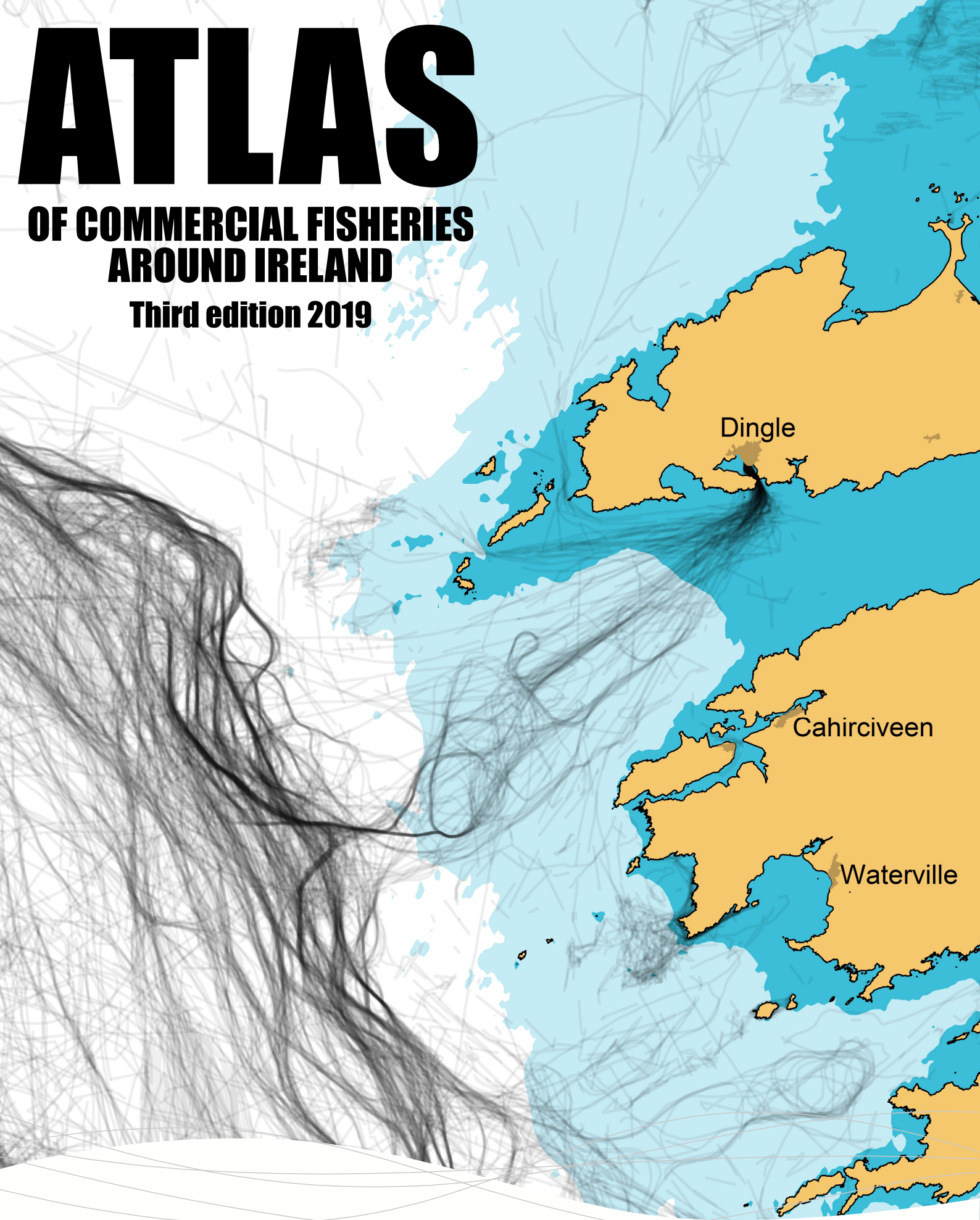


# ATLAS

## OF COMMERCIAL FISHERIES AROUND IRELAND

Third edition 2019



# Atlas of Commercial Fisheries Around Ireland

Third Edition

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## About this Atlas

The Atlantic Ocean is the world's second-largest ocean and covers 20% of the earth's surface. The waters around Ireland constitute a small part of that vast ocean but they are very productive; they support a diverse range of international fishing activities and contain important marine habitats and ecosystems. This resource requires careful management to protect vulnerable components whilst ensuring sustainable exploitation. This "Atlas of Commercial Fisheries around Ireland" provides a series of detailed maps of fishing activity around Ireland with the aim of providing insights into fishing activities and fisheries resources. Fishing effort is mapped by gear and country. Irish landings of the key commercial species are mapped individually and by gear.

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## Cover image

The cover shows some of the tracks made by fishing vessels off the south-west coast of Ireland.

## Disclaimer

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## Acknowledgements

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An Roinn Talmhaíochta,  
Bia agus Mara  
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and Fisheries Fund

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## Contents

1	Introduction .....	1
1.1	Management Units .....	1
1.2	Fishing Grounds.....	2
1.3	Bathymetry.....	2
2	Data.....	5
2.1	Data Sources .....	5
2.2	Data Analysis.....	5
3	Irish Fishing Ports .....	6
4	The fishery in the EEZ.....	7
4.1	Fishing gear .....	7
4.2	Vessel nationality.....	7
5	Fishing effort and species composition .....	10
5.1	Interpretation.....	10
5.2	Demersal otter trawl effort.....	11
5.3	Beam trawl effort.....	15
5.4	Demersal seine effort.....	19
5.5	Gill net effort.....	23
5.6	Longline effort.....	27
5.7	Dredge effort.....	31
5.8	Potting effort.....	35
5.9	Pelagic trawl effort.....	39
6	Landings of key commercial species .....	43
6.1	Interpretation.....	43
6.2	Albacore tuna landings .....	44
6.3	Anglerfish landings .....	45
6.4	Black sole landings .....	46
6.5	Blue whiting landings .....	47
6.6	Boarfish landings.....	48
6.7	Cod landings.....	49
6.8	Haddock landings .....	50
6.9	Hake landings .....	51
6.10	Herring landings .....	52
6.11	Horse mackerel landings.....	53
6.12	John Dory landings.....	54
6.13	Lemon sole landings.....	55
6.14	Ling landings.....	56
6.15	Mackerel landings .....	57
6.16	Megrim landings .....	58
6.17	<i>Nephrops</i> landings.....	59
6.18	Plaice landings.....	60
6.19	Pollack landings.....	61
6.20	Rays and Skates landings .....	62
6.21	Saithe landings .....	63
6.22	Sprat landings.....	64
6.23	Whiting landings .....	65
6.24	Witch landings.....	66
7	Glossary.....	67
8	References .....	69

# 1 Introduction

On an average day, approximately 500 fishing vessels are active in the waters of Ireland Exclusive Economic Zone (EEZ), clocking up more than 1.8 million fishing hours per year. Much of the seabed near Ireland is trawled at least once per year and some regions are trawled more than 10 times per year [Ref.1]. Fishing is clearly one of the most significant ocean uses in the waters around Ireland.

The fisheries in Irish waters are highly diverse. The Irish otter trawl fleet alone can be divided into 33 distinct fisheries [Ref.2], each using a different fishing technique or targeting different species or groups of species. A large part of this heterogeneity in the fisheries can be explained by spatial patterns in the availability of the target species and in this Atlas we aim to give insights into these fisheries by providing maps of fishing activities and landings of the most important fish and shellfish species. This Atlas is the third of its kind, following the 2009 and 2014 publications of the 'Atlas of the Commercial Fisheries around Ireland' [Ref.3, 4]; the current version provides updated information as well as new types of maps.

## 1.1 Management Units

The Northeast Atlantic is divided into a range of fishing areas and political zones. For the purpose of catch reporting and fisheries management, ICES divides the area into sub-areas, divisions and statistical rectangles (Figure 1). Additionally, each coastal country claims an Exclusive Economic Zone in which it has special rights over the use of the marine resources (Figure 2).

