ENERGINET - MARINE ENVIRONMENTAL STUDIES

Kriegers Flak II North & South- fisheries report

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Applicable contract(s) governing the provision of this Report:

Objective:

The objective of this report is to provide baseline conditions on fishery activity in the Kriegers Flak II North and South offshore wind farm area in the western Baltic Sea.

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1 INTRODUCTION

In order to accelerate the expansion of Danish offshore wind production, it was decided with the agreement on the Finance Act for 2022 to offer an additional 2 GW of offshore wind for establishment before the end of 2030. In addition, the parties behind the Climate Agreement on Green Power and Heat 2022 of 25 June 2022 (hereinafter Climate Agreement 2022) decided), that areas that can accommodate an additional 4 GW of offshore wind must be offered for establishment before the end of 2030. Most recently, a political agreement was concluded on 30 May 2023, which establishes the framework for the Climate Agreement 2022 with the development of 9 GW of offshore wind, which potentially can be increased to 14 GW or more if the concession winners – i.e. the tenderers who will set up the offshore wind turbines – use the freedom included in the agreement to establish capacity in addition to the tendered minimum capacity of 1 GW per tendered area.

In order to enable the realization of the political agreements on significantly more energy production from offshore wind before the end of 2030, the Danish Energy Agency has drawn up a plan for the establishment of offshore wind farms in three areas in the North Sea, the Kattegat and the Baltic Sea respectively.

The area for Kriegers Flak II Offshore Wind Farm (OWF) consists of two sub-areas: North and South. The areas are located 25-50 km off the coast of South Zealand and Møn. Kriegers Flak II North is located approximately 15 km from the east coast of Møn, while Kriegers Flak II South is located approximately 30 km southeast of Møn. The area for the Kriegers Flak II OWF is approximately 175 km^2, divided into 99 km^2 for North and 76 km^2 for South. The Kriegers Flak II OWF will be connected to land via subsea cables making landfall close to Rødvig on South Zealand.

The objective of this baseline report is to present an overview of fishery activities in the offshore wind development area Kriegers Flak II North and South (Figure 1-1). This baseline study will contribute to a future project-specific environmental impact assessment (EIA) for the Kriegers Flak II North and South area, enabling offshore wind farm (OWF) developers to evaluate the project's potential impact on fisheries and plan for appropriate mitigation measures.

A scope study report on fish and fisheries activities in the planned Kriegers Flak II North and South area was previously conducted (DNV, 2023). This report concluded that there are no significant knowledge gaps in the area and that a combination of existing baseline data, interviews with local fishers, and data analysis would provide a comprehensive overview of the fishery activities in the area. These conclusions were presented to and agreed upon with the Danish Energy Agency in a meeting held in January 2024.

Fishery activities are generally conducted in regulated areas where catch rates are optimal in relation to sailing distance. Additionally, the distance to shore and landing ports partly determines the size of vessels fishing in relevant areas. Fisheries must also adapt to the distribution of target species, reduced stocks, and/or low availability of a given target species. The fishing industry is also subject to extensive regulations concerning gear type, access to fishing areas, fishing periods, quotas, etc. Conditions that reduce the profitability of fisheries in each area, such as access restrictions and tool restrictions, could potentially increase fishing pressure to an unfavourable level in other waters.

This report presents data compiled from publicly available sources and previous studies in the relevant area, commercial fishery statistics from ICES subdivision 24, and relevant harbours. Interviews with local fishers have provided supplemental information about the distribution and characteristics of different fisheries in the Kriegers Flak II North and South project area and its region.

1.1 Abbreviations

Abbreviation	Explanation
AIS	Automatic Identification Systems
CFP	European Union's Common Fisheries Policy
DMA	Danish Maritime Authority (Søfartsstyrelsen, SFS)
DPFO	Danmarks Fiskeriforening
EIA	Environmental Impact Assessment
GPS	Global Positioning System
GW	Giga watt
ICES	International Council for the Exploration of the Sea
Landfall	Is where the cable transfers from sea to land
MSP	Marine Spatial Plan
OWF	Offshore Wind Farm
VMS	Vessel Monitoring System

2 KRIEGERS FLAK II NORTH AND SOUTH

The planned Kriegers Flak II North and South OWF is located in the western Baltic Sea (Figure 2-1). Details on the OWF area size, water depths, and cable corridors are given in Table 2-1.

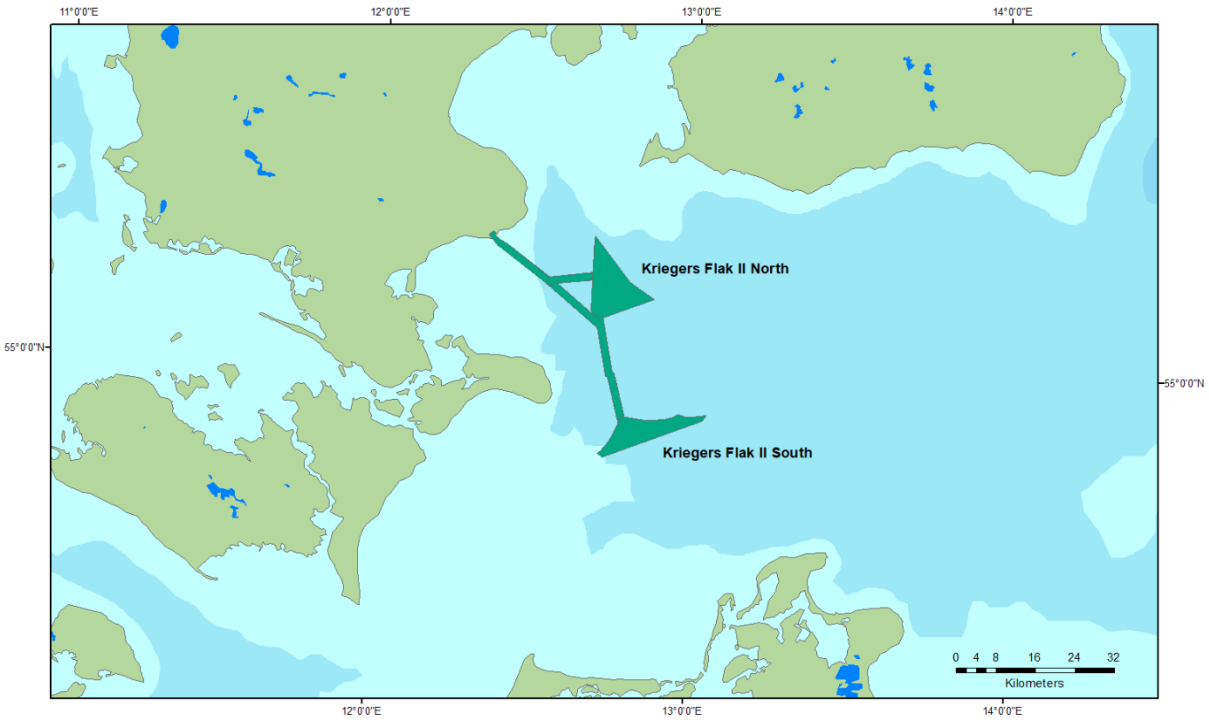


Figure 2-1. Kriegers Flak II North and South OWF area and export cable routes. Source: Energinet, 2023.

Table 2-1. Kriegers Flak II North and South OWF area and export cable routes. Source: Energinet, 2022.

Offshore wind farm	Area (km^2)	Water depths (m)	Export cable corridor	Shortest distance to shore (km)
Kriegers Flak II North	99	25-40	Southern part of Zealand	15
Kriegers Flak II South	76	10-50	Southern part of Zealand	15

2.1 Hydrography

In prehistoric times, the area where Kriegers Flak II North and South is planned was a freshwater lake. Consequently, the Baltic Sea is considered a geologically young water body with relatively low biodiversity. The salinity in the area is approximately 7-11 PSU at a depth of seven meters (NIRAS, 2015). High salinity currents and relatively dense water from the North Sea flow into the Kattegat through the Øresund and into the Baltic Sea, see Figure 2-2. Here, these water masses mix with brackish water, and the outflow of Baltic Sea water, characterized by low salinity, typically occurs as northwestern surface currents (COWI, 2021).

The depths in the planned KF OWF area range from 10-50 m (Table 1-1). The planned Kriegers Flak OWF area has a central position in the water exchange between the North Sea and the Baltic Sea (Figure 2-2). Heavy bottom currents through the Øresund generally flow north of Kriegers Flak but can, if strong enough, cover the entire area (NIRAS, 2015). Figure 2-2 and 2-3 shows the currents and average current velocity in the Baltic Sea and specifically for the Kriegers Flak OWF area.

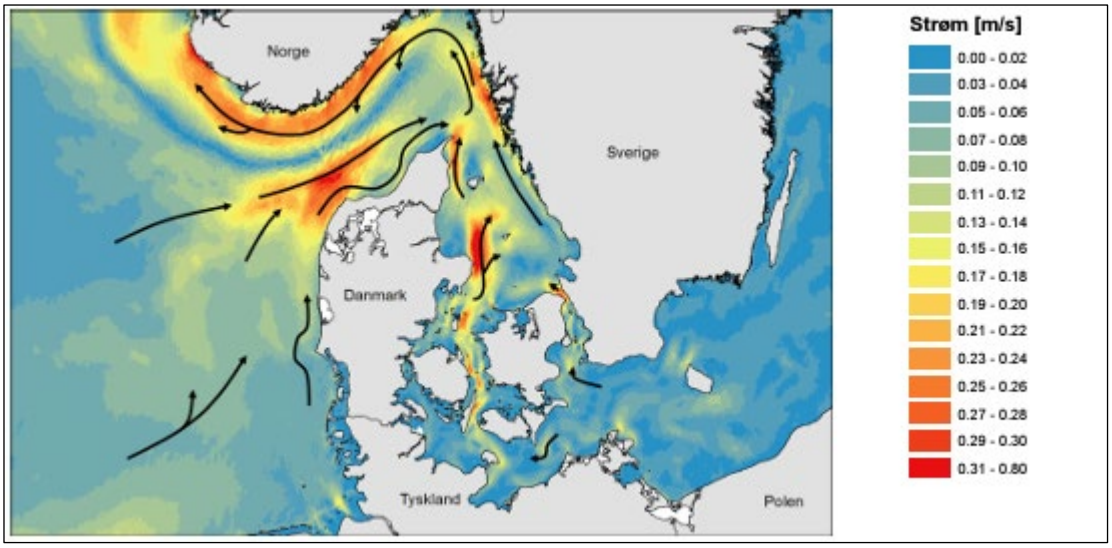


Figure 2-2. Average current speed, 2013 -2016. Source: DHI, 2017 in Miljø- og Fødevareministeriet, 2019.

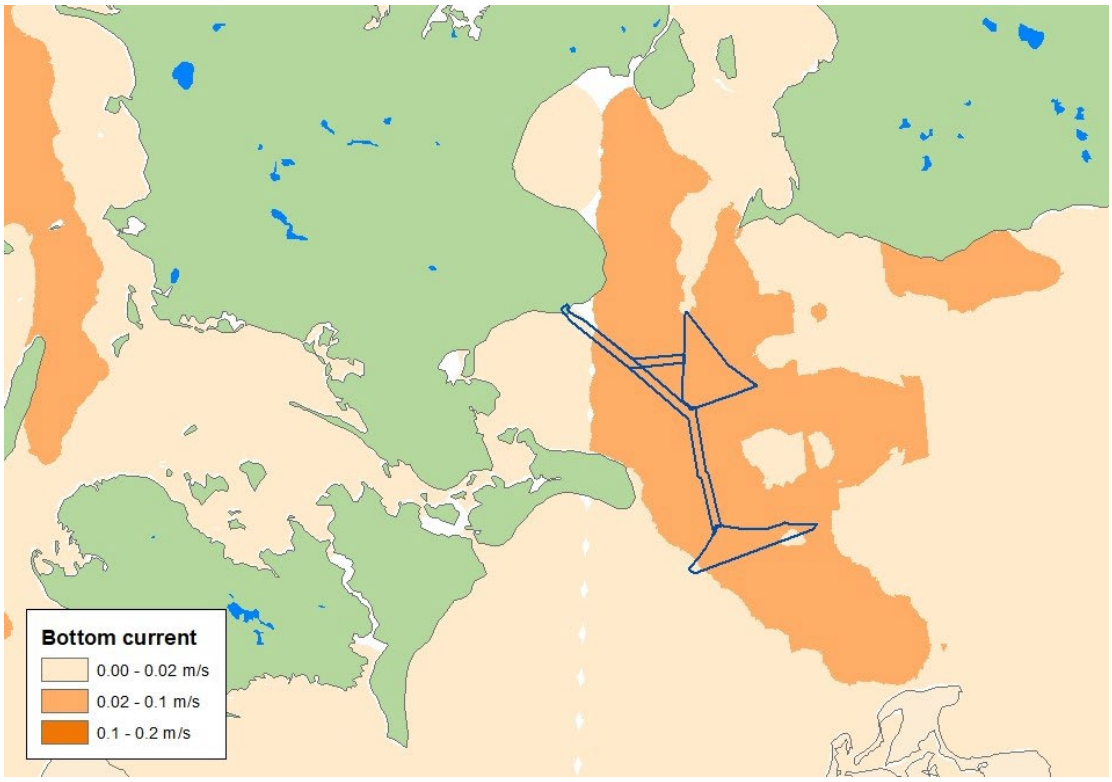


Figure 2-3. Annual mean bottom current velocity in the Kriegers Flak OWF area. Source: The Danish Spatial and Environmental Planning Agency, 2007.

2.2 Marine substrate

Large parts of the planned Kriegers Flak II North area are covered by muddy sand (Figure 2-4). In this region, as in the rest of the western Baltic Sea, there is typically a weak flow, allowing marine muddy sand to accumulate over the past 5000 years (Naturstyrelsen, 2014). A significant area in the western part of Kriegers Flak II North consists of till (a mixed sediment type of glacial origin, often covered by a thin layer of sand, gravel, boulders, and/or sandy mud washed out from

the till) / diamicton (containing particles ranging in size from clay to boulders). The hard bottom composed of moraine, rock bottom, and rock in the Kriegers Flak II North area is vital for specific fish species that inhabit hard substrates.

The eastern part of Kriegers Flak II South is covered by muddy sand, while the western and central parts are covered by sand (Figure 2-5). The export cable corridors will cross areas of till/diamicton, muddy sand, sand, gravel, and coarse sand. Closer to shore, near Faxe Bugt, the cable corridor will cross an area of sedimentary rock (Figures 2-3 and 2-4).

Flatfish are typically found on sandy bottoms, which are crucial for their ability to hide by covering themselves or burrowing. This is also important for sand eel, which burrow at night and during long periods in winter. Usually, a more varied seabed closer to the coast, like what is found in some parts of Kattegat, create a variety of habitats, often leading to high fish species diversity. For instance, common gobies (*Gobiidae* spp.), sand eel, and juvenile plaice and flounder are likely abundant in these mixed habitats (Muus & Nielsen, 1999 in NIRAS, 2022).

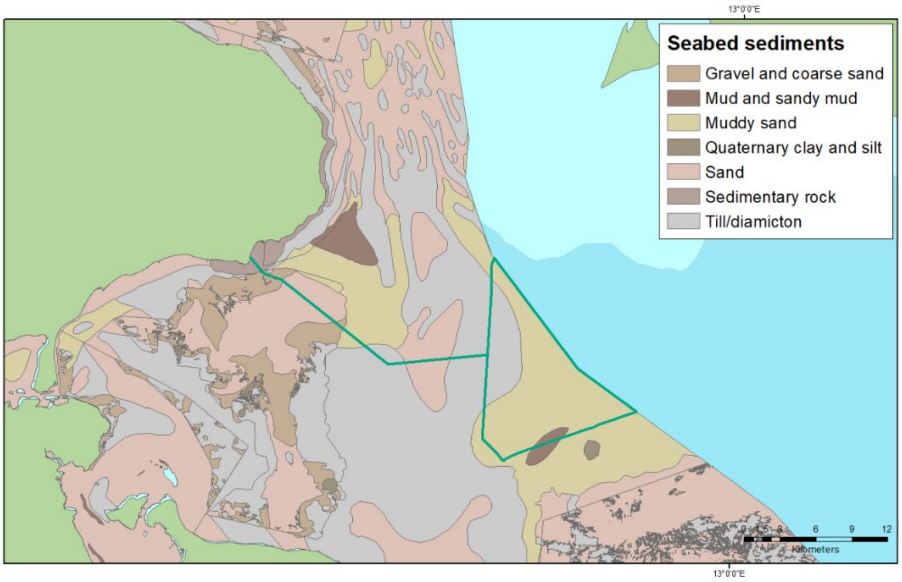


Figure 2-4. Seabed sediments in the Kriegers Flak II North OWF area, cable corridor and landfall. Source: GEUS, 2023.

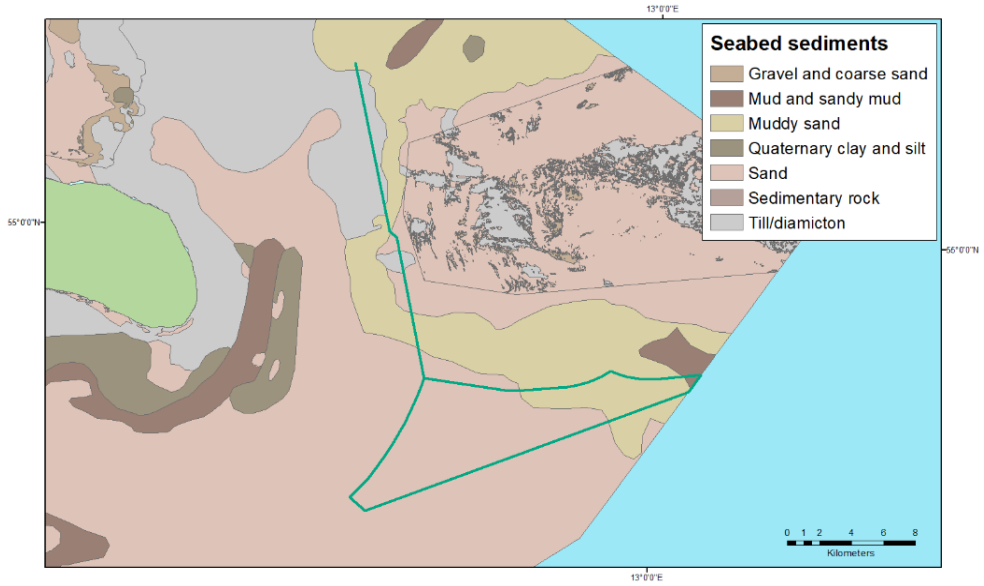


Figure 2-5. Seabed sediments in the Kriegers Flak II South OWF area and cable corridor. Source: GEUS, 2023.

3 DATA SOURCES

The characteristics of the fisheries are described using official fishery statistics obtained from Statistics Denmark and from interviews with several fishers who conduct their fisheries in and near the OWF area of Kriegers Flak II North and South. Detailed catch, landings, and vessel information have been obtained from Statistics Denmark. AIS and VMS data have been used to illustrate the fishing intensity in these areas.

The fisheries in the western part of the Baltic Sea are divided by international fishery zones where national and international fishery regulations, requirements, and quotas apply, and catch data is separated. These zones, ICES subdivision 24, are used to set boundaries on the regional fishing area of the Kriegers Flak II North and South project area and form the baseline data of the fisheries.

The Vessel Monitoring System (VMS) is a satellite-based global positioning system (GPS) used in commercial fishing to monitor the location of fishing vessels at sea. Since 2012, VMS monitoring has been applied to all vessels ≥12 m. By estimating the period of fishery activity according to vessel speed, this data can be used to indicate specific distributions of the fisheries according to gear. Because the VMS data only includes vessels ≥12 m, it is not possible to fully determine the distribution of smaller vessels and how often these may be fishing in the Kriegers Flak II North and South area. However, because the OWF area is a considerable distance offshore and the predominant fisheries are by trawlers, which are generally large, the VMS data were considered to represent the fisheries in the OWF area. Furthermore, the landings by vessels < 10 m can be assumed to be considerably less than those from larger vessels and are considered of less relevance than those obtained from logbooks (all vessels ≥10 m).

3.1 Official fisheries statistics

In addition to VMS data for the ICES subdivision 24, data on commercial fisheries, fleet statistics, along with data from the harbours in the regional area of the Kriegers Flak II North and South OWF project area, were obtained from Statistics Denmark.

Only catches from larger vessels (≥10 m) are registered at the ICES subdivision 24. Given that the fishery statistical areas are relatively large compared to the areas for Kriegers Flak II North (approximately 99 km²) and South (approximately 75 km²), the official fishing statistics can only provide a general insight into the extent and characteristics of the fisheries over a much larger area than the OWF site.

For a better resolution of specific fishing areas, Danish vessel monitoring system (VMS) data linked to logbook data by time - correlating the time and dates from fishing trips noted in logbook data with corresponding time and dates of VMS plots of the same vessel - was obtained from Statistics Denmark. This allowed for the association of VMS position points with the distribution of fisheries using specific gear and targeting specific species.

To further provide information on active fishing areas, a combination of AIS (Automatic Identification System) and VMS data has been utilized. AIS, developed as a collision avoidance system, complements the VMS data to give a more detailed view of fishing activities.

The landing data of smaller vessels from the local harbour of Rødvig is presented to estimate the contribution to the fisheries potentially locally affected by the establishment of an OWF.

All values of landings and economic calculations are based on the average price per kilo for each commercial species over the past 10 years (2013-2023). The data was obtained from Statistics Denmark.

3.2 Information from fishers and their organisations

Fishers naturally possess extensive knowledge and experience regarding the occurrence of commercial fish species and the practice of fishing in specific areas. This knowledge is typically not documented and can only be obtained through interviews. Therefore, interviews were performed with six (6) fishers located mainly in Rødvig and Klintholm who have interests in the relevant waters. The interviews were conducted by Krog Consult, represented by fishery consultant Carsten Krog, who carried out these interviews.

Initially, the main organization for fishers, Danmarks Fiskeriforening (DFPO), was contacted to inform them about the ongoing project and to get suggestions for fishers who might be relevant to contact (Krog Consult, 2024). Subsequently, contact was made with the local fishing association chairmen in the ports of Klintholm, Grenå, and Gilleleje to arrange meetings with the fishers in the primary landing ports. Due to the significant decline in fishing in the Baltic Sea in recent years, the extent, nature, and development of fishing here are mainly described based on telephone interviews. Information from these interviews was noted and used as a source of confirmation. To survive financially, these fishers also fish in waters other than the western Baltic Sea/Kriegers Flak area (Krog Consult, 2024).

During the meetings, fishers were asked about their interests in the Kriegers Flak II North and South OWF area - where and when they fish (possibly documented with GPS data), which gear they use (possibly with photos), fish species and quantities, knowledge of spawning areas, etc. Furthermore, each fisherman was asked about their knowledge of other fishers, possibly from other ports (including foreign ones), who are also active in the area.

A total of 17 fishers were interviewed. Electronic maps were obtained from several fishers. The records show a high similarity, and it is considered sufficient to present maps from a single trawler, which, combined with the interviews conducted, provide a detailed insight into the fishing activities in the waters on and around Kriegers Flak. The names of the interviewed fishers and others are not publicly available, and the fishers are therefore indicated by a number which refers to a number on the list of participants (Krog Consult, 2024).

3.3 Fisheries control and regulations

The fishing effort in a given area is not only dependent on the available resources and the technical abilities of the fishermen but has increasingly been subject to more comprehensive and detailed regulations. These regulations are predominantly based on the biological advice from the National Institute of Aquatic Resources (DTU Aqua) and the International Council for the Exploration of the Sea (ICES), but they also consider political and economic factors. This framework is crucial for the composition and amount of the catches; therefore, a brief description of these regulations is given in the following.

The National Institute of Aquatic Resources (DTU Aqua) and the International Council for the Exploration of the Sea (ICES) provide scientific advice to support sustainable fisheries management in Denmark and the western Baltic Sea. Their biological advice is based on comprehensive assessments of fish stocks, ecosystems, and environmental conditions. DTU Aqua conducts regular monitoring of fish stocks such as cod, herring, and sprat, providing data on population size, age structure, and reproductive status. They also conduct ecosystem considerations based on research on the impacts of fishing on the broader marine ecosystem, including bycatch, habitat destruction, and interactions with other species. ICES provides scientific advice to inform fisheries management decisions within the framework of the European Union's Common Fisheries Policy (CFP). ICES recommends total allowable catches based on stock assessments, ensuring that fishing pressure is kept within sustainable limits, and reports on the status of key fish stocks, highlighting trends, stock health, and potential risks.

As an example, both DTU Aqua and ICES have expressed concerns about the status of cod in the western Baltic Sea. ICES advises that the total allowable catch for cod in the western Baltic Sea (subdivisions 22-24) should be significantly reduced and recommends a precautionary approach with a catch limit of only 24 tonnes for both 2024 and 2025 (ICES,

2023). This limit applies to the combined total of commercial and recreational catches. The advice is based on concerns about the continued poor status of the cod stock, which is affected by both overfishing and environmental factors such as low oxygen levels in the Baltic Sea. Another example is herring in the western Baltic Sea, where ICES recommends a total allowable catch of 6,400 tonnes for 2024. This advice also reflects a precautionary approach to ensure that the herring population can sustain itself and recover from previous declines (ICES, 2024).

By integrating these scientific recommendations into fisheries management policies, Denmark, and the EU aim to ensure the long-term sustainability and health of fish stocks and marine ecosystems in the western Baltic Sea. These regulations can significantly influence the number of landings from year to year, and these mechanisms can create fluctuations in the total annual landings and value of the fisheries in the ICES subdivision 24 that contain the Kriegers Flak II North and South OWF area.

3.4 Commercial species

Information about the fish species in and near the Kriegers Flak II North and South OWF area, including commercial fish species of interest, as well as an assessment of the sensitivities of these fish species to the construction, operation, and decommissioning of the Kriegers Flak II North and South OWF, is presented in a separate report (DNV, 2024).

To provide a comprehensive picture of the potential impacts on the fisheries, including their resources (fish and shellfish), the overall results of the impact on relevant commercial fish species will be assessed in a future project-specific EIA.

4 THE EXTENT OF FISHERIES IN THE ICES SUBDIVISION 24

The Kriegers Flak II area are defined by the ICES subdivision 24 (Figure 4-1). References will also be made to waters outside these ICES rectangles where appropriate.

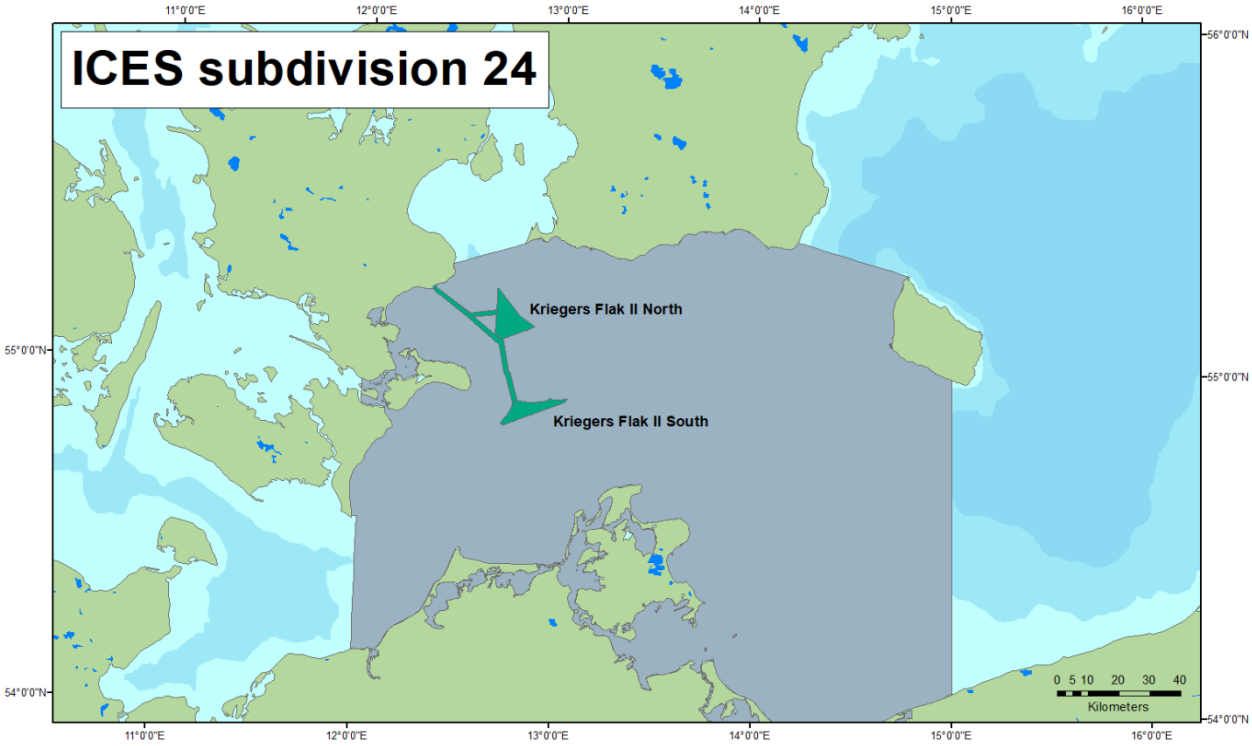


Figure 4-1. Relevant ICES subdivision 24 for fishery activities in the Kriegers Flak II North and South area. Source: ICES, 2024.

