year) and a few flatfish species (Table 4.45). It appears that before 2004,

this harbour has not been used to land commercial species from Fehmarnbelt and its region, at least by larger vessels (≥10 m before 2005 and ≥8 m from 2005-2008), which did not register their landings by logbooks before 2005. This suggests that the landings in this harbour (Table 50) originate from vessels fishing in areas further away than the 6 ICES rectangles representing the near and regional field of Fehmarnbelt.

Table 4.45: Annual landings (tons) in Kramnitze of the most important commercial species from fishing in the near field and regional area of Fehmarnbelt (ICES 38G1, 37G1, 38G0, 37G0, 38G2 and 37G2). Data obtained from logbooks which include vessels ≥8 m (≥10 m before 2005).

Kramnitze	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	0	0	0.2	0	0	0.3	23	34	35	34	49
Cod	0	0	0	0	0	0.3	23	33	33	28	33
Flounder	0	0	0.2	0	0	0	0	0	0.1	0.5	2.4
Dab	0	0	0	0	0	0	0	0.4	1.2	2	4.8
Plaice	0	0	0	0	0	0	0.3	0	0.1	0.8	2.4
Turbot	0	0	0	0	0	0	0	0.1	0.3	2.7	4.9
Silver eel	0	0	0	0	0	0	0	3	5	3	0
Unspecified	0	0	0	0	0	0	0	0	0	0.1	1.4
38G0	0	0	0	0	0	0.1	0	0.1	0	1.5	0
Cod	0	0	0	0	0	0.1	0	0.1	0	1.4	0
Dab	0	0	0	0	0	0	0	0	0	0.1	0
Total (tons)	0	0	0.2	0	0	0.4	23	37	40	39	49

Annual landings from the near field and regional area of Fehmarnbelt by vessels that have their basis harbour in Kramnitze are given in Table 4.46.

The vessels that have their basis harbour in Kramnitze also catch predominantly cod (24-37 tons and 47,000-71,000 euro) along with a variety of flatfish species (dab, flounder, plaice and turbot) when fishing in the area near Fehmarnbelt (ICES 38G1) (Table 4.46). Landings of the valuable flatfish turbot have increasingly contributed to the value of the landings over the last couple of years (2007-2008). The similarity between what is landed in Kramnitze from near Fehmarnbelt and what is landed by the vessels from Kramnitze suggest that vessels from Kramnitze predominately land their catches in their home harbour.

Table 4.46: Annual landings (tons) and value (1,000 euro) from the near field of Fehmarnbelt (ICES 38G1 and 37G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) by vessels that have their basis harbour in Kramnitze.

						Landings (tons)					
Kramnitze	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	0	0	0	0	0	0.7	24.1	37.1	35.3	40	50.6
Cod	0	0	0	0	0	0.7	23.8	36.5	33.6	33.9	34.6
Flounder	0	0	0	0	0	0	0	0.1	0.1	0.5	2.5
Dab	0	0	0	0	0	0	0	0.4	1.2	2	4.8
Plaice	0	0	0	0	0	0	0.3	0	0.1	0.8	2.4
Turbot	0	0	0	0	0	0	0	0.1	0.3	2.7	4.9
Unspecified	0	0	0	0	0	0	0	0	0	0.1	1.4
38G0	0	0	0	0	0	0.1	0	0.1	0	1.5	0
Cod	0	0	0	0	0	0.1	0	0.1	0	1.4	0
Dab	0	0	0	0	0	0	0	0	0	0.1	0
Total (tons)	0	0	0	0	0	0.8	24.1	37.2	35.3	41.5	50.6

						Value (1000 euro)					
Kramnitze	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	0.0	0.0	0.0	0.0	0.0	1.4	46.8	72.0	68.5	85.5	109.7
Cod	0.0	0.0	0.0	0.0	0.0	1.4	46.3	70.9	65.3	65.9	67.2
Flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	1.4
Dab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.2	2.1	5.0
Plaice	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.2	1.4	4.1
Turbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.7	15.7	28.5
Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.5
38G0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	2.8	0.0
Cod	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	2.7	0.0
Dab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total (value)	0.0	0.0	0.0	0.0	0.0	1.6	46.8	72.2	68.5	88.3	109.7

Errindlev and Nysted

The number of registered commercial and sideline vessels in the harbours of Errindlev and Nysted are given in Table 4.47.

Both Errindlev and Nysted harbours in the bay of Nysted Nor are small. At Errindlev from 1998-2001 there were 5 commercial vessels, all less than 8 meters. The following two years

the number of vessels decreased to two commercial vessels in 2003 and has been that number since. At Errindlev there were two small sideline vessels registered for part-time fishing in 2008. In the harbour of Nysted, there has been only one commercial vessel and three sideline vessels (all <8 meters in size) since 2002. The main landings in both of these harbours have been European eel and common or "Baltic" prawns, primarily before 2006, especially in Errindlev.

Table 4.47: The number of registered commercial and sideline vessels and their lengths (<8 m, 8-11.9 m, 12-14.9 m and ≥15 m) in Errindlev and Nysted harbours in Nysted Nor.

Errindlev harbour - number of commercial and sideline vessels

Vessel length (m)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<8	commercial	5	5	5	5	3	3	2	2	2	2	2
	sideline	1	1						1	1	1	2
8-11.9	commercial											
	sideline											
12-14.9	commercial											
	sideline											
≥15	commercial											
	sideline											
Total		6	6	5	5	3	3	2	3	3	3	4

Nysted harbour - number of commercial and sideline vessels

Vessel length (m)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<8	commercial	1	2	1	1	1	1	1	1	1	1	1
	sideline	5	5	4	4	3	3	3	3	3	3	3
8-11.9	commercial											
	sideline											
12-14.9	commercial											
	sideline											
≥15	commercial											
	sideline											
Total		6	7	5	5	4	4	4	4	4	4	4

The development of total annual landings at Errindlev by commercial vessels is shown in Figure 4.85. Annual landings were comparatively large (20-42 tons) from 1998-2002, primarily due to landings of Baltic prawns (14-27 tons and 31,000-55,000 euro) and yellow eel (2-13 tons and 11,000-73,000 euro). The total landings have since, decreased from year to year due to a decrease in the landings of primarily Baltic prawns. Over the last three years (2006-2008) the total landings at Errindlev have been between 3-9 tons and approximately 14,000-68,000 euro due to landings of yellow and silver eel.

At Nysted Harbour, the total landings have been one ton or less consisting of Baltic prawns, European eel and unspecified species since 2001. Over the last couple of years there has been little or no (less than 500 kg) registered landings in this harbour (Figure 4.85).

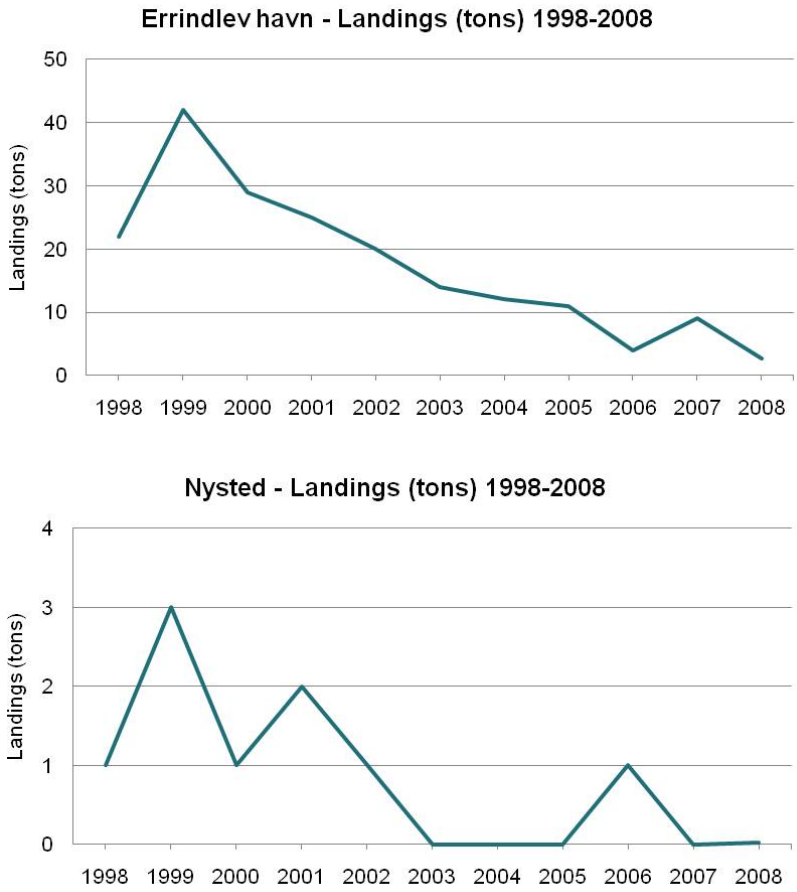


Figure 4.85: The development of the landings (tons) at Errindlev havn and Nysted from 1998-2008. Source: Danish Directorate of Fisheries.

Langø

There were between a total of 34-36 vessels from 1998-2004 where after the number has declined to a total of 21 vessels in 2008 (Table 4.48). Over the last decade almost all the fishing vessels in this harbour have been small (<12 m) with only 1 larger vessel (12-15 m) in 2005 and 2006.

Table 4.48: The number of different size commercial and sideline vessels and their lengths (<8 m, 8-11.9 m, 12-14.9 m and ≥15 m) in Langø harbour.

Langø harbour - number of commercial and sideline vessels

Vessel length (m)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<8	commercial	18	16	15	15	14	14	13	11	12	8	8
	sideline	5	4	4	3	3	3	2	2	2	2	2
8-11.9	commercial	10	10	12	14	16	17	18	14	13	12	11
	sideline	2	1	1	1	1	1	1	1			
12-14.9	commercial	1	1	1					1	1		
	sideline											
≥15	commercial											
	sideline											
Total		36	32	33	33	34	35	34	29	28	22	21

The development of the annual landings in Langø harbour is given in Figure 4.86.

After an initial decline in the landings in Langø from approximately 800 tons to 500 tons from 2000-2004, the amount of landings have been relatively stable in recent years. Landings in Langø are comprised almost exclusively of demersal species, primarily cod and a variety of flatfish species (Table 4.49). Furthermore, garfish are consistently landed in this harbour every year (6-70 tons and 8,000-23,000 euro) along with European eel (3-9 tons and 14,000-71,000 euro). Before 2005, between 3-4 tons (6,700-14,000 euro in value) of Baltic prawns (in un-specified landings) were also landed annually in Langø.

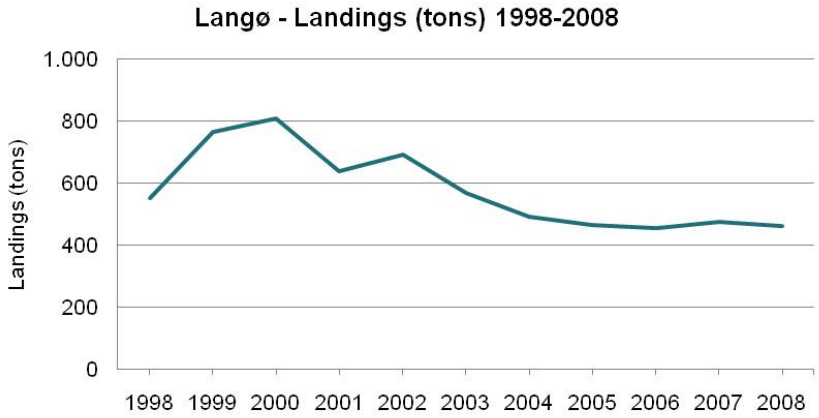


Figure 4.86: The development of the landings (tons) at Langø from 1998-2008. Source: Danish Directorate of Fisheries.

The landings in Langø harbour from the commercial fishing in the 6 ICES rectangles of the Western Baltic region including Fehmarnbelt are given in Table 4.49. Over the last decade (1998-2008) the majority of landings in Langø (208-385 tons) from the region of Fehmarnbelt have been cod (148-263 tons) and diverse flatfish species (flounder, dab, plaice, turbot and brill). These have primarily been caught in ICES 38G0 to the west of Fehmarnbelt. Only between 1-12 tons landed in Langø annually come from any of the other 5 ICES rectangles (38G1, 37G1 and 37G0, 38G2 and 37G2).

The landings and value of the landings in the Fehmarnbelt area and region by vessels from Langø are given in Table 4.50. The fishing vessels from Langø harbour only catch between 0-6.8 tons (primarily cod) from near the Fehmarnbelt (ICES 38G1). In general, vessels from Langø fish in the ICES rectangle (38G0) to the west of Fehmarn when they fish in the Western Baltic. Langø fishermen have been landing between 177-309 tons of primarily cod and flatfish species (primarily plaice and turbot) annually from the ICES rectangle 38G0 since 1998. These landings have amounted to annual revenue of 348,000 to 640,000 euro (Table 4.50).

Table 4.49: Annual landings (tons) in Langø of the most important commercial species from vessels ≥8 m (≥10 m before 2005) fishing in the near field and regional area of Fehmarnbelt (ICES 38G1, 37G1, 38G0, 37G0, 38G2 and 37G2). Data obtained from logbooks.

Langø	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	0.5	3	3.1	1.6	0.6	0	0.2	0	0.9	0.3	0.3
Cod	0.4	2.5	2	1.4	0.5	0	0.2	0	0.6	0.3	0.3
Whiting	0	0.3	0.2	0	0	0	0	0	0	0	0
Flounder	0.1	0	0.3	0.1	0	0	0	0	0.2	0	0
Unspecified	0	0.2	0.6	0.1	0.1	0	0	0	0.1	0	0
37G1	0	4	0	0	0	0	0	0	0	0	0
Cod	0	3.3	0	0	0	0	0	0	0	0	0
Flounder	0	0.3	0	0	0	0	0	0	0	0	0
Unspecified	0	0.4	0	0	0	0	0	0	0	0	0
38G0	341	385	330	256	245	214	208	229	270	304	313
Cod	263	259	210	172	159	150	148	149	183	215	221
Flounder	35	21	19	14	21	8	7	6	26	2	9
Dab	1.5	0.9	1	1.9	1.7	2.3	2.4	5.8	4.6	3.6	6
Plaice	12	74	75	42	39	26	17	21	21	53	37
Turbot	7.1	4.9	2.6	4.5	2.4	2.7	5.4	9.8	6	6.1	12
Sole	0	0	0	0.2	0	0	0	0.3	0	0	1.5
Silver eel	0	0	0	0	0	0	0	0.4	0	0.1	0
Brill	0.2	0.1	0	0.2	0	0.1	0.2	1.1	0.3	0.6	1.2
Unspecified	22	26	22	21	21	24	28	35	28	23	26
38G2	1.5	5.1	2.6	0.4	1.4	0.6	1.7	2.2	4.1	6.4	5.5
Cod	1.1	4.1	1.7	0.3	0.7	0.4	1.1	1.2	1.7	5.1	4.2
Flounder	0.2	0.2	0	0	0.2	0	0	0.3	0.3	0	0.2
Dab	0	0	0	0	0	0.1	0.2	0	0.3	0	0
Plaice	0	0.6	0.8	0	0.5	0.1	0.2	0.2	0.5	0.7	0.5
Turbot	0.1	0	0	0	0	0	0	0.2	0.3	0	0.2
Unspecified	0.1	0.2	0.1	0.1	0	0	0.2	0.3	1.5	0.8	0.4
Total (tons)	343	397	336	258	247	214	210	231	275	311	319

Annual landings from the near field of Fehmarnbelt and regional area by vessels that have their basis harbour in Langø are given in Table 4.50.

Table 4.50: Annual landings (tons) and value (1000 euro) from the near field of Fehmarnbelt (ICES 38G1 and 37G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) by vessels that have their basis harbour in Langø.

	Landings (tons)										
Langø	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	0.5	36.2	46.6	6.8	0.6	0	0.2	0	0.9	0.2	0.3
Cod	0.4	32	42	6.2	0.5	0	0.2	0	0.6	0.2	0.3
Whiting	0	0.3	0.1	0	0	0	0	0	0	0	0
Flounder	0.1	0.2	1.2	0.3	0	0	0	0	0.2	0	0
Dab	0	2.6	1.5	0.1	0	0	0	0	0	0	0
Plaice	0	0.9	0.6	0.1	0	0	0	0	0	0	0
Turbot	0	0.1	1.4	0	0	0	0	0	0	0	0
Unspecified	0	0.1	0.1	0.1	0.1	0	0	0	0.1	0	0
38G0	250	309	254	200	186	179	177	199	246	275	303
Cod	194	218	166	138	121	127	129	133	169	197	214
Flounder	28	19.2	14.5	10.7	14.3	6.3	5.2	4.3	24	0.9	8.6
Dab	1.5	0.7	0	1.7	0.3	1.5	0.2	3.2	3.8	1.4	5.4
Plaice	6.4	49.8	57.2	29.6	33.9	23.1	14	18.5	19.6	50.4	36.5
Turbot	4.8	4.4	0.9	3.9	1.8	2.7	4.3	8.3	5.7	4.7	11.2
Sole	0	0	0	0.3	0	0	0	0.2	1	0	1.5
Brill	0.2	0.1	0	0	0	0.1	0.1	1	0.3	0.6	1.2
Unspecified	15.9	16.9	15.4	15.4	14.9	17.9	24.3	30.2	23	19.6	24.5
38G2	1.4	6.6	3.4	0.4	2.4	0.4	1.7	2.1	3.4	6.2	5.5
Cod	1	5.8	3	0.3	1.7	0.3	1.1	1.1	1.6	5.1	4.2
Flounder	0.2	0.2	0	0	0.2	0	0	0.3	0.3	0	0.2
Dab	0	0.1	0	0	0	0	0.2	0	0.3	0	0
Plaice	0	0.4	0.3	0	0.5	0.1	0.2	0.2	0.5	0.7	0.5
Turbot	0.1	0	0	0	0	0	0	0.2	0.2	0	0.2
Unspecified	0.1	0.1	0.1	0.1	0	0	0.2	0.3	0.5	0.4	0.4
Total (tons)	252	351	304	207	189	179	179	201	251	281	308

	Value (1000 euro)										
Langø	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	0.8	67.6	92.7	12.7	1.2	0.0	0.4	0.0	1.5	0.4	0.6
Cod	0.8	62.2	81.0	12.0	1.0	0.0	0.4	0.0	1.2	0.4	0.6
Whiting	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flounder	0.1	0.1	0.7	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Dab	0.0	2.7	1.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plaice	0.0	1.5	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turbot	0.0	0.6	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unspecified	0.0	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.3	0.0	0.0
38G0	473.5	587.2	472.1	391.7	348.2	352.7	364.3	428.2	484.0	550.0	640.2
Cod	376.2	422.7	323.2	268.8	234.6	247.4	251.1	258.7	328.0	382.6	415.3
Flounder	16.0	10.9	8.3	6.1	8.2	3.6	3.0	2.5	13.7	0.5	4.9
Dab	1.6	0.7	0.0	1.8	0.3	1.6	0.2	3.3	3.9	1.4	5.6
Plaice	10.8	84.4	96.9	50.1	57.4	39.1	23.7	31.3	33.2	85.4	61.8
Turbot	27.9	25.6	5.2	22.6	10.5	15.7	25.0	48.2	33.1	27.3	65.0
Sole	0.0	0.0	0.0	3.8	0.0	0.0	0.0	2.5	12.6	0.0	18.9
Brill	1.2	0.6	0.0	0.0	0.0	0.6	0.6	6.1	1.8	3.7	7.3
Unspecified	39.8	42.3	38.5	38.5	37.3	44.8	60.8	75.6	57.5	49.0	61.3
38G2	2.9	12.4	6.6	0.8	4.3	0.8	3.2	4.6	6.9	12.1	11.3
Cod	1.9	11.3	5.8	0.6	3.3	0.6	2.1	2.1	3.1	9.9	8.2
Flounder	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.2	0.0	0.1
Dab	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.0	0.0
Plaice	0.0	0.7	0.5	0.0	0.8	0.2	0.3	0.3	0.8	1.2	0.8
Turbot	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	0.0	1.2
Unspecified	0.3	0.3	0.3	0.3	0.0	0.0	0.5	0.8	1.3	1.0	1.0
Total (value)	477.2	667.2	571.4	405.3	353.7	353.5	367.9	432.7	492.3	562.5	652.1

Gedser

After an initial decline from a total of 23 to 16 fishing vessels from 1998-2000, the number of vessels has been relatively constant at 13-16 since (Table 4.51). Historically, the majority of the vessels have been less than 12 m (≤12 m) with no registered commercial vessel ≥12 m in recent years. There were 14 vessels (8 commercial and 6 sideline) in 2008.

Table 4.51: The number of different size commercial and sideline vessels (<8 m, 8-11,9 m, 12-14,9 m and ≥15 m) in Gedser harbour.

Gedser harbour - number of commercial and sideline vessels

Vessel length (m)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<8	commercial	11	9	5	5	5	5	7	5	5	5	4
	sideline	4	4	4	4	4	5	3	4	4	3	4
8-11.9	commercial	4	4	5	5	5	4	3	3	2	3	4
	sideline	2	1	1	1	1	1	1	1	1	2	2
12-14.9	commercial	1	1	1	1	1	2	2	2	1	0	
	sideline											
≥15	commercial	1	1									
	sideline											
Total		23	20	16	16	16	17	16	15	13	13	14

The development of the total annual landings at Gedser is shown in Figure 4.87. Since landings at Gedser peaked at 4,913 tons (2.1 million euro) in 2001 there has been a considerable decline to 435 tons (518,000 euro) landed in this harbour in 2008. The large amount of landings in this harbour in the early part of the decade were primarily composed of herring (2,496-3,878 tons), cod (501-975 tons) and some sprat (10-274 tons) in the years 2000-2002.

Landings in the most recent years (2007-2008) consist mainly of cod (235 tons and 446-000-484,000 euro), herring and sprat (174-302 tons and 24,000-80,000 euro) and several flatfish species (25-34 tons and 37,000-44,000 euro).

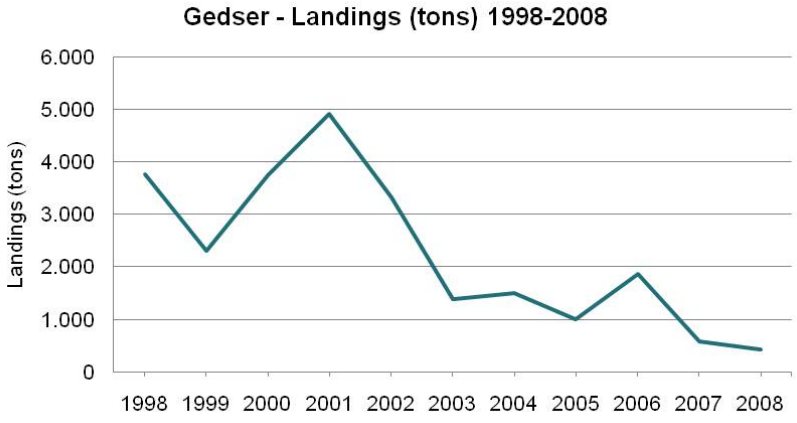


Figure 4.87: The development of the landings (tons) at Gedser from 1998-2008. Source: Danish Directorate of Fisheries.

The landings in Gedser harbour from vessels fishing in the area near Fehmarnbelt and the Western Baltic region (ICES rectangles 38G1, 37G1 and 38G0,37G0, 38G2 and 37G2) from 1998-2008 are given in Table 4.52.

The landings in Gedser harbour seem to come from fisheries in several of the ICES rectangles around Fehmarnbelt and the region, especially those near Fehmarnbelt (ICES 38G1 and 37G1 and those to the east of Fehmarnbelt (ICES 38G2 and 37G2). Landings in Gedser from near Fehmarnbelt (ICES 38G1) varied anywhere from 16-496 tons (primarily herring and sprat) over the last decade (1998-2008). The majority of the landings in Gedser from the other areas near Fehmarnbelt were also sprat and herring, however, the landings from ICES 38G2 to the east also consisting of a large amount of cod (84-190 tons) and flatfish species (4-34 tons) over the last 5 years (2004-2008).

Table 4.52: Annual landings (tons) in Gedser harbour of the most important commercial species from vessels ≥8 m (≥10 m before 2005) fishing in the near field and regional area of Fehmarnbelt (ICES 38G1, 37G1, 38G0, 37G0, 38G2 and 37G2). Data obtained from logbooks.

Gedser	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	496	72	120	225	99	115	24	41	226	16	130
Cod	28	50	77	22	23	12	18	14	32	0	1.6
Baltic herring	340	18	35	79	55	30	0	0	33	14	0
Sprat	124	0	0	121	18	72	0	25	140	2	128
Whiting	0.5	0	0.1	0.1	0.6	0	0.2	0.4	18.4	0	0
Flounder	0.7	1.1	4.2	1.9	2.3	0.3	1.1	0.3	0.7	0	0
Dab	2.4	1.3	1.3	0.5	0.1	0.5	4.4	0.8	1.4	0	0.1
Plaice	0	0.8	0.6	0	0.1	0	0.1	0.4	0.2	0	0
Turbot	0.4	0.3	0.2	0	0.1	0	0.1	0	0.3	0	0
Unspecified	0.2	0.9	1.4	0.4	0.1	0.2	0.2	0	0	0	0
37G1	1,160	827	163	121	132	24	42	58	494	106	65
Cod	28	57	151	60	58	18	32	31	29	48	58
Baltic herring	1,066	759	0	19	67	3	0	14	385	50	0
Sprat	61	0	0	28	0	0	0	0	71	1	0
Whiting	0	0.1	0.1	4.2	1.6	0.1	0.1	2.6	5.6	0.6	0.5
Flounder	0.5	6.5	6.8	5.3	2.5	1.6	2.4	3.6	0.3	0.1	0.1
Dab	3.3	1.5	0.8	1.6	1.1	0.8	7.2	5.3	1.8	4.8	5.3
Plaice	1.3	2.2	0.9	0.9	0.3	0.1	0.1	0.2	0.2	0.7	0.2
Turbot	0.2	0.1	0.2	0.1	0	0.2	0	0.1	0	0.1	0.1
Unspecified	0.4	1.7	3.5	2.2	1.1	0.2	0.2	1	0.1	0.1	1
38G0	36	4.2	4	144	0.8	1.5	0.4	0	0.9	0.9	2.8
Cod	3.5	4	3.6	1.8	0.7	1.4	0.2	0	0.9	0.1	2.2
Baltic herring	21	0	0	40	0	0	0	0	0	0	0
Sprat	11	0	0	102	0	0	0	0	0	0	0
Flounder	0.2	0.1	0	0	0	0	0	0	0	0	0.1
Dab	0.2	0.1	0	0	0	0	0.2	0	0	0.6	0.5
Plaice	0.1	0	0	0.4	0	0	0	0	0	0.2	0
Unspecified	0	0	0.4	0.1	0.1	0.1	0	0	0	0	0
37G0	0	0	4	1.3	2.6	0	0	1.4	0	0	13.5
Cod	0	0	4	1.2	2.2	0	0	1.2	0	0	12
Flounder	0	0	0	0	0.3	0	0	0	0	0	0.1
Dab	0	0	0	0	0	0	0	0.1	0	0	1.1
Plaice	0	0	0	0	0	0	0	0	0	0	0.1
Unspecified	0	0	0	0.1	0.1	0	0	0.1	0	0	0.2
38G2	1,138	458	1,993	1,934	1,867	895	1,144	727	703	352	150
Cod	326	423	369	361	198	201	166	190	98	117	84
Baltic herring	749	0	1,559	1,522	1,547	567	632	334	445	148	0
Sprat	29	0	35	8	95	99	310	172	145	69	61
Whiting	0	0.1	0.7	0.6	0.8	0.6	0	1.4	1	0	0
Flounder	12	12.6	14.4	31	16.5	13.1	14.8	8.9	3.9	8	0.3
Dab	11	10	2.5	3	2.6	9.8	15	13	6.7	6.4	3.1
Plaice	2.1	6.7	2.8	1.1	3.2	0.9	1.6	4.8	1.4	2.2	0.1
Turbot	3.2	2.3	2.2	2	2.1	1.7	2.2	2.7	1.5	0.2	0.5
Sole	5.5	0	0	0	0.2	0	0	0	0	0	0
Silver eel	0	0	0	0	0.2	0	0	0	0	0	0
Brill	0	0.2	0	0	0	0	0	0.5	0.1	0	0
Haddock	0.1	0.1	0.1	1.2	0	0.1	0	0	0	0.1	0
Unspecified	0.4	2.3	6.8	3.8	1.9	2.1	1.4	0.9	0.2	1.2	0.5
37G2	318	532	203	387	49	24	81	41	226	29	22
Cod	68	41	41	35	38	19	43	32	20	27	20
Baltic herring	244	486	145	339	0	0	0	6	116	0	0
Sprat	0	0	15	8	0	0	32	0	87	0	0
Whiting	0	0	0	0.1	2.8	0.1	0.7	0	0	0	0.2
Flounder	1.2	1.7	0.9	3.3	2.6	1.4	1.4	0.4	1.3	0.2	0
Dab	2.7	1	0.2	0.4	2.9	2.3	2.9	1.3	1.1	1.4	1.2
Plaice	1.1	1.4	0.4	0.4	1.5	0.2	0	0.1	0.3	0.1	0.1
Turbot	0.4	0.1	0.2	0.1	0	0.1	0	0	0	0	0
Unspecified	0.6	0.4	0.4	0.8	0.8	0.6	1	1.3	0.4	0.4	0.1
Total (tons)	3,147	1,893	2,487	2,813	2,150	1,059	1,292	868	1,649	504	382

Annual landings from the near field of Fehmarnbelt and regional area by vessels that have their basis harbour in Gedser are given in Table 4.53.

The vessels from Gedser that fished in the Western Baltic did most of their fishing in ICES 38G2 to the east of Fehmarnbelt. However, landings and value from this ICES rectangle varied considerable over the years and were as low as 800 kg (1,600 euro) in 2008 and as high as 415 tons (250,000 euro in value) in 2006. These fluctuations are primarily a result of a few years (2004-2006) where comparatively large amounts of herring were landed (154-330 tons), and further back in time (1998-2002) landings of cod (31-177 tons) from ICES 38G2. Vessels (≥8 m) from Gedser have not landed any commercial species from near Fehmarnbelt (38G1) and only occasionally from (ICES 37G1) south of Fehmarnbelt (Table 4.53). There are 8 vessels (4 commercial and 4 sideline) in Gedser harbour where it is not possible to determine where they have been fishing in relation to Fehmarnbelt.

Table 4.53: Annual landings (tons) and value (1000 euro) from the near field of Fehmarnbelt (ICES 38G1 and 37G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) by vessels that have their basis harbour in Gedser.

	Landings (tons)										
Gedser	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	0	6.7	0.7	1.6	1.4	0	0	0	0	0	0
Cod	0	6.6	0.7	1.6	1.4	0	0	0	0	0	0
Dab	0	0.1	0	0	0	0	0	0	0	0	0
37G1	5.3	2	0	0	0	0	0.7	0	63.1	1.8	0
Cod	4.9	1.8	0	0	0	0	0.5	0	0.3	1.8	0
Sprat	0	0	0	0	0	0	0	0	58	0	0
Whiting	0	0	0	0	0	0	0.1	0	4.8	0	0
Flounder	0.2	0	0	0	0	0	0.1	0	0	0	0
Dab	0.1	0.1	0	0	0	0	0	0	0	0	0
Plaice	0	0.1	0	0	0	0	0	0	0	0	0
Turbot	0.1	0	0	0	0	0	0	0	0	0	0
38G2	170	177	62	61	32	62	248	357	415	16	0.8
Cod	153	170	62	60	31	46	70	93	73	15	0.8
Herring	0	0	0	0	0	12	154	245	330	0	0
Sprat	0	0	0	0	0	0	19	9.9	0	0	0
Flounder	6.2	2.7	0.3	0.5	0.7	1.6	2.5	3	4	0.3	0
Dab	7.4	1.5	0.1	0.1	0.2	1.5	2.3	3.8	4	0.6	0
Plaice	0.9	1.8	0	0	0	0.1	0.2	1.1	1	0	0
Turbot	1.7	0.8	0.2	0.2	0.4	0.5	0.4	0.9	0.7	0.1	0
Unspecified	0.2	0.2	0	0	0	0.1	0.1	0.4	2.8	0	0
37G2	13.1	4.3	0	0	0	0	0	6	0	0	0
Cod	12	4.3	0	0	0	0	0	0	0	0	0
Herring	0	0	0	0	0	0	0	6	0	0	0
Flounder	0.2	0	0	0	0	0	0	0	0	0	0
Dab	0.4	0	0	0	0	0	0	0	0	0	0
Plaice	0.2	0	0	0	0	0	0	0	0	0	0
Turbot	0.3	0	0	0	0	0	0	0	0	0	0
Total (tons)	188	190	63	63	33	62	249	363	478	17.8	0.8

	Value (1000 euro)										
Gedser	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	0.0	12.9	1.4	3.1	2.7	0.0	0.0	0.0	0.0	0.0	0.0
Cod	0.0	12.8	1.4	3.1	2.7	0.0	0.0	0.0	0.0	0.0	0.0
Dab	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37G1	10.3	3.8	0.0	0.0	0.0	0.0	1.1	0.0	13.0	3.5	0.0
Cod	9.5	3.5	0.0	0.0	0.0	0.0	1.0	0.0	0.6	3.5	0.0
Sprat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7	0.0	0.0
Whiting	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	3.8	0.0	0.0
Flounder	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Dab	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plaice	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turbot	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38G2	321.2	340.9	121.3	118.3	62.6	98.6	187.9	262.4	250.1	30.5	1.6
Cod	298.1	329.6	119.9	116.8	59.7	89.6	136.6	180.5	141.3	29.2	1.6
Herring	0.0	0.0	0.0	0.0	0.0	3.2	41.7	66.7	89.7	0.0	0.0
Sprat	0.0	0.0	0.0	0.0	0.0	0.0	2.8	1.5	0.0	0.0	0.0
Flounder	3.5	1.5	0.2	0.3	0.4	0.9	1.4	1.7	2.3	0.2	0.0
Dab	7.7	1.6	0.1	0.1	0.2	1.6	2.4	3.9	4.1	0.6	0.0
Plaice	1.5	3.0	0.0	0.0	0.0	0.2	0.3	1.9	1.7	0.0	0.0
Turbot	9.9	4.6	1.2	1.2	2.3	2.9	2.3	5.2	4.1	0.6	0.0
Unspecified	0.5	0.5	0.0	0.0	0.0	0.3	0.3	1.0	7.0	0.0	0.0
37G2	25.9	8.4	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0
Cod	23.3	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Herring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0
Flounder	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dab	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plaice	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turbot	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (value)	357.4	365.9	122.7	121.5	65.3	98.6	189.0	264.1	263.2	34.0	1.6

Bagenkop

The number and length groups of the vessels registered in Bagenkop are given in Table 4.54.