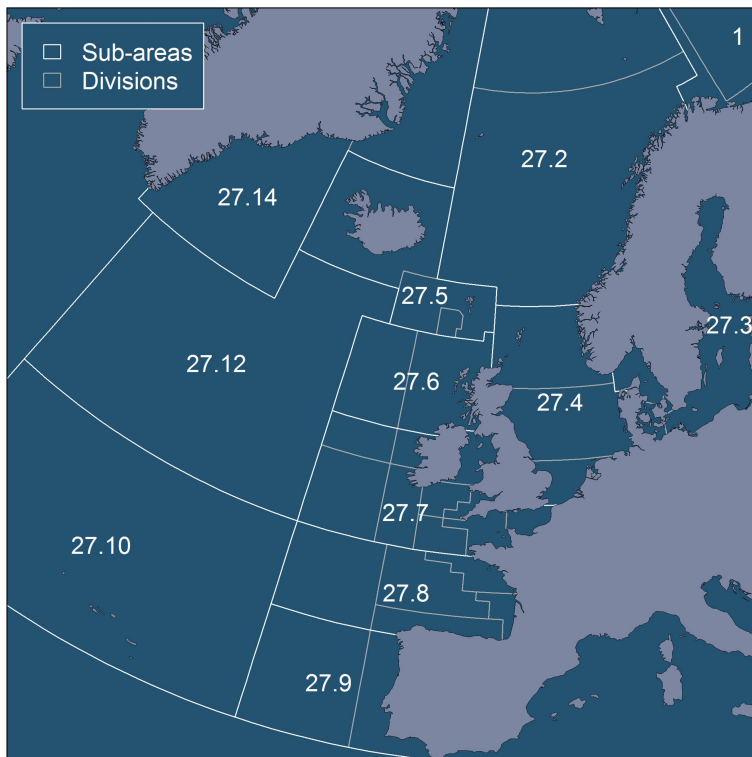


Figure 1: The Northeast Atlantic is divided into 14 sub-areas, which can consist of a number of divisions.

### Key Points: Introduction

- Approximately 500 fishing vessels are active per day in the waters of Ireland EEZ.
- 1.8 million fishing hours are logged in Irish waters per year.
- Much of the seabed near Ireland is trawled at least once per year.
- Fisheries in Irish waters are highly diverse due to spatial patterns in the distribution of target species.