The Danish fisheries in the ICES subdivision 24 primarily involve trawl and net fishing. Additionally, bottom nets are used along the east coast of Zealand. Other forms of fishing with some relevance to the western Baltic Sea include passive gear such as longlines and pot fishing. However, the extent and importance of these methods are considerably less than net and trawl fishing. Both towed and passive gear are used in the planned Kriegers Flak area, however, only a small part of this fishery is registered within the project area (Figure 4-2) (COWI, 2022).

This section gives an overview of different types of fishing gear and how they are used. Development of OWF could potentially have impacts on fishing activities in the OWF area and the immediate surroundings. Furthermore, this section gives an overview of the landed catch from the OWF area in order to provide information of potential income loss for fishers using the OWF area as part of their catch area.

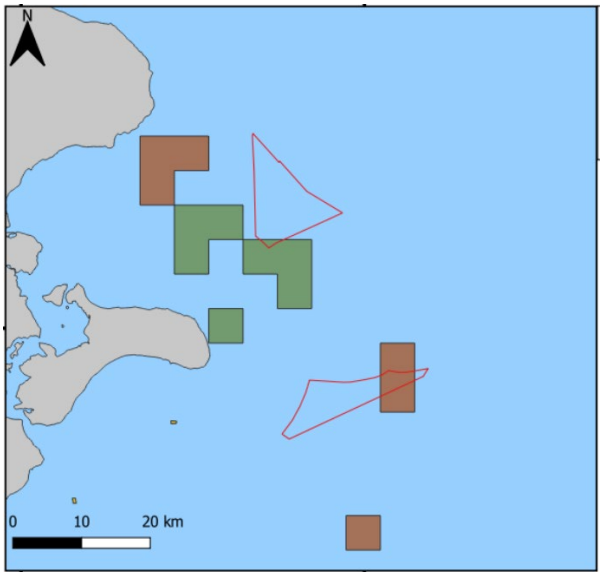


Figure 4-2. The most important fishing areas for trawling vessels (brown) and net fishing (green) in the Kriegers Flak II North and South OWF area, 2007-2015. Source: Egekvist et al., 2017 in COWI, 2022.

The following sections describe the most common types of fishing gear used in the Kriegers Flak II OWF area.

Trawl fishing is the predominant method in the western Baltic (NIRAS, 2015). In trawl fishing, the trawl net is spread out using so-called trawl doors. When employing a multi-trawl, two or more trawls are connected with weights at the connection points, in addition to weights at the wing tips of the trawl (Figure 4-3). The trawls can be either bottom or floating (pelagic) trawls. On very uneven or stony seabeds, some type of trawl protection is used on the lower part of the trawl (Figure 4-4).

When fishing for species like sand eel and sprat, floating trawls might occasionally touch the seabed, and the vessels must be cautious of larger structures to avoid hooking. This gear is characterized by relatively long towing times of 3.5 to 7 hours at a speed of approximately 3 knots (NIRAS, 2015).

Regardless of whether floating or bottom trawls are used, trawl doors are employed to spread the trawl. Trawl doors are steel plates of various shapes and weights, depending on the size of the vessel (typical weight in the western Baltic Sea is 300-500 kg). Vessels aim to minimize drag, so it is crucial that the trawl blades do not hook on the seabed. Under normal conditions, the top few centimetres of the seabed can be affected. In shallower waters, such as the Kriegers Flak II OWF area, the trawl blades in floating trawling can also touch the seabed (NIRAS, 2015).

In double trawl fishing, trawl doors are not used. The fishing depth and the vertical opening of the trawl are regulated using chain blocks (typically weighing 300-500 kg in the western Baltic Sea) on the lower tip of the trawl. Depending on the water depth, these weights can drag along the seabed, but it is optimal to reduce drag as much as possible while maintaining the necessary fishing depth and vertical opening of the trawl (NIRAS, 2015). The distance between two vessels in double trawling depends on water depth and the size of the trawl, typically around 200 meters. In single trawl fishing, the distance between the trawl doors is usually around 100 meters. The distance between the vessel(s) and the trawl is typically around 500 meters (NIRAS, 2015).

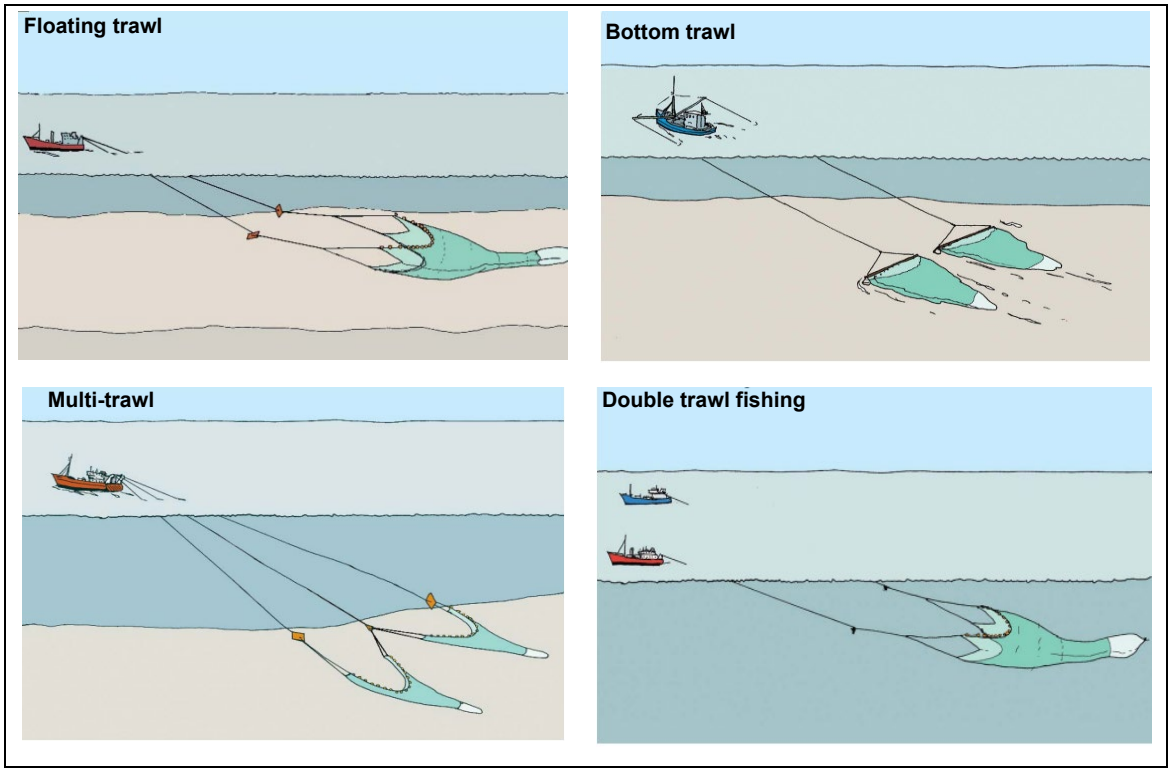


Figure 4-3. Illustration of different trawl gear and trawl fishing. Source: Korsgaard et. al., 2007.

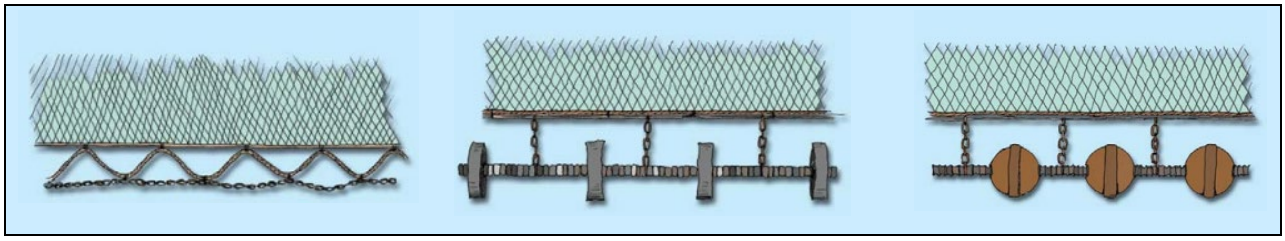


Figure 4-4. Different types of seabed protection on bottom trawls. Source: Korsgaard et.al., 2007.

Net fishing is the second most important form of fishing in the western Baltic Sea (NIRAS, 2015). Several nets, typically 10-20, are set together to form a chain. This chain of nets is anchored (Figure 4-5). Each net has a typical length of around 50-60 meters. From each end of the chain, a line is led up to a buoy. The nets are fitted at the bottom with a high-density line, which holds the net to the seabed, while a buoyant line at the top keeps the net in an upright position. The target species are primarily benthic species, such as flatfish, cod, and catfish.

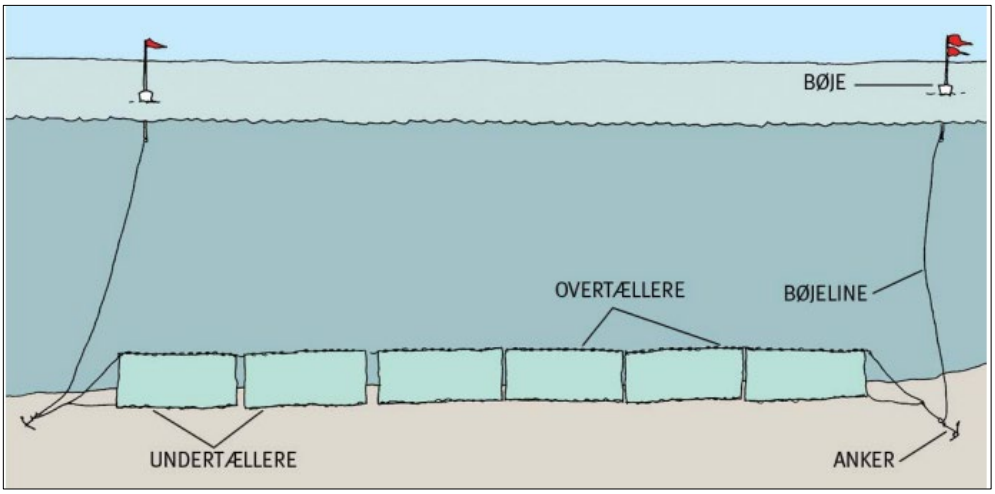


Figure 4-5. Net fishing. Source: Korsgaard et.al., 2007.

Bottom nets are used along the east coast of Zealand and are deployed in coastal waters at depths of less than 10-15 meters. The gear consists of a long net leading into a main net (Figure 4-6). The long net, which can be up to 500 meters long, is mounted either on poles or on brackets at the bottom, extending from the shore out to the main net. The main net is a round net from which the fish cannot escape. Bottom nets are often set in extension of each other and can thus, depending on the water depth, extend several kilometres from the coast. In recent times, it has become very common to replace the poles with anchors (concrete blocks or anchors). The most important target species for bottom net fishing is the eel.

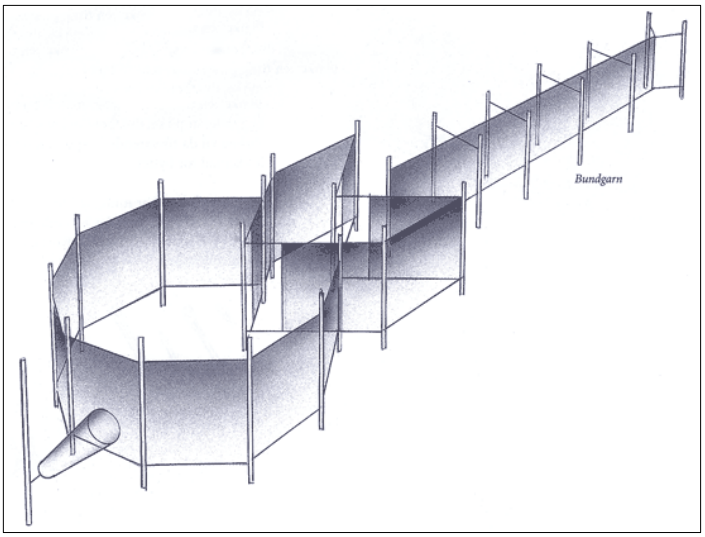


Figure 4-6. Bottom net. Source: NIRAS,2015.

4.1 Vessels and gear use in Denmark

In general, there has been a significant decline in the number of vessels (>10 m) reporting landings in Denmark (Figure 4-7). The statistics is shown for Denmark in total as fishing is not only carried out by vessels native to North Zealand, but periodically also by vessels from more distant ports.

Between 2013 and 2023, the total number of trawling vessels decreased from 288 in 2013 to 190 in 2023. Additionally, vessels using net and longline gear declined from approximately 829 in 2013 to 647 in 2023. The combination of seine gear with other gear also saw a decrease, from 285 vessels in 2013 to 183 in 2023. Seine vessels specifically declined from 27 in 2013 to 12 in 2023.

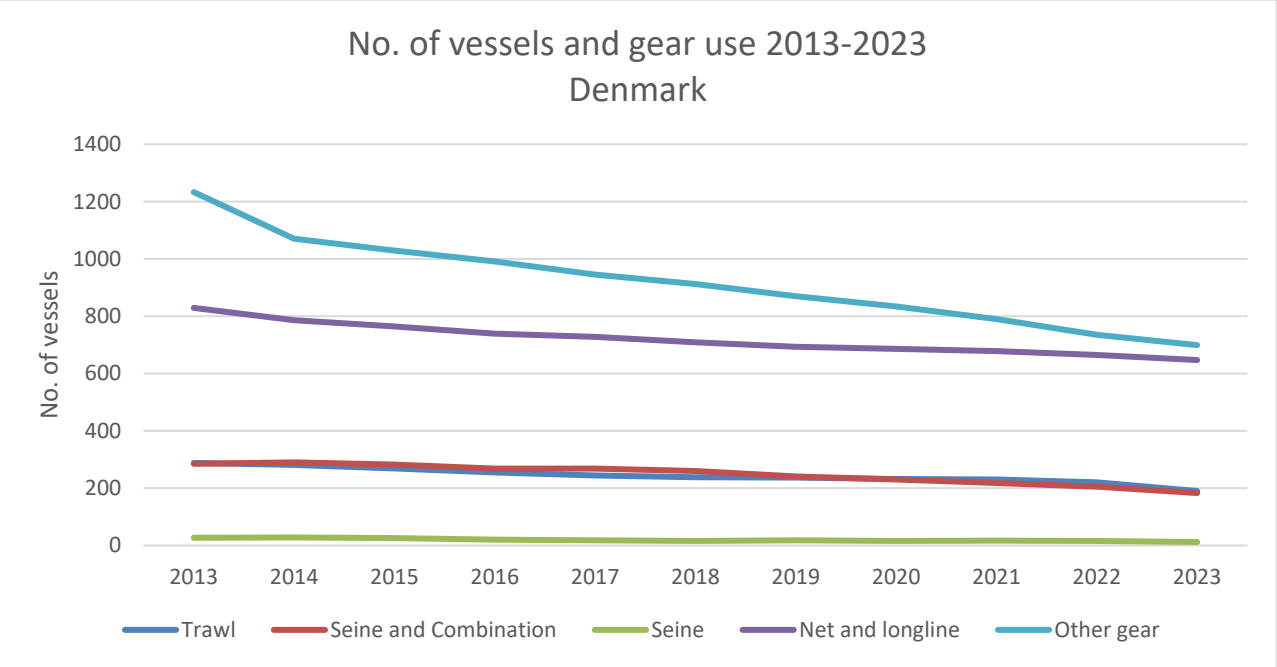


Figure 4-7. The number of vessels and primary gear types in Denmark in the period 2013-2023. Source: Statistics Denmark, 2024.

4.2 Landings and value of the fisheries

The most important fish species for fishing in the ICES subdivision 24 in 2023 were: sprat (around 60% of total landing value), herring (13 %), sole (8 %), plaice (7 %), eel (4 %) and turbot (2 %) (Figure 4-8).

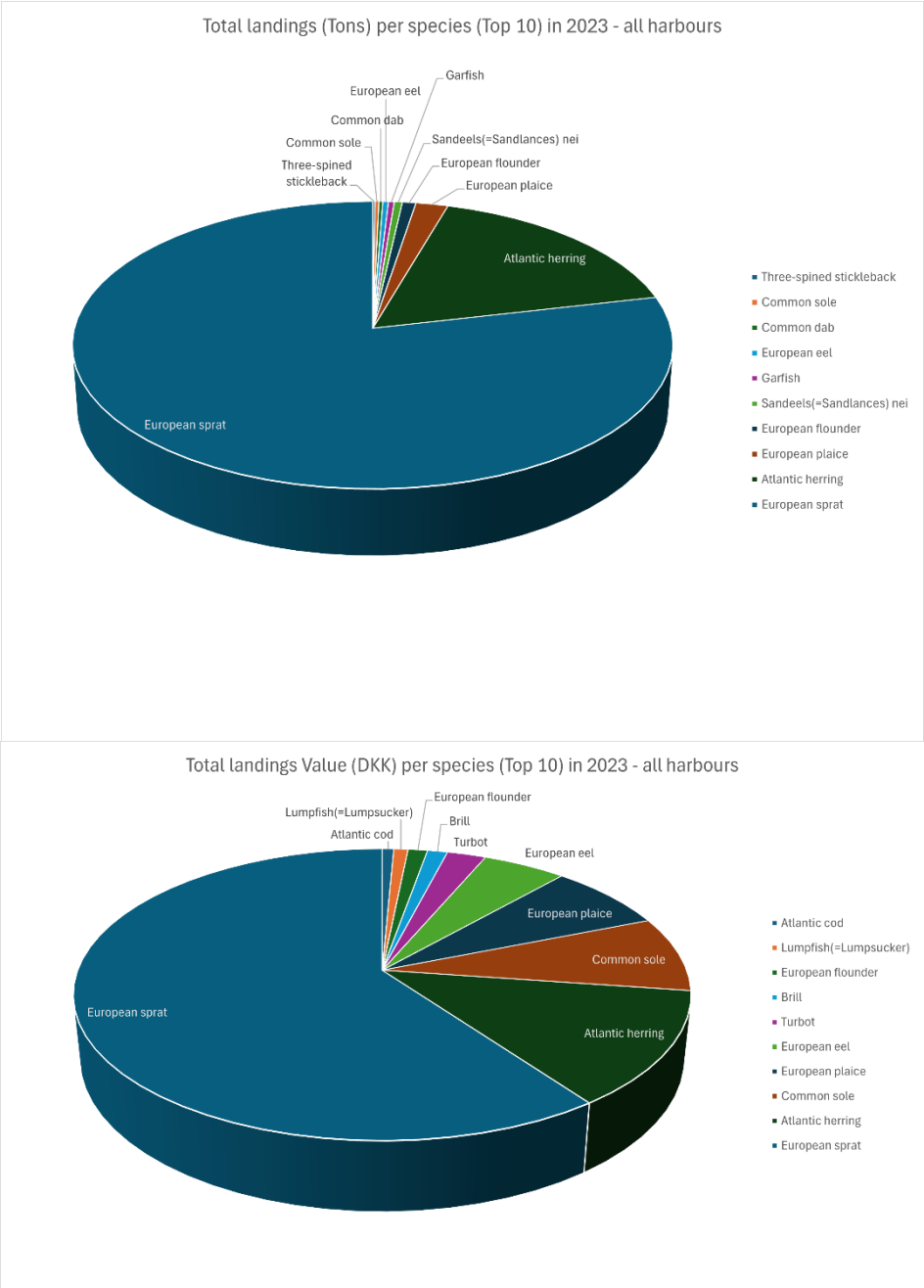
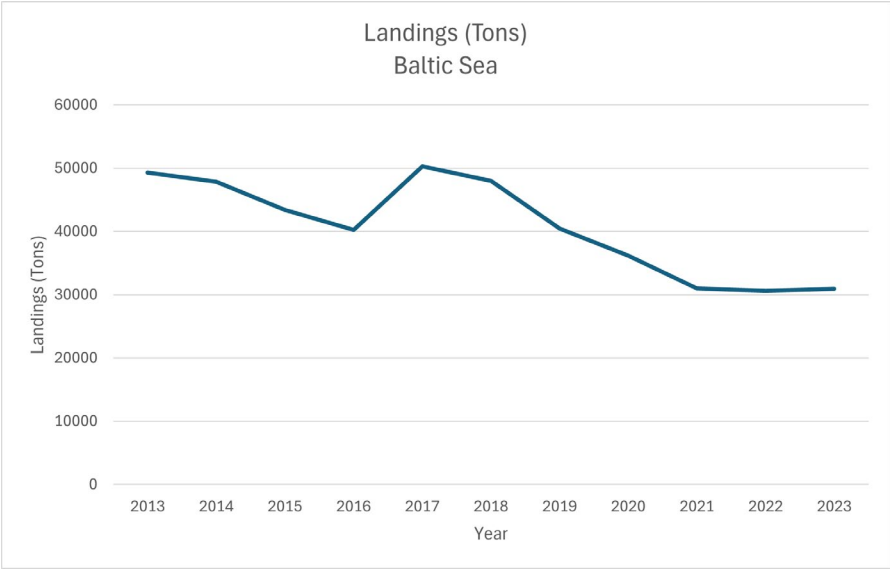


Figure 4-8. Total landings (tons) and value (DKK) for the top 10 fish species in 2023. Source: Statistics Denmark, 2024.

Fishery in the Baltic Sea, including the Kriegers Flak II North and South area, has experienced a drastic decline over the past decade (Figure 4-9). The total landings of Danish fisheries from ICES subdivision 24 have varied between 39.000 and 17.000 tons in 2017 and 2021, respectively. The value of these landings has fluctuated between 75.125.316 and 193.991.174 DKK in 2022 and 2013.



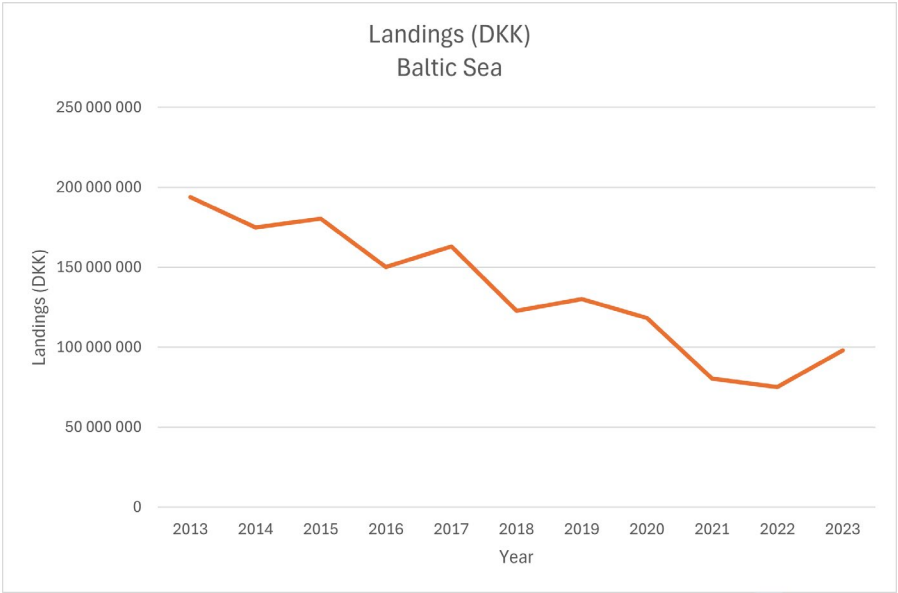


Figure 4-9. The development of the landings in the Baltic Sea in the period 2013-2023. Data from logbooks, which include vessels ≥10 m. Source: Statistics Denmark, 2024.

The main trends for commercial fish species in the Baltic Sea are shown in Figure 4-10. Notably, cod landings show a significant decrease over the years, dropping from 8.808 tonnes in 2013 to just 44 tonnes in 2023. Flatfishes also exhibit a decreasing trend, starting at 3.592 tonnes in 2013 and reducing to 1.167 tonnes by 2023. Herring landings fluctuate but overall show a decline from 28.983 tonnes in 2013 to 18.640 tonnes in 2023. Mackerel shows fluctuations, with an increase from 43-47 tonnes in 2017 and 2018 to dropping slightly 39 tonnes in 2023. Industrial fish have variable landings with no clear trend, ending at 77.722 tonnes in 2023. Crustaceans and molluscs have relatively stable landings with slight fluctuations.

A combination of ecological, anthropogenic, and environmental factors shapes the landing value of the different fish species in the Baltic Sea. The landing value for codfish has generally declined over the past decade, with some fluctuations. Flatfish show an overall decrease in landing value, although some years exhibit slight increases. Herring's values fluctuate year by year but show an overall downward trend. Mackerel values are inconsistent, and the landing value for industrial fish (such as sprat and other small pelagic species) has decrease steadily throughout the years. These species play a

crucial role in the ecosystem and fisheries, but their economic value has declined. The landing value for crustaceans and molluscs (such as shrimp, crab, and mussels) has remained relatively stable during the past decade.

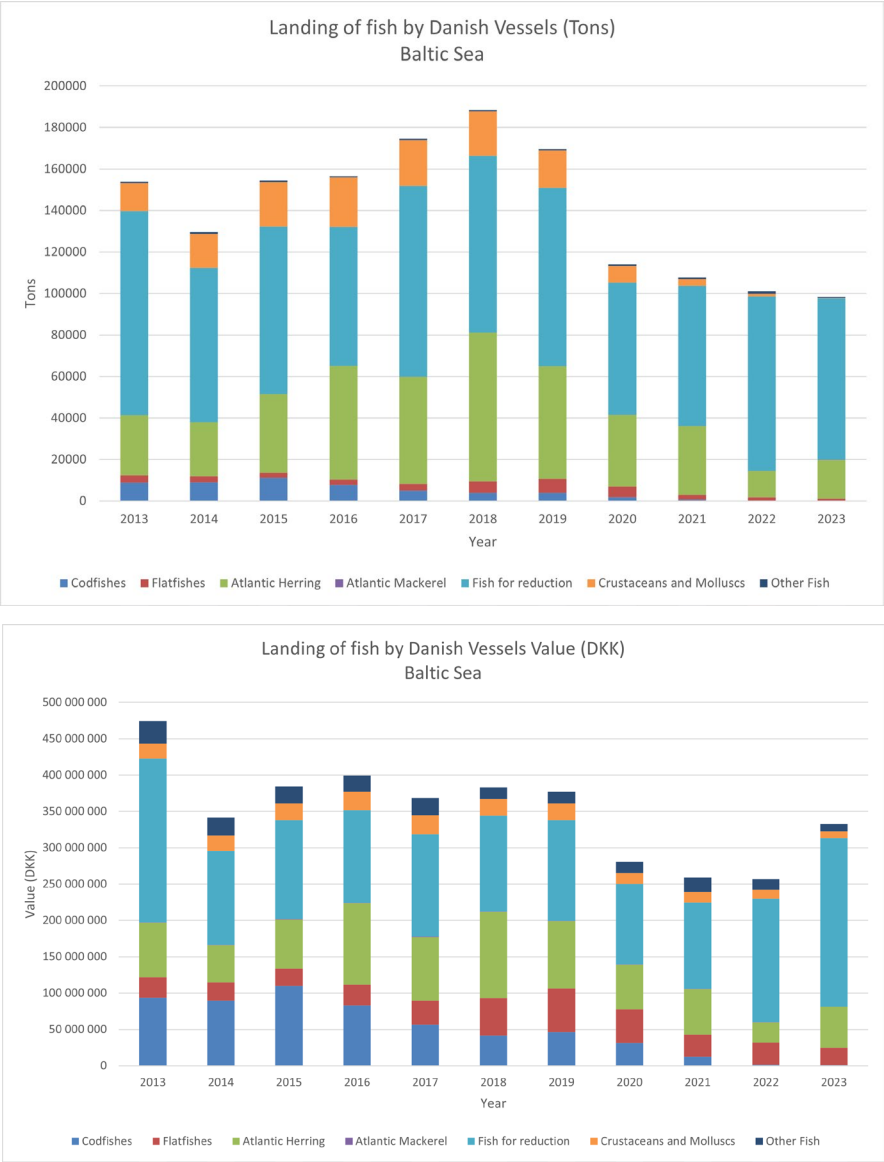


Figure 4-10. Landings (in tons) and value (DKK) of commercial species in the Baltic Sea from 2013-2023 by Danish fishers and vessels > 10 m. Source: Statistics Denmark, 2024.

