



# Hesselø Offshore Wind Farm

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Fisheries  
Technical report

Energinet Eltransmission A/S

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## 2 Summary

This technical report presents baseline information on the commercial fisheries in the area of the southern Kattegat where installation of Hesselø Offshore Wind Farm is planned. Data and information on the local fisheries over a 10 year period (2011-2020) were acquired from the Danish Fisheries Agency, the Swedish Fisheries Agency (Havs- og Vattenmyndigheten, 2020) and from interviews with local fishermen and the Danish Fishermen PO and the Association for Low Impact Coastal fishing (FSK). Baseline fishery information of different sectors of the commercial fisheries based on gear use (bottom trawl, pelagic trawls, gillnets, Danish seine nets and "other gear") and target species will be used to make an evaluation of the importance of the Hesselø OWF planned area to the commercial fisheries.

The baseline fisheries in the southern Kattegat region were presented according to the ICES rectangles 42G1, 41G1 and 41G2 that contain different sections of the planning area for the Hesselø OWF and ECC (Export Cable Corridor).

The commercial fish community in the Kattegat is dominated by a number of commercially valuable flatfish species (primarily plaice, dab, sole, flounder, turbot, brill), Atlantic cod and other codfish (whiting and haddock) and in recent years a large abundance of greater weever. Because a large part of the deeper parts of the southern Kattegat seabed are soft bottoms, a preferred habitat by the shellfish Norway lobster, this valuable commercial species is also abundant. The Kattegat also has had a large abundance of the pelagic species sprat and herring as well as seasonal migrants of commercial species that include lumpsucker, mackerel, garfish and eel among others.

The total landings in all three ICES rectangles that contain parts of the planning area for Hesselø OWF and ECC have fluctuated considerably over the 10 year period from 2011-2020 (ICES 42G1: 807-1,821 tons, ICES 41G1: 665-4162 tons and ICES 41G2: 438-2933 tons).

The greatest contribution to the annual value of the landings in all 3 ICES fishing areas were landings of Norway lobster (between 155-254 tons and 10.4-17.3 million DKK annually). These were almost exclusively landed with bottom trawls. Other commercial species contributing substantially to value of the landings are diverse flatfish species such as sole (between 15-30 tons and 1,2-2,9 million DKK), plaice (54-72 tons and 618-770 thousand DKK), brill (4,6-11 tons and 165-403 thousand DKK) and turbot (1,5-2,5 tons and 92-150 thousand DKK) and Atlantic cod (17-170 tons and 283 thousand- 2,6 million DKK).

Commercial vessels using trawls (bottom and pelagic trawlers) annually accounted for between 86,1-98,8% of the total landings by weight and between 84,5-98,1% of the total annual value of the landings in all 3 ICES fishery areas (42G1, 41G1 and 41G2) from 2011-2020. The gillnet fishery over the same 10 year period accounted for between 1,2-12,8% of the landings by weight and 1,9-14,2% of the value.

The use of Danish seine nets only accounted for 0,2% and fisheries with "other gear" for less than 2,4% of the total landings by weight.

Seasonally, the largest overall catches in all three ICES rectangles generally occurred in the first part of the year (January-March/April) and again in the latter part of the year (September-November), whereas the lowest catches and value of the catches occurred in the summer months (May-July). Catches of the economically important Norway lobster were observed year round, but were typically higher in the warmer months of the year peaking in the late summer months (August-September).

The distribution of the fisheries according to gear show that the fisheries with bottom trawl is very intense in a corridor that stretches from the middle and northern parts of the cable corridor through almost the entire planning area of the OWF. The bottom trawl fishery primarily targets Norway lobster with catches of cod, greater weever and a number of flatfish species; plaice, sole, flounder, turbot and brill in the planning area of the OWF and outer ECC. Noticeable in the distribution of the bottom trawl fisheries are the large regional areas, both to the east and southwest of the planning area of the OWF and outer ECC that are not fished by bottom trawlers because the seabed in these areas are primarily made up of mixed and hard bottom habitats that cannot be used by bottom trawlers due to the risk of gear damage and because Norway lobster, the most important target species for bottom trawlers, are only found in soft bottom habitats. VMS data indicates the distribution of the fishery with pelagic trawls is spread throughout the central part of the Kattegat, as well as throughout the planning area of the OWF and in the northern part of the cable corridor. In contrast, VMS data indicates that the distribution of the gillnets, seine nets and fisheries with "other gear" is spread out along the northern coast of Zealand and undertaken only sporadically and with low effort in the planning area of the Hesselø OWF and ECC.

Baseline data shows that the planning area of the Hesselø OWF and ECC is very important to the bottom trawl fishery, particularly those that target the commercially important Norway lobster, both in the planning area for Hesselø OWF where wind turbines will be placed, and along the offshore sections of the ECC. The planning area for Hesselø OWF and ECC has some importance to the pelagic trawl fisheries, typically targeting sprat and herring and occasionally sandeel, while the planning area for Hesselø OWF and ECC has only limited or no importance to the fisheries using gillnets, seine net and "other gear (pots, fyke nets and hook and line).

Because a very large part of the catches from the local and regional area, including much of the planning area for the Hesselø OWF and ECC, and many of the commercial vessels that undertake these fisheries have their home port in Gilleleje, the regional and local areas used by the commercial fisheries, including the planning area for Hesselø and ECC are important to the port of Gilleleje.

### **3 Introduction and aim**

With the Energy Agreement in June 2018 and the following 'Climate agreement for energy and industry, etc. 2020' in June 2020, the Danish parliament decided to tender for a new offshore wind farm of 800 – 1200 MW with grid connection in 2027. The offshore wind farm will be located in the central Kattegat approx. 30 km north of Gilbjerg Hoved on the north coast of Zealand. The wind farm is named Hesselø Offshore Wind Farm (Hesselø OWF) after the small uninhabited island of Hesselø, which is located southwest of the area. The Hesselø OWF will have an installed capacity of minimum 800 MW and maximum 1,200 MW.

The planning area for Hesselø OWF and ECC (Export Cable Corridor) is shown in Figure 3.1.



Figure 3.1: Planning area for Hesselø Offshore Wind Farm.

In order to ensure that Hesselø OWF will be supplying electricity by 2027, the Minister of Climate, Energy and Utilities has instructed Energinet to initiate the preliminary studies for the project – both offshore and onshore. This includes strategic environmental assessment (SEA) of the plan for the overall project, completion of relevant environmental surveys etc., investigation of a grid connection from the coast to the connection point at Hovegaard High Voltage (HV) station and preparation of an environmental impact report (EIA) for the onshore facilities.

The location of Hesselø OWF is based on a detailed screening of multiple areas for offshore wind farms in Danish waters carried out for the Danish Energy Agency and reported in spring 2020 (COWI, 2020).

The plan for Hesselø OWF is described in a memorandum from the Danish Energy Agency (Energistyrelsen, 2021a) and in the scoping report for the environmental assessment of the plan (Energistyrelsen, 2021b), which was issued in connection with the first public consultation (February 12<sup>th</sup> to March 19<sup>th</sup> 2021).

### 3.1 Aim

This aim of this technical report is to describe the importance of the commercial fisheries in the regional and local area of the southern Kattegat in relation to the planning area for Ø OWF and ECC. The first section of the report presents the planning area for Hesselø OWF and ECC including a description of project scenarios followed by a

method description. In the second section, a description of the existing (baseline) conditions of the commercial fisheries in and around the planning area for Hesselø OWF and ECC are outlined. Based on this data, the importance of the planning area for Hesselø OWF and the ECC to the commercial fisheries was determined.

## **4 Methods**

### **4.1 Commercial fisheries**

This section gives an overview of the origin of data and information used to describe the commercial fisheries in the planning area for Hesselø OWF and ECC.

The extent and characteristics of the commercial fisheries are described by using official fisheries statistics (landing, fleet statistics and VMS (Vessel Monitoring System) data for a 10 year period (2011-2020) obtained from the Danish Fisheries Agency (Fiskeristyrelsen, 2020), and for a 5 year period (2015-2019) from the Swedish Fisheries Agency (Havs- og Vattenmyndigheten, 2020). This data is supplemented with information from interviews with a number of fishermen that undertake their fisheries in and near the planning area for Hesselø OWF and ECC, and interviews with representatives of the local department of the Danish Fisherman's Producers Organization in the port of Gilleleje and the chairman for the Association for Low Impact Coastal Fisheries (FSK). In the following sections, the methods for obtaining data and its analysis are described in detail.

#### **4.1.1 Official fisheries statistics – logbook data**

In Danish waters, all commercial fishing vessels are required to register their catches (BEK 1514, 2017). The international Council for the Exploration of the Sea (ICES) have divided the Danish waters into international fishery zones, so-called ICES-rectangles of approximately 30x30 nautical miles (56x56 km) and larger sub-divisions, where catch data is separated, and national and international fishery regulations, requirements and quotas apply.

In general, only larger fishing vessels are required to register their catches in logbooks and ICES rectangles, and in the Kattegat, where the Hesselø OWF and cable corridor is located, fishing vessels equal to or larger than 10 meters ( $\geq 10$  meters) register their catches at the ICES rectangle level. Vessels less than ten meters ( $< 10$  m) are only required to fill in so-called "local water declarations" where catches are only attributable to ICES subareas, in this case the Kattegat. There is however, relatively few active fishing vessels less than 10 meters and therefore, their contribution to the total landings only comprise a very small part (few percentages).

The planning area for Hesselø OWF and ECC is located in parts of 3 different ICES rectangles (42G1, 41G1 and 41G2), see Figure 4.1. The size of the entire proposed planning area located in the southern Kattegat is approximately 317 km<sup>2</sup>, of which approximately 247 km<sup>2</sup> is the planned area for the offshore windfarm area that will be used for wind turbines.



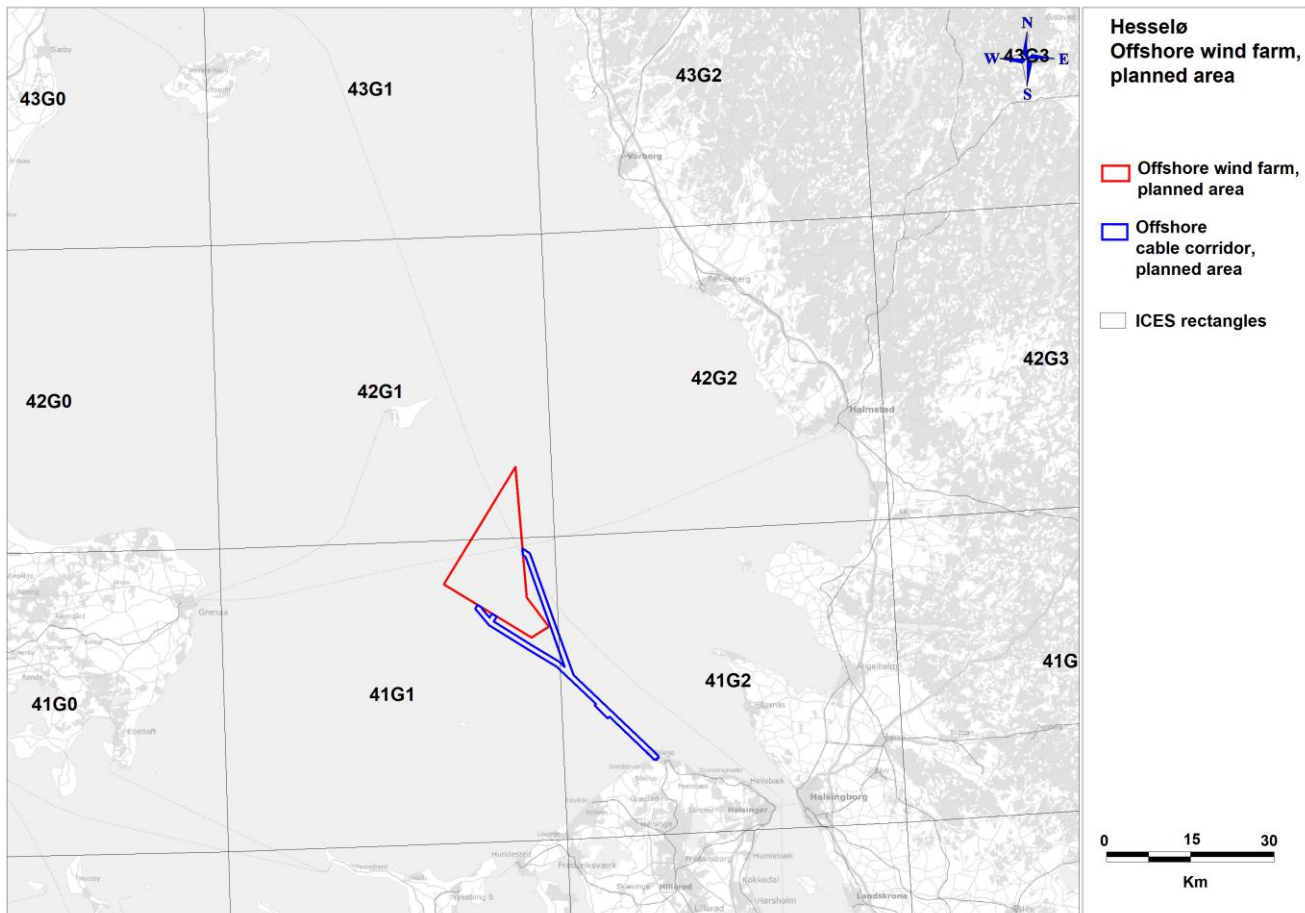


Figure 4.1: Map of Kattegat outlining the ICES rectangles and the proposed Hesselø OWF planned project area including the wind farm area (red borders) and the cable corridor (blue borders).

Approximately 60 km<sup>2</sup>, or the equivalent of 1,7% of the northern section of the planning area for the wind farm is in ICES 42G1, and approximately 187 km<sup>2</sup> or 5,4 % of the southern section of the planning area for the wind farm and 38 km<sup>2</sup> or 1,1 % of the export cable corridors is in ICES 41G1. The export cable corridor section going towards the landfall at Gilbjerg Hoved is approximately 31 km<sup>2</sup> or approximately 0.9% of the area in ICES 41G2.

Because of the relatively small area the proposed planning area for the Hesselø OWF and ECC in each ICES rectangle, the official fisheries statistics can only be used to give an overall insight into the extent and characteristics of the fisheries for an area that is much larger than the planning area for Hesselø OWF and ECC.

#### 4.1.2 Determining the distribution of the fisheries – VMS data

Commercial fishing vessels at different lengths over time ( $\geq 24$  meters since 2002,  $\geq 15$  meters since 2005 and  $\geq 12$  since 2012) have been required to have a satellite-based global positioning Vessel Monitoring System (VMS) onboard to register their location at sea approximately every 1-2 hours. VMS data was used to estimate a fishing vessels speed and by creating speed frequency diagrams and using knowledge and assumptions of the normal speed at which vessels are moving when undertaking their fisheries with different types of fishing gear (supported by fishermen during interviews), this data was used as a proxy to map the distribution of the fisheries according to their gear. The

speeds in which fishing vessels were assumed to be undertaking their fisheries according to the primary gear types (bottom trawls, pelagic trawls, gillnets, seine nets and other gear (passive gear) are given in Table 4.1

Table 4.1: Vessel speeds while actively fishing according to the primary gear types.

Fishing gear (groups)	Vessel speed (knots)
Bottom trawl	1 – 5 knots
Pelagic trawl	1 – 5 knots
Gillnets	0,4 – 5 knots
Seine nets	0,2 – 3,0 knots
Other gear	0,2 – 3,0 knots

Both bottom and pelagic trawling vessels were assumed to be fishing when their speed was between 1-5 knots. Vessels using gillnets were assumed to be fishing (setting and retrieving nets) when their speed was 0,4-5 knots. Vessels using seine nets were assumed to be fishing when their speed was between 0,2-3 knots and vessels using other passive gear (primarily whelk pots) were assumed to be actively fishing (setting and retrieving fishing gear) when their vessel speed was 0,2-3 knots.

Because VMS data only includes vessels equal to or larger than 12 meters it is not possible to specifically determine the distribution of small vessels, which are primarily represented by gillnet and other passive gear fisheries. However, because the majority of the planning area for Hesselø OWF and ECC is a considerable distance offshore, and the predominant fisheries are undertaken by trawlers, which are generally larger than 12 meters, the VMS data represents a large majority of the fishing fleet, and important fishing areas identified by VMS data are considered to also apply to smaller trawling vessels, which are assumed to fish in the same areas.

#### *Relative importance of the planning area for Hesselø OWF and ECC (Export Cable Corridor)*

The number of VMS data points in fishing areas can also be used to compare the ratio of fishing effort, both within and outside the planning area for Hesselø OWF and ECC and thus they can be used as a proxy to indicate the importance of the planning area for different sectors of the fisheries according to gear and target species. The weakness of this method is that it is based on the assumption that catches per unit effort (CPUE) are evenly distributed, which is seldom true. However, using a large amount of data reduces this bias, thus the difference in relative amounts of VMS data is considered to give a good approximation of the difference in importance of fishing areas.

The value of the landings is calculated for each year (2011 through 2020) by multiplying the amount of the landed fish with the average price per kilo of that fish species for the respective year from the relevant Danish fish auction data received from the Danish Fisheries Agency.

In addition to the Danish fisheries, the Swedish fisheries were also investigated to determine how important the planning area for Hesselø OWF and ECC is to their fisheries. Information of the Swedish fisheries in the relevant four ICES rectangles (42G1, 41G1, 41G2 and 42G2) were obtained from the Swedish Fisheries Agency. Although ICES rectangle 42G2 does not contain any part of the planned project area it was included in the presentation of the Swedish statistics because it also represented an area where the Swedish fisheries were prevalent, and showed available alternative fishing areas in the event that potential project pressures made it necessary for Swedish vessels to use alternative areas.

### **4.1.3 Interviews of fishermen and their interest organisations**

Local fishermen naturally have comprehensive knowledge of the specific distribution and target species of the commercial fisheries in the Hesselø wind farm area and. Therefore, official data from the Danish Fisheries Agency was supplemented by information from interviews with relevant fishermen from the ports of Gilleleje and Hundested, as well as representatives of the Danish Fisheries Producer Organization (DFPO) and the Association for Low Impact Coastal fishing (Forening for Skånsomt Kystfiskeri). Interviews were undertaken in February, May and June of 2021 (see Minutes of Meetings) and gave important supplemental information on the distribution and catches of small commercial vessels (less than 12 meters) in the project area not represented in the official data (logbooks and VMS data) for the relevant ICES statistical rectangles. Fishermen also validated the distribution of fisheries based on VMS plots and their assumptions.

### **4.1.4 Fisheries control and regulations**

The fishing effort in a given area is not only dependent on the fish resources available and the technical ability of the fishermen to undertake fishing, but has increasingly been subject to more comprehensive and detailed regulations, These are predominantly based on the biological advice from the National Institute of Aquatic Resources (DTU Aqua) and International Council for the Exploration of the Sea (ICES), but also takes political and economic factors into consideration. This framework is crucial for the undertaking of the fisheries and for the composition and amount of the catches. The most important fishery restrictions in the Kattegat region are based on improving the heavily reduced cod populations in the Kattegat. With the aim of reducing bycatch of cod (primarily cod under legal sizes) several areas in the southern Kattegat have been established where the fisheries are subject to a number of restrictions Figure 4.2. The fishery with bottom trawl is responsible for the largest amount of the catches, both in amount and value, and therefore these restrictions have a considerable impact. Thus, the Danish and Swedish fishermen are completely excluded from using bottom trawls in a large area to the east of the Hesselø planned project area (referred to as Area 3 in Figure 4.2. The same restrictions apply during the 1<sup>st</sup> quarter (January-March) in Area 2 in Figure 4.2. In the other areas (Area 1 and 4), the fisheries are allowed, but only with the use of special gear.

Generally trawling is forbidden within a 3 nautical mile zone from the coastline to generally protect the coastal fisheries with small vessels and passive gear (gillnets, pound nets traps etc.), however there are a number of variations to this rule which, is comprehensive and beyond the need of this report ( (BEK nr. 366 of 02.04.2019).

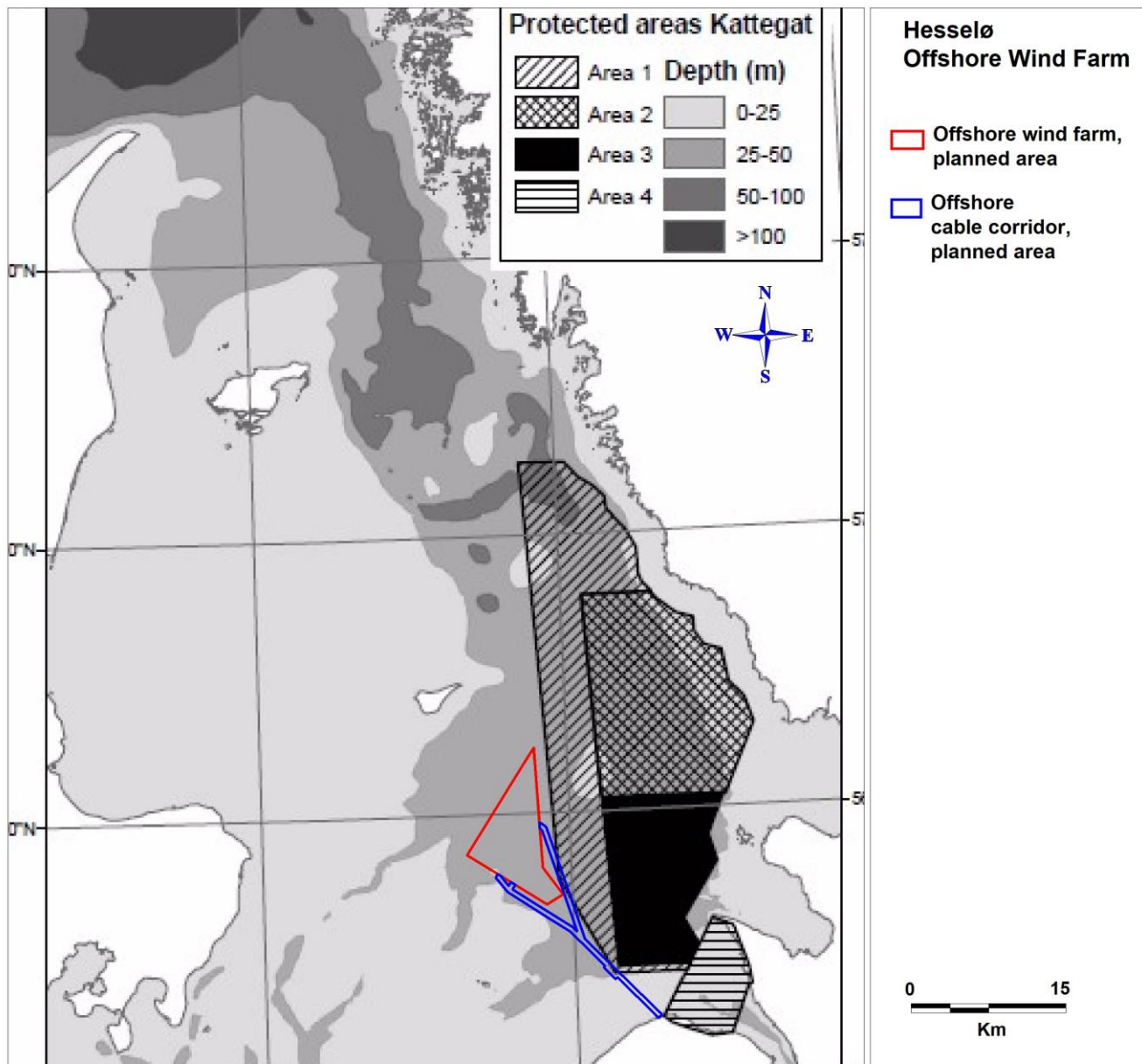


Figure 4.2: Map of Kattegat outlining the areas where the fisheries are subject to restrictions: Area 1) Seasonally closed (1 January–31 March) for fisheries targeting cod, 2) Permanently closed for fisheries targeting cod and closed for all fisheries during the first quarter (1 January–31 March), Area 3) permanently closed for all fisheries, Area 4) Seasonally closed (1 February–31 March) for fisheries targeting cod. (Source: (Madsen & Valentinsson, 2010) (BEK nr. 979 af 21 juni, 2020).