Table 4.54: The number of registered commercial and sideline vessels (<8 m, 8-11.9 m, 12-14.9 m and ≥15 m) in Bagenkop harbour.

Bagenkop harbour - number of commercial and sideline vessels

Vessel length (m)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<8	commercial	16	10	9	8	9	9	9	9	9	9	9
	sideline	8	7	7	6	6	6	6	5	5	5	4
8-11.9	commercial	7	9	10	11	12	12	11	12	13	8	7
	sideline										1	1
12-14.9	commercial	12	11	10	10	9	6	5	5	2	3	4
	sideline											
≥15	commercial	4	4	5	5	3	3	3	4	5	4	5
	sideline											
Total		47	41	41	40	39	36	34	35	34	30	30

Bagenkop is one of the largest harbours in the Western Baltic and Fehmarnbelt area in terms of the number of fishing vessels and historically, many vessels of different lengths have been registered in this harbour. However, the total number of vessels has been steadily declining over the last decade, from a peak of 47 in 1998 to 30 in 2008. This has been due to a decline in the number of vessels less than 15 m (≤15 m). In particular, there was a large decline in the number of vessels from 8-11.9 m in length in recent years (from 2006-2008).

The development of the total landings in Bagenkop is shown in Figure 4.88.

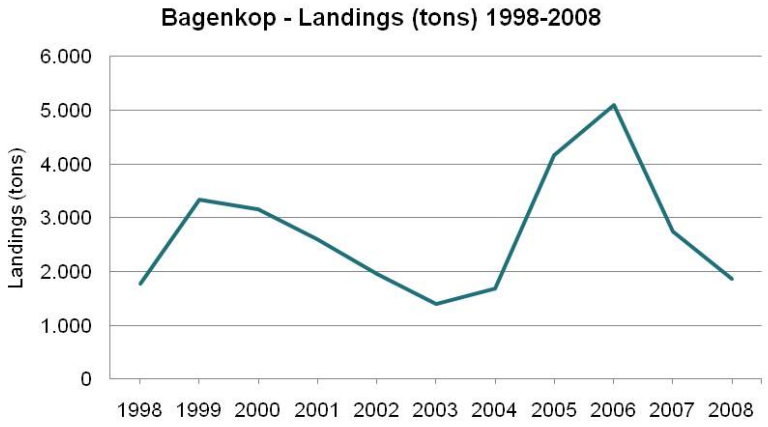


Figure 4.88: The development of the landings (tons) at Bagenkop from 1998-2008. Source: Danish Directorate of Fisheries.

The annual landings in Bagenkop have fluctuated considerably over the last decade with a low of 1,397 tons (2.2 million euro) in 2003 and a peak of 5,105 tons (2.7 million euro) in 2006. The landings in Bagenkop over the last 5 years have been dominated by sprat (157-3,791 tons) and cod (495-1,234 tons) according to weight and cod by value (1.2-1.8 million euro).

The landings in Bagenkop harbour from vessels ≥8 m (≥10 m before 2005) fishing in the 6 ICES rectangles of the Western Baltic region including Fehmarnbelt are given in Table 4.55.

The majority of the landings in Bagenkop from the fisheries near Fehmarnbelt and the regional area primarily come from the ICES 38G0 to the west of Fehmarnbelt. Over the last decade, annual landings at Bagenkop from this area have amounted to 734-2,889 tons, which were predominantly made up of cod in the early years (826-1,496 tons from 1998-2002) and sprat in the most recent years (645-2,184 tons from 2005-2008). Landings in Bagenkop from vessels fishing near Fehmarnbelt (ICES 38G1 and 37G1) in recent years (2005-2008) have amounted to 154-841 tons (primarily sprat) in ICES 38G1 and 128-490 tons (also primarily sprat) in ICES 37G1, respectively (Table 4.55).

Annual landings from the near field of Fehmarnbelt and regional area by vessels that have their basis harbour in Bagenkop are given in Table 4.56.

The vessels from Bagenkop that fish in the Fehmarnbelt and regional area do most of their fishing in the ICES 38G0 to the west of Fehmarnbelt and to a certain extent in ICES 38G2 to the east of Fehmarnbelt (Table 4.56). In both of these areas the dominant fisheries is for cod, sprat and herring with a variety of flatfish species (Table 4.56). The vessels from Bagenkop only have sporadic fisheries near Fehmarnbelt as the total landings from fishing in ICES 38G1 and 37G1 fluctuated between 800 kg-362 tons from 38G1 and 0-207 tons from 37G1, respectively. The few years where the landings from this area are considerably high are due to landings of the industrial species sprat.

Table 4.55: Annual landings (tons) in Bagenkop harbour of the most important commercial species from vessels ≥10 m before 2005 and ≥8 m after 2005 fishing in the near field and regional area of Fehmarnbelt (ICES 38G1, 37G1, 38G0, 37G0, 38G2 and 37G2). Data obtained from logbooks.

Bagenkop	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	39	129	40	74	89	21	9	379	841	421	154
Cod	30	25	26	30	3	19	6.5	10	18	5.6	16
Baltic herring	0	30	5	21	7.5	0	0	0	0	0	0
Sprat	0	73	5	22	78	0	0	368	818	414	132
Whiting	0	0	0.5	0	0	0.3	0.1	0.1	3	0	0.9
Flounder	4	0.3	0.9	0.6	0.1	0.6	1.1	0.3	0.2	0.2	1.3
Dab	1.8	0.6	0.8	0.4	0	0.7	1.2	0.5	0.8	1.1	3.3
Plaice	1.9	0.2	0.6	0.4	0.6	0.3	0.4	0.1	0.2	0.2	0.2
Unspecified	1.6	0.4	1.2	0.6	0.1	0.3	0	0.1	0.1	0.2	0.3
37G1	10	55	73	20	1.3	0.5	42	128	490	231	137
Cod	7.7	0.2	8.3	2.7	1.2	0.4	0.8	9.3	14	3.7	7
Baltic herring	0	10	26	8.5	0	0	0	0	0	0	0
Sprat	0	45	39	8.5	0	0	40	117	476	227	130
Flounder	1.3	0	0	0	0	0	0.1	0.4	0	0.2	0
Dab	0.1	0	0	0	0	0	1.1	1.2	0.3	0.6	0.3
Plaice	0	0	0	0	0	0	0.2	0	0	0	0
Unspecified	0.7	0.1	0.1	0	0.1	0.1	0.3	0.4	0	0	0.1
38G0	1,133	2,213	1,874	1,748	1,256	734	970	2,785	2,889	1,522	1,184
Cod	945	1,496	1,304	1,145	826	578	675	513	601	526	321
Baltic herring	5.3	219	208	226	109	0	2.3	30	0	0	0
Sprat	5.3	246	156	184	182	0	95	2,105	2,184	794	645
Whiting	3.7	13.5	7	2.9	5.4	3.2	4	0.7	1.1	5.1	0
Flounder	38	56	62	59	37	32	30	15	9	23	30
Dab	42	60	44	49	49	84	127	93	60	123	129
Plaice	43	66	42	37	27	22	24	15	15	27	39
Turbot	5.1	3.4	1.7	1.8	1.6	1.7	3	1.7	1	1	2.9
Sole	0	0.2	0	0.3	0	0	0.4	0.8	0.2	0.1	2.6
Brill	0.2	0.3	0.2	0.5	0.6	1.7	1.5	1.7	1.1	0.6	2.6
Unspecified	45	53	49	43	19	13	9	10	16	24	11
37G0	18	0	69	12	4.6	0.7	2.5	58	28	91	5
Cod	18.2	0	3.6	10.7	4.3	0.4	2.1	3	2.6	17.3	4.5
Baltic herring	0	0	31	0	0	0	0	0	0	0	0
Sprat	0	0	34	0	0	0	0	55	25	51.5	0
Whiting	0	0	0	0	0	0	0	0	0	14	0
Flounder	0	0	0	0.4	0	0.1	0	0	0	3.2	0.1
Dab	0	0	0	0	0	0.2	0.2	0	0.7	4.1	0.4
Plaice	0	0	0	0.2	0.1	0	0.1	0	0	0.7	0
Unspecified	0	0	0	0.6	0.2	0	0.1	0	0	0.1	0
38G2	19	15	74	41	29	73	25	207	113	16	68
Cod	15	13	68	37	25	39	23	29	12	6	27
Baltic herring	0	0	0	0	0	15	1.5	0	0	0	0
Sprat	0	0	0	0	0	7.5	0	173	98	7	32
Whiting	0	0	0.1	0	0	0.5	0	0	0	0	0.1
Flounder	1.6	0.8	0.5	2.2	1.1	2.5	0.3	1.7	0.2	0.5	2.1
Dab	0.7	0.1	0.2	0.6	0.5	4.1	0.2	0.8	2	1.8	5
Plaice	0.5	0.4	0.1	0.7	0.7	1.7	0.3	0.2	0.5	0.7	0.8
Turbot	0.1	0	0	0	0	0.1	0	0	0	0	0.2
Unspecified	1.1	0.7	4.6	1	2.7	4.3	0.2	2.5	0.1	0.1	0.6
37G2	**0**	0.5	1.3	0	0	0	3.6	0	0	0	0
Cod	0	0.4	1.1	0	0	0	2.9	0	0	0	0
Flounder	0	0	0.1	0	0	0	0.2	0	0	0	0
Dab	0	0.1	0.1	0	0	0	0.3	0	0	0	0
Unspecified	0	0	0	0	0	0	0.2	0	0	0	0
Total (tons)	1,219	2,413	2,130	1,895	1,379	830	1,053	3,557	4,361	2,281	1,548

Table 4.56: Annual landings (tons) and value (1000 euro) from the near field of Fehmarnbelt (ICES 38G1 and 37G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) by vessels that have their basis harbour in Bagenkop.

	Landings (tons)										
Bagenkop	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	32.3	22.2	49.1	28.7	29.8	97.6	0.8	57	362	14.1	8.4
Cod	24.7	20.9	11.3	14.7	1.7	3.1	0.7	2.1	4.4	0.1	6.4
Herring	0	0	35	12.2	5	61.5	0	0	0	14	0
Sprat	0	0	0	0	23	33	0	54	354.3	0	0
Flounder	3.2	0.3	1	1.1	0.1	0	0	0	0	0	0.3
Dab	1.7	0.5	0.9	0.4	0	0	0.1	0.4	0	0	1.5
Plaice	1.7	0.2	0.2	0.1	0	0	0	0	0	0	0.1
Turbot	0.2	0	0.1	0	0	0	0	0.1	0	0	0
Unspecified	0.8	0.3	0.6	0.2	0	0	0	0.1	3	0	0.1
37G1	0	0	1.3	2.5	0	7.1	0	3	207	3	15.4
Cod	0	0	1.3	2.5	0	0.1	0	3	12.9	2.2	5.1
Herring	0	0	0	0	0	7	0	0	0	0	0
Sprat	0	0	0	0	0	0	0	0	194	0	10
Flounder	0	0	0	0	0	0	0	0	0	0.2	0
Dab	0	0	0	0	0	0	0	0	0.3	0.6	0.2
Unspecified	0	0	0	0	0	0	0	0	0	0	0.1
38G0	1,123	1,525	1,523	1,037	904	556	620	1,039	2,086	1,246	852
Cod	946	1,307	1,042	874	622	428	468	366	405	426	204
Herring	0	0	173	0.2	99	0	0.3	30	0	0	0
Sprat	0	0	137	0	69	0	0	536	1,605	670	467
Whiting	4.4	7.2	6.8	2.6	4.9	2.5	3	0.6	0.9	0.1	0
Flounder	39	49	50	51	30	22.7	21.5	11.7	6.5	19.5	27.4
Dab	42	56	40	43	43	75	101	75	41	100	106
Plaice	42	59	36	32	23.4	17.5	19.3	12.4	11.3	21.7	32.1
Turbot	5.2	3.3	1.7	1.6	1.5	1.6	2.2	1.6	0.9	0.9	2.4
Sole	0	0.2	0	0.3	0	0	0.3	0.8	0.1	0.1	2.3
Brill	0.2	0.2	0.2	0.5	0.5	1.7	1.1	1.5	1.1	0.6	1.7
Unspecified	43	43	37	31	11.1	6.7	3.9	3.8	14.4	7.8	8.9
37G0	18.2	0	1.2	0.3	0	0.7	2.5	2.2	2	23.6	5
Cod	18.2	0	1.2	0.3	0	0.4	2.1	2.2	1.9	0.2	4.5
Sprat	0	0	0	0	0	0	0	0	0	22.5	0
Flounder	0	0	0	0	0	0.1	0	0	0	0.7	0.1
Dab	0	0	0	0	0	0.2	0.2	0	0.1	0	0.4
Plaice	0	0	0	0	0	0	0.1	0	0	0.1	0
Unspecified	0	0	0	0	0	0	0.1	0	0	0.1	0
38G2	234.7	307	334.6	440.5	293.6	547.4	71.6	333.3	139	266.2	365.8
Cod	208	292	178	117	47	89	59	164	30	56	71
Herring	0	0	134	308	237	378	0	0	0	195	215
Sprat	0	0	0	0	0	35	0	146	93	7	67
Whiting	0.6	0	0.1	0.7	0.1	0.5	0	1.4	0	2	0.1
Flounder	7.5	3.2	3.5	7.4	4.9	23.2	7.9	10.9	5	2.5	4.3
Dab	1	0	0.4	0.8	0.8	9.2	2.9	6.1	2.3	1.4	4.9
Plaice	0.9	1.4	1.2	1.4	1.9	10	0.7	3.1	8.5	1.9	2.5
Turbot	0.3	0.2	0	0.1	0	0.5	0.2	0.1	0	0.1	0.3
Sole	0	0	0	0	0	0	0.1	0	0	0	0.1
Unspecified	16.2	10.3	17.8	5.1	2.7	2.5	0.5	1.9	0.6	0.5	0.6
37G2	0.1	2	1.3	0	0	0	0	20	0	0	1.3
Cod	0.1	2	1.1	0	0	0	0	0	0	0	1.3
Sprat	0	0	0	0	0	0	0	20	0	0	0
Unspecified	0	0	0.2	0	0	0	0	0	0	0	0
Total (tons)	1,408	1,856	1,910	1,509	1,227	1,209	695	1,454	2,796	1,553	1,248

	Value (1000 euro)										
Bagenkop	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
38G1	57.6	42.4	35.4	33.6	8.2	27.7	1.5	13.4	69.1	4.0	14.6
Cod	48.0	40.6	22.0	28.6	3.3	6.0	1.4	4.1	8.6	0.2	12.4
Herring	0.0	0.0	9.5	3.3	1.4	16.7	0.0	0.0	0.0	3.8	0.0
Sprat	0.0	0.0	0.0	0.0	3.4	4.9	0.0	8.1	53.1	0.0	0.0
Flounder	1.8	0.2	0.6	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.2
Dab	1.8	0.5	0.9	0.4	0.0	0.0	0.1	0.4	0.0	0.0	1.6
Plaice	2.9	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Turbot	1.2	0.0	0.6	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0
Unspecified	2.0	0.8	1.5	0.5	0.0	0.0	0.0	0.3	7.5	0.0	0.3
37G1	0.0	0.0	2.5	4.9	0.0	2.1	0.0	5.8	54.4	5.0	11.9
Cod	0.0	0.0	2.5	4.9	0.0	0.2	0.0	5.8	25.1	4.3	9.9
Herring	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0
Sprat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.1	0.0	1.5
Flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Dab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.2
Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
38G0	2,119	2,862	2,331	1,923	1,391	991.1	1,094.1	943.6	1,142.3	1,109.6	721.9
Cod	1,839	2,539	2,025	1,698	1,209	832.5	909.3	711.5	786.7	828.6	396.6
Herring	0.0	0.0	46.9	0.1	26.8	0.0	0.1	8.2	0.0	0.0	0.0
Sprat	0.0	0.0	20.5	0.0	10.3	0.0	0.0	80.2	240.4	100.3	70.0
Whiting	3.5	5.6	5.3	2.0	3.8	2.0	2.4	0.5	0.7	0.1	0.0
Flounder	22.2	28.0	28.3	29.3	17.2	12.9	12.3	6.7	3.7	11.1	15.6
Dab	43.5	57.4	41.8	44.7	44.6	77.6	104.4	77.5	42.5	103.0	109.7
Plaice	71.7	100.1	60.1	54.2	39.6	29.6	32.7	21.0	19.1	36.8	54.4
Turbot	30.2	19.2	9.9	9.3	8.7	9.3	12.8	9.3	5.2	5.2	13.9
Sole	0.0	2.5	0.0	3.8	0.0	0.0	3.8	10.1	1.3	1.3	29.0
Brill	1.2	1.2	1.2	3.1	3.1	10.4	6.7	9.2	6.7	3.7	10.4
Unspecified	108.3	108.6	92.8	78.6	27.8	16.8	9.8	9.5	36.0	19.5	22.3
37G0	35.4	0.0	2.3	0.6	0.0	1.0	4.7	4.3	3.8	4.6	9.2
Cod	35.4	0.0	2.3	0.6	0.0	0.8	4.1	4.3	3.7	0.4	8.7
Sprat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0
Flounder	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.1
Dab	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.1	0.0	0.4
Plaice	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0
Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.3	0.0
38G2	454.2	598.4	430.6	332.0	168.7	329.2	127.6	364.4	93.5	172.0	222.8
Cod	404.6	567.3	345.1	227.0	90.8	172.0	115.2	318.3	58.5	108.4	138.0
Herring	0.0	0.0	36.4	83.7	64.3	102.7	0.0	0.0	0.0	53.0	58.4
Sprat	0.0	0.0	0.0	0.0	0.0	5.2	0.0	21.9	13.9	1.0	10.0
Whiting	0.5	0.0	0.1	0.5	0.1	0.4	0.0	1.1	0.0	1.6	0.1
Flounder	4.3	1.8	2.0	4.2	2.8	13.2	4.5	6.2	2.8	1.4	2.5
Dab	1.0	0.0	0.4	0.8	0.8	9.5	3.0	6.3	2.4	1.4	5.1
Plaice	1.5	2.4	2.0	2.4	3.2	16.9	1.2	5.3	14.4	3.2	4.2
Turbot	1.7	1.2	0.0	0.6	0.0	2.9	1.2	0.6	0.0	0.6	1.7
Sole	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	1.3
Unspecified	40.5	25.8	44.5	12.8	6.8	6.3	1.3	4.8	1.5	1.3	1.5
37G2	0.2	3.9	2.6	0.0	0.0	0.0	0.0	3.0	0.0	0.0	2.5
Cod	0.2	3.9	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5
Sprat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
Unspecified	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (value)	2,667	3,506	2,805	2,294	1,568	1,351	1,228	1,334	1,363	1,295	983

Danish regional harbour landing statistics

The landings and value of the Danish landings from the fisheries in the 6 ICES rectangles (ICES 37G0, 38G0, 37G1, 38G1, 37G2 and 38G2) according to the basis harbours of the vessels from the majority of the regional harbours in the Western Baltic is given in Table 4.57. Because data is derived from logbooks it does not take into consideration the landings from vessels less than (<8 m).

In recent years (2006-2008), vessels from the regional harbours of Sønderborg (approx. 2,000 tons and 334,000-535,000 euro) and Åresund (approx. 250-1,000 tons and 60,000-230,000 euro), and the distant harbours of Hvide Sande (approx. 450-1,300 tons and 252,000-487,000 euro) and Thyborøn (52-105 tons and 100,000-193,000 euro) have accounted for the largest proportion of the fisheries near Fehmarnbelt (ICES 38G1 and 37G1) (see also Figure 4.40). There are also vessels from a number of other regional harbours, both near and far, that periodically undertake their fisheries near Fehmarnbelt (Kerteminde, Gilleleje, Thyborøn, Marstal, Bogense), but these vessels usually only account for a much smaller amount of the landings (typically <100 tons) and are not consistently fishing in the area. Despite some exceptions, there is a general trend indicating most of the fisheries from commercial vessels are in the general area (nearest ICES rectangles) of their basis harbours.

Table 4.57: Annual landings (tons) and value (1000 euro) from the Danish fisheries near Fehmarnbelt (ICES 38G1 and 37G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) according to where vessels have their basis harbours. Source: Danish Directorate of Fisheries.

Basis harbour - landings and value															Landings (tons)											Value of landings (1000 euro)
Harbours	**ICES**	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	**ICES**	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
KLINTHOLM HAVN	37G1	182.6	0.0	47.4	250.2	3.0	0.0	0.0	30.0	0.0	0.0	0.0	37G1	41.8	0.0	92.2	71.5	5.2	0.0	0.0	4.5	0.0	0.0	0.0
	38G1	46.0	13.4	17.4	136.4	74.4	76.2	80.7	25.4	118.3	1.1	0.0	38G1	18.3	13.6	20.5	66.3	25.5	14.8	13.4	4.5	23.5	2.1	0.0
	38G0	0.7	63.1	48.3	30.3	42.4	23.0	159.3	774.1	352.3	0.5	1.3	38G0	1.1	116.6	87.2	57.8	80.0	41.5	129.6	232.9	91.4	0.9	2.5
	37G2	1.0	0.0	26.8	26.9	0.0	0.6	0.0	0.0	0.0	0.0	0.0	37G2	1.7	0.0	10.1	10.5	0.0	1.2	0.0	0.0	0.0	0.0	0.0
	38G2	4,098	4,625	4,236	5,067	3,634	2,676	3,396	2,980	1,743	1,346	1,271	38G2	2,821	3,517	2,837	3,071	2,162	1,750	1,719	1,790	1,356	1,213	959
Totals	(tons)	4,328	4,702	4,375	5,510	3,754	2,775	3,636	3,809	2,214	1,348	1,272	(1000 euro)	2,884	3,647	3,048	3,277	2,273	1,808	1,862	2,032	1,470	1,215	962
STUBBE-KØBING	37G1	0.0	0.0	4.8	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	37G1	0.0	0.0	9.1	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0
	38G1	0.8	14.3	17.2	45.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G1	1.6	27.6	16.7	12.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	38G0	0.0	0.2	1.6	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	38G0	0.0	0.4	3.1	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
	38G2	660	345	364	486	281	170	64.9	0.0	0.0	0.0	5.9	38G2	458.6	393.7	276.5	269.7	143.9	91.1	55.2	0.0	0.0	0.0	11.8
Totals	(tons)	661	359	388	531	282	171	64.9	0.0	0.0	0.0	5.9	(1000 euro)	460.2	421.6	305.4	282.1	144.6	91.9	55.2	0.0	0.0	0.0	11.8
NAKSKOV	38G1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.0		38G1	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
	38G0	68.9	77.8	58.0	57.9	59.4	36.1	31.4	30.1	21.2	34.2	11.1	38G0	134.4	149.1	113.4	110.8	108.6	67.8	62.5	62.4	39.9	69.5	24.5
	38G2	0.0	0.7	0.4	0.0	0.1	0.2	0.0	0.1	0.9	0.2	0.0	38G2	0.0	1.2	0.8	0.0	0.2	0.3	0.0	0.2	2.4	0.5	0.0
Totals	(tons)	68.9	78.5	58.8	57.9	59.5	36.3	31.4	30.2	22.1	34.6	11.1	(1000 euro)	134.4	150.3	114.9	110.8	108.8	68.1	62.5	62.6	42.3	70.4	24.5
SPODS-BJERG	38G1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.0	1.9	38G1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.2	0.0	3.7
	37G0	0.0	0.0	0.0	0.7	0.0	0.0	0.3	0.0	0.0	0.0	0.0	37G0	0.0	0.0	0.0	1.3	0.0	0.0	0.6	0.0	0.0	0.0	0.0
	38G0	81.0	103.2	82.6	80.1	67.5	58.3	68.3	80.5	91.7	182.8	176.6	38G0	153.7	197.4	158.3	151.2	124.9	109.0	134.6	169.9	178.4	350.1	366.3
	38G2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G2	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	(tons)	81.0	103.2	82.8	80.8	67.5	58.5	68.6	80.5	91.8	182.8	178.5	(1000 euro)	153.7	197.4	158.7	152.5	124.9	109.4	135.2	169.9	178.6	350.1	370.0
MOMMARK	37G1	250.0	50.0	160.4	315.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37G1	50.0	13.6	34.5	65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	38G1	84.0	95.0	264.6	125.3	25.3	0.0	0.0	0.0	0.0	0.0	0.0	38G1	19.0	17.5	64.0	29.7	14.5	0.0	0.0	0.1	0.2	0.0	0.0
	37G0	0.0	20.0	0.0	60.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37G0	0.0	3.0	0.0	15.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	38G0	1,372	1,534	1,204	1,120	166	0.0	0.0	0.0	0.0	0.0	0.0	38G0	303.4	447.6	301.3	246.8	61.8	0.0	0.0	0.0	0.0	0.0	0.0
	37G2	65.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37G2	13.7	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	38G2	30.0	12.0	0.0	1.7	1.8	0.0	0.0	0.0	0.0	0.0	0.0	38G2	4.5	23.3	0.0	3.3	3.1	0.0	0.0	0.0	0.0	0.0	0.0
Totals	(tons)	1,801	1,711	1,629	1,624	193	0.0	0.0	0.0	0.0	0.0	0.0	(1000 euro)	390.7	504.9	399.8	362.6	79.4	0.0	0.0	0.1	0.2	0.0	0.0
FÅBORG	37G1	32.0	18.4	7.0	172.1	28.3	0.0	0.0	6.7	5.7	0.0	0.0	37G1	58.8	35.1	13.1	41.0	8.2	0.0	0.0	18.4	10.8	0.0	0.0
	38G1	60.3	30.8	16.0	16.1	0.6	0.8	1.1	66.0	134.0	2.6	0.3	38G1	91.5	64.9	32.6	30.1	3.1	2.3	1.8	28.1	62.6	4.1	0.5
	37G0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	37G0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
	38G0	905	322	1,150	1,134	279	116	250	281	135	48.6	11.8	38G0	325.0	400.5	629.2	547.0	242.5	196.0	387.7	175.1	168.7	77.0	17.9
	37G2	0.0	1.4	19.7	11.0	7.6	0.0	0.0	9.1	0.0	0.0	0.0	37G2	6.6	39.4	45.6	28.8	19.4	3.3	5.1	20.3	2.7	10.4	14.8
	38G2	13.1	93.1	55.4	63.7	51.1	32.3	9.3	6.6	0.1	5.1	0.0	38G2	3.9	171.6	99.4	109.3	90.8	54.9	11.7	12.4	0.1	9.4	0.0
Totals	(tons)	1,011	466	1,249	1,397	366	149	261	370	275	56.3	12.1	(1000 euro)	485.7	711.4	820.5	756.2	364.0	256.5	406.3	256.3	244.8	100.9	33.3
MARSTAL	38G0	51.6	60.6	58.5	69.7	62.9	55.5	55.6	61.5	70.3	71.4	62.4	38G0	102.5	117.7	108.9	128.3	113.5	108.8	115.3	124.1	138.8	146.9	132.1
	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Totals	(tons)	51.6	60.6	58.5	69.7	62.9	55.5	55.6	61.5	70.3	71.7	62.4	(1000 euro)	102.5	117.7	108.9	128.3	113.5	108.8	115.3	124.1	138.8	147.8	132.1
SØNDER-BORG	37G1	241.5	0.0	37.0	201.2	0.0	0.0	316.7	212.8	690.0	1,187	1,073	37G1	65.1	0.0	6.0	42.7	0.2	0.0	48.7	38.7	132.0	401.7	177.2
	38G1	66.4	93.0	16.1	66.2	30.9	66.0	142.0	776.6	1,382	743.0	989.8	38G1	17.8	25.7	6.2	17.2	9.7	11.0	21.3	134.1	260.1	133.0	156.9
	37G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.4	0.0	36.1	37G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.9	12.8	7.4
	38G0	2,045	1,153	1,384	2,045	216	3,613	1,460	2,347	1,390	580	294	38G0	600.6	549.2	646.8	684.3	247.7	1,004.7	327.0	527.7	422.8	247.9	117.8
	37G2	0.0	0.0	1.7	0.0	0.0	0.0	487.1	0.0	0.0	0.0	0.0	37G2	0.0	0.0	3.3	0.0	0.0	0.0	73.4	0.0	0.0	0.0	0.0
	38G2	1.8	6.5	14.2	38.3	2.1	2.0	980.3	32.7	0.0	0.7	11.3	38G2	3.5	12.6	3.3	14.2	3.7	4.0	227.3	4.1	0.0	1.3	21.6
Totals	(tons)	2,355	1,253	1,453	2,350	249	3,681	3,386	3,369	3,519	2,511	2,404	(1000 euro)	687.0	587.5	665.6	758.5	261.2	1,020	697.7	704.6	826.8	796.7	480.9
GILLELEJE	37G1	0.0	0.0	0.0	17.0	0.0	0.0	0.0	0.0	0.0	67.4	25.0	37G1	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.1	0.0	46.2	0.0
	38G1	0.0	0.0	9.2	26.0	6.3	2.0	0.0	0.0	90.9	0.0	19.2	38G1	82.8	25.1	16.9	30.6	12.2	7.8	0.0	16.3	30.1	0.0	11.0
	38G0	0.0	0.3	1.6	154	10.1	0.6	50.8	7.4	15.4	16.0	133.1	38G0	0.1	2.1	2.7	44.0	13.5	0.6	88.9	15.4	30.1	24.8	20.2
	37G2	0.0	0.0	76.8	272	0.0	12.7	26.1	0.0	166.0	0.0	0.0	37G2	0.0	0.0	32.2	73.8	0.0	7.9	8.7	0.0	40.2	0.0	0.0
	38G2	826	936	2,436	2,143	1,267	487	714	627	600	368	18	38G2	357.1	847.9	859.6	772.7	389.5	255.9	225.2	294.6	186.0	120.3	10.6
Totals	(tons)	826	936	2,524	2,612	1,284	502	791	635	872	452	195	(1000 euro)	440.0	875.1	911.4	925.8	415.2	272.2	322.8	326.4	286.3	191.2	41.8
ÅRØSUND	37G1	0.0	0.0	170.8	14.0	10.0	26.0	0.0	81.6	479.8	224.6	6.0	37G1	0.0	0.0	43.5	27.3	2.7	3.9	0.0	17.2	129.8	34.5	0.6
	38G1	69.0	47.0	0.0	76.7	5.0	33.0	47.1	233.5	534.5	634.2	246.4	38G1	26.2	17.3	3.7	26.9	2.2	6.2	7.9	39.9	100.1	98.2	59.7
	37G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	37G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0
	38G0	25.0	434.1	275.3	309.8	218.1	236.4	347.9	712.5	315.7	195.8	101.5	38G0	6.8	105.0	87.7	118.9	104.4	162.1	70.9	122.4	76.7	48.1	23.1
	38G2	0.0	0.0	0.0	1.0	0.0	1.7	469.4	51.7	148.1	0.0	0.0	38G2	1.6	1.2	1.1	2.3	0.6	4.6	104.6	12.9	27.7	0.0	0.2
Totals	(tons)	94	481	446	402	233	297	864	1,079	1,488	1,055	354	(1000 euro)	34.7	123.5	136.0	175.3	109.9	176.8	183.4	192.4	335.8	180.7	83.6
KERTEMINDE	37G1	58.5	0.0	72.3	644.9	579.5	220.0	0.0	6.0	31.2	0.0	36.2	37G1	13.0	0.0	14.4	141.9	180.1	37.4	0.2	0.9	6.8	0.0	5.7
	38G1	63.2	5.7	134.9	459.4	56.0	22.3	1.3	71.3	96.5	37.3	1.2	38G1	41.6	11.2	30.0	105.4	25.6	39.6	3.4	12.5	22.8	23.4	2.3
	37G0	1.0	0.0	1.1	151.0	0.3	1.5	0.6	0.2	70.4	2.2	0.0	37G0	1.9	0.0	2.1	34.5	0.5	5.0	1.3	1.4	11.3	4.3	0.0
	38G0	41.4	278.9	186.7	200.2	91.9	433.5	943.4	878.1	247.9	136.2	29.0	38G0	76.2	227.8	213.7	331.3	119.4	174.2	430.7	207.8	235.1	163.6	40.4
	37G2	0.0	0.0	0.0	0.3	6.6	0.0	0.0	0.5	0.0	0.0	0.0	37G2	0.0	0.0	0.0	0.6	12.8	0.0	0.0	0.9	0.0	0.0	0.0
	38G2	0.5	7.2	79.2	170.0	417.8	116.1	780.2	368.8	137.5	0.6	17.8	38G2	31.4	14.7	153.5	249.6	248.6	145.6	228.9	330.1	150.0	1.7	31.7
Totals	(tons)	165	292	474	1,626	1,152	793	1,726	1,325	584	176	84.2	(1000 euro)	164.2	253.7	413.7	863.1	586.9	401.8	664.4	553.7	426.1	193.0	80.0
BOGENSE	37G1	738.5	165.5	416.1	184.4	0.0	36.0	0.0	0.0	322.3	0.0	0.4	37G1	176.2	84.0	170.3	43.3	0.0	5.4	0.0	0.0	50.8	0.0	0.5
	38G1	281.5	242.8	149.1	562.5	218.7	16.0	0.0	23.5	182.8	0.0	0.0	38G1	72.9	111.6	278.4	188.4	65.0	2.4	0.5	8.6	63.8	0.4	0.0
	37G0	0.0	0.0	288.6	98.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	37G0	0.0	0.0	56.2	24.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0
	38G0	468.6	700.1	223.5	501.4	52.4	51.3	0.0	31.6	23.7	0.0	0.0	38G0	154.6	235.3	202.0	170.9	94.7	25.5	0.0	28.4	47.0	0.2	0.0
	37G2	16.1	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37G2	31.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	38G2	175.0	113.6	101.8	34.1	140.0	195.5	165.6	393.9	31.8	0.0	0.0	38G2	287.4	207.1	174.0	53.5	43.4	66.3	33.0	134.8	14.9	0.1	0.0
Totals	(tons)	1,680	1,222	1,182	1,380	413	299	166	449	561	0.0	0.4	(1000 euro)	722.2	637.9	885.7	480.0	206.6	99.7	33.5	171.8	176.4	0.6	0.5
HVIDE SANDE	37G1	1,125	786.8	273.8	337.0	89.6	77.9	561.9	100.6	1,052	538.8	301.5	37G1	366.6	252.9	498.6	347.3	151.3	143.7	373.4	163.6	265.4	332.0	189.7
	38G1	86.5	29.1	134.9	192.4	152.3	35.0	64.7	21.5	254.9	30.4	164.7	38G1	56.2	26.2	246.7	322.8	272.4	65.2	106.1	35.4	222.0	53.0	63.0
	37G0	0.6	4.2	4.6	46.3	0.0	21.6	19.1	70.3	284.2	28.2	20.0	37G0	1.2	8.4	8.7	84.4	0.0	35.2	23.2	33.9	44.3	45.6	36.8
	38G0	628.3	196.6	537.5	730.8	516.7	656.3	752.4	868.3	389.3	483.4	380.6	38G0	249.0	346.4	996.3	1,100.5	830.4	438.1	1,044.1	663.0	622.7	787.2	605.6
	37G2	248.5	490.2	45.5	73.5	93.2	32.3	242.8	60.1	7.7	10.4	7.1	37G2	75.3	138.9	81.2	133.6	147.7	56.8	129.4	25.8	13.4	19.1	12.7
	38G2	125.3	105.8	147.0	102.9	171.7	51.3	482.4	246.1	27.6	10.8	50.8	38G2	139.1	192.1	260.7	176.7	271.3	92.7	132.0	58.5	44.1	19.0	91.7
Totals	(tons)	2,214	1,613	1,143	1,483	1,024	874	2,123	1,367	2,016	1,102	925	(1000 euro)	887.4	964.7	2,092	2,165	1,673	831.8	1,808	980.1	1,212	1,256	999.5
THYBORØN	37G1	23.7	46.5	67.9	48.5	12.1	6.9	54.7	29.2	34.4	97.4	86.5	37G1	46.8	90.0	132.7	89.8	23.9	13.7	104.9	50.3	67.6	178.8	164.5
	38G1	28.0	99.4	102.9	41.2	12.8	16.1	21.1	2.3	17.6	7.7	12.0	38G1	54.9	184.1	193.0	76.6	24.4	30.1	38.1	4.2	33.2	14.6	23.5
	37G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.8	0.0	0.0	37G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	5.2	0.0	0.0
	38G0	10.7	7.2	39.5	0.0	27.0	0.0	19.3	1.6	2.4	1.7	0.0	38G0	21.3	14.0	69.3	0.0	67.6	0.0	37.8	3.2	4.7	3.3	0.0
	37G2	53.5	68.0	111.7	175.0	84.9	35.5	100.3	85.6	156.5	90.4	109.0	37G2	99.8	129.3	206.5	308.9	159.2	64.0	184.5	158.4	288.3	172.6	207.5
	38G2	231.3	606.3	579.7	1,121	631.5	796.9	548.6	425.3	708.1	659.4	576.3	38G2	440.2	1,033	1,095	1,791	1,075	1,445	948.7	775.3	1,148	1,234	1,096
Totals	(tons)	347.2	827.4	901.7	1,386	768.3	855.4	744.0	544.4	921.8	856.6	783.8	(1000 euro)	662.9	1,451	1,696	2,266	1,350	1,553	1,314	992.1	1,547	1,604	1,491

The landings and value of the landings from the fisheries in the 6 ICES rectangles (ICES 37G0, 38G0, 37G1, 38G1, 37G2 and 38G2) according to regional and distant landing harbours is given in Table 4.58. Because data is derived from logbooks it does not take into consideration the landings from vessels less than (<8 m).