The decline in cod landings is particularly evident in the two harbours, Rødvig and Klintholm, which were previously crucial for fishing in the western Baltic Sea. Until 2017, these ports annually saw fish valued at 20-30 million DKK. However, in 2023, the total landing value was less than 1 million DKK (Krog Consult, 2024). The decline in cod landings in these two ports has been even more dramatic: from 5-10 million DKK annually up to and including 2017, to less than 10.000 DKK in 2023 (Krog Consult, 2024).

Rødvig harbour, located near the Kriegers Flak II OWF landfall, has experienced a significant reduction in landings over the past decade. In 2013, 5111 tonnes of landings were registered there, but by 2023, only 15 tonnes were recorded (Figure 4-11). Herring and sprat are the species with the highest landings in terms of weight, while eel and herring contribute the highest value (in DKK) in Rødvig (Figure 4-12).

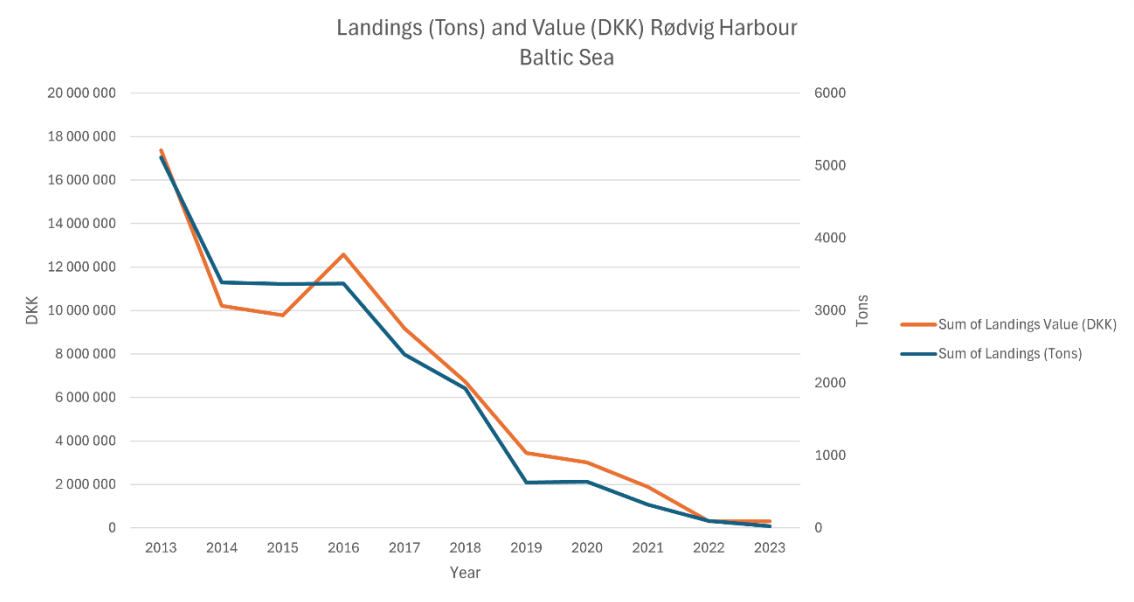


Figure 4-10. Landings (in tons) and value (DKK) in Rødvig Harbour. Source: Statistics Denmark, 2024.

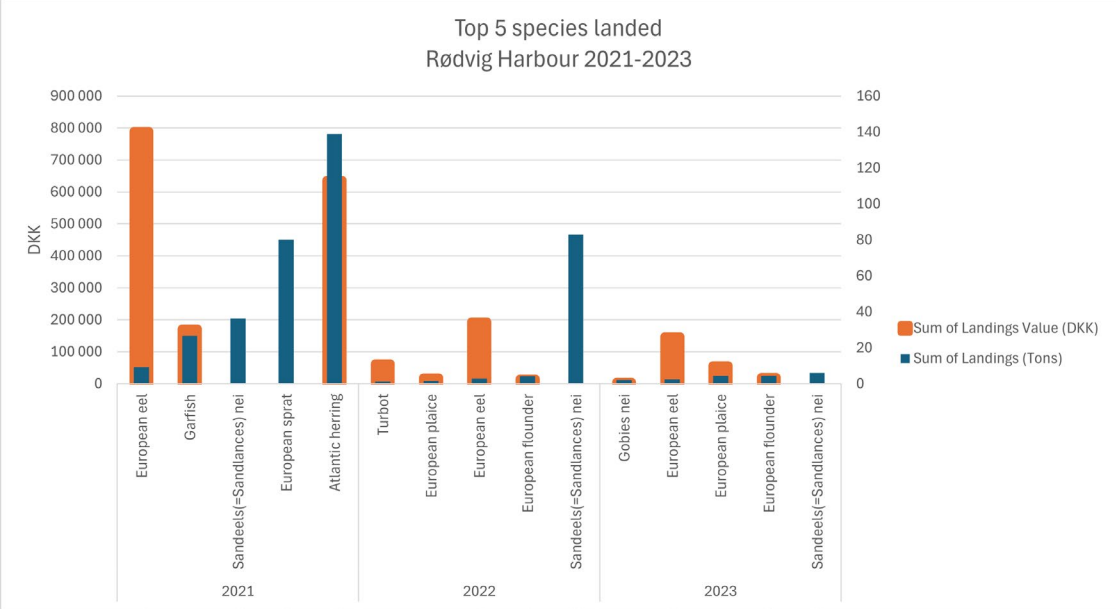
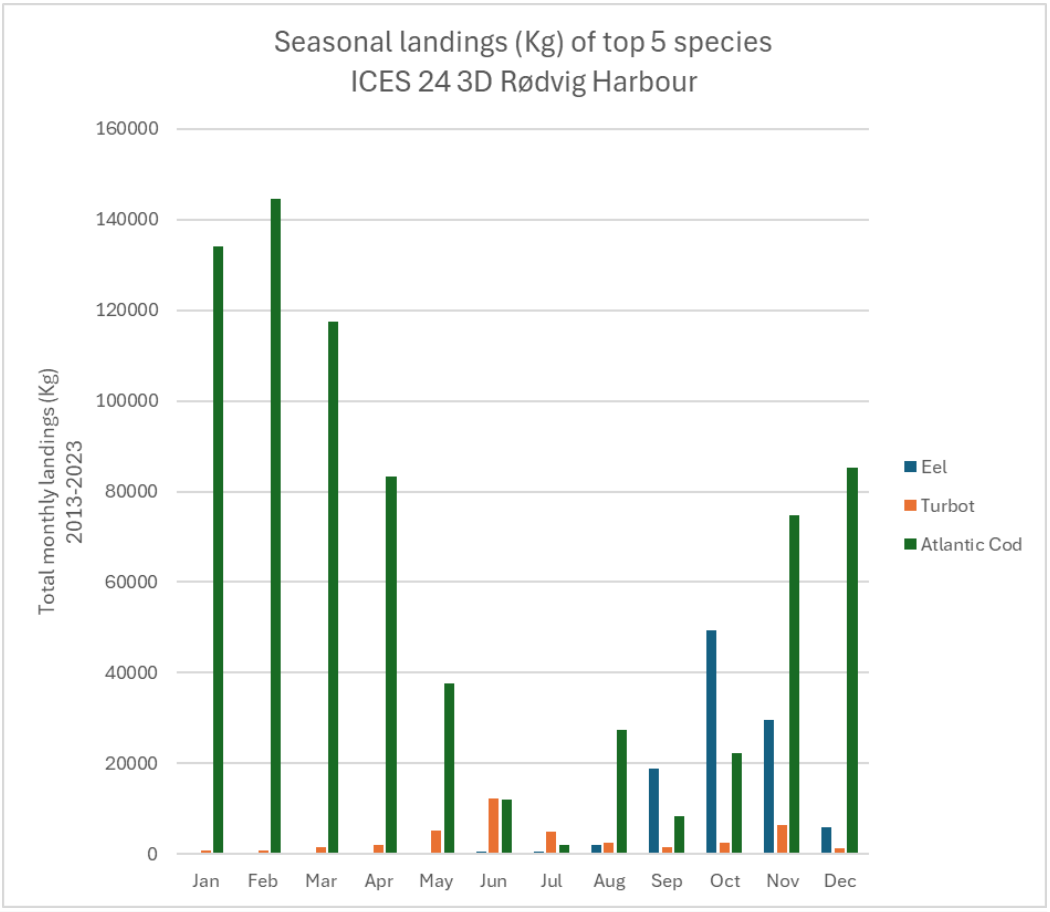


Figure 4-11. Top five fish species landed at Rødvig, 2021-2023. Source: Statistics Denmark, 2024.

The seasonal distribution of catches for the main species in Rødvig over the past 10 years is shown in Figure 4-12. The results indicate that sandeel catches predominantly occurs from May to September. Herring landings, on the other hand, primarily take place between October and April. Eel fishing occurs during the late summer months through the end of the year. As for cod, landings occur throughout the year, except for lower catches in June and July.



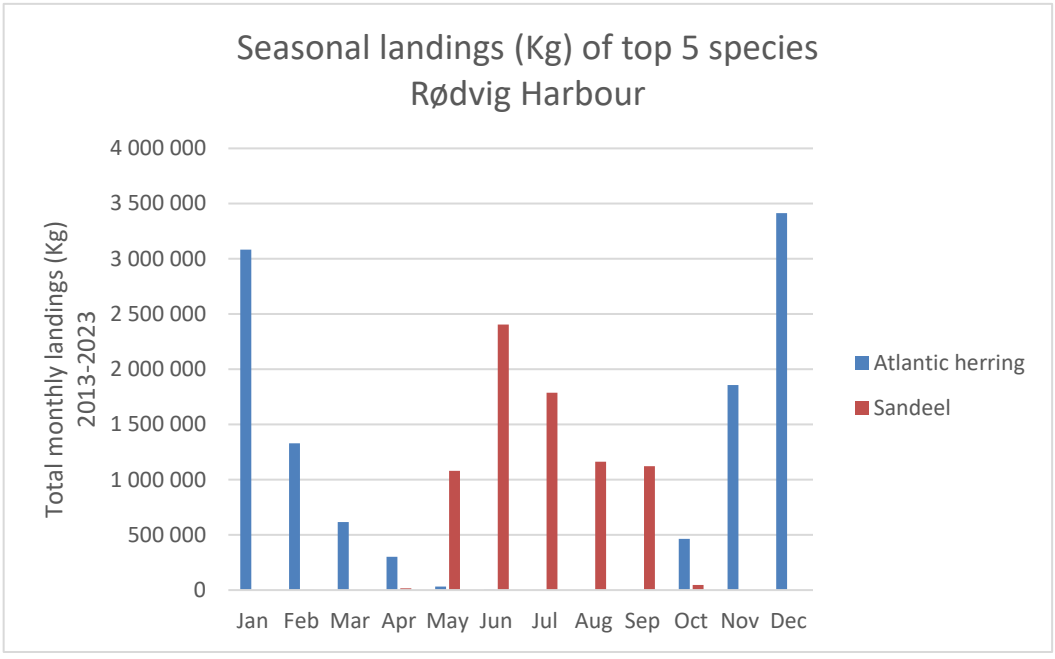


Figure 4-12. Monthly landings (kg) of the top four species in Rødvig. Based on trends in total monthly landings from 2013-2023. Source: Statistics Denmark, 2024

The harbours that have landed most fish from the ICES subdivision 24 the past 10 years are Grenå, Thyborøn, and Skagen (Figure 4-13).

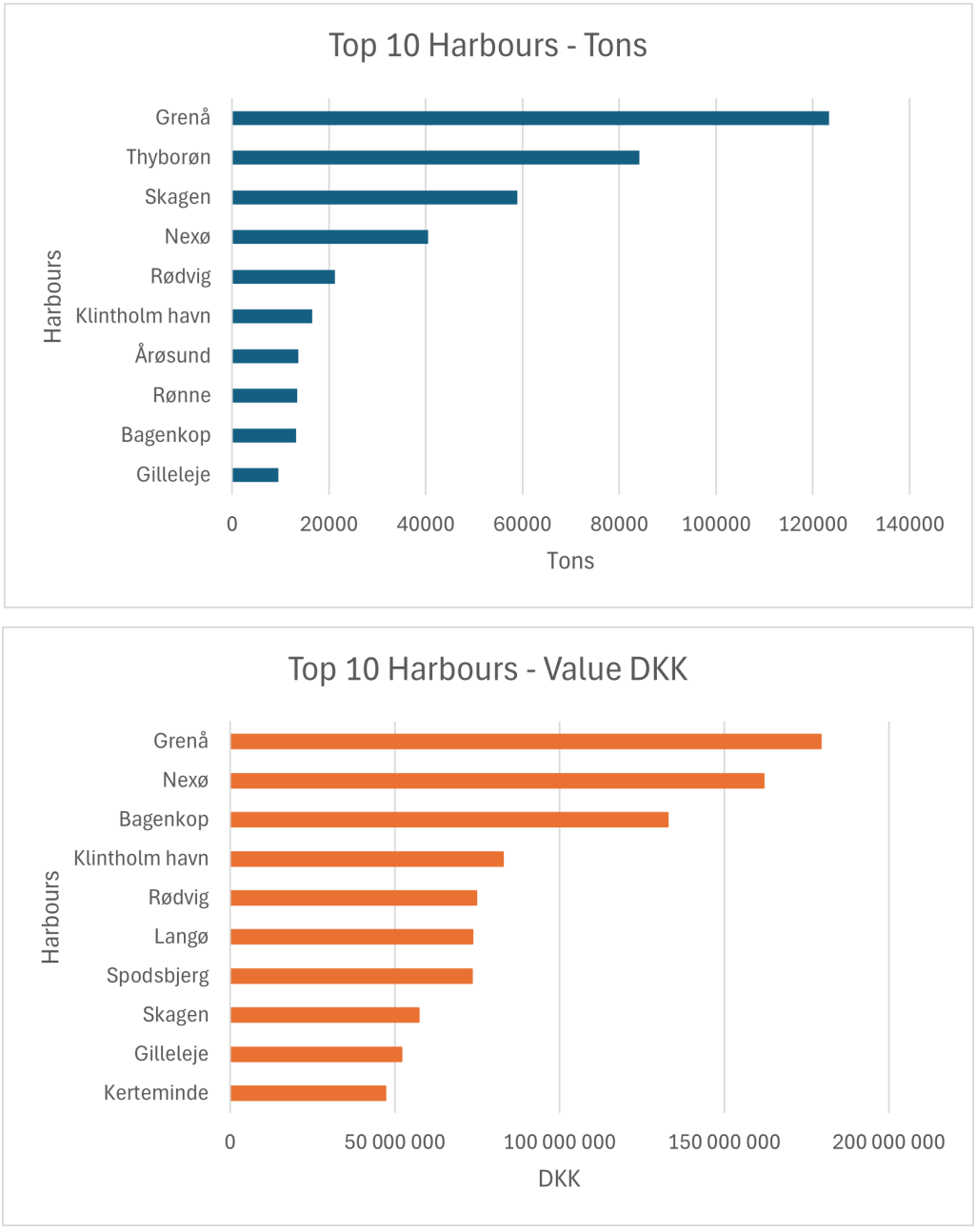
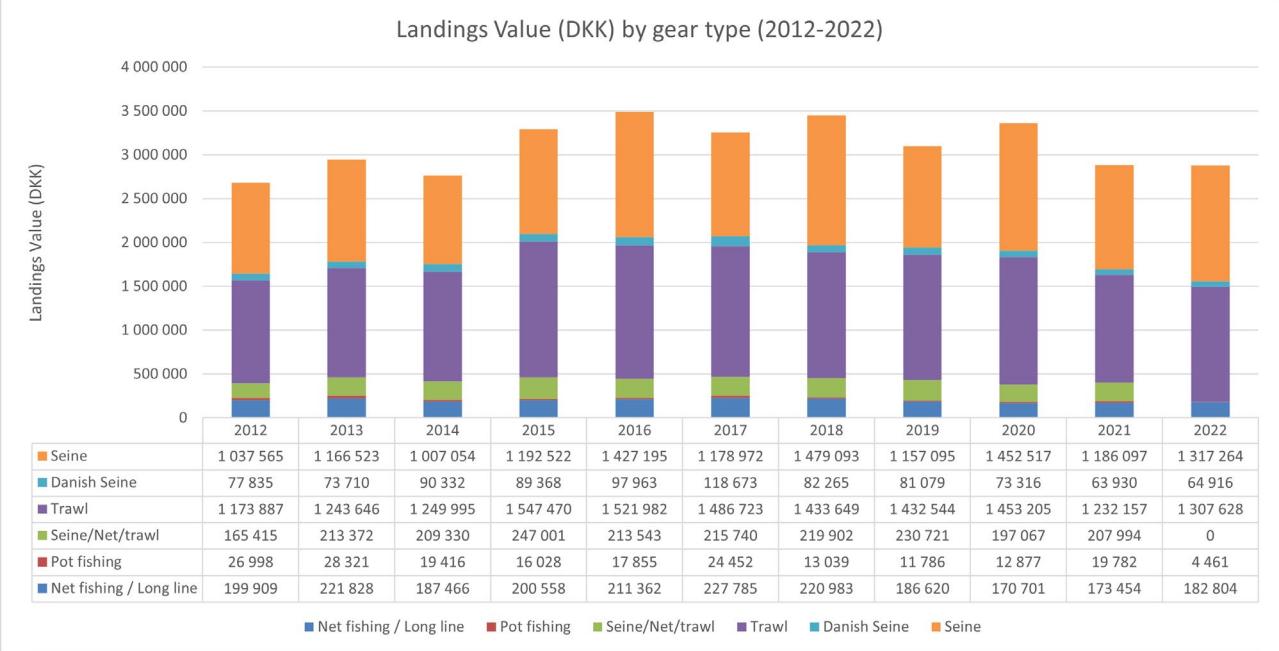


Figure 4-13. Topp 10 harbours in tons and DKK in the period 2013-2023. Source: Statistics Denmark, 2024.

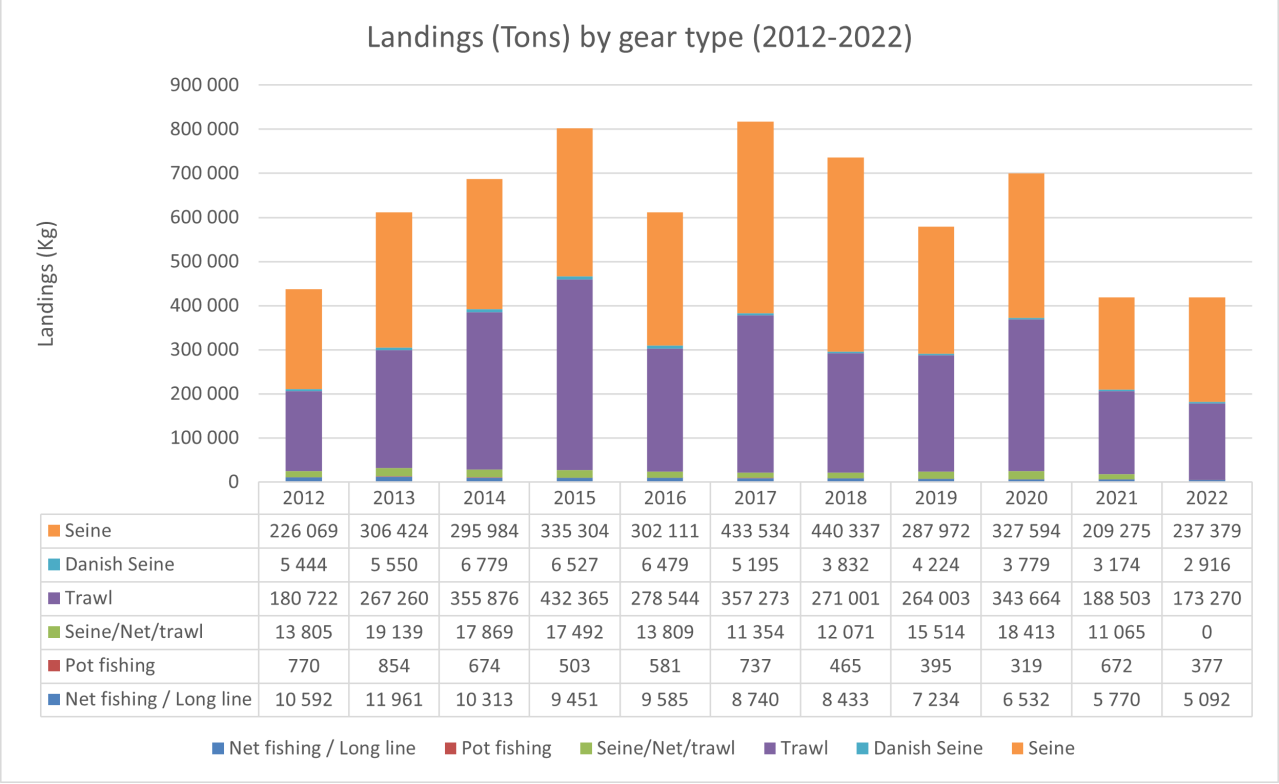
4.3 Landings by gear type

Fishing with seine have fluctuated in the period 2012-2022 with peaks in 2017 and 2018 and had a noticeable decline in use after 2018 with a slight increase in 2022 (Figure 4-14). Trawl fishing have consistently the highest landings, peaking in 2015 and showing a general decline thereafter, especially significant in 2020 and onwards. Fishing with Danish seine

have been relatively stable, with slight increases in the early years and a noticeable decline after 2018. There was a general decline in total landings from 2019 onwards, with noticeable variability among different gear types.



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Seine	1 037 565	1 166 523	1 007 054	1 192 522	1 427 195	1 178 972	1 479 093	1 157 095	1 452 517	1 186 097	1 317 264
Danish Seine	77 835	73 710	90 332	89 368	97 963	118 673	82 265	81 079	73 316	63 930	64 916
Trawl	1 173 887	1 243 646	1 249 995	1 547 470	1 521 982	1 486 723	1 433 649	1 432 544	1 453 205	1 232 157	1 307 628
Seine/Net/trawl	165 415	213 372	209 330	247 001	213 543	215 740	219 902	230 721	197 067	207 994	0
Pot fishing	26 998	28 321	19 416	16 028	17 855	24 452	13 039	11 786	12 877	19 782	4 461
Net fishing / Long line	199 909	221 828	187 466	200 558	211 362	227 785	220 983	186 620	170 701	173 454	182 804



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Seine	226 069	306 424	295 984	335 304	302 111	433 534	440 337	287 972	327 594	209 275	237 379
Danish Seine	5 444	5 550	6 779	6 527	6 479	5 195	3 832	4 224	3 779	3 174	2 916
Trawl	180 722	267 260	355 876	432 365	278 544	357 273	271 001	264 003	343 664	188 503	173 270
Seine/Net/trawl	13 805	19 139	17 869	17 492	13 809	11 354	12 071	15 514	18 413	11 065	0
Pot fishing	770	854	674	503	581	737	465	395	319	672	377
Net fishing / Long line	10 592	11 961	10 313	9 451	9 585	8 740	8 433	7 234	6 532	5 770	5 092

Figure 4-14. Annual landings (tons) and value of landings (DKK) per gear type from all Danish waters. Source: Statistics Denmark, 2024.

5 THE DISTRIBUTION OF FISHING VESSELS IN THE KRIEGERS FLAK II OWF AREA

The planned Kriegers Flak II North and South OWF area (approx. 175 km^2) will cover only a small part of the ICES subdivision 24 (approx. 15 400 km^2). To get more accurate data concerning the fishing activities in the OWF area (than can be obtained from official catch statistic), information from the mapping of the distribution of the large vessels (>12 m) according to gear types in the entire ICES areas by using VMS data. These VMS data are supplemented by information collected from fishers in the area, including some electronic map plotter data showing their fish tracks and fishing grounds.

5.1 VMS data

Vessels with a length ≥12 m are required to carry an electronic vessel monitoring system (VMS). VMS data can be used both to locate the vessel, and to determine the speed with which vessels travel. Estimated vessel speeds, are used to indicate when vessels using different gear are assumed to be undertaking fishing activities. Based on the assumptions about the speed with which vessels normally undertake certain fisheries it is possible to plot where fishing vessels are actively fishing (Table 5-1). Furthermore, by combining VMS data with logbook data it is possible to get an indication of which commercial species are being fished in specific areas. Fishing vessels are generally considered to be fishing when their speed is between 1- 5 knots (Kontopoulos, et al. 2020; Souza, et al., 2016; Gerritsen & Lordan, 2011). The speed range is commonly used to identify fishing activity through the analysis of AIS-data and other monitoring systems. All fishing vessels were therefore assumed to be fishing when their speed was < 6 knots speed.

Figure 5-1 to 5-4 show VMS data in the planned Kriegers Flak area by quarters in the period 2020 to 2022. There is a low fishing activity in the KF II OWF area in both 2021 and 2022. However, in 2022 there is a slight increase in fishing activity in the area, where some small specific areas have a high fishing activity. In general, there are more fishery activity in the KF II South OWF area compared to KF II North OWF area.

Fishing activity in the years 2020-2022 were highest in October-December, followed by July- September. Lowest fishing activity were registered in April- June, where there were no VMS registrations overlapping the KF II OWF area.

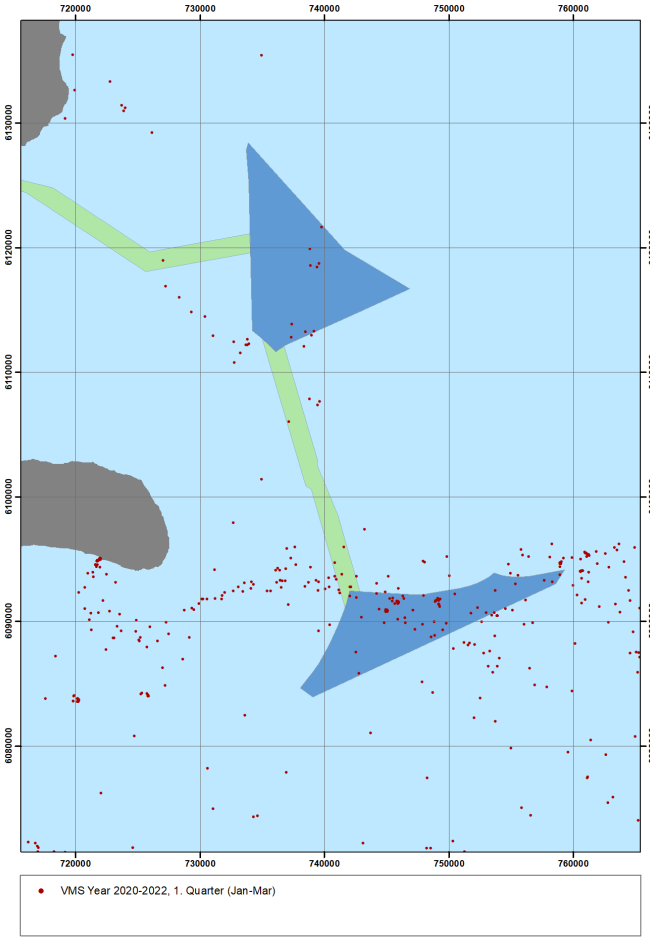


Figure 5-1. VMS registrations 1st Quarter (Jan – Mar) in the period 2020 to 2022. Source: Danish Fisheries Agency, 2023.