## 5 Baseline description of the commercial fisheries

The Kattegat forms part of the transitional waters between the North Sea and the brackish (low salinity) Baltic Sea where hydrographical conditions are strongly influenced by the run-off of freshwater from the Baltic Sea and the input of Atlantic water from the west/northwest parts of the North Sea. The Kattegat has a strong salinity gradient, from 15 to 25 PSU often with less saline surface water from the Baltic and inflowing high saline water from the Skagerrak and the North Sea in the deeper parts.

The commercial fish community in the Kattegat is similar to the North Sea and is dominated by a number of commercially valuable flatfish species (primarily plaice, dab, sole, flounder, turbot, brill), Atlantic cod and other codfish (haddock, whiting and pollack) and in recent years a large abundance of the greater weever. Because a large part of the deeper parts of the southern Kattegat seabed are soft bottoms, a preferred habitat by the shellfish Norway lobster, this valuable commercial species is also very abundant and supports a lucrative fishery. The Kattegat also has had a large abundance of the pelagic species sprat and herring and visited by seasonal migrants of commercial species that include lumpsucker, mackerel, garfish and eel among others.

### 5.1 Fishing Methods

In the Kattegat and more specifically inside the area of the Hesselø OWF planned project area, including the cable corridor there are a number of different types of commercial fisheries that are being undertaken. Fishery activities include using gear that are considered "active gear" (for example; bottom and pelagic trawls and occasionally seine nets) that are actively pulled along the bottom or through the water, and "passive gear" (gillnets, pots and fyke nets etc.) which are stationary and dependent on movement of the target species to be captured.

Trawl fisheries in and near the Hesselø OWF project area can be divided into: a) industrial fishery primarily with pelagic trawls targeting sprat, herring and sandeel, which are used to make fish meal, oil and animal feed and thus are less valuable per kilo fish and b) bottom trawl fishery targeting a diverse number of species with the shellfish Norway lobster being the most important in the Kattegat, but also including targeted and bycatches of cod, greater weever and diverse flatfish species (plaice, sole, flounder, brill, turbot etc.) which are targeted for human consumption. Characteristic for the fisheries with trawls are the use of heavy "trawl doors" that spread the arms of the trawl to open up a net and create a larger swept area. Furthermore, the trawl doors can either be fished along the bottom (bottom trawls) or in the water column or midwater (pelagic trawls). Bottom trawls are designed to target commercial species living on or near the bottom such as cod, flatfish species, shellfish such as Norway lobster etc., while pelagic trawls target species primarily living in the water column (pelagic environment) often in large schools, such as sprat and herring.

The trawl fisheries have hauls that can last for several hours, typically having the shortest hauls during the summer months (3-4 hours) and the longest hauls during the winter (8 hours), thus hauls are typically undertaken over long distances.

The landings in amount and value by the trawl fisheries (pelagic and bottom trawls) are by far the most important in the Danish fisheries (<https://fiskeristyrelsen.dk/erhvervsfiskeri/>).

## Trawl fisheries - gear

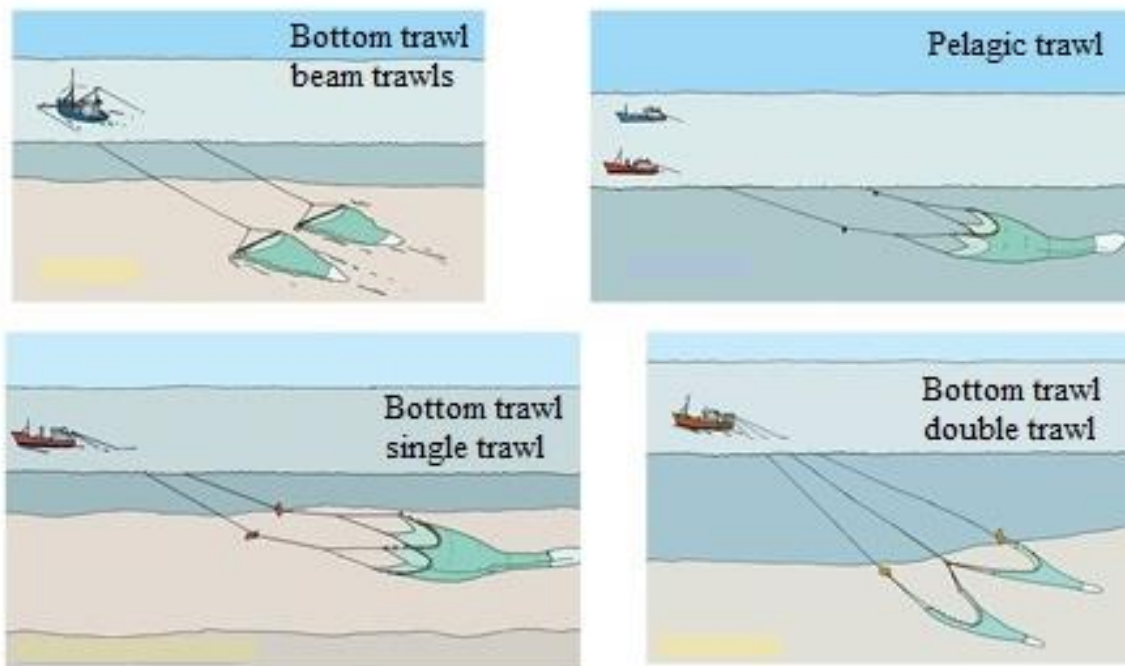
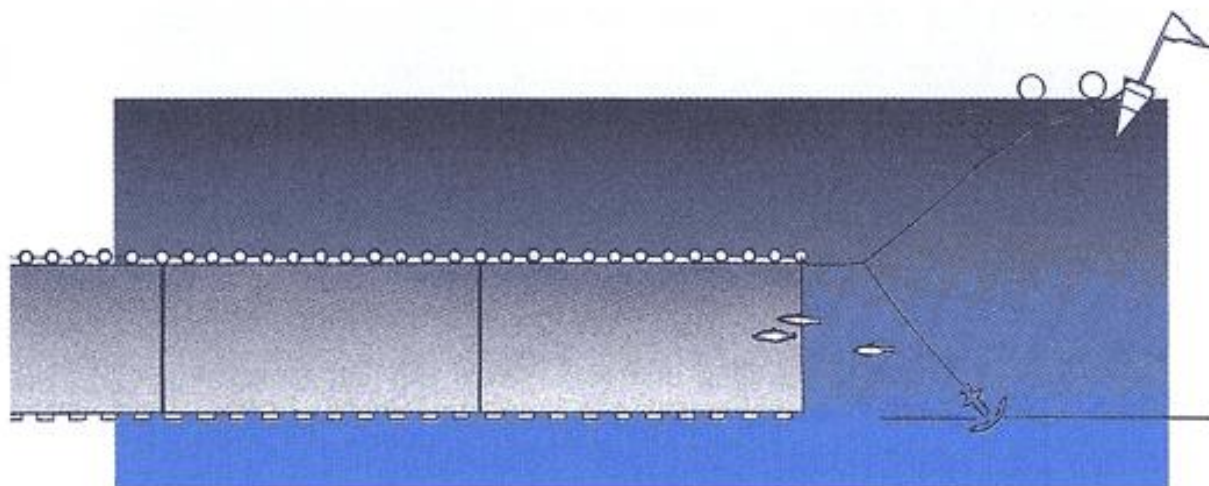


Figure 5.1: Different forms of trawl fishing gear (Drawing by: Niels Knudsen, Fisheries and maritime museum, Esbjerg)

Gillnet fisheries are undertaken with passive (stationary) gear made up of “panels” of interlaced nets that are often linked together in sets of 10-20, and typically fished along the bottom, where they are anchored at each end. Gillnets can, however, also be fished midwater or along the surface to target pelagic species. Gillnets are fished with a variety of mesh sizes depending on which commercial species are targeted and the fishes body shape or form. In this part of the Kattegat, gillnets primarily target flatfish species (sole, plaice, turbot, and brill), cod and lumpsucker when in season. The mesh size of the nets for these fisheries is between 70-270 mm – with the smallest mesh sizes primarily used to catch sole, and the larger mesh sizes primarily used to catch a variety of other flatfish (plaice, turbot, brill etc.) and cod. Vessels participating in the gillnet fisheries are usually smaller than trawlers, and generally set and retrieve their gear within a time frame of 12-36 hours.





**Bottom gillnets**

Figure 5.2: Illustration of a bottom gillnet ([www.fiskerforum.dk](http://www.fiskerforum.dk)).

Danish seine net fishing is an active fishery form that is undertaken with gear made up of two long ropes attached to each end of a seine net in the center. The gear is set by surrounding a certain area with the gear that is placed along the bottom and is operated by pulling the two ropes in which herds are “scared” the fish towards the seine net to capture the fish, thus fishing with seine nets requires a relatively large area with relatively smooth bottom. Fishing with seine nets is of relatively limited importance in this region of the Kattegat and is responsible for only very few of the registered catches in comparison to trawlers and gillnets. The primary target species of the Danish seine net fishery are typically cod and flatfish species.

Other gear (pots, traps, fyke nets and hooks and lines) are stationary gear involving a variety of gear types that include enclosed nets, baited hooks and pots targeting a variety of species and functioning by fish typically being retained and/or entering the gear voluntarily and being hampered from escaping. This gear is used to catch a variety of commercial species (flatfish, cod, migrating silver eel and garfish etc). Along the northern coast of Zealand in this part of the Kattegat in recent years, plastic containers used as a form of pot or trap has been used to catch whelk, a commercial marine snail.

## 5.2 Landings / Catches

The development of the total landings by weight (tons) and value (1000 DKK) of the most important commercial species in the three ICES rectangles (42G1, 41G1 and 41G2) that include the planning area for Hesselø OWF and ECC is presented in Figure 5.3.

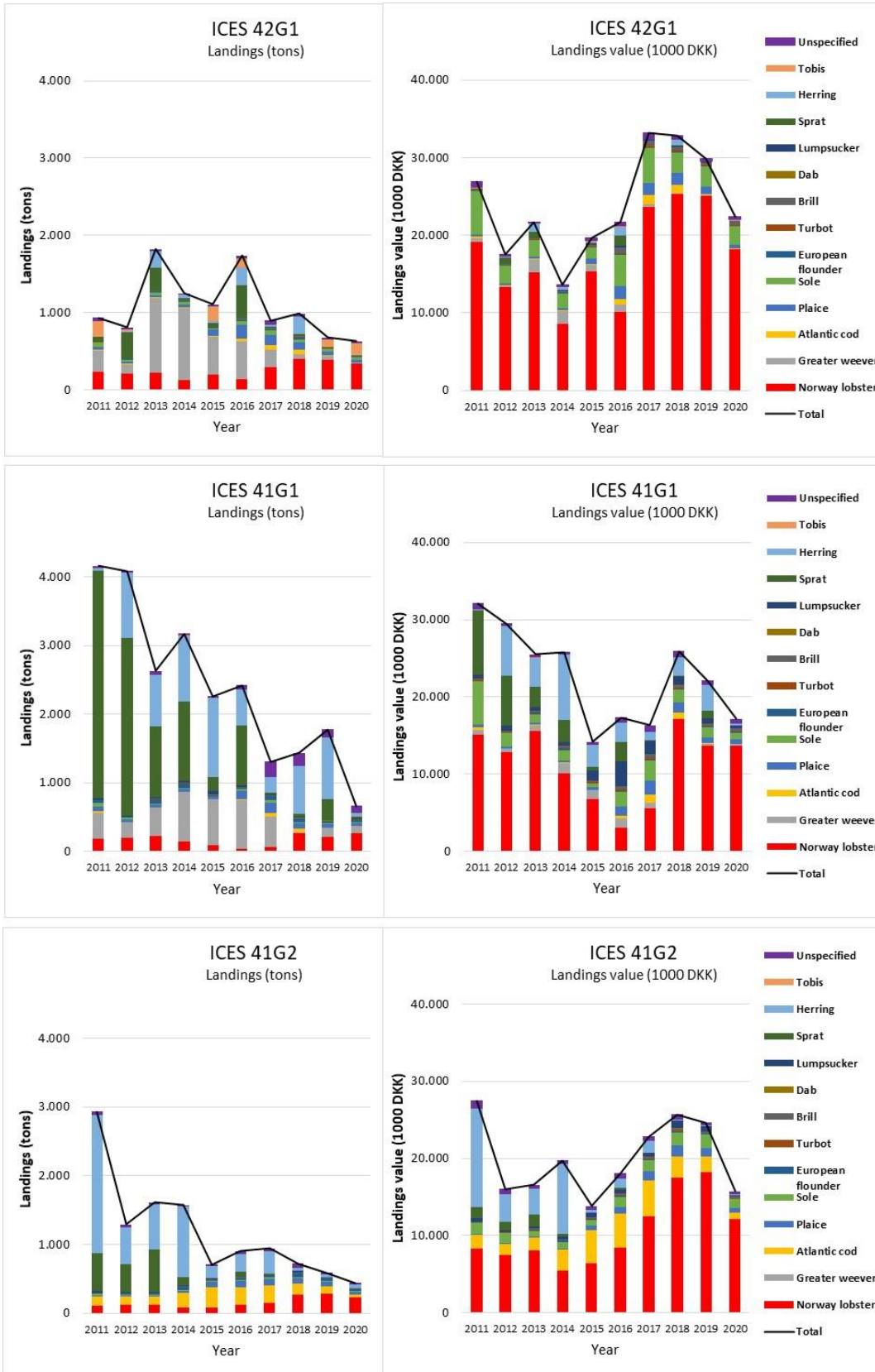




Figure 5.3: The development of the landings and the value of the landings in relation to the most important commercial species in a 10 year period (2011-2020) in all three ICES rectangles (ICES 42G1, 41G1 and 42G1) where parts of the planning area for Hesselø OWF and ECC is located. Data from the Danish Fisheries Agency 2021.

The total landings and value of landings in all three ICES rectangles that contain parts of the planning area for Hesselø OWF and ECC have fluctuated considerably over the 10-year period from 2011-2020 (ICES 42G1: 628-1,821 tons and 13,6-33.2 mDKK / ICES 41G1: 665-4162 tons and 14,2-32,1 mDKK / ICES 41G2: 438-2933 tons and 13,9-27,5 mDKK).

In all three ICES areas the fluctuations in the weight of the landings are generally attributed the variable landings of the pelagic fish species sprat and herring, and the species greater weever, which are often caught in large amounts. The general decline in the total landings over the past 10 years, primarily in ICES 42G1 and 41G1 also correlates well with the decline in the landings of sprat, herring and greater weever during this time. In contrast, landings of the valuable shellfish Norway lobster have been increasing in all three ICES areas in recent years, while landings of valuable consume species such as sole, cod and plaice have been relatively stable, albeit with considerable annual fluctuations.

Economically, fluctuations in the value of the landings from all three ICES rectangles typically correspond to fluctuations in the large landings of the industrial species (primarily sprat, herring) and greater weever as the low price per kilo for these species is compensated for by the large amounts that are landed. The landings of the valuable Norway lobster, the flatfish species sole, plaice, and cod (primarily in ICES 41G2) are also economically important due to a combination of these species having a relatively high price per kilo combined with relatively good and stable landings. Particularly, the shellfish Norway lobster is one of the most economically important species in this part of the Kattegat (relevant in all three ICES rectangles) as this species accounted for approximately 30-82% of the total value of the landings in ICES 42G1, 11-76% of the total value of the landings in ICES 41G1 and 27-77% of total landings value in ICES 41G2 from 2011-2020. The increased landings of Norway lobster in recent years in all three fishery areas (ICES rectangles) have led to this valuable species contributing to no less than 58-75 % of the total landings value (12-25 mDKK) in any one of the three ICES rectangles since 2017.

The annual average landings by weight and value of commercial specie in the three ICES rectangles over a 10-year period from 2011-2020 is shown in Table 5.1. Results showed that landings and value of landings were on average 1,085 tons and 23,9 mDKK in ICES 42G1, 2,393 tons and 22,6 mDKK in ICES 41G1 and 1,172 tons and 20,1 mDKK in ICES 41G2.

The greatest average annual value of the landings in all three ICES areas were predominantly made up of Norway lobster (between 155-254 tons and 10.4-17.3 mDKK annually), followed by diverse flatfish species such as sole (between 15-30 tons and 1,2-2,9 mDKK), plaice (54-72 tons and 618-770 kDKK), brill (4,6-11 tons and 165-403 kDKK) and turbot (1,5-2,5 tons and 92-150 kDKK)(Table 5.1).

The average annual landings of the pelagic species sprat and herring varied considerably between the 3 ICES rectangles. The average annual landings of these two industrial species in ICES 42G1, in the northern part of the planning area for Hesselø OWF, was relatively low (126 and 77 tons amounting to 346 and 360 kDKK, respectively), while in contrast, landings of sprat and herring were much greater in the ICES rectangles in the southern and eastern parts of the planning area for Hesselø OWF and ECC (ICES 41G1 and 41G2). Here, average annual landings of sprat in ICES 41G1 were 958 tons and 2,5 mDKK, while average landings and value of herring was 624 tons and 3,1 mDKK from

2011-2020. In ICES 41G2 during the same period (2011-2020) the average annual landings and value of sprat was 180 tons and 456 kDKK, and herring was 509 tons and 3,2 mDKK.

Other economically important species include lumpsucker (primarily females with roe) , which are landed from ICES 41G1, at an average of 19 tons and 1 million DKK annually, and landings of cod from ICES 41G2, which encompasses the inner part of the cable corridor and the northern part of The Sound (Øresund), amounting to 170 tons and 2,6 million DKK annually (Table 5.1).

Table 5.1: The average annual landings by weight (tons) and value (DKK) of the most important commercial fish and shellfish species in each of the ICES rectangles (42G1, 41G1 and 41G2) containing sections of the Hesselø OWF planned area during the 10-year period (2011-2020). Data from the Danish Fisheries Agency 2021.

ICES rectangles Species	42G1		41G1		41G2	
	tons	1000 DKK	tons	1000 DKK	tons	1000 DKK
Norway lobster	254	17.369	169	11.339	155	10.473
Greater weever	360	649	381	685	0,1	0,2
Atlantic cod	24	402	17	283	170	2.648
Plaice	72	770	66	709	54	618
Sole	36	2.951	23	1.873	15	1.232
European flounder	11	31	37	103	32	90
Turbot	1,5	92	2,5	150	1,6	96
Brill	11	403	6,4	226	4,6	165
Dab	0,8	3,7	3,3	15	2,1	11
Lumpsucker	1,1	61	19	1.055	9,2	474
Sprat	126	346	958	2.461	180	456
Herring	77	360	624	3.126	509	3.240
Sandeel	79	107	0,7	0,9	0,0	0,0
Unspecified	32	413	87	571	37	581
<b>Total</b>	<b>1.085</b>	<b>23.957</b>	<b>2.393</b>	<b>22.596</b>	<b>1.172</b>	<b>20.084</b>

### 5.2.1 Landings and value by gear type

The amount (tons) and value (1000 DKK) of the landings from each of the ICES rectangles according to the primary gear are shown in Figure 5.4. The overall importance of trawlers to the fisheries both by weight and economically in all 3 ICES fishery areas (42G1, 41G1 and 41G2) that include sections of the Hesselø OWF planned project area, is illustrated by trawlers (bottom and pelagic trawlers) accounting for between 86,1-98,8% of the total landings by weight and between 84,5-98,1% of the value of the landings from 2011-2020.

In the northern ICES 42G1, bottom trawlers accounted for 77,8% of the landings by weight and 92,1 % of the value of the landings, while pelagic trawlers accounted for 21% by weight and 5,7% of the value. In ICES 41G1, bottom trawlers accounted for 40,7% and 69,6% of the landings by weight and value while pelagic trawlers accounted for 55,2% by weight and 21,4% of the value. In ICES 41G2 bottom trawlers accounted for approximately 28,7% of the landings by weight and 66,4% of the value of the landings, while pelagic trawlers accounted for approximately 57,4% of the landings by weight and 18,1% of the landings value (Figure 5.4).

By far the most economically important species in the landings of bottom trawlers was the shellfish Norway lobster, and a variety of flatfish species (sole, plaice, flounder and brill) either targeted directly or landed as bycatch in the Norway lobster fisheries in all three ICES rectangles (Table 5.2). Furthermore, the bottom dwelling species greater weever was landed in large amounts by bottom trawlers in both ICES 41G1 and 41G2, along with sprat by pelagic trawlers in ICES 41G1, and cod in bottom trawlers and gillnets in ICES 41G2.

For pelagic trawlers the most important species in the registered landings in all the fishing areas (ICES 42G1, 41G1, 41G2) were sprat and herring and occasionally sandeel in ICES 42G1, the ICES fishing area that includes the northern section of the wind farm area (see Figure 4.1).