The regional harbour that has been used to land a substantial amount of the catches from the fisheries near Fehmarnbelt (ICES 38G1 and 37G1) in recent years is Sønderborg (approx. 350-1,400 tons). Other harbours where a smaller amount (typically <100 tons) of catches from the Fehmarnbelt area are Åresund, Klintholm Havn, Kerteminde and Rødvig (see Figure 4.42).

Table 4.58: Annual landings (tons) and value (1000 euro) from the Danish fisheries near Fehmarnbelt (ICES 38G1 and 37G1) and regional areas (ICES 38G0, 37G0, 38G2 and 37G2) in the regional harbours. Source: Danish Directorate of Fisheries.

Landings harbour - landings and value									Landings (tons)											Value of landings (1000 euro)										
Harbours	**ICES**	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	**ICES**	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
	37G1	0.0	0.0	0.0	0.0	1.3	0.0	0.7	0.0	0.0	0.0	0.0	37G1	0.0	0.0	0.0	0.0	0.0	2.5	0.0	1.0	0.0	0.0	0.0
	38G1	2.3	2.0	0.0	20.0	2.3	0.4	0.0	0.6	21.4	0.0	0.5	38G1	4.5	4.0	0.0	5.4	4.5	0.7	0.0	1.1	8.0	0.0	0.9
GILLELEJE	38G0	0.0	0.0	0.2	0.5	0.0	0.0	1.1	0.0	3.5	0.0	0.0	38G0	0.0	0.0	0.3	1.0	0.0	0.0	2.0	0.0	6.8	0.0	0.0
	37G2	0.0	0.0	0.0	0.0	0.0	0.5	25.0	9.2	10.0	0.0	0.0	37G2	0.0	0.0	0.0	0.0	0.0	1.0	6.8	17.6	2.7	0.0	0.0
	38G2	94.1	174.7	414.0	460.5	115.4	234.8	293.0	164.7	70.7	65.5	11.7	38G2	42.3	76.1	211.7	230.0	67.6	105.6	84.1	57.7	17.9	18.6	22.6
Totals	(tons)	96.4	176.7	414.2	481.0	117.7	237.0	319.1	175.2	105.6	65.5	12.2	(1000 euro)	46.9	80.1	211.9	236.4	72.1	109.8	92.8	77.4	35.4	18.6	23.5
	37G1	0.0	0.0	1.9	0.2	0.0	1.6	0.0	0.9	36.6	40.0	4.1	37G1	0.0	0.0	3.6	0.1	0.0	3.1	0.0	1.8	67.2	20.2	7.1
	38G1	0.8	1.0	1.9	56.6	5.7	1.1	1.4	1.5	71.8	4.7	54.2	38G1	1.6	1.9	3.2	91.1	10.7	2.1	2.4	1.7	94.4	7.9	33.1
RØDVIG	38G0	1.8	0.0	0.0	1.7	0.0	0.7	0.1	1.2	1.1	0.0	0.1	38G0	3.5	0.0	0.0	3.4	0.0	1.4	0.2	2.1	2.2	0.0	0.2
	37G2	0.5	0.0	0.9	6.2	0.1	0.1	4.0	2.2	18.9	0.0	0.0	37G2	0.8	0.0	1.6	12.1	0.2	0.2	7.0	2.2	6.6	0.0	0.0
	38G2	118.8	213.3	108.7	181.4	149.5	58.1	39.4	151.9	87.8	103.1	101.7	38G2	208.3	400.8	198.9	285.2	82.9	71.8	36.2	77.2	96.2	156.5	161.9
Totals	(tons)	121.9	214.3	113.4	246.1	155.3	61.6	44.9	157.7	216.2	147.8	160.1	(1000 euro)	214.2	402.7	207.2	391.8	93.8	78.6	45.7	85.0	266.7	184.6	202.3
	37G1	210.3	17.1	55.9	249.2	3.0	0.6	0.0	7.0	12.0	0.0	3.8	37G1	59.9	30.7	104.2	72.7	5.5	1.2	0.0	12.6	1.8	0.0	7.0
	38G1	48.4	14.2	24.1	159.8	29.1	30.2	15.0	0.9	2.0	15.2	12.1	38G1	22.5	15.1	16.1	66.5	12.6	13.6	2.3	1.7	3.7	6.0	13.7
KLINT-	37G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	37G0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
HOLM	38G0	23.2	22.5	20.6	133.6	16.4	15.1	2.4	1.9	0.4	0.5	1.3	38G0	43.5	43.6	32.8	69.3	17.4	27.0	4.1	3.1	0.7	0.9	2.5
	37G2	17.2	2.0	1.6	26.9	3.6	13.2	0.0	22.1	0.0	0.0	1.3	37G2	32.9	3.9	3.0	10.6	6.8	25.0	0.0	6.2	0.0	0.0	2.5
	38G2	5,381	6,129	5,296	6,397	4,376	3,229	4,395	3,658	2,207	1,593	1,670	38G2	4,263	5,434	3,768	4,025	2,622	2,349	2,347	2,611	1,803	1,365	1,247
Totals	(tons)	5,680	6,185	5,398	6,966	4,428	3,288	4,413	3,690	2,221	1,608	1,689	(1000 euro)	4,422	5,527	3,924	4,244	2,664	2,416	2,354	2,635	1,809	1,372	1,274
	37G1	2.2	10.2	44.5	26.7	12.5	13.2	26.9	21.7	28.9	75.8	28.8	37G1	3.7	19.0	85.9	50.4	23.2	19.4	48.0	38.9	54.3	137.4	54.5
STUBBE-	38G1	1.4	11.4	10.4	21.2	15.6	0.6	7.8	1.9	16.0	4.9	0.0	38G1	3.0	22.4	18.0	40.3	10.5	0.5	12.4	3.2	29.2	9.0	0.0
KØBING	37G0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	37G0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0
	38G0	1.8	0.4	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38G0	3.4	0.4	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	37G2	4.9	34.3	59.4	133.0	99.8	20.0	93.3	94.1	182.9	111.3	78.4	37G2	9.6	64.9	107.8	234.1	186.1	36.9	168.4	171.0	337.2	210.4	149.1
	38G2	230.1	460.3	594.4	1,069	685.1	713.4	559.5	420.3	745.2	645.0	624.0	38G2	418.6	884.3	1,120	1,846	1,162	1,284	968.7	758.6	1,308	1,209	1,190
Totals	(tons)	240	518	709	1,254	813	747	688	538	976	837	731	(1000 euro)	438.2	992.9	1,332	2,177	1,382	1,341	1,197	971.8	1,734	1,566	1,393
	38G1	5.4	14.1	12.6	4.8	0.7	1.3	0.0	0.0	0.1	0.0	1.9	38G1	10.2	27.7	24.5	9.4	1.4	2.5	0.0	0.0	0.2	0.0	3.7
SPODSBJERG	37G0	0.0	0.0	0.0	0.7	0.0	0.0	0.3	0.0	0.0	0.0	0.0	37G0	0.0	0.0	0.0	1.3	0.0	0.0	0.6	0.0	0.0	0.0	0.0
	38G0	109.0	150.3	116.2	86.0	74.9	102.1	73.2	81.3	91.5	182.8	176.6	38G0	203.5	283.0	222.4	160.6	139.1	132.5	142.2	157.2	177.4	348.0	364.8
	38G2	0.0	2.6	0.2	3.8	1.3	0.2	0.0	0.0	0.0	0.0	0.0	38G2	0.0	4.9	0.4	7.2	2.5	0.4	0.0	0.0	0.0	0.0	0.0
Totals	(tons)	114.4	167.0	129.0	95.3	76.9	103.6	73.5	81.3	91.6	182.8	178.5	(1000 euro)	213.7	315.6	247.3	178.6	142.9	135.4	142.7	157.2	177.6	348.0	368.5
MARSTAL	38G0	51.6	60.6	58.2	69.7	62.0	55.3	55.6	61.5	67.7	71.4	74.3	38G0	102.5	117.7	108.4	128.3	113.0	108.4	115.3	124.1	133.8	146.9	152.2
	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	38G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Totals	(tons)	51.6	60.6	58.2	69.7	62.0	55.3	55.6	61.5	67.7	71.7	74.3	(1000 euro)	102.5	117.7	108.4	128.3	113.0	108.4	115.3	124.1	133.8	147.8	152.2
	38G1	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	38G1	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7
MOMMARK	37G0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37G0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	38G0	13.3	3.1	11.6	4.8	9.2	10.2	42.9	24.1	34.9	38.7	26.2	38G0	26.0	5.8	22.2	8.4	15.6	19.5	79.2	44.1	66.6	72.9	53.2
	38G2	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	38G2	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0
Totals	(tons)	13.3	3.9	13.8	4.8	9.2	10.2	44.9	24.1	34.9	38.7	27.6	(1000 euro)	26.0	7.0	26.7	8.4	15.6	19.5	82.8	44.1	66.6	72.9	55.9
	37G1	301.5	66.9	189.3	490.6	6.6	14.4	301.3	148.3	448.4	462.1	247.2	37G1	97.0	44.6	114.1	166.1	12.4	25.1	83.8	37.7	121.0	257.9	64.2
	38G1	129.9	244.0	188.6	249.5	81.3	49.5	102.6	352.1	962.1	293.6	111.1	38G1	33.7	75.5	139.0	137.6	66.3	16.7	33.1	113.9	293.6	97.4	25.9
	37G0	0.0	24.2	0.2	88.4	0.0	22.1	7.5	14.5	289.2	3.9	37.5	37G0	0.0	11.1	0.4	61.0	0.0	37.4	13.7	24.0	44.6	5.7	9.9
SØNDER-	38G0	4,089	3,212	3,082	3,828	907	4,483	2,463	2,550	1,579	943	348	38G0	1,121	1,412	1,862	1,902	1,033	1,496	1,221	1,036	895.7	900.5	435.5
BORG	37G2	67.7	0.0	5.2	22.5	3.6	0.6	311.1	3.3	10.9	1.1	0.0	37G2	19.3	0.0	9.3	38.7	6.7	1.1	55.5	6.4	19.9	2.0	0.0
	38G2	34.6	35.3	29.9	53.5	43.3	2.6	695.7	63.6	2.0	1.7	2.9	38G2	68.4	68.1	30.3	66.7	70.2	4.9	117.6	23.0	3.0	2.8	5.3
Totals	(tons)	4,622	3,582	3,495	4,732	1,042	4,572	3,881	3,132	3,292	1,705	747	(1000 euro)	1,340	1,611	2,155	2,372	1,189	1,582	1,525	1,241	1,378	1,266	540.8
	37G1	6.6	1.2	0.3	10.8	0.0	0.0	19.6	1.2	2.7	0.3	0.0	37G1	12.3	2.2	0.4	3.8	0.0	0.0	35.8	2.3	5.1	0.6	0.0
	38G1	21.3	6.5	3.7	2.6	0.0	0.0	11.9	28.7	40.7	3.1	0.3	38G1	23.0	11.6	6.6	4.6	0.0	0.0	21.6	24.6	64.6	5.0	0.5
FÅBORG	37G0	0.0	0.0	0.3	0.0	0.0	1.1	0.0	0.0	0.0	0.0	1.8	37G0	0.0	0.0	0.6	0.0	0.0	2.2	0.0	0.0	0.0	0.0	2.9
	38G0	953.9	721.8	1,665	1,027	347.8	221.5	642.4	293.7	255.6	103.1	23.8	38G0	334.9	512.5	1,090	538.9	362.4	325.0	791.4	199.8	423.1	164.0	37.6
	37G2	0.0	0.0	16.2	4.8	4.6	0.0	0.0	1.0	0.0	0.0	0.0	37G2	0.0	0.0	31.4	8.8	8.5	0.0	0.0	1.9	0.0	0.0	0.0
	38G2	0.0	0.0	7.4	3.8	6.5	0.0	1.1	2.0	0.0	4.5	0.0	38G2	0.0	0.0	14.5	7.1	10.9	0.0	1.8	3.5	0.0	6.4	0.0
Totals	(tons)	981.8	729.5	1,693	1,049	358.9	222.6	675.0	326.6	299.0	111.0	25.9	(1000 euro)	370.3	526.3	1,143	563.3	381.8	327.2	850.7	232.1	492.8	176.0	41.0
	37G1	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	37G1	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0
	38G1	2.9	3.8	0.0	1.6	0.0	1.9	5.2	0.0	0.0	4.4	0.0	38G1	5.2	5.0	0.0	3.0	0.0	3.3	9.8	0.0	0.0	7.3	0.0
SØBY HAVN	38G0	330.3	518.2	433.5	336.7	414.2	277.4	287.4	252.3	456.1	281.0	179.9	38G0	568.7	907.0	743.9	566.5	504.1	480.2	496.2	281.6	324.1	464.0	290.2
	37G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	37G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0
	38G2	0.0	0.4	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.3	0.0	38G2	0.0	0.6	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.3	0.0
Totals	(tons)	333.2	522.4	437.4	338.3	416.6	279.3	292.6	253.1	456.1	287.4	179.9	(1000 euro)	573.9	912.6	749.1	569.5	508.3	483.5	506.0	283.2	324.1	474.7	290.2
	37G1	36.5	7.6	47.3	66.2	1.0	15.0	0.0	0.0	62.1	0.0	0.4	37G1	18.9	14.2	9.5	16.0	1.9	4.1	0.0	0.0	9.5	0.0	0.5
	38G1	22.3	5.9	47.9	20.5	3.6	7.4	1.3	20.2	19.5	32.8	1.1	38G1	19.5	9.7	16.3	17.0	6.6	13.7	3.4	3.3	10.6	15.1	1.9
KERTEMINDE	37G0	1.0	0.0	0.4	27.5	0.3	1.5	0.6	0.2	45.3	2.2	0.0	37G0	1.9	0.0	0.8	8.2	0.5	5.0	1.3	1.4	7.3	4.3	0.0
	38G0	94.7	144.2	90.0	49.3	51.9	382.0	853.8	724.8	121.5	66.9	30.5	38G0	83.8	132.0	63.7	82.9	52.8	104.5	258.2	170.1	88.9	74.0	58.6
	37G2	0.0	1.3	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37G2	0.0	2.4	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	38G2	20.4	14.9	11.1	4.5	6.3	2.1	385.0	62.4	11.1	0.0	4.0	38G2	38.8	26.9	20.0	7.8	11.5	3.8	75.3	26.6	1.8	0.0	7.0
Totals	(tons)	174.9	173.9	196.8	168.3	63.1	408.0	1,241	807.6	259.5	101.9	36.0	(1000 euro)	162.9	185.2	110.3	132.4	73.4	131.1	338.2	201.4	118.3	93.4	68.1
	37G1	0.0	1.4	123.9	106.1	20.0	12.0	0.0	32.5	86.6	68.5	38.2	37G1	0.0	2.6	54.5	53.6	5.4	1.8	0.0	4.9	14.1	11.2	8.0
	38G1	58.7	34.0	0.0	42.8	0.0	8.0	17.0	92.4	85.1	89.6	37.3	38G1	13.6	9.2	0.0	15.2	0.0	13.0	2.6	14.6	13.0	17.1	8.9
ÅRØSUND	37G0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	35.1	0.0	0.0	0.0	37G0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	5.5	0.0	0.0	0.0
	38G0	71.2	405.8	397.7	400.1	203.9	275.2	179.9	235.5	280.4	61.4	59.8	38G0	17.0	99.1	154.8	141.3	95.7	111.7	45.2	53.2	104.8	73.7	45.4
	38G2	0.0	0.0	0.0	0.0	1.7	0.0	70.0	101.5	43.9	1.1	0.0	38G2	0.0	0.0	0.0	0.0	3.4	0.0	10.5	18.0	13.5	1.8	0.0
Totals	(tons)	129.9	442.1	521.6	549.0	225.6	295.2	266.9	497.0	496.0	220.6	135.3	(1000 euro)	30.6	112.3	209.3	210.1	104.5	126.5	58.3	96.2	145.4	103.9	62.3

4.2 Baseline - economic situation of fisheries

4.2.1 Gill net and trammel net fisheries

Denmark

- Landings and value of landings

For the different length classes of gill and trammel net fisheries, the following average annual landings and values of landings were calculated from the available logbook and price data:

Table 4.59: Average annual weight and value of landings in gill/trammel net fisheries, Denmark.

Length class	Unit	2005	2006	2007	2008	∅ 2005-8
8-12 m	kg	15,877	21,130	23,700	21,743	20,613
	1,000 Euro	31.1	40.1	55.3	49.3	43.9
12-15 m	kg	43,945	56,852	60,385	81,472	60,664
	1,000 Euro	91.0	121.9	133.8	163.4	127.5

Source: Logbook data

The available data indicated lower values for vessels below 8 m and higher values for bigger vessels.

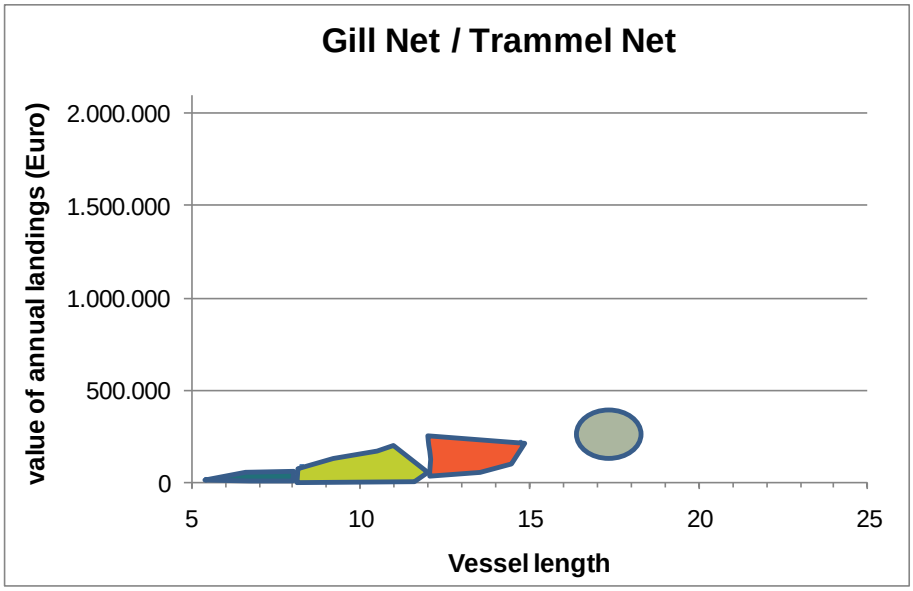


Figure 4.89: Visualisation of average value of landings (in Euro) per year by vessel length for gill/trammel net, Denmark. Source: Logbook data, price data, own calculations (adjusted data, see below). The different colours represent the various vessel lengths categories. The individual data did not show any significant clusters, but rather formed a continuum.

Due to reasons of confidentiality, data for the individual vessels could not be displayed in the chart, but clusters were formed instead. The result shows a rise of value of landings with increasing vessel length (Figure 4.89) – a result which had been expected. The figure also indicates that some of the vessels above 10 m generated only marginal landings. This pattern suggests that they are not used for full-time professional fisheries.

Table 4.60: Share of value in gill/trammel net fisheries by size class and species, Denmark.

Size class	8-<12 m		12-<15 m	
Rank	Species	Share	Species	Share
1	Atlantic cod	76%	Atlantic cod	61%
2	European plaice	7%	European plaice	17%
3	Unspecified	6%	Turbot	6%
4	Turbot	5%	Unspecified	6%
5	Common dab	1%	Common sole	6%

Cod has by far the highest share in the value of gill net fisheries landings, followed by various flat fish (Table 4.60). The limited data available on gill net fisheries of vessel between 15 and 18 m length suggest that sole has a high first rank there.

Table 4.61: Share of value in gill/trammel net fisheries by size class and specific gear.

Size class	8-<12 m		12-<15 m	
Rank	Gear	Share	Gear	Share
1	Gill net	58%	Gill net	75%
2	Trammel nets	19%	Trammel nets	18%
3	Gill nets	15%	Gill nets	3%
4	Handlines, fishing rods	4%	Bottom trawl	3%
5	Longlines	2%	Handlines, fishing rods	1%

As expected, gill and trammel nets are the predominant gears, contributing to the overall value of landings (Table 4.61). Some vessels above 12 m that generate most of the value of landings with gear of the gear group gill/trammel net apparently also practice bottom trawling.

The figures on the value of landings derived from logbook and price data were compared to the data of the official Danish account statistics on fisheries for the gear class net and hook fisheries (although this is not exactly the same reference, vessels in the “gill/trammel net” group also used hand- and longlines as demonstrated above, so that a large congruence of both groups is assumed).

Table 4.62: Average annual value of landings in gill/trammel net fisheries according to own survey and to account statistics (in 1,000 Euro). Data sources: Logbook data and FOI/FD Statistics.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	∅05-08
own 8-<12 m						31.1	40.1	55.3	49.3	43.9
DK Stat < 12 m	74.2	74.4	68.3	69.8	69.4	69.4	83.1	81.5	86.2	80.0
adjusted value of average annual landings 2005-2008 (8-12 m)										62.0
own 12-<15 m						91.0	121.9	133.8	163.4	127.5
DK Stat 12-<15m	179.3	184.7	162.4	175.8	139.7	160.7	198.5	230.5	200.1	197.4
adjusted value of average annual landings 2005-2008 (12-<15 m)										162.6

The comparison of both time series shows that figures of the official statistics for all of Denmark are higher than those calculated on the basis of logbook data for our region. As discussed in chapter 3, there is some reason to assume that the value of landings is lower in the region under consideration than in other parts of Denmark, but certain shortcomings of the data used by us cannot be excluded, so that an average between our figures and those of the account statistics will be used for further calculations.

The factor of adjustment of the official account statistics is 77% in case of vessels below 12 m and 82% for vessels from 12 m to below 15 m.

- Income, cost and profit structure

Scaled with this factor, the average annual value of landings was 62,000 Euro per vessel between 8 and 12 m, the average additional output (fishery income other than the value of landings as well as subsidies and incomes from other sources) for the period 2005-2008 was 2,000 Euro or 3% of the total output. For vessels from 12 m to below 15 m, the adjusted value of landings was 162,600 Euro, 3,600 Euro output came from other sources.

Table 4.63: Average annual output, costs and profit in gill/trammel net fisheries for the period 2005-2008, Denmark.

	8-<12 m		**12-<15 m**	
	1,000 Euro	**% of output**	**1,000 Euro**	**% of output**
Gross output				
Value of landings	62.0	97%	162.6	98%
Other incomes (other turnover, subsidies, compensations)	2.0	3%	3.6	2%
Total output	64.0	100%	166.2	100%
Costs				
Fuel and lubricants	3.9	6%	11.1	7%
Other variable costs (ice, landing & sales costs, etc.)	8.6	13%	21.5	13%
Maintenance (vessel, gear, etc.)	8.9	14%	15.0	9%
Depreciation (vessel, gear, etc.)	8.7	14%	22.1	13%
Wages (excl. wage to owner, incl. flexible shares of crew)	5.5	9%	35.3	21%
Insurances, administrative costs etc.	6.8	11%	16.1	10%
Other fixed costs (rent of plant etc.)	0.4	1%	0.5	0%
Interests (income - expenditure)	1.7	3%	8.3	5%
Total Costs	44.6	70%	130.1	78%
Net profit / loss	19.5	30%	36.1	22%

The share of individual cost positions on the overall costs are presented in the figure below (Figure 4.90).

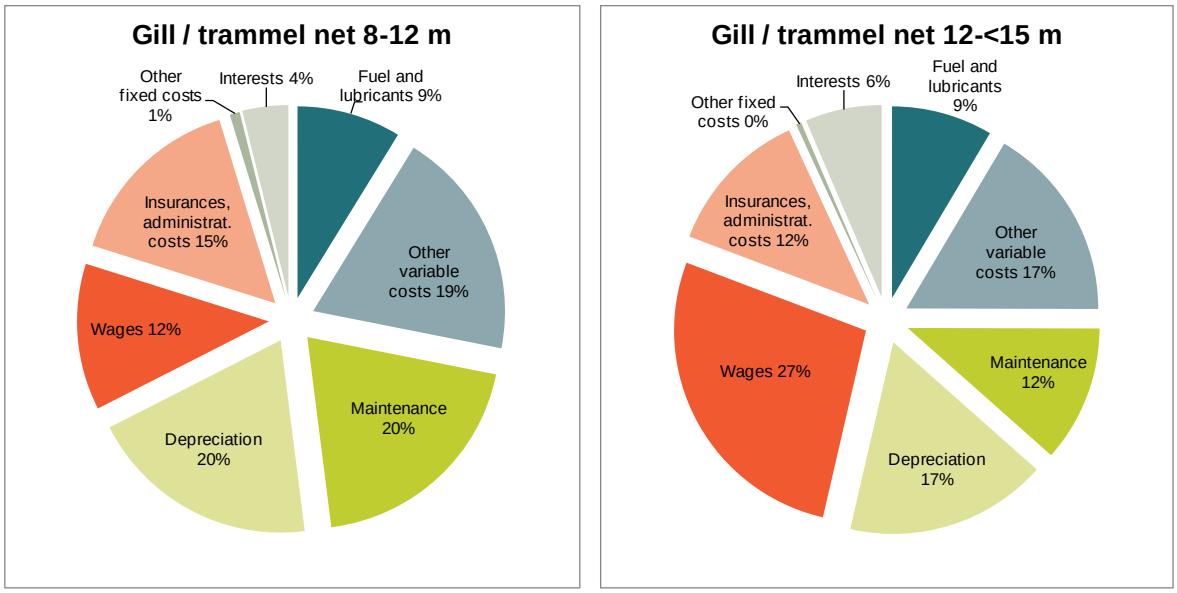


Figure 4.90: Share of cost positions on total costs in gill and trammel net fisheries, Denmark.

According to the official account statistics, vessels below 12 m were in average 103 days per year at sea, whereas fishing operations required 181 labour days, i.e. 1.8 labour days per day at sea.

The total labour days include paid labour with a wage of 5,500 Euro or 12% of the overall costs, while presumably the majority of the labour is unpaid work of the owner and should be compensated by the profit. Nevertheless, the resulting (adjusted) profit of 19,500 Euro per year for vessels between 8 and 12 m is hardly sufficient to support a fisherman's family – the same applies to a profit of 25,100 Euro, which is the Danish annual average for this vessel category for the period 2005-2008 according to the official statistics. Days at sea, labour days and remaining profit support the assumption that these vessels are not operated on a full-time basis, but still over a considerable time of the year. Most probably the vessels are often operated as one amongst more vessels of a firm or in the context of a part-time or sideline activity.

For vessels between 12 and below 15 m using mainly gill and trammel net, official account statistics exhibit an average time at sea of 116 days and a labour input of 256 days, which suggest an operation effort performed in average by 2.2 men. With 27%, wages have a much higher share in the overall costs, the remaining profit in the adjusted calculation is 36,100 Euro.

Germany

- Landings and value of landings

Only for gill netters of the size class 8 to below 12 m, sufficient data were available. This fleet segment generated the following landings in weight and value Table 4.64:

Table 4.64: Average annual weight and value of landings in gill net fisheries, Germany (in EUR).

Unit	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Ø05-08
gill net 8 - <12 m												
kg	19,983	20,309	21,900	21,140	14,589	20,045	13,690	19,408	16,971	18,078	16,549	17,752
EUR	22,832	26,809	30,808	34,992	26,689	30,188	22,913	25,960	25,285	24,672	21,857	24,443

The average was calculated for the period 2005 to 2008, parallel to the Danish example, where earlier logbook data have not been available. An average over the whole 11 years would result in slightly higher figures for gill net fisheries (an average value of 26,637 Euro), but in considerably lower figures for the bigger trawler vessels. An average of the selected four years appears to give a fair figure for fisheries in its present state.

All vessels investigated under this group use predominantly gill net or similar passive gear and were between 8 and 12 m. Sufficient data was not available on smaller or bigger gill net vessels.

The average value of these vessel's landings can be clustered as follows (Figure 4.91):

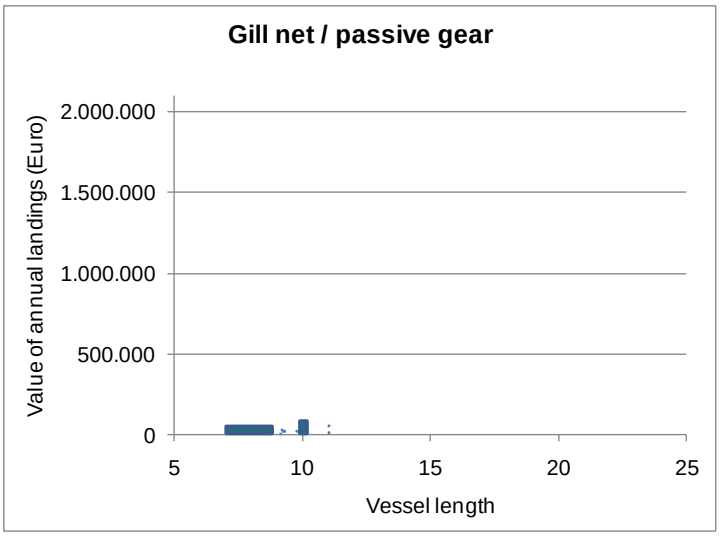


Figure 4.91: Average value of landings (in EUR) per year by vessel length in gill net, Germany.

The different species contributed to the overall value of landings as follows (Table 4.65):

Table 4.65: Share of value in gill net fisheries by species, German. Source: Logbook data, 1998 – 2008.

Size class	**8-<12 m**	
Rank	**Species**	**Share**
1	Atlantic cod	72%
2	European eel	16%
3	European flounder	4%
4	Herring	2%
5	Turbot	1%

Similar to Denmark, cod has by far the highest economic importance in the catches. Eel also has a considerable value (in Denmark only in the context of pound net fisheries, see below).

No data on the specific gear used by vessels of this group have been available for Germany.

The resulting data were compared to figures of the AER data for Germany, passive gear, 0 - 12 m for 2002 to 2007. These data refer to catches almost exclusively made in the Baltic sea, which would fit our purposes. But while the AER notes 12.1 tons and 8,811 Euro value of landings for this period, our logbook data results are 17.1 tons and 25,951 Euro value of landings for the same period.

The major difference presumably lies in the population referred to: According to the EU vessel register, on 01 January 2007 out of a total of 1,825 vessels in the German fleet, 1,138 were below 8 m in length, all together 1,453 below 12 m. AER figures differ from those of the vessel registry, as it mentions 619 inactive vessels below 12 m, 1,008 using passive gear and 31 beam and demersal trawlers. Still, from these figures, it is clear that a substantial part of the vessel the AER is evaluating under this category are such below 8 m, while our logbook survey only referred to vessels between 8 and 12 m. On this background, both results seem well compatible.

The AER also notes only 22 effort days per year for this vessel category. No data were available for the vessels covered by our logbook survey, but is seems clear that these were fishing at a higher intensity. There may also have been a certain bias in our survey, as full time professional fishermen may have been more willing to provide logbook data than those practicing fisheries only as a sideline activity.