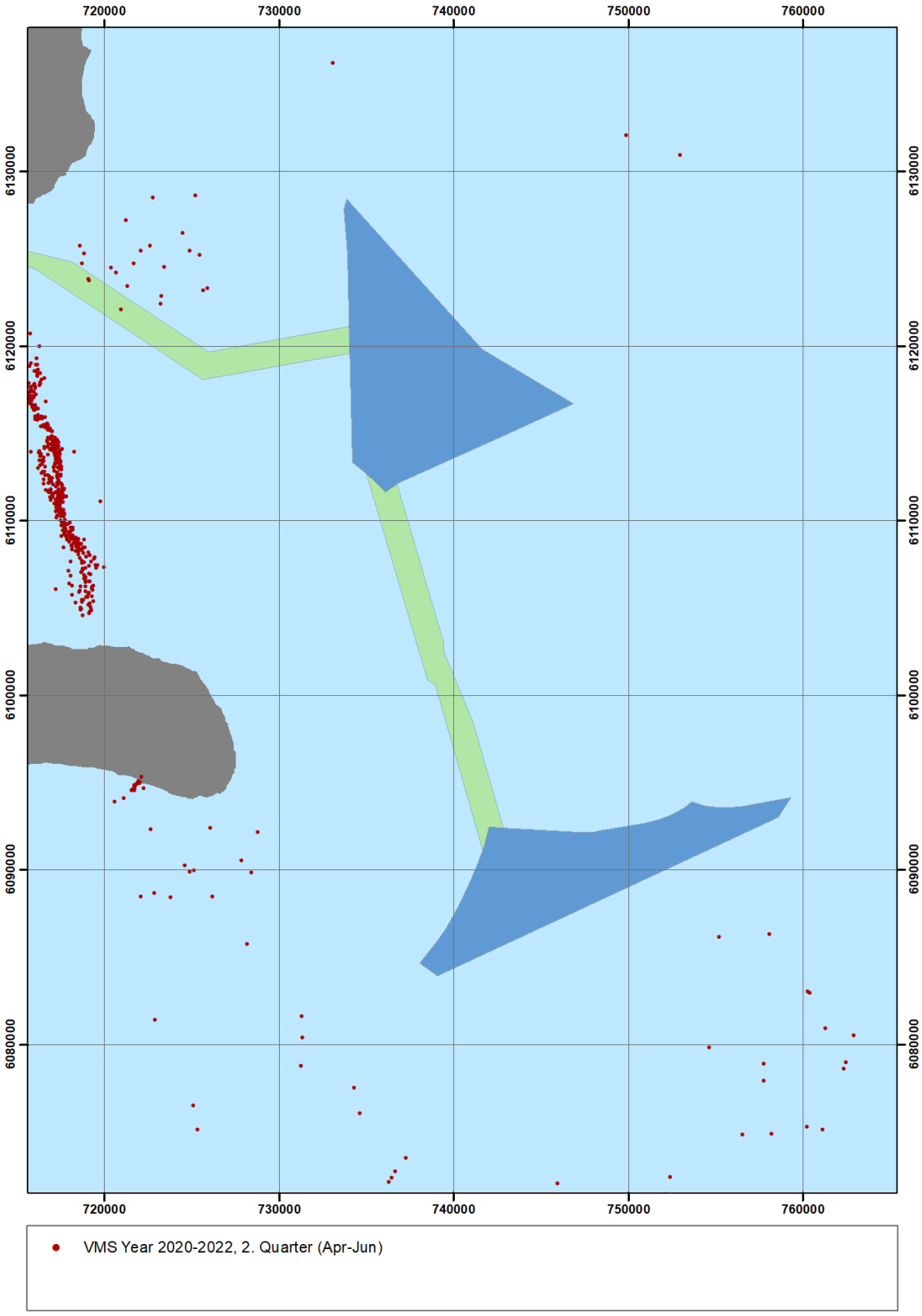


Figure 5-2. VMS registrations 2nd Quarter (Apr – Jun) in the period 2020 to 2022. Source: Danish Fisheries Agency, 2023.

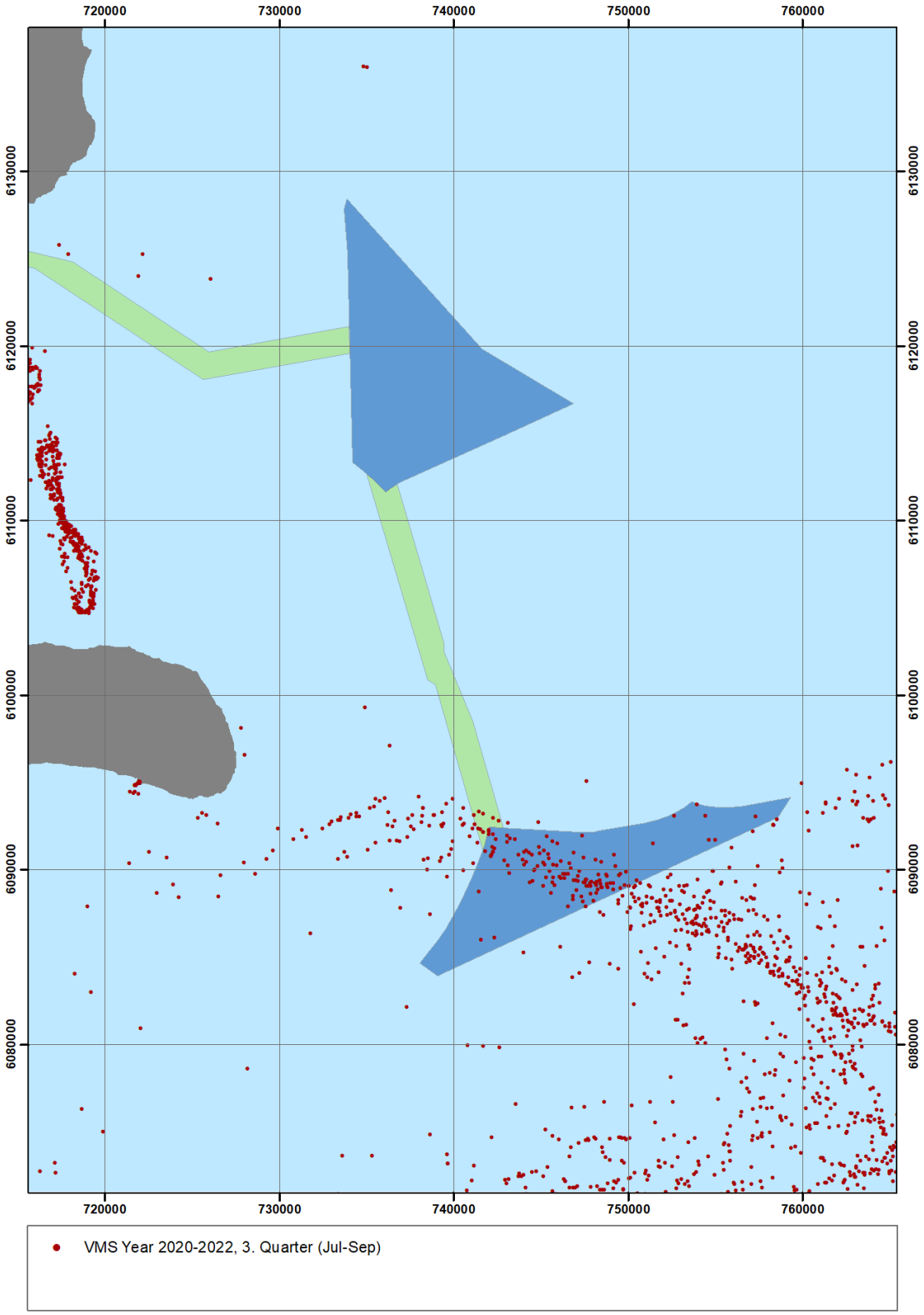


Figure 5-3. VMS registrations 3rd Quarter (Jul – Sep) in the period 2020 to 2022. Source: Danish Fisheries Agency, 2023.

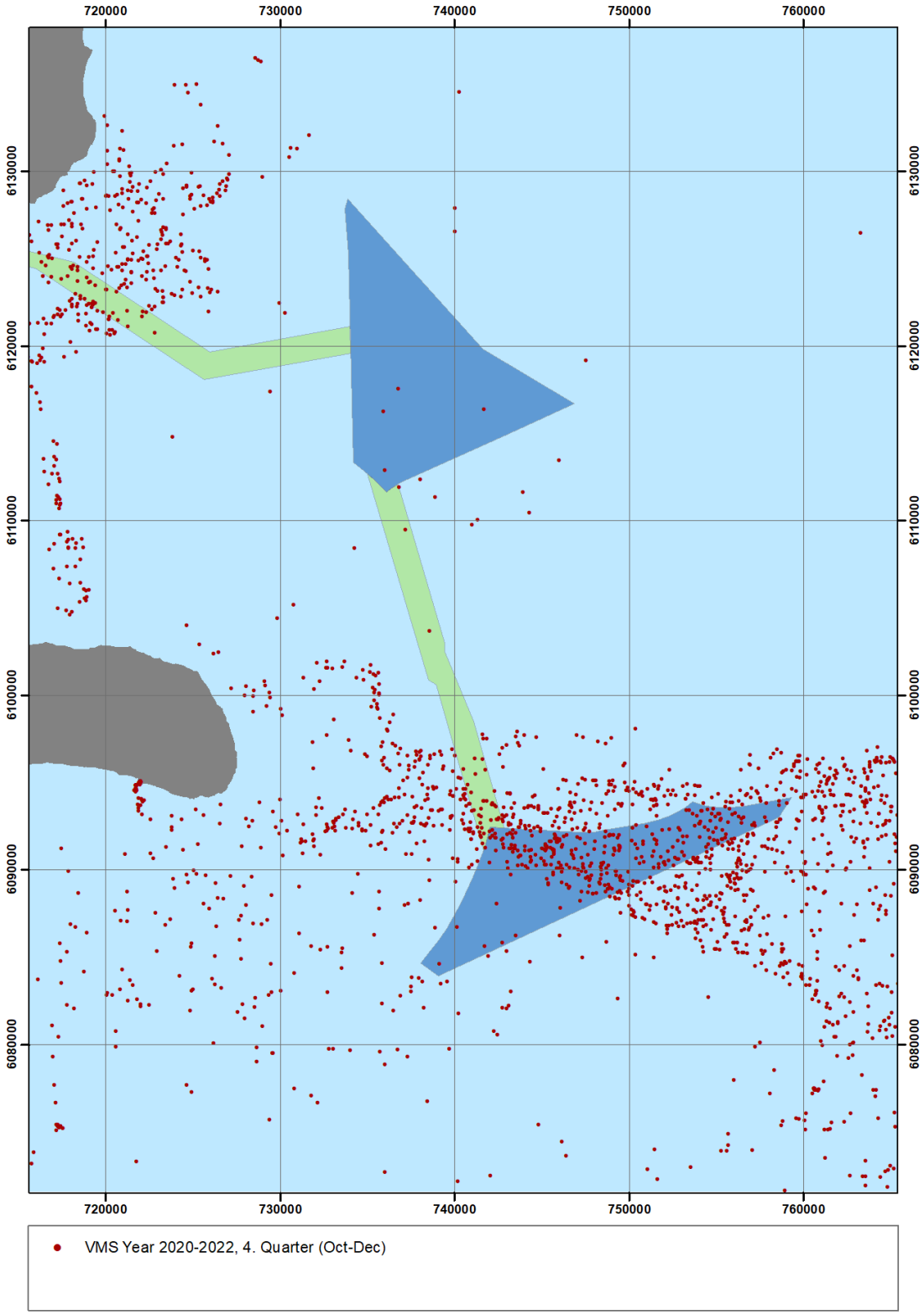


Figure 5-4. VMS registrations 4th Quarter (Oct – Dec) in the period 2020 to 2022. Source: Danish Fisheries Agency, 2023.

5.2 AIS data

AIS, developed as a collision avoidance system, complements the VMS data to give a more detailed view of fishing activities. The figures below (Figure 5-5 and 5-6) show the AIS tracking data in 2021 and 2022 for fishing vessels with less than 6 knots speed. There is a low fishing activity in the KF II OWF area in both 2021 and 2022. However, in 2022 there is a slight increase in fishing activity in the area, where some small specific areas have a high fishing activity. In general, there are more fishery activity in the KF II South OWF area compared to KF II North OWF area.

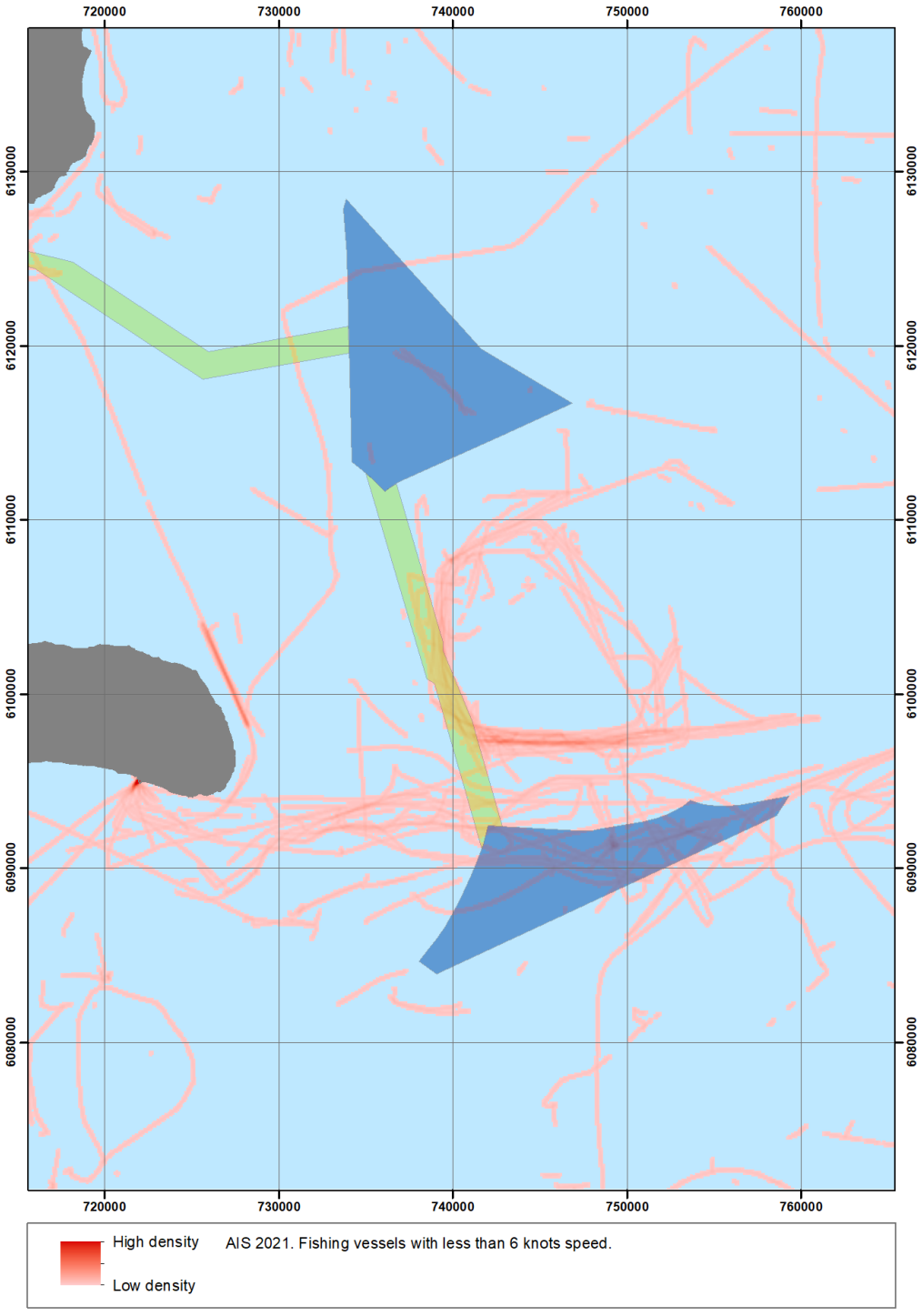


Figure 5-5. AIS tracking data for fishing vessels with less than 6 knots speed in the planned Kriegers Flak area in 2021.Source: Danish Maritime Authority, 2024.

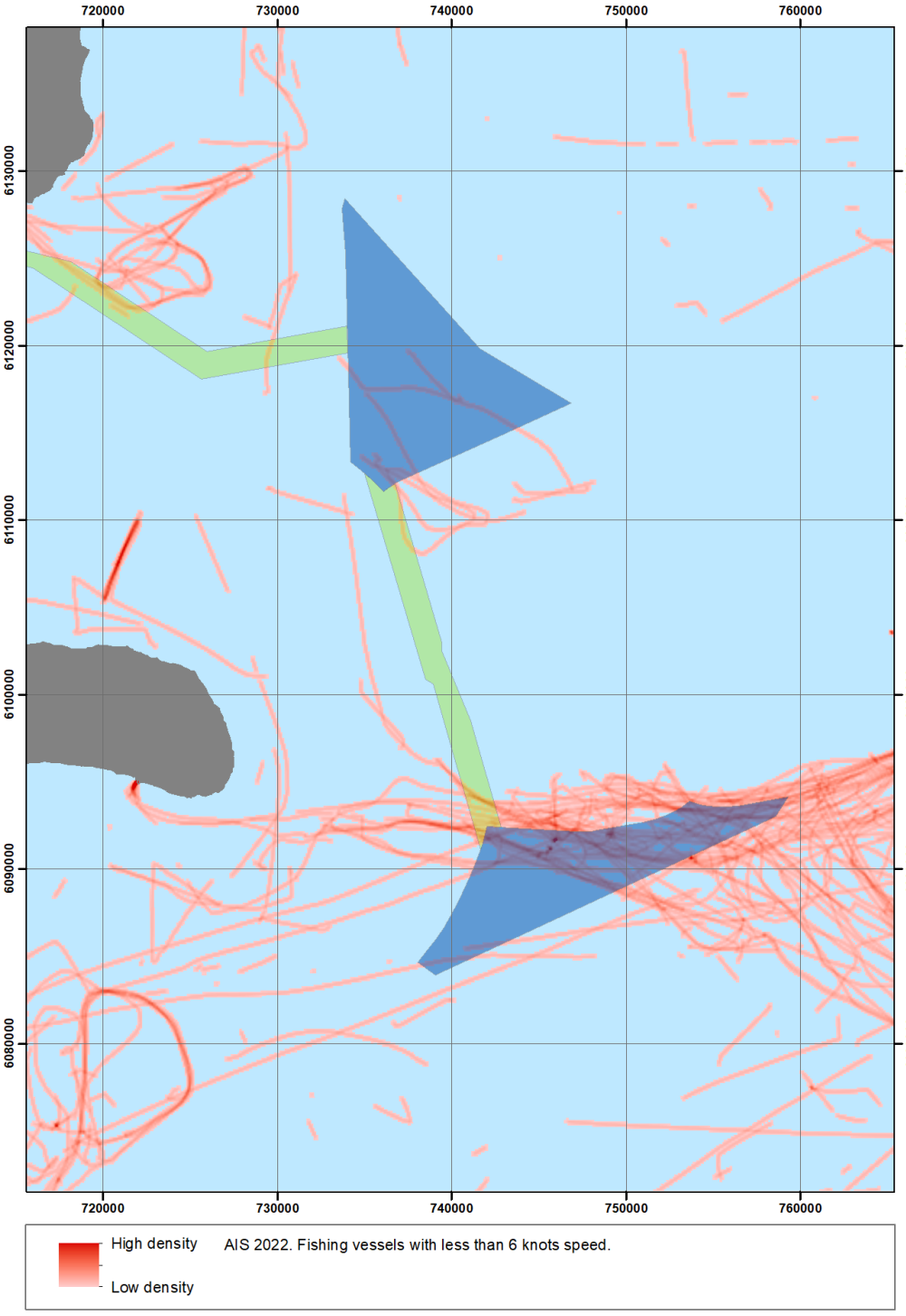


Figure 5-6. AIS tracking data for fishing vessels with less than 6 knots speed in the Kriegers Flak area in 2022. Source: Danish Maritime Authority, 2024.

5.3 AIS & VMS data

To further provide information on active fishing areas, a combination of AIS (Automatic Identification System) and VMS data has been utilized. The figures below (Figure 5-7 and 5-8) show the combination of AIS tracking data and VMS data in 2021 and 2022.

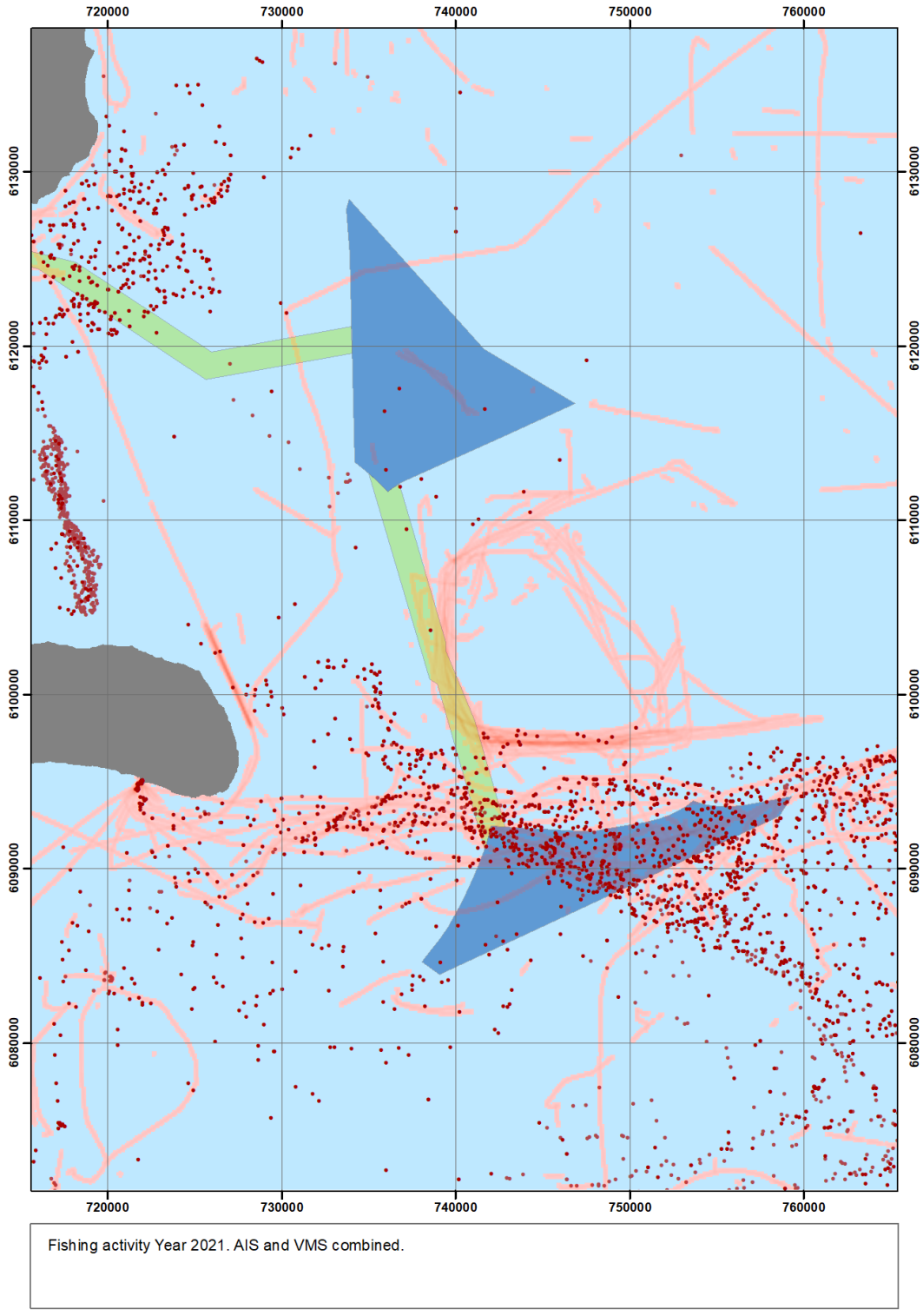


Figure 5-6. The figure shows fishing activity for fishing vessels in the planned Kriegers Flak area in 2021 by combination of AIS and VMS data. Source: Danish Maritime Authority, 2024 & Danish Fisheries Agency, 2023.

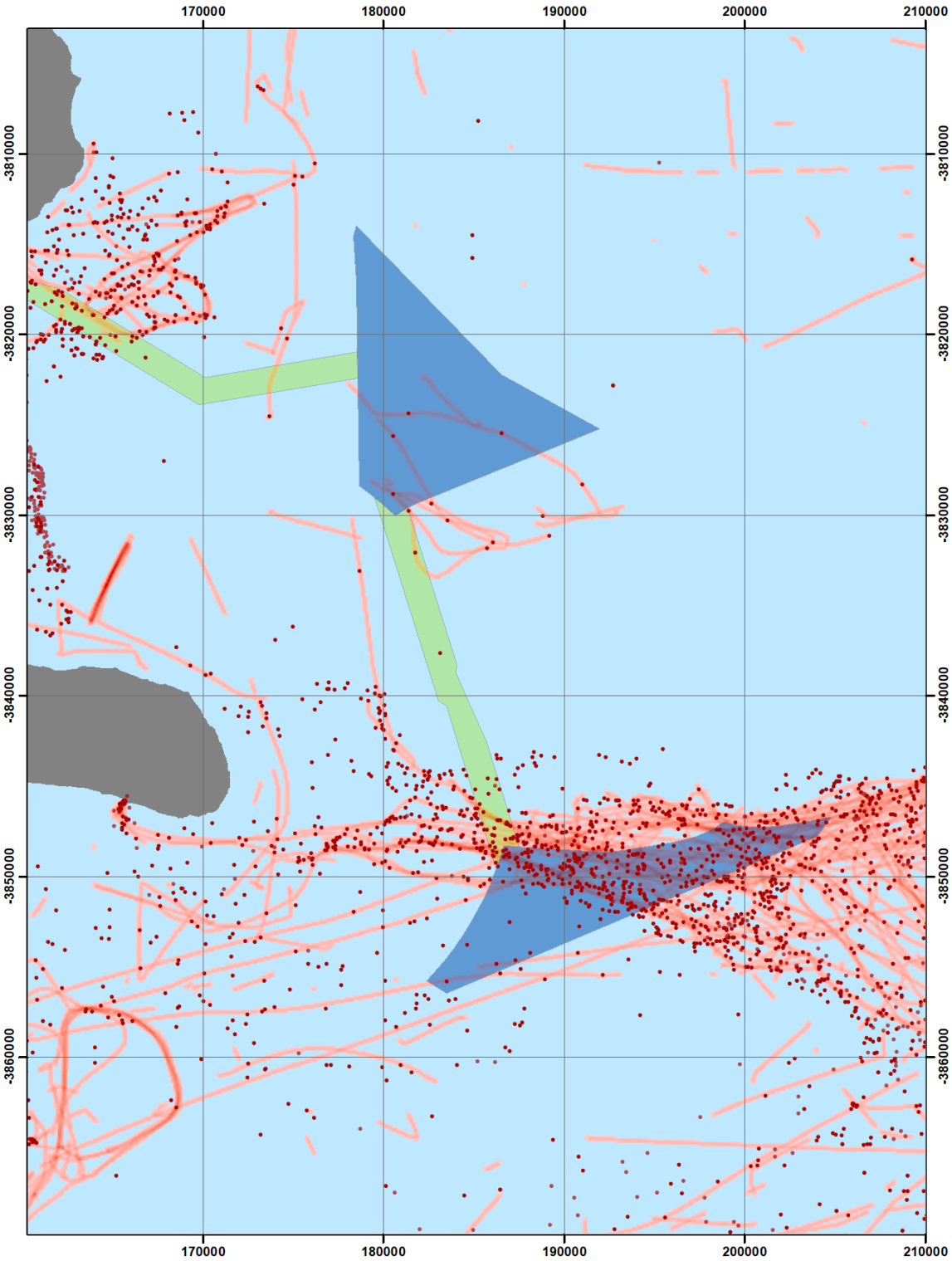


Figure 5-6. The figure shows fishing activity for fishing vessels in the planned Kriegers Flak area in 2022 by combination of AIS and VMS data. Source: Danish Maritime Authority, 2024 & Danish Fisheries Agency, 2023.

5.4 Map plotter data

Fishing in the Baltic Sea, including the Kriegers Flak II OWF area, has experienced a drastic decline over the past decade. According to information gathered from interviews with fishers, there are now only three trawlers left with significant interest in the waters where Kriegers Flak II North and South are to be established (Krog Consult, 2024). Due to the poor condition of the cod stock, existing restrictive fishing regulations, and the relatively long distance from home ports, the planned Kriegers Flak area holds very limited or no interest for the remaining net fishers in the vicinity.

In the Kriegers Flak II North area, fishing activity is extremely limited, while the fishery in the Kriegers Flak II South area is more substantial (Krog Consult, 2024) (Figure 5-4). The trawl lines indicated primarily date back to before the significant decline in fishing that began before 2018. Historically, cod was the primary target species, but in recent years, flatfish - mainly plaice, sole, turbot, and flounder—have become the most important species for trawling in the area. Additionally, there has been a notable occurrence of small plaice (fry, fish below the minimum size) in the region (Krog Consult, 2024).