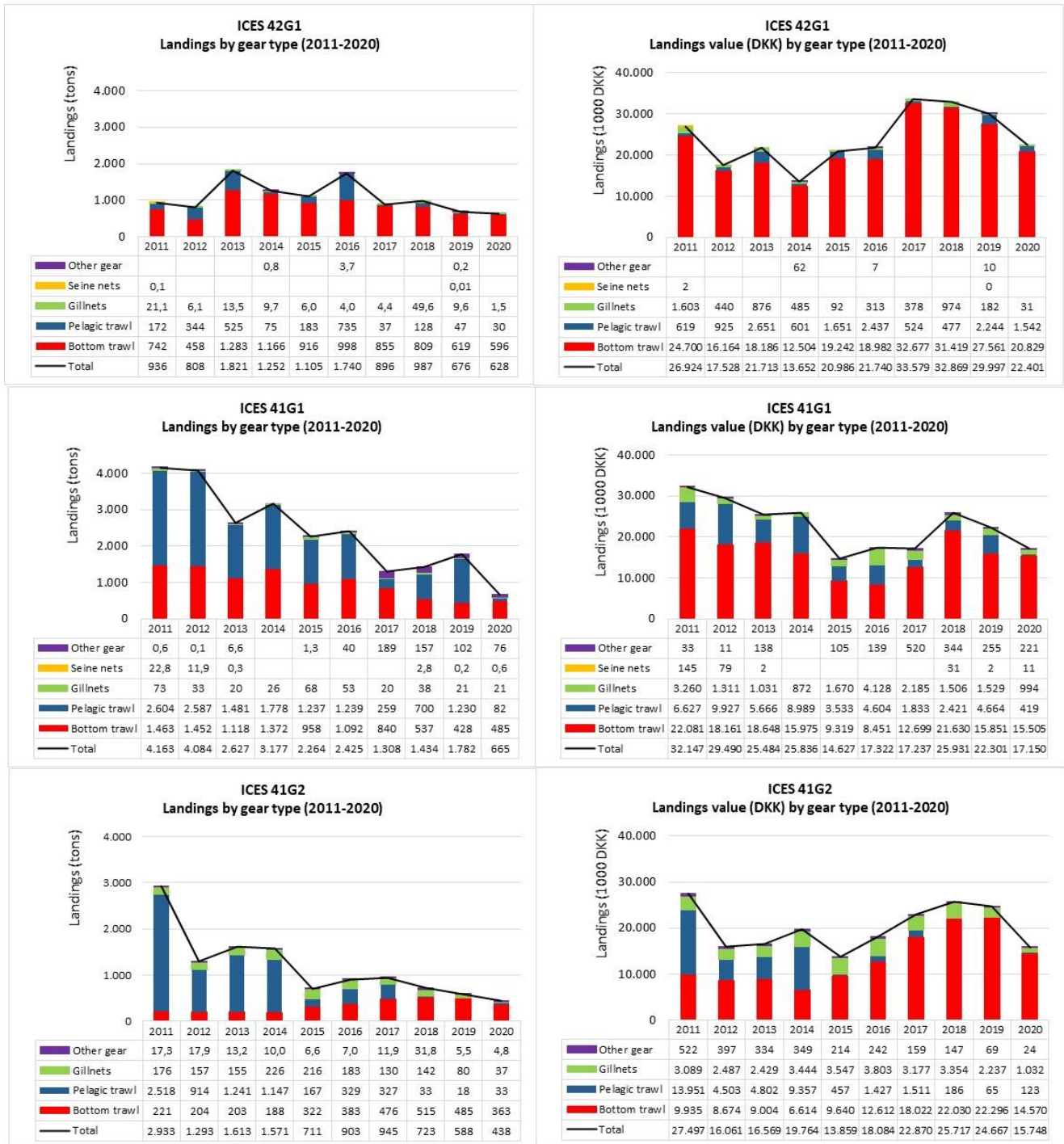


Figure 5.4: The development of the landings and the value of the landings in relation to the gear types over a 10 year period (2011-2020) in all three ICES rectangles (ICES 42G1, 41G1 and 42G1) the planning area for Hesselø OWF and ECC is located. Data from the Danish Fisheries Agency 2021.

The gillnet fishery over the 10-year period from 2011-2020 accounted for 1,2% (2,2% of the value) and 1,6% (8,1% of the value) of the total landings in the ICES fishing areas where the planning area for the windfarm area and outer cable corridor is located (41G2 and 41G1, respectively), and 12,8% of the landings by weight (14,2% of the value) in the ICES 41G2 fishing area where the nearshore planning area for the cable corridor is located. Gillnets was primarily used

to target economically valuable flatfish such as sole, plaice, turbot and brill, as well as lumpsucker and cod, which were caught in comparatively large amounts in ICES 41G2, where the use of gillnets in the commercial fisheries was more common compared to the other ICES rectangles.

The fisheries with "other gear" which in recent years (since 2016) have primarily been represented by plastic "pots" that target the snail whelk, and a variety of other passive gear (fyke nets, hook and lines, conical pots etc.) that have been used near the northern coast of Zealand have been used to land a number of different commercial species in comparatively small amounts (<2,4% of the total landings) in ICES 41G1 (Table 5.2). The use of Danish seine nets has only been sporadically used in the commercial fisheries in ICES 41G1, and has accounted for only 0,2% of the landings over the past 10 years (2011-2020). Danish seine nets generally target the flatfish species plaice with occasional bycatch of flounder, dab and cod (Table 5.2).

Table 5.2: Total landings (tons) and value of landings (DKK) of commercial species according to gear type in ICES 42G1, 41G1 and 41G2 during the 10-year period 2011-2020. Data from the Danish Fisheries Agency 2021.

42G1 - Total landings (tons) of species by gear type (2011-2020)						Total value (1000 DKK) of species by gear type (2011-2020)					
Species	Bottom trawl	Pelagic trawl	Gillnets	Seine nets	Other gear	Species	Bottom trawl	Pelagic trawl	Gillnets	Seine nets	Other gear
Norway lobster	2.468	70	0,5		0,1	Norway lobster	169.236	4.413	32		9,5
Greater weever	3.443	162				Greater weever	6.198	291			
Atlantic cod	221	0,9	14		0,01	Atlantic cod	3.744	15	259		0,2
Haddock	39	0,2	0,0			Haddock	342	2	0		
Plaice	678	5,7	33	0,1	0,02	Plaice	7.139	66	493	0,7	0,2
Sole	309	4,1	46			Sole	25.507	338	3.664		
European flounder	103	0,0	8,5		0,01	European flounder	287	0	24		0,02
Turbot	13	0,4	1,3			Turbot	802	29	89		
Brill	109	2,2	1,6			Brill	3.890	78	57		
Dab	8,1	0,0	0,2			Dab	35	0	1		
Lemon sole	15	0,4	0,2			Lemon sole	325	9	4		
Witch flounder	18	0,1	1,8			Witch flounder	192	1	21		
Lumpsucker	0,1		11			Lumpsucker	1		612		
Sprat	90	1.167				Sprat	263	3.200			
Herring	131	638				Herring	487	3.114			
Tobis	567	222				Tobis	788	278			
Unspecified	230	2,4	6,8	0,1	4,5	Unspecified	3.027	16	117	1,2	69,8
<b>Total (tons)</b>	<b>8.443</b>	<b>2.276</b>	<b>125</b>	<b>0,1</b>	<b>4,7</b>	<b>Total (1000 DKK)</b>	<b>222.263</b>	<b>11.849</b>	<b>5.374</b>	<b>1,9</b>	<b>79,7</b>

41G1 - Total landings (tons) of species by gear type (2011-2020)						Total value (1000 DKK) of species by gear type (2011-2020)					
Species	Bottom trawl	Pelagic trawl	Gillnets	Seine nets	Other gear	Species	Bottom trawl	Pelagic trawl	Gillnets	Seine nets	Other gear
Norway lobster	1.672	6	16,1	0,1	0,4	Norway lobster	112.022	371	965	6	26
Greater weever	3.668	140	0,03	0,04		Greater weever	6.602	252	0,05	0,07	
Atlantic cod	158	0,2	6,1	1,1	0,1	Atlantic cod	2.711	3	98	13	1
Haddock	40		0,04			Haddock	376		0,4		
Plaice	593	0,9	35,8	28,7	1,3	Plaice	6.461	9	389	214	18
Sole	164	0,4	61,7	0,003	0,3	Sole	13.497	32	5.172	0,2	30
European flounder	350	0,2	9,4	6,4	0,5	European flounder	980	0,5	26	18	1
Turbot	17,0	0,1	8,3	0,01	0,005	Turbot	1.011	4	483	1	0,3
Brill	59,4	0,3	3,9	0,01	0,009	Brill	2.115	9	138	0,5	0,3
Dab	28,9	0,3	2,6	1,5	0,001	Dab	130	2	12	6	0,01
Lemon sole	6,6	0,03	0,5	0,003	0,002	Lemon sole	142	1	12	0,1	0,04
Witch flounder	6,3	0,01	1,4		0,001	Witch flounder	71	0,1	17		0,01
Lumpsucker	0,1		188,7		0,2	Lumpsucker	6		10.535		4
Sprat	2.155	7.411			16,0	Sprat	5.475	19.092			46
Herring	585	5.634	17,4		2,0	Herring	3.810	27.326	115		9
Horse mackerel	30,8	4				Horse mackerel	120	16			
Unspecified	212	1	21,4	0,7	551,9	Unspecified	2.790	6,4	524	11,7	1.631
<b>Total</b>	<b>9.746</b>	<b>13.198</b>	<b>374</b>	<b>38,6</b>	<b>573</b>	<b>Total</b>	<b>158.320</b>	<b>47.122</b>	<b>18.486</b>	<b>270</b>	<b>1.767</b>

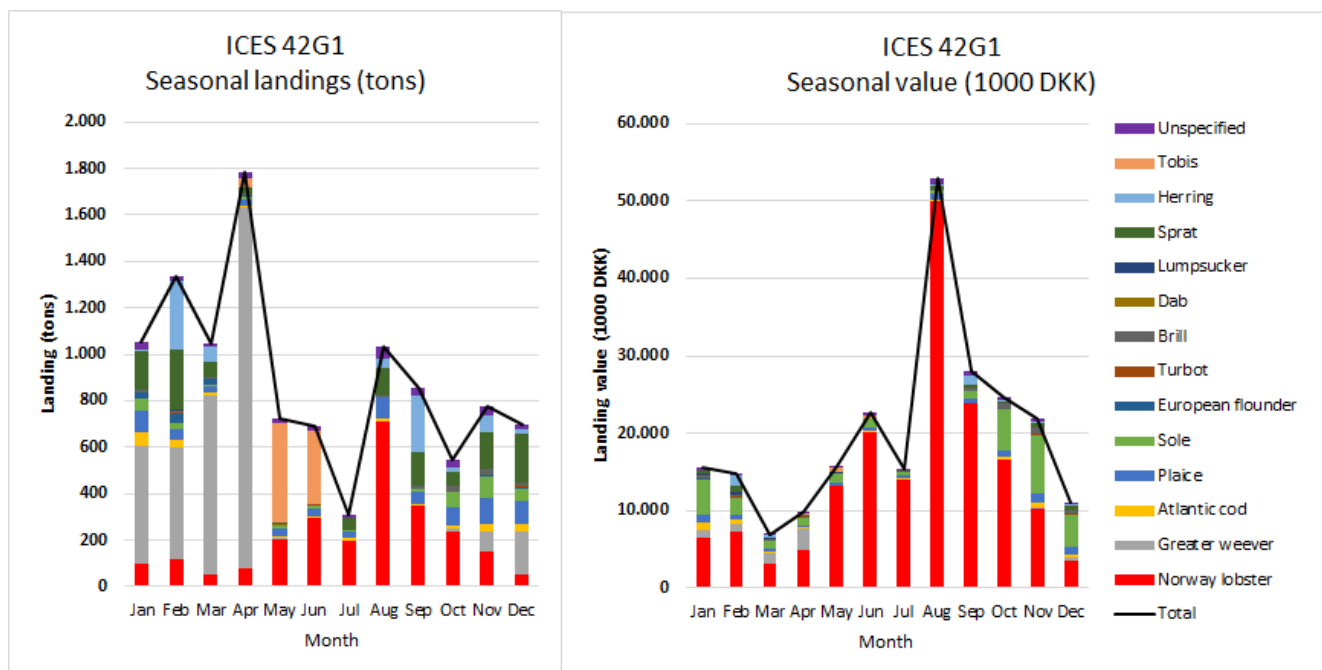
41G2 - Total landings (tons) of species by gear type (2011-2020)						Total value (1000 DKK) of species by gear type (2011-2020)					
Species	Bottom trawl	Pelagic trawl	Gillnets	Seine nets	Other gear	Species	Bottom trawl	Pelagic trawl	Gillnets	Seine nets	Other gear
Norway lobster	1.550	3,2	0,9		0,7	Norway lobster	104.404	215	55		54
Greater weever	0,9					Greater weever	1,6				
Atlantic cod	655	0,7	1.042		4,3	Atlantic cod	10.985	9,3	15.423		60
Haddock	20		1			Haddock	189		14		
Plaice	456	0,3	87		0,1	Plaice	5.277	2,7	898		1,0
Sole	87	0,1	63		0,03	Sole	7.159	3,8	5.159		2,6
European flounder	259		63		0,5	European flounder	724		176		1,3
Turbot	7	0,01	8,8		0,03	Turbot	441	0,7	512		1,7
Brill	37	0,004	9,2		0,02	Brill	1.320	0,1	328		0,6
Dab	17		4,2			Dab	90		18		
Lemon sole	5	0,02	1,3		0,001	Lemon sole	104	0,4	29		0,02
Witch flounder	8	0,02	0,0			Witch flounder	91	0,3	1		
Lumpsucker	0,1		97		0,4	Lumpsucker	2		4.712		25,6
Sprat	43	1.757	0,1			Sprat	120	4.438	0		
Herring	66	4.967	58		4,5	Herring	408	31.704	267		16,5
Tobis	0,004					Tobis	0				
Unspecified	149	0,5	66	0,0	115,5	Unspecified	2.082	7,9	1.006		2.295
<b>Total</b>	<b>3.360</b>	<b>6.728</b>	<b>1.502</b>		<b>126</b>	<b>Total</b>	<b>133.397</b>	<b>36.383</b>	<b>28.598</b>		<b>2.458</b>

## 5.2.2 Seasonal landings

The seasonal distribution of the landings of the most important commercial species by weight (tons) and value (1000 DKK) varied considerably over the year in each of the ICES rectangles (Figure 5.5). The largest overall catches in all the ICES rectangles generally occurred in the first part of the year (January-March/April) and again in the latter part of the year (September-November), whereas the lowest catches and value of the catches occurred in the summer months

(May-July). The large seasonal fluctuations in the total catch were often attributable to peaks in catches of greater weever (in ICES 42G1 and 41G1) in the early part of the year, and the pelagic species sprat and herring by pelagic trawls in the early and late part of the year. Catches of the economically important Norway lobster were observed year round, but were typically higher in the warmer months of the year peaking in the late summer months (August-September) in alle 3 ICES rectangles (Figure 5.5). Generally, the most important flatfish species (sole and plaice) were caught during the colder times of the year (October-March). Similarly, the catches of cod, which were greatest in ICES 41G2 located in the southeastern part of the Kattegat near Øresund (The Sound), also peaked in the colder months of the year (December-March). The very seasonal lumpsucker fishery, which was important locally for the gillnet fishery in some years, particularly in 41G1 and 41G2, typically peaked in February-March in all 3 ICES areas (Figure 5.5).

Economically, general fluctuations in the value of the landings strongly followed the seasonal trends in the large catches of sprat and herring and the economically valuable Norway lobster due to reasonably good catches and Norway lobster’s comparatively high price per kilo (Figure 5.5).





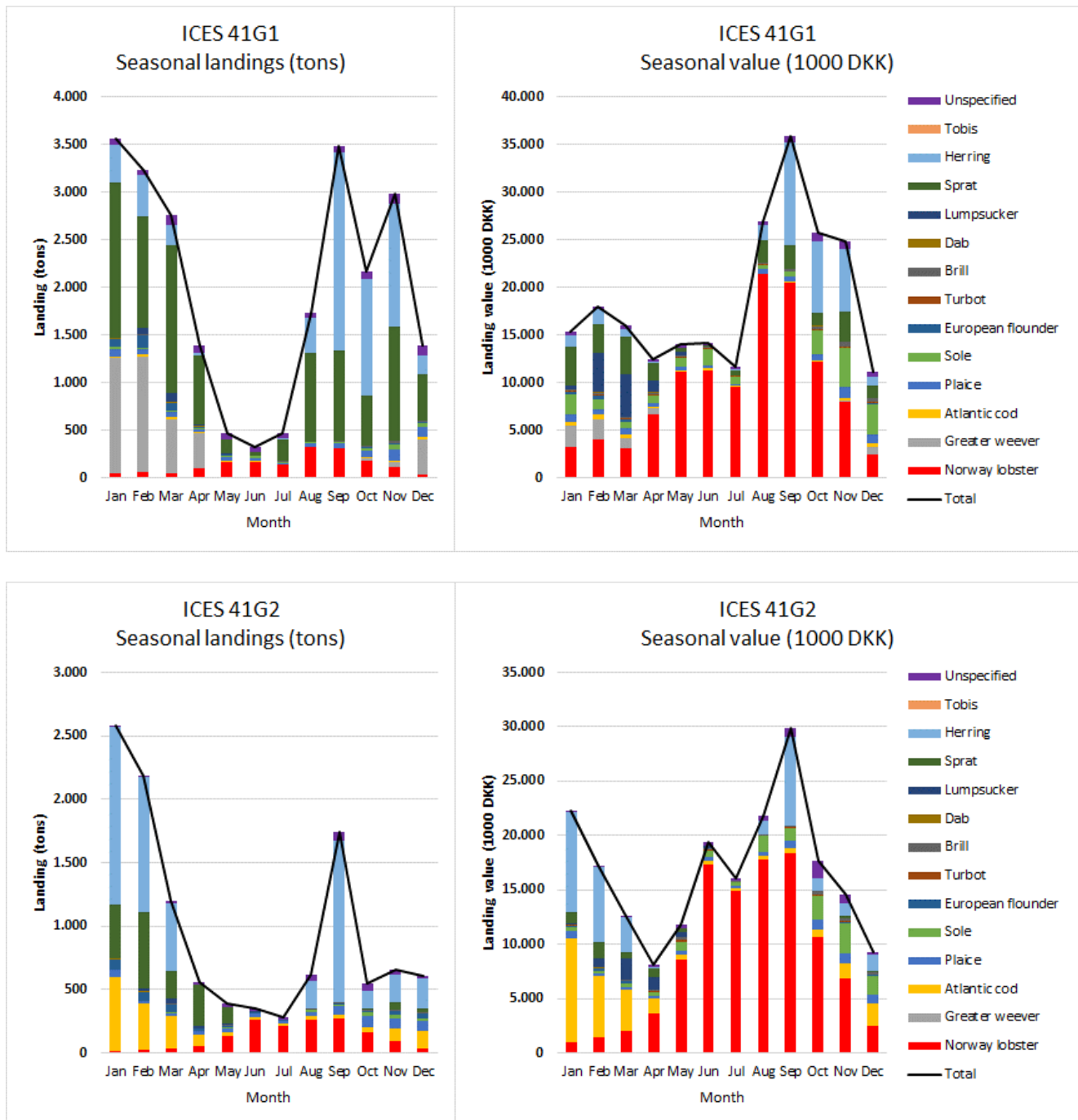


Figure 5.5: Monthly landings (tons) and value (1000 DKK) of landings for the most important commercial species in the ICES rectangles 42G1, 41G1 and 41G2. Data derived from logbooks for the period 2011-2020. (Data from the Danish Fisheries Agency, 2021).

### 5.2.3 Fleet statistics and fishing effort

In the 10 year period from 2011-2020, the total number of commercial vessels equal to or larger than 10 meters ( $\geq 10$  meters) that have fished (registered landings) in the three ICES rectangles that include the planning area for Hesselø OWF and ECC have decreased (Figure 5.6). The general decrease across all three ICES rectangles can be attributed to



both a steady decrease in the number of pelagic trawlers (from 13-25 vessels in 2012/2013 to between 1-7 vessels in the past three years) and the number of vessels using gillnets (from 13-33 vessels in 2011/2012 to between 3-17 vessels in 2020). In contrast, the number of bottom trawlers, which is by far the most common gear used by fishing vessels in the three ICES rectangles, has been comparatively stable throughout the same period (ICES 42G1: 61-72 / ICES 41G1: 58-67 / ICES 41G2: 42-51) (Figure 5.6).

Over the 10-year period between 2011-2020 only between 1-4 fishing vessels using Danish seine nets have fished in the 2 ICES rectangles 42G1 and 41G1 that contain the planning area of the windfarm and the outer ECC and only 1-2 vessels over the past three years. No vessels using seine nets have fished in ICES 41G2 during the period 2011-2020 (Figure 5.6). Similarly, only a few fishing vessels (1-6 vessels over the past 3 years, 2018-2020) using "Other gear", which includes small pots, fyke nets and hook and line, have been fishing in the region of the planning area for Hesselø OWF and ECC in ICES 41G1 and 41G2 (Figure 5.6).