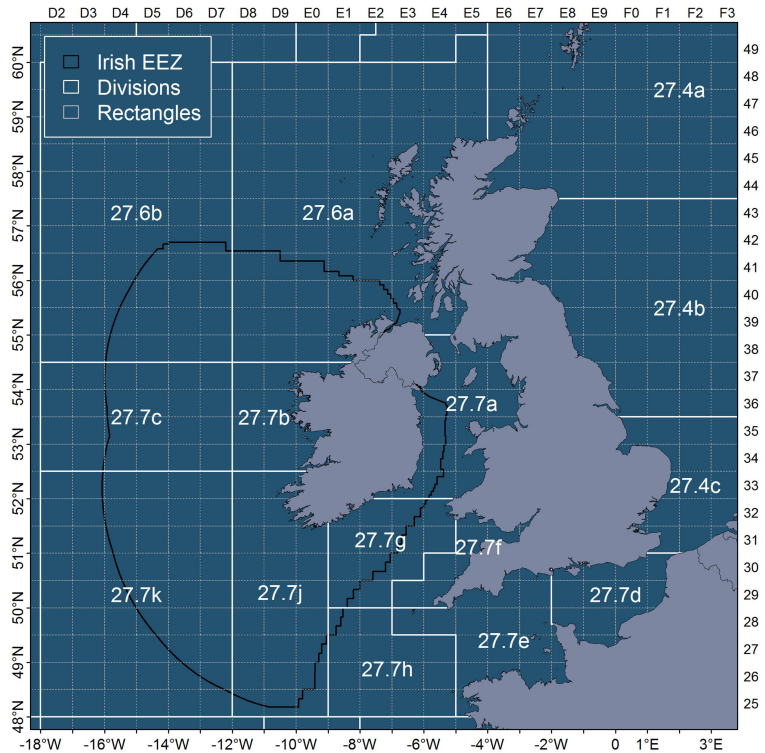


Figure 2: The waters around Ireland consist of ICES Sub-areas 6 and 7 which contain Divisions 6a, b and 7a-k. The Divisions are further partitioned into statistical rectangles of 0.5° latitude by 1.0° longitude. The Irish Exclusive Economic Zone (EEZ) is the sea area in which Ireland has special rights over the use of the marine resources. It extends to 200nm offshore.

## 1.2 Fishing Grounds

The character of the seabed can vary considerably from one area to the next and fishers distinguish fishing grounds based on the bottom type, depth and on the expected catch composition. Marine Institute fisheries observers record the names used for these grounds and although the names may vary between fishers and some grounds have no clear boundaries, patterns emerge when the observer records are overlaid over fishing effort data from Vessel Monitoring Systems (VMS) and catch composition data from the logbooks. Figure 3 shows the main demersal fishing grounds that were distinguished in this way.