- Income, cost and profit structure

Data on cost structure have been derived from annual accounts of individual firms and compared to data from other sources. Based on these sources, an adjusted (estimated) income and cost structure has been produced (Table 4.66).

As compared to the data on Denmark above, a number of cost positions were summarized as “Other costs”, as less detailed information was available here.

A significant difference exists to AER figures on wages and interests, and profits. AER figures apparently are based on standard values for labour and interests and calculate a shadow wage for work of the owner. This leads to a situation where crew costs in average make up 124% of the value of landings. As a result, a vessel of this class suffers from an average loss of 12,114 Euro per year (-137% of the value of landings) or an accumulated loss of -72,686 Euro in the period 2002 to 2007. No proof for such a situation could be found in the annual accounts available for this study, and it can safely be assumed that the results are unrealistic, as many small-scale fishermen would not even have the financial assets to subsidise their activity with more than 72,000 Euro over six years.

There are, however, indications that fishermen do not get their labour input compensated at an average wage rate and that insufficient capital is accumulated for reinvestments. While it may be worthwhile to demonstrate this in a calculation using shadow prices for the mentioned positions, our calculations are based on actual in- and output data, which do not cover such wider economic considerations. But even under these premises, AER data do not seem fully plausible, as they report an average labour input of 0.56 Full-time equivalent, which would mean more than a half time job, but in average only 22 days at sea per year for the period 2002-2007. As a consequence, AER data on wages and interests were largely ignored.

Table 4.66: Output, cost and profit structure according to different sources, gill net/passive gear fisheries 8 - <12 m, Germany.

Source	BMELV Meckl.-Vorpom.	BMELV remaining Germany	AER	Denmark Account survey	Own account survey	Adjusted data
Region	Baltic Sea	All	Mainly Baltic Sea	All	Target area	Target area
Gear type	All	All	passive gear	gill-trammel net	gill net / passive gear	gill net / passive gear
Vessel length	All	All	<12	8 - <12 m	8 - <12	8 - <12
Time	2002-08	2002-08	2002-07	2005-08	various	
Output						
Value of landings			100%	97%	98%	93%
Other turnover/fisheries income				2%		2%
Total turnover / fisheries income	92%	89%	100%	99%	98%	95%
Other incomes	8%	11%		1%	2%	5%
Total output	100%	100%	100%	100%	100%	100%
Costs						
Fuel and lubricants	11%	12%	12%	6%	9%	9%
Depreciation	11%	9%		14%	11%	11%
Wages (excl. wage to owner)	16%	20%	124%	9%	3%	6%
Maintenance			22%	14%	13%	13%
Other costs - fix and flexible	33%	31%	54%	24%	18%	18%
Interests (income - expenditure)	2%	3%	26%	3%		2%
Total Costs	73%	74%	238%	70%	53%	59%
Profit/Loss						
Net profit / loss (after interests, before tax)	27%	26%	-137%	30%	47%	41%

The following figure (Figure 4.92) shows the share of the individual cost positions on the total costs.

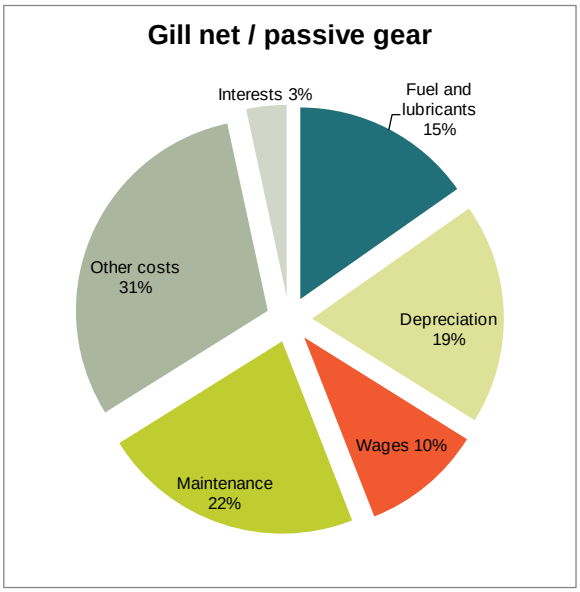


Figure 4.92: Share of cost positions on total costs in gill net / passive gear fisheries, Germany.

Combined with the value of landings derived from the logbooks, the following absolute figures (Table 4.67) for the different output and cost positions could be calculated.

Table 4.67: Average annual output, costs and profit in gill net / passive gear fisheries, Germany.

	8-<12 m EUR	% of output
Gross output		
Value of landings	24,443	93%
Other turnover/fisheries income	526	2%
Other incomes (other turnover, subsidies, compensations)	1,314	5%
Total output	26,283	100%
Costs		
Fuel and lubricants	2,365	9%
Depreciation	2,891	11%
Wages (excl. wage to owner, incl. flexible shares of crew)	1,577	6%
Maintenance	3,417	13%
Other costs - fixed and variable	4,731	18%
Interests (income - expenditure)	526	2%
Total Costs	15,507	59%
Net profit / loss	10,776	41%

The resulting profit of 10,766 Euro or 41% if the value of landings has to be seen in the context of the high involvement of unpaid labour and hence is mainly a compensation of the work of the owner. In fact, if the labour input of the owner is indeed in the magnitude of half a full time job as suggested by the AER (a small portion of the labour input is paid in our model), the remuneration would be quite low. Individual examples of smaller vessels using passive gear show that wage (crew costs) and profit are closely related; as soon as paid labour is involved in fishing operations to a significant degree, profit in fading away. Wages and profit together – for this vessel group an estimated 47 % of the total output or roughly 50% of the value of landings – can be taken as an indication for the value added at this stage of production.

In some cases, it was reported that fishermen process a part of their catches or sell them directly to end consumers for much higher prices than used in these calculations. Such economic activities may be one of sources of additional incomes, but played a minor role only in the cases evaluated. Non-fisheries sources may include subsidies and compensation such as the “Hohwacht-Compensation” paid due to impairments of fisheries in the military training site “Hohwachter Bucht”. Only few firms were in the sample that received such compensation, which could reach about 15% of the value of landings.

Comparison Denmark - Germany

The following chart compares outputs, costs and profits in gill/trammel net/passive gear fisheries by vessels from 8 to below 12 m in Denmark and Germany (Figure 4.93).

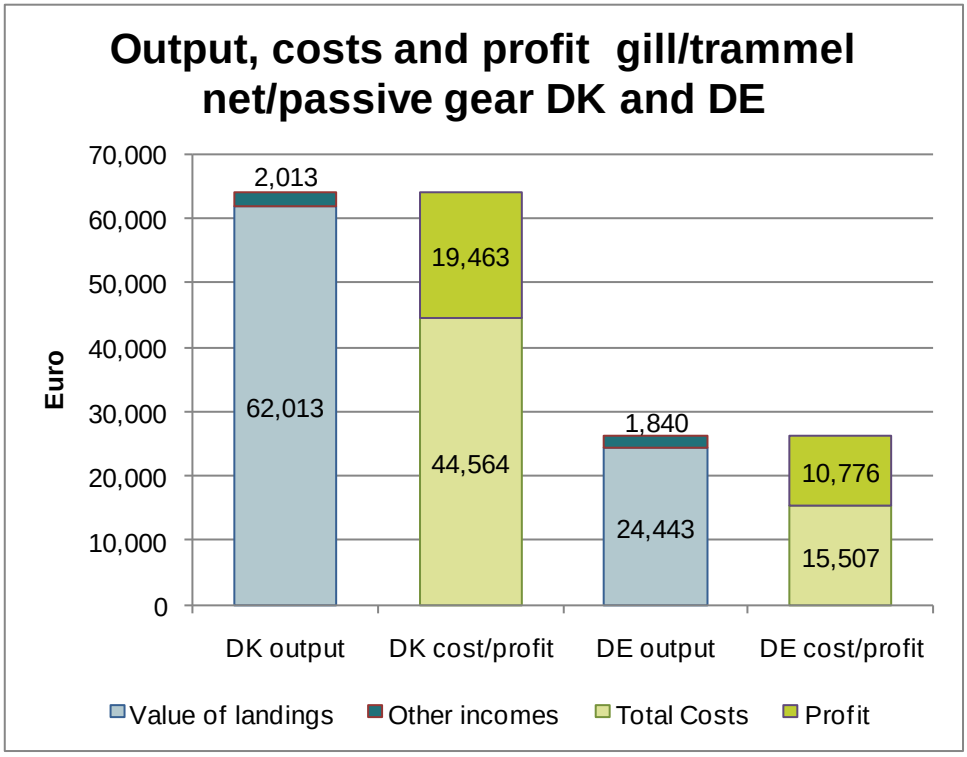


Figure 4.93: Comparison: Output, costs and profit in gill net fisheries, 8 - <12 m, Denmark and Germany

According to these figures, the total output of this gear-size class in Denmark is more than twice (2.6 times) as high than in Germany, profit per vessel is, with 19,463 Euro, 1.8 times as high as in Germany with 10,766 Euro.

It has to be kept in mind that these are figures per (small) vessel, not per fishing firm or similar. One reason for the difference may be that these small vessels are used in a different way in Germany as compared to Denmark.

In addition, specific statistical problems in covering small-scale fisheries may be relevant. Apparently such problems also influence the data of the AER, to which – as a source covering both fisheries – our results have been compared. For Denmark, the AER 2009 gives a figure of 64.76 m EUR for the value of landings of 1,194 vessels with „polyvalent passive gears 0 m - 12 m" for 2007, while the figure for 1,008 German vessels, "passive gear 0 m-12 m", is only 8.67 m EUR. This results in an average value of landings of 54,238 Euro in Denmark, while the value of landings would be only 8,601 Euro for a German vessel of this class. It should be mentioned in this context that the Danish fleet has a comparable structure to the German, with 1,619 out of 3,133 vessels below 8 m, 2,416 below 12 m (Source: EU fleet register, data for 01.01.2007; no inactive vessels mentioned in the AER Denmark).

Background of such differences may be that the German contributors to the AER tried to cover the small boats below 8 m adequately, while the Danish side focused on vessel above 8 m, the size class discussed here. In any way, the AER data do not seem to challenge the correctness of the data generated by this study.

4.2.2 Trawl fisheries

Denmark

- Value of Landings

The following (unadjusted) values of landings were calculated from logbook data:

Table 4.68: Average annual weight and value of landings in trawl fisheries, Denmark. Source: Logbook data.

Length class	Unit	2005	2006	2007	2008	∅ 2005-8
8-12 m	kg	25,812	72,423	35,092	42,469	43,949
	1,000 Euro	45.2	55.8	76.2	102.8	70.1
12-15 m	Kg	300,457	240,221	204,703	224,263	242,411
	1,000 Euro	135.3	163.4	186.0	166.3	162.7
15-18 m	Kg	824,763	633,085	580,440	466,657	626,236
	1,000 Euro	262.8	311.5	360.9	336.6	318.0
18-24 m	Kg	899,680	895,197	637,216	606,760	759,713
	1,000 Euro	421.2	503.0	529.5	630.2	520.9
24-40 m	Kg	1,923,615	2,058,341	1,769,556	874,646	1,656,540
	1,000 Euro	1,100.9	893.6	1,273.0	1,313.0	1,145.1

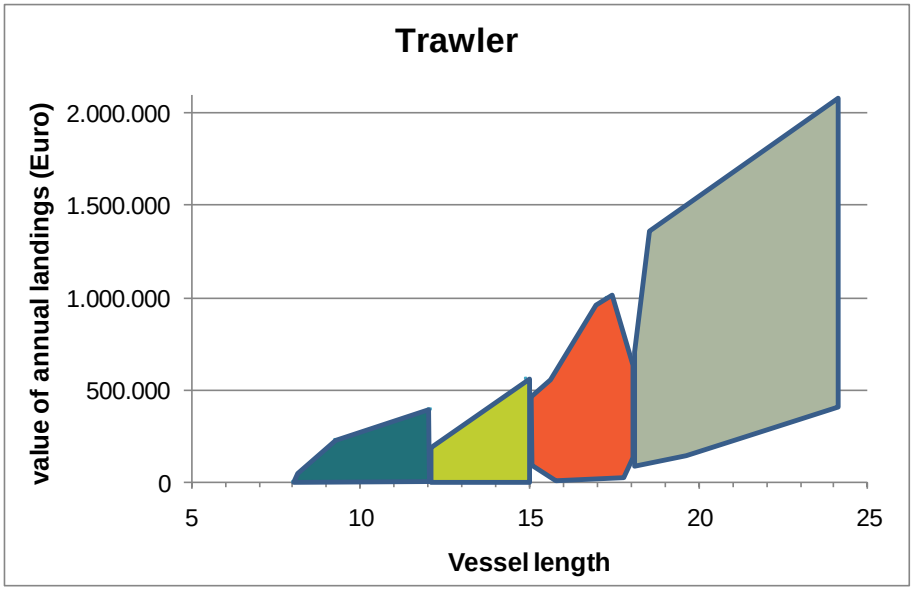


Figure 4.94: Visualisation of average value of landings (in Euro) per year by vessel length for trawl fisheries. Again, the value of landings does not show any clear clusters, but rather a continuum; the different colours in the figure are only to distinguish the various length cases used in fisheries statistics.

There is a clear increment of the average value of landings with increasing length of vessels (Figure 4.94), but individual data lie within a considerably wide range. While also in this case no individual length-value combination can be displayed for reasons of data confidentiality, it can be said that only few vessels are found in the higher range, while the majority of vessels achieved only values in the mid- and lower range. Up to about 18 m length, a significant number of vessels only declared landings of rather low value.

Cod has the highest share in the landing of all size classes of trawlers, but with a decreasing tendency for bigger vessels (Table 4.69). For trawlers between 15 and 24 m, Norway lobster has the second rank, and even vessels between 8 and 12 m make 10 % of their value of landings on this species. As Norway lobster hardly occurs in the Fehmarnbelt area, this indicates that there is some exchange between the regions, and in particular bigger vessels move between regions. Sandeel, which contributes 10% to the value of landings for trawlers above 24 m, is predominantly fished by industrial trawlers. The biggest vessel class, trawlers above 24 m, are not allowed to fish in the Belt itself, but in some parts of the 6 ICES statistical rectangles in the focus of our investigations.

Table 4.69: Share of value in trawl fisheries by size class and species, Denmark.

	8 - < 12 m		**12 - < 15 m**		**15 - < 18 m**	
Rank	Species	Share	Species	Share	Species	Share
1	Atlantic cod	56%	Atlantic cod	45%	Atlantic cod	33%
2	European Plaice	12%	Sprat	15%	Norway Lobster	17%
3	Norway Lobster	10%	Norway Lobster	12%	Sprat	17%
4	Unspecified	5%	European Plaice	11%	Atlantic Herring	8%
5	Common Dab	5%	Common Dab	3%	European Plaice	5%

	18 - < 24 m		**24 - < 40 m**	
Rank	Species	Share	Species	Share
1	Atlantic cod	27%	Atlantic cod	30%
2	Norway Lobster	16%	Lemon Sole	15%
3	European Plaice	16%	Atlantic Herring	14%
4	Sprat	12%	Sandeel	10%
5	Lemon Sole	8%	European Plaice	9%

Table 4.70: Share of value in trawl fisheries by size class and specific gear, Denmark.

	8 - < 12 m		**12 - < 15 m**		**15 - < 18 m**	
Rank	Gear	Share	Gear	Share	Gear	Share
1	Bottom trawl	89%	Bottom trawl	74%	Bottom trawl	63%
2	Pair bottom trawl	7%	Pair bottom trawl	14%	Pair bottom trawl	21%
3	Gill nets (Sættegarn)	2%	Pair midwater trawl	10%	Pair midwater trawl	14%
4	Dredge	1%	Net gear	1%	Beam trawl	1%
5	Gill net (Garnredskaber)	1%	Gillnets	0,4%	Pelagic trawl	1%

	18 - < 24 m		**24 - < 40 m**	
Rank	Gear	Share	Gear	Share
1	Bottom trawl	80%	Bottom trawl	80%
2	Pair midwater trawl	10%	Pair bottom trawl	15%
3	Pair bottom trawl	7%	Seine nets - surface	4%
4	Seine nets with anchor	1%	Pair midwater trawl	0,5%
5	Pelagic trawl	1%	Pelagic trawl	0,04%

In line with the species caught, bottom trawling makes by far the highest contribution to the value of landings; individual and pair bottom trawling together between 84% and 96% in the different size groups (Table 4.70). Pelagic/midwater trawling is of minor importance.

The figures on the value of landings from logbook were again compared to the data of the Danish account statistics:

Table 4.71: Average annual value of landings in trawl fisheries according to own survey and to account statistics (in 1,000 Euro).

	2000	2001	2002	2003	2004	2005	2006	2007	2008	∅05-08
Own 8-<12 m						45.2	55.8	76.2	102.8	70.1
DK Stat < 12 m	57.0	70.3	69.0	0.0	0.0	0.0	77.6	0.0	62.3	69.9
Adjusted value of average annual landings 2005-2008 (8-12 m)										69,9
Own 12-<15 m						135.3	163.4	186.0	166.3	162.7
DK Stat 12-<15m	144.8	155.6	153.6	136.9	132.6	163.0	185.4	213.3	178.9	185.1
Adjusted value of average annual landings 2005-2008 (12-<15 m)										174,0
Own 15-<18 m						262.8	311.5	360.9	336.6	318.0
DK Stat 15-<18m	294.1	245.5	257.4	209.4	218.9	271.1	331.5	352.6	316.6	318.0
Adjusted value of average annual landings 2005-2008 (15-<18 m)										318,0
Own 18-<24 m						421.2	503.0	529.5	630.2	520.9
DK Stat 18-<24m	384.7	420.3	451.7	397.0	352.3	400.7	508.2	597.6	585.2	523.0
Adjusted value of average annual landings 2005-2008 (18-<24 m)										522,0
Own 24-<40 m						1,100.9	893.6	1,273.0	1,313.0	1,145.1
DK Stat 24-<40m industrial trawling	752.2	921.2	1,189.7	690.6	559.7	575.6	1,070.5	590.2	1,044.8	820.3
DK Stat 24<40 m other trawling	666.6	802.0	780.1	675.6	659.1	820.0	1,027.2	1,163.1	1,165.0	1,043.9
Adjusted value of average annual landings 2005-2008 (24-<40 m)										1,068.3

The scaling factor with which results of the official account statistics are used in the further course of this study are:

- 100% for vessels between 8 and below 12 m. This figure, however, is based only on a small sample in official account statistics as well as in our survey, as only few of these vessels exist.
- 94% for trawlers between 12 and below 15 m.
- 100% for the size group 15 to below 18 m.
- 100% for trawlers between 18 and below 24 m.
- 108% for trawlers between 24 and below 40 m. For this size class, official account statistics differentiate between industrial and other trawl fisheries; this could not be emulated in our investigation due to a lack of respective data (only indications such as a high percentage of sandeel landings were available). Therefore, data of industrial and other trawling were blended, weighing their relative number in overall Danish fisheries within this size group (11 industrial and 36 other trawler in 2008; source: Account Statistics). As industrial trawlers performed rather bad in the considered period, the share in the sample and the calculated average from the account statistics may well influence the result.

All in all, the high degree of consistency between official data and own findings, in particular with regard to the strong size-group of vessels between 12 and 24 m, was considered an evidence for the correctness and accuracy of the method applied in this study.

Table 4.72: Average annual output, costs and profit in trawl fisheries for the period 2005-2008, Denmark.

	8-<12 m		12-<15 m		15-<18		18-<24		24-<40	
	1,000 Euro	% of output	1,000 Euro	% of output	1,000 Euro	% of output	1,000 Euro	% of output	1,000 Euro	% of output
Gross output										
Value of landings	69.9	93%	174.0	96%	318.0	98%	522.0	97%	1,068.3	97%
Other in-comes	5.1	7%	7.1	4%	8.1	2%	14.8	3%	31.0	3%
Total output	79.2	100%	181.1	100%	326.0	100%	536.6	100%	1,099.3	100%
Costs										
Fuel and lubricants	11.1	15%	25.6	14%	42.6	13%	87.8	16%	233.8	21%
Other varia-ble costs	6.4	9%	18.5	10%	34.6	11%	59.1	11%	118.1	11%
Maintenance	10.7	14%	21.1	12%	31.0	9%	53.2	10%	122.1	11%
Depreciation	13.3	18%	21.6	12%	34.5	11%	63.1	12%	139.7	13%
Wages	0.9	1%	36.1	20%	80.0	25%	140.1	26%	283.9	26%
Insurances, admin. etc.	7.1	9%	17.3	10%	26.6	8%	39.2	7%	86.7	8%
Other fixed costs	0.8	1%	0.9	1%	2.4	1%	2.4	0%	3.4	0%
Interests	2.6	3%	10.3	6%	15.7	5%	32.6	6%	106.6	10%
Total Costs	53.2	71%	151.8	84%	267.2	82%	477.4	89%	1,094.4	100%
Net profit / loss	21.9	29%	29.3	16%	58.7	18%	59.3	11%	5.0	0%

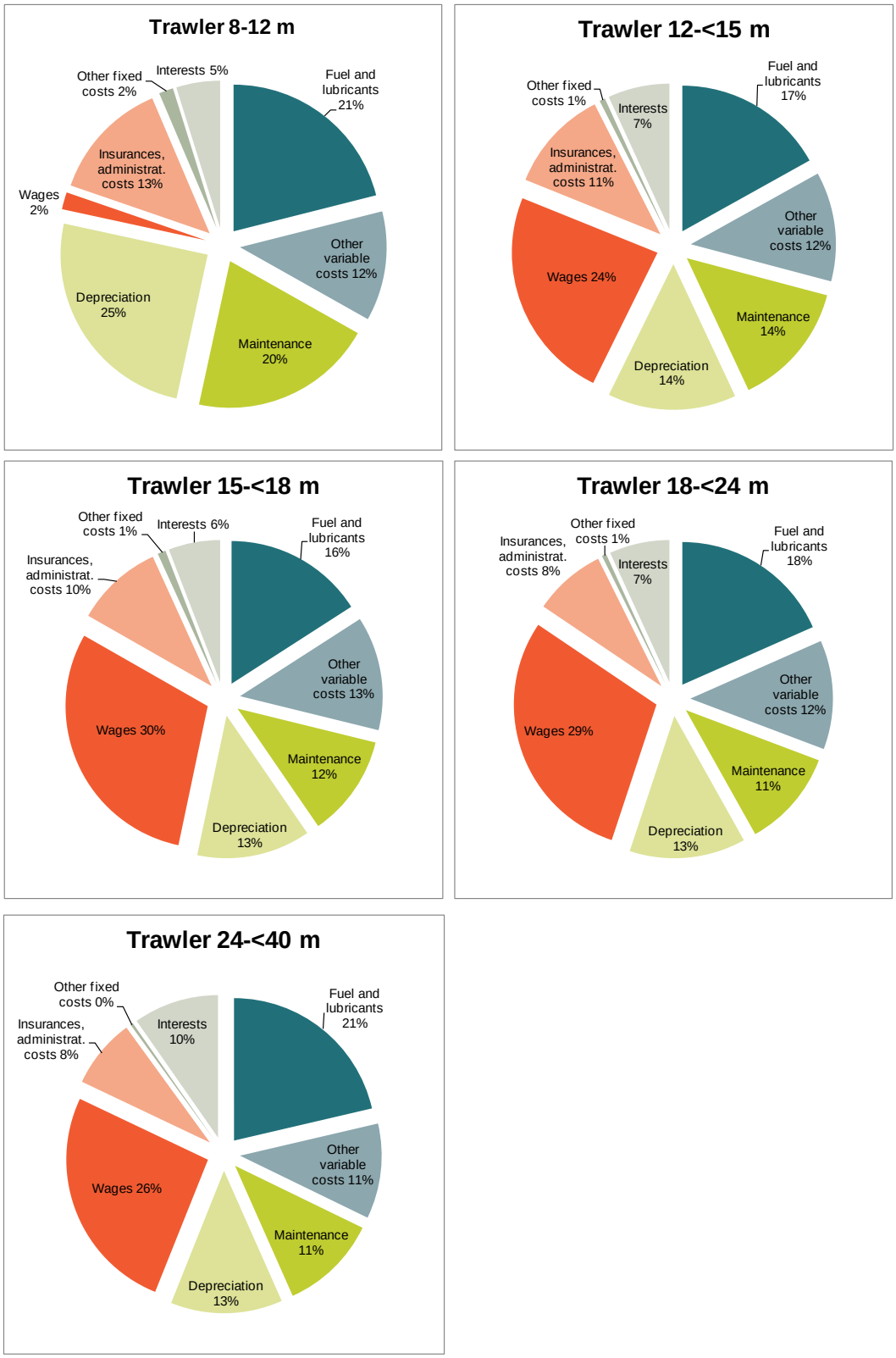


Figure 4.95: Share of cost positions in trawl fisheries.

The figures (Figure 4.95) show an increasing share of wages with increasing vessel length; only for biggest size class, this share is slightly decreasing again, while interests and fuel require a higher share. Again, the low share of wages for vessel below 12 m has to be regarded as directly linked to the higher share of profit, which compensates unpaid family labour.

The share of profits on the value of landings is decreasing with increasing vessel size, the biggest class barely makes profits at all. This is in particular caused by the bad performance of industrial trawlers. According to the Danish account statistics, the overall number of industrial trawlers between 24 and 40 m decreased from 69 in 2000 to 11 in 2008, while that of "other trawlers" of the same size (not including beam trawlers) decreased from 70 to 36 over this period.

Germany

- Landings and value of landings

In trawl fisheries, sufficient logbook-data for the for three size groups 12 to below 15, 15 to below 18 and 18 to below 24 m were available:

Table 4.73: Average annual weight and value of landings in trawl fisheries, Germany (in EUR).

Unit	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Ø05-08
Trawl 12 - <15 m												
kg	87,505	104,142	89,132	78,500	105,994	95,167	77,685	137,663	196,458	151,127	120,924	151,543
EUR	83,671	107,001	93,384	95,936	87,714	78,311	72,660	88,729	118,981	106,806	85,830	100,086
Trawl 15 - <18 m												
kg	112,282	149,107	102,275	137,318	234,727	218,261	172,921	162,751	208,527	138,983	134,769	161,257
EUR	115,131	157,085	124,740	128,004	129,703	96,048	98,181	111,618	126,659	123,465	99,527	115,317
Trawl 18 - <24 m												
kg	298,635	259,528	253,188	263,005	358,680	413,206	581,941	633,692	585,969	591,880	521,044	583,146
EUR	332,576	336,234	350,374	332,036	324,194	285,541	354,964	396,290	396,134	413,081	392,971	399,619

The following figure depicts the average value of landings per year (1998 - 2008) per vessel by length, based on the sample of logbook files evaluated:

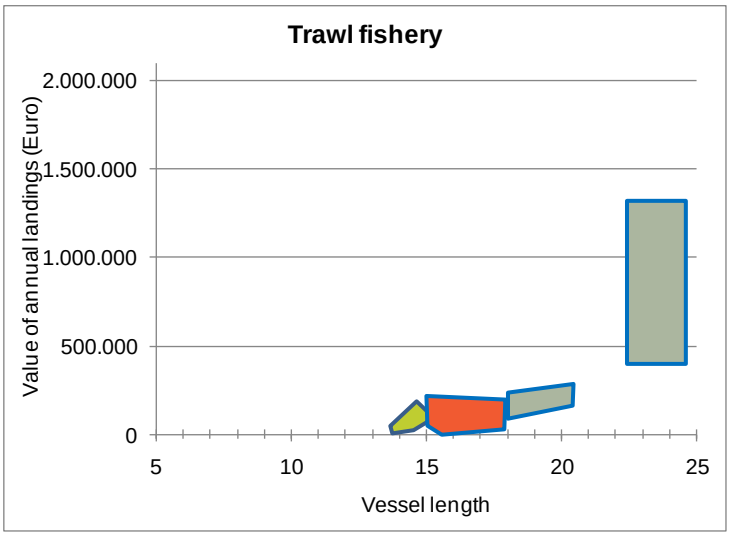


Figure 4.96: Average value of landings per year by vessel length for trawl fisheries, Germany.

As the figure shows, there is a continuum of vessel lengths between about 14 and 20 m, over which the value of landings generally increases, within a certain bandwidth. Within our sample, the average value of landings has in some years even been higher for the vessels below 15 m than for those of the next bigger size class, but this may be caused by limited sample size. At the upper margin of our biggest size class, slightly below 24 m, there is another small class of trawler vessels (partly Eurocutters/mixed beam-bottom trawlers), that yield considerably higher values of landing than the smaller trawlers.

Only for one vessel above 24 m logbook data were available, which therefore cannot be published, but it can be said that these data confirm the general trend that bigger vessels achieve higher values of landing.

Table 4.74: Share of value in trawl fisheries by size class and species, Germany.

	12 - < 15 m		**15 - < 18 m**		**18 - < 24 m**	
Rank	Species	Share	Species	Share	Species	Share
1	Atlantic cod	78%	Atlantic cod	63%	Atlantic cod	39%
2	Herring	7%	European plaice	11%	Saithe	26%
3	Whiting	6%	Herring	9%	Sprat	13%
4	Common dab	3%	European flounder	3%	Herring	11%
5	European plaice	2%	Turbot	3%	Haddock	3%

In samples of German trawl fisheries, cod contributed the highest share to the value of landings, but with a declining tendency for increasing vessel size. The pelagic species herring and sprat have some importance, so do whiting and different flat fish for the vessels below 18 m. For those above 18 m, saithe (*Pollachius virens*) contributes more than a quarter of the value of landings. Saith, however, is not fished in the Fehmarnbelt area, which shows that the bigger vessels also fish in other regions.

Only for a small sample of vessels, gear data have been available, which does not allow for differentiations between size groups. The results may not be fully representative for all trawl vessels, but still give some indication on the economically most important fishing gears:

Table 4.75: Share of value in trawl fisheries by specific gear, Germany.

Rank	Gear	Share
1	One ship bottom trawl	63%
2	Two ship (pair) pelagic trawl	15%
3	Two ship (pair) bottom trawl	14%
4	One ship pelagic trawl	7%

All other gear was below 0.5%. Bottom trawling accordingly is the most important fishing technique and generates – in our limited sample – about three quarters of the value of landings, the remaining share is almost exclusively created by pelagic trawling. Also here, the results correspond well to the species caught.

- Income, cost and profit structure

Table 4.76: Output, cost and profit structure according to different sources, trawl fisheries 12 - <15 m, Germany.

Source	BMELV Meckl.-Vorpom.	BMELV remaining Germany	AER	Denmark Account survey	Own account survey	Adjusted data
Region	Baltic Sea	all	Mainly Baltic Sea	all	Target area	Target area
Gear type	all	all	Dem. trawl & demersal seiner	trawler	trawler	trawler
Vessel length (loa)	all	all	12-24	12 - < 15 m	12 - <15	12 - <15
Time	2002-08	2002-08	2002-07	2005-08	various	
Output						
Value of landings			97%	96%	72%	75%
Other turnover/fisheries income					17%	15%
Total turnover / fisheries income	92%	89%	97%		90%	90%
Other incomes	8%	11%	3%	4%	10%	10%
Total output	100%	100%	100%	100%	100%	100%
Costs						
Fuel and lubricants	11%	12%	12%	14%	9%	11%
Depreciation	11%	9%		12%	9%	9%
Wages (excl. wage to owner)	16%	20%	46%	20%	19%	19%
Maintenance			11%	12%	20%	14%
Other costs - fix and flexible	33%	31%	20%	20%	20%	20%
Interests (income - expenditure)	2%	3%	11%	6%	2%	2%
Total Costs	73%	74%	100%	84%	78%	75%
Profit/Loss						
Net profit / loss (after interests, before tax)	27%	26%	0,1%	16%	22%	25%

Table 4.77: Output, cost and profit structure according to different sources, trawl fisheries 15 - <18 m, Germany.

Source	BMELV Meckl.-Vorpom.	BMELV remaining Germany	AER	Denmark Account survey	Own account survey	Adjusted data
Region	Baltic Sea	all	Mainly Baltic Sea	all	Target area	Target area
Gear type	all	all	Dem. trawl & demersal seiner	trawler	trawler	trawler
Vessel length (loa)	all	all	12-24	15 - < 18 m	15 - <18	15 - <18
Time	2002-08	2002-08	2002-07	2005-08	various	
Output						
Value of landings			97%	98%	93%	93%
Other turnover/fisheries income					2%	2%
Total turnover / fisheries income	92%	89%	97%		95%	95%
Other incomes	8%	11%	3%	2%	5%	5%
Total output	100%	100%	100%	100%	100%	100%
Costs						
Fuel and lubricants	11%	12%	12%	13%	21%	17%
Depreciation	11%	9%		11%	2%	9%
Wages (excl. wage to owner)	16%	20%	46%	25%	14%	18%
Maintenance			11%	9%	7%	8%
Other costs - fix and flexible	33%	31%	20%	20%	21%	20%
Interests (income - expenditure)	2%	3%	11%	5%	0%	2%
Total Costs	73%	74%	100%	82%	64%	74%
Profit/Loss						
Net profit / loss (after interests, before tax)	27%	26%	0.1%	18%	36%	26%

Table 4.78: Output, cost and profit structure according to different sources, trawl fisheries 18 - <24 m, Germany.