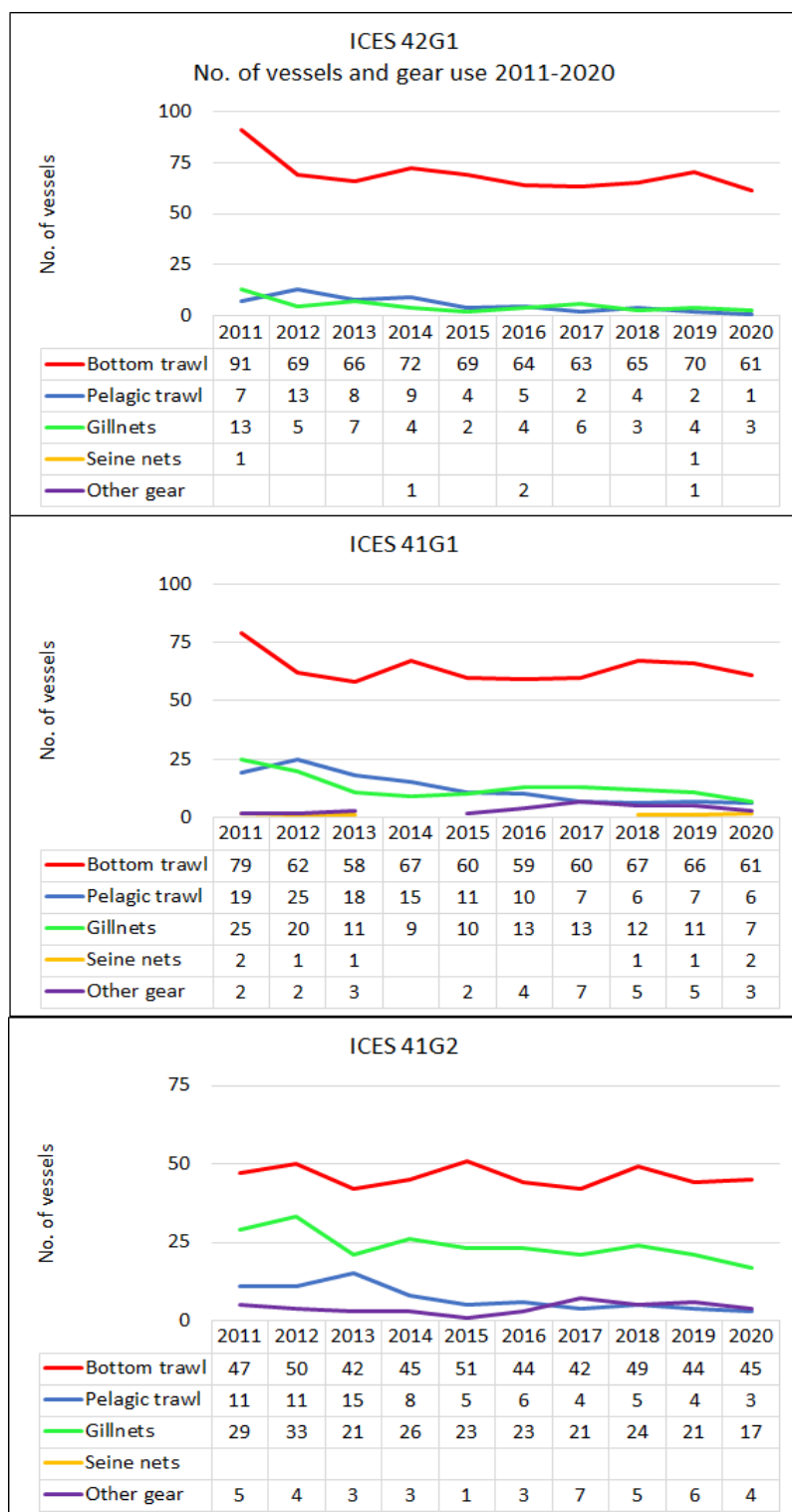


Figure 5.6: The development of the number of fishing vessels that recorded landings in the ICES rectangles 42G1, 41G1 and 41G2 according to their primary gear use (bottom trawl, pelagic trawl, gillnets, seine nets and other gear (pots, fyke nets, hook and lines) from 2011-2020. (Data from the Danish Fisheries Agency, 2021).

## 5.2.4 Small fishing vessels <10 meters

The majority of fishing vessels less than 10 meters do not register their catches in logbooks and thus are not part of the fishery statistics depicted in the data at the ICES rectangle level. Because smaller fishing vessels usually undertake their fisheries in the local waters of their home (basis) ports, the number of vessels under 10 meters for the local ports of Gilleleje and Hundested near the Hesselø OWF planned area over the past 10 years (2011-2020) are reported in Table 5.3.

Table 5.3: Total development of the number of registered fishing vessels less than 10 meters (<10 meters) in the local ports of Gilleleje and Hundested during the 10-year period 2011-2020. Data from the Danish Fisheries Agency 2021.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gilleleje	35	36	38	46	44	48	46	38	30	30
Hunedsted	14	15	15	13	12	11	8	9	9	9

In both ports, the number of small fishing vessels have decreased over the 10-year period between 2011-2020, and at present (2020) there are 30 registered vessels in the port of Gilleleje and 9 registered vessels in the port of Hundested.

Interviews with local fishermen have suggested that although there are a comparatively large number of small boats registered to undertake fisheries with primarily gillnets, fyke nets and whelk pots, most of the registered vessels only participate in the commercial fisheries on a very limited basis and some of the registered vessels are prams, rowboats and small support boats. During interviews with local fishermen from Gilleleje, it was noted that the gillnet fisheries in the local area has declined considerably in recent years and that there is only 1 full-time gillnet fisherman and only 2 part-time gillnet fishermen that only fish on occasion from the port of Gilleleje. Other fishermen occasionally using the smaller fishing vessels with a variety of "other gear" (fyke nets, whelk pots, hooks and line etc.) are mostly retired, less active and fish only part-time.

Similarly, there is also only 1 full-time gillnet fishermen and 2 part-time fishermen that fish with small vessels along the coast and in local waters from the port of Hundested. Furthermore, a few small vessels from distant ports will also fish along the north coast of Zealand from time to time (information from interviews). It should be noted that the catches from these vessels make up only a small fraction of the fisheries in this region (approx. 5% - Danish Fisheries Agency).

### 5.2.4.1 Number of fishing trips (fishing effort)

Although a fishing trip can represent from one to several days of fishing for different vessels, the number of fishing trips in an area can be used as a proxy for the amount of effort used for the different fisheries in ICES rectangles 42G1, 41G1 and 41G2.

Table 5.4: Development of the number of registered fishing trips undertaken by fishing vessels >10 meters according to gear during the 10-year period 2011-2020. Data from the Danish Fisheries Agency 2021.

ICES rectangle		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
42G1	Bottom trawl	886	985	975	891	1.130	783	926	1.242	1.035	1.076
	Pelagic trawl	15	28	18	15	10	35	5	7	112	110
	Gillnets	35	15	35	33	12	13	20	45	19	8

	Seine nets	1								1	
	Other gear			17		14				1	
41G1	Bottom trawl	1.414	1.506	1.523	1.445	932	664	815	1.439	1.207	1.523
	Pelagic trawl	164	251	172	145	86	73	21	48	104	27
	Gillnets	407	260	160	137	207	230	120	140	196	181
	Seine nets	29	25	1					5	1	3
	Other gear	2	5	20		27	68	285	169	124	93
41G2	Bottom trawl	942	941	842	814	929	1.269	1.177	1.617	1.556	1.431
	Pelagic trawl	138	97	210	147	54	43	36	21	23	11
	Gillnets	818	731	647	651	657	598	443	462	440	295
	Seine nets										
	Other gear	46	41	28	38	25	25	35	44	22	11

The number of fishing trips registered for bottom trawls for all 3 ICES rectangles have increased over the last several years to well over a thousand trips a year (Table 5.4) indicating that the stable number of bottom trawlers fishing in all three ICES rectangles have increased their efforts in recent years in this part of the Kattegat. The increase in the number of fishing trips by bottom trawlers also corresponds well with the increase in the landings of primarily Norway lobster in recent years (see Figure 5.3). Similarly, the large increase in the number of fishing trips by pelagic trawlers in the northern ICES 42G1 (from 7-35 during the period 2011-2018, to 110-112 trips over the past 2 years 2019-2020) also indicates the 1-2 pelagic fishing vessels have targeted the pelagic fisheries in this area. In contrast, the fishing effort (number of fishing trips) by pelagic trawlers has generally decreased in the southwestern ICES 41G1, from 145-251 yearly trips in the period 2011-2014 to 21-104 trips a year since 2015, and in ICES 41G2 from 97-210 fishing trips before 2015 to 11-54 trips since 2015 (Table 5.4).

The number of fishing trips by vessels using gillnets has never been high in ICES 42G1 (from 5-45 trips a year since 2011). In contrast, the number of fishing trips by vessels using gillnets has been considerably higher in ICES 41G1 (120-230 yearly fishing trips over the past 5 years), and particularly the ICES 41G2 fishing area (295-598 fishing trips a year the past 5 years) (Table 5.4).

The 1-2 vessels using seine nets, almost exclusively in ICES 41G1 had only 1-5 registered fishing trips since 2013. These were undertaken in the western part of the ICES rectangle (Figure 5.12). In contrast, the number of fishing trips from the 1-7 vessels using "other gear" (primarily pots after the shellfish whelk) ranged between 68-285 trips in ICES 41G1 from 2016-2020, and less (11-46 trips) in the fishing area ICES 41G2. The location of these trips was south and west of the planned project area, including the cable corridor (see Figure 5.13).

### 5.3 The distribution of the commercial fisheries in the Hesselø planned area

As a proxy for the distribution of the commercial fisheries according to gear types (bottom trawls, pelagic trawls, gillnets, seine nets and other gear), VMS data indicating where vessels equal to or larger than 12 meters were actively fishing was used to map fishing areas in the four ICES rectangles (41G2, 41G1, 42G1 and 42G2) that include the planning area for Hesselø OWF and ECC and regional alternative fishing areas

### 5.3.1 Bottom trawls

The fishery with bottom trawls is very intense in almost the entire planning area for Hesselø OWF and ECC (Figure 5.7). Noticeable in the distribution of the bottom trawl fisheries are the large regional areas, both to the east and southwest of the planning area that are not fished by bottom trawlers, or utilised by the fisheries at all (see Figure 5.7). The seabed in these areas are either primarily made up of mixed and hard bottom habitats which cannot be used by bottom trawlers due to the risk of gear damage, or because the fisheries are no longer allowed in order to protect the cod population, for example in the so-called "Cod box" east of the planned project area (see section 4.1.4).

In general, fishing with bottom trawls (and with trawls in general) takes place predominantly outside 3 nautical miles, however, a number of exceptions exist for certain types of vessels and gear (cf. the Trawl Order (BEK no. 366 of 02/04/2019)). Bottom trawling is often carried out with hauls (tows) that extend over several hours (4-8 hours) and with a towing speed of approximately 3 knots (5 km/hr.), the hauls can often have a length that exceeds the length of the entire outer section of the planning area for the Hesselø OWF. Interviews with fishermen from local ports (Gilleleje and Hundested) indicate that the smaller (under 12 meters), non-VMS registered trawlers undertake their fisheries in the same areas as the larger trawlers. However, their fishery is more concentrated in the southern parts of the planning area for Hesselø OWF and sections of the ECC. The direction of trawling routes derived from VMS data and confirmed in interviews with fishermen indicate the bottom trawling fishery usually takes place from southeast to northwest and vice-versa, but can also take place in an east-west direction, particularly in the southern part of the planned area.

By far, the most important target species with bottom trawls in and around the planning area for Hesselø OWF and ECC is Norway lobster. In addition, there is also important bottom trawl fisheries of cod, greater weever and a number of flatfish species: plaice, sole, flounder, turbot and brill either targeting them directly or as bycatch when targeting Norway lobster.



Figure 5.7: The distribution of the bottom trawling activity in the four ICES rectangles (42G1, 42G2, 41G1 and 41G2) in the southern Kattegat and in relation to the planning area for Hesselø OWF and ECC. Data derived from VMS data over a 10-year period (2011-2020). (Data from the Danish Fisheries Agency, 2021).

The seasonal intensity of the fishery with bottom trawl was comparatively high throughout the entire year in most of the planning area for Hesselø OWF and ECC (Figure 5.8).



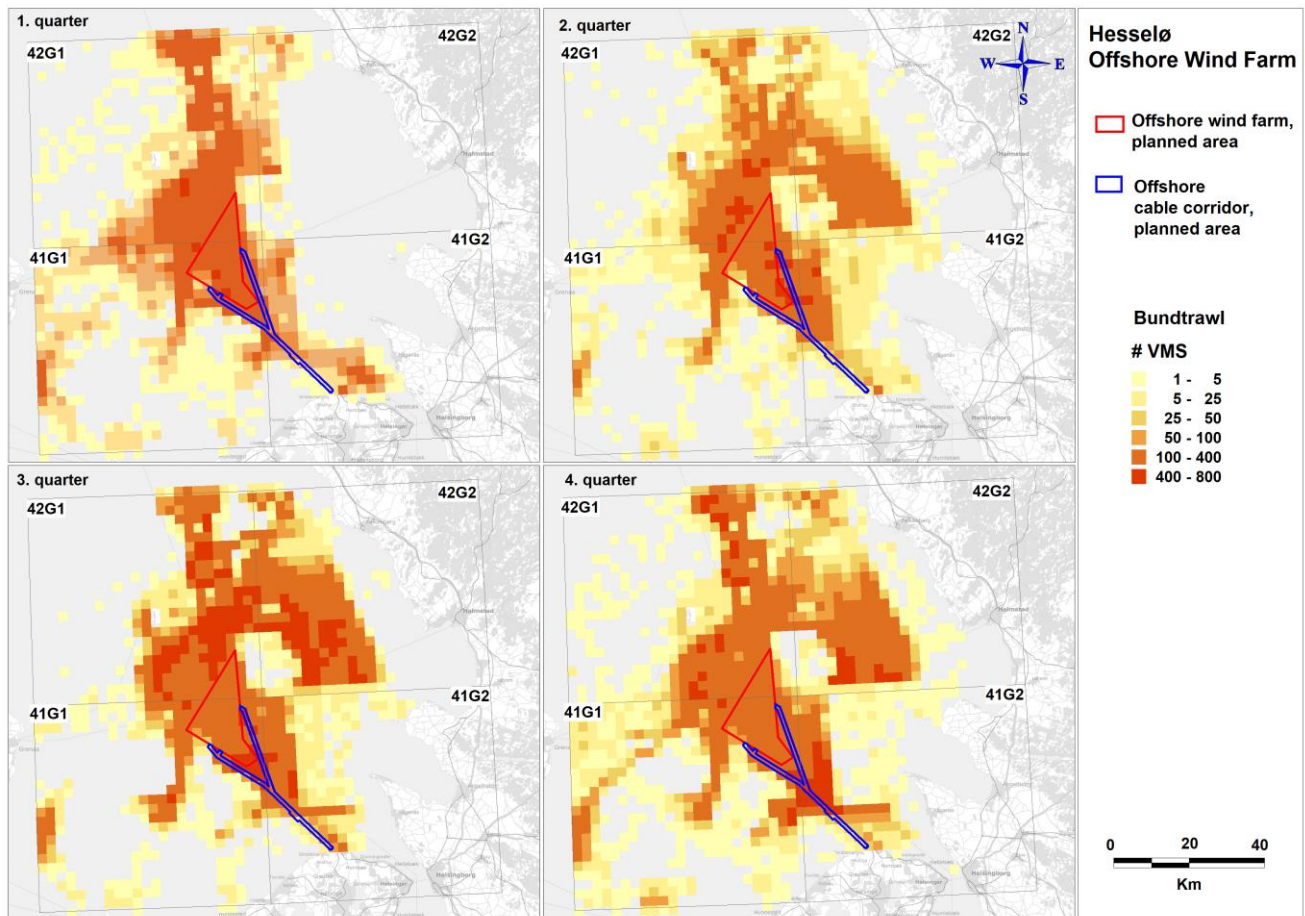


Figure 5.8: The seasonal distribution of the intensity of the bottom trawl fishery based on VMS data points from 2011-2020 divided into the 4 quarters of the year (1. quarter (Jan-Mar) / 2. quarter (Apr-Jun) / 3. quarter (Jul-Sep) / 4. quarter (Oct-Dec). Data derived from VMS data over a 10-year period (2011-2020). (Data from the Danish Fisheries Agency, 2021).

### 5.3.2 Pelagic trawls

The distribution of the fishery with pelagic trawls is spread throughout the central part of the Kattegat, as well as throughout the planning area for Hesselø OWF and sections of the ECC as well as to the east in the northern part of Øresund (The Sound)(Figure 5.9). Logbook data over 10 years (2011-2020) from the three relevant ICES rectangles in which the planning area for Hesselø OWF and ECC is located, indicate that the pelagic species brisling and herring are by far the most dominant commercial species in the landings by pelagic trawls. Sprat dominate the landings in the northern ICES rectangle 42G1, while both herring and sprat are caught in large and somewhat equal amounts in ICES 41G1, while landings of herring in pelagic trawls dominate in ICES rectangle 41G2, which includes the eastern and near shore section of the EEC.

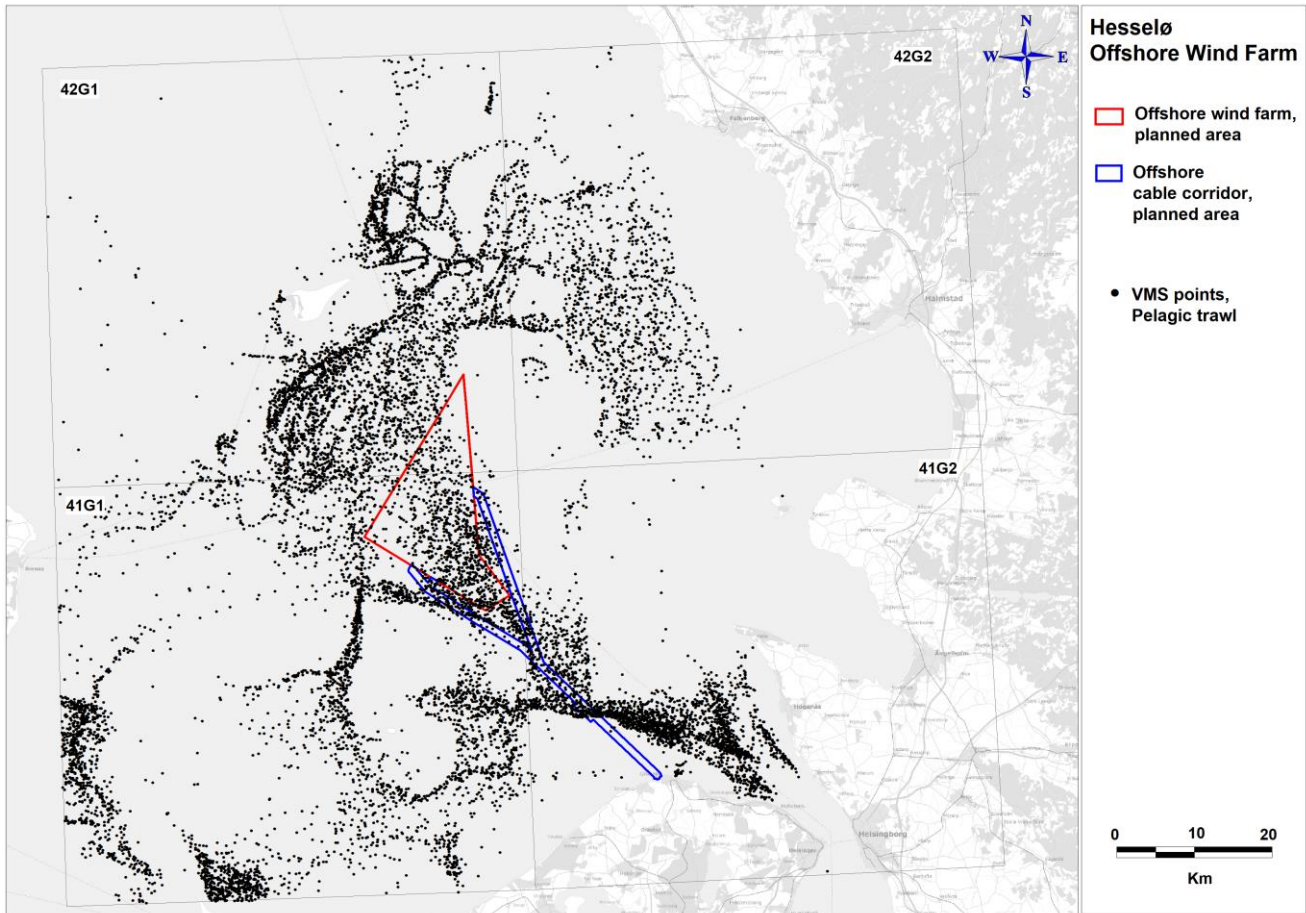


Figure 5.9: The distribution of the pelagic trawling activity in the 4 ICES rectangles (42G1, 42G2, 41G1 and 41G2) in the southern Kattegat and in relation to the planning area for Hesselø OWF and ECC. Data derived from VMS data over a 10-year period (2011-2020) from the Danish Fisheries Agency, 2021.

Seasonally over the past ten years (2012-2020) the intensity of the fishery with pelagic trawl in the wind farm planned area was most intense in the 1<sup>st</sup>, 3<sup>rd</sup> and 4<sup>th</sup> quarter of the year and most intense in the cable corridor planned area in the 1<sup>st</sup> and 2<sup>nd</sup> quarter of the year (Figure 5.9).



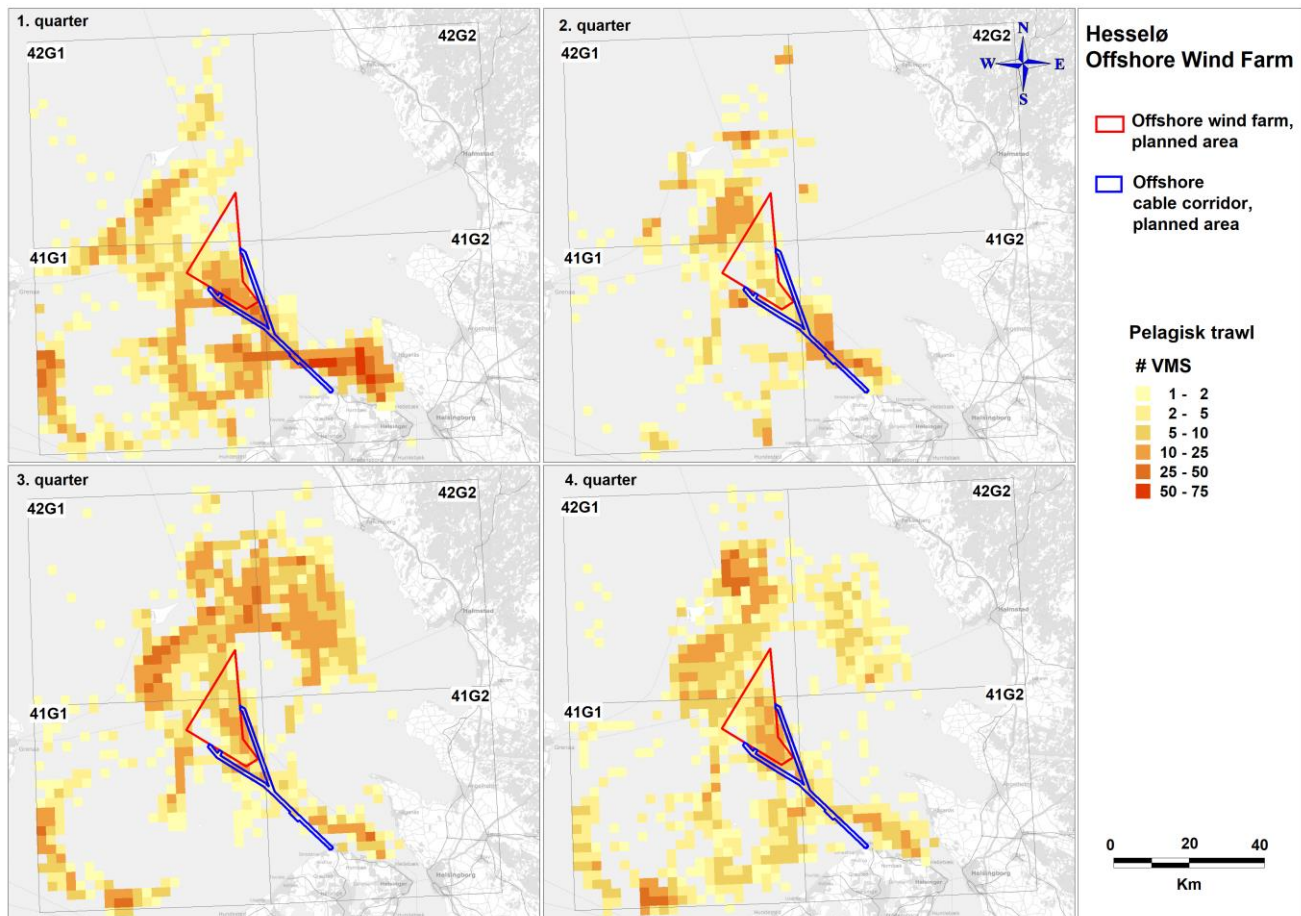


Figure 5.10: The seasonal distribution of the intensity of the pelagic trawl fishery based on VMS data points from 2011-2020 divided into the four quarters of the year (1. quarter (Jan-Mar) / 2. quarter (Apr-Jun) / 3. quarter (Jul-Sep) / 4. quarter (Oct-Dec). Data derived from VMS data over a 10 year period (2011-2020) from the Danish Fisheries Agency, 2021

### 5.3.3 Gillnets

The distribution of the gill nets fisheries in and around the Kattegat including the planning area for Hesselø OWF and ECC based on VMS data of gillnet vessels ( $\geq 12$  meters in length) during the period 2011-2020 is shown in Figure 5.11. Results indicate that the gillnet fishery from these larger vessels are primarily undertaken just east of the northern part of the planning area for Hesselø OWF, and along the coast close to land primarily to the east and west of the ECC. According to interviews with local gillnet fishermen (section 5.4) the gillnet fishery just east of the outer planning area for Hesselø OWF (see Figure 5.11) has almost stopped. Today, the limited gillnet fishery including the smaller (<12 meters) gillnet fishing vessels not shown on the VMS map, fish predominantly along the coast with the majority of their fishery being undertaken within 6-7 kilometers of the coastline and in water depths less than 20 meters. The gillnet fisheries typically target a variety of flatfish species such as sole, turbot and brill from January-September, cod in the colder months of the year and other seasonal fish species such as lumpsucker (winter/early spring). The population of many of these commercial species and thus their targeted fisheries, fluctuate considerably from year to year, and according to information from the local fishermen during interviews many of these fisheries have been at low levels in recent years.