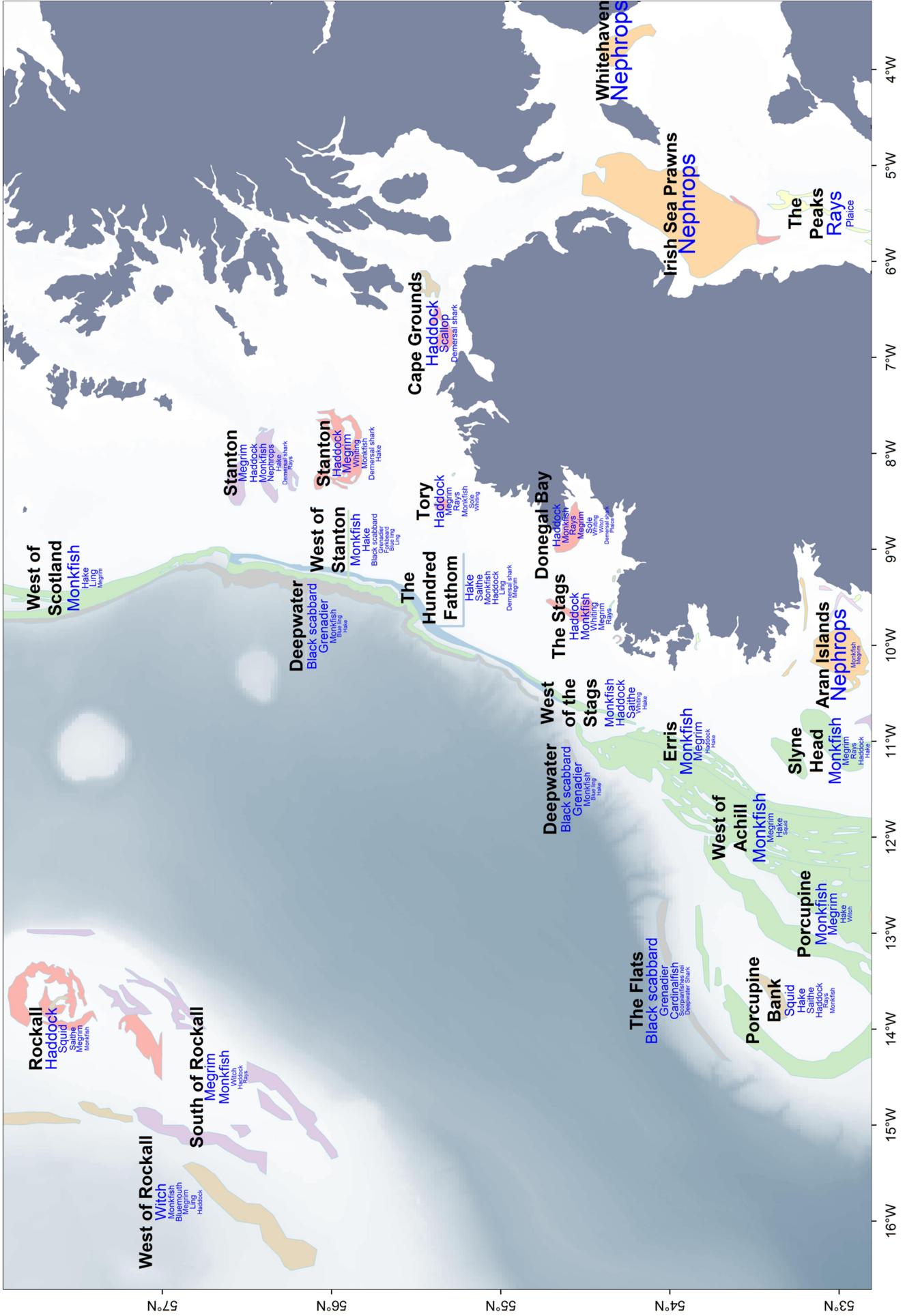
## 1.3 Bathymetry

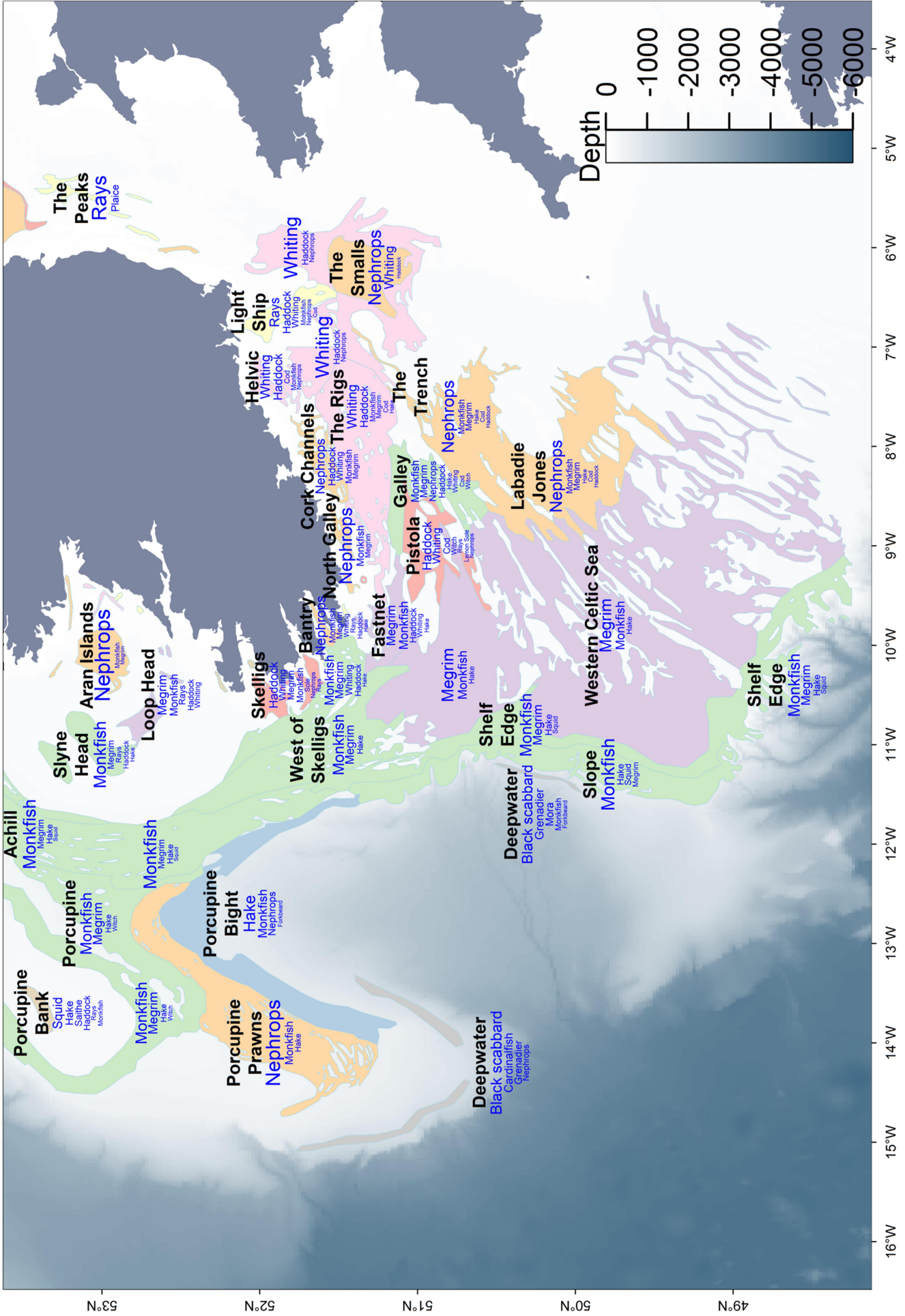
The seabed around Ireland gently slopes down towards a depth of around 200m (continental shelf) after which it slopes steeply to the abyssal depth of the ocean floor (Figure 3). A large number of species are caught in the waters of the continental shelf, including *Nephrops*, cod, haddock, whiting, megrim, plaice, black sole, herring and boarfish. Along the shelf edge, species like anglerfish and hake are targeted as well as mackerel and horse mackerel, which migrate to the shelf edge to spawn. Tuna and blue whiting are mainly caught in waters beyond the continental slope.