Source	BMELV Meckl.-Vorpom.	BMELV remaining Germany	AER	Denmark Account survey	Own account survey	Adjusted data
Region	Baltic Sea	all	Mainly Baltic Sea	all	Target area	Target area
Gear type	all	all	Dem. trawl & demersal seiner	trawler	trawler	trawler
Vessel length (loa)	all	all	12-24	18 - < 24 m	18 - <24	18 - <24
Time	2002-08	2002-08	2002-07	2005-08	various	
Output						
Value of landings			97%	97%	92%	90%
Other turnover/fisheries income					1%	3%
Total turnover / fisheries income	92%	89%	97%		93%	93%
Other incomes	8%	11%	3%	3%	7%	7%
Total output	100%	100%	100%	100%	100%	100%
Costs						
Fuel and lubricants	11%	12%	12%	16%	16%	16%
Depreciation	11%	9%		12%	11%	11%
Wages (excl. wage to owner)	16%	20%	46%	26%	19%	19%
Maintenance			11%	10%	9%	9%
Other costs - fix and flexible	33%	31%	20%	19%	19%	19%
Interests (income - expenditure)	2%	3%	11%	6%	1%	2%
Total Costs	73%	74%	100%	89%	75%	76%
Profit/Loss						
Net profit / loss (after interests, before tax)	27%	26%	0.1%	11%	25%	24%

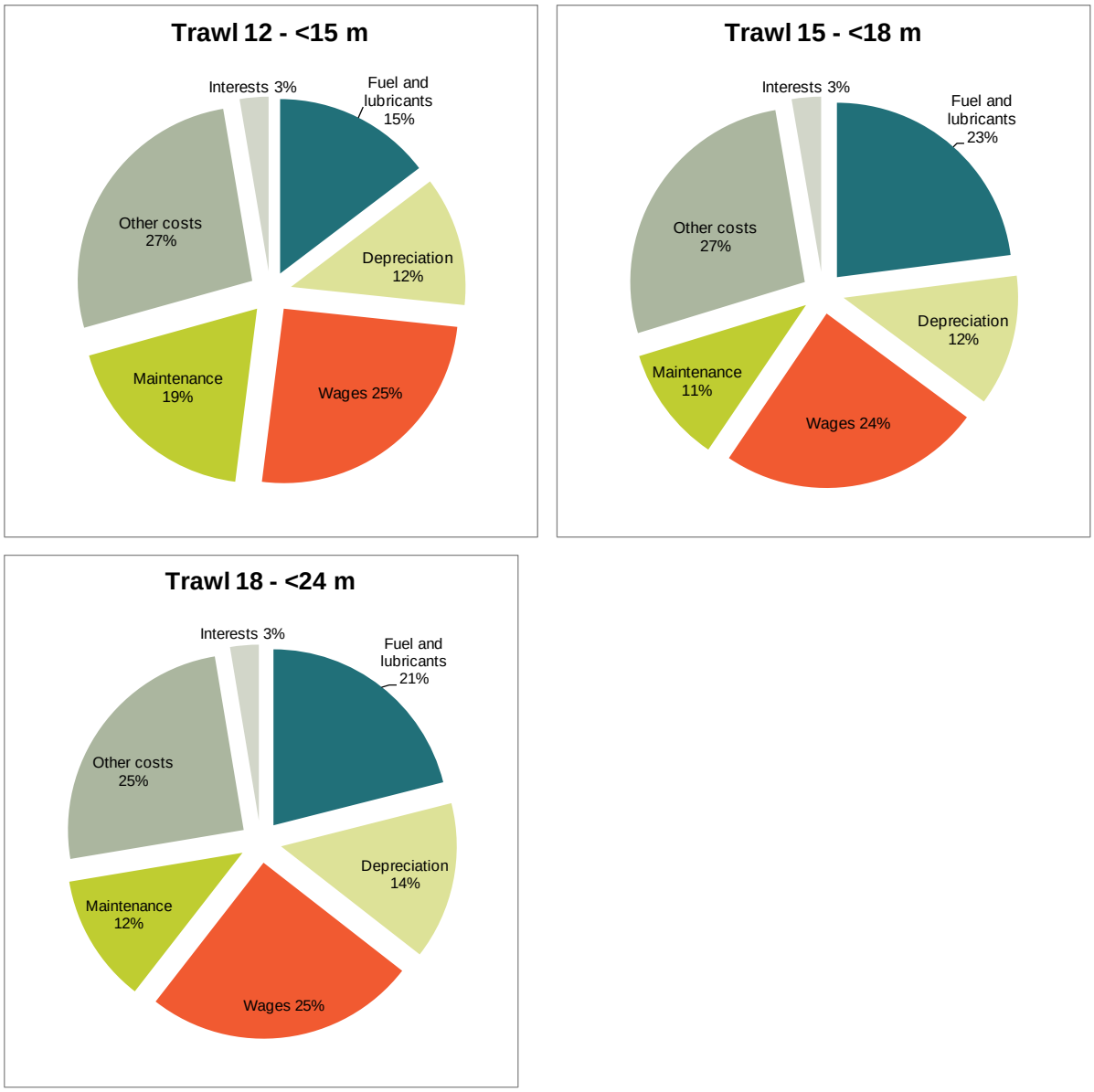


Figure 4.97: Share of cost positions on total costs in trawl fisheries, Germany.

Between the different size classes, the shares of the individual cost positions on the overall costs do not differ very much. Even the differences between the different published statistics are less severe here than in case of the smaller gill net vessels. Presumably, this is because the trawlers are operated in more formalized businesses and therefore are easier to cover by statistics.

Combined with logbook data, the above percentages result in the following standard output, cost and profit figures:

Table 4.79. Average annual output, costs and profit in trawl fisheries, Germany.

	12 - <15 m		15 - < 18 m		18 - <24 m	
	EUR	% of output	EUR	% of output	EUR	% of output
Gross output						
Value of landings	75,065	75%	107,245	93%	359,657	90%
Other turnover/fisheries income	15,013	15%	2,306	2%	11,989	3%
Other incomes	10,009	10%	5,766	5%	27,973	7%
Total output	100,086	100%	115,317	100%	399,619	100%
Costs						
Fuel and lubricants	11,009	11%	19,604	17%	63,939	16%
Depreciation	9,008	9%	10,379	9%	43,958	11%
Wages (excl. wage to owner)	19,016	19%	20,757	18%	75,928	19%
Maintenance	14,012	14%	9,225	8%	35,966	9%
Other costs - fixed and variable	20,017	20%	23,063	20%	75,928	19%
Interests	2,002	2%	2,306	2%	7,992	2%
Total Costs	75,065	75%	85,335	74%	303,710	76%
Net profit / loss	25,022	25%	29,982	26%	95,909	24%

Comparison Denmark – Germany

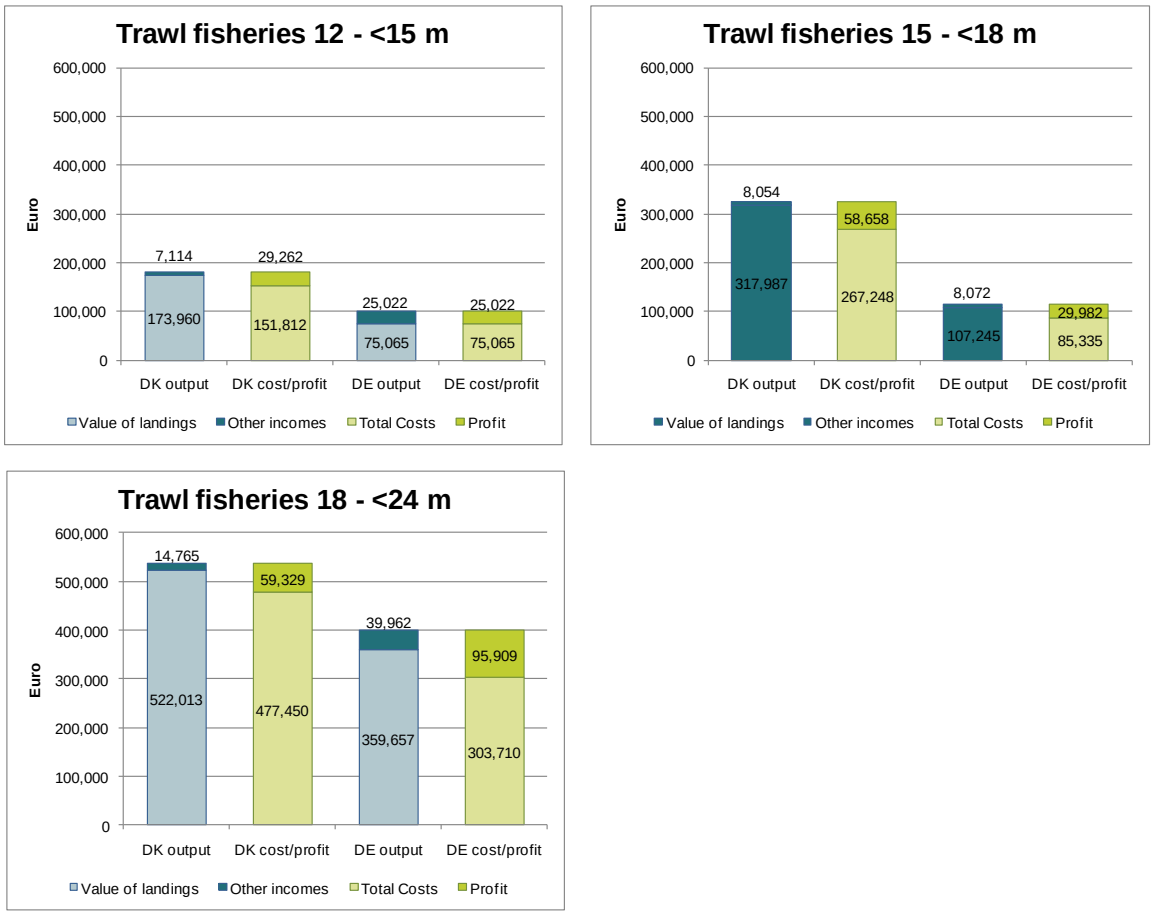


Figure 4.98: Comparison: Output, costs and profit in trawl fisheries, Denmark and Germany.

Danish trawl fisheries produces considerably higher values of landing in all size classes. The biggest difference is found in the class 15 to 18 m, where it was noticed before that vessels produced only a slightly higher value of landings than those of the smaller class. It cannot be completely excluded that our logbook data were not fully representative for the whole group. The difference between both countries concerning value of landings is least significant for the biggest size class.

Profits in German trawl fisheries are only slightly below those of Danish counterparts in the smallest size class and even higher than Danish ones in the biggest size class. Only in the size class 15 to below 18 m, profits calculated for Denmark are about twice as high as those for German vessels.

A difference in the value of landings between both fleets is confirmed by the AER: for 2007, for instance, the average value of landings for a Danish trawler and seiner between 12 and 24 m length was about 516,000 Euro according to AER, while a similar German vessel only had landings at a value of 267,000 Euro to this source.

4.2.3 Seine fisheries

Denmark

- Weight and value of Landings

Major size classes for seiners are 15 to below 18 and to below 24 m.

Table 4.80: Average annual weight and value of landings in seine fisheries, Denmark.

Length class	Unit	2005	2006	2007	2008	∅ 2005-8
15-18 m	kg	87,931	102,313	110,775	104,904	101,481
	1,000 Euro	167.5	199.9	238.0	194.5	200.0
18-24 m	kg	124,258	162,272	172,311	188,851	161,923
	1,000 Euro	255.7	359.2	396.4	392.8	351.0

The following figure gives some indications on the distribution of the individual size-value of landings combinations.

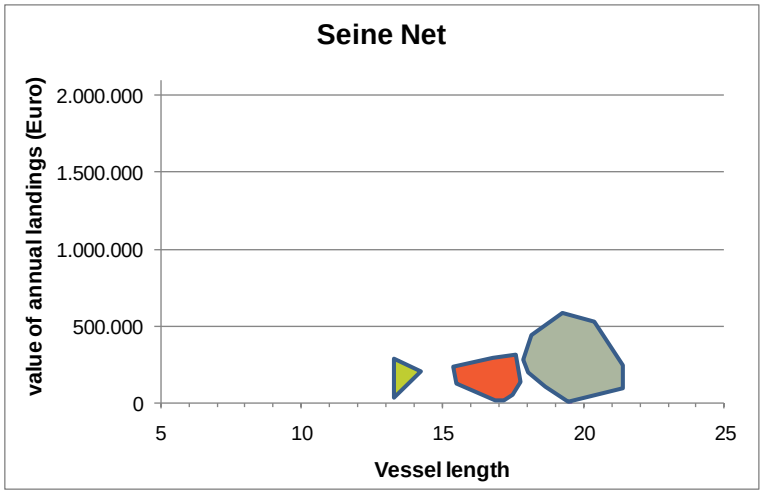


Figure 4.99: Visualisation of average value of landings (in Euro) per year by vessel length for seine fisheries.

For seiners between 12 and 15 m, an insufficient sample of data has been available, but the data suggest that the figure on value of landings in the Danish account statistics of about 116,000 Euro may be realistic.

Half of the value of landings of the smaller seiners is contributed by plaice, followed by cod and dab; for the bigger seiners, cod makes the highest contribution to the value of landings, followed by plaice and haddock (Table 4.81).

Table 4.81: Share of value in seine net fisheries by size class and species, Denmark.

	15 - < 18 m		**18 - < 24 m**	
Rank	Species	Share	Species	Share
1	European plaice	50%	Atlantic cod	39%
2	Atlantic cod	37%	European Plaice	33%
3	Common dab	3%	Haddock	8%
4	Unspecified	3%	Witch flounder	5%
5	Lemon sole	2%	Unspecified	4%

99.5% of the value of landings of seiners between 15 and 18 m is made by seine with anchor, some minor catches were made by drift net. In the bigger group, 98% of the value of landings is achieved by seine net with anchor, followed by bottom trawl and surface seine nets.

The results of our logbook survey compare to official account statistics as follows:

Table 4.82: Average annual value of landings in seine net fisheries according to own survey and to account statistics (in 1,000 Euro)

	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**∅05-08**
Own 15-<18 m						167.5	199.9	238.0	194.5	200.0
DK Stat 15-<18m	209.5	327.8	302.6	267.8	172.2	216.9	236.6	318.8	303.0	268.9
Adjusted value of average annual landings 2005-2008 (15-<18 m)										234.4
Own 18-<24 m						255.7	359.2	396.4	392.8	351.0
DK Stat 18-<24m	331.0	327.4	301.6	243.1	235.3	269.1	395.2	458.8	521.6	411.1
Adjusted value of average annual landings 2005-2008 (18-<24 m)										381.1

The resulting scaling factors for Danish seiners from 15 to below 18 m is 87%, for those between 18 und below 24 m is 93%. This results in the following outputs, costs and profits:

Table 4.83: Average annual output, costs and profit in seine fisheries for the period 2005-2008

	15-<18 m		18-<24 m	
	1,000 Euro	% of output	1,000 Euro	% of output
Gross output				
Value of landings	234.4	99%	381.1	96%
Other incomes (other turnover, subsidies, compensations)	1.5	1%	16.2	4%
Total output	235.8	100%	397.3	100%
Costs				
Fuel and lubricants	13.0	6%	25.1	6%
Other variable costs (ice, landing & sales costs, etc.)	29.8	13%	49.5	12%
Maintenance (vessel, gear, etc.)	26.2	11%	39.9	10%
Depreciation (vessel, gear, etc.)	18.9	8%	35.8	9%
Wages (excl. wage to owner, incl. flexible shares of crew)	49.3	21%	131.7	33%
Insurances, administrative costs etc.	18.8	8%	41.3	10%
Other fixed costs (rent of plant etc.)	0.3	0%	0.3	0%
Interests (income - expenditure)	10.2	4%	24.3	6%
Total Costs	166.4	71%	347.9	88%
Net profit / loss	69.4	29%	49.4	12%

The cost structure differs only gradually from that of trawlers of the same size, with the exception that the share of fuel is lower, while wages are higher for the bigger size class. Value of landings is lower than for trawlers, profits for vessels between 15 and 18 m are higher than those of trawlers of the same size and of seiners of the bigger size class.

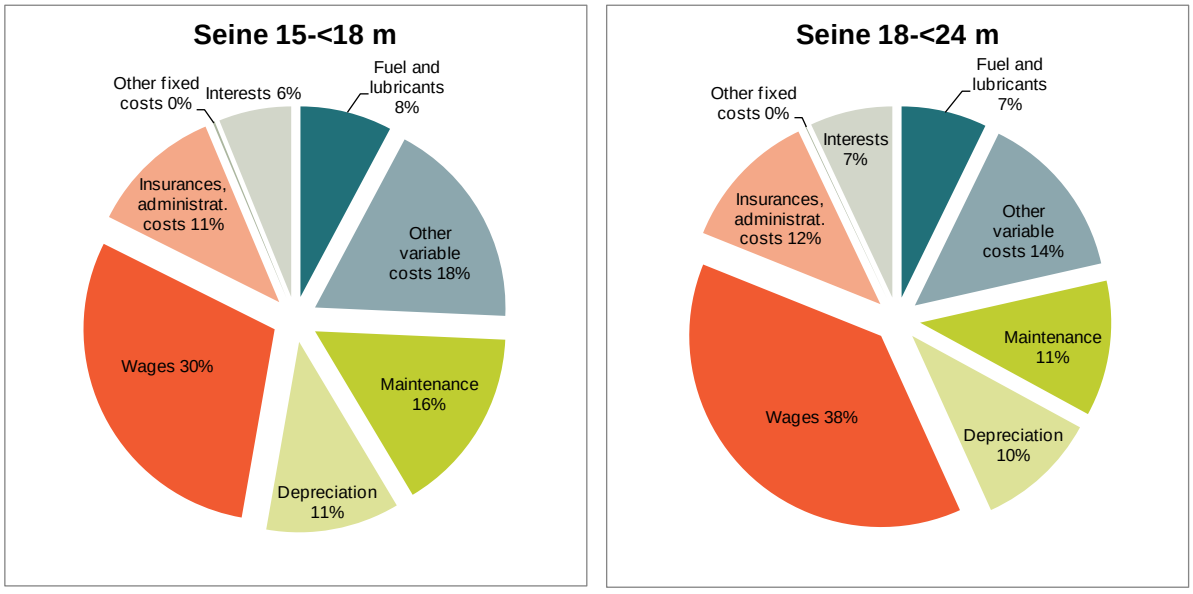


Figure 4.100: Share of cost positions for seine fisheries.

Germany

There is only few German seine fishing vessels in the 6 ICES rectangles and no specific information on economic performance was available.

4.2.4 Pound net fisheries

Denmark

- Weight and value of Landings

All vessels that produced the majority of their value of landings by pound nets were between 8 and 10 m in length. Their average catch was about 30 tons per year at a value of 78.000 Euro.

Table 4.84: Average annual weight and value of landings in the pound net fisheries, Denmark.

Length class	Unit	2005	2006	2007	2008	Ø 2005-8
8-12 m	Kg	37,029	33,057	28,721	22,864	30,418
	1,000 Euro	105.5	85.1	77.7	43.5	78.0

Table 4.85: Share of value in pound net fisheries by species, Denmark.

	8 - < 12 m	
Rank	Species	Share
1	Silver eel	63%
2	Atlantic cod	16%
3	Garfish	12%
4	Yellow eel	2%
5	Unspecified	2%

The economically most important species in pound net fisheries accordingly is European eel in the form of silver eel, yellow eel contributes to a minor extend to the value of landings (Table 4.85). Vessels for which pound net is the most important gear in terms of value of landings make 95% of their catches with this gear. In addition, “other gear” (official denomination in logbook statistics) and gill nets are used. If we only regard the value of landings from pound net, independently if this is the most important gear of the vessel or not, the picture does not change much: 66% of the value in that case is contributed by silver eel, again followed by cod and garfish.

All vessels that were mainly engaged in pound net fisheries are between 8 and 10 m long, their value of landing is spread considerably - which is rather a consequence of differences in number, size and efficiency of the pound nets than of the vessels.

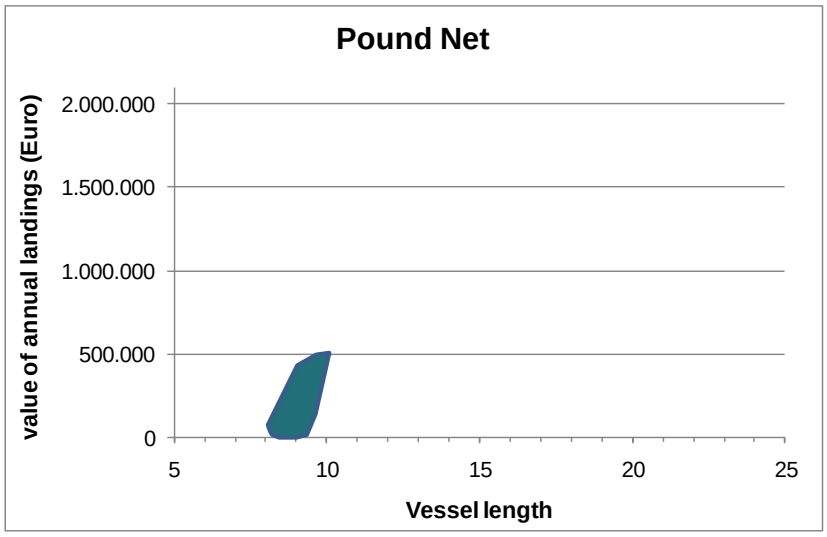


Figure 4.101: Visualisation of average value of landings (in Euro) per year by vessel length for pound net fisheries.

Fishing firms operating pound nets usually have a number of such nets, which they operate with more than one vessel, and apply other fishing techniques in addition. Accordingly, the economic situation of such firms cannot be directly related to the figures calculated for the vessels here.

Results of our logbook evaluations of pound net vessels have been compared to “trap setters” in the Danish account statistics.

Table 4.86: Average annual value of landings in pound net fisheries according to own survey and to account statistics (in 1,000 Euro).

	2000	2001	2002	2003	2004	2005	2006	2007	2008	∅05-08
own 8-<12 m						105.5	85.1	77.7	43.5	78.0
DK Stat < 12 m	59.3	56.5	85.0	81.3	64.8	81.9	71.8	96.9	68.6	79.9
adjusted value of average annual landings 2005-2008 (8-12 m)										78.9

Results matched considerably well (scaling factor 99%). This resulted in the following standard value of landing, costs and profit per vessel:

Table 4.87: Average annual output, costs and profit per pound net vessel for the period 2005-2008.

	8-<12 m	
	1.000 Euro	% of output
Gross output		
Value of landings	78.9	95%
Other incomes (other turnover, subsidies, compensations)	4.2	5%
Total output	83.0	100%
Costs		
Fuel and lubricants	3.2	4%
Other variable costs (ice, landing & sales costs, etc.)	4.3	5%
Maintenance (vessel, gear, etc.)	13.0	16%
Depreciation (vessel, gear, etc.)	9.5	11%
Wages (excl. wage to owner, incl. flexible shares of crew)	15.3	18%
Insurances, administrative costs etc.	9.8	12%
Other fixed costs (rent of plant etc.)	1.9	2%
Interests (income - expenditure)	2.6	3%
Total Costs	59.5	72%
Net profit / loss	23.5	28%

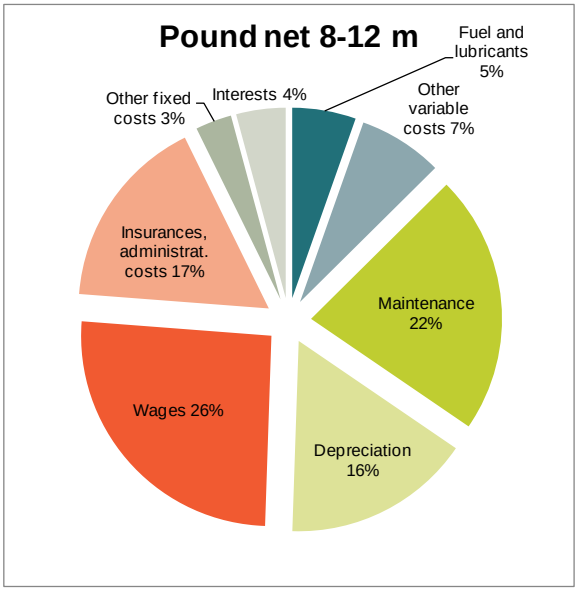


Figure 4.102: Share of cost positions for pound net fisheries.

As expected, fuel only plays a minor role in the cost structure of pound not fisheries. Other cost positions are within the usual range.

Germany

Pound nets are less important in Germany in comparison to Denmark, and no specific data on their economic performance are available.

Based on the landings of European eel from 3-5 pound nets over an 11 year period (1998-2008), an estimate of the annual average landings per pound net came to 222 kg eel and a value of 1,661 euro.

If this truly represents the pound net fisheries on Fehmarn, then it indicates that these fisheries in general are run as a sideline business. However, because of the lack of data from these fisheries it is not prudent to make any concrete conclusions concerning the German pound net fisheries in the Fehmarnbelt area.

4.2.5 Other fisheries

Denmark

Between two and six vessels per year in our sample were classified as “others”, as they were mainly using gear outside of the main gear classes. 38% of their values of landings originate from dredges (in particular used in mussel fisheries), for some landings, the gear is denoted as “others” or “unspecified”. To a certain extent, this group also uses common gear types such as bottom trawl. The available figures indicate that the value of landings is within a usual range in relation to the vessel size, but no statistically reliable figures can be given.

Germany

No significant “Other fisheries” have been reported.

5. Fisheries - discussion and conclusions

This document describes the baseline of the German and Danish commercial fisheries within areas relevant to the proposed Fehmarnbelt Fixed Link across Fehmarnbelt between Denmark and Germany.

This baseline information is based on the logbook and landing statistics from the official fishery directorates of Germany (Bundesanstalt für Landwirtschaft und Ernährung (BLE)) and Denmark (Danish Directorate for Fisheries) and supplemented by data from ICES, Eurostat, the EU Community Fishing Fleet Register and own surveys of fishermen and their representatives.

Trawling, primarily by Danish vessels after sprat and cod, is the most prominent form of fisheries in Fehmarnbelt. Trawling is primarily undertaken in the central part of Fehmarnbelt, but trawling activity and haul routes extend both to the east and west into other important more regional fishing areas.

The gill/trammel net fisheries in Fehmarnbelt, primarily after cod and valuable flatfish species (plaice, turbot, brill and more recently sole) are undertaken along the entire northern coast of Fehmarn Island for German fishermen and along most of the southern coast of Lolland, thus bordering all of Fehmarnbelt. The German net fisheries in Fehmarnbelt are most intense along the north-eastern coast of Fehmarn Island, primarily after cod. Furthermore, Danish net fishermen extend their fisheries across the western section of Fehmarnbelt to an area west of Fehmarn Island where the intensity of gill net fisheries after cod and flatfish for both Danish and German fishermen is high.

Seine net fishing, undertaken in the central part of Fehmarnbelt by Danish fishermen generally in the first part of the year, has decreased considerably in recent years, and has only been undertaken by 1-3 vessels targeting cod and flatfish in 2007-2008. Seining (primarily by Danish fishermen) is mainly undertaken in the regional fishing areas east of Fehmarnbelt (ICES 37G2 and 38G2).

The pound net fisheries in Fehmarnbelt are considerably more prominent by Danish fishermen, along the southern coast of Lolland, than by German fishermen, on the coast of Fehmarn Island. The fisheries in both areas target European eel (economically most important), however species such as cod, garfish, flatfish and occasionally Baltic prawns (caught in fykes nets) in the Danish pound net fisheries are also important. Seasonally, this fishery is generally undertaken from August to November, however in Denmark there is a spring and summer fishery (typically after garfish and yellow eel) as well. Because these fisheries are with stationary gear and primarily at fixed locations local to Fehmarnbelt, they could be considered the most vulnerable to environmental impacts due to the establishment of the fixed link.

Economically, the trawl fisheries in Fehmarnbelt are the most important, however the net fisheries are important for the smaller vessels in both the German and Danish fishing fleet and seine netting is important in the regional area to the east. The average overall and net income of vessels in the Fehmarnbelt and Western Baltic fisheries is lower than the national averages. This indicates that the fisheries in Fehmarnbelt and region could be more economically vulnerable to changes in their fisheries.

5.1 Biases

Most of the fishery statistics in this report are presented according to ICES rectangles, and much of Fehmarnbelt lies within ICES 38G1 allowing for some more or less direct associations with the fisheries therein. However, the south-eastern corner of Fehmarnbelt crosses into ICES 37G1, and the very western part of Fehmarnbelt straddles ICES 38G0 and 37G0, thus the

official fisheries here are mixed with the overall fisheries for these ICES rectangles making direct associations with official fishery statistics difficult.

In Fehmarnbelt, the outer areas to the west are important gill net fishing grounds for both the German and Danish fisheries, thus making it of strong interest to be able to assess these specific fisheries in the event that impacts from the Fehmarnbelt Fixed Link affect these areas. However, to compensate for the more diffuse knowledge base on the fisheries in these areas, it is possible to use and associate the harbour specific statistics from nearby harbours, or those that are associated with these fisheries, to help interpret the fisheries that could be impacted.

Other general biases with official fishery statistics are 1) Reporting catches in one ICES rectangle in logbook data from fishing activities (for example long trawl hauls) over a stretch of water represented in 2 or more ICES rectangles, 2) Possible imprecise reporting of catches, both in the general fisheries pertaining to logbooks and more limited in the “coastal “pound net fisheries” 3) Data from logbooks representing the landings and values of the fisheries in the ICES rectangles do not include the fisheries from vessels less than 8 meters (< 8 m) (less than 10 m prior to 2005), 4) Differences between estimated catches in logbook data and weighed landings.

There were some minor differences in the value of the landings between some datasets. While the value of the landings of the individual species was given in some years and with some datasets, the values had to be calculated in other datasets by using averages over a number of years, or taken from other sources.

VMS data, used to derive the distribution of the fisheries in Fehmarnbelt and Western Baltic in this report, only truly represent vessels ≥15 m, and only from 2005-2008, albeit there was a strong correlation with the distribution data of both small and large vessels obtained from interviews. Another potential bias of VMS data is that the distribution of the fisheries indices are based on assumptions of fishing activity when vessels are steaming within a certain speed range according to gear types. These assumptions have only been verified through interviews with fishermen about their steaming speeds during the undertaking of their fisheries and thus cannot be verified in real time. This, in principal leaves open the possibility of fishing vessels undertaking non-fishing activities at vessel speeds where they are assumed to be fishing and vice-versa.

Although, the data recorded by ICES rectangles is the most comprehensive commercial fisheries data available, ICES rectangles (30x30 nm) may be in some cases be large relative to the area of the fixed link and the spatial extent of some of the potential impacts. To take this into consideration, a proposal for associating landings and their value to specific distributions of the fisheries according to gear in the expected corridor (1 and 1-10 km) along the anticipated transect of the link according to VMS data for trawlers and seine netters and according to interview data for gill and trammel net fishermen.

5.2 Experience of impacts to the fisheries from other fixed links

5.2.1 The impact to the fisheries from other fixed links - the Great Belt

The annual environmental statements from “Sund & Bælt Holding A/S” do not describe or assess the development of the fisheries in relation to the establishment of the fixed link across the Great Belt. However, in the following is a statement regarding the Great Belt and the environment as cited from the Sund & Belt website: “The environment in the Great Belt before, during and after the construction of the Great Belt Bridge has been assessed in greater detail than any other construction project in Denmark. Investigations showed that the number and abundance of fauna and flora species in the Great Belt is just as rich now as before, and that the 0-solution for the flow of water has been met” (Sund & Bælt, 1999). The fish populations

have not been studied since the establishment of the fixed link, but the following conclusion based on studies of the blue mussels in the area have relevance for the fisheries: “The abundance of blue mussels per m² is approximately three times greater on the bridge pillars than on the seabed around the island of Sprogø”. This has led to a positive effect on the marine environment by the bridge pillars, a so-called ”reef-effect”, which benefits among other things, the amount of fish and thus the fisheries in the area (Sund & Bælt, 2008).

Landings from the Great Belt

Landings from the Danish fisheries in the inner Danish waters, defined as ICES subdivisions 23 (3B) (Øresund), 22 (3C) (Belt Sea/and Western Baltic) and 24 (3D) (The Baltic Sea west of Bornholm) have decreased from levels of around 60,000 tons in mid 1990s to approximately 10,000 tons annually in 2008 (Figure 5.1).

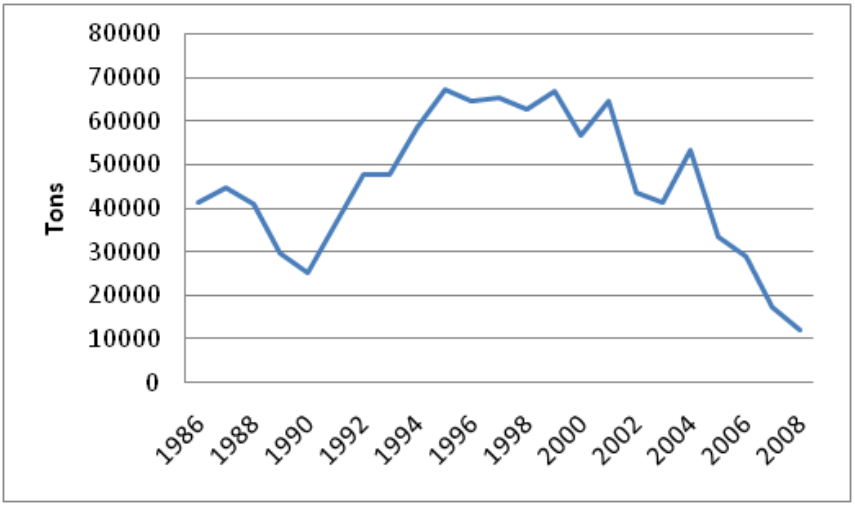


Figure 5.1: The development of the Danish landings (live weight in tons) of fish from the inner Danish waters. Data only includes landings in Danish, Swedish and German harbours within the ICES area 3B (Øresund – also called ICES subdivision 23), 3C (the Western Baltic and Belt Sea – also called ICES subdivision 22) and 3D (the Baltic Sea west of Bornholm – also called subdivision 24). (Source: Danish Directorate of Fisheries).

Some fish caught in the inner Danish waters are also landed in other parts of Denmark and thus the total landings are larger than shown.

The landings by vessels (≥10 m until 2005 and ≥8 m after 2005) from the Great Belt area, defined as the ICES rectangles 39G0 and 39G1, show fluctuating catches over the years from 1986-2008, (Appendix 2). Current catches are at a very low level - less than 2,000 tons (Figure 5.2). The decrease in landings would have been more significant if not for the extraordinary large catches of sprat from 2004-2006. Of considerable importance is the significant decrease in landings of the economically important cod, which decreased by 1/2 to 1/5 of the landings observed in the last half of the 1990s. It is interesting to note that the amount of landings of cod in the Great Belt increased during the entire construction period of the Great Belt Fixed Link (1988-1998).

The most important commercial species in the Great Belt according to weight ranked in order is sprat, herring, cod and the flatfish species flounder, plaice and dab (Figure 5.2). The most important commercial species and fishery according to value is cod. In later years the landings of sole have increased considerably (24 tons in 2008). This fishery now contributes substantially to the economy of the fisheries in this area because of the high economic value of sole.