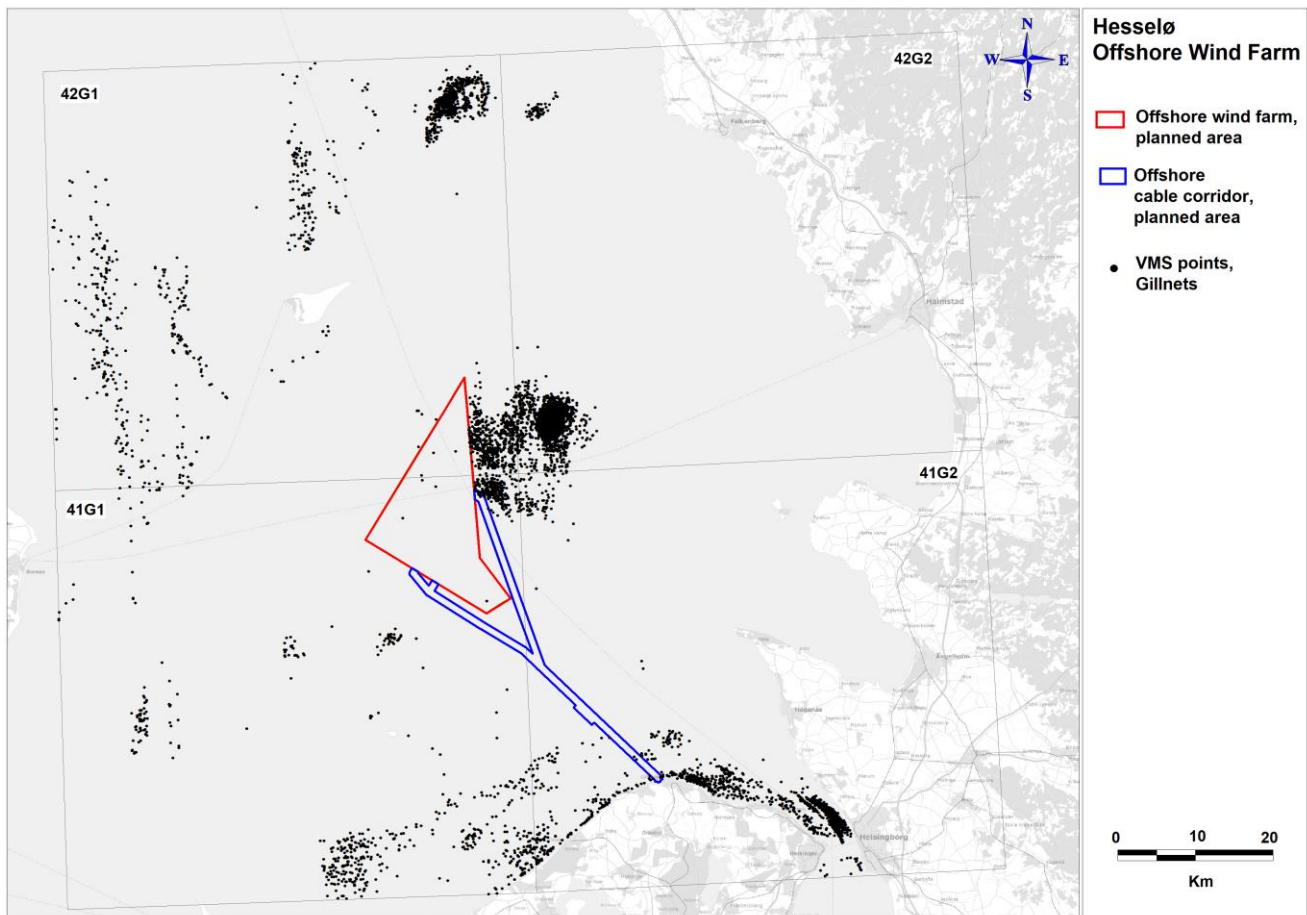


Figure 5.11: The distribution of the gillnet fishery in the four ICES rectangles (42G1, 42G2, 41G1 and 41G2) in the southern Kattegat and in relation to the planning area for Hesselø OWF and ECC. Data derived from VMS data over a 10-year period (2011-2020) from the Danish Fisheries Agency, 2021.

### 5.3.4 Seine nets

VMS data over the past 10-year period (2011-2020) indicates that there has been very little seine fisheries in the Kattegat and none registered in the planning area for Hesselø OWF and ECC (Figure 5.12). The very low intensity of this fishery over the past 10 years was also supported by local fishermen during interviews.

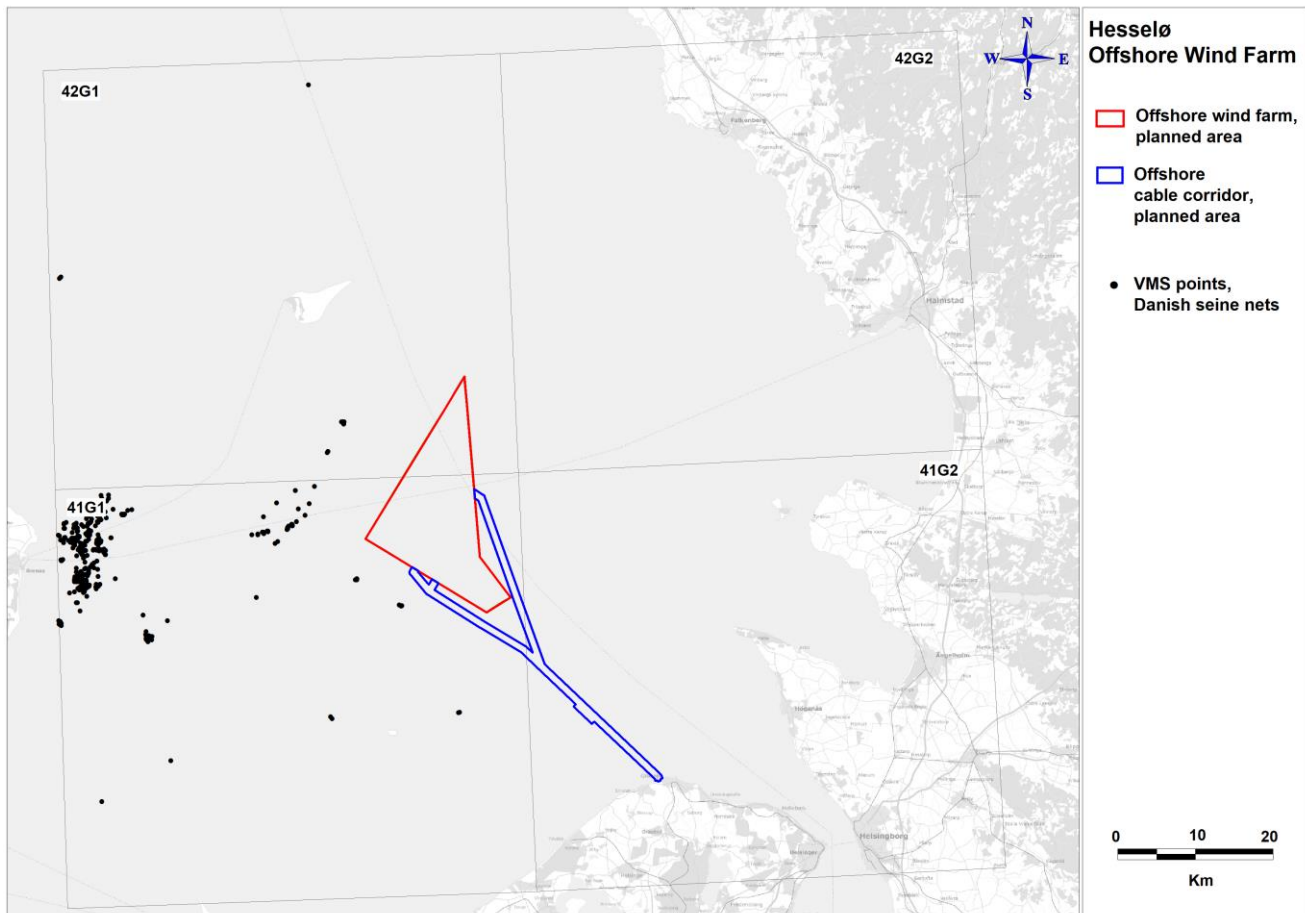


Figure 5.12: The distribution of the seine net fishery in the 4 ICES rectangles (42G1, 42G2, 41G1 and 41G2) in the southern Kattegat and in relation to the planning area for Hesselø OWF and ECC. Data derived from VMS data over a 10 year period (2011-2020) from the Danish Fisheries Agency, 2021.

### 5.3.5 Other gear (pots, fyke nets, lines etc.)

The distribution of the local fisheries with other gear, was almost exclusively in an area near the coast, south and west of the planning area for Hesselø OWF and ECC (Figure 5.13). The fisheries with “other gear” which according to logbook data primarily includes fisheries with fyke nets, hook and lines and pots targeting a variety of commercial flatfish species and cod, and included seasonal fisheries targeting garfish, mackerel and eel. In later years (since 2016) there has been a fishery targeting the marine snail called whelks with home-made plastic “pots”, however this fishery is not being undertaken at present (information from interviews). In general, the fisheries with these different types of passive gear along the coast has been sporadic and decreasing, and is generally undertaken by part-time and retired fishermen.

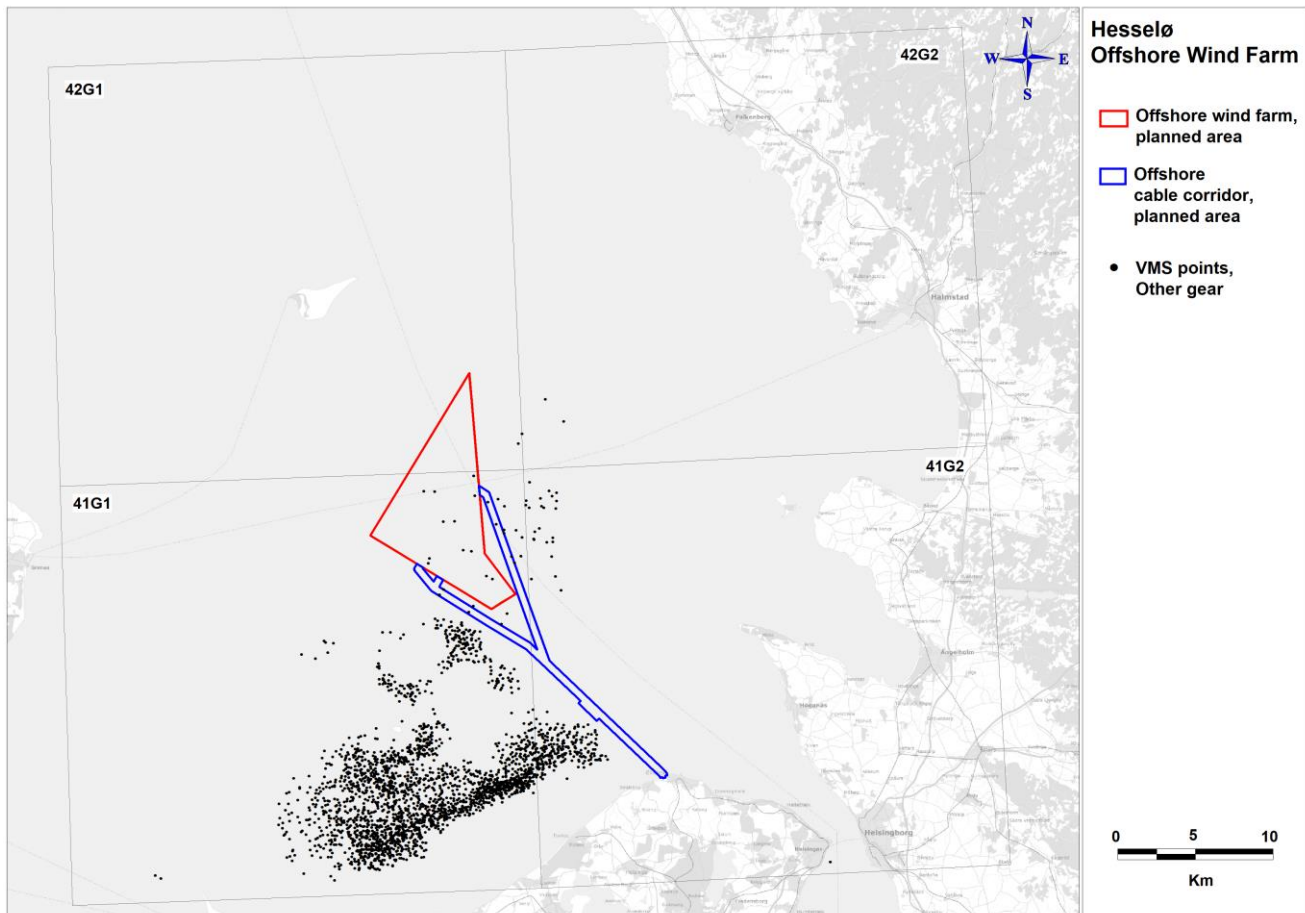


Figure 5.13: The distribution of the fisheries with "other gear" (primarily whelk pots, conical pots, fyke nets and hook and line) in the 4 ICES rectangles (42G1, 42G2, 41G1 and 41G2) in the southern Kattegat, and in relation to the planning area for Hesselø OWF and ECC. Data derived from VMS data over a 10 year period (2011-2020) from the Danish Fisheries Agency, 2021.

#### 5.4 Interviews of fishermen and their organisations

Interviews with 6 local fishermen from the ports of Gilleleje and Hundested, representatives from the local department of the Danish Fishermen Producers Organisation (DFPO) and the chairman for the Association for Low Impact Coastal Fisheries (FSK), were undertaken during May and June of 2020.

Information from interviews confirmed that the most important economical fishery for the port of Gilleleje was the bottom trawl fisheries targeting Norway lobster, with different bycatch of a number of other commercially important species (sole, plaice, cod, greater weever, turbot and brill etc.) that are also periodically targeted. Earlier there was also a relevant bottom trawl fishery targeting cod, but since 2018 the cod fishery has decreased considerably due to the low numbers of cod in the region. The Norway lobster fishery is undertaken throughout the year by a number of vessels from the local ports of Gilleleje and Hundested, as well as from a number of distant ports, such as Grenå, Bornholm, Bogense, Kerteminde and as far away as Hvide Sande. There are also German trawlers that periodically trawl in the regional area and land their catch at Gilleleje. Many of the bottom trawlers only have one fisherman onboard, particularly the smaller vessels, while up to three fishermen are on the larger trawlers. Seasonally, the bottom trawling vessels from Gilleleje are most active during the autumn and winter months (until April). Some bottom trawlers are less than the 12 meters that are registered in the VMS data, but they generally fish in the same



areas (see Figure 5.7), although the smaller vessels are more concentrated in the fishing areas closer to the port of Gilleleje.

The local fishermen pointed out that the gillnet fishery in the local coastal area has decreased considerably in recent years, and at present are only represented by 1-2 full-time gillnet fishing vessels from Gilleleje and 1-2 full-time gillnet fishing vessels from the local fishing port of Hundested, approximately 40 kilometers west of Gilleleje. During the year, there are also a few vessels (estimated to be 3-4 vessels) that periodically fish locally with gillnets and land their catch in Gilleleje.

The target species for gillnet fishermen are sole, turbot/brill and lumpsucker (winter/early spring). The population of these commercial species and thus the fisheries, fluctuate considerably from year to year and in recent years these fisheries have been at low levels.

There are a few smaller fishing vessels that periodically use other gear such as fyke nets, pots and hooks and line targeting commercial flatfish, and seasonally target lumpfish, garfish (early spring) and silver eel (autumn) and more recently the shellfish whelks. These have, however declined considerably in recent years and are generally undertaken by retired and part-time fishermen.

It was confirmed that there are no pound net fisheries along the entire coastline between Helsingør and Hundested and thus none in the planning area for Hesselø OWF and ECC.

## 5.5 Fishery statistics in ports near the Hesselø OWF planned area

### *Landing ports*

Various amounts of the catches from ICES 42G1, 41G1 and 41G2 have been landed in up to 47 different ports (from 32 to 47 ports) throughout Denmark over the past 10 years (2011-2020). This includes distance ports such as Hvide Sande on the west coast of Jutland and Sønderborg in the southern inner Danish waters. Table 5.5 lists the top 10 landing ports for each of the 3 ICES fishing areas. Results indicate, the catches from ICES 42G1, which contains part of the northern section of the planning area for Hesselø OWF, are primarily landed in the ports of Grenå (avg. of 54% (639 tons) by weight and 21,5% (5,1 mDKK) by value, Anholt (avg. of 11,5% by weight (110 tons) and 23,7% (5,4 mDKK) by value and Gilleleje (10,4% (98 tons) by weight and 16,8% (4 mDKK) by value.

For the fisheries in ICES 41G1 that contains the southern section of the planning area for Hesselø OWF and much of the ECC, the most important landing ports are Grenå (avg. of 36,2% by weight (145-1899 tons) of the annual landings and an avg. of 21,7% of the value (3,1-15,8 mDKK), and the port of Gilleleje (avg. of 34,1% (199-1.119 tons) by weight and 41,7% (3,3-14,5 mDKK) of the landings value, followed by the port of Hundested (avg. of 12% (64-456 tons) by weight of the annual landings and 15,5% (2,6-4,7 mDKK) of the annual value. Over the past 3 years however, landings in the port of Gilleleje has increased to approximately 53,6% by weight and 53,5% by value of the total catches from ICES 41G1.

Catches from ICES 41G2 have also been primarily landed in the port of Gilleleje as between 80-95% (383-2486 tons) of the landings by weight with a value of between 12,4-24,1 mDKK have been annually landed in this port over the 10-year period 2011-2020 (Table 5.5).

In general, landings by weight and value are also relatively high in the ports of Bønnerup, Hundested, Østerby and Strandby (nordjylland)(Table 5.5).

In summary, the catches in the southeastern part of the Kattegat are primarily landed in the port of Gilleleje, while the catches in the area of the Kattegat that contains the northern part of the planning area for Hesselø OWF are landed in the ports of Grenå and Anholt.

Table 5.5: Ports where from the fisheries (catch) by Danish vessels in ICES 42G1, 41G1 and 41G2 were landed according to weight (tons) and value (DKK) during the period 2011-2020. Data from the Danish Fisheries Agency 2021.