### Key Points: Fishing Grounds and Bathymetry

- Fishing grounds are based on bottom type, depth and on expected catch composition.
- The seabed around Ireland gently slopes down towards a depth of around 200m (continental shelf) after which it slopes steeply to the abyssal depth of the ocean floor.
- Different species assemblages are found on the continental shelf and continental shelf edge (>200m).

Figure 3: (Next page) Main demersal fishing grounds around Ireland. Names of the grounds are based on records from fisheries observers and the outlines are derived from VMS data. Blue text gives an indication of the main species caught on each of the fishing grounds, with the most dominant species in the largest font size. The colour of the background gives an impression of the water depth with darker colours indicating deeper water.







## 2 Data

Data from a number of different sources have been integrated to provide new perspectives on the resource and fishing activities. Some of the data used in this Atlas are freely available, others are confidential. All data have been aggregated to a level that does not compromise the confidentiality of individual vessels.

### 2.1 Data Sources

The following data sources were used to create the maps and graphs in this Atlas:

*Vessel Monitoring Systems (VMS)*. VMS transmit the geographical position and speed of fishing vessels at intervals of two hours or less [Ref.5]. VMS data for the most recent five years (2014-2018) were used in this Atlas. VMS data were supplied to the Marine Institute by the Irish Naval Service. The data are available for all EU vessels of 12m and larger, operating inside the Irish EEZ; outside this zone only Irish VMS data are routinely available.

VMS do not record whether a vessel is fishing, steaming or inactive. Vessels were assumed to be fishing if their speed fell within a certain range. The following gear-specific criteria were applied (minimum and maximum speed in knots):

Gear	Min Speed	Max Speed
Otter trawl	0.5	5.5
Beam trawl	0.5	6
Seine	0.1	4.5
Gill net	0.1	4.5
Longline	0.1	6
Dredge	0.5	5.5
Pots	0.1	4.5
Pelagic trawl	0.5	6

This approach works well for active gears, where vessels spend much of their time engaged in fishing operations (e.g. demersal otter trawls [Ref.6]). However, vessels using pelagic trawls tend to spend most of their time steaming and relatively short time fishing and it is likely that some fishing operations are missed during the 2-hour time interval between VMS transmissions. For vessels using passive gears (nets, lines, pots), fishing operations may be identified using speed criteria, but this gives no information on the soaking time, the length of gill nets, the number of hooks or the number of pots. Therefore, any maps based on pelagic trawl data or passive gear data are indicative of the general distribution pattern only and cannot be evaluated in a quantitative way. It should also be noted that the speed criteria are not 100% accurate in identifying fishing activity, there will be some cases where vessels were steaming slowly, which will have been identified as fishing; this is particularly likely to happen near ports and in bays. No additional data processing was performed to remove these wrongly identified fishing positions.