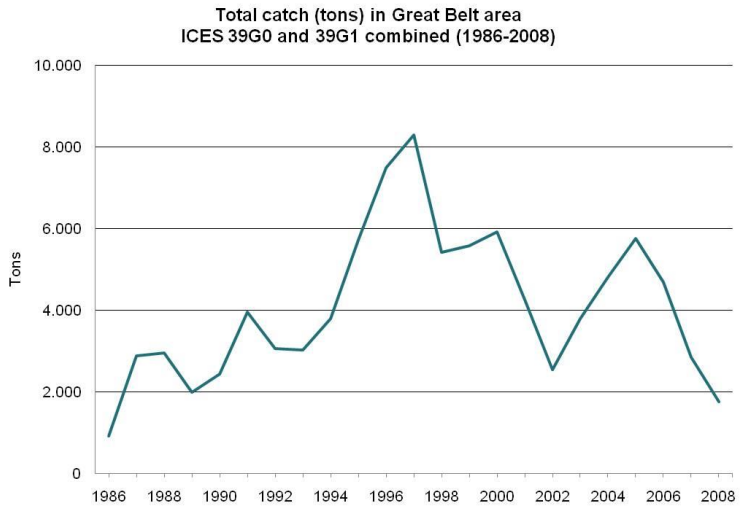


Figure 5.2: The development of the Danish landings in the Great Belt from 1986 to 2008 (ICES rectangles 39G0 and 39G1). Data represents landings from vessels required to fill in logbooks (vessels ≥10 m before 2005 and ≥8 m from 2005). (Source: Danish Directorate of Fisheries).

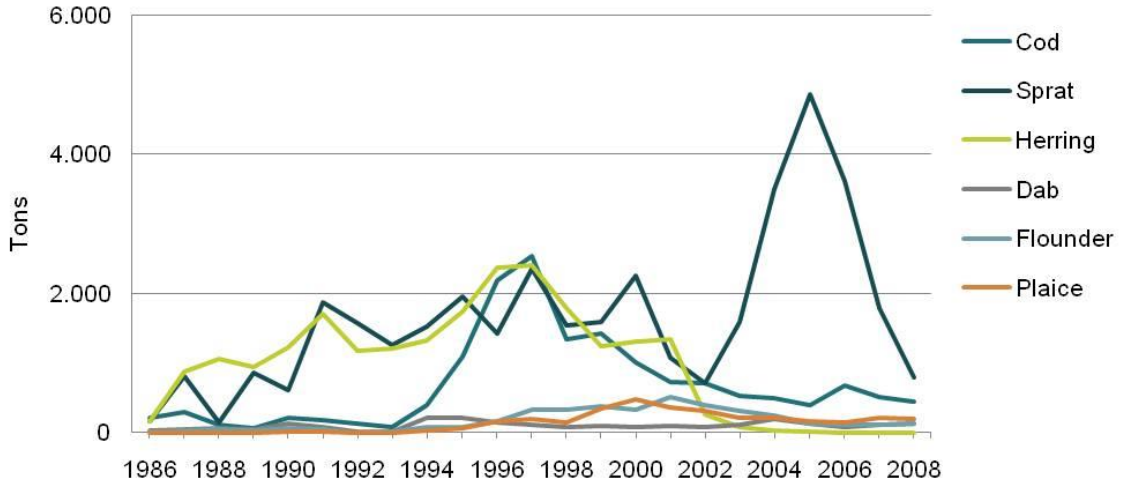


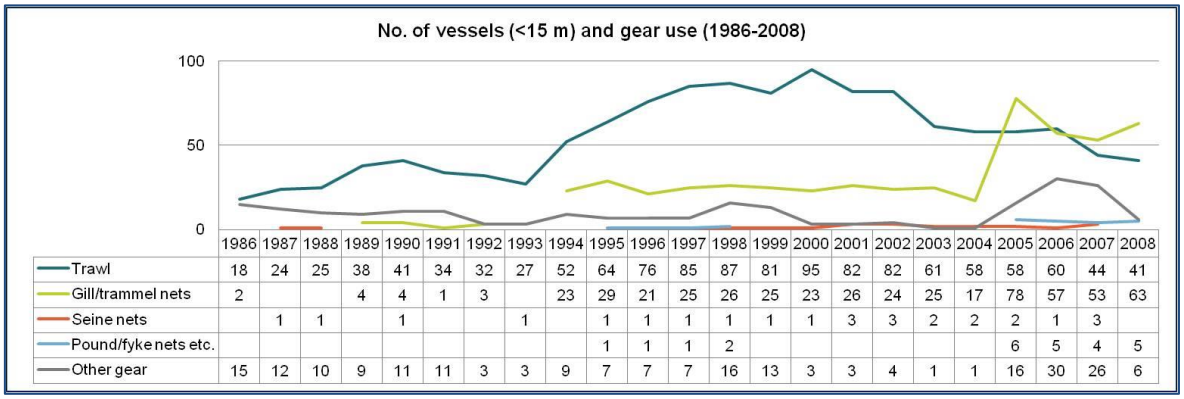
Figure 5.3: The development in the landings of the most important commercial species from 1986 to 2008 in the Great Belt (ICES 39G0 and 39G1). (Source: Danish Directorate of Fisheries).

5.2.2 The fishing fleet in the Great Belt

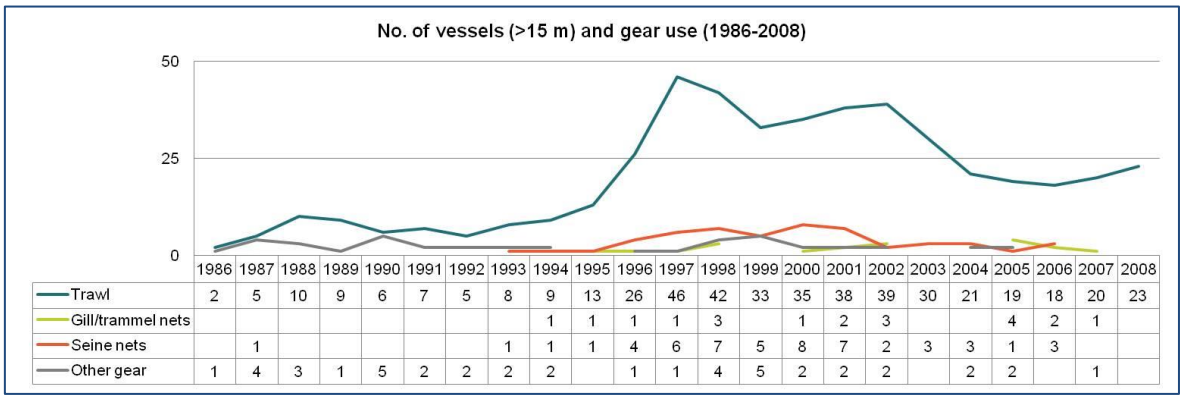
The number of fishing vessels, especially trawlers, that have registered landings from the Great Belt has been considerably higher after 1993 than before (Figure 5.4). In recent years however, the number of vessels have been decreasing and is approaching the low levels from before 1993. The largest vessels (≥15 m) are almost exclusively comprised of trawlers. Although it appears the number of smaller fishing vessels that use nets (net fishermen) appeared to have increased considerably after 2004, this is primarily due to new rules implemented in 2005 that required smaller vessels between 8-10 m (which are primarily net fishermen) to also register their catches in logbooks and thus register their catches in ICES rectangles. The use of other forms of gear for fishing such as pound nets and hooks etc. were only registered in a

few vessels from 1986 to 2004. The number of registered vessels (especially vessels <15 m) using this gear also increased in 2005 and thereafter. Again, this is probably because many of these vessels are between 8-10 m and thus were first included in the fleet data as of 2005.

According to regulations to the fisheries (Order nr. 1443, 2009) it is forbidden to undertake commercial fisheries in ICES subdivision 22 with vessels that have a greater motor power than 300 HP or with vessels larger than 17 meters in length. This does not apply to vessels with historic fishing rights in this area.



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	18	24	25	38	41	34	32	27	52	64	76	85	87	81	95	82	82	61	58	58	60	44	41
Gill/trammel nets	2			4	4	1	3		23	29	21	25	26	25	23	26	24	25	17	78	57	53	63
Seine nets		1	1		1			1		1	1	1	1	1	1	3	3	2	2	2	1	3	
Pound/fyke nets etc.										1	1	1	2							6	5	4	5
Other gear	15	12	10	9	11	11	3	3	9	7	7	7	16	13	3	3	4	1	1	16	30	26	6



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl	2	5	10	9	6	7	5	8	9	13	26	46	42	33	35	38	39	30	21	19	18	20	23
Gill/trammel nets									1	1	1	1	3		1	2	3			4	2	1	
Seine nets		1						1	1	1	4	6	7	5	8	7	2	3	3	1	3		
Other gear	1	4	3	1	5	2	2	2	2		1	1	4	5	2	2	2		2	2		1	

Figure 5.4: The development of the number of small vessels (<15 m; vessels ≥10 m before 2005 and ≥8 m from 2005) and large vessels (≥15 m) fishing in the Great Belt (ICES 39G0 and 39G1) from 1986-2008 according to their gear use. (Source: Danish Directorate of Fisheries).

VMS (Vessel Monitoring System)

VMS data from vessels (≥15 m) fishing in the Great Belt (ICES 39G0 and 39G1) was used to indicate the distribution of the fisheries. The number of larger trawlers that have sailed/fished in the Great Belt during the period 2005-2008 was between 10 and 18. According to VMS data, the distribution of trawlers actively fishing indicates they fish in several specific locations both north and south of the Great Belt Bridge Figure 5.5). In particular, this includes the deep channel in the central/eastern part of the Great Belt. Furthermore, there are very few of the larger vessels that actually appear to come within 3 km of the bridge. Data analysis did reveal, however, that approximately 60% of the trawling vessels that have fished in the Great Belt have done so both north and south of the fixed link.

According to current fishing regulations, vessels with motor power of more than 175 HP are not allowed to fish within 3 nautical miles of the shoreline (Trawling Order, 1993). Because

large trawlers normally have more motor power than 175 HP, they would be excluded from undertaking their fisheries between Funen and Sprogø and between Sprogø and Zealand.

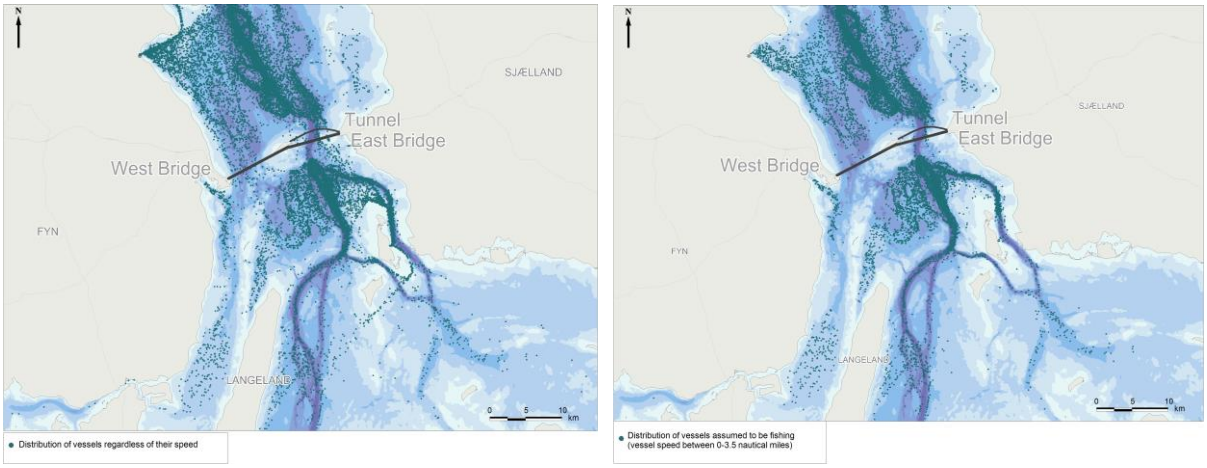


Figure 5.5: VMS data showing the distribution of trawlers (≥15 meter) in the Great Belt in the years 2005-2009. The map on the left shows the distribution of vessels regardless of their speed. The map on the right shows the distribution of vessels that are assumed to be fishing (vessel speeds between 0-3.5 nautical miles). (Source: Danish Directorate of Fisheries).

Only very few large vessels (≥15 m) using seine or gill nets have been actively fishing in the Great Belt in recent years (three vessels in 2005, one in 2006, none in 2007 and 2008 (Figure 5.6). As indicated by VMS data they have not undertaken any fisheries near or under the Great Belt Bridge. It should be noted that vessels that fish with gill nets are seldom larger than 15 m and thus VMS data does not give a complete picture of the distribution of the net fisheries.

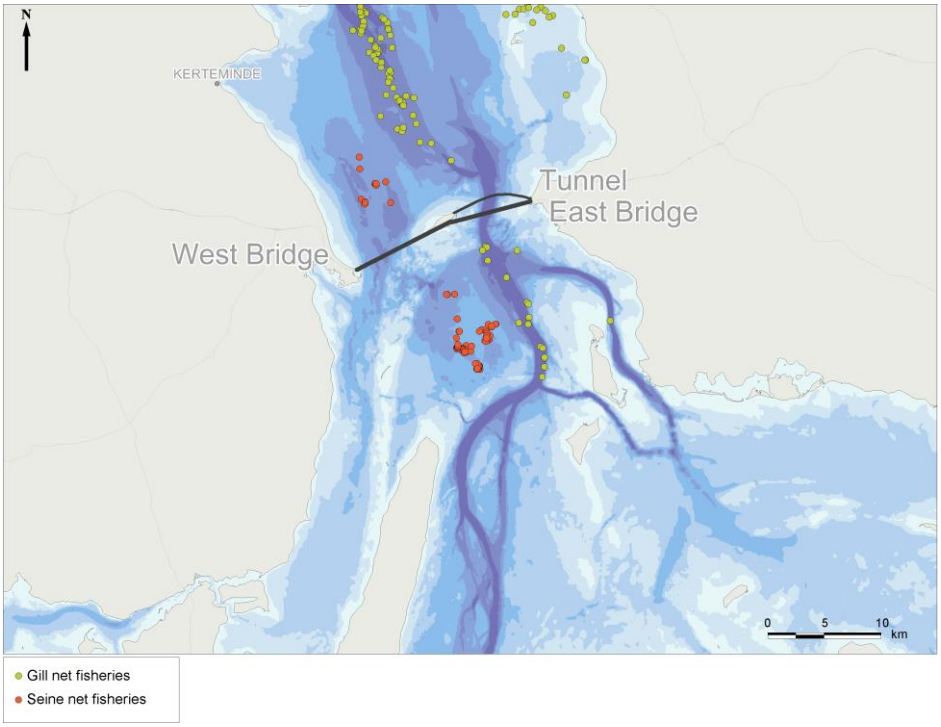


Figure 5.6: The distribution of gill net (yellow squares) and seine net (green circles) fisheries for vessels ≥15 m in the Great Belt from 2005-2009. Based on VMS data for vessels ≥15 m (Source: Danish Directorate of Fisheries).

Interviews with commercial fishermen

The interviews with commercial fishermen showed overall, that no negative effects to the fisheries can be attributed to the bridges alone. This is especially true regarding the fisheries with gill nets which have more or less registered an improvement in their fisheries, possibly due to the so-called “reef effect” where the new bridge structures, including the protective scour material, offer a good substrate for the growth of blue mussels and other organisms representing food items. Furthermore, these structures also function as habitats and protective hiding places for a number of fish such as cod. In contrast, the new structures associated with establishing the Great Belt Fixed Link have a negative impact on the ability of trawlers to undertake their fisheries. This was clearly evident when trawling in the deep Østerrenden, which goes under the eastern section of the Great Belt Bridge, was not possible after its construction. Before construction of the bridge, Østerrenden was an important fishing area, especially for large cod. Similarly, there have also been disturbances to the fisheries due to limited access to fishing areas and damage and removal of nets during preliminary investigations and the construction phase. Furthermore, lost construction material that has settled on the bottom has also been a problem for net fishermen, whose gear has gotten caught on this material and damaged. During the construction processes, such as dredging the seabed southeast of Romsø, extensive sediment plumes spread throughout a large part of the Great Belt and had negative effects on some parts of the fisheries. Finally, there are many fishermen that have the impression that current conditions in the Great Belt have changed considerably. Locally, this has exposed the remains of an ancient forest an area southeast area of Romsø and large boulders along the bottom causing problems in setting nets or trawling. How much the change in the conditions of the currents has affected the fisheries is however, unclear.

The recreational fisheries in the Great Belt

There is a substantial amount of recreational fisheries along most of the Danish coastline, including the coastline in the Great Belt area. There are, however, no available statistics on the extent of the recreational fisheries in the Great Belt making it impossible to quantify the eventual effects to this fishery due to the establishment of the fixed link.

A large decline in the cod populations throughout the inner Danish waters and Kattegat over the last 10-15 years has also affected the fisheries in the Great Belt region. Considering that cod traditionally is the most important species for the recreational fisheries, it is assumed, that the fishing effort by recreational fishermen at sea has also declined during the same period. This is reflected by the rather limited number of commercial angling vessels and tour boats, offering fishing trips in the central part of the Great Belt. During the same period, there has been an increase in the fisheries after sea trout, which is a very important species to the recreational fisheries along the shoreline. Similarly, after the construction of the Great Belt Bridge a small fishery using hooks and jigs around the bridge pillars has developed. To verify this information it would be necessary to undertake a registration of the catches/landings from a representative group of recreational fishing organisations and recreational fishermen. However, because such a registration has not been done prior to the construction of the fixed link, such an exercise on its own could not be used to expose eventual impacts to the recreational fisheries due to the establishment of the fixed link.

In this report, interviews of sports- and hobby fishing organisations and recreational fishermen were undertaken in the Great Belt area (Appendix 2). The results of these interviews can be summarised in the following: The effect on the recreational fisheries has generally been positive, as bridge pillars and protective material along their foundations and the shoreline has added structures to the environment, and led to an increase in the growth of blue mussels, and other sources of food for fish. These structures and material have also led to more varied habitats, and added protective hiding places for a number of fish species. Because of this, disturbances to the recreational fisheries due to the establishment of the bridges have only been of limited importance. One of these, however, is the reduction of the reef area around Sprogø, which is considered to be detrimental to the environment, and potentially has had negative consequences for local fish populations.

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5.2.3 The fisheries in Øresund

Øresund is statistically defined as the waters between lines from Gilleleje (DK) to Kullen (S) and from Stevns Klint (DK) to Falsterbro (S). Under ICES, this area is called ICES subdivision 23 (3B). The location of the Øresund Bridge is in the southern part of ICES subdivision 23 (3B) and in ICES rectangle 40G2 (Figure 3.6).

Since 1932, there has been an agreement between Sweden and Denmark that has prohibited trawling, and partially prohibited seine net fishing in Øresund. The agreement also allows fishermen from each country to fish in the other countries territorial waters from deeps waters up to 7 meters of depth. However, for the herring fishery and fishing with hooks, each country is allowed to fish all the way up to the shoreline. The majority of the fisheries in Øresund are on a small scale and use passive gear (gill nets, pound nets, fyke nets and hooks), and the majority of the catches are landed locally.

Landings by the Swedish commercial fisheries are considerably lower than the Danish commercial fisheries, except for herring, which quantitatively, but not economically, is the most important commercial species. Landings of the economically most important species (cod and eel) by Danish fishermen have historically been 2-3 times greater than landings by Swedish fishermen (Swedish Board of Fisheries, 2005a). The eel fishery, however, is undergoing a period of greater catch restrictions to protect the threatened population. It is therefore expected that the importance of the eel fishery to the Danish commercial fisheries will probably decrease in the coming years.

Annual landings in Øresund (ICES subdivision 23 (3B)) by Danish fishermen over the last 25 years have varied considerably (from 2,000 to 9,000 tons annually), with the largest landings in the last half of the 1990s (Figure 5.7). A large part of the fluctuations can be attributed to varying landings of herring.

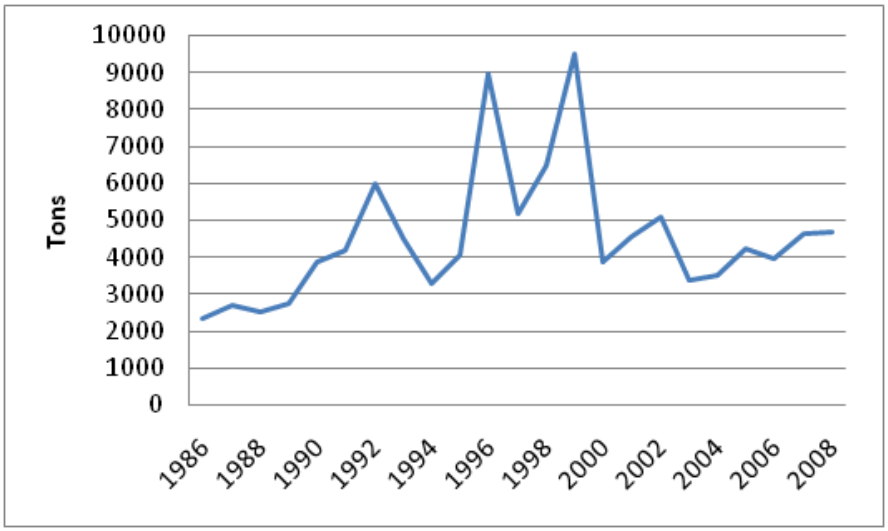


Figure 5.7: Development of the landings in Øresund (ICES subdivision 23 (3B) by Danish fishermen from 1986-2008. Data includes landings from vessels ≥10 m before 2005 and vessels ≥8 m since 2005. (Source: Danish Directorate of Fisheries).

The development of the landings in the central part of Øresund (ICES 40G2) shows a significant increase in the total landings in the middle of the 1990s (Figure 5.8). A part of this increase can probably be attributed to changes in the regulations concerning logbook registration in 1994, which required all vessels that undertook licensed commercial fisheries (for example the cod fishery), regardless of length, to fill out official logbooks, and thus register catches in ICES rectangles. This requirement was removed again in 1996, but a number of the smaller vessels continued to use logbooks to register their landings. It is probable that the landing statistics for all of Øresund (Figure 5.7) gives a better indication of the development of the landings during the period 1986-2008 than statistics for ICES rectangle 40G2, that are presented in Figure 5.8.

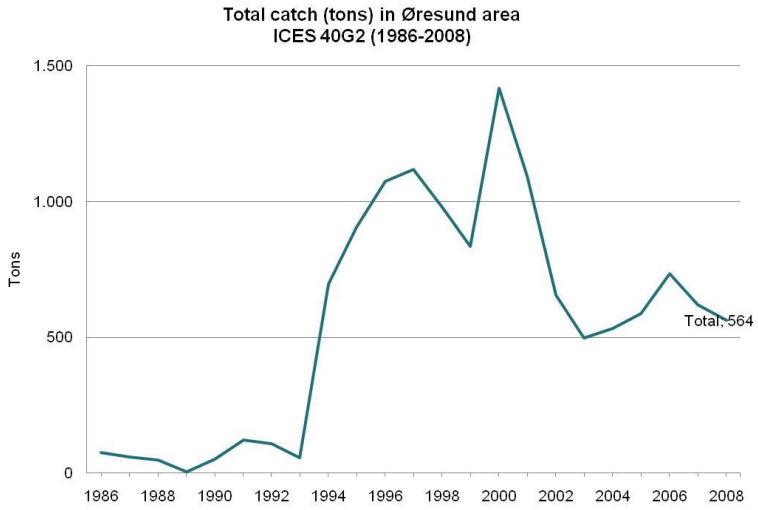


Figure 5.8: Development of the landings by Danish fishermen in the central part of Øresund (ICES 40G2) (1986-2008). Data includes only landings by commercial vessels required to register their landings in logbooks (commercial vessels ≥10 m before 2005 and vessels ≥8 m since 2005) and all commercial vessels during the period 1994-1996, regardless of length. (Source: Danish Directorate of Fisheries).

Landings of the most important species show that cod have comprised the largest fraction of the landings over the last 5-10 years, but also landings of herring were of high importance, especially from 1994-2002, although, these landings have fluctuated considerably (Figure 5.9).

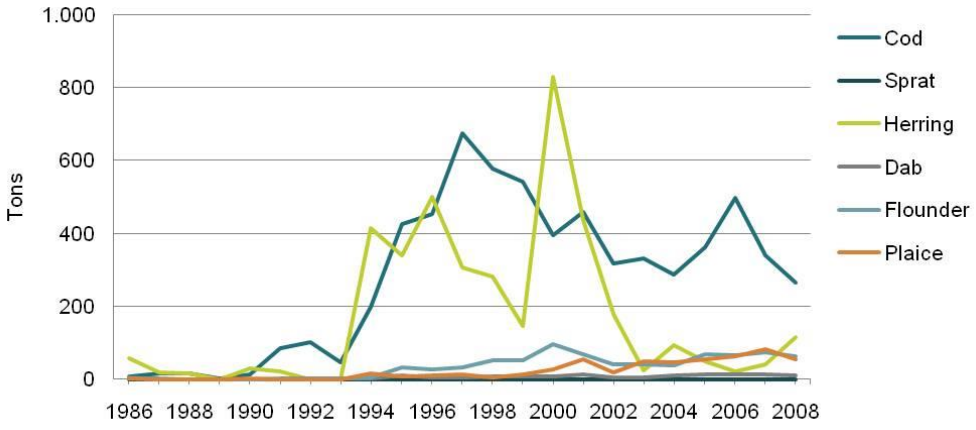


Figure 5.9: Development of the landings by Danish fishermen of the most important commercial species in the central part of Øresund (ICES 40G2). (Source: Danish Directorate of Fisheries).

Landings of eel, which are the most important commercial species for the pound net and fyke net fisheries in Øresund, increased to 40-50 tons (only registered landings from logbooks) up to the year 2000, hereafter landings decreased to its current level around 10-20 tons per year (Figure 5.10). A large part of the increase in the landings of eel in the last part of the 1990s was due to a substantial increase in the landings of yellow eel, which decreased again in 2000-2001. From 2000-2002 there was a significant increase in the landings of silver eel, and thereafter also a large decrease. Landings in recent years have been made up of both yellow and silver eel in approximately the same amounts (8-10 tons).

As mentioned earlier, the changing methods for gathering fishery statistics suggests that the landing statistics do not entirely represent all the actual landings. This is especially true before 1994, where landings were not registered in logbooks, and therefore could not be associated with specific ICES rectangles.

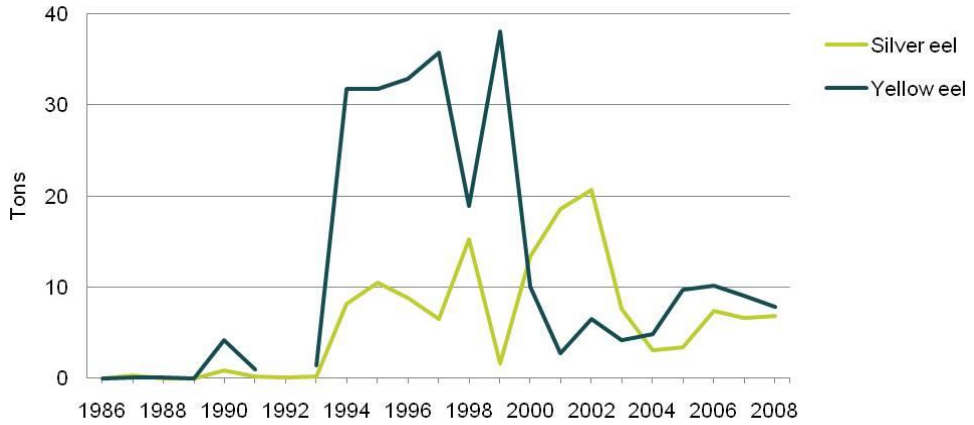
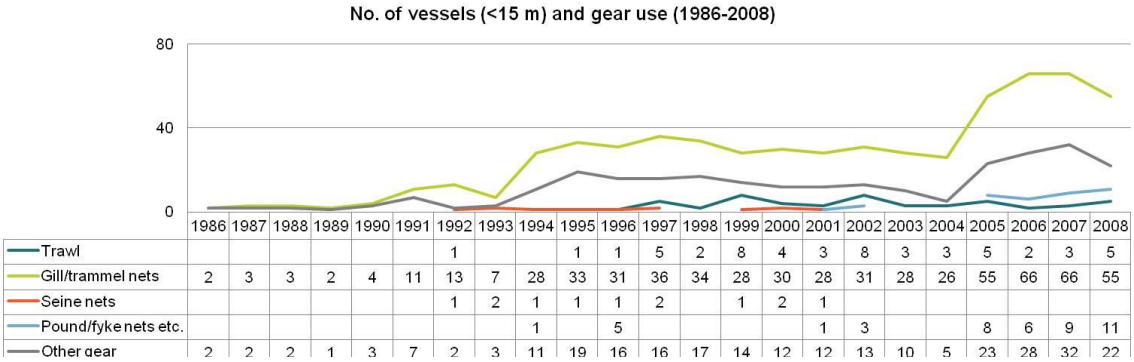


Figure 5.10: Development of the landings by Danish fishermen of yellow and silver eel in the central part of Øresund (ICES 40G2). Data represents only vessels that register their landings in logbooks, which only have included a larger part of the commercial fleet since 1993. (Source: Danish Directorate of Fisheries).

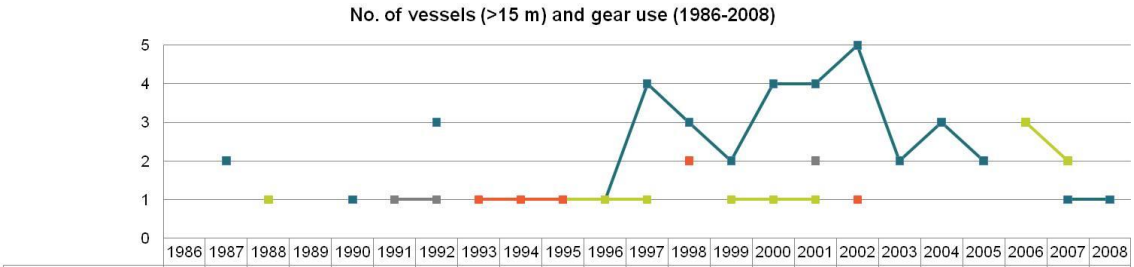
The fishing fleet in Øresund

The fishing fleet with landings from the central part of Øresund (ICES 40G2) are predominantly made up of small vessels that fish with pound nets, gill nets, fyke nets and hooks (longlines) (Figure 5.11). Trawling and seine netting are not allowed in this part of Øresund. Only very few vessels with a length over 15 meters (from 1 to 7) have registered landings from Øresund.

In 2005, there was a significant increase in the number of smaller vessels using gill nets and other unspecified gear. This could probably be attributed to vessels in the length group 8-10 meters being required to register their landings by logbooks as of 2005. An increase in the number of fishing vessels is also observed in 1994, when all commercial vessels regardless of length and with a license to fish (primarily cod fishermen) had to register their landings in logbooks. This demand was only in effect from 1994-1996, but several fishing vessels continued to use logbooks to register their landings regardless.



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl							1			1	1	5	2	8	4	3	8	3	3	5	2	3	5
Gill/trammel nets	2	3	3	2	4	11	13	7	28	33	31	36	34	28	30	28	31	28	26	55	66	66	55
Seine nets							1	2	1	1	1	2		1	2	1							
Pound/fyke nets etc.									1		5					1	3			8	6	9	11
Other gear	2	2	2	1	3	7	2	3	11	19	16	16	17	14	12	12	13	10	5	23	28	32	22



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Trawl		2			1		3				1	4	3	2	4	4	5	2	3	2		1	1
Gill/trammel nets			1			1			1	1	1	1		1	1	1					3	2	
Seine nets						1		1	1	1			2				1						
Other gear						1	1									2							

Figure 5.11: Number of Danish vessels with landings from the central part of Øresund (ICES 40G2) in the period 1986-2008 separated according to vessels <15 m (includes vessels ≥10-15 m before 2005 and ≥8-15 m from 2005) and vessels ≥15 m and gear. (Source: Danish Directorate of Fisheries).

VMS data

Only a limited number of VMS data from Øresund (Figure 5.12) exists because trawling is not allowed (Trawling Order, 1993), and the majority of vessels that use nets are less than 15 m, which is the minimum length of vessels required to participate in VMS registrations.

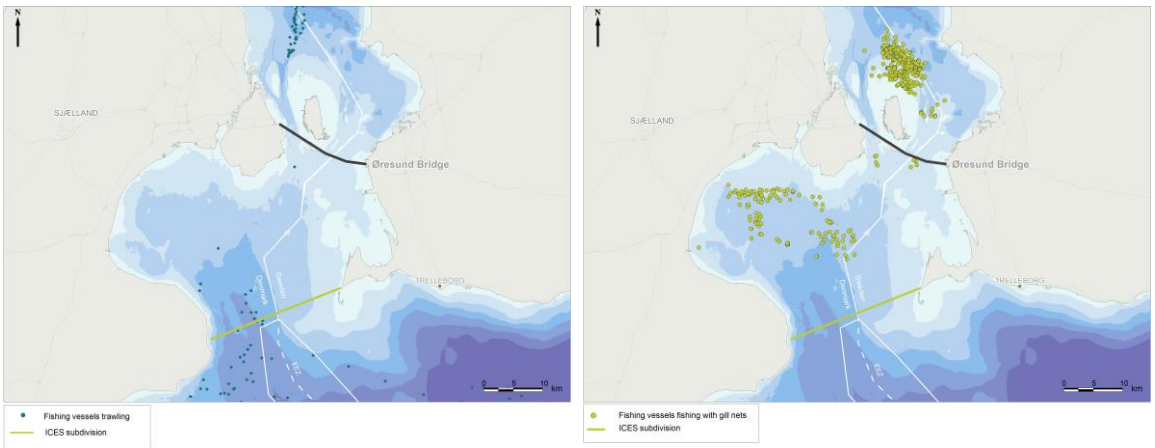


Figure 5.12: VMS data (vessels ≥15 meters) in Øresund for the period 2005-2009 indicating the distribution of fishing vessels trawling (map on left) and fishing with gill nets (map on right). (Source: Danish Directorate of Fisheries).

Swedish investigations of the impact to the fisheries due to the Øresund fixed link

The Swedish Board of Fisheries (Fiskeriverket) investigated the development of the fisheries in Øresund during the period 1994-2003 (Swedish Board of Fisheries, 2005a). The investigation was undertaken with the help of 12 fishermen that continually gathered fishery data from the area before, during and after the construction of the fixed link. Their catch per effort (CPUE) was registered both in the area of the bridge, and in two reference areas to the north and south of the bridge.