#### ICES 42G1 - Landing ports (tons and value (1000 DKK))

Landings (tons)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gilleleje	81	79	73	97	39	69	104	262	79	103
Hundested	14	27	20	24	15	47	47	29	10	42
Grenå	495	333	1.345	992	807	1.247	362	309	265	237
Bønnerup	85	37	35	21	58	40	66	74	68	56
Strandby (nordjylland)	107	115	41	16	23	58	45	56	21	14
Anholt	50	171	101	74	114	152	80	138	127	101
Østerby	38	31	44	5	36	57	101	67	85	55
Odden	9	4	10	8	5	16	21	6	3	9
Skagen	12	4	149	8	2	6	4	27	9	7
Hals	8	0,3	1	5	1	42	38	6	3	1
Other ports	38	8	0,3	3	5	7	28	13	5	2
Landings value (1000 DKK)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gilleleje	5.169	3.918	3.520	2.626	1.994	2.284	4.605	7.938	3.789	4.461
Hundested	640	985	1.070	951	699	1.350	1.628	1.099	571	1.797
Grenå	4.613	3.166	5.953	3.097	4.543	6.192	6.632	5.073	6.904	4.492
Bønnerup	4.739	1.818	1.955	885	2.099	1.817	3.977	4.008	3.935	2.727
Strandby (nordjylland)	3.254	918	705	442	646	1.024	1.335	1.344	1.079	352
Anholt	3.640	4.356	4.442	4.354	7.600	4.673	5.319	7.375	7.594	5.048
Østerby	2.321	1.521	2.411	234	1.385	2.123	5.361	3.645	4.982	2.629
Odden	300	212	529	379	294	447	937	267	145	415
Skagen	782	194	1.045	367	109	186	227	1.059	503	329
Hals	523	20	65	173	34	1.445	1.337	354	61	69
Other ports	943	420	18	145	312	191	1.817	708	292	82

#### ICES 41G1 – Landing ports (tons and value (1000 DKK))

Landings (tons)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gilleleje	199	1.119	1.088	899	917	416	262	968	1.062	225
Hundested	64	456	171	417	213	102	252	233	158	194
Grenå	1.899	1.463	875	1.211	837	1.739	564	109	505	145
Odden	1.241	972	446	569	279	43	77	48	24	34
Bønnerup	36	16	3	1	12	20	27	27	16	7
Strandby (nordjylland)	109	15	15	48	0,2	5	9	24	2	51
Anholt	22	19	23	27	3	4	1	10	6	4
Østerby	1	2	3	3	0,02	3	4	1	2	
Skagen		1		0,4	0,1	1	2	7	2	1
Helsingør							0,04			
Other ports	592	23	3	2	2	94	111	7	4	3

Landings value (1000 DKK)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gilleleje	8.822	13.146	12.800	12.164	6.039	3.293	4.175	14.511	11.831	8.769
Hundested	2.631	4.413	4.789	3.085	2.302	3.199	3.038	3.734	3.187	3.324
Grenå	11.150	5.834	3.771	4.411	3.184	6.304	3.923	3.227	4.262	2.678
Odden	5.190	4.287	2.225	4.215	2.203	3.092	2.693	2.181	1.636	1.591
Bønnerup	1.103	318	135	42	57	505	586	891	444	269
Strandby (nordjylland)	535	62	65	126	13	86	252	358	60	129
Anholt	811	1.071	1.318	1.539	241	126	38	485	345	225
Østerby	66	87	188	153	1	35	112	77	56	
Skagen		56		17	2	21	88	289	101	29
Helsingør							1			
Other ports	1.838	217	193	85	118	660	1.445	177	170	137

#### ICES 41G2 - Landing ports (tons and value (1000 DKK))

Landings (tons)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gilleleje	2486	1035	1482	1441	634	777	896	643	536	383
Hundested	11	36	41	59	4	14	17	33	9	32
Helsingør	21	21	19	23	17	17	13	27	18	12
Sletten	4	8	30	21	5	12	6	1	17	3
Rungsted	5	15	7	6	4	9	7	7	5	2
Bønnerup	1	1	4	1	1	1	0,5	1		1
Skudehavnen/København	16	31	14	10	7	6	1	1		
Snekkersten	3	5	5	7	10	10	0,2	1	1	0
Odden	20	0	1	0,1	0,4	1		1	0,4	0,5
Grenå	359	57	7	0,3	0,4			2		1
Other ports	6	84	3	3	29	55	4	6	3	3

Landings value (1000 DKK)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gilleleje	24.166	13.913	14.785	18.145	12.399	16.048	21.649	24.044	23.403	14.853
Hundested	66	235	153	191	120	511	331	176	238	207
Helsingør	358	409	326	383	306	396	483	859	707	338
Sletten	84	125	379	321	70	149	92	20	83	62
Rungsted	61	160	78	72	51	127	105	107	83	46
Bønnerup	48	51	170	31	35	26	5	18		47
Skudehavnen/ København	461	528	342	337	214	235	74	55		
Snekkersten	44	54	48	108	157	160	9	11	10	13
Odden	65	13	9	4	13	55		18	20	24
Grenå	1.977	238	165	18	19			92		59
Other ports	169	337	113	155	475	377	120	318	123	101

#### Basis port – Home ports

Similar to the large number of ports where the catch from ICES 42G1, 41G1 and 41G2 have been landed, vessels fishing in these ICES rectangles over the past 10 years 2011-2020 come from many different ports. Over the past 10 years (2011-2020) vessels from 48 different ports have fished in ICES 42G1, while vessels from 61 different ports have registered landings from ICES 41G1, and vessels from 47 different ports have registered landings from ICES 41G2. While vessels from many ports only fish in the individual ICES areas on occasion (one to a few years), there are also vessels from a number of ports that consistently fish in this part of the Kattegat.

Table 5.6 lists the total landings (tons) and value of landings (1000 DKK) from 2011-2020 of the top 10 basis ports or home ports of where the vessels registering the landings come from.

For ICES 42G1, fishery data indicates that vessels from the ports of Grenå (annual average of 202 tons and 2,6 mDKK), Bønnerup (annual average of 160 tons and 3,1 mDKK), Strandby (nordjylland) (annual average of 137 tons and 1,0 mDKK) and the local port of Gilleleje (annual average of 98 tons and 1,9 mDKK) landed 55% by weight and 36% by value of the landings from the northern most ICES rectangle that includes the northern part of the planning area for Hesselø OWF (42G1). These landings were made up of a variety of commercial species dominated by the shellfish Norway lobster, flatfish species; plaice, sole, turbot and brill as well as Atlantic cod.

For the ICES rectangle 41G1, vessels from the ports of Gilleleje (annual average of 653 tons and 6 mDKK) and Hundested (annual average of 99 tons and 2,6 mDKK) accounted for 31% of the total landings by weight and 38% of the value of the landings from this ICES rectangle. Similar to the landings from the northern ICES 42G1, the landings by vessels from these ports were also dominated by the shellfish Norway lobster, flatfish species; plaice, sole, European flounder, brill and turbot as well as Atlantic cod and lumpsucker.

The fishing areas in ICES rectangle 41G1 were also very important for vessels from the ports of Bønnerup (annual average of 229 tons and 1,0 mDKK), Grenå (annual average of 202 tons and 3,2 mDKK), Kerteminde (annual average of 230 tons and 1,5 mDKK), Odden (annual average of 215 tons and 1,6 mDKK) and Strandby-nordjylland (annual average of 161 tons and 479 kDKK) (Table 5.6). Landing from these vessels were also dominated by the shellfish Norway lobster, diverse flatfish species (plaice, sole, European flounder, brill and turbot) as well as Atlantic cod and lumpsucker. Vessels from the ports of Grenå, Bønnerup and Standby also landed large amounts of greater weever, sprat and herring in different years.

The importance of ICES 41G2 to the vessels with their home port in Gilleleje is illustrated by the large majority of the landings (917 tons and 12,5 mDKK) from ICES 41G2 come from vessels in this port (Table 5.6). Similarly, vessels from a number of other ports consistently fish in ICES 41G2 including the nearby port of Hundested (annual average of 10 tons and 242 kDKK) and ports such as Kerteminde (annual average of 30 tons and 1,5 mDKK), Søby (annual average of 23 tons and 1 mDKK), Rødvig (annual average of 28 tons and 941 kDKK) and Bagenkop (annual average of 14 tons and 504 kDKK)(Table 5.6).

Table 5.6: Home ports (Basis ports) of the Danish vessels that registered landings from ICES 42G1, 41G1 and 41G2 according to weight (tons) and value (1000 DKK) during the period 2011-2020. Data from the Danish Fisheries Agency 2021.

ICES 42G1 - Landings according to home ports of vessels (tons and value (1000 DKK))										
Landings (tons)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gilleleje	124	40	47	83	238	46	42	169	21	167
Hundested	11	19	8	21	18	26	41	34	17	33
Grenå	25	42	163	479	336	639	169	53	81	33
Bønnerup	130	273	118	45	184	411	113	72	172	86
Strandby (nordjylland)	283	175	486	68	121	55	110	31	29	8
Anholt	16	21	28	20	15	18	21	25	36	30
Kerteminde	35	17	4	28	11	47	24	64	5	4
Bagenkop	13	9	15	16	10	33	44	57	40	36



Søby	20	46	17	7	19	12	27	28	19	26
Hasle	4	5	12	9	4	15	32	25	18	13
Ebeltoft	11	14	13	14	29	33	32	42	48	36
Østerby	35	12	15	0	26	53	83	50	52	49
Korsør	6	6	7	10	16	31	21	22	33	38
Other ports	222	130	889	451	75	322	136	314	104	70
<b>Landings value (1000 DKK)</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Gilleleje	2.026	1.564	2.252	2.067	2.197	1.576	1.652	3.128	797	1.772
Hundested	806	1.016	442	971	902	778	1.954	1.421	881	1.344
Grenå	1.676	1.496	1.988	1.338	2.558	2.920	4.633	2.914	4.749	1.599
Bønnerup	4.080	2.100	2.309	1.800	2.604	2.954	4.509	3.759	4.216	3.021
Strandby (nordjylland)	3.139	1.430	1.619	269	396	537	873	957	738	316
Anholt	1.141	1.057	1.696	1.213	990	923	1.426	1.421	2.219	1.542
Kerteminde	726	612	205	371	678	1.589	1.031	863	259	168
Bagenkop	835	506	767	619	499	1.091	1.503	2.363	2.276	1.604
Søby	1.415	2.239	941	320	1.011	537	1.618	1.484	1.138	1.173
Hasle	287	275	644	424	291	443	1.458	1.163	993	573
Ebeltoft	740	749	751	559	1.354	1.369	1.990	2.289	2.901	1.749
Østerby	2.177	533	654	27	896	1.702	4.191	2.677	3.066	2.348
Korsør	500	394	488	683	1.175	445	1.443	1.300	1.996	1.874
Other ports	7.374	3.556	6.956	2.991	4.163	4.870	4.895	7.129	3.626	3.318

#### ICES 41G1 - Landing according to home ports of vessels (tons and value (1000 DKK))

<b>Landings (tons)</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Gilleleje	164	1.166	919	842	892	394	206	811	960	177
Hundested	45	69	87	113	95	53	123	146	131	132
Grenå	151	115	137	334	510	578	144	22	17	14
Bønnerup	387	525	133	6	169	808	140	16	87	24
Strandby (nordjylland)	333	170	228	208	34	56	172	15	295	95
Nexø	8	10	21	11	10	6	13	16	20	27
Kerteminde	838	516	142	626	16	54	40	38	14	13
Bagenkop	129	211	13	20	113	24	36	52	6	19
Ebeltoft	14	8	10	12	13	47	19	23	29	22
Søby	12	11	11	9	4	8	2	33	20	7
Hasle	18	12	9	10	138	11	23	31	28	20
Odden	718	534	309	345	140	16	35	22	10	25
Other ports	1.347	738	608	641	129	369	355	208	165	90
<b>Landings value (1000 DKK)</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Gilleleje	4.106	9.879	8.968	10.039	4.155	2.578	2.272	7.351	6.443	4.033
Hundested	2.532	3.272	4.280	2.447	1.466	1.954	2.109	3.106	2.707	2.526
Grenå	4.645	1.798	1.060	1.234	1.657	1.895	981	1.080	939	611
Bønnerup	1.382	1.488	689	202	475	2.428	1.173	718	845	379
Strandby (nordjylland)	914	483	437	393	98	133	567	289	1.071	403

Nexø	606	557	1.183	578	517	155	389	803	956	974
Kerteminde	2.679	2.801	1.512	2.171	1.007	877	952	1.370	553	536
Bagenkop	576	890	798	671	523	901	1.048	1.694	349	676
Ebeltoft	828	382	529	559	444	1.002	879	1.230	1.587	1.021
Søby	661	551	590	420	132	179	65	1.053	1.175	290
Hasle	1.159	619	504	497	578	280	998	1.451	1.473	924
Odden	2.334	2.196	1.085	2.943	1.558	1.570	1.006	1.016	815	1.165
Other ports	9.726	4.575	3.849	3.682	1.553	3.372	3.913	4.770	3.180	3.612

#### ICES 41G2 - Landing according to home ports of vessels (tons and value (1000 DKK))

Landings (tons)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gilleleje	2.727	1.017	1.280	1.409	529	593	710	366	308	237
Hundested	1	3	1	2	5	10	22	39	16	5
Bønnerup		1	10	1	2	0,1		1		4
Strandby (nordjylland)	1	5	1	0,03	11	13	25	24	30	19
Kerteminde	19	16	15	6	19	26	37	52	59	52
Hornbæk	24	23	20	26	18	18	10	21	14	11
Bagenkop	2	3	24	1	1	21	17	27	24	21
Søby	2			1	30	17	21	45	38	34
Nexø	0,5	11	7	3	5	7	3	26	10	6
Rødvig		0,2	52	53	1	13	47	46	32	7
Other ports	159	214	202	70	89	186	52	74	58	42
Landings value (1000 DKK)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gilleleje	22.215	11.242	12.157	16.913	8.647	11.026	12.955	11.783	10.814	7.409
Hundested	41	130	56	52	147	322	489	422	635	124
Bønnerup		64	272	31	114	2		26		172
Strandby (nordjylland)	39	181	75	0	327	314	790	1.147	1.358	810
Kerteminde	1.237	890	712	323	802	1.018	1.591	2.380	3.291	2.400
Hornbæk	462	431	376	426	314	413	402	719	570	329
Bagenkop	122	197	124	28	62	555	603	1.249	1.340	757
Søby	107			37	851	593	1.065	2.018	2.175	1.581
Nexø	36	610	417	154	258	454	199	1.587	572	272
Rødvig		11	137	249	48	517	3.102	2.475	1.619	312
Other ports	3.238	2.305	2.244	1.552	2.288	2.871	1.675	1.910	2.292	1.580

## 5.6 Foreign fisheries in the planned project area and region - Swedish fisheries

Limited fishery data on foreign vessels undertaking their fisheries in this part of the Kattegat from the Danish Fisheries Agency supplemented with information from interviews of local fishermen and representatives of The Danish Fishermen PO indicated that fisheries by foreign vessels are primarily limited to Swedish vessels. Germany does however have a small quota in Danish territorial waters and although Danish and Swedish vessels are restricted from trawling in the "Cod Box" that is approximately 10 to 15 kilometers to the east of the planning area for Hesselø OWF

and ECC, local Danish fishermen said that German trawlers target Norway lobster with bycatches of cod and plaice in this area (fishery data not available).

To give an overview of the Swedish commercial fisheries in the region of the planning area for Hesselø OWF and ECC, fishery data obtained from the Swedish Fisheries Agency (Havs- og Vattenmyndigheten, 2020) is presented in the following.

Similar to the Danish vessels, the movement of the Swedish commercial fishery vessels equal to or larger than 12 meters ( $\geq 12$  meters) are also monitored by VMS (Vessel Monitoring System) equipment. This data was used to map the distribution of the Swedish fisheries in the four regional ICES rectangles that include the planning area for Hesselø OWF and ECC over a 5 year period (2016-2020) (Figure 5.14).

Result indicated that the distribution of the Swedish fisheries was predominantly concentrated in a large area in the ICES rectangle 42G2 north of the Hesselø windfarm planned area. During the 5 year period from 2016-2020, only a small fraction of the Swedish fisheries were undertaken in a corridor of the northern section of the planning area for Hesselø OWF (Figure 5.14). Similarly, there was only indications of sporadic Swedish fishery activity in other areas near the southern sections of the planning area for Hesselø OWF and ECC near the Danish coast (Figure 5.14).

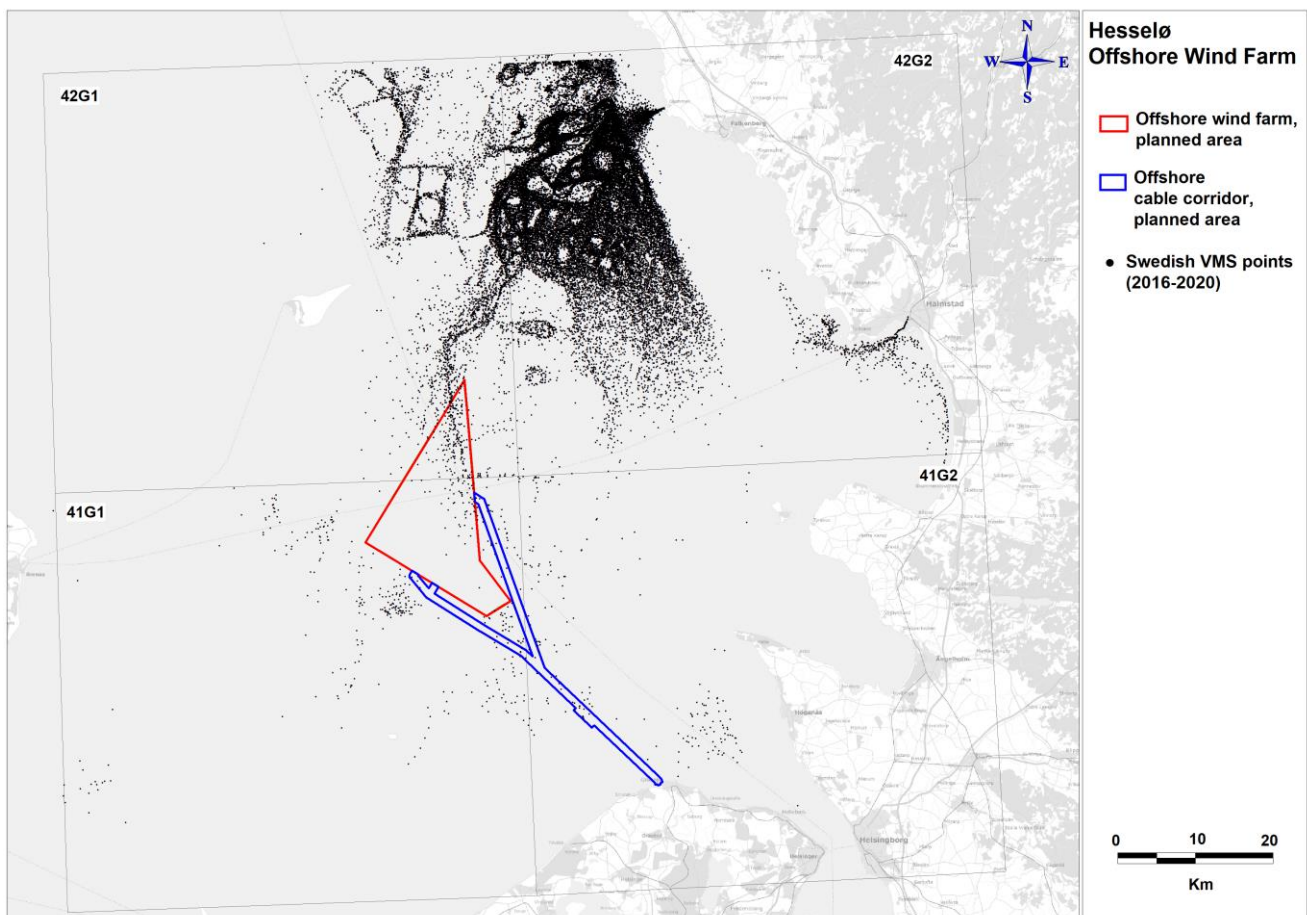


Figure 5.14: The distribution of the Swedish fisheries (all gear types) in the 4 ICES rectangles (42G1, 42G2, 41G1 and 41G2) in the southern Kattegat and in relation to the planning area for Hesselø OWF and ECC. Data derived from VMS data over a 5 year period (2016-2020). Data from the Swedish Fisheries Agency (Havs- og Vattenmyndigheten, 2020).

### 5.6.1 Swedish fleet statistics

In the western offshore ICES rectangles 42G1 and 41G1, the Swedish fishing fleet is primarily made up of trawlers (primarily bottom trawlers), while in ICES 42G2 the Swedish fleet is made up of vessels that use a number of different gear types (Figure 5.15). In contrast, in the fishing area ICES 41G2 which is just north of The Sound and fishing vessels using gillnets are most numerous (Figure 5.15). This is not reflected in the distribution of the fisheries depicted by the VMS data in ICES 41G2, as the majority of these vessels are less than 12 meters in length and thus are not represented by VMS data.

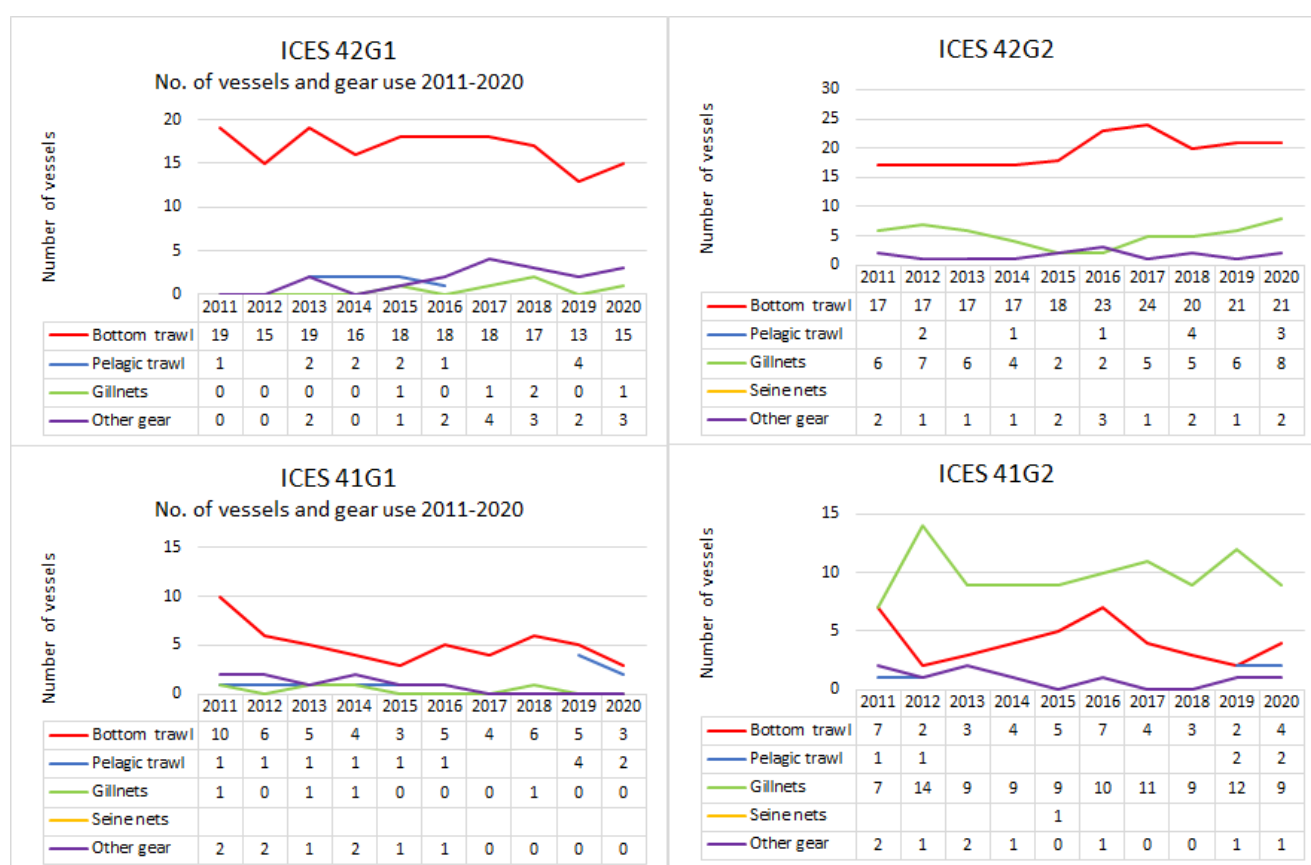


Figure 5.15: The development of the number of Swedish fishing vessels that recorded landings in the ICES rectangles 42G1, 41G1 and 41G2 according to their primary gear use (bottom trawl, pelagic trawl, gillnets, seine nets and other gear (pots, fyke nets, pound nets and hook and lines) from 2011-2020. Data from the Swedish Fisheries Agency (Havs- og Vattenmyndigheten, 2020).