*Logbooks*. VMS data of Irish vessels were linked to logbook data to obtain the fishing gear used and the landings for each day the vessel was fishing [Ref.6]. Logbook data are collected by the Sea-Fisheries Protection Authority and supplied to the Marine Institute by the Department of Agriculture, Food & the Marine. Landings data are generally only available for Irish vessels.

*EU Fleet Register*. For non-Irish vessels, gear information was obtained from the EU fleet register ([https://ec.europa.eu/fisheries/cfp/fishing\\_rules/fishing\\_fleet\\_en](https://ec.europa.eu/fisheries/cfp/fishing_rules/fishing_fleet_en)). For vessels for which the gear was not known from the logbooks, the main gear type listed in the EU fleet register was used. Note that if vessels use more than one gear, it is possible that the gear type assigned to them was not the one that was actually used.

### 2.2 Data Analysis

VMS data were analysed using the approach described by Gerritsen and Lordan [Ref.6]. This approach assigns effort and landings values to each of the VMS data points. The effort of a VMS data point is defined as the time interval since the previous data point; if this interval is larger than 4 hours, a value of 4 hours is used. Next the data are filtered for fishing activity using the speed criteria above. Landings of each vessel were then assigned to VMS fishing

positions on a daily basis. So, for example, there might be 12 VMS positions available for a vessel on a certain date, with 10 of those positions corresponding to fishing activity. If the vessel recorded a retained catch of 120kg of haddock for that day in its logbook, then 12kg of haddock will be assigned to each of the 10 fishing positions. This procedure is performed for all combinations of vessel, date and species. The last step is aggregating the landings or effort data to a grid; a commonly used grid cell size in this Atlas is 0.03° longitude x 0.02° latitude. The data were standardised by dividing by the surface area of the grid cell. This way the data can be expressed as fishing hours per km<sup>2</sup> or as landings per km<sup>2</sup>. The analysis and mapping of the data was performed in the R environment (R 3.6.1, [Ref.7]); specifically, the package ‘mapplots’ (<https://cran.r-project.org/web/packages/mapplots>).

#### Key Points: Data

- Data presented is integrated from various sources at an aggregated level to preserve confidentiality.
- Vessel Monitoring Systems provided geographical position and speed of vessel.
- Logbooks and Fleet Register provided the catch and fishing gear used.

### 3 Irish Fishing Ports

Fish are landed into numerous ports around the Irish coast.

Killybegs (Co. Donegal) is by far the largest port in terms of live weight of fish landed (around 122kt per year during 2014-18; including landings from foreign vessels). Pelagic species dominate in Killybegs but it is also the largest port for landings of demersal species. Castletownbere (Co. Cork) is the second largest port in terms of landings (around 24kt per year), followed by Dunmore East, Co. Waterford (8kt). Demersal species dominate in these ports but pelagic species also account for around one third of the landings. Rossaveal (Co. Galway) is the main port in the west of Ireland (3kt per year) and receives a mix of pelagic, demersal and shellfish species (the shellfish are nearly exclusively *Nephrops*). There are a large number of medium-sized ports along the south and east coast of Ireland. The ports along the south coast receive a mix of pelagic, demersal and shellfish species while those on the east coast mainly deal with *Nephrops* landings.