The results showed large year to year fluctuations in the CPUE for most of the commercial species. This made it difficult to demonstrate any clear differences in the catches before, during and after the construction and operation of the bridge. For cod and flounder the catches were significantly lower during the construction and operational phase compared to the catch levels before the bridge was built. For dab there were significantly lower catches during the construction phase. During the same time period of these studies the cod stocks in the adjacent sea areas (Kattegat and Western Baltic) have also been decreasing. This suggests that the decrease in the CPUE in Øresund is probably more an effect of a general decrease in cod stocks than necessarily a decrease associated with the establishment of the bridge. Flounder in the southern part of Øresund are recruited from stocks in the Baltic, where development is uncertain. Although, the CPUE of flounder in gill nets and fyke nets in Øresund have not shown any significant changes in CPUE, overall, it is still possible that their catches were reduced during the construction phase.

For eel, plaice, herring, turbot and lumpsucker it has not been possible to isolate any effects on the abundance of their catches during the construction phase.

The results from the Swedish investigation was summarised as: “Results of the investigations of the impact to the commercial fisheries has not demonstrated any large differences in the species composition and catches between the study area in Øresund and the nearby reference areas during the investigation period” (Swedish Board of Fisheries, 2005a).

According to the Swedish Board of Fisheries, results of the biological investigations and their assessments indicating impacts due to the establishment of the Øresund Bridge, include a reduction in the amount of juvenile eels during the construction phase, as well as a significant reduction in fish spawning and nursery areas. Consequently, it cannot be ruled out that the “zero-solution” that was chosen, including its margin of error in calculations, still may lead to a risk of impacting and decreasing the cod stocks in the Baltic and Øresund. These impacts and uncertainties have led to demands from the Swedish Board of Fisheries/The Legal, Financial and Administrative Services Agency, for an annual compensation of 355,000 SEK and the release of 40 million juvenile eels over 4 years. The Environmental Courts decision of 1st September 2008, however only approved a compensation of 70,000 SEK for measures to promote the increase of fish.

The decision by the Water Rights Court/Environmental Court is principally very important because it supports The Swedish Board of Fisheries and The Legal, Financial and Administrative Services Agency in giving a Swedish court the ability to make demands about compensation to the fisheries, even though part of the installation (the fixed link) is outside of Swedish territory.

Both, the Øresund Consortium and The Legal, Financial and Administrative Services Agency have appealed the Environmental Courts decision to the Swedish Supreme Court – where a ruling is still pending.

One of the consequences of the ruling by the Environmental Court in 2008 is that the road lights on the bridge have been shielded, this was intended to remove any disturbances light may have on eel migrating through Øresund.

Recreational fisheries in Øresund

In the northern part of Øresund there is a significant amount of recreational fisheries, not least because of commercial angling vessels/tour boats originating from the Danish harbours in Øresund. This is, however, not the case in the section of Øresund where the Øresund Bridge and tunnel are located. The lower amount of recreational fisheries in this area has to do with the high amount of shipping traffic, and the strong currents through the Drogden. In contrast, on the Swedish side of Øresund between Saltholm and Lernacken, there is an extensive amount of recreational fisheries. This has been the subject of a comprehensive investigation by the Swedish Board of Fisheries (Swedish Board of Fisheries, 2005a).

It is speculated that the landings of the majority of species in Øresund by recreational fishermen are considered to be greater than the landings in the commercial fisheries. The landings from Øresund by Swedish recreational fishermen were estimated to be approximately 1,200-1,300 tons in 1990. These landings, however, were not necessarily only from Øresund and so are uncertain. The landings by Danish recreational fishermen during the period 1987-1993, if landings of herring are not included, was only estimated to around 400 tons (Nielsen, 1994). This was approximately the same level as the annual catch of the Danish commercial fishermen in Øresund. However, because there are no complete statistical data available on the amount of the landings from recreational fisheries, the extent and approximate amount of landings from these fisheries are uncertain (Swedish Board of Fisheries, 2005a).

Similar to Denmark, the recreational fisheries in Sweden are split into two categories, respectively, (1) hobby fishermen where passive gear (gill nets, fyke nets, hooks etc.) are used, and (2) sports fishermen or anglers, where fishermen generally use a rod and reel. According to requirements from the Swedish Water Rights Court, surveys of the recreational fisheries were undertaken both before (1993) and after (2001) the establishment of the Øresund Bridge (Swedish Board of Fisheries, 2005a). The surveys were undertaken with the help of questionnaires to each and every hobby- and sports fisherman. Furthermore, all the boats used by hobby fishermen in every harbour in Øresund were registered. The surveys showed that there was very little fishing by hobby fishermen near the bridge, and conclusions of the investigation stated that it was not possible to document any significant changes in the recreational fisheries after the establishment of the Øresund Bridge. Of the hobby and sports fishermen that participated in the survey, only a few answered that the fixed link over Øresund had negative effects on their fisheries.

Interviews of fishermen

Statements from interviews with recreational and commercial fisheries can be summarised into the following: There have been large changes in the fish stocks in Øresund, but the assumed causes are primarily attributed to changes in the stocks in the waters that border Øresund, and are not due to the establishment of the Øresund Fixed Link. Due to the narrowing of Drogden the currents have increased in certain local areas significantly. This increase in current speed has not only affected the area near the bridge but the waters south and east of Amager that flow towards and into Køge Bay. This has had a negative effect on the possibility to undertake fisheries using passive gear, especially pound nets along the coast and gill nets, particularly in deeper waters (more than 7-8 meters), where fishing is now only possible a few days a year. Furthermore, during the summer, large amounts of loose filamentous algae are carried by the strong currents and get caught in diverse gear and disturb the fisheries.

During the construction of the bridge large plumes of slurried chalk were occasionally observed in the water, which also periodically disturbed the fisheries.

Other information

As background material for negotiations to compensate the fisheries between The Danish Fishermen's Association and the Øresund Consortium, a report was produced describing the

extent and value of the fisheries in an impact area defined as 15 km to each side of the bridge (Danish Fishermen's Association and the Øresund Consortium, 1996a). The impact area was further subdivided into four areas depending on the degree of impact. The largest impacts were considered to be in the construction zone where the bridge was being built (area: 18.6 km²). Cod and eel were the most important commercial species in Øresund in the period up to the construction of the bridge, where the annual catch of eel in the period 1988-1993 alone represented the same value of all other species combined (Sund & Bælt, 2008).

Included in the data for assessing the total impact to the fisheries, due to the establishment and operation of the fixed link over Øresund, was a description of the impacts to the fisheries on Kriegers Flak in the Baltic, southeast of Øresund. Here, bottom material was to be removed and used for land reclamation purposes etc. during the construction of the Øresund fixed link (Danish Fishermen's Association and the Øresund Consortium, 1996b).

5.2.4 The access of the fisheries to areas with tunnels and bridges

Laws for fisheries and aquaculture contains rules that have the objectives of protecting the interest of the fisheries against measures and interventions that can cause disadvantages, or prevent the undertaking of fisheries in marine areas, create bottom conditions unfit for the fisheries, or effect the fauna and flora in fishing territories (Fiskeriloven, 2006) (§77). Permission to undertake such interventions can only occur if one of the following has been put into effect:

1) A final ruling has been taken regarding questions of compensation to the affected commercial fishermen.

2) Negotiations of potential compensation have begun between the group that undertake the measures or intervention, and the commercial fishermen who could be affected.

3) The issue of possible compensation to the affected commercial fishermen has been referred to a decision board (commissioned by the Minister for Food, Agriculture and Fisheries).

In almost all cases regarding issues of compensation to fishermen, an agreement is made between those that undertake the intervention, and the commercial fishermen affected.

Only on rare occasions are questions regarding compensation sent further to a decision board. In connection with the establishment of the fixed links across the Great Belt and Øresund, settlements were reached between those responsible for building the fixed links and the affected commercial fishermen and their associations. Hereafter economical compensation to the affected fishermen was given.

In most cases, dredging seabed and marine reclamation works can be undertaken without negotiations with fishermen for compensation. This is not the case in large scale and isolated marine construction works where the permits are given to the developer (§78, stk. 2). This was the case in the construction of the Øresund Fixed Link in Øresund and its use of dredged material from Kriegers Flak. Thus, negotiations between developers and fishermen to compensate for using seabed material from Kriegers Flak during construction were also undertaken.

5.2.5 Regulations of the fisheries and vessel traffic in the Great Belt

The specific provisions for the fisheries and vessel traffic around the Great Belt Bridge are presented by the Maritime Authority in Order nr. 488 of 31 May 2007 (Maritime Authority, 2007) (Order nr. 488 replaces Order nr. 86 of 12 February 2004 - Maritime Authority, 2004):

Sailing

- All vessels with a gross tonnage of 50 tons or more, and vessels with a height of 15 meter or more above the water surface, shall report transit under the bridge to the ship reporting system BELTREP
- Under the West Bridge a northbound vessel traffic lane between pillars 34 and 35 and a southbound vessel traffic lane between pillars 37 and 38 have been established (Figure 5.13). The width between the pillars is 104 meters and the height of free passage is 18 meters.
- Passage under the West Bridge is only allowed for vessels with a dead weight tonnage under 1,000 tons, and vessels with a height less than 18 meters from the water surface.
- A traffic separation system has been established in the passage lane between the two bridge towers of the East Bridge (Figure 5.14).
- All vessels with a gross tonnage of 50 tons or more that would like to pass under the West Bridge have to do so through the two marked passage lanes.
- Vessels with a length of 20 meters or more have to use the passage route under the East Bridge
- Vessels not larger than 20 meters and all sailing ships should avoid using the passage route within the traffic separation system under the East Bridge, and use all the other passage routes instead.

Fisheries

- All fisheries are forbidden in the separation area of the traffic lanes under the East Bridge, and in the traffic lanes that extend 2-3 km on both sides of the bridge (Figure 5.14).
- Anchoring and fishing are forbidden in the two traffic lanes under the West Bridge (notice the restriction applies from the marked bouys (see Figure 5.13)) and within the 500 meter extension of these traffic lanes on both sides of the bridge.
- Sailing across the two traffic lanes at the West Bridge is prohibited at a distance of less than 500 meters from the bridge.
- Mooring or anchoring under both bridges is forbidden without prior permission from the Great Belt VTS (Vessel Traffic Service).

Fisheries can be undertaken at and under both bridges, except for within the two traffic lanes under the West Bridge and in the traffic separation zone under the East Bridge. The exceptions to these rules are:

- Sailing/fishing along the West Bridge is not allowed within the marked traffic lanes and at a distance of less than 500 meters from the bridge
- Fishing vessels with a gross tonnage of 50 tons or more are not allowed to pass under the West Bridge outside the two marked traffic lanes
- Fishing vessels with a length of more than 20 meters may not pass under the East Bridge outside the marked traffic lanes.

In summary, the imposed regulations (Order nr. 488) lead to forbidding fisheries under the West Bridge for vessels more than 50 gross tons (GT) and forbidding fisheries under the East Bridge for vessels more than 20 meters in length.

There are no specific rules for the different forms of fisheries in the named Orders (nr. 488 and 86), thus it is assumed that fishing with trawls, nets and hooks under the bridge is allowed

under the conditions that vessels do not moor or anchor. If mooring and anchoring is necessary then permission from the Great Belt VTS is necessary.

Trawling is undertaken without anchoring. When fishing with nets it is necessary to use anchors, typically for every 10th net (total length approximately 500 meters) to keep the nets in place, but this does not necessitate anchoring by the vessels. When fishing with hooks and jigs, which are used by recreational anglers, it is not necessary to anchor.

Violations of the regulations in these Orders can lead to fines or imprisonment of up to one year. Under extreme circumstances (for example, if a financial advantage is sought or obtained) then violations can be punished with imprisonment of up to two years.

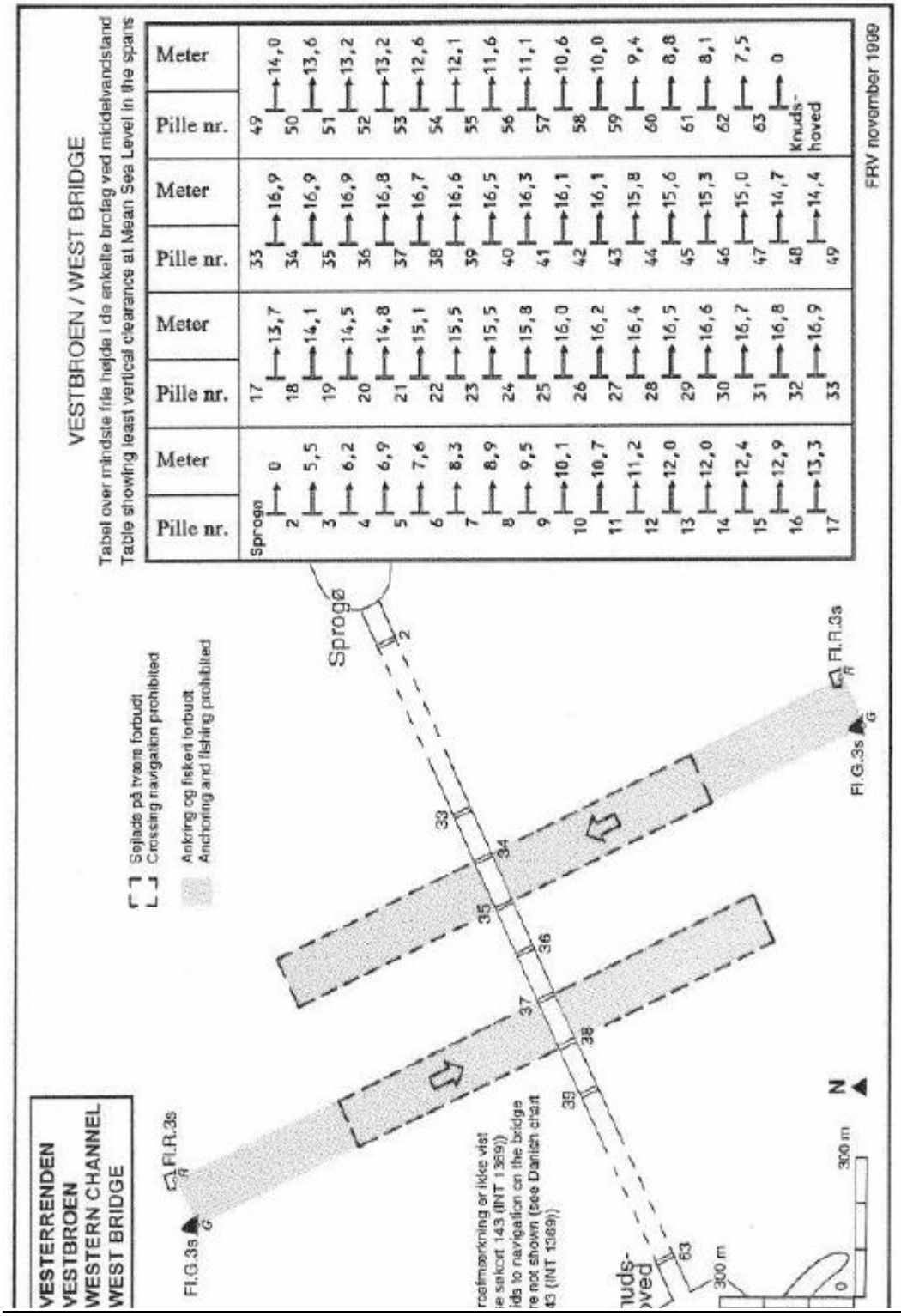


Figure 5.13: Sailing lanes under the West Bridge with marking of zones where fishing is forbidden. Source: Maritime Authority (2007).

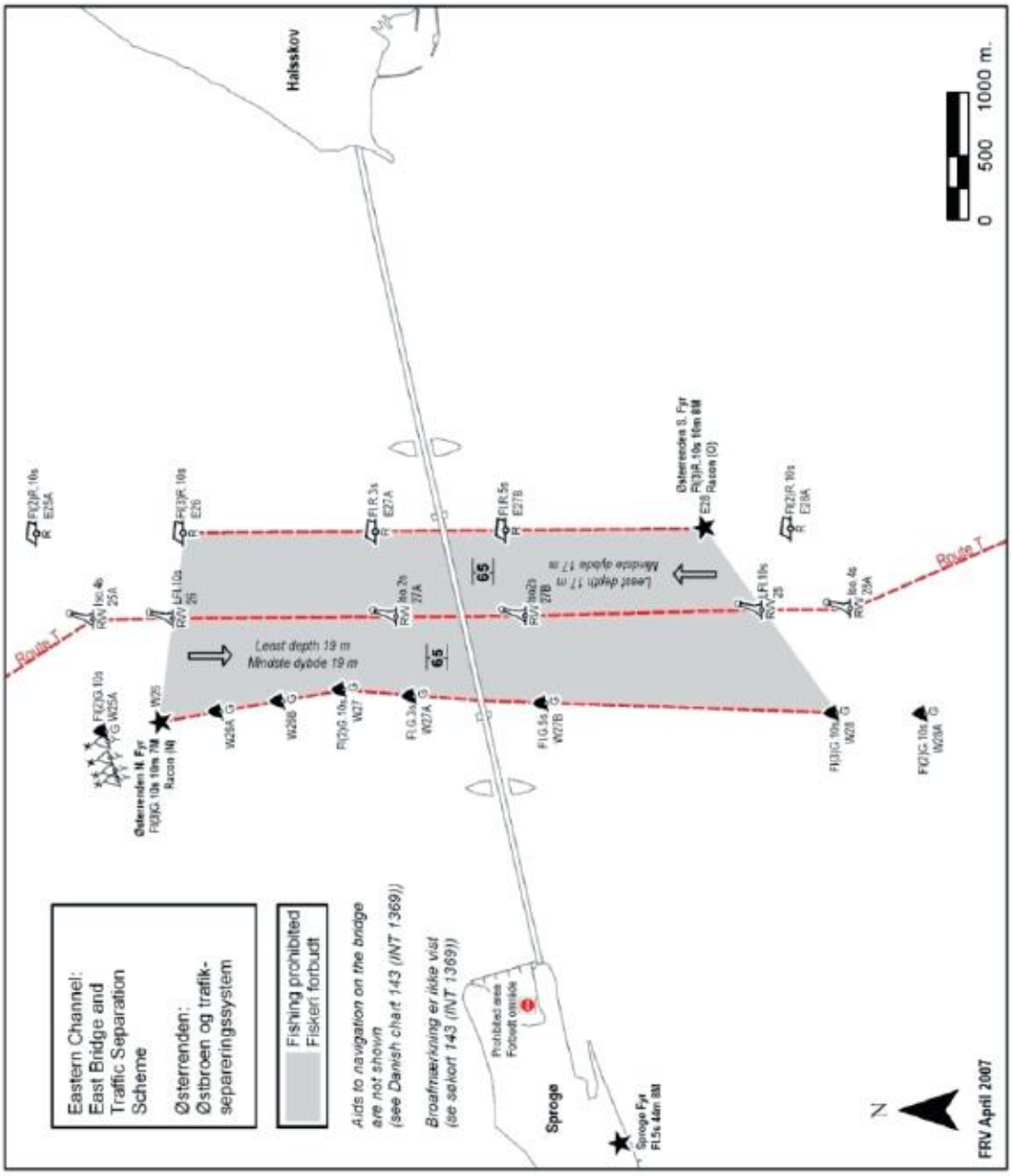


Figure 5.14: Traffic separation areas and sailing lanes under the East Bridge with marking of the zones where fishing is forbidden. Source: Maritime Authority (2007).

A/S Storebælt (pers. comm.) has in a mail on the 16th of March 2010 been requested to evaluate the aforementioned description and interpretation of the current rules for both the fisheries and for vessels passing under and sailing in the area of the Great Belt Bridges. The answer, dated 16 March 2010, is in its entirety presented below:

"The following report presents the rules for fishing and passage around the Great Belt Bridges based on interpretations of the Marine Authorities Order nr. 488 of 31st May 2007 and Order nr. 135 of the 4th March, 2005.

The report concludes that –

There are no specific rules for the different forms of fisheries in the named Orders (nr. 488 and 135), thus it is assumed that fishing under the bridge with trawls, nets and hooks is allowed under the conditions that it is not necessary for vessels to moor or anchor. If mooring and anchoring is necessary then permission from the Great Belt VTS is necessary.

Furthermore it states that -

"The trawl fisheries are undertaken without mooring or anchoring. In the net fisheries, anchors are used, typically for every 10th net (total length approximately 500 meters) to hold the nets in place (but not to hold the vessel in place). For the fisheries using hooks, including jigs, which are typically used by recreational fishermen it is not necessary for vessels to moor or anchor.

A/S Storebælt does not want to comment on the interpretations presented in this report but will only mention that on earlier occasions A/S Storebælt has warned against drifting or fishing under the bridge due to for example, the dangers of material and debris dropped from the bridge by the traffic.

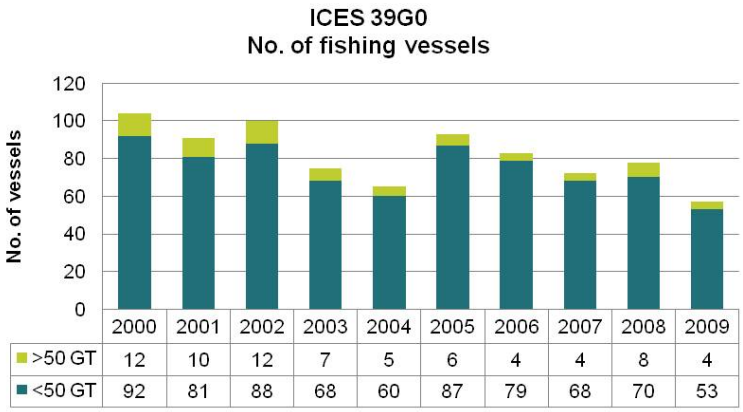
Similarly, A/S Storebælt has strongly warned against fishing with a trawl or any other form of gear that is hauled between the bridge pylons, because this gear can lead to damage of the bridge construction under the water surface, such as cement foundations with their anti-corrosion installations as well as the protective material to prevent erosion placed around the pillar foundations. The erosion preventive material around the pillars is placed at a distance of up to 25 meters from the pylon shafts.

The costs of repairing eventual damage to the bridge construction or the erosion protection material will be imposed on the person/persons that commit the damage according to civil laws.

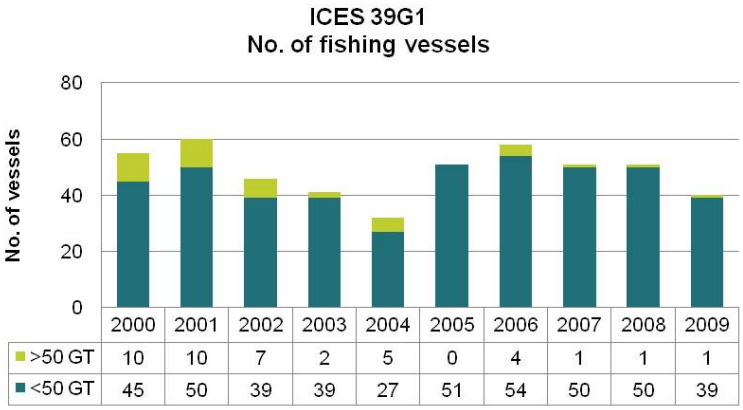
According to information from Storebælt A/S (Maritime Authority pers.com.), the annual inspection of the bridges, has uncovered damage to the protective surface of the pillars and to the anode fixtures, which have been necessary to replace in certain instances. It is believed that damage was caused by fishing with trawls very close to the bridge pillars. At present, no fishermen have been taken to court in these matters.

The impact on the fisheries due to regulations to vessels

As already mentioned, the vessels over 50 GT can only pass under the West Bridge in the two marked traffic lanes, where all forms of fishery is forbidden during passage. To get an idea of how many vessels larger than 50 GT were actively fishing in the Great Belt, fleet statistics were obtained from the Danish Directorate of Fisheries in the two relevant ICES rectangles (Figure 5.15). As shown, the number of fishing vessels larger than 50 GT only amount to a small percentage (max. 5-10%) of the total number of fishing vessels that have registered landings in the Great Belt. Slightly more of these vessels have registered their landings from the western part of the Great Belt (ICES 39GO) than from the eastern part of the Great Belt (ICES 39G1). Whether these large fishing vessels (primarily trawlers) would like to pass under the West Bridge (outside the marked traffic lanes) is unclear. According to current fishing regulations, vessels with motor power greater than 175 HP are not allowed to undertake their fisheries within 3 nautical miles from land. In reality, this means that it is forbidden for these vessels to undertake fisheries between Funen and the island of Sprogø and the island of Sprogø and Zealand.



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
>50 GT	12	10	12	7	5	6	4	4	8	4
<50 GT	92	81	88	68	60	87	79	68	70	53



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
>50 GT	10	10	7	2	5	0	4	1	1	1
<50 GT	45	50	39	39	27	51	54	50	50	39

Figure 5.15: The number fishing vessels that have registered landings in the western (ICES 39G0) and eastern (39G1) part of the Great Belt according to vessel size (GT Gross tonnage) and within the period 2000-2009. Source: Danish Directorate of Fisheries.

5.2.6 Special regulations in Øresund

As already mentioned, it is forbidden to fish with dragging gear (trawl, seine) in Øresund and so the majority of the fisheries are undertaken by small vessels that use passive gear (gill nets, fyke nets, pound nets and hooks). This type of fishery is not expected to influence the material of the Øresund Bridge.

Due to the airline safety at Kastrup airport no fisheries are allowed (except for some commercial fishermen with dispensation) within an area off the eastern coast of Amager between Dragør harbour and Kastrup Marina, and out to Drogden. This ban includes the coastal waters immediately south of the tunnel / ramp.

The Danish Maritime Authority (pers.com.) is not aware of restrictions to the fisheries around the Øresund Bridge, but suggests that there can be special Swedish regulations as the bridge is under Swedish jurisdiction (Swedish Board of Fisheries (2005b).

6. Discussion – experiences from other fixed links

In general, it is difficult to quantify impacts to the fisheries due to the establishment of fixed links because of the considerable variability in the catches of different species from year to year that are a natural part of the fisheries. Furthermore, the methods or standards by which official fishery data is gathered and quality assured often change over time. This can make official fishery data prior to, during, and following the establishment of a fixed link, less comparable, and ultimately less reliable in helping interpret changes.

The most concrete measurable impact to the fisheries is the direct and indirect loss of fishing area due to restriction zones during and after construction, and establishment and extension of reclamation areas and ramps etc. An area that is temporarily or permanently lost to the fisheries can be measured and quantified according to for example, size. Quantifying the losses to the fisheries is still however difficult because of the variety of factors that play a role in determining these losses. These are factors such as; which fisheries are represented in the lost areas (trawling, net fishing etc.), which commercial species are represented and their economical importance, which problems can be associated with material extraction from the seabed, and what alternative fishing areas are available and the extra demands on the fishermen to utilise these areas (travel distance, increased fishing intensity in an area etc.).

Another unforeseen factor effecting the fisheries that arose in this investigation was the potentially broad interpretation of new regulations regarding what vessels may and may not do around bridge pillars, and along the transect of the Great Belt Fixed Link, and how these are interpreted with regard to fishing vessels. Similarly, rules on where vessels are not allowed to pass under the Great Belt Bridge according to vessel size, or undertake fisheries according to distance from land (taking into consideration the greater extension of land due to the reclamated areas on the island of Sprogø etc.) have indirectly restricted the undertaking of fisheries for larger vessels.

Information from interviews with fishermen that are directly affected by the establishment of a fixed link has been shown to be a very important supplement to official statistics. This information has given insight into which environmental impacts and decisions to regulate the fisheries, have had the greatest disturbances to the particular fisheries. Interviews with affected fishermen have also helped expose the impacts that have been unforeseeable. This was evident in this investigation as several fishermen have experienced damage or loss to gear due to debris left on the bottom following construction, or the limited possibility of using fishing nets in some areas due to changes in water current regimes.

Exposing information by bringing forth the experiences of fishermen directly affected by impacts during and after the establishment of a fixed link can only lead to a better understanding of the broad number of potential impacts that can arise. This can ultimately lead to better insight to what environmental impacts and potential mitigation measures may be most helpful and beneficial, in reducing detrimental impacts to the fisheries in future fixed link projects.

7. Conclusion – experiences from other fixed links

The results from investigations summarizing the impacts on the fisheries from other fixed link solutions - experiences from the Great Belt and Øresund (Øresund) are summarised in the following:

- The fishery statistics on landings of the most important commercial species for the ICES rectangles, representing the fishing areas around the two fixed link areas, varied considerably. According to these data, together with insufficient and missing statistics especially for the period before 1994, it is difficult to make valid conclusions about potential impacts to the fisheries from the establishment of the Great Belt and Øresund fixed links.

- Overall, the landings within the ICES rectangles that represent the fishing areas around both fixed links have been decreasing since the mid 1990s. A similar decrease in landings has been observed in the adjacent marine areas (Kattegat and the Baltic) with which the Great Belt and Øresund link together.

- The major changes in the official number of fishing vessels over the past two decades in the ICES rectangles, where both the Great Belt and the Øresund fixed link are located, are made uncertain because of the changes in rules that required smaller vessels, and thus the inclusion of a new group of vessels, to register their catches in ICES rectangles.

- According to results of one of the few studies investigating the impact to fish and the fisheries in Øresund, there was a reduction in the amount of juvenile eels during the construction phase as well as a significant reduction in spawning and nursery areas. It was also concluded that it could not be ruled out that the “zero-solution”, that was chosen, including its margin of error in calculations, will not lead to a risk of impacting and decreasing the cod stocks in the Baltic and Øresund.

- Results from monitoring the fisheries in Øresund with the help of 12 fishermen gathering fishery data before, during, and after the construction of the Øresund Fixed Link, showed large year to year fluctuations in the CPUE for most of the commercial species. Their results did show, however, that landings of cod and flounder were significantly lower during the construction and operational phase compared to levels before the bridge was built. For dab there were significantly lower landings during the construction phase. For eel, plaice, herring, turbot and lumpsucker, it was not possible to isolate any effects on the abundance of their landings during the construction phase.

- Fishermen claim that alterations of original water flow condition through dredging and reclamation, adding ramps and other structures such as pillars, pylons and scour material - even in a “zero solution scenario - have caused alterations in currents and the ability to undertake fisheries in both the Great Belt and Øresund.

- Changes in hydrographical and morphological conditions can also create unforeseeable impacts such as - exposure of ancient forests and large boulders on the seabed (in the Great Belt), which alter bottom characteristics and can affect fishing practices.

- The restrictions to the fisheries in the traffic corridors under the Great Belt Bridge and Øresund Bridge have resulted in a reduction in the area where it is now possible to fish.

- The fisheries in the Great Belt are regulated by a number of rules, one of which states vessels that have motor power of more than 175 HP are not allowed to fish within 3 nautical miles of the shoreline (measured as the water line at low tide). This restricts larger fishing vessels, primarily trawlers, from undertaking their fisheries in the waters between Funen and Zealand where the fixed link is located.

- Other rules of vessel passage under the Great Belt Bridge and interpretations of rules for vessels staying near the bridge structures have had an indirect negative impact on the fisheries.

- There are no new rules from the Danish authorities that restrict the fisheries around the Øresund Fixed Link in Øresund

- Commercial and recreational fishermen have increased their fishing activities around the bridge structures, such as pillars because of a greater concentration of commercial and recreational species of interest - especially cod.

- According to interviews of commercial fishermen, there were periodic disturbances to their fisheries due to restricted access to areas, turbid water from sediment spills during reclamation work and compensation dredging during the establishment of both fixed links. These disturbances affected their fishing time and lead to reduced catches.

- Lost or dumped debris from construction site activities have caused considerable problems to some of the fisheries - such as damage or loss of gear etc.

- Interviews also exposed the need for a high level of information between construction groups and fishery organisations for informing fishermen of when, where and how long, potential activities such as area closure, high periods of vessel traffic, anticipation of sediment plumes etc. are being undertaken that could disturb the fisheries.

- In Øresund, surveys of the recreational fisheries showed that there were very little Danish recreational fishing near the Øresund Bridge and in conclusion, it was not possible to document any significant changes in the recreational fisheries after the establishment of the Øresund Fixed Link. Of the hobby and sports fishermen that participated in the survey, the majority said they had not experienced any negative effects on their fisheries.

- In the Great Belt, according to interviews of sports- and hobby fishing organisations and recreational fishermen, the effect on the recreational fisheries has generally been positive as bridge and protective structures have created good local fishing spots. After the construction of the Great Belt Bridge a small recreational fishery using hooks and jigs around the bridge pillars has developed.

8. Abbreviations

DK – Denmark

DE – Germany

EU – European Union

FD – Danish Directorate of Fisheries

BLE – Bundesanstalt für Landwirtschaft und Ernährung

ICES - International Council for the Exploration of the Sea

FOI - Institute of Food and Resource Economics (Denmark)

WW II – World War II

SSB – Spawning stock biomass

CFP – EU Common Fisheries Policy

TAC – Total Allowable Catch

vTI-OSF – Johann Heinrich von Thünen-Institut – The Institute of Baltic Sea Fisheries

BBD – Danish pound net firms

AER – Annual Economic Report on the European Fishing Fleet

9. References

Bundesamt für Landwirtschaft und Ernährung BLE (2010). Statistical fishery data. Personal communication.

Bundesministerium der Justiz (1998) Bundesministerium der Justiz. Seefischereigesetz, SeeFischG, Ausfertigungsdatum: 12.7.1984, in der Fassung der Bekanntmachung vom 6. Juli 1998 (BGBl. I S. 1791).

Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (BMELV) (various years): Wirtschaftliche Lage der Kleinen Hochsee- und Küstenfischerei. Buchführungsergebnisse der Testbetriebe (various years).

Carl, J., Tröltzsch, C. & Krog, C. (2010) Recreational Fisheries in Fehmarnbelt. Document No. E4-TR-034. Krog Consult for FeBEC (Fehmarnbelt Consortium). Sund og Belt.

Danish Directorate of Fisheries (FD), (2010). Statistical fishery data. Personal communication.

Danmarks Statistik (2009): Regnskabsstatistik for fiskeri 2008 / Account Statistics for Fishery 2008.

Danish Fishermen's Association and the Øresund Consortium (1996a). Danmarks Fiskeriforening og Øresundskonsortiet (a). Vurdering af påvirkningen af fiskeriet i Øresund fra anlægsarbejdet med den faste forbindelse over Øresund. Notat udarbejdet som grundlag for erstatningsforhandlinger.