The majority of the number of Swedish vessels using trawls (bottom and pelagic) in the offshore ICES rectangles 42G1 and 41G1 is also reflected by the vast majority of the landings (between 75-847 tons in ICES 42G1 and between 34-462 tons in ICES 41G1 in the period 2011-2020) were registered by bottom and pelagic trawlers in these areas (Figure 5.16).

### 5.6.2 Swedish landings statistics

The amount (tons) of the landings from each of the ICES rectangles according to the primary gear are shown in Figure 5.4Figure 5.16. The trends of the landings over the 10-year period (2011-2020) show the overall importance of trawlers (bottom and pelagic) to the fisheries by weight in all three ICES fishery areas (42G1, 42G2 and 41G1). In contrast, the gillnets fisheries are more predominant in ICES 41G2.

From 2011-2012 the landings (by weight) of the most important species landed by Swedish bottom trawlers were the shellfish Norway lobster (primarily in ICES 42G2) and the commercial species greater weever (primarily ICES 42G1). The importance of these commercial species was followed by a variety of flatfish species (plaice, brill, sole flounder etc.) and codfish (Atlantic cod, haddock and whiting) either targeted or caught as bycatch (Figure 5.16).

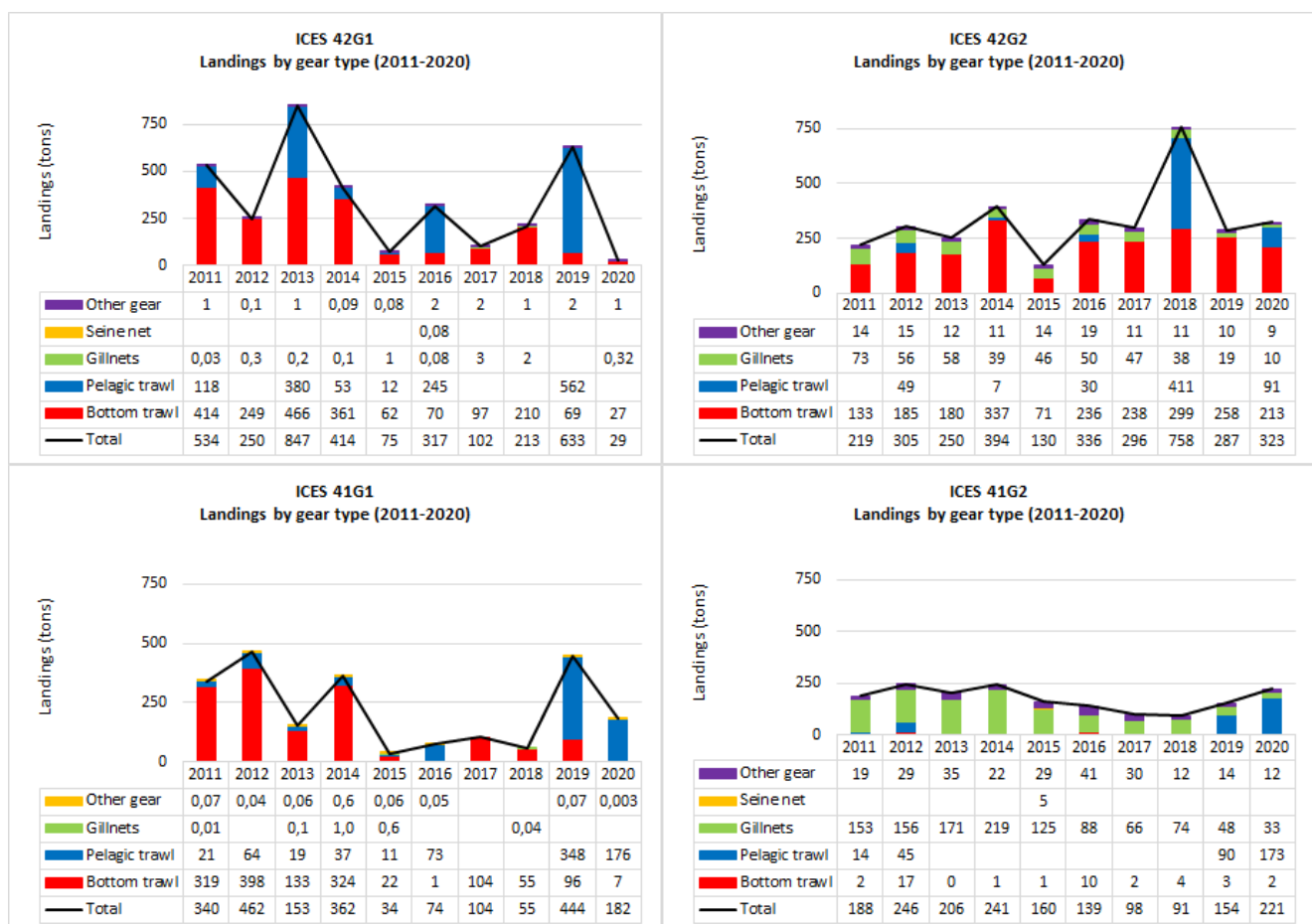


Figure 5.16: The development of the Swedish landings in relation to the main gear types over a 10 year period (2011-2020) in all 4 ICES rectangles (ICES 42G1, 42G2, 41G1 and 42G1) that are in the local and regional area of the Hesselø OWF planned project area. Data from the Swedish Fisheries Agency (Havs- og Vattenmyndigheten, 2020).

For pelagic trawlers, catches of the pelagic species herring and occasionally sprat dominated the landings in all 4 ICES rectangles. The landings statistics in the gillnet fisheries, primarily undertaken in the ICES rectangles that included the Swedish coastal areas (ICES 42G2 and ICES 41G2) indicated these fisheries targeted and caught a wide variety of different economically important commercial species dominated by flatfish species (sole, plaice, brill, turbot, lemon sole), cod and salmon in ICES 41G2, and lumpsucker in both ICES areas (Table 5.7). Landings by “other gear” (predominantly pound nets, fyke nets and crab pots) in ICES 42G2 and 41G2 were dominated by eel and the edible crab (Table 5.7).

Table 5.7: Total landings (tons) and value of landings (DKK) of commercial species according to gear type in the Swedish fisheries in ICES 42G1, 41G1 and 41G2 during the 10-year period 2011-2020. Data from the Swedish Fisheries Agency (Havs- og Vattenmyndigheten, 2020).

42G1 - Total landings (tons) of species by gear type (2011-2020)						42G2 - Total landings (tons) of species by gear type (2011-2020)					
Species	Bottom trawl	Pelagic trawl	Gillnets	Seine nets	Other gear	Species	Bottom trawl	Pelagic trawl	Gillnets	Seine nets	Other gear
Greater Weever	1462	1,4	0,0		3,1	Norway lobster	1.260	0,1			44,9
Herring	120,2	996				Herring	1,4	566	14		
Sprat	32,0	370				Greater Weever	436	0,03	0,2		
Norway lobster	156,5				0,7	Plaice	218	0,01	98		0,1
Plaice	93,7	0,001	1,0			Sole	21		125		0,0
Cod	76,2	0,02	2,3		1,3	Cod	101	0,01	24		1,9
Whiting	14,9	2,7	0,1			Edible crab	0,8		28		64
Brill	14,7		0,2			Brill	43,4	0,003	30		
Haddock	13,5		0,2			Turbot	8,4		46		0,02
Sole	8,7		0,03			Lumpsucker	0,003		39		
Flounder	6,7					Haddock	27,8		0,001		
Saithe	2,4		1,2		1,3	Flounder	2,3		20,3		0,1
Witch	4,1		0,04			Sprat	0,0	22,0			
Anchovy	4,0	0,01				Witch	10,0	0,01	0,5		
Grey Gurnard	2,8	0,01	0,02			European lobster			0,001		7,0
Mackerel	0,1	0,002	0,2	0,1	2,2	Lemon Sole	5,8	0,004	0,8		
Lemon Sole	2,5		0,02			Dab	0,5		5,3		0,3
Turbot	2,2		0,2			Whiting	5,9		0,01		
Pollack	1,0		0,8		0,0	Mackerel	0,1	0,1	2,6		3,1
Dab	1,6					Grey Gurnard	3,0	0,01	0,3		
Horse Mackerel	1,2					Salmon					2,5
Unspecified	4,2	0,0	0,7		1,1	Unspecified	4,3	0,02	2,7		2,4
<b>Total</b>	<b>2.026</b>	<b>1.370</b>	<b>7,0</b>	<b>0,1</b>	<b>9,8</b>	<b>Total</b>	<b>2.149</b>	<b>588</b>	<b>435</b>		<b>126</b>



41G1 - Total landings (tons) of species by gear type (2011-2020)						41G2 - Total landings (tons) of species by gear type (2011-2020)					
Species	Bottom trawl	Pelagic trawl	Gillnets	Seine nets	Other gear	Species	Bottom trawl	Pelagic trawl	Gillnets	Seine net	Other gear
Greater Weever	1.324	0,1				Herring	0,03	282	174	4,8	
Herring	57	617	0,1			Cod	8,6	0,01	445		1,2
Sprat	35	131				Eel, Silver Eel					2.013
Norway lobster	16				0,9	Lumpsucker	0,006		182		
Cod	11	0,002	0,1		0,02	Plaice	5,7		91,9		
Plaice	8,7					Sole	0,6		52,0		0,1
Sole	1,7		0,03			Sprat	0,003	41,0	0,003		
Flounder	1,6					Salmon			39,6		
Haddock	1,3					Flounder	0,8		36,6		0,04
Grey Gurnard	1,0	0,003				Turbot	0,03		36,8		
Mackerel			0,9		0,04	Norway lobster	6,9				22,8
Brill	0,8					Mackerel		0,02	25,3		0,7
Dab	0,7	0,01				Greater Weever	16,6	0,02			
Saithe	0,1		0,5			Dab	0,3	0,002	16,1		
Turbot	0,1		0,001			Lemon Sole	0,02		13,9		
Whiting	0,1	0,02				Brill	0,6		7,5		0,001
Unspecified	0,2	0,01	0,01		0,02	Unspecified	0,5	0,003	12,7	0,1	4,6
<b>Total</b>	<b>1.459</b>	<b>749</b>	<b>1,7</b>		<b>1,0</b>	<b>Total</b>	<b>41</b>	<b>323</b>	<b>1.133</b>	<b>4,9</b>	<b>243</b>

The seasonal distribution of the Swedish landings of the most important commercial species by weight (tons) varied considerably over the year in each of the ICES rectangles (Figure 5.17). In general, the total landings in all the ICES rectangles occurred in the first part of the year (January-March/April) and again in September-October. The large landings in ICES 42G1, 42G2 and 41G1 during this time were generally attributed to the large landings of herring, sprat and greater weever. In ICES 42G1, the peak in landings in the early part of the year was also attributed to large landings of cod, while landings of silver eel in the autumn period contributed strongly to the overall peak in landings during this time. In contrast, landings of the economically important Norway lobster primarily registered in ICES 42G1 and 42G2 were greatest during the summer and early autumn months (May-September) (Figure 5.17).

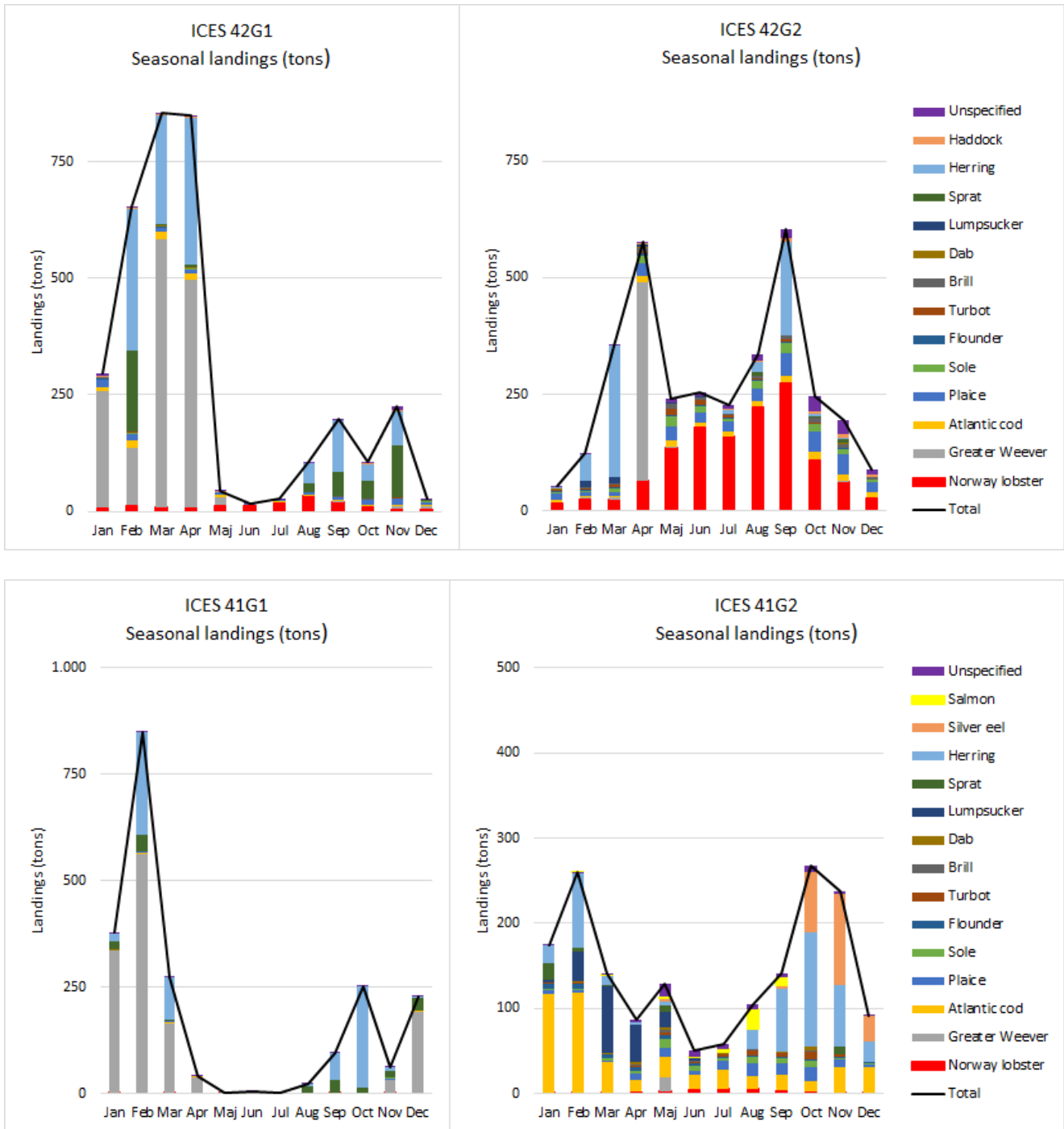


Figure 5.17: Monthly landings (tons) of the most important commercial species in the ICES rectangles 42G1, 42G2, 41G1 and 41G2. Data derived from logbooks for the period 2011-2020. (Data from the Danish Fisheries Agency, 2021). Data from the Swedish Fisheries Agency (Havs- og Vattenmyndigheten, 2020)

## 6 Estimating the importance of the planning area for Hesselø OWF for the commercial fisheries

The importance of the planning area for Hesselø OWF and export cable corridor (ECC) to different commercial fisheries and the fisheries' sensitivity to potential impacts due to offshore wind farm development can be determined by referring to baseline information, which includes maps derived from VMS data showing the distribution of the different fisheries according to primary gear types (bottom trawls, pelagic trawls, gillnets, seine nets and other gear) and official fishery data indicating the magnitude of the commercial fisheries in the region according to the primary gear types and the importance of specific commercial species. This information is supported by supplemental information from interviews with local fishermen.

More specifically, the importance of the planning area for Hesselø OWF and ECC according to different fishing methods based on each of the primary gear types (bottom trawls, pelagic trawls, gillnets, seine nets and other gear) can be illustrated by using VMS maps showing the distribution of the fisheries (Figure 5.7-Figure 5.13) and the number of VMS points indicating fishing vessel activity as a proxy for fishery activity within the planning area for Hesselø OWF and ECC in comparison to the two primary ICES fishery areas (ICES 42G1 and 41G1) that contain the majority of the planning area (Figure 6.1). This information can be supplemented by using an area-based comparison of the percentage of VMS points within the planning area and the percentage of VMS points in the entire ICES rectangles and finally, the importance of the Hesselø OWF plan area for the trawl fisheries can be illustrated by the percentage of fishing vessels, based on VMS data, that have actively fished in the planning area over the past 10 years (2011-2020). In the following these factors will be presented for the primary gear types representing the different fishing methods.

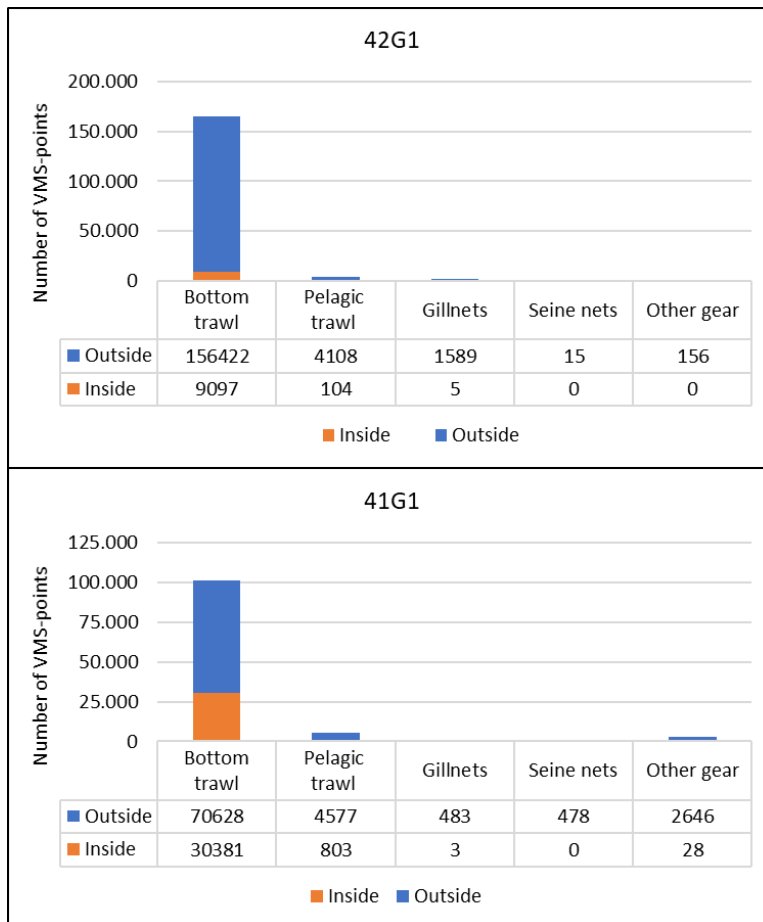


Figure 6.1: The number of VMS points indicating commercial vessels actively fishing in the two ICES rectangles (42G1 and 41G1) that contain the majority of the planning area for Hesselø OWF and ECC. VMS points are distributed for each primary gear type (bottom trawl, pelagic trawl, gillnets, seine nets and "other gear" and inside and outside the planning area.

## 6.1 Bottom trawls

Maps showing the distribution of the bottom trawl fisheries derived from VMS data indicate an intense bottom trawl fishery is consistently undertaken in a large majority of the planning area for Hesselø OWF and ECC including its regional area over the last 10 years (2011-2020)(see Figure 5.7). Under assumptions that catch-per-unit effort is the same for each VMS point, the relative importance of the planning area for Hesselø OWF for the bottom trawl fisheries can be determined by using an area-based comparison of the number of VMS points representing bottom trawlers within the plan area and the entire ICES rectangle (Figure 6.1). In both ICES rectangles 42G1 and 41G1, calculations indicate the planning area for Hesselø OWF is of relatively large importance to the bottom trawl fisheries based on that 5.5 % and 30.1 % of the total effort (measured as the number of VMS points) by bottom trawlers in ICES 42G1 and ICES 41G1 are undertaken within the plan area in comparison to the plan area only makes up 1.8 % of the ICES rectangle 42G1 area and 6.7 % of ICES rectangle 41G1 area.

Furthermore, according to VMS data, an average of 75 % of the 50 to 64 bottom trawlers that have been actively fishing in the ICES 42G1 rectangle in the ten year period 2011-2020, have been fishing where the planning area for Hesselø OWF is located. Similarly, an average of 80 % of the 34 to 56 VMS registered bottom trawlers that have been

fishing in the ICES 41G1 rectangle every year, have been actively fishing in the planning area for Hesselø OWF and ECC are located.

The most economically important fishery for bottom trawlers throughout this region of the Kattegat and particularly in all three ICES rectangles (42G1, 41G1 and 41G2) that include the entire planning area for Hesselø OWF and ECC is the Norway lobster. This commercial species is strongly associated with soft bottom habitats and is thus limited to the soft bottoms found along a broad corridor running through the planning area for Hesselø OWF and much of the ECC, while the areas to the east and west of the planning area and main bottom trawling corridor is made up of mixed and hard bottom habitats where bottom trawling isn't undertaken due to potential damage to bottom trawling on hard bottoms. This further increases the importance of the planning area for the Hesselø OWF and much of the ECC for bottom trawlers, as it is not possible for bottom trawlers to use the hard bottom areas adjacent the planning area as alternative fishing areas. Furthermore, if bottom trawlers extend their fisheries into other regional soft bottom areas due to restrictions to bottom trawling in the planning area for Hesselø and the ECC, then this will potentially increase the fishery pressure in the alternative soft bottom habitats preferred by economically important Norway lobster, as potentially more vessels will exert a greater effort on the remaining fishing areas leading to potential reductions in the available resource and landings as a result.