Regarding the export cables from Kriegers Flak II North and South OWF, they are expected to partly follow the same cable tracks as those from the Kriegers Flak OWF. According to current legislation ("Kabelbekendtgørelsen"), unless cable owners apply for exemptions from the order's rules, a ban on using anchors and bottom dragging tools will automatically be established within 200 meters of the cables (Krog Consult, 2024). Since the cables will intersect trawl tracks all the way to the landing point at Rødvig (Figure 5-5), this could significantly impact trawl fishing, although it's worth noting that this consequence is already evident in connection with the existing Kriegers Flak OWF (Krog Consult, 2024).

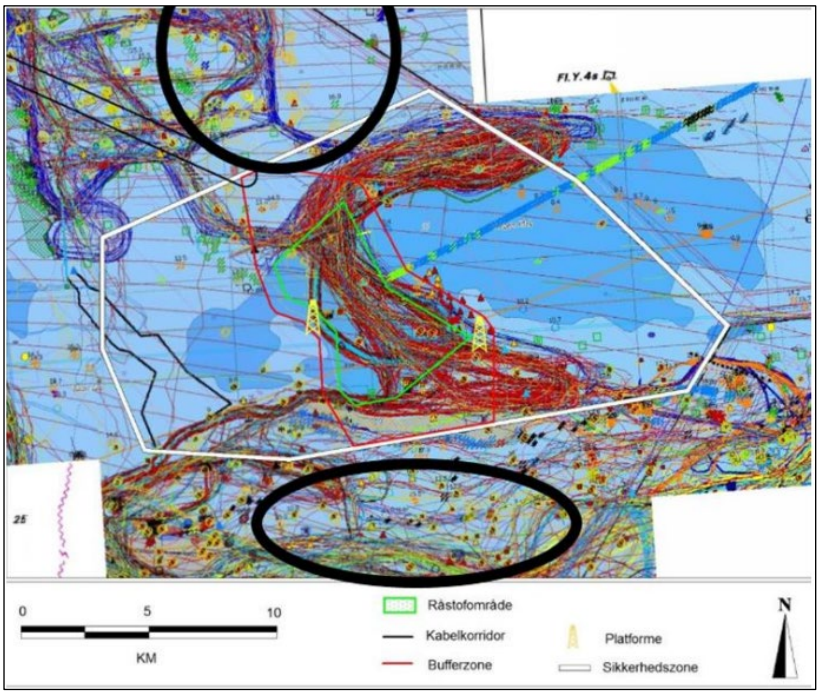


Figure 5-4. Trawl tow lines in the Kriegers Flak area. The boundary of the existing Kriegers Flak offshorewind farm is marked with the white safety zone. The area marked with a green line is laid out for raw material extraction (sand). The red line marks the demarcation of the two parts of the wind farm that make up the existing wind park. The approximate location of the Kriegers Flak II North and South is marked with a black line. Source: Krog Consult, 2024.

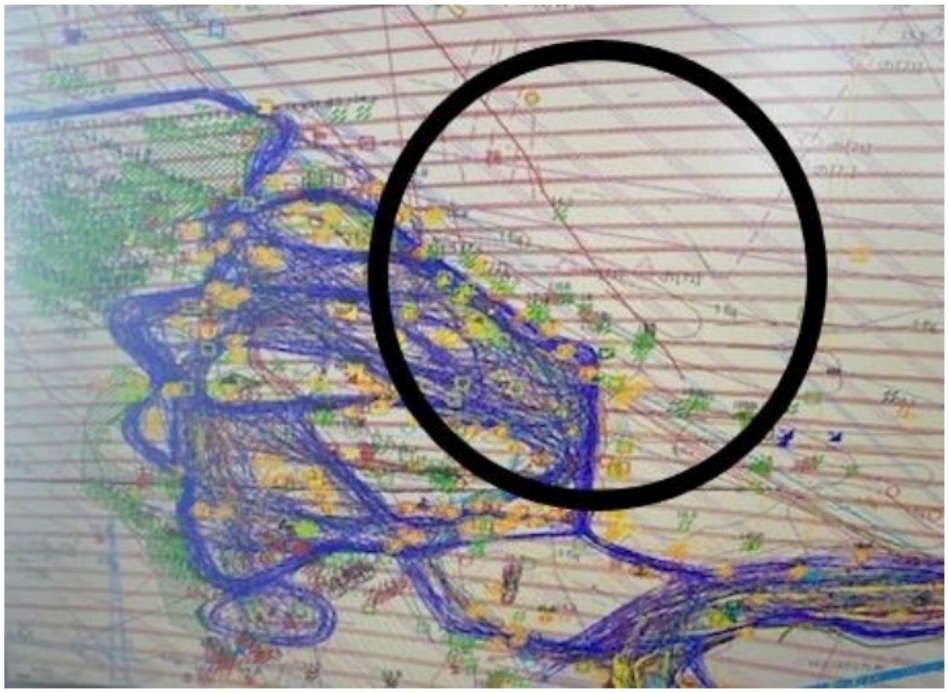


Figure 5-5. Trawl lines in the waters north of the existing wind farm on Kriegers Flak, where the Kriegers Flak II North is planned to be located (approximate location marked with a black line) and through which the cable to land will pass. Source: Fisher no. 10, Krog Consult, 2024.

Figure 5-6. Trawl lines from a demersal trawler showing the fishing pattern in the Kriegers Flak II area. The approximate location of the Kriegers Flak II North OWF is marked with a black line. Source: Fisherman no. 9, Krog Consult, 2024.

Figure 5-7. Trawl lines in the Kriegers Flak II South OWF area. Source: Fisherman no. 10, Krog Consult, 2024.

6 CONCLUSION

The Baltic Sea fisheries have experienced a notable decline in the number of fishing vessels reporting landings. Cod landings have significantly decreased over the years, from 8 808 tonnes in 2013 to 44 tonnes in 2023. Flatfish landings have also shown a downward trend over the past decade, decreasing from 3592 tonnes in 2013 to 1167 tonnes in 2023. Herring landings have fluctuated but overall show a decline, from 28 983 tonnes in 2013 to 18 640 tonnes in 2023. Mackerel and industrial fish landings exhibit variability without clear trends, while crustaceans and molluscs have relatively stable landings with minor fluctuations.

In recent years, flatfish - primarily plaice, sole, turbot, and flounder - have become the most important species for trawling in the western Baltic Sea. Ports such as Rødvig and Klintholm, once crucial for western Baltic Sea fishing, have seen a significant decline in cod landings, with Rødvig's total landings dropping from 5 111 tonnes in 2013 to 15 tonnes in 2023. Flatfish and herring landings have also experienced a drastic decline. Until 2017, these ports annually handled fish valued at 20-30 million DKK; however, by 2023, the total landing value had fallen to less than 1 million DKK.

In the KF II North area, fishing activity is extremely limited, whereas the fishery in the KF II South area is more substantial. According to interviews with fishers, only three trawlers now have significant interest in the waters of the planned KF II North and South areas. Generally, the highest fishing activity during the year is from October to December, followed by July to September, with the lowest fishing activity recorded from April to June.

The export cables from KF II North & South OWF are expected to partly follow the same cable corridor as those from the Kriegers Flak OWF. Current legislation mandates a ban on using anchors and bottom-dragging tools within 200 meters of the cables. Since the cables will intersect trawl tracks all the way to the landing point at Rødvig, this could significantly impact trawl fishing, a consequence already evident with the existing Kriegers Flak OWF.

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APPENDIX 1 NOTAT - INDHENTNING AF OPLYSNINGER FRA FISKERE I FORBINDELSE MED FORUNDERSØGELSERNE TIL HAVVINDMØLLEPROJEKTER I KATTEGAT OG ØSTERSØEN

Carsten Krog: ***UDKAST***

NOTAT

Indhentning af oplysninger fra fiskere i forbindelse med forundersøgelserne til havvindmølleprojekter i Kattegat og Østersøen

Juni 2024

DNV Denmark A/S har af Energinet Eltransmission A/S fået til opgave at gennemføre marine miljøundersøgelser i Indre danske Farvande i forbindelse med udbygningen af havvindområderne i Kattegat og Østersøen (*DNV Denmark A/S. Energinet - marine Environmental Studies (Fisheries), project no.10443476)*.

Arbejdet inkluderer baseline beskrivelse/undersøgelse af fisk og fiskeri i de omhandlede områder. Det er af DNV/Energinet besluttet ikke at gennemføre fiskeundersøgelser men alene at beskrive fisk og fiskeri baseret på eksisterende informationer. Det er dog samtidig besluttet, at der skal gennemføres interviews af fiskere med interesser i de relevante farvandsområder. Dette arbejde har DNV Denmark overdraget Krog Consult v./fiskerikonsulent Carsten Krog at gennemføre.

Metode

Indledningsvis er fiskernes hovedorganisation, Danmarks Fiskeriforening DFPO /4/ blevet kontaktet med henblik på dels at informere om det igangværende projekt, og dels at få forslag til fiskere, som det kunne være relevant at kontakte. Herefter er der taget kontakt med de lokale fiskeriforeningsformænd i havnene i Klintholm /5/, Grenå /1/ og Gilleleje /6/ for at aftale møder med fiskerne i de primære landingshavne for fiskeriet i Kattegat - Grenå og Gilleleje. Fiskeriet i Østersøen er gået overordentligt meget tilbage i de senere år, og fiskeriets omfang, karakter og udvikling her er hovedsageligt beskrevet ud fra telefoniske interviews.

Formændene i de nævnte primære havne er anmodet om at indkalde andre relevante fiskere til at de aftalte møder. – Praksis viser, at det sjældent går helt som forventet/aftalt, bl.a. fordi fiskerne er på fiskeri eller andet på dagen. Det er ofte muligt, når man først er på stedet, at finde frem til fiskere og andre, som kan være relevante at interviewe. De der ikke har været hjemme på besøgstidspunktet, og fiskere fra andre havne, er herefter kontaktet telefonisk. Fleksibel planlægning og opfølgning er derfor en forudsætning for at kunne gennemføre processen.

På møderne er fiskerne blevet spurgt ind til deres interesser i de pågældende mølleområder – hvor og hvornår de fisker (evt. dokumenteret med GPS-data), hvilke redskaber de anvender (evt. fotos), fiskearter og mængder, kendskab til gyde- og opvækstområder m.v. Endvidere er den enkelte fisker blevet spurgt ind til deres kendskab til andre fiskere, eventuelt fra andre havne (også udenlandske), som også er aktive i det pågældende område.

Navnene på de interviewede fiskere og andre fremgår ikke af nærværende notat men er angivet ved et nummer, som refererer til en deltagerliste, som ikke er offentligt tilgængelig.

Udkast til notat har været sendt til centrale fiskere til kommentering.

Kattegat mølleområdet

Der er blevet afholdt et møde/besigtigelse i Grenå den 1. maj 2024 med deltagelse af formanden for Grenå Fiskeriforening /1/ og en trawlfisker fra Grenå /2/ samt en mangeårig, tidligere formand for Bønnerup Fiskeriforening /3/. Efterfølgende er der taget telefonisk kontakt med 4 andre fiskere (/12/, /14/,/15/, /16/).

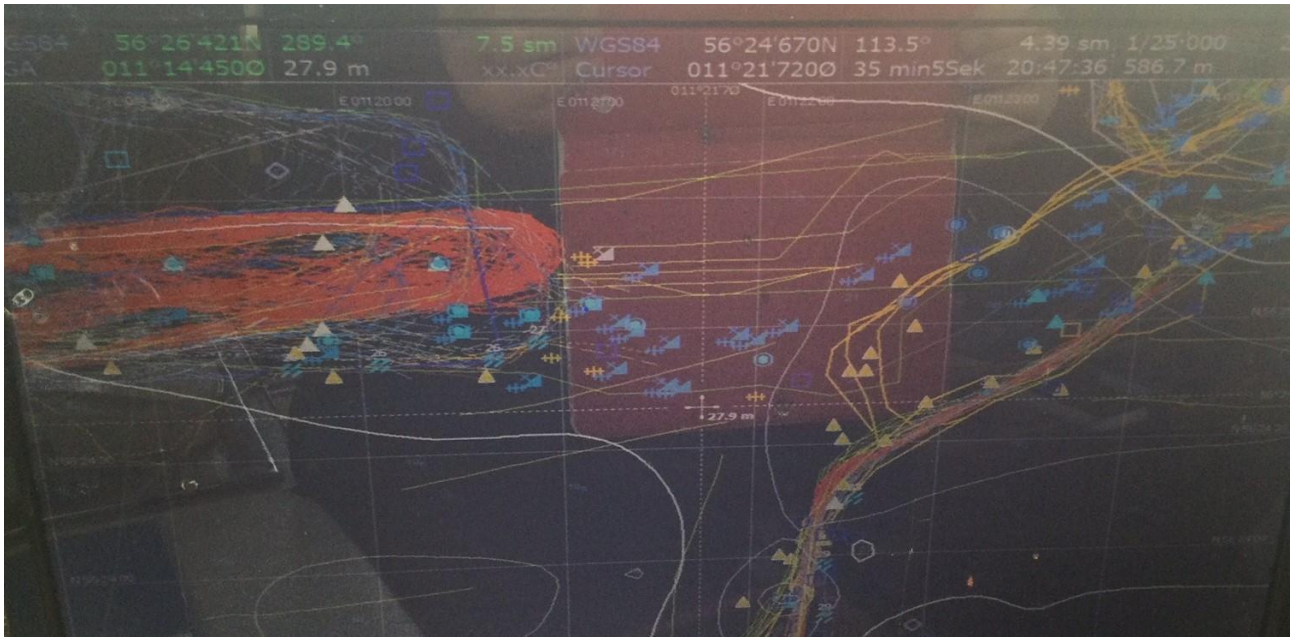
Generelt er fiskeriet i Kattegat gået overordentligt meget tilbage igennem de sidste 20 år, det gælder især for fangsterne af fisk som er reduceret fra omkring 40.000 tons i begyndelsen af 2000-tallet til nu kun ca. 1500 tons. En væsentlig del af forklaringen herpå er, at rettigheden til at lande industrifiskearterne (især brisling) er solgt til fartøjer fra andre, fjerntliggende havne, og at disse arter derfor fanges/landes i Skagerrak/Nordsøen i stedet. Fiskerne i Grenå, og eventuelle udefrakommende fartøjer her, lander deres konsumfisk til Grenå Fiskeauktion mens fisk der landes i Bønnerup overvejende sendes til Strandby Fiskeauktion.

De vigtigste konsum-fiskearter er nu fladfiskearterne tunge, slethvarre, pighvarre og rødspætte, mens landingerne af torsk de seneste år har været på mindre en 1000 kg (Grenå Fiskeauktion, Fiskeristyrelsen). Fangsterne af jomfruhummer i Kattegat er derimod, modsat situationen for fangsten af fisk , gået markant frem fra omkring 1300 tons i begyndelsen af 2000-tallet til nu omkring 1800 tons. Eftersom jomfruhummer er en højværdi-art, har den samlede værdi af alle landinger fra Kattegat kun udvist en relativt begrænset nedgang fra omkring 220 mio. kr i begyndelsen af 2000-tallet til nu omkring 150 mio. kr (alle landingsoplysninger fremgår af BILAG 2A).

Denne udvikling i fiskeriet blev diskuteret med fiskerne. Konsekvensen har naturligvis været, at især fiskeriformer, specielt garnfiskeriet, som ikke har jomfruhummer som målart er gået markant tilbage. I Bønnerup og Grenå er der således nu kun en håndfuld garnfartøjer tilbage, som kan betegnes som fuldtids kommercielle – nogle af disse fisker endvidere periodisk i fjernere farvande (Skagerrak, Nordsøen) for at kunne opretholde den nødvendige indtjening. Der er fortsat et betydeligt antal enmands joller med fiskerinummer udrustet til garnfiskeri i både Grenå og Bønnerup – de pågældende fiskere har en beskeden aktivitet og er overvejende registreret som bierhvervsfiskere, eller er erhvervsfiskere med alternativ beskæftigelse, og oppebærer en stor del af deres samlede indtægt fra arbejde i land eller fra pension.

De vigtigste fiskearter for garnfiskeriet har i de senere år været arter af fladfisk (pighvarre, slethvarre, tunge, rødspætte) – i visse år har også fangster af stenbider (”kulso”) været af væsentlig betydning.

Der foregår nu kun meget lidt fiskeri med garn i mølleområdet /1/, 3/, /14/, der er dog enkelte garnfartøjer som fisker fladfisk, og som i sommer- efterårsperioden desuden driver et fiskeri med såkaldte krabbegarn (aflagte, stormaskede stenbider-eller pighvarregarn) efter taskekrabber (Se fig. 1). Tidligere da torskebestanden/-kvoten var meget højere udgjorde mølleområdet en attraktiv, kystnær fiskeplads for mindre garnfartøjer – også fra andre havne og selv fra fjerne havne som eksempelvis Hvide Sande.



Figur 1. Slæbestreger samt garnsætninger fra et mindre garn/trawlfartøj. Garnsætningerne er vist med rette, gule streger især centralt i området (vest for Torskerenden, se nedenfor) /14/.

Trawlfiskeriet er ikke gået lige så meget tilbage som garnfiskeriet, eftersom det har været muligt at oppebærer den nødvendige indtjening ved at fokusere på jomfruhummer som den primære målart - i værdi repræsenterende ca. 90% af den samlede værdi af landingerne. Den resterende værdi af landingerne hidrører fra bifangst af diverse konsumarter (fladfisk, taskekrabber). Endelig skal bemærkes, at der i de seneste 3 år har været gennemført et forsøgmæssigt fiskeri efter fjæsing med bundtrawl, som kan fanges med mindre maskestørrelse (60 mm), end den der ellers er tilladt til konsumfiskeri. Forsøgsfiskeriet har været begrænset til 3 fartøjer). Dette og tidligere forsøg (Krog, 2005) har dokumenteret, at bestanden af fjæsing er meget stor, og at den i det tidlige forår kan fanges med minimal bifangst af andre arter. Endvidere har afsætningen været god, dog meget afhængigt af fiskenes størrelse (helst > 25 cm). De primære fiskeområder for forsøgsfiskeriet efter fjæsing fremgår af kortet (fig. 7) i det følgende afsnit om Hesselø mølleparken. Ingen af disse områder ligger inden for afgrænsningen af Kattegat mølleparken.

Fiskeriet efter jomfruhummer i Kattegat gennemføres ikke alene af fartøjer hjemmehørende på Djursland eller i Nordsjælland men periodisk også af fartøjer fra fjernere havne (Strandby, Hvide Sande m.fl). For ca. 5 og 10 trawlere i henholdsvis Bønnerup og Grenå har fangst af jomfruhummer i en stor del af året en afgørende betydning for deres økonomi. I opgørelsen indgår også enkelte fartøjer, som er indregistreret i andre lokale havne (Anholt (1) og Ebeltoft (2)).

Jomfruhummer fanges overvejende i bundtrawl som er rigget som 2-trawl med en såkaldt klump, eller evt en rulle i midten, hvor de 2 trawl er koblet sammen, trawlene spiles ved brug af 2 skovle af varierende størrelse (afhængigt af fartøjets størrelse/maskinkraft) – se figur 2. For at kunne fange jomfruhummerne er det nødvendigt, at trawlet følger bunden meget nøje, hvorfor det er monteret med enten en kæderub/såkaldt ”hængebly” eller med en rub med gummiskiver (ofte 6 tommer i diameter). Førstnævnte type af rub anvendes, hvor havbunden er jævn, og uden sten, mens den anden type anvendes, hvor der i havbunden kan forekomme sten, som kan ødelægge trawlet hvis de ”fanges” heri.

Enkelte mindre trawlere /12/, /14/,15/, fisker med enkelttrawl efter primært fisk, men med jomfruhummer som bifangst. Disse trawl er forsynet med ”bobbins” (trawlkugler) eller skiver, således at de kan anvendes på

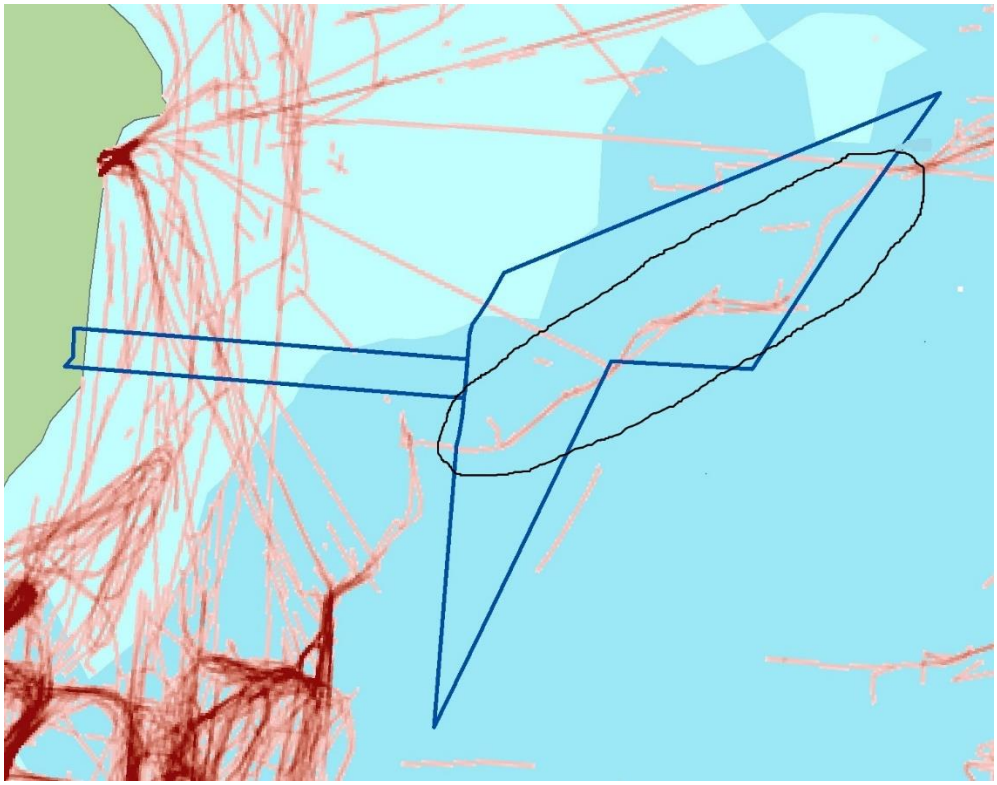
mere ujævn havbund, eventuelt med sten, deres fiskeri foregår derfor overalt i mølleområdet, dog undtaget visse områder med store sten/stenbunker. De primære målarter er fladfiskearter som rødspætter, pighvarre, slethvarre og tunger. Indtil for 15-20 år siden udgjorde torsken også en væsentlig del af fangstværdien.

Fiskeriet efter jomfruhummer foregår om natten eller i skumringen, hvor jomfruhummeren er oppe af deres huler i havbunden for at søge føde. Hvert trawltræk har typisk en varighed på omkring 5 timer svarende til en trawlet strækning på 25-30 km.

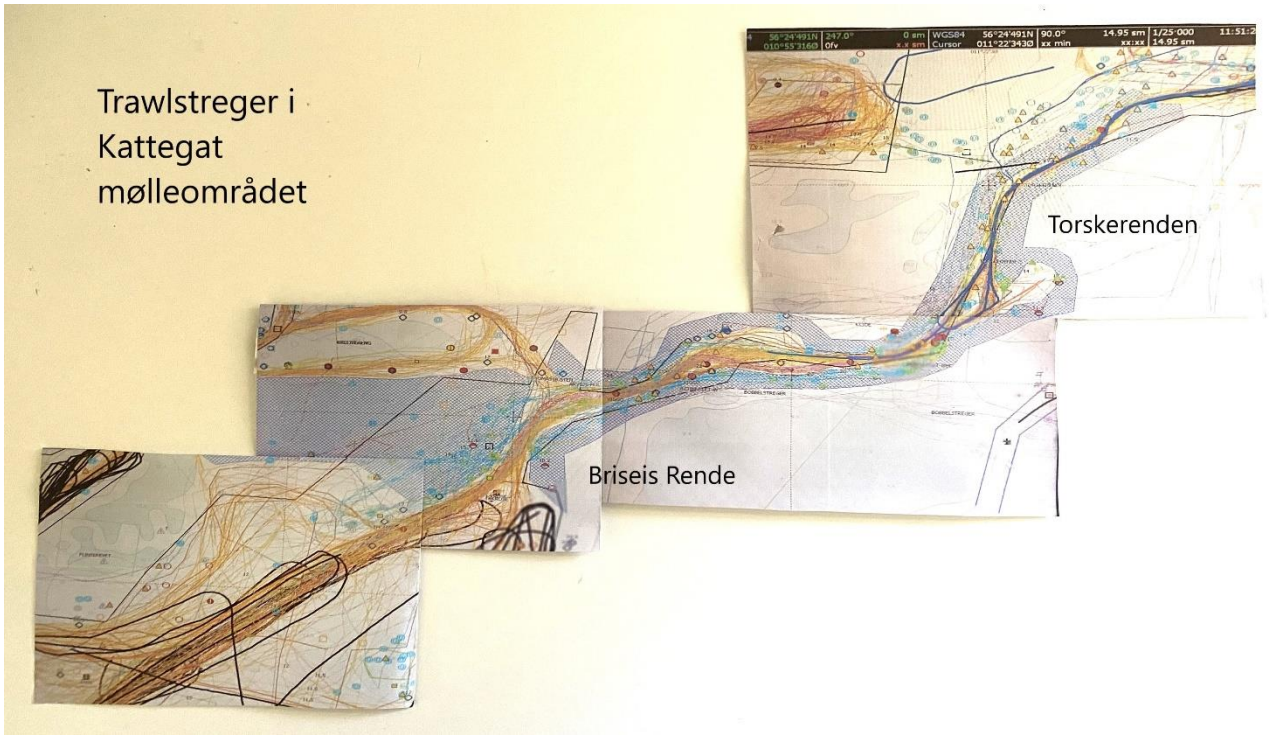
Figur 2. Hummertrawler i Grenå Havn. Bemærk 2 trawltromler, trawlskovle og kædeklump, hvortil de to trawl er forbundet.

Hummertrawlerne fra Djursland fisker naturligvis ikke kun i de helt lokale farvandsområder men fisker også i andre dele af Kattegat, herunder også i det andet mølleområde (nord for Hesselø). Der er et vigtigt, og tydeligt afgrænset trawlspor tværs igennem Kattegat-mølleområdet, som tydeligt fremgår af figur 3. Det skal bemærkes, at denne figur alene bygger på en begrænset mængde VMS-data og på en mangelfuld sortering af data. Samme trawlspor fremgår af Miljøstyrelsens kortlægning i forbindelse med etableringen af Natura 2000 området umiddelbart syd og øst for det nævnte trawlspor - se BILAG 1 (Naturstyrelsen, 2014). Fiskerne /1/ har beredvilligt stillet deres GPS-data over deres fiskeris geografiske udstrækning til rådighed. I figur 4 er fotos heraf sat sammen til en helhed, som dækker hele forløbet igennem Kattegat-mølleområdet. Som det tydeligt fremgår, er fiskeriet efter primært jomfruhummer begrænset til en meget snæver og bugtende rende som strækker sig fra NØ mod SV igennem mølleområdet. Trawlsporet omgives af områder med sten og ujævn bund, hvor der ikke kan anvendes jomfruhummertrawl, der på grund af deres tætte bundkontakt uvægerligt ville hænge fast i bunden her. Den befiskede rende er 30-50 meter dyb og bunden her er relativt blød (mudder, sand). Afstanden igennem området svarer nogenlunde til et trawltræk (20-25 km).

Udenfor den nævnte relativt dybe rende på tværs af mølleområdet fiskes der i begrænset omfang også med trawl (med kugler/skiver) efter fisk - primært fladfisk: rødspætter, pighvarre, slethvarre, tunge) tidligere også efter torsk. Denne type fiskeri drives nu kun af ganske få mindre trawlere, dels pga bestands- og kvotesituationen, dels fordi mange er ophørt med fiskeri, og dels fordi fiskeri efter jomfruhummer udgør et attraktivt alternativ. Disse mindre trawleres positioner/fiskeri fremgår ikke af VMS-registreringen, eftersom fartøjerne er mindre end 12 meter.



<u>Figur 3.</u> VMS-positioner for fiskefartøjer med aktivitet i farvandet øst for Djursland (2022, hastighed< 6 knob). Kattegat-mølleområdet og kabeltraceet til land er markeret med blå streg. (DNV, 2024). Området med sort streg markerer det område, hvorfra der er fremskaffet trawlstreger fra fiskerne (se figur 4). (DNV, 2024).