Danish Fishermen's Association and Øresund Consortium (1996b). Danmarks Fiskeriforening og Øresundskonsortiet. 1996 (b). Beskrivelse af påvirkningen af fiskeriet som følge af sandindvindingen på Kriegers Flak. Notat udarbejdet som grundlag for erstatningsforhandlinger.

EC (2002) Council Regulation (EC) No 2371/2002 of 20 December 2002.

EC (2005) Council Regulation (EC) No 2187/2005 of 21 December 2005.

EC (2007a) Council Regulation (EC) No 1098/2007 of 18 September 2007.

EC (2007b) Council Regulation (EC) No 1100/2007 of 18 September 2007.

EC (2009a) European Commission. The Common Fisheries Policy, a user´s guide. European Communities, 2009.

EC (2009b) European Commission. Green Paper. European Communities, 2009.

EC (2009c) Council Regulation (EC) No 1226/2009 of 20 November 2009.

EC (2010) European Commission. Proposal for Regulation (EU) No / of the European parliament and of the Council. Brussels, 22.6.2010, COM (2010) 325 final, 2010/0175 (COD).

EC, 2004) Council Regulation (EC) No 812/2004 of 26 April 2004.

Feistel, R., Nausch, G. Wasmund, N. (ed.) (2008) State and Evolution of the Baltic Sea, 1952-2005, John Wiley & Sons, Inc., Hoboken, New Jersey, 703 p.

Fisheries and Aquaculture (2010) Fisheries and Aquaculture in Europe, No 48, August 2010.

Florin, A.-B. & Höglund (in press) J. Population structure in flounder (*Platichthys flesus*) in the Baltic.

HELCOM, 2007. HELCOM Red list of threatened species of fish of the Baltic sea. Baltic Sea Environmental Proceedings, No. 109, 40 pp.

ICES (2007) Interim report 2006 for the ICES/BfN-project: "Environmentally Sound Fisheries Management in Protected Areas" [EMPAS], 107pp.

ICES (2008a) Report of the Baltic Fisheries Assessment Working Group (WGBFAS) 8-17 April 2008, ICES Headquarters, Copenhagen. ICES CM 2008\ACOM:06. 692 pp.

ICES (2008b) Interim report 2007 for the ICES/BfN-project: Environmentally Sound Fisheries Management in Protected Areas (EMPAS). 67pp.

Institute of Food and Ressource Economics / Fødevareøkonomisk Institut (FOI) (various years): Fiskeriets Økonomi / The Economics of the Fisheries.

LALLF M-V (2005) Fischereigesetz für das Land Mecklenburg-Vorpommern (Landesfischereigesetz – LFischG M-V) vom 13. April 2005, http://www.lallf.de/Landesrecht.242.0.html, accessed 03.11.2010.

LALLF M-V (2006) Verordnung zur Ausübung der Fischerei in den Küstengewässern (Küstenfischereiverordnung - KüFVO M-V) vom 28. November 2006, http://www.lallf.de/Landesrecht.242.0.html.

Law for fisheries and aquaculture (Fiskeriloven) (2006). Lov om fiskeri og fiskeopdræt, Lovbekendtgørelse nr. 372 af 26. april 2006 som ændret ved Lov nr. 317 af 31. marts 2007.

LBK (2007) Lov om fiskeri og fiskeopdræt. LBK nr. 372 af 26. april 2006 som ændret ved Lov nr.317 af 31. marts 2007.

LLUR (2006) (Ed.) Allgemeinverfügung zur Zulassung von Ausnahmen nach §22 Landesverordnung über die Ausübung der Fischerei in den Küstengewässern, http://www.lsfv-sh.de/docman/gesetze-verordnungen/index.html, accessed 12.12.2009.

LLUR (2008) (Ed.) Landesverordnung über die Ausübung der Fischerei in den Küstengewässern (Küstenfischereiverordnung – KüFO – vom 11. November 2008) http://www.schleswig-holstein.de/Umwelt Landwirtschaft/DE/LandFischRaum/08__Fischerei/PDF/KueFO__11__2008.html, accessed 11.12.2009.

Maritime Authority, (pers.com.). Søren Østerberg Forup.

Maritime Authority (2004). Søfartsstyrelsens bekendtgørelse nr. 86 af 12. februar 2004: Bekendtgørelse om sejlads gennem Østbroen og Vestbroen i Storebælt (Ophævet, erstattet af (Maritime Authority, 2007)). (in Danish).

Maritime Authority (2007). Søfartsstyrelsens bekendtgørelse nr. 488 af 31. maj 2007: Bekendtgørelse om skibsmeldesystemet BELTREP og sejlads under Østbroen og Vestbroen i Storebælt (in Danish).

Mehl, H., Tillmann, D. (ed.) (1999) Fischer-Boote-Netze, Geschichte der Fischerei in Schleswig-Holstein, Westholsteinsche Verlagsanstalt Boyens, Heide, 216 p.

Ministry of Food, Agriculture and Fisheries (1992) In Danish - Bekendtgørelse nr. 895 af 6. november 1992 om fredningstider for fisk og krebsdyr i saltvand.

Ministry of Food, Agriculture and Fisheries (1993) In Danish - Bekendtgørelse nr. 18 af 14. januar 1993 om trawl- og andet vodfiskeri ("Trawlbekendtgørelsen").

Ministry of Food, Agriculture and Fisheries (2008a) In Danish - Bekendtgørelse nr. 1200 af 13. december 2008 om betingelserne for erhvervsmæssigt fiskeri af ål i saltvand og ferskvand.

Ministry of Food, Agriculture and Fisheries (2008b) In Danish - Bekendtgørelse nr. 1199 af 11. december 2008 om rekreativt fiskeri i salt- og ferskvand samt redskabsfiskeri mv. i ferskvand.

Ministry of Food, Agriculture and Fisheries (2009) In Danish - Reguleringsbekendtgørelsen 2010 af 15 december 2009.

Ministry of Food Agriculture and Fisheries (2008). Danish Eel Management Plan of December 2008.

MLUR (2005) (Ed.) Landesfischereigesetz (LFischG) vom 10.Februar 1996, last modified 12.10.2005,http://www.schleswighostein.de/UmweltLandwirtschaft/DE/LandFischRaum/08__Fischerei/PDF/LFischG1996.html, accessed 11.12.2009.

Nissling, A. Westin, L., Hjerne, O. (2002) Reproductive success in relation to salinity for three flatfish species, dab (Limanda limanda), plaice (Pleuronectes platessa) and flounder (Pleuronctes flesus), in the brackish water Baltic Sea, ICES Journal of Marine Science 59, p. 93-108.

Nielsen, J.R. (1994). An analysis of the Danish fishery in Øresund: Analysis of landing og effort data from Danish professional and recreational fishery in Øresund during the period 1987-1993. Danmarks Fiskeri- og Havundersøgelser. DFH Rapport.

Order Nr. 1443 (2009). Reguleringsbekendtgørelsen. Bekendtgørelse nr.1443 af 15. december 2009 om regulering af fiskeriet i 2010 og visse vilkår for fiskeriet i følgende år.

Pedersen, S.A., (2006). Hav & Fisk nr. 60 (in Danish).

Riber, H.H. and N. Raschke, 1999. Fehmarnbelt Feasibility Study Coast-to-Coast investigations, investigation of Environmental Impact, COWI-Lahmeyer, January, 1999.

Scientific, Technical and Economic Committee for Fisheries (STECF) (2009): The 2009 Annual Economic Report on the European Fishing Fleet.

Storebælt A/S. (pers.com). Ernst Laursen.

Sund & Bælt (1999). Sund & Bælt Holding A/S. Storebælt og Miljøet (the Great Belt and Environment).

Sund & Bælt (2008). Sund & Bælt Holding A/S. 2008. Miljøredegørelse (Environmental Report).

Swedish Board of Fisheries (2005a). Øresund fixed link impact on fish and the fisheries Background report 1992-2005. Fiskeriverket. Öresundförbindelsens indvirkan på fisk och fiske – Underlagsrapport 1992-2005.

Swedish Board of Fisheries (2005b). Søfartsstyrelsens bekendtgørelse nr. 135 af 4. marts 2005: Bekendtgørelse om forbud mod sejlads, ankring og fiskeri mv. i visse områder i danske farvande.

Thurow, F. (1997) Über die Fortpflanzung des Dorsches Gadus morhua (L.) in der Kieler Bucht. Ber. Dt. Wiss.

Trawling Order (1993). Trawlbekendtgørelsen. Bekendtgørelse nr. 18 af 14. januar 1993 om trawl- og andet vodfiskeri.

WWF (2006) A Sustainable Future for Baltic Sea Cod and Cod Fisheries, Prepared by WWF Denmark October 2006 in corporation with WWF Baltic Ecoregion programme.

10. Table of figures

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12. Appendixes

1. Questionnaire

questionnaire for professional fishermen page 1

Fehmarnbelt Fixed Link Fish and fisheries services

Interviewer: Datum:

Introduction

Within the environmental impact assessment for the Fehmarn Belt fixed link, the influence of the construction on the local fishermen shall be assessed. Therefore, we would like to ask you (fishermen) for some details on your catch statistics and economy to be able to help assess what influence the construction might have.

The data obtained from you will be analysed by the fisheries group only within the framework of the environmental impact assessment. It will be stored and processed in summarised statistics only which does not show information for the individual fishermen. The original questionnaire will be kept until the end of the impact assessment and then destroyed.

All data will be anonymous and the results of the survey will only be available to the public and the decision-makers within the framework of the construction plans. The outcomes of the assessment may form one basis for the calculation of compensation for professional fishermen.

General data

1. Please tell me some basic data of your business. **Please fill in the table.**

Name of the respondent/owner				
Numer of vessels in the business				
Registration of the vessel				
vessel lenght [m]				
Registered tonnage [gross tons]				
Power of the vessel [kW]				
Type of fuel				
Used gears				
Number of hired crew				
Number of unpaid crew (owner or family members if they are fishing)				
Age of the ship				
Age of owner				

2. How many people were employed in the business in 2008 – including land personnel and unpaid labour (family members)?

	Full time	**Part time ... hours/week**
All-the-year		
Seasonal for ... month		

3. How do you report your catch?

- coastal water declarations (Anlandeerklärungen)
- logbooks (Logbuchscheine)
- sales slips (Verkaufsabrechnungen)
- monthly forms (Formblätter mit monatlichen Ergebnissen der Fischereitätigkeit)
- others:..

please explain shortly... ... ...

....

Fishing grounds

4. Please outline in the map the fishing grounds within the ICES rectangles 37G0, 37G1, 37G2, 38G0, 38G1 & 38G2 where you have fished in the last 3 years. (sea chart with ICES rectangles will be provided.)

   Alternatively, navigation data (map plots) can be obtained from the fishermen / vessels.

5. On which routes do you travel between your basis harbour, fishing grounds and landing harbours in the vicinity of the Fehmarn Belt? **Please draw the routes in the map with start and end point.**
6. In case there are restrictions to fishing in the construction corridor or disturbances to fishing grounds on either side of it – would you be able to go to other fishing grounds?

	Vessel...	Vessel...	Vessel...	Vessel...
Alternative fishing grounds are available	Yes/No	Yes/No	Yes/No	Yes/No

7. If you can go to alternative fishing grounds - where are they located? **Please outline them on the sea chart and mark them with the given codes for the gear and target species.**

   gillnet [GNS], trammel net [GTR], seine [SE], ground trawl [TB], pelagic trawl [TM], ground longline [LLS], pelagic longline [LLD], pound net [FPO], fishtrap [FX]

   Cod [COD], Sprat [SPR], Herring [HER], Flounder [FL], Plaice [PLE], Sole [SOL], Turbot [TUR], Dab [DAB], Eel [ELE], Brill [BLL], Whiting [WHT], Salmon [SAL], Sea trout [TRO]

Landings

8. Which gear was used and which target species did you catch in your entire fishing area in the year 2008?

   Which gear was used and which target species did you catch in the outlined fishing areas in 2008?

   (If no fishing areas were outlined - navigation data was obtained: What gear was used and which target species were caught in the ICES rectangles 37G0, 37G1, 37G2, 38G0, 38G1 & 38G2?)

   Please fill in the table. Numbers which could only be produced with high effort can be estimated. Alternatively, logbook data can be provided either now or late via the producer organisation. If the producer organisation is to hand out your data, the chairman Mr. .... needs your written permission.

   If logbook data is provided, please fill in only the cells the logbook data contains no information on.

questionnaire for professional fishermen ..... page 3

Area	Gear	fished days/ year	Season month-month	with vessel No.	landing har-bours	Number / length of passsive gear	Amount caught [select kg or tons]													
							COD	WHT	SPR	HER	FL	PLE	SOL	TUR	DAB	BLL	ELE	SAL	TRO	others
all (2008)																				
1																				
2																				
3																				
4																				
Sum of areas 1-4																				

questionnaire for professional fishermen page 4

9. Please give an overview on your overall landings in the years 1999, 2006 and 2007. **If you provide your logbook data, please only estimate the catches which you have not included in your logbook data.**

Year	Amount caught **[select kg or tons]**													
	COD	WHT	SPR	HER	FL	PLE	SOL	TUR	DAB	BLL	ELE	SAL	TRO	others
1999														
2006														
2007														

10. Over the past 10 years what changes have you observed / experienced regarding certain fish species in the six ICES rectangles 37G0, 37G1, 37G2, 38G0, 38G1 & 38G2?

Changes	Yes	No	Fish species	Explanation/reasons
Changes in catches (quantity)				
Changes in the size of stocks				
Changes in location of fishing grounds				
Different migration routes				
Big differences in the size of age groups				
Shift in the fishing (catch) seasons				
Other changes of interest				

11. What changes in the regulations of your fishing - except quotas - had effects on your enterprise in the last 10 years?

Changes	Fish species	Explanation/reasons

questionnaire for professional fishermen page 5

12. Can you estimate in which percentages your catches are sold (directly) to the following clients:

client	Fish species	% of whole catch	Price [€ or DKK/kg)
producer organisation			
wholesalers			
Processing factories			
restaurants			
shops			
Individual clients			
Others:			

Effort

13. Can you estimate the fuel consumption of the vessels during the following activities:

activity	Fuel consumption in:	Vessel 1:	Vessel 2:	Vessel 3:	Vessel 4:
Sailing without fishing – average speed:.....kn	l/sm or l/km (select for whole table)				
Fishing with (gear).....	Speed if towed: .....kn				
Fishing with (gear).....	Speed if towed: .....kn				
Fishing with (gear).....	Speed if towed: .....kn				
Fishing with (gear).....	Speed if towed: .....kn				

14. How many people usually work on the vessel while fishing with the different gears:

Number of people needed	Vessel 1:	Vessel 2:	Vessel 3:	Vessel 4:
Fishing with (gear).....				
Fishing with (gear).....				
Fishing with (gear).....				
Fishing with (gear).....				

Fishing with (gear).....				
Fishing with (gear).....				

15. How many **days** does the vessel(s) spend at sea and how many **hours** does the vessel(s) spend at sea on average?

	Vessel 1	Vessel 2	Vessel 3	Vessel 4
Days at sea per year				
Average hours per day at sea				

Earnings & costs (not necessary if bookkeeping data available)

More than the physical impacts the Fehmarn Belt Fixed Link may have on your fisheries, i.e. on landings and effort as discussed above, you will most probably be concerned about financial impacts.

To calculate possible financial impacts, we have to have information on your cost and earning situation before the construction. Knowing how your turnover and income is composed, and how different activities at sea are linked to costs, we can calculate which financial impacts different changes brought about by a FFL (e.g. additional ways and time) have.

In Germany, some of the fishing firms deliver their bookkeeping data to the "Testbetriebsnetz". The Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (BMELV) publishes these data in their statistics. The same does FOI in Denmark.

16. Are you or is your tax advisor delivering bookkeeping data of your firm to the "Testbetriebsnetz" of the Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (BMELV)?

○ **Yes**

Do you agree to give us or to let your tax advisor hand out the data that is usually delivered to the "Testbetriebsnetzwerk"? Yes/No **(note contact if yes)**

○ **No**

Would you let us use the profit and loss account of your firm in order to be able to calculate as accurate as possible? Yes/No **(photograph the documents if yes)**

17. What was you total turnover from selling of your landings in the following years?

year	1999	2006	2007	2008
Turnover [€ or DKK]				

18. Do you have additional incomes from fisheries except for selling your own fish landings?

○ **Yes** - please specify these incomes and give and average income per year.

.....

.....

.....

(estimated) income in 2008:.....€ or DKK

○ **No**

19. Do you have additional non-fisheries incomes?

○ **Yes** - please indicate rough amount (2008): .....€ or DKK

○ **No**

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20. To calculate the impact, the FFL might have on fisheries, it is essential to know what costs are linked to certain activities at sea. Can you please give an overview regarding the costs of each of your vessels? (can be done in € or DKK if % is impractical)

Item	Total	Vessel 1 (€ / DKK)*	Vessel 2 (€ / DKK)	Vessel 3 (€ / DKK)
Kosten (Costs)				
Abschreibungen (depreciation)				
Wartungskosten (Maintenance vessels, engines, gear, others)				
Materialaufwand (costs of material)				
- dar.: Treib- und Schmierstoffe (among these: fuel and lubricants)				
Personalaufwand (wage expenses)				
Sonstige betriebliche Aufwendungen (Other expenses)				
Summe Aufwendungen (total costs) *				

(If interviewee can only give %, the interviewer should calculate figures)

21. What was the profit/loss of your entire firm in 2008:

Total earnings before interests and tax (EBIT) or operating profit (Betriebsergebis)	€ / DKK
Net profit before tax (including regular interests received or paid (Ergebnis der gewöhnlichen Geschäftstätigkeit, Ergebnis vor Steuern)	€ / DKK
Profit / loss after tax (Gewinn / Verlust, Jahresüberschuss / Fehlbetrag)	€ / DKK

(Interviewer should compare total earnings / operating profit with total incomes and costs above; if discrepancy, please seek clarification.)

22. How many hours of unpaid labour have been accomplished (by you and your family) for your firm in 2008 (i.e. should be compensated for by the financial result): .....

23. How was your financial performance in the following years:

	1999	2006	2007
Total incomes			
Total costs			
Operating Profit / Betriebsergebnis*			
or: other financial indicator as above: specify			

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Fehmarn Belt fixed link

24. How would you rank your own knowledge about the fixed link across the Fehmarn Belt?

- ○ excellent
- ○ good
- ○ satisfactory
- ○ fragmentary
- ○ bad

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25. According to the present plans for construction, as of 2018 the Fehmarn Belt fixed link shall link the islands Fehmarn on the German side to Lolland on the Danish side.

In 2012/2013 the construction of the link (either a tunnel or bridge between Puttgarden and Rødby) will be started. What do you personally think about those plans?

- ○ Basically, I approve of the plan.
- ○ I haven´t formed an opinion yet.
- ○ Basically, I disapprove of the plan.
- ○ I neither approve, nor disapprove the plan. I am neutral

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26. During construction and further existence of the FFL, how do you expect your landings and fishing effort to develop compared to the development you might have expected without a bridge or tunnel? (Fishing effort: time at sea, time of trawling, fuel consumption, number and size of passive gears, etc.) **If more than one vessel in the firm: Note to which vessels the changes apply.**

During **construction**	**landings** will	○ increase ○ remain unchanged ○ decrease	and **fishing effort** will	○ increase ○ remain unchanged ○ decrease
During operation of a **bridge**	**landings** will	○ increase ○ remain unchanged ○ decrease	and **fishing effort** will	○ increase ○ remain unchanged ○ decrease
During operation of a **tunnel**	**landings** will	○ increase ○ remain unchanged ○ decrease	and **fishing effort** will	○ increase ○ remain unchanged ○ decrease

27. If there are restrictions to fishing in the Fehmarn Belt and its surrounding sea area – which consequences do you expect for your firm to the best of your current knowledge? **Please delete where inapplicable and fill in missing information.**

	Vessel...	**Vessel...**	**Vessel...**	**Vessel...**
Do you think you can catch the same amounts of the same fish species in the alternative fishing grounds?	Yes/No Less of: .... More of:	Yes/No Less of: .... More of:	Yes/No Less of: .... More of:	Yes/No Less of: .... More of: ....
Do you think you can fish the alternative fishing grounds with the same efficiency as you did in the Fehmarn Belt?	.....% less 100% (alike) .....% more	.....% less 100% (alike) .....% more	.....% less 100% (alike) .....% more	.....% less 100% (alike) .....% more
Do you think you will change your basis harbour to have shorter journeys to alternative fishing grounds? (new sm, new h)	new harbour:	new harbour:	new harbour:	new harbour: .....

I probably have to give up fishing with the following vessels:				
I will probably have to dismiss personnel: (all-the-year/seasonal, full time/part time, ship/land personnel, how many people)				
	land personnel:			
Conflicts about fish will probably arise when more fishermen use the alternative fishing grounds.	Yes/No	Yes/No	Yes/No	Yes/No
Conflicts between fishermen and other users (e.g. tourism, shipping traffic, nature protection, etc.) **probably arise when more fishermen use the alternative fishing grounds.**	Yes/No conflict with whom:	Yes/No conflict with whom:	Yes/No conflict with whom:	Yes/No conflict with whom:
Others:				

28. In case the construction corridor of the FFL (see map) will be closed for fishing or certain fishing practices during the construction: What would be the major impacts on your fisheries?

impacts		**Vessel...**	**Vessel...**	**Vessel...**	**Vessel...**
Loss of fishing grounds					
Longer distances to fishing grounds	**Short explanation**				
	Additional sm (single distance):				
	How many times to go per year?				
	Time needed for single distance for the additional sm:				
Interruption of trawling/ fishing routes	**Short explanation**				
	Additional sm (single distance)				
	How many times to go per year?				
	Time needed for single distance:				
	Additional work on board				
	Time needed for additional work on board if not carried out on the way				
Estimated additional costs [€ or DKK] of all mentioned impacts					
Other financial impacts – Please describe.					

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Business perspectives

29. What are the greatest challenges for your business at present and in the near future?

You have 5 votes to give to the greatest challenges for your business. The votes can all be given to one challenge or assinged to different challenges.	**votes**
Decreasing fish stocks	
Increasing prices for fuel and maintenance	
Limited fishing quota	
Increasing environmental constraints	
Increasing security constraints	
Low price for fish	
Increasing competition	
Possible future catch regulations in the Natura 2000 areas	
Construction phase of the Fehmarn Belt fixed link	
Operation of a bridge over the Fehmarn Belt	
Operation of a tunnel under the Fehmarn Belt	
Others, namely:	

30. Which perspecitves are most likely for your business in the next 10 years?

You have 3 votes for the most likely perspectives. You can give all votes to one perspective or assingn them to different perspectives.	**votes**
A business extension can be expected.	
A business reduction can be expected.	
The closure of the business can be expected.	
I will probably sell the business	
Business will continue in the same way as now.	
A family member will take over the business.	
Others, namely:	

31. For which reasons have you chosen the business perspectives given above?

You have 3 votes for the reasons. You can give all votes to one reason or assign them to different reasons.	**votes**
Because of the challenges I gave my votes in question 29.	
Due to retirement	
For personal reasons	
Others, namely:	

Request

To gather additional information as a basis for exact calculations of effort and earnings we would like to ask a group of fishermen in 2010 to note their catches per day, position of the fishing area, the gear used, the working and travelling time on the trip and the price for the fish. A booklet will be provided with which to put the data in for each day / trip.

Together with this data, we would like to gather the tracks from the navigation systems of your vessels. By associating catch data from the special logbooks and position data from navigation systems on the vessels, it would be easier to asses and show changes in fishing areas, journeys to the fishing areas and times at sea etc.

We would collect these notes several times a year. Any published data will be anonymous.

For the additional effort resulting from reporting such detailed data, an allowance per person is planned.

Would you be ready to report such data from your vessel? ☐

If yes - interviewer: add contact to list

Thank you very much for your time and your answers!

"The concept of the problem is more important than the concept of the solution; there is more in the question than in the answer." *Walter Rathenau*

2. Danish interviews in experiences from other fixed links (abbreviated)

A. The Great Belt

Nyborg, hobby fisherman: He experienced better fishing possibilities after the Great Belt Bridge was built - cod are strongly attracted to the bridge pillars. There are problems with lost objects (wire pieces etc) around the bridge. The restricted access during the fixed link construction was the primary disturbance for his fisheries.

Chairman for Danish Amateur Fishermen's Association: Has the general perception that the bridge pillars and the corresponding protective erosion material have increased the perspectives of the fisheries – due to more food and shelter / habitat for the fish (especially cod) and thus greater catches.

Chairman for the local Danish Amateur Fishermen's Association, East Zealand, hobby fishermen. The Great Belt Bridge has not had any noticeable negative impact on the fisheries.

Chairman for the local Danish Amateur Fishermen's Association, Zealand West, hobby fisherman: He feels the fisheries have improved after the bridge has been established. This he attributes to less trawling activity.

Slagelse, hobby fishermen: The fisheries have not been affected by the establishment of the Great Belt Bridge. He says that there were more cod during the construction period of the fixed link.

Nyborg, owner of several commercial angling vessels: Administrates 4 tour boats that occasionally fish in the Great Belt. For several years the stocks of fish (primarily cod) have not been good enough for recreational angling from commercial vessels. These conditions are not associated with the bridge but with the general decrease in fish stocks. In fact, shortly after the construction of the bridge there was an improvement in the cod fisheries. At present there is only 1 commercial angling vessel left that regularly takes trips with anglers in the Great Belt.

Kerteminde, commercial fisherman (nets): The fisheries have not been affected by the establishment of the Great Belt Bridge. He fishes for cod around the bridge pillars. He cited a negative effect on the fisheries during the construction of the bridge and in connection with preliminary environmental studies. He has had problems with gear getting tangled with objects and debris "lost" on the bottom during the construction of the bridge.

Nyborg, commercial fisherman (nets): He says the fisheries have not been affected by the establishment of the Great Belt Bridge. He fishes for cod around the bridge pillars. He experienced negative effects on the fisheries during the construction of the bridge and in connection with preliminary environmental studies. During this time, he lost nets during preliminary environmental investigations and tried to get these replaced with help from The Danish Fishermen's Association without success. Has a recording (DVD) of the problems to the fisheries as a result of the Great Belt Bridge, which has been shown on local TV.

Karrebæksminde, commercial fisheries (nets): He has fished around the pylons of the East Bridge - a good fishery with large cod.

Kerteminde, commercial fisherman (trawl): He has a large trawler (110 GT, ≥15 m). This fishermen is not allowed to fish within 3 nautical miles of land with the large vessels that he has. He experienced a negative effect in the fisheries (especially cod) during the construction of the bridge and several years after, partially because of the large amount of suspended material which spread over a large area, and partly because of the removal of seabed material from an area southeast of Romsø where, he says an ancient forest uncovered on the seabed led to problems for trawling for a number of years. Because of the vessel traffic separation scheme and the general regulations to the fisheries, which do not allow vessels with more than 175 HP to fish within 3 nautical miles of the shoreline than, he is not allowed to fish between Funen

and Sprogø and between Sprogø and Zealand. This includes the deep trench under the Eastern channel, which was an important fishing area for cod. The water currents in the Great Belt have changed considerably after the building of the fixed link.

Slagelse, sports fishermen: Although the bridge did not lead to large problems to the fisheries. The largest problem for the environment / fisheries is caused by the compensation dredging (the partial removal of the eastern reef (Østerrev) of Sprogø) and the use and removal of seabed material at Romsø.

Korsør, sports fishermen: The fisheries were positively affected with a greater number of mussel beds and habitats for cod. The fisheries were negatively influenced by the reduction of the eastern reef (Østerrev) of Sprogø, and to a lesser extent by the reduction of the western reef (Vesterrev) of Sprogø.

B. Øresund

Dragør, hobby fisherman: He does not think changes in the fish stocks are associated with the construction of the Øresund Bridge. He experienced an increase in the water currents and red algae after the construction of the bridge. Except for the areas forbidding fisheries, he has not experienced disturbances to his fisheries due the establishment of the bridge and tunnel.

Copenhagen, commercial fisherman: He fished after turbot in an area south of what is now Peberholm – that fishery is now gone. The other fisheries have not changed. He experienced disturbances to his fisheries and a reduction in catches when the water was milky white due to dredging. Also, he has experienced much stronger currents after the construction in comparison to before, as well a greater presence of red algae or ”rødmøg” as it is called.

Holbæk, hobby fisherman: Fishes from Dragør in the area around the bridge. Has experienced a decline in the fisheries after the establishment of the bridge but was unsure of the reason why. The currents are stronger and there are more red algae and crabs now than before the establishment of the bridge. He said it was possible to fish during the construction of the bridge and experienced more cod during construction than prior to construction.

Dragør, hobby fisherman: experienced fewer cod and turbot but more eel after the construction of the bridge and tunnel, although he was unsure of the reasons. Experienced the water currents are stronger and there are more red algae now than before the construction of the bridge. It was possible to fish outside the no fishing zones during the construction of the bridge where he experienced more cod during this time, in comparison to before construction started.

Copenhagen, commercial fisherman: Fishes with pound nets from the eastern and southern coastline of Amager. He has experienced large problems with an increase in the currents that run along Amager and to its south. Fishing in deeper waters (from 8 meters) is now only possible a few days a year due to the strong currents in contrast to before construction where it was possible to fish over most of the year. He has experienced a greater amount of red algae (called rødmøg) but does not consider this to be a big problem. Says there have been large changes in the fish stocks but the cause is unclear and does not consider this to be a problem originating from the bridge/tunnel alone. There are no commercial angling vessel´s that take trips with anglers in the part of the Øresund where the bridge/tunnel is placed.

Kastrup, commercial fisherman: Fishes together with Brian Kyed and has many years of experience. The largest effect from the establishment of the bridge and tunnel is the large increase in the water currents through Drogden as a result of the area being narrowed due to the establishment of Peberholm and the ramp from Amager plus the enlargement of Kastrup Airport. The strong water currents are also clearly noticeable south of Amager (Aflandshage) and in Køge Bay, for example by the pound net fishermen in Mosede. He fished at one time with pound nets on the eastern side of Saltholm before the bridge was built, however, this fishery he has now stopped because sailing the large distance from Dragør became uneconomical.

He experienced a considerable amount of suspended material in the water during construction and a negative influence on his landings.

3. Landings data for the Great Belt and Sound

Landings of the most important commercial species from the Great Belt area (ICES rectangles 39G0 and 39G1 combined)

Species	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cod	206	298	114	63	208	183	127	79	399	1.095	2.191	2.544	1.349	1.429	1.011	724	719	521	495	389	679	504	444
Sprat	160	813	154	860	617	1.866	1.578	1.257	1.527	1.954	1.424	2.353	1.535	1.590	2.249	1.084	718	1.587	3.492	4.856	3.621	1.790	793
Herring	163	883	1.053	943	1.218	1.711	1.168	1.207	1.327	1.736	2.377	2.407	1.795	1.235	1.305	1.345	259	88	38	20	0	0	0
Dab	35	49	64	53	122	82	13	18	221	220	144	114	75	104	76	90	86	112	196	131	75	119	123
Flounder	14	33	39	25	57	53	5	10	76	73	164	337	336	371	329	513	399	313	254	133	115	121	136
Plaice	5	5	4	1	6	8	4	2	39	59	159	191	142	346	471	364	305	216	207	163	139	221	199
Turbot	1	1	0	2	3	3	1	1	15	21	20	14	9	5	5	7	5	5	7	3	2	3	5
Brill	0	0	0	0	0	0	0	0	7	8	1	1	1	0	1	0	5	4	3	2	2	2	2
Sole	0	0	0	0	1	0	0	1	15	12	2	12	1	1	1	1	1	0	3	14	13	15	24
Silver eel	0	0	0	0	0	0	0	0	0	0	2	2	2	0	1	0	1	0	0	0	0	0	0
Yellow eel	0	0	0	0	0	0	0	0	0		0	0	0	1	1	2	0	0	0	0	0	0	0
Sea trout	0	0	0	0	0	0	0	0	0	1	0	0	9	1	0	0	1	0	1	0	0	0	0
Horse Mackerel	16	70	1.275	0	0	0	0	0	0	0	0	0	0	0	0	0	0	728	0	0	6	5	0
Unspecified	325	725	242	42	211	52	163	454	171	545	998	313	169	492	472	134	43	222	117	39	27	64	28
Total	**924**	**2.878**	**2.944**	**1.988**	**2.442**	**3.958**	**3.057**	**3.029**	**3.797**	**5.724**	**7.483**	**8.289**	**5.423**	**5.576**	**5.921**	**4.263**	**2.540**	**3.796**	**4.811**	**5.752**	**4.678**	**2.845**	**1.755**

Landings of the most important commercial species from Øresund area (ICES rectangle 40G2)

Species	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cod	8	17	16	3	13	86	102	48	199	427	452	674	578	543	396	460	318	332	288	362	497	341	264
Sprat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Herring	58	20	17	0	30	22	0	1	415	339	500	306	281	147	829	436	179	23	93	50	22	42	115
Dab	4	0	1	0	0	1	1	2	4	10	6	6	8	8	8	13	4	5	10	13	14	14	10
Flounder	4	1	0	0	0	2	1	3	5	32	26	31	53	51	96	68	40	41	39	69	67	74	64
Plaice	1	0	0	0	1	1	1	1	15	9	11	12	6	13	27	54	20	48	46	54	64	82	54
Turbot	0	0	0	0	0	0	0	0	0	1	2	2	3	3	3	2	3	1	2	1	1	2	2
Brill	0	0	0	0	0	0		0	0	0	0	1	0	1	2	0	0	0	0	1	2	1	1
Sole	0	0	0	0	0	0	0	0	0	0	1	3	3	2	0	1	0	1	3	4	5	3	2
Silver eel	0	0	0	0	1	0	0	0	8	11	9	7	15	2	13	19	21	8	3	3	7	7	7
Yellow eel	0	0	0	0	4	1		1	32	32	33	36	19	38	10	3	7	4	5	10	10	9	8
Sea trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Unspecified	0	21	14	1	1	7	3	1	17	47	36	43	14	29	32	36	64	34	43	20	44	47	35
Total	**75**	**60**	**48**	**5**	**50**	**121**	**109**	**57**	**696**	**907**	**1.075**	**1.119**	**980**	**836**	**1.417**	**1.093**	**657**	**497**	**532**	**587**	**735**	**620**	**564**