## **6.2 Pelagic trawls**

Maps of the distribution of the pelagic trawl fisheries show that this type of fishery is undertaken throughout the central and southern part of the Kattegat, including the planning area for Hesselø OWF and in much of the ECC (Figure 5.9). The relative importance of the planning area for the pelagic trawl fisheries using the area-based comparison of the number of VMS points representing effort by pelagic trawlers (see Figure 6.1), showed that 2,5 % and 14,9 % of the pelagic trawl effort undertaken in ICES 42G1 and ICES 41G1 respectively, was undertaken within the planning area for Hesselø and ECC, thus indicating that a slightly greater percentage of the fishing effort by pelagic trawlers is undertaken in the planning area for Hesselø OWF and ECC than in the rest of the ICES rectangles.

The importance of the planning area of Hesselø OWF for the pelagic trawlers is also illustrated by approximately 56-60% of the 7 to 14 pelagic trawlers that annually fish in the in the ICES rectangles 42G1 and 41G1 have fished in the planning area for Hesselø OWF and ECC in these rectangles over the ten year period from 2011-2020.

## **6.3 Gillnet fisheries**

Results from VMS data indicate that the gill net fishery from vessels equal to or larger than 12 meters primarily undertake their fisheries just east and outside the northern part of the planning area for Hesselø OWF and along the coast primarily to the east and west of the ECC into land. According to interviews (section 5.4) with local gillnet fishermen the prominent gillnet fishery undertaken further from the coast and just east of the planning area for Hesselø OWF (see Figure 5.11) was only undertaken in earlier years, and has over the last 3-5 years more or less ceased.

In the most recent years, the limited gillnet fishery, undertaken by only a few local fishing vessels and several part-time fishing vessels, occurs predominantly along the coast and only sporadically in the inner sections of the planning area for the Hesselø OWF and ECC, with the greatest majority of their fishery being undertaken within 6-7 kilometers of the coastline and in water depths less than 20 meters. Thus the importance of the planning area for Hesselø OWF and ECC to the gillnet fisheries is considered low.

#### **6.4 Seine net fisheries**

VMS data over the last 10-year period (2011-2020) indicates that there has been very little seine fisheries in the Kattegat and none registered in the planning area for Hesselø OWF and ECC (see Figure 5.12). The very low intensity of this fishery over the last 10 years was also supported by local fishermen during interviews, thus indicating that this planning area for Hesselø OWF and ECC has no importance to this fishery.

#### **6.5 Other gear (fyke nets, hook and lines and conical pots etc.)**

According to VMS data, the distribution of the local fisheries with other gear, was almost exclusively in an area near the coast, south and west of the planning area for the Hesselø OWF and ECC (Figure 5.13). In general, the fisheries with these different types of passive gear (fyke nets, hook and lines and conical pots) along the coast has been sporadic and decreasing and is generally undertaken by part-time and retired fishermen. Although, the fisheries with "other gear" are undertaken with relatively small vessels that are often less than 12 meters and not entirely represented in the VMS maps, supplemental information from interviews with fishermen support the general trends in distribution displayed by the VMS map indicating that the planning area for Hesselø OWF and ECC are not important to these fisheries.

#### **6.6 Importance of the planning area for Hesselø OWF to the local fishery port of Gilleleje**

The port of Gilleleje is the most important port in the southern part of Kattegat for landing the catches by the different fisheries in this region. This is illustrated by landings in the port of Gilleleje over the past 10 years (2011-2020), which have averaged 917 tons (78% of the total catches by weight) from ICES 41G2 and averaged 653 tons (27 % of the total catches by weight) from ICES 41G1, which are the fishing areas where the planning area for Hesselø OWF and ECC are located within. Furthermore, the fishing vessels that have their home ports in Gilleleje have accounted for 31 % of the total catches in ICES 41G1 and 75 % of the total catches from ICES 41G2. Thus, the commercial fisheries undertaken in this region of the Kattegat, including the planning area for Hesselø OWF and ECC, is very important to this port.

#### **6.7 Sensitivity of the commercial fisheries**

The sensitivity of the commercial fisheries according to primary gear types to the establishment of the Hesselø OWF and ECC is different for each gear component depending on the importance of the planning area for the Hesselø OWF and ECC to the fisheries, the distribution of its resource (targeted commercial species), the mobility of the individual fishery in relation to a pressure or restriction, and the availability of alternative fishing areas to the fishery component. Thus, loss of fishing areas or the ability to undertake fisheries due to areas being subjected to regulations forbidding commercial fisheries can be of considerable magnitude depending on the spatial and temporal extent of restrictions to the individual commercial fisheries.

Bottom trawling is consistently and largely limited to being undertaken in much of the planning area for Hesselø OWF and ECC because this fishery primarily targets the economically important Norway lobster found in the soft bottom habitats that make up the majority of the planning area. Furthermore, there are very few local alternative fishing areas. Thus, the bottom trawl fishery will be highly sensitive to loss or restrictions to this fishery in the planning area for Hesselø OWF and ECC.

Although the relative distribution of effort of the pelagic trawl fishery is slightly higher in the planning area for the Hesselø OWF and ECC, the sensitivity of this fishery to losing fishing grounds due to restrictions or other hindrances is considered low, as the general overall effort of this fishery is located in the regional area outside the planning area for Hesselø OWF and because their primary target species (sprat and herring) are pelagic and mobile and thus can be targeted in a number of alternative fishing areas.



The sensitivity of the gillnet fisheries to potentially being restricted from fishing areas in the planning area for the Hesselø OWF and ECC is considered to be low, as this fishery is only undertaken in the planning area and ECC with a very low effort, and because this fishery is mobile and utilizes other alternative fishing areas along the entire coast, east and west of the planning area including the ECC.

There has been no seine net fishing registered in the planning area for the Hesselø OWF and ECC during the most recent ten year period (2011-2020) and thus, this fishery is not sensitive to the pressures from establishing the Hesselø OWF and export cables.

The sensitivity of the fisheries with other gear in the planning area for the Hesselø OWF and ECC is considered to be low, as the importance of the planning area for Hesselø and ECC is very low due to the distribution and effort of these fisheries are almost exclusively outside the planning area and ECC. Furthermore, this fishery is generally very variable and primarily undertaken by a few part-time and retired fishermen, which can utilize a number of alternative areas along the coast, east and west of the planning area.

## **6.8 Conclusion**

In conclusion, the planning area for Hesselø OWF and ECC is very important to the most economically important bottom trawl fisheries in this part of the Kattegat, which are highly dependent on the economically important Norway lobster found throughout the planning area and outer ECC, and for which there are very few local alternative fishing areas. The planning area for Hesselø OWF and ECC is only marginally important to the pelagic trawl fisheries, as the effort of this fishery in the planning area and ECC is only slightly higher than in the surrounding areas, and because this fishery has a number of alternative fishing areas where they can catch their primary target species (sprat and herring). The planning area for Hesselø OWF and ECC and is of low importance to the gillnet fisheries and fisheries using other gear (fyke nets, hook and lines and conical pots) because of the low effort of these fisheries within the planning area and ECC and the availability of alternative fishing areas. No seine net fishery is undertaken in or near the planning area for Hesselø OWF and ECC and thus the planning area is not important to this fishery.

The commercial fisheries undertaken in this region of the Kattegat, including the planning area for Hesselø OWF and ECC, is very important to the port of Gilleleje, as this port receives a very large part of the landings from the local and regional area including much of the planned area for the Hesselø OWF and ECC, and the port of Gilleleje is the home port for many of the commercial fishing vessels that undertake their fisheries in the local and regional area and are thus dependent on the availability of the fishing areas in the region.

## 7 References

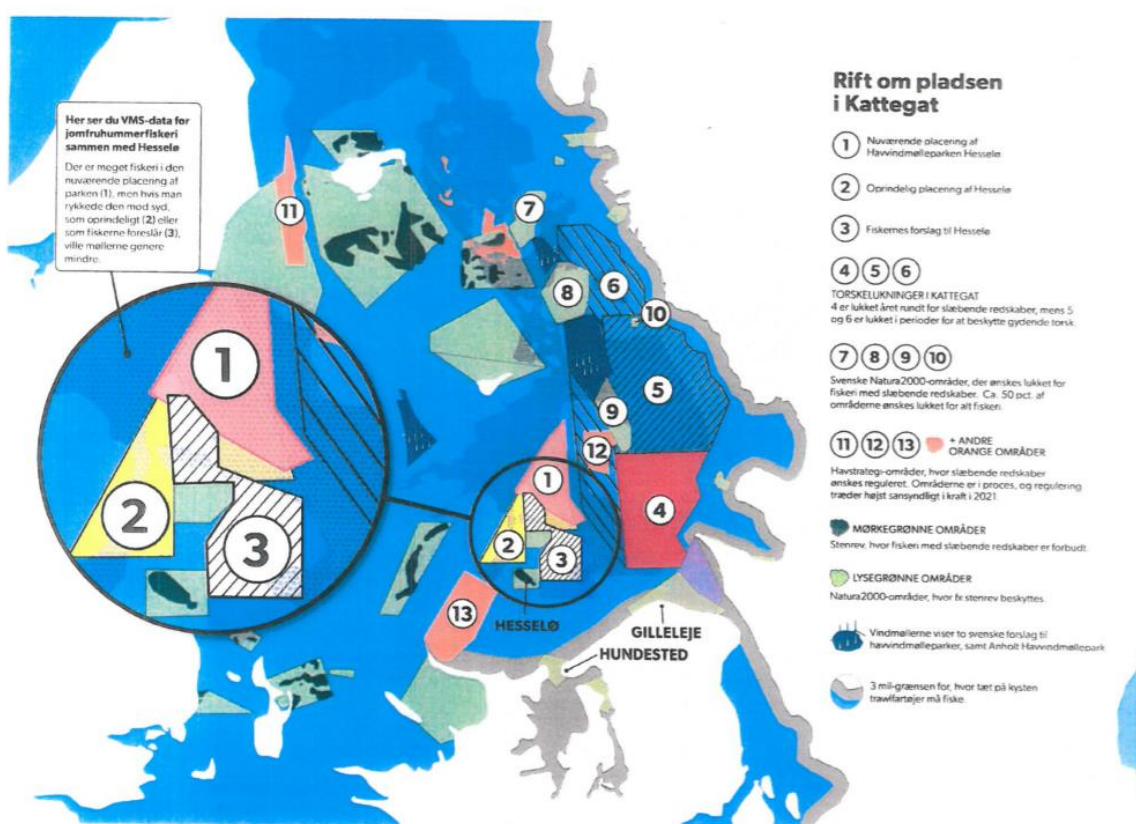
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## 8 Appendix

### 8.1 Minutes of meeting (MoM/referat) of interviews with fishermen – Hesselø OWF (in Danish)

REFERAT – 15 juni 2021: Interviews af fiskere i Gilleleje den 27. maj 2021 om Hesselø Havvindmøllepark

Der er gennemført interviews af 6 fiskere i Gilleleje (en af disse er hjemmehørende på Bornholm) – 2 af disse repræsenterer trawlfiskeri med mindre fartøjer (<12m), 1 repræsenterer garnfiskeriet, de øvrige 3 repræsenterer fartøjer >12m/auktionen/fiskeriforeningen. Der er efterfølgende indhentet supplerende oplysninger fra fiskerne. Indledningsvis udtrykte alle stor utilfredshed med placeringen af den planlagte vindmøllepark og af kabelforbindelsen til land. Fiskerne i den sydlige del af Kattegat føler sig i forvejen stærkt pressede af de mange begrænsninger af fiskeriet i form af redskabsrestriktioner og adgangsbegrænsninger i forbindelse med naturbeskyttelse og vindmølleparker (se nedenstående kort udarbejdet af Danmarks Fiskeriforening).



Kort over områder med gældende eller planlagte restriktioner overfor erhvervsfiskeriet i Kattegat (udarbejdet af Danmarks Fiskeriforening).

#### Fiskeriet fra Gilleleje

I Gilleleje er der i alt 12-14 hjemmehørende trawlere, heraf er de 8 større end 12 meter. Hertil kommer 25-30 trawlere fra andre egne af landet, eksempelvis fra Hv. Sande, Bornholm, Grenå, Bogense, Kerteminde m.fl., samt 3 fra Tyskland, som i perioder fisker ud fra Gilleleje. Trawlfartøjer dominerer i havnen men der er dog fortsat et antal små/mindre

garn fartøjer (en mands-) som dog kun repræsenterer en begrænset fiskeriindsats/fangst, alle med en længde under 10 m. Kun en enkelt af de hjemmehørende fartøjer er fuldtids-garnfisker, hertil komme 2 andre erhvervs-garnfiskere som ofte har Gilleleje som udgangspunkt (1 fra Hundested, 1 fra Sletten). De øvrige garnfartøjer i Gilleleje ejes af bierhvervsfiskere eller tilhører fiskere som primært er forhyret på trawlfartøjer, men som i "fritiden" fisker med garn. Det eneste større garnfartøj er netop lagt om til fiskeri med trawl.

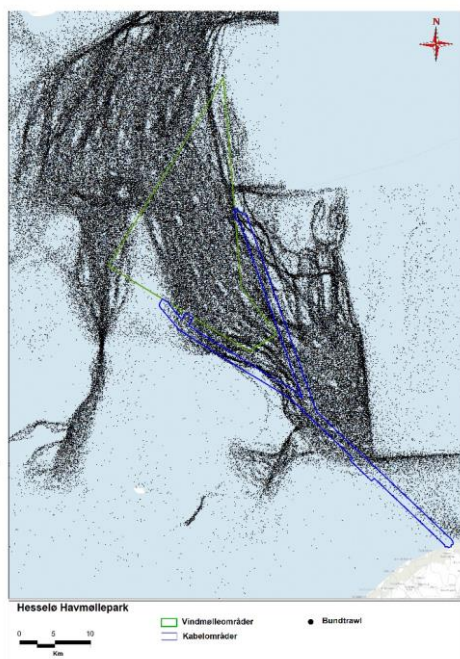
De tyske trawlfartøjer som lander i Gilleleje fisker primært jomfruhummer i den danske del af den såkaldte "Torskekasse" øst for mølleområdet, som svenske og danske fiskere er udelukket fra.

### Fiskeriet i og omkring mølleparken og kablerne

Det vigtigste fiskeri i mølleområdet og i farvandet heromkring er fiskeri med bundtrawl efter jomfruhummer (nu ca. 80% af landingsværdien på auktionen i Gilleleje). Tidligere var også fiskeriet med bundtrawl efter fisk, især tunge og torsk, af stor betydning men torskefiskeriet har efter 2018 været stærkt reduceret – den negative udvikling i fiskebestandene tilskrives af fiskerne de ekstraordinært høje temperaturer i 2018.

Fiskeriet efter jomfruhummer foregår i varierende omfang igennem hele året. Der fiskes overvejende om natten fra solnedgang til solopgang, på dybt vand dog også i dagtimerne (- undertiden i den nordligste, dybere del af møllepark-området). Fiskeriet gennemføres med de korteste slæb om sommeren (3-4 timer), og med de længste om vinteren (7-8 timer). Hvert slæb har derfor en længde på 18-45 km, og kan således ofte have en længde på mere end længden af hele den planlagte møllepark. Fiskeriet foregår som regel SØ-NV men kan også i den sydlige del foregå Ø-V. Det meste af jomfruhummerfiskeriet fra Gilleleje foregår i efterårs- og vinterperioden (til sidst i marts) i "møllestrøget".

Hummerfiskeriet gennemføres af fartøjer over og under 12 meter – kortlægningen ved brug af VMS-registreringer er således ikke fuldstændig (se kort neden for). De mindre fartøjer fisker i samme områder som de større fartøjer men er dog mere koncentreret i den sydlige del af "hummerstrøget"/mølleparken og kabelområdet.



### VMS-registreringer 2011-2020 fra fartøjer (> 12 meter efter 2012)

#### Trawlfiskeriet

På de mindre fartøjer er der kun en mand ombord mens de større er bemandede med 1-3 mand. De større fartøjer anvender naturligvis større redskaber end de mindre. De fleste større fartøjer fisker med 2 trawl som spiles af 2 skovle med en størrelse på 63-66 tommer (målt diagonalt) – se foto 1, i midten mellem de 2 trawl er der monteret en såkaldt "klump", bestående af kæder se foto 2. Afstanden mellem skovlene under fiskeri er 80-90 meter. De mindre fartøjer fisker kun med et trawl og med trawlskovle på 40-50 tommer med en indbyrdes afstand under fiskeri på 40-50 meter. På underlinet er der monteret ruller af gummi (oftest ca. 10 cm i diameter), se foto 3, som sikrer at trawlet kører let hen over bunden. Når der fiskes efter konsumfisk anvendes der de samme trawlskovle som til hummerfiskeriet, men andre trawltyper (højere).



Foto 1. Trawlskovl, 65 tommer



Foto 2. "Klump" af kæde





*Foto 3. Underlig, gummirub med ruller*

Traditionelt har der fra Gilleleje været et betydeligt fiskeri efter sild men dette er i de seneste år næsten elimineret ved bortsalg af kvoter, så der nu kun er 3 trawlere med mindre sildekvoter tilbage. Kvoterne fiskes i vestlige Østersø.

#### Garnfiskeriet

Gilleleje: Kun 1 fuldtids garnfartøj i Gilleleje / 2 deltids garnfisker som er trawlfiskere men bruge garn i "fritiden") (<10 meter) / Hundested: Kun en enkelt egentlige erhvevs-garnfisker tilbage, samt 2 bierhvervsfiskere

Fiskeriet med garn har været stærkt på retur igennem de senere år. I Gilleleje er der således nu kun et enkelt **garn** fartøj som anvendes til fuldtids erhvervsfiskeri med garn, hertil kommer 2 andre som bruges på deltids basis af trawlfiskere som i "fritiden" fisker med garn. – Alle er enmandsfartøjer mindre end 10 meter. Endelig er der et antal mindre aktive joller som anvendes af pensionister/mindre aktive bierhvervsfiskere.

#### Fiskerisæsoner:

Garn: medio januar- sept

Den primære fiskesæson for erhvervsfiskeriet med garn er medio januar til 1. oktober.

Primære fiskearter: er tunge, stenbider/kulso og diverse fladfish (pighvarre, slethvarre m.fl.). I vinterperioden fiskes der i Øresund. Fiskeområdet er overvejende inden for 4 sømil fra kysten og ud til 20-meter kurven. Tidligere tiders garnfiskeri længere fra kysten som blev gennemført af større garnfartøjer fra andre dele af landet er stort set ophørt. Dette fiskeri blev gennemført uden for det mølleområdet, blandt andet øst herfor på St. Middelgrund, se kort neden for. I Hundested er der, som Gilleleje kun en enkelt egentlige erhvevs-garnfisker tilbage, samt 2 bierhvervsfiskere.

I perioden hvor kablerne placeres i havbunden vil garnfiskeriet kunne generes som følge af adgangsrestriktioner og evt. også som følge af sedimentfaner der kan påvirke fiskenes adfærd.

#### Bekymring for konsekvenser for fiskeriet

Fiskerne i Gilleleje, og fiskere fra andre danske havne som benytter Gilleleje Havn som udgangspunkt, er af den opfattelse at gennemførelsen af Hesselø vindmølleprojektet, i sammenhæng med de øvrige lukkede områder i Kattegat, udgør en alvorlig trussel mod den fortsatte eksistens af den sidste større fiskerihavn på Sjælland (Gilleleje). Både auktionen og isværket forventes at måtte lukke som konsekvens heraf.

De lokale fiskere og Danmarks Fiskeriforening har holdt flere møder om sagen med både lokale politikere og med politikere fra Folketinget med henblik på at få ændret placeringen af møllepark og kabler.



Placeringen af Hesselø Vindmøllepark vil dels optage en stor del af et meget vigtigt fiskeområde for trawlfiskeriet efter jomfruhummer og vil reelt genere/umuliggøre et endnu større område end det møllerne optager. Det traditionelle fiskeområde vil blive delt i 2 af mølleparken, idet det ikke vil være muligt at passere området øst eller vest herfor med trawlet ude pga store forekomster af sten på begge sider. Fiskeriet kan således først påbegyndes, når området er passeret hvilket vil betyde en øget sejltid på op imod 2 timer, og dermed også en betydelig merudgift for fiskerne. Eftersom jomfruhummeren er knyttet til særlige havbundsforhold vil det forhold, at mølleparken optager et vigtigt hummerområde alt andet lige betyde at fiskeritrykket øges på de resterende områder med deraf følgende mulige negative konsekvenser for hummerbestanden, og dermed også for fiskeriudbyttet.

Forslag af 2 alternative placeringer for Hesselø

Fiskerne har tidligere foreslået 2 alternative placeringer af mølleparken – dels syd for og dels SV for den valgte placering af mølleparken. Fiskerne gav udtryk for, at de savnede en forklaring på hvorfor disse foreslåede placeringer ikke kan anvendes, eftersom de dels ligger nærmere kabel-ilandføringspunktet og dels ligger på lavere vanddybder (18-25 m) end den valgte placering (vanddybder 25-35 m). Det samme forhold gør sig gældende mht den valgte kabeltracé som vil forstyrre fiskeriet betydeligt, mens en af fiskerne anbefalet mere stik syd-gående placering af kablerne vil give minimale gener for fiskeriet. Fiskerne efterspørger helt konkret en forklaring fra de ansvarlige myndigheder/Cowi A/S som efter sigende er ansvarlige for udpegningen af områderne. Der er blandt fiskerne en udtalt frygt for, at der fra anlægsejerne vil komme krav om at der skal etableres forbud mod fiskeri med bundslæbende redskaber henover kablerne til land, jf kabelbekendtgørelsens bestemmelser herom. Af andre betæneligheder ved projektet blev der nævnt de observationer som fiskerne har gjort ved Anholt Mølleparken, hvor tusindvis af skarver anvender fundamenterne som hvilested, og hvor de negative konsekvenser af deres konsum af fisk – farvandet heromkring omtales som "tømt for fisk" reducerede fiskebestande. Endelig blev der udtrykt frygt for hvilke konsekvenser de mange kabler (elektromagnetisk stråling) vil kunne betyde for fiskenes adfærd/gydning i området.

I forbindelse med projektet gennemføres der undersøgelser af marsvinebestanden i farvandsområdet. Dette gøres ved udplacering af "lytteposter" som kan registrere marsvinenes lyde. Med henblik på at undgå konflikter med fiskeriet, primært med trawl, blev fiskerne anmodet om at udpege positioner hvor disse lytteposter kunne placeres uden at komme i konflikt med fiskeriet. Fiskerne fremsendte herefter 6 placeringsmuligheder til forskerne. Uden at informere fiskerne, og uden at forklare hvorfor de foreslåede positioner ikke kunne anvendes, valgte man imidlertid at placere lytteposterne på andre positioner – hvilket har haft det forventelige resultat, at alle lytteposter er blevet sejlet ned i forbindelse med sædvanlige fiskeriaktiviteter. – Fiskerne understreger, at dette ikke er gjort bevist, men alene skal ses som en følge af en uhensigtsmæssig placering og af en manglende information.