<u>Figur 4.</u> Trawlspor fra jomfruhummerfiskeri igennem den nordlige del af Kattegat-mølleområdet fra NØ mod SV (se placeringen i fig. 9) /1/. Den blå skravering angiver områder med sten.

Området mellem mølleparken og land, hvor ilandføringskablet skal placeres, er vigtigt for det kystnære fiskeri med garn /14/. Der forventes en effekt på fiskeriet i anlægsperioden, hvor forstyrrelser og uklart vand vil kunne have en midlertidig effekt på fiskenes forekomst/vandring. Tidligere tiders fiskeri med bundgarn på Djurslands østkyst er ophørt for mange år siden, bundgarnsfiskeriet på Djurslands nordkyst forventes ikke at blive berørt af mølleprojektet /16/.

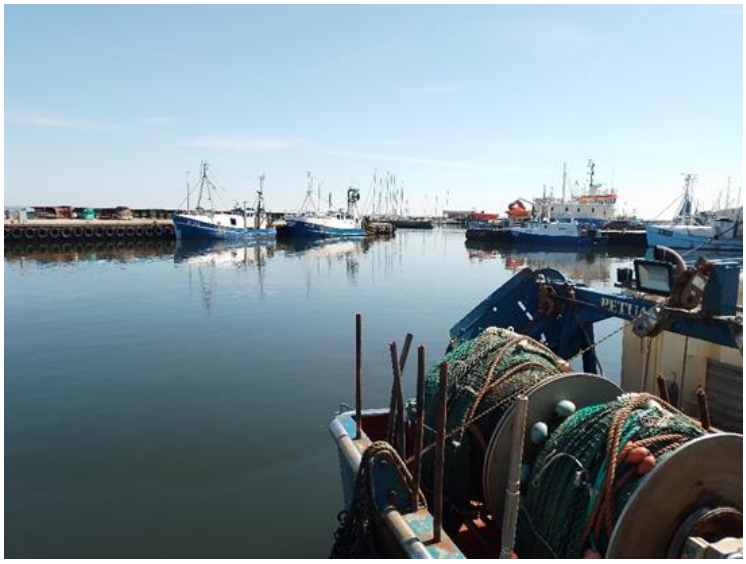
Flere fiskere (/1/, /3/, /14/), udtrykte frygt for, at elektromagnetisk stråling fra kablerne vil kunne have en vedvarende effekt på fisk. Samme bekymring gælder fsa kabler/stråling fra kablerne internt i mølleparken – eventuelt kombineret med vibrationer fra møllefundamenter/driften af møllerne. Den dokumenterede viden om en sådan mulig effekt er meget begrænset, men flere af fiskerne henviste til erfaringer fra Anholt-mølleparken, hvor /12/ eksempelvis gentagne gange uden held, og modsat situationen før parken blev etableret, havde forsøgt at lodde fisk (kun fisk oppe i vandet som sild, brisling, fjæsing) ved gennemsejling af mølleparken på vej mod Anholt. En garnfisker /14/ omtalte fiskeriforsøg inde i mølleparken, hvor der kun blev fanget krabber men ingen fisk. Vedkommendes vurdering er dog, at uanset om der er fisk eller ej, avil det ikke være sikkerhedsmæssigt forsvarligt at fiske med enmands fartøjer inde i mølleparken pga risikoen for at drive ind mod møllefundamenterne.

Generelt var fiskerne uforstående overfor, at man havde valgt den pågældende placering af mølleparken, når der både nord og syd herfor var områder hvor fiskeriet ville blive generet i væsentlig mindre grad. En friholdelse af det intensivt anvendte trawlspor på tværs af mølleområdet og en placering af møllerne henholdsvis nord og syd herfor, eventuelt indenfor afgrænsningen, ville kunne reducere generne for fiskeriet betragteligt.

Hesselø mølleområdet

Der er blevet afholdt et møde/besigtigelse i Gilleje den 7. maj 2024 med deltagelse af auktionsmesteren /7/, Formanden for Gilleleje Fiskeriforening /6/ og 2 trawlfiskere (/8, /9/). Efterfølgende er der taget kontakt med 3 andre fiskere med interesser i Hesselø mølleområdet (/1/, /13/, /17/).

Som beskrevet i afsnittet om Kattegat mølleområdet er fiskeriet generelt gået overordentligt meget tilbage i Kattegat igennem de sidste 20 år, det gælder især for fangsterne af fisk, mens landingerne af jomfruhummer er gået markant frem. Eftersom jomfruhummer er en højværdiart har den samlede værdi af alle landinger af både fisk og skaldyr fra Kattegat kun udvist en relativt begrænset nedgang fra omkring 220 mio. kr i begyndelsen af 2000-tallet til nu omkring150 mio. kr (alle landingsoplysninger fremgår af BILAG 2A).



Figur 5. Hummertrawlere i Gilleleje Havn, maj 2024.

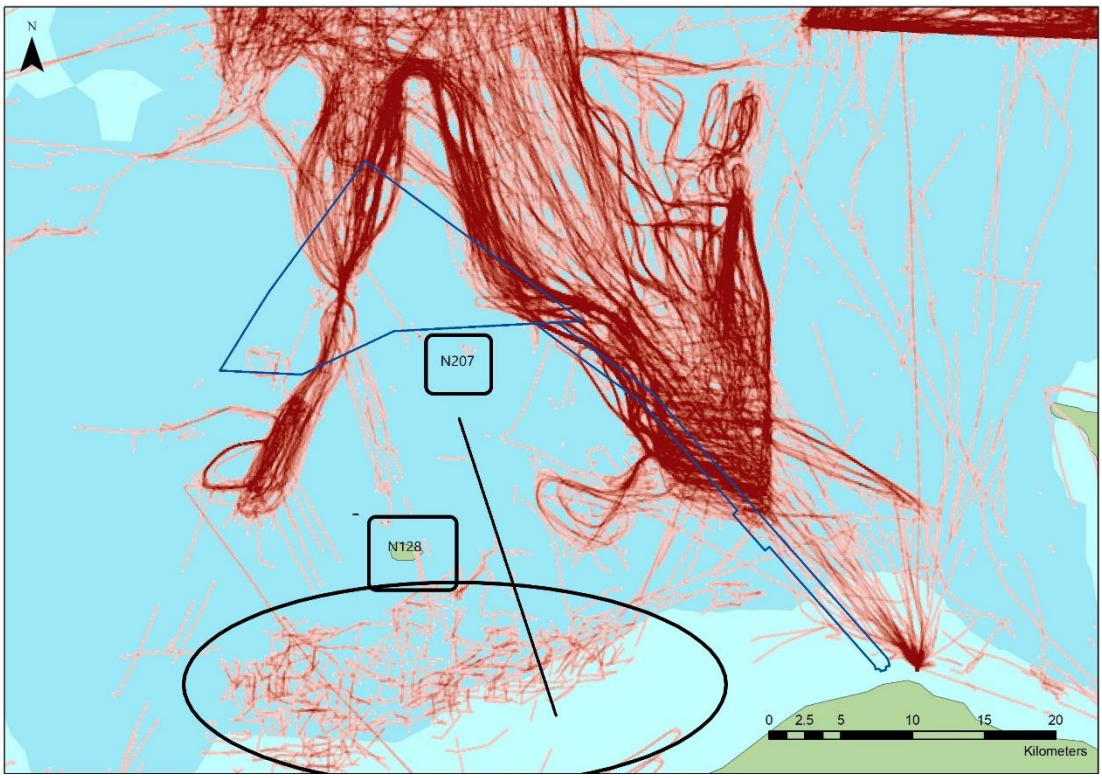
Fiskerne i Gilleleje, og mange udefrakommende fartøjer, lander deres fangster til Gilleleje Fiskeauktion Værdien af landingerne i Gilleleje har udvist mindre dramatiske og negative udsving end i Kattegat generelt, men også her dominerer landingerne af jomfruhummer i stadig stigende grad. I løbet af de sidste 10 år er værdien af jomfruhummerlandingerne næsten fordoblet fra godt 26 mio kr (gennemsnit 2012-2014) til ca. 47 mio kr (gennemsnit 2021-2023). Værdien af landingerne af jomfruhummer udgør nu ca. 85% af den samlede værdi af alle landinger sammenlignet med ca. 75% for 10 år siden (Gilleleje Fiskeauktion AS/Fiskeristyrelsen).

De vigtigste konsum-fiskearter er nu fladfiskearterne tunge, slethvarre, pighvarre og rødspætte. Værdien af landingerne i Gilleleje af disse arter har holdt sig relativt konstant eller endog stigende fsa pighvarre og slethvarre. Landingerne af torsk til Gilleleje auktionen er derimod gået dramatisk tilbage fra at have haft en værdi på mere end 5 mio kr i 2017 til nu (2022-2023) kun godt 100.000 kr.

Denne udvikling i fiskeriet blev diskuteret med fiskerne. Konsekvensen har naturligvis været, at især fiskeriformer, specielt garnfiskeriet, som ikke har jomfruhummer som målart er gået markant tilbage. I Gilleleje – og i de andre havne på Sjællands nordkyst (Hundested og Sj. Odde) - er der således nu kun en håndfuld garnfartøjer tilbage, som kan betegnes som fuldtids kommercielle. Der er fortsat et betydeligt antal enmands joller med fiskerinummer udrustet til garnfiskeri i de nævnte havne – ejerne af disse fartøjer er registreret som bierhvervsfiskere eller erhvervsfiskere med en beskeden aktivitet, og som oppebærer en stor del af deres indtægt fra arbejde i land eller fra pension.

I Gilleleje er der nu 7 hjemmehørende trawlere, men i hummersæsonen er der ofte op til 15 trawlere fra andre dele af landet, som har deres udgangspunkt i Gilleleje havn. I hver af havnene i Hundested og Odden er der 2 hjemmehørende hummertrawlere. Den dominerende fiskeriform er fiskeri med særlige hummertrawl (fig. 5), enkelte af trawlerne driver periodisk også et målrettet fiskeri efter konsumfisk med bobbins-trawl (rub med bobbins/kugler eller skiver), som gør det muligt at fiske på mere ujævn/stenet grund.

De primære fiskeområder fremgår af figur 6, der viser VMS registreringer i 2022 fra alle fiskefartøjer i den sydlige del af Kattegat i og omkring Hesselø-mølleområdet (DNV, 2024). Det skal dog bemærkes, at kun fartøjer >12 meter er omfattet af VMS-registreringen, og at mindre fartøjers fiskeri i området således ikke er omfattet af denne kortlægning (se også BILAG 3). Værdien af de mindre fartøjers fiskeri er imidlertid, set i den store sammenhæng, af minimal betydning (værdien af landingerne fra alle danske fiskefartøjer <12 meter udgør kun 5-10% af den samlede værdi af alle landinger).



Figur 6. VMS-positioner fra fiskefartøjer i Hesselø-området (2022, hastighed <6 knob). Mølleområdet og placeringen af kabeltraceet til land er markeret med blå streg (DNV, 2024). Fiskernes forslag til omtrentlig placering af den midterste del af kabeltraceet er markeret med sort streg /8/, /9/. Den omtrentlige placering af Natura-2000 områderne N207 og N128 er markeret med firkanter. VMS-registreringer af garnfiskeriet er indeholdt i elipsen markeret med sort streg nederst i billedet.

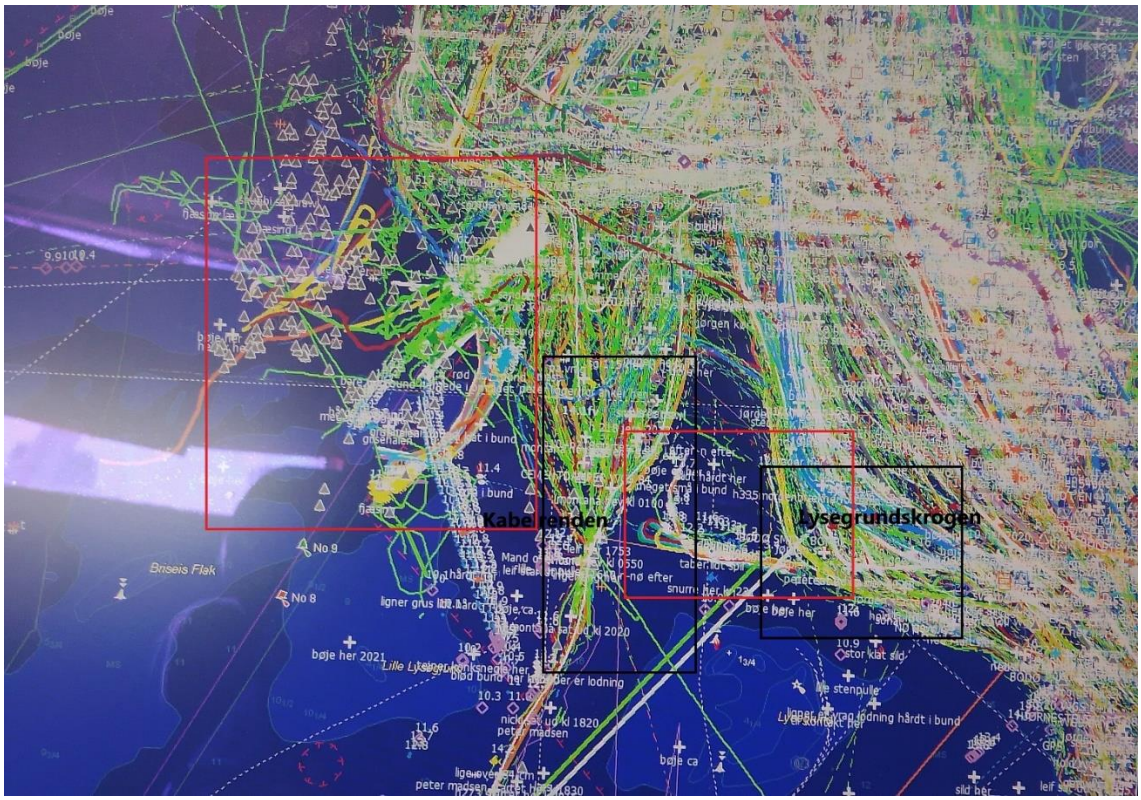
Mølleområdet er, som det fremgår af figur 6, placeret nord for Hesselø, og umiddelbart nord for Lysegrund (Natura-2000 område N207) og som det tydeligt fremgår foregår der inden for afgrænsningen af mølleområdet og af kabelforløbet mod land et intensivt fiskeri med trawl. Flere fiskere har givet adgang til deres GPS-loggere, som understøtter VMS-kortlægningen. I figur 7 ses fiskernes kortlægning/trawlstreger, hvor især skal bemærkes de 2 vigtige trawlområder: "Kabelrenden" igennem den centrale del af mølleområdet og "Lysegrundskrogen" i den østlige del af mølleområdet /9/. I figur 8 er vist trawlstreger fra en mindre trawler /17/, som fisker intensivt i "Kabelrenden". Den markante indsnævring af fiskeområdet skyldes dårlige bundforhold (sten) på begge sider heraf, som umuliggør fiskeri med bundtrawl. Fiskeriet med

trawl følger som regel dybdekurverne, og som det fremgår, fiskes der overvejende nord-syd igennem området. Den primære målart her er jomfruhummer, med en mindre bifangst af fladfiskearter. Som noget specielt i år er der desuden en relativ stor forekomst af kuller i fangsterne – dog overvejende under mindstemålet. Udover hummer-trawlfiskeriet foregår der desuden et mindre trawlfiskeri med "fisketrawl" (rub med kugler/skiver), som gør det muligt at fiske på mere stenet/ujævn grund) uden for de omtalte intensivt befiskede trawlspor.

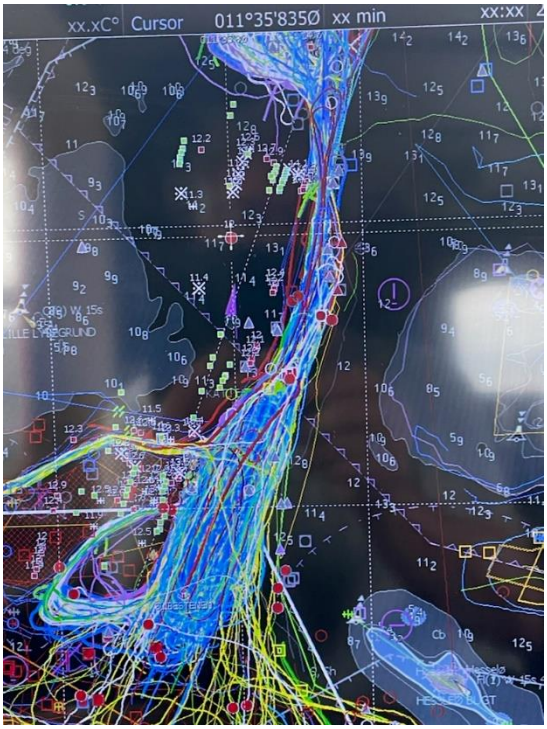
Der er igennem de seneste 4 år gennemført et forsøgsmæssigt fiskeri efter fjæsing med særlige trawl med reduceret maskestørrelse. Fjæsingen forekommer visse steder, især om foråret, i enorme mængder. Som det fremgår af figur 7 vil et par af disse områder blive berørt af mølleprojektet.

Som tidligere nævnt er der kun ganske få aktive garnfartøjer i de nordsjællandske havne, deres fiskeri foregår naturligvis uden for trawlområderne og overvejende mere kystnært /13/. Vigtige arter for dette fiskeri er fladfisk (især tunger om foråret), og stenbider("kulso") i årets første måneder (dette fiskeri er nu på det seneste blevet stærkt reguleret/begrænset). Garnfiskerne ser temmelig mange småtorsk i deres redskaber men kun sjældent torsk over mindstemålet. Garnkutterne i området anvender sjældent mere end 100 garn, som fastholdes med mindre ankre (typisk 3 kg) for hver 10-15. garn /13/.

Den valgte placering af eksportkablerne fra mølleparken og til ilandføringen vest for Gilleleje vil i den nordlige halvdel af forløbet (fra ca. 10 sømil fra kysten) komme til at gå igennem vigtige trawlområder. Eftersom fiskeri med bundslæbende redskaber i udgangspunktet vil være forbudt indenfor 200 meter fra kablerne vil det valgte kabelforløb være ødelæggende for bundtrawlfiskeriet i området. Fiskerne foreslår derfor en andet forløb af kabelkorridoren længere mod vest (se figur 6).

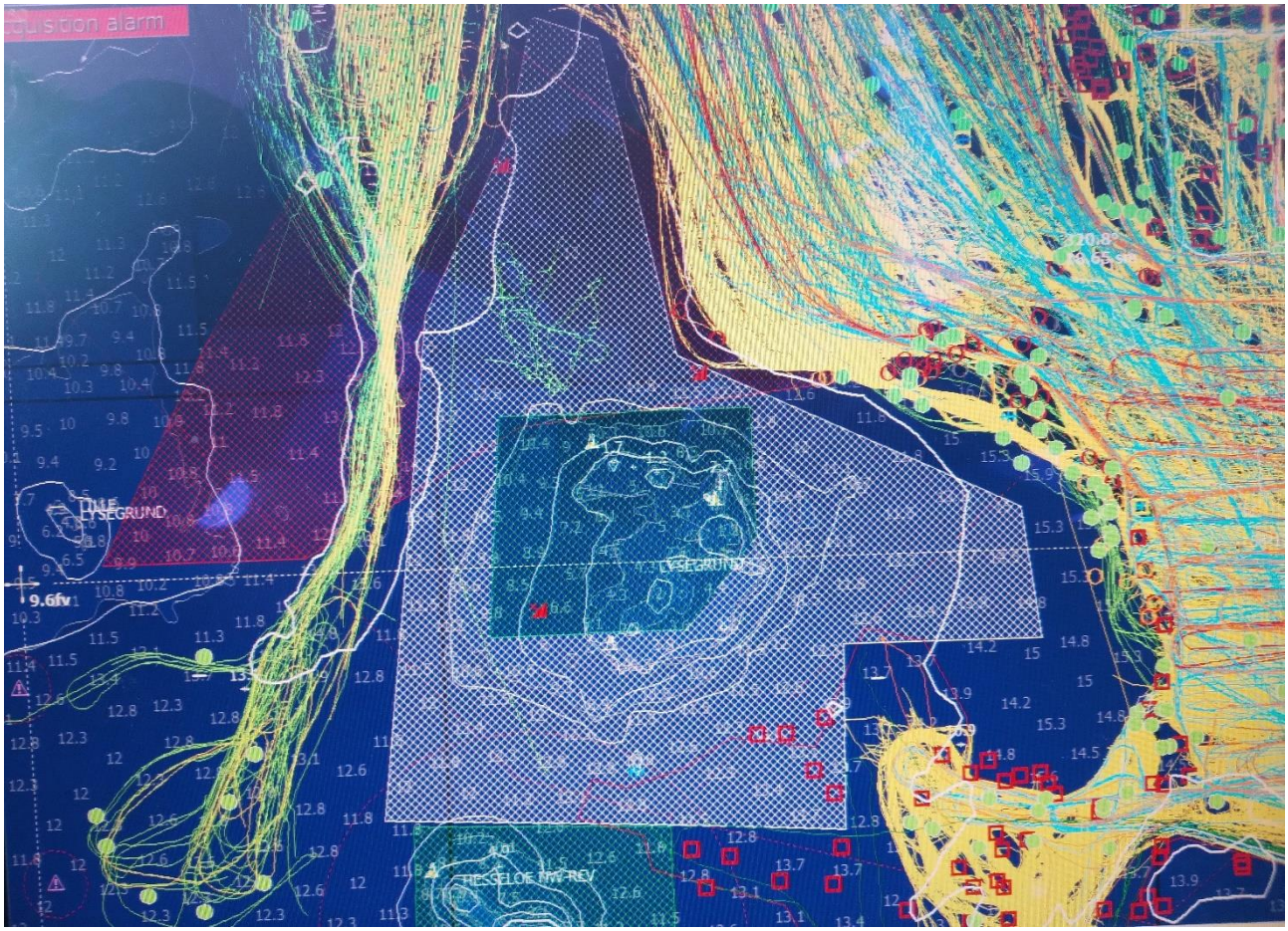


Figur 7. Trawlstreger i og omkring Kattegat-mølleområdet /9/. I områderne angivet med rød streg er der i de seneste år gennemført et forsøgsfiskeri efter fjæsing - det østlige af disse områder ligger inden for afgrænsningen af mølleparken. Med sort streg er angivet vigtige trawlområder (Kabelrenden og Lysegrundskrogen), som begge ligger inden for afgrænsningen af mølleparken.



<u>Figur 8</u>. Nord-syd gående trawlstreger fra mindre trawler (fisker med enkelt trawl) igennem Kabelrenden i den vestlige del af Hesselø mølleområdet /17/.

Fra fiskerne og deres organisations side (/4/, /7/, /8/) er der udarbejdet et alternativt forslag til placering af mølleparken som vil genere fiskeriet væsentligt mindre end det nuværende forslag til placering (Figur 9). Som det fremgår, foreslås møllerne placeret i et område imellem hhv "Kabelrenden" og "Lysegrundskrogen", nord for Hesselø (Natura 2000 område N128) men omkransende Natura 2000 omr. N207 (Lysegrund).



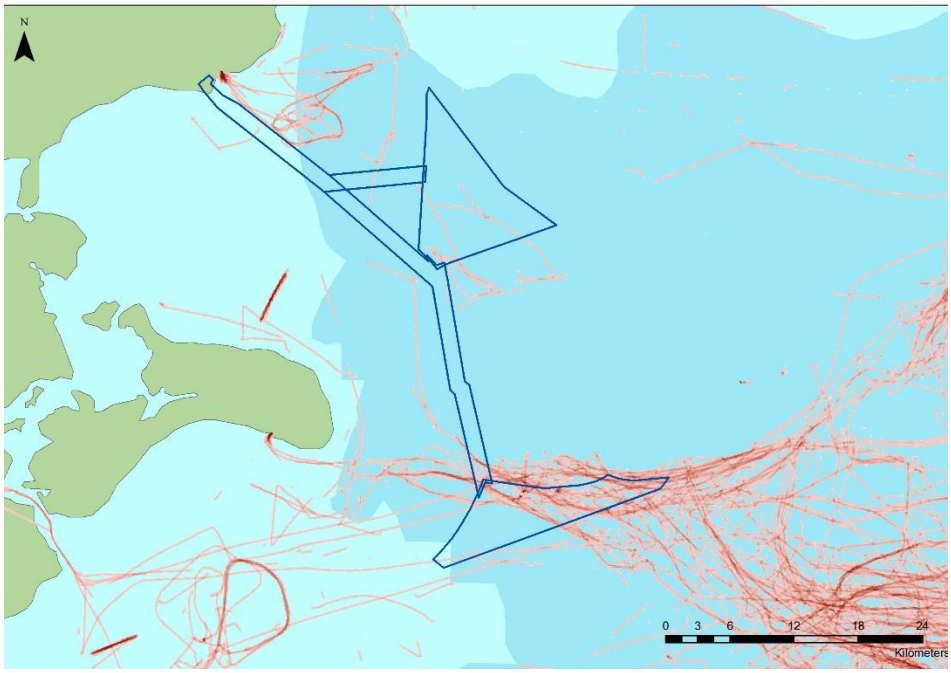
<u>Figur 9</u>. Fiskernes forslag til alternativ placering af Hesselø mølleparken (hvid skravering) /8/.

Kriegers Flak mølleområderne (nord og syd)

De vigtigste fiskere i Kriegers Flak mølleområderne er blevet kontaktet enten telefonisk /10/, /11/ eller ved opmøde /9/. For at overleve økonomisk fisker de alle også i andre farvande end vestlige Østersø/Kriegers Flak.

Fiskeriet i Østersøen, herunder i de nævnte mølleområder, er gået voldsomt tilbage i løbet af det sidste tiår, dette gælder især for så vidt angår landingerne af torsk, som er gået tilbage fra en årlig landingsværdi på 200-380 mio. kr til nu (2022-2023) så lidt som ca. 1-2 mio. kr årligt (se BILAG 2B). Denne udvikling ses også markant i de 2 havne (Rødvig og Klintholm), som tidligere var de vigtigste for fiskeriet i den vestlige Østersø/Krigers Flak – til og med 2017 blev der i disse havne årligt landet fisk til en værdi af 20-30 mio kr, værdien af de samlede landinger var i 2023 på mindre end 1. mio kr. Nedgangen i de samlede landinger af torsk i de 2 havne har været endnu mere dramatisk - til og med 2017 blev der årligt landet torsk til en værdi af 5-10 mio kr for så i 2023 at falde til en værdi på mindre end 10.000 kr. De vigtigste fiskearter for fiskeriet i Østersøen er nu, i nævnte rækkefølge: Brisling (omkring 50% af samlede landingsværdi), sild, tunge, rødspætte, ål og pighvarre.

Det er hensigten at etablere 2 nye vindmølleparker hhv nord og syd for den nuværende Kriegers Flak Vindmøllepark (se figur 10).



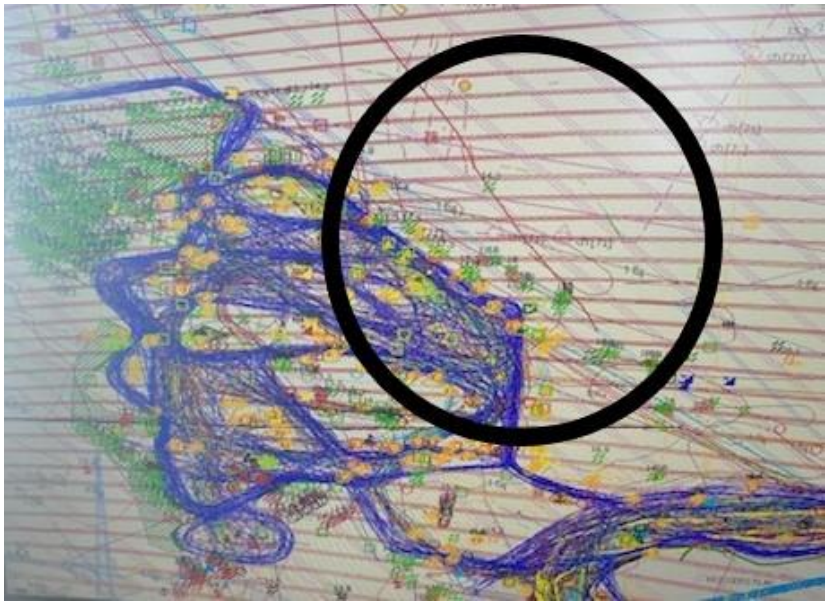
Figur 10. VMS-registreringer i 2022 fra fiskefartøjer der bevæger sig med en hastighed over 6 knob. Endvidere er vist placeringen af de 2 nye vindmølleparker henholdsvis nord og syd for den nuværende Kriegers Flak Vindmøllepark (DNV, 2024).