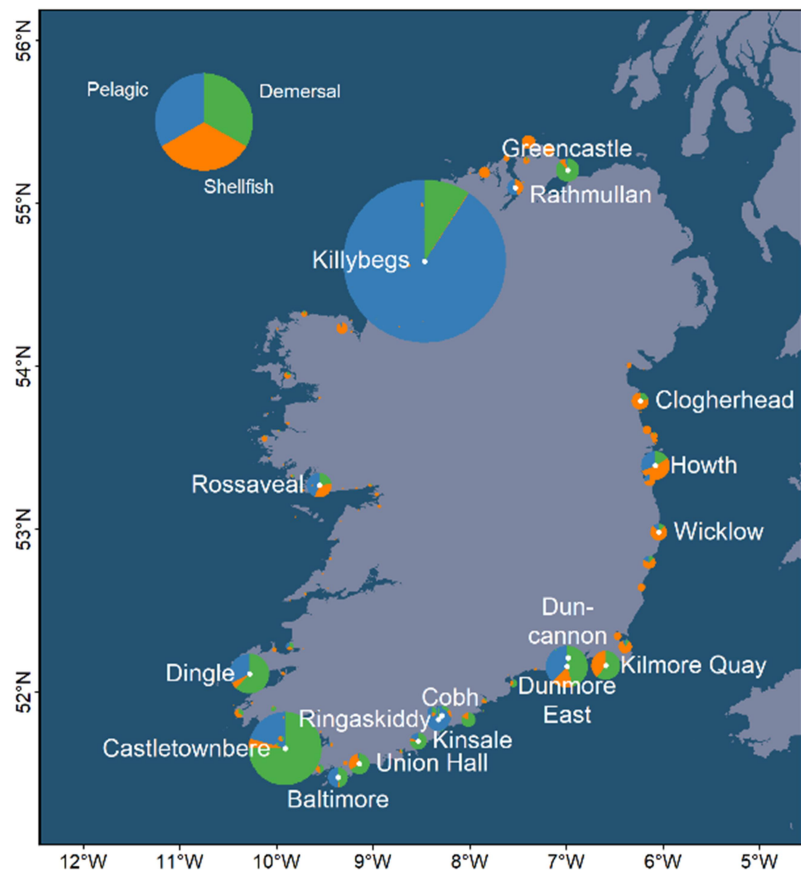


Figure 4: Landings by port and catch category

## 4 The fishery in the EEZ

The Irish Exclusive Economic Zone (EEZ) extends up to 200nm off the Irish coast. Ireland has access to VMS data from all EU fishing vessels operating inside the Irish EEZ. Outside this zone, only data from Irish vessels are routinely available. VMS data were used to create detailed maps of the distribution of fishing activity by gear type and vessel nationality and to estimate the proportions of effort by gear and nationality.

### 4.1 Fishing gear

Demersal otter trawlers account for the majority of fishing effort of vessels  $\geq 12\text{m}$  inside the Irish EEZ (around 57% of the fishing hours in 2014-18). Long liners account for around 11% and Gill and trammel netters for 8%. Pelagic trawlers only account for 5% of the total effort inside the EEZ but they are responsible for more landings than any other gear type, both in terms of volume and value. Pots and dredges account for around 5% each (but note that there are a considerable number of vessels  $< 12\text{m}$ , with no VMS, involved in potting and dredging). Beam trawlers and seiners account for around 4% and 3% respectively. Other fishing gears (or unknown gears) account for the remaining 2%. Figure 5 shows the spatial distribution of fishing gears inside the Irish EEZ.

### 4.2 Vessel nationality

VMS data also reveal that the vast majority of fishing effort by Irish vessels  $\geq 12\text{m}$  takes place within the Irish EEZ (77%). However, more than half of the fishing effort inside the Irish EEZ is carried out by foreign vessels (55%). The UK and France account for 21% and 18% respectively (dominated by demersal otter trawlers for both countries). Spain accounts for 14% of the fishing effort in the Irish EEZ (mainly demersal otter trawlers and long liners). Belgium and Germany account for  $< 1\%$  of the effort. Figure 6 shows the spatial distribution of fishing effort by nation inside the Irish EEZ.

#### Fishery Key Points

- Ireland has access to VMS data from all EU fishing vessels inside the Irish EEZ.
- Outside Irish EEZ, Ireland only has access to VMS data from Irish vessels.
- Majority of fishing effort ( $> 12\text{m}$ ) inside Irish EEZ is by otter trawlers.
- Ireland is responsible for 45% of fishing effort ( $> 12\text{m}$ ) inside Irish EEZ.