Fiskeriets omfang og karakter på og omkring Kriegers Flak er tidligere, i forbindelse med Krigers Flak Vindmølle-projektet, blevet beskrevet temmelig detaljeret (Klaustrup & Krog, 2015 og 2021). Eftersom fiskeriet i de senere år, efter 2018, er gået dramatisk tilbage, er oplysningerne i disse redegørelser dog mindre relevante.

I henhold til de nye oplysninger fra fiskerne (/9/, /10/, /11/) er der kun 3 trawlere tilbage, som kan siges at have en væsentlig interesse i farvandet, hvor de nye mølleparker skal etableres. Kriegers Flak-området har set i relation til torskebestandens dårlige tilstand, den gældende restriktive fiskeriregulering, og den relativt

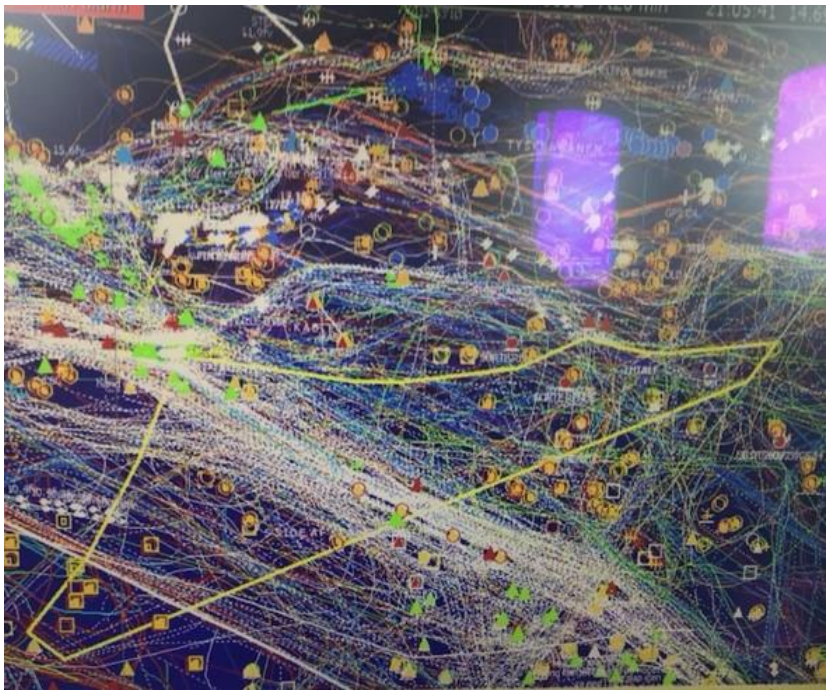
store afstand fra hjemhavnene, kun en meget begrænset eller ingen interesse for de få tilbageblevne garnfiskere i nærområdet.

I Kriegers Flak Nord–området er der som det fremgår af figur - og af Bilag 4 A og B - kun en meget begrænset fiskeriaktivitet, idet det skal bemærkes, at de angivne trawlstreger overvejende er fra før den nævnte dramatiske nedgang i fiskeriet begyndte (før 2018).



Figur 11. Trawlstreger i farvandet nord for den eksisterende møllepark på Kriegers Flak, hvor den nye møllepark, Kriegers Flak Nord tænkes placeret (omtrentlig placering markeret med sort streg) og hvorigennem kablet til land vil komme til at gå igennem/10/.

Fiskeriet i Kriegers Flak Syd-området er mere betydningsfuldt end i den nordlige møllepark, se figur 12 og 13, men også her skal det understreges, at en overvejende del af trawlstregerne er fra før den store nedgang i fiskeriet begyndte. Tidligere udgjorde torsk den primære målart, men i de seneste år har fangsten af fladfisk - primært rødspætte, tunge, pighvarre, slethvarre og skrubbe været de vigtigste arter for trawlfiskeriet i området. I de seneste år er der observeret en stor forekomst af små rødspætter (yngel, fisk under mindstemålet) i området /10/, 11/.



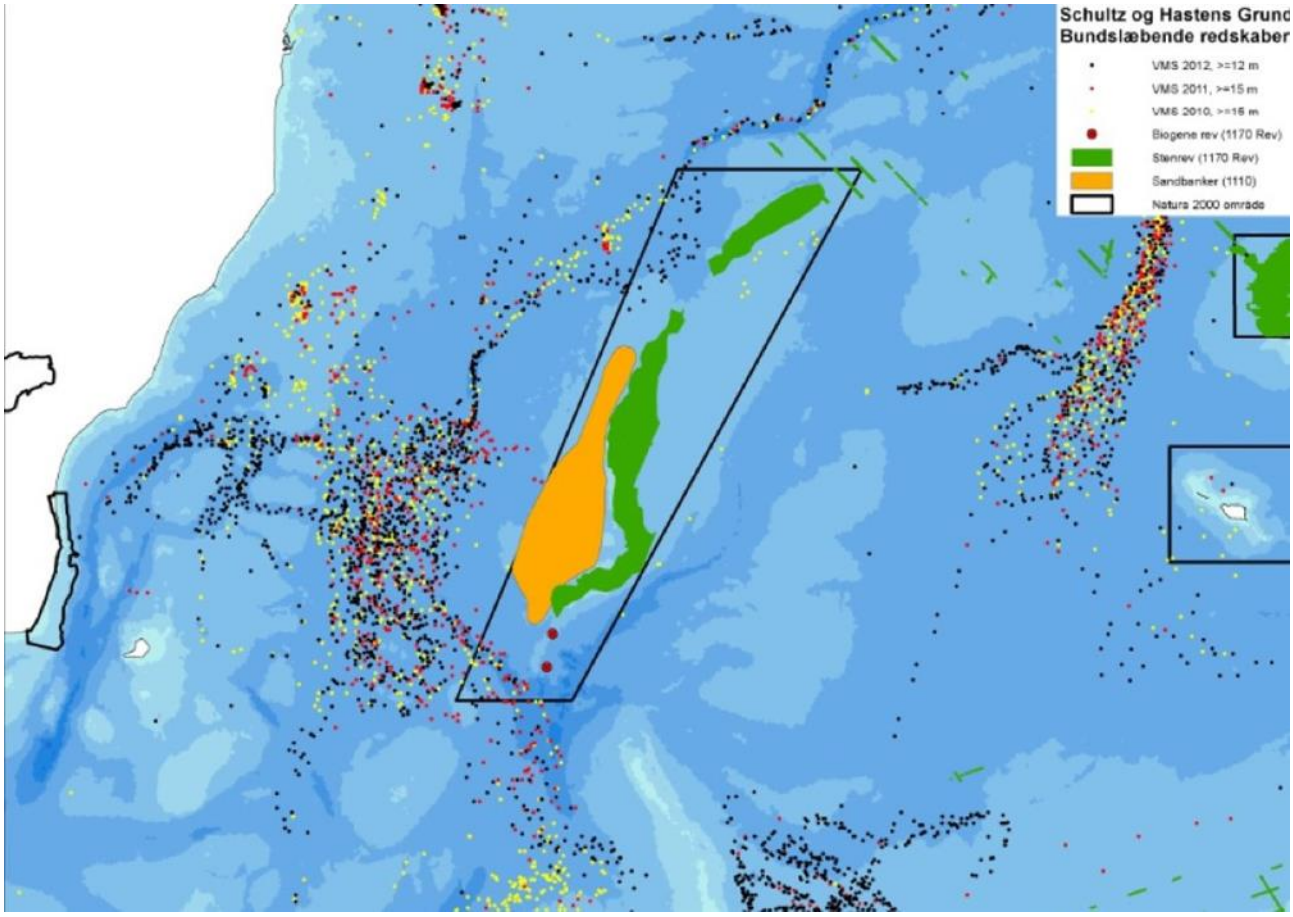
Figur 12. Trawlstreger syd for den eksisterende møllepark på Kriegers Flak med markering (gul streg) af afgrænsningen af den planlagt, nye møllepark)Kriegers Flak Syd) /10/

Figur 13. Trawlstreger fra demersal trawler /9/, der viser fiskerimønsteret i Kriegers Flak området. Med sort streg er markeret den omtrentlige placering af Kriegers Flak Nord mølleparken.

Eksportkablerne fra de 2 nye mølleparker forventes til dels, at blive placeret i de samme kabeltraceer som kablerne fra Kriegers Flak Vindmølleparken. I henhold til gældende lovgivning ("Kabelbekendtgørelsen") vil der, medmindre kabelejerne søger om dispensation fra bekendtgørelsens regler, automatisk blive etableret et forbud mod brug af ankre og bundslæbende redskaber indenfor 200 meters afstand fra kablerne. Eftersom kablerne vil komme til at krydse trawlspor hele vejen ind til ilandføringen ved Rødvig (se BILAG 4 A og B), kan dette have store konsekvenser for trawlfiskeriet, idet det dog skal bemærkes, at denne konsekvens allerede er mærkbar i forbindelse med den nuværende møllepark

BILAG 1

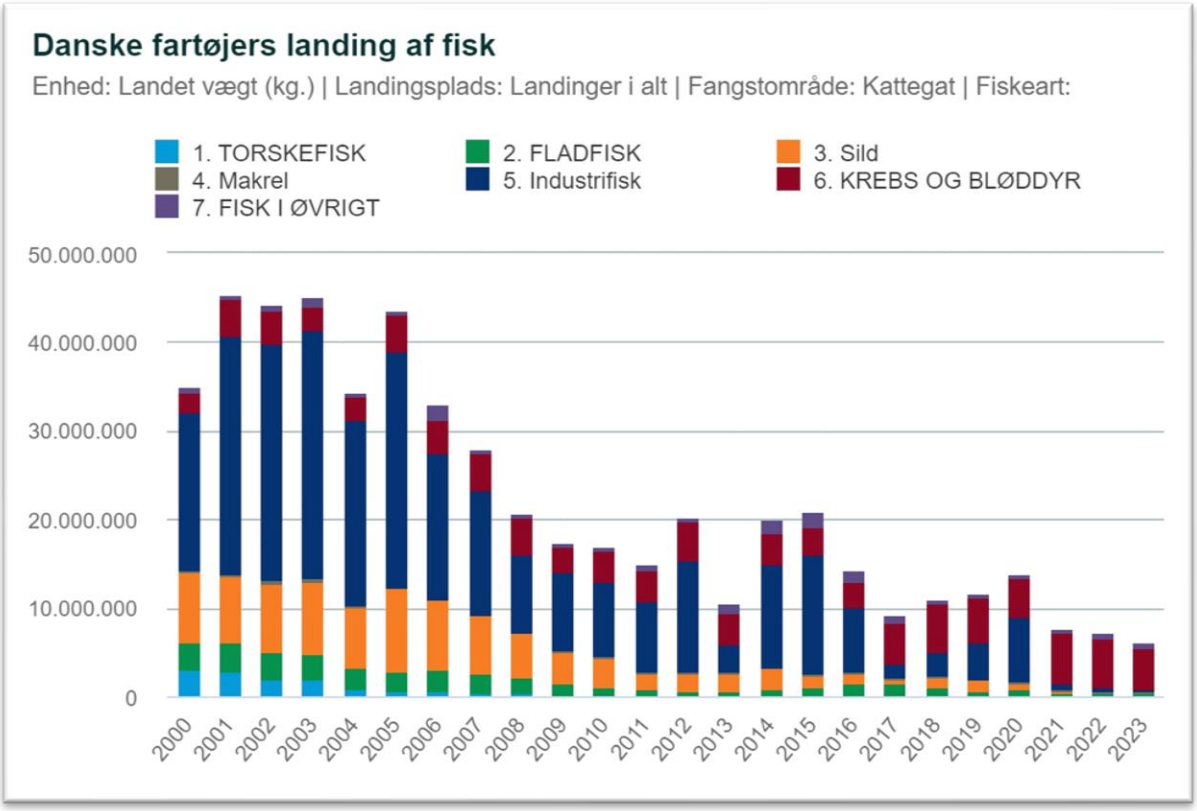
VMS-positioner for fiskefartøjer over 12 meter som fiskede med bundslæbende redskaber og med en hastighed på under 6 knop i perioden 2010-2012. Udarbejdet af DTU Aqua. Natura 2000 omr. Det med sort markerede rektangel angiver afgrænsningen af Natura 2000 område H224 (Naturstyrelsen, 2014). Kattegat-mølleområdet er placeret helt op til afgrænsningen af den nordlige og nordvestlige del af Natura 2000 området.

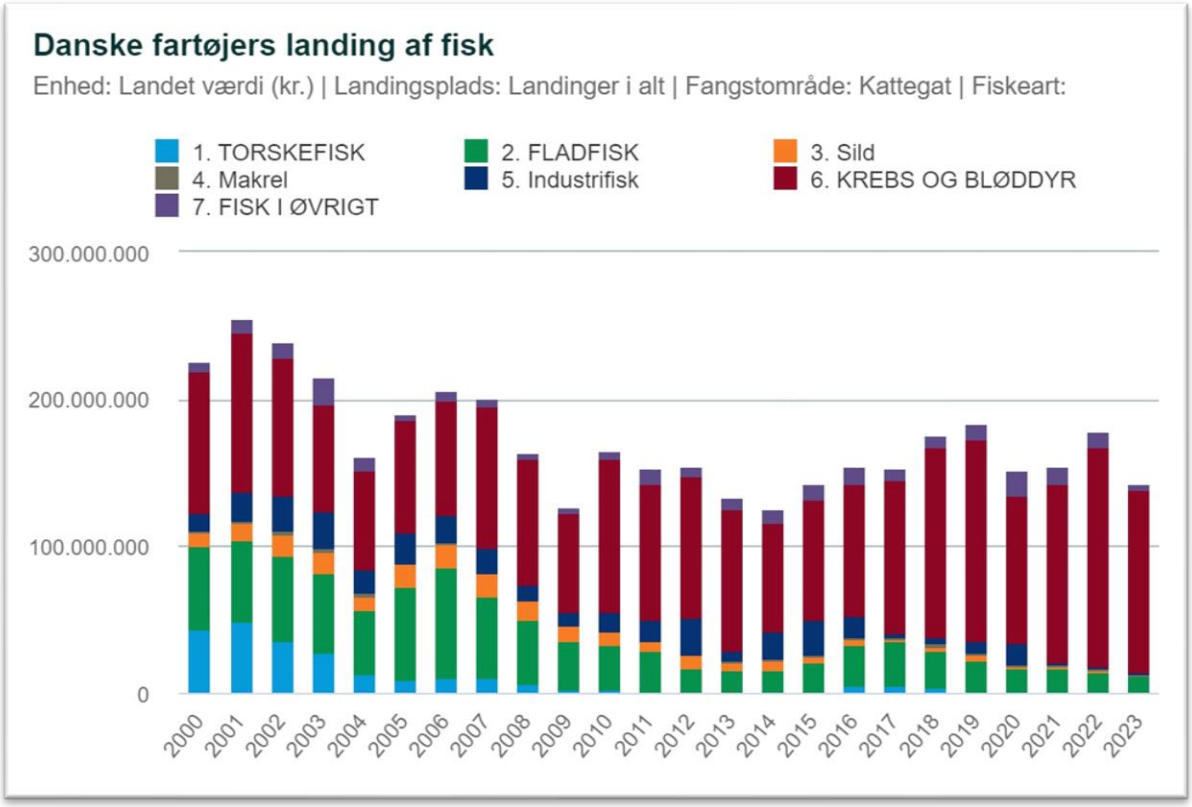


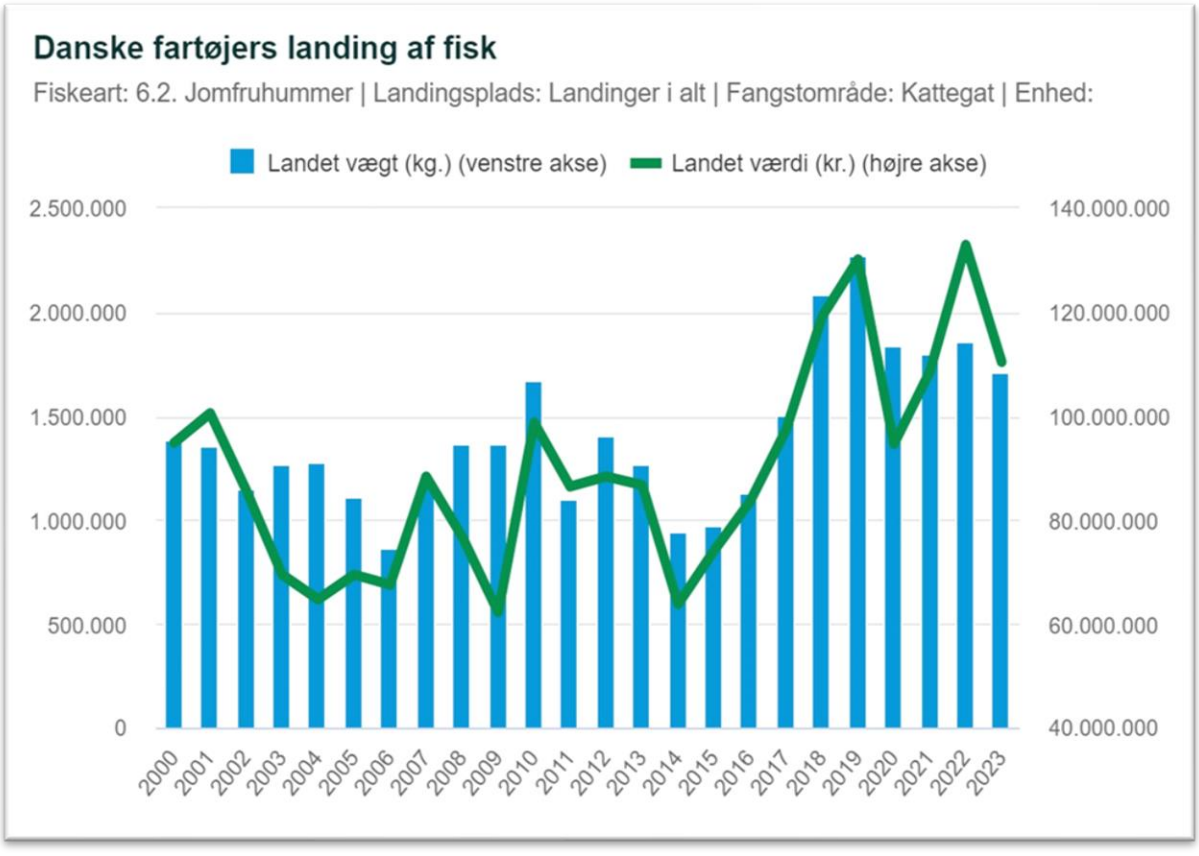
BILAG 2

Landingsstatistik (Danmarks Statistik/Fiskeristyrelsen)

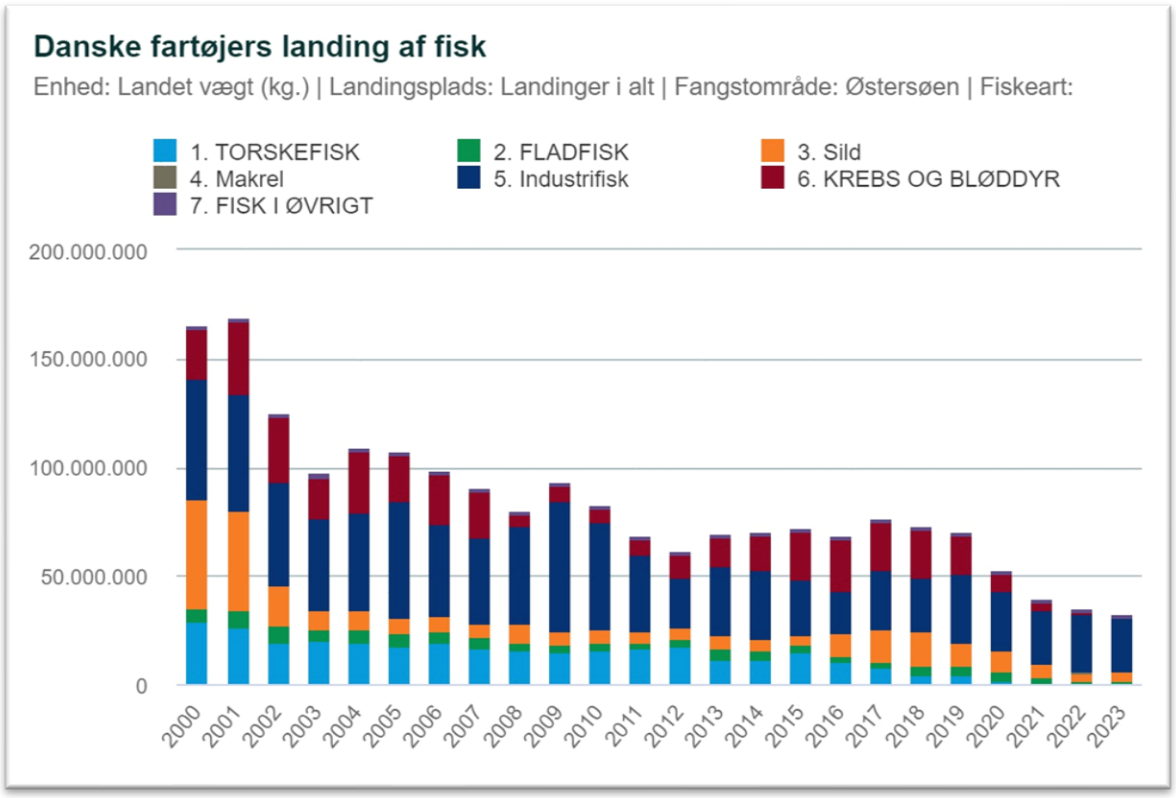
A. Kattegat

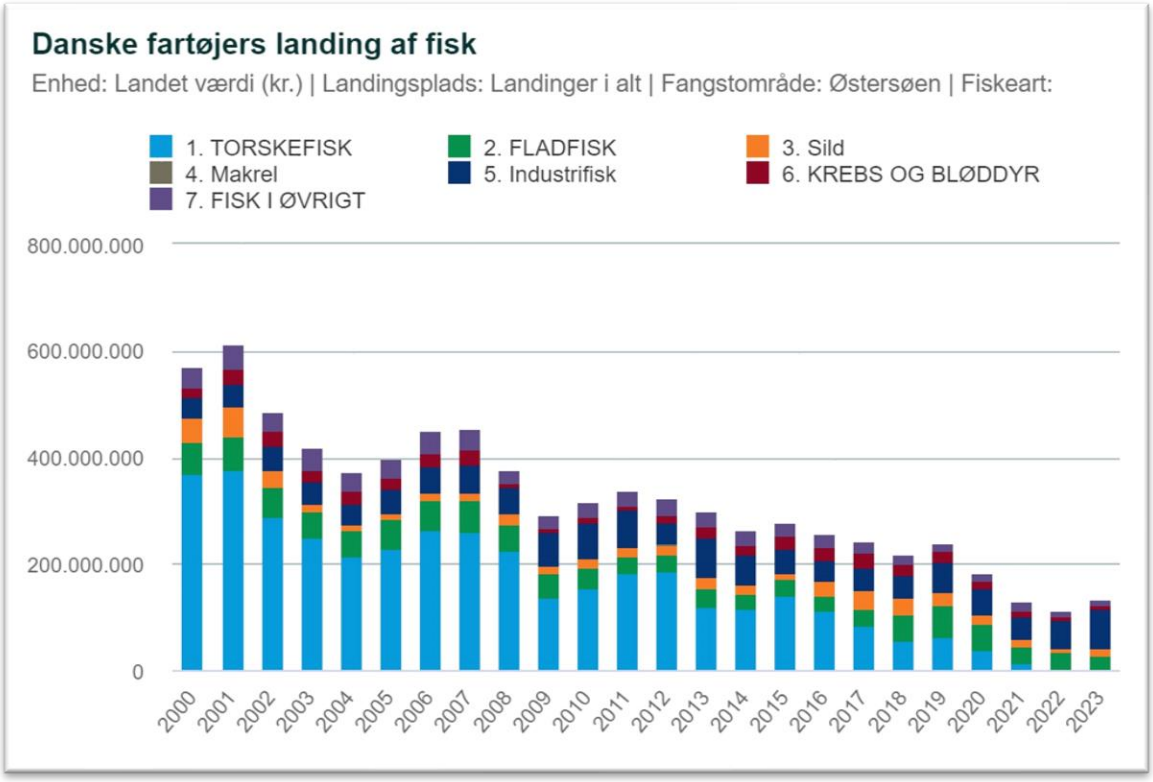



Danske fartøjers landing af fisk
Enhed: Landet værdi (kr.) | Landingsplads: Landinger i alt | Fangstområde: Kattegat | Fiskeart:
1. TORSKEFISK
2. FLADFISK
3. Sild
4. Makrel
5. Industrifisk
6. KREBS OG BLØDDYR
7. FISK I ØVRIGT
300.000.000
200.000.000
100.000.000
0
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Danske fartøjers landing af fisk
Fiskeart: 6.2. Jomfruhummer | Landingsplads: Landinger i alt | Fangstområde: Kattegat | Enhed:
Landet vægt (kg.) (venstre akse)
Landet værdi (kr.) (højre akse)
2.500.000
2.000.000
1.500.000
1.000.000
500.000
0
140.000.000
120.000.000
100.000.000
80.000.000
60.000.000
40.000.000
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

B. Østersøen

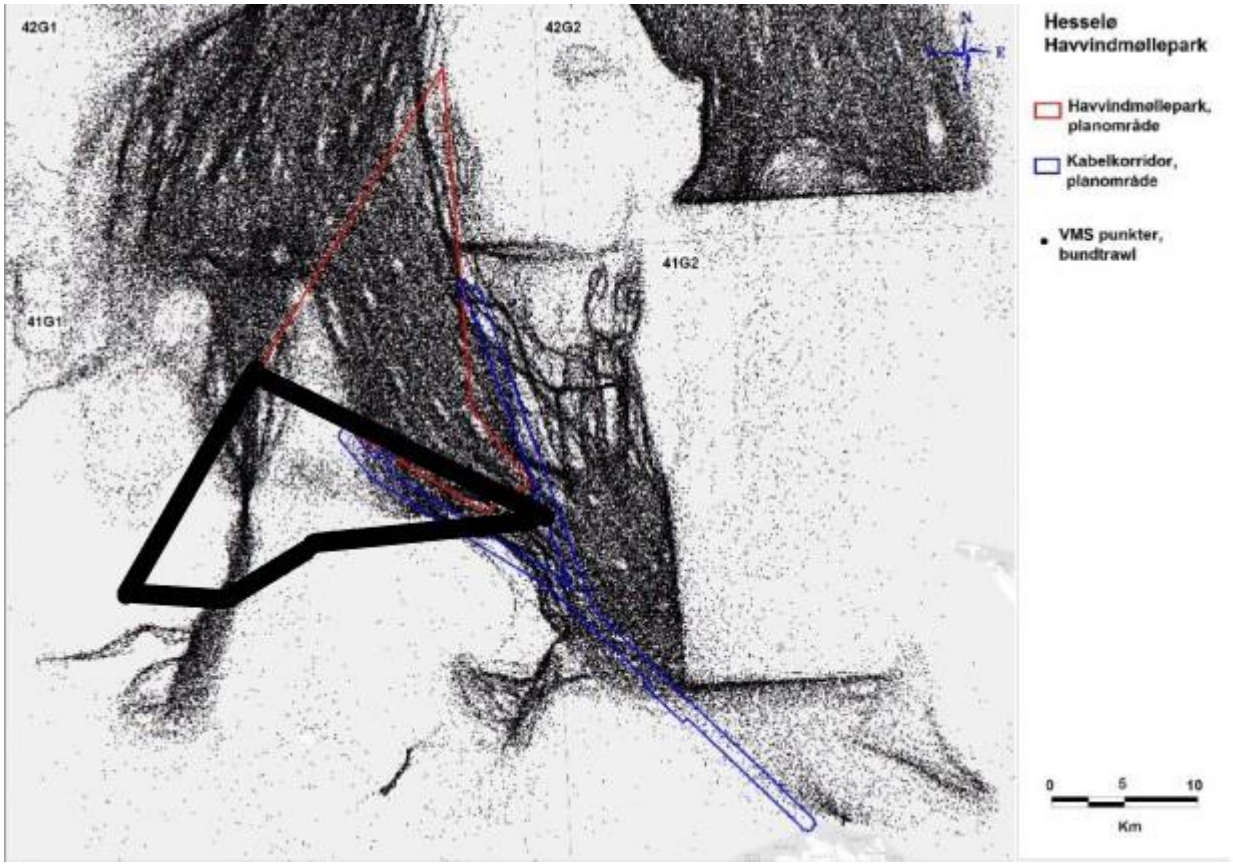

Danske fartøjers landing af fisk
Enhed: Landet vægt (kg.) | Landingsplads: Landinger i alt | Fangstområde: Østersøen | Fiskeart:
1. TORSKEFISK
2. FLADFISK
3. Sild
4. Makrel
5. Industrifisk
6. KREBS OG BLØDDYR
7. FISK I ØVRIGT
200.000.000
150.000.000
100.000.000
50.000.000
0
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


Danske fartøjers landing af fisk
Enhed: Landet værdi (kr.) | Landingsplads: Landinger i alt | Fangstområde: Østersøen | Fiskeart:
1. TORSKEFISK
2. FLADFISK
3. Sild
4. Makrel
5. Industrifisk
6. KREBS OG BLØDDYR
7. FISK I ØVRIGT
800.000.000
600.000.000
400.000.000
200.000.000
0
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

BILAG 3

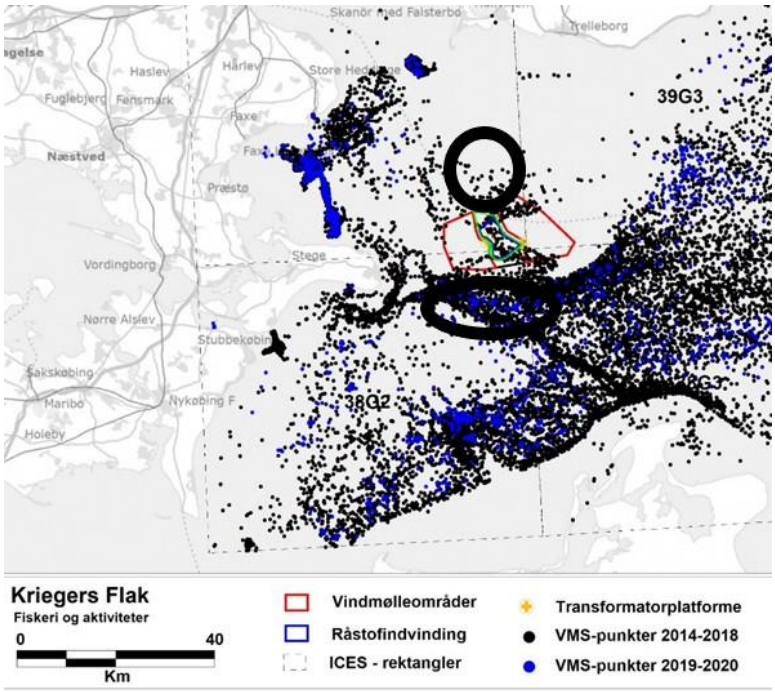
Fiskeri med bundtrawl i og nær planområdet for Hesselø Havvindmøllepark og kabelkorridor (Fra: Niras/Energistyrelsen, 2022. Miljøvurdering af planen for Hesselø Havvindmøllepark – Delrapport 2: Miljø på havet)

Den nye, omtrentlige placering af mølleparken er markeret med sort streg

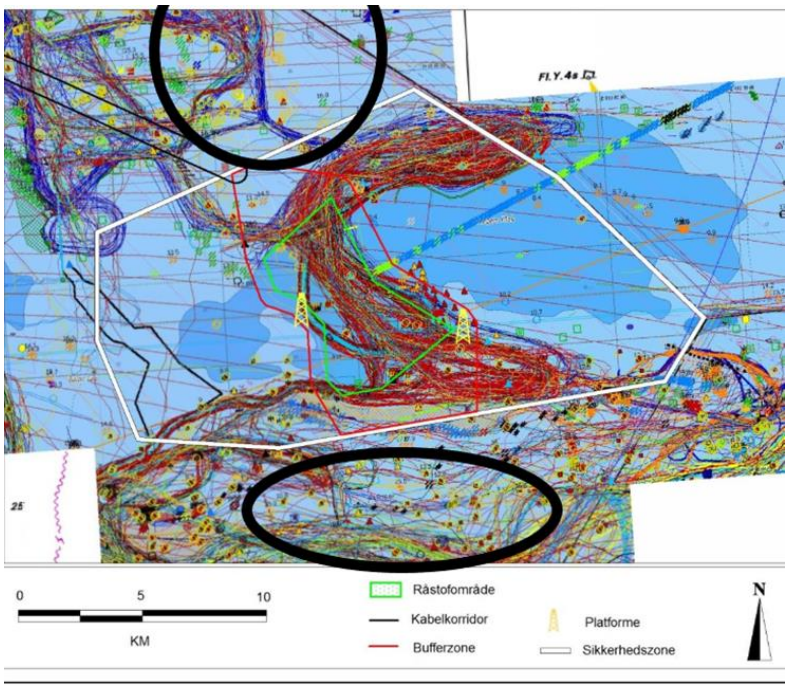


BILAG 4

A. De 8 mest aktive fartøjers fiskeriindsats i 4 ICES-rektangler fordelt på hhv perioden 2014-2018 og perioden 2019-2020 (Fra Klaustrup & Krog, 2021. Fiskeriinteresser ved Kriegers Flak – Overblik over fiskeriets udvikling i perioden 2014-2020).De kommende mølleparkers omtrentlige placering hhv nord og syd for Kriegers Flak Havmøllepark er markeret med sorte cirkler.



B.Trawl-slæbestreger i Kriegers Flak-området /10/. Afgrænsningen af den nuværende møllepark er markeret med den hvide sikkerhedszone. Det med grøn streg markerede område er udlagt til råstofindvinding (sand). Den røde streg markerer afgrænsningen af de 2 del-mølleområde som den eksisterende møllepark består af (Klaustrup og Krog, 2015). Den omtrentlige placering af de 2 nye mølleparker er markeret med sort streg.



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APPENDIX 2 FISHERIES STATISTICS

Table 2a. Landings (tons) of commercial species from the ICES subdivision 24 from 2013-2023 by Danish fisher and vessels > 10 m. Source: Statistics Denmark, 2024.

Sum of Landings (Tons)	Years										
Species	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Angler	0,046	0,0365	0,0245	0,034	0,016	0,008	0,0885	0,1476	0,0565	0,0477	0,0561
Atlantic cod	8479,47457	8846,04162	10694,29578	7539,93134	4518,62162	2914,35372	2643,86362	1365,63514	566,94663	51,8043	37,5371
Atlantic halibut	0,004	0,0165	0,0104	0,0113	0,0031	0,0047	0,002	0,0024	0	0	0,001
Atlantic herring	5347,935	4322,3145	3224,9767	10196,69899	14971,51649	15952,16901	9371,98598	8929,85038	5700,00852	2814,82443	5198,71602
Atlantic horse mackerel	6,42	0	0,041	0,0019	0	0	0	0,001	0	0	0
Atlantic mackerel	41,7053	13,188	41,4267	32,75648	42,9813	33,50965	18,8102	18,7031	37,3854	12,2054	12,718
Atlantic pomfret	0	0	0	0	0,01	0,017	0,0035	0	0,032	0	0
Atlantic salmon	87,7368	83,09031	61,6739	28,826	11,5473	27,4823	23,9369	12,4957	14,5796	0,0244	0,005
Ballan wrasse	0,0011	0,011	0,0193	0	0,0005	0,003	0,0011	0,0008	0,0002	0	0
Brill	27,24961	22,7287	33,043	32,55451	32,9062	43,04901	38,133	50,79363	39,50372	31,1427	19,1053
Common dab	450,16722	360,43928	256,8965	263,56727	270,1952	278,74988	363,83259	349,35544	231,53984	92,958	73,05137
Common sole	29,9293	44,0164	34,55745	53,07428	44,22508	54,74208	74,2927	76,7292	64,59391	91,06334	70,3324
Eelpout	0,452	0,3705	0,285	0,14	0,256	0,319	0,385	0,3485	0,5728	0,5433	0,677
Eelpouts nei	1,7199	0,5811	0,098	0,3263	0,0685	0,1835	0,024	0,01	0,001	0	0,016
European anchovy	0	0	0	0	0	0	0	0,014	0,028	0	0,16701
European eel	272,2345	282,947	221,7475	218,3895	209,2741	130,3388	138,9751	154,3853	202,9995	135,6047	103,4964
European flounder	1381,0525	975,8609	654,2312	706,96978	772,33346	885,52143	1106,89779	929,76495	527,503	339,734	251,3089
European hake	0,0387	0,1836	0,6423	0,24568	0,0105	0,0134	0,0092	0,0185	0,023	0,0021	0,0044
European perch	68,8065	56,4663	24,2912	10,5995	7,9988	4,3767	1,8	0,5159	0,4005	0,373	0,3935
European plaice	1602,4629	1341,43182	1268,52254	1380,51882	1595,61841	2165,74541	2661,40253	2330,88322	1166,69152	672,6765	596,14978
European seabass	0,001	0,002	0,004	0,0016	0,0637	0,038	0,0464	0,0739	0,045	0,017	0,024
European smelt	0	0	0	0	0	0,005	0	0	0	0	0,001
European sprat	27612,622	28393,621	23472,504	18409,904	27051,02805	24576,43703	23663,90796	21042,63515	22048,91499	25589,19901	24214,79097
Freshwater bream	0,0035	0	0,031	0,011	0,046	0,04	0,012	0,0028	0	0,001	0
Garfish	207,8575	238,024	190,098	196,987	208,5635	167,798	92,207	104,2005	164,5692	119,2183	107,8825
Gobies nei	32,34	6,646	2,142	30,977	24,778	1,521	6,086	2,754	1,552	1,2485	2,031
Greater weever	0,0885	0,0217	0,0248	0,01822	0,02905	0,04	0,0235	0,00392	0,0492	0,01	0,0225
Greenland halibut	0,001	0,002	0	0	0	0	0	0	0	0	0
Grey gurnard	0,0085	0,0106	0,0219	0,06541	0,0461	0,02994	0,0254	0,0134	0,0134	0,005	0,0026
Haddock	0,2816	0,6802	1,7175	0,95327	0,2725	0,23799	0,0956	0,03961	0,04184	0,0015	0,0005
Lemon sole	5,4057	3,7561	3,8063	3,10254	2,6208	3,09295	10,0171	24,52346	10,99124	3,27961	2,0102
Ling	1,0484	1,2106	0,9276	0,87047	0,8125	1,6393	0,9602	0,678	1,0004	0,96107	0,5911
Lumpfish(=Lumpsucker)	22,6965	183,4256	163,17025	46,4425	25,4474	50,18356	20,7456	18,5253	18,9264	12,8489	4,2287
Mullets nei	4,4744	2,2239	3,0693	1,182	0,7368	1,7105	0,1697	0,154	0,1375	0,1126	0,1115
Northern pike	1,8445	4,4	6,1425	2,627	2,2264	0,9468	0,9795	0,499	0,048	0,019	0,0065
Picked dogfish	0,006	0	0,012	0,016	0	0,004	0,005	0,014	0	0,002	0,0025
Pike-perch	0,006	0,008	0	0,01	0,0385	0,892	0	0	0	0	0
Pollack	0,0315	0,0498	0,0987	0,31477	0,2399	0,1793	0,128	0,0368	0,0249	0,0104	0,0025

Rainbow trout	75,467	2,0235	1,1435	14,0455	6,323	1,6305	0,6285	0,41	0,404	0,9515	0,196
Raja rays nei	0	0,0075	0,01	0,017	0,004	0,00073	0	0,001	0,003	0,002	0,002
Roach	0,347	0,008	0,37	0,777	1,352	0,463	0,271	0,091	0,388	0,2105	0,011
Saithe	3,1587	25,8438	46,4509	4,1021	1,0503	2,9827	2,2117	1,7969	0,5223	0,4583	0,1803
Sandeel nei	3350,71	2449,82	2781,39001	901,49018	300,139	519,18	61,59	625,497	93,231	519,802	148,497
Sea trout	6,3783	10,2659	7,7398	3,79903	4,891	3,172	3,3332	2,3756	1,8453	5,5608	3,1115
Shorthorn sculpin	0	0	0	0,002	0,001	0,0077	0	0	0	0	0
Small-spotted catshark	0	0	0	0,00015	0,0007	0	0	0	0	0	0
Starry ray	0	0	0	0	0	0	0,003	0	0	0	0
Sticklebacks	0	0	0	0	0	0	26,901	36,36802	14,731	38,378	14,52099
Surmullet	0,044	0,002	0	0,042	0	0,007	0,0005	0,00105	0,0002	0	0
Tench	0	0,008	0,005	0,006	0,0005	0	0	0,015	0	0	0,01
Thornback ray	0	0	0	0,00085	0	0	0	0	0	0	0
Three-spined stickleback	0	0	0	0	5	0	0	0	0	0	43,387
Tope shark	0,016	0	0	0	0	0	0,006	0	0	0	0,004
Tub gurnard	0,011	0,0425	0,0965	0,13816	0,01	0,09666	0,044	0,04881	0,0257	0,0179	0,0226
Turbot	83,328	105,22565	98,1114	100,47956	93,41228	138,70799	68,9748	72,17687	63,05062	44,52383	42,8027
Twaite shad	0,024	0,004	0	0	0	0	0,002	0	0	0	0,001
Whiting	76,5588	73,3177	96,1804	58,91576	66,2593	22,01974	16,7613	6,1305	2,6349	1,1303	0,0844
Witch flounder	0,0617	0,0591	0,1956	0,19133	0,0454	0,03028	0,1651	0,13285	0,0321	0,0738	0,0825
Wolffishes nei	0,0628	0,3203	0,2081	0,03428	0	0,004	0,0025	0,0029	0,0039	0	0

Table 2b. Landings in value (DKK) of commercial species from the ICES subdivision 24 from 2013-2023 by Danish fishers and vessels > 10 m. Source: Statistics Denmark, 2024.

Sum of Landings Value (DKK)	Years										
Species	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Angler(=Monk)		482,4				129,9	1824,75	3135,2	371,95		299,05
Atlantic cod	88303640,48	86738298,05	103783018,7	79034224,96	54360630,07	38530447,98	42846375,16	30011296,11	11846241,47	1123676,1	691162,29
Atlantic halibut		360,4	269,5	53,6							
Atlantic herring	16826539,42	12092088,77	9252840,17	18323719,98	29833076,89	12295303,93	11192993,35	12751309,49	5462338	5356296,42	12420393,35
Atlantic horse mackerel			31,42								
Atlantic mackerel	233700,64	83510,35	302666,3	199128,48	276336,18	254309,76	217701,96	240477,33	308039,6	166940,9	126513,62
Atlantic salmon	2953827,96	2802264,06	2104459,87	1181124,88	180329,7	1225053,2	1006609,02	322681,2	429278,53		
Brill	1183148,95	930357,79	1105051,86	1250031,49	1461728,99	2110760,07	1845871,9	1793506,03	2035163,62	2262548,25	1199152,77
Common dab	2256920,52	1860677,11	1401112,97	1640398,39	2237222,2	2275594,68	3097033,57	2013109,18	1871987,92	693633,58	467244,35
Common sole	2855456,88	3855203,97	3335782,99	5002290,85	4118053,67	5356415,69	8342308,64	6588590,71	7073964,68	10794756,53	8091842,14
Eelpout										2575	659
Eelpouts nei	11215,5	5352									
European eel	17631364,67	12990639,51	11684852,64	13496214,53	15201408,7	7759430,39	7550659,66	8000342,6	10445655,88	6129053,15	5003612,39
European flounder	4776660,03	3781860,27	2125620,33	2465227,94	3357297,08	3745322,17	4236859,56	3098166,25	1434986,95	1044401,18	1165835,53
European hake	318,3	1103,95	758,39	393,01		114,45		102,1	9,29		
European perch	562553,98	494674,5	249298,49	117578,75	92261,69	22758,2	3980	1135	1441		179

European plaice	12238897,81	9077870,18	9888901,51	11872806,02	16214603,91	26973053,24	33379918,68	25530332,28	12561056,17	9988317,02	7204784,47
European sprat	31281104,83	29605190	22456889,65	6811449,49	28849441,4	12885385,87	10563827,8	23294962,24	21574924,8	33580311,05	58421066,5
Garfish	552690,35	422052,45	700820,4	286247,65	289330,35	10783,5	303287	192949	171302,11	248158,5	
Gobies nei	74364	13535		22671	93599,5		1952	1114	1959		4789,5
Grey gurnard	15,43		181,14	488,91	397,77	323,49	453,34				
Haddock	1467,43	2179,94	15569,82	8118,77	3470,52	3117,01	1273,03	697,44	127,42		
Lemon sole	183800,94	116169	130886,6	97843,62	101325,36	113081,39	276789,82	695998,29	403123,58	132092,28	74542,05
Ling	12885,97	16795,9	8121,46	10062,21	8314,16	16548,15	13227,02	5123,24	9334,53	12576,09	8615,07
Lumpfish(=Lumpsucker)	705950,47	1522585,12	2557689,05	1851988,59	1660808,62	1481989,71	1366749,81	379780,59	1613830,61	920769,39	852508,68
Mullets nei	140468,25	24790,4	34237,95	5349,8							1575
Northern pike	19280,7	37115,7	81965,5	33620,8	2098,5	2019,75					
Pollack	170,65	347,7	865,18	2994,62	4175,82	1668,35	243,6	217,45			
Rainbow trout	1202258,6	32009,1	19990,8	106243,57	47962,05	8615,55	20608,49			1122,5	
Saithe(=Pollock)	6984,24	123852,41	478895,56	42621,29	8832,03	13181,7	7843,79	5131,34	1536,33	38,8	158,09
Sandeels(=Sandlances) nei	5821188	3323473,15	3759328,8	1636753,39		760120		424313			
Sea trout	109077,2	171093,85	178172,45	79886,41	69707,48	51165,65	43593,41	31945,19	21773,45	120257,59	67710,59
Tub gurnard	136	416,3	843,4	1851,3	32,95	176,52	313,27	277,69	62,16	228,79	496,62
Turbot	3452929,12	4171179,65	3964701,5	4126997,94	3994663,52	6795970,61	3633713,21	2784799,06	3156785,33	2527289,97	2324497,43
Twaite shad	42,75	6									
Whiting	581103,83	681921,21	741295,99	447105,88	584086,39	161611,68	129200,7	39223,68	14054,5	7852,5	
Witch flounder	188,73	235,51	1954,5	1805,68	508,19	101,16	1953,88	905,6	78,75		
Wolffishes(=Catfishes) nei			9321,6	1203,97							

Table 2c. Sum of landings (tons) for different species in Rødvig harbour, 2013-2023. Source: Statistics Denmark, 2024.

Sum of Landings (Tons)	Years										
Species	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Atlantic cod	143,8645	179,184	172,3305	109,3	62,969	53,038	21,552	4,393	1,901	0,205	0,554
Atlantic herring	2280,849	1477,902	1059,241	2357,389	1973,746	1146,136	431,085	238,4732	138,8226	0,961	0,128
Atlantic mackerel	0,1295	0,002	0,0925	0,06709	0,123	0,091	0,032	0,236	1,117	0,002	0,001
Atlantic salmon	0	0	0	0,0076	0,018	0,003	0	0	0,847	0	0
Brill	0,11901	0,192	0,1355	0,0632	0,11	0,151	0,1	0,175	0,143	0,0265	0,0314
Common dab	3,8715	3,194	2,191	2,3315	2,15	0,791	1,961	3,504	0,715	0,4655	0,2125
Common sole	0,002	0,0005	0,0128	0,0073	0,035	0,069	0,032	0,02	0,048	0,0395	0,1
Eelpout	0,0535	0,0065	0,051	0	0,004	0,017	0,011	0,024	0,068	0,0335	0,3035
European eel	18,6075	19,8655	14,566	13,2615	14,458	7,172	8,773	8,594	9,1385	2,9225	2,3943
European flounder	26,5255	44,888	36,436	29,8055	14,6315	21,116	17,964	21,029	8,989	4,258	4,5185
European perch	0,358	0,082	0,695	0,788	0,196	0,03	0,124	0,129	0,138	0,0785	0,0795
European plaice	8,1415	8,051	4,644	8,1275	5,452	40,783	15,641	5,694	7,366	1,5985	4,3419
European sprat	388,745	93,5	186,742	21,687	3,14	90,413	27,7	44,059	80,076	0,14	0,09
Garfish	12,984	1,938	23,112	41,575	53,872	35,961	32,879	22,071	26,585	0,003	0
Gobies nei	0	0	1,411	3,279	3,842	0,041	1,585	1,934	1,315	1,0325	2,031

Grey gurnard	0	0	0,0015	0,001	0,002	0	0	0	0,001	0	0
Haddock	0	0,001	0,019	0	0	0	0	0	0	0	0
Lumpfish(=Lumpsucker)	0,1	1,283	1,5675	0,574	0,118	0,56	0,049	0,243	0,038	0,021	0,0265
Mullets nei	0,0115	0,0195	0,0015	0,0125	0,002	0,009	0	0	0,001	0	0
Northern pike	0,0025	0,0055	0,0205	0,0585	0,114	0,004	0,006	0	0,023	0,003	0,0025
Roach	0	0	0	0	0	0	0,012	0,091	0,386	0,2075	0,01
Saithe	0,088	0,1905	2,2755	0,015	0,002	0,001	0,021	0,007	0,018	0	0
Sandeels nei	2214,99	1553,595	1850,435	773,23018	241	519,18	61,59	279,057	36,104	82,9	6,071
Sea stickleback	0	0	0	0	0	0	0	0,005	0	0	0
Sea trout	0,1495	0,1247	0,0975	0,08523	0,078	0,08	0,007	0,023	0,046	0	0,0005
Sticklebacks	0	0	0	0	0	0	0	1,572	2,383	0,05	0,008
Turbot	1,3697	4,037	3,783	6,86765	5,9075	7,369	3,427	4,505	2,573	1,1526	0,9733
Whiting	10,267	1,232	5,515	1,5305	8,65	0,709	0,176	0,124	0,007	0	0

Figure 2d. Sum of values (DKK) for the different fish species in Rødvig harbour, 2013-2023. Source: Statistics Denmark, 2024.

Sum of Landings Value (DKK)	Years										
Species	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Atlantic cod	1668870,58	2124164,75	1846100,05	1226566,2	766571,5	669268,13	316705	65596	27941	3467,5	7078,5
Atlantic herring	8107334,12	4212661,01	3151980,35	7902335,04	6234105,44	3462997	1574778,7	1182476,65	636827,63	5854,76	
Atlantic mackerel	1295		925		1055	647	249	3550	4829		
Brill	3916	6985,35	4285,6	2004,2	3534	5356,6	3036	4014	5150	1279	1714
Common dab	18183,53	12729	9283	13115,9	13119	5949	12778	17639	4579	2795,8	879,5
Common sole			800,8	541	1644	3511,5	1503	1173	4918	3955,3	9180
European eel	1687563,25	1180077,04	1027380,2	1065866,55	1438882	688577	829558	737799	789119	193268	147020
European flounder	116777,5	154250,5	122893,5	93038,8	61149,25	83607	58673	49858,25	25317,5	14124,86	19255,5
European perch	1888,88		6644,5	2189,5	2869	274	1531	1135	1441		
European plaice	43183,98	44428,75	28883,51	58473,3	54417	544725,9	178978	58895	96460	18625,6	56396,7
European sprat	878082,09		324413	46380	3340	141238		99932			
Garfish	54237,5	16907	145175,4	222017,15	268618		303287	192949	171035		
Gobies nei				3959	7569		1952	1114	1959		4789,5
Lumpfish	3079	6939,2	8631,75	3928,9	1582	5331	266	1224	840	823	2583,5
Saithe	543	1093	25370,85	245			195				
Sandeels nei	4669172,8	2269924,8	2883897,9	1636753,39		760120		424313			
Sea trout	3034,5	2646	2234,5	1692,01	1195						
Turbot	56161,95	173123,97	142990,55	278156,54	240542	343783,3	161421	163370	120683,5	62273,3	47053,1
Whiting	51522,85	7564,25	45190,56	13088,8	75227	5656,2	1846				

APPENDIX 3 LANDINGS MADE BY FOREIGN VESSELS

In addition to Danish fisheries activity, foreign vessels also conduct fishery in the ICES subdivision 24 area. Landings (tons) in the period 2013-2023 are presented in Figure 3a. Landings information from these vessels have been obtained from Statistics Denmark, 2024.

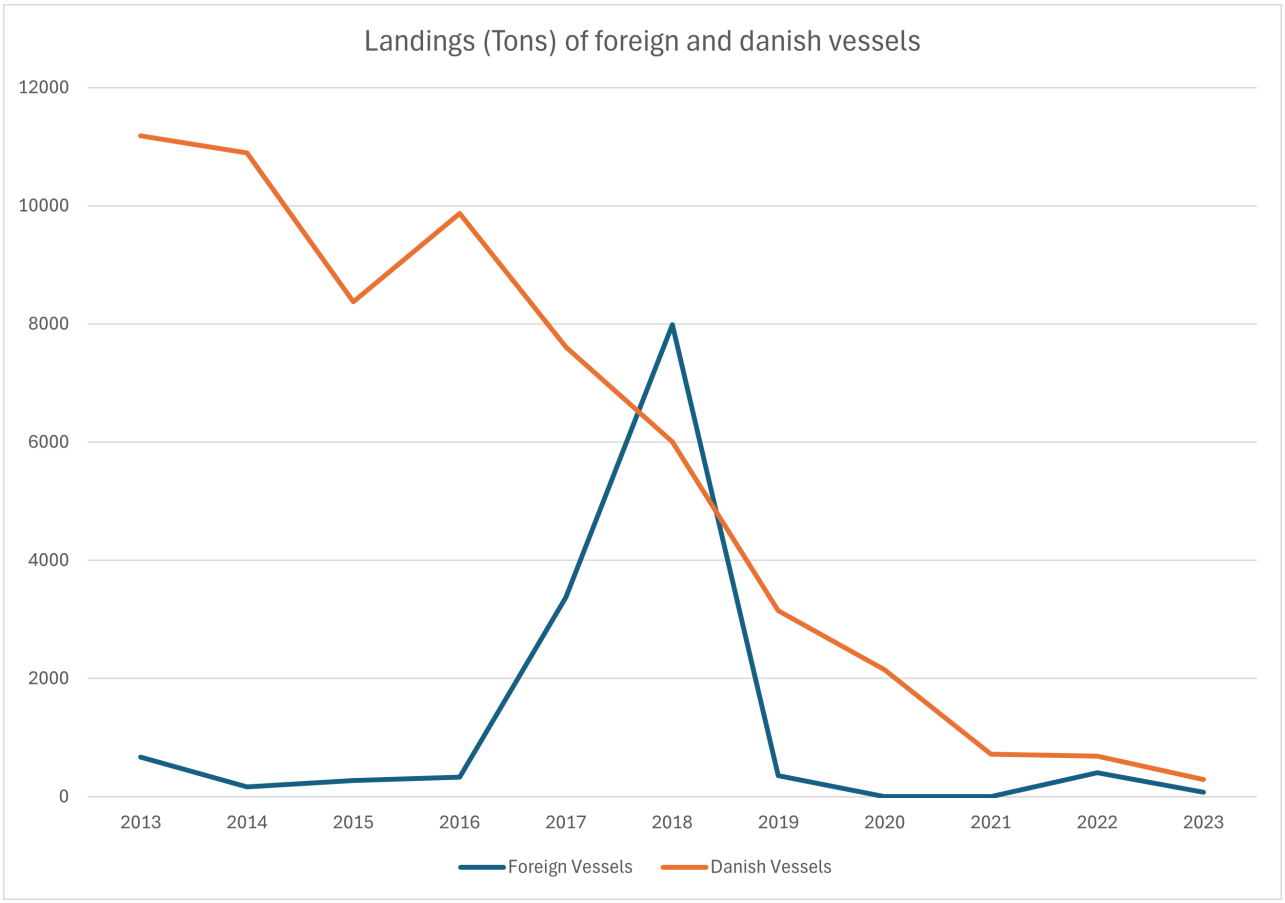

Figure 3a. Landings in weight (tons) of foreign vessels and Danish vessels in the ICES subdivision 24 area in the period 2013-2023. Source: Statistics Denmark, 2024.

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DNV is the independent expert in risk management and assurance, operating in more than 100 countries. Through its broad experience and deep expertise DNV advances safety and sustainable performance, sets industry benchmarks, and inspires and invents solutions.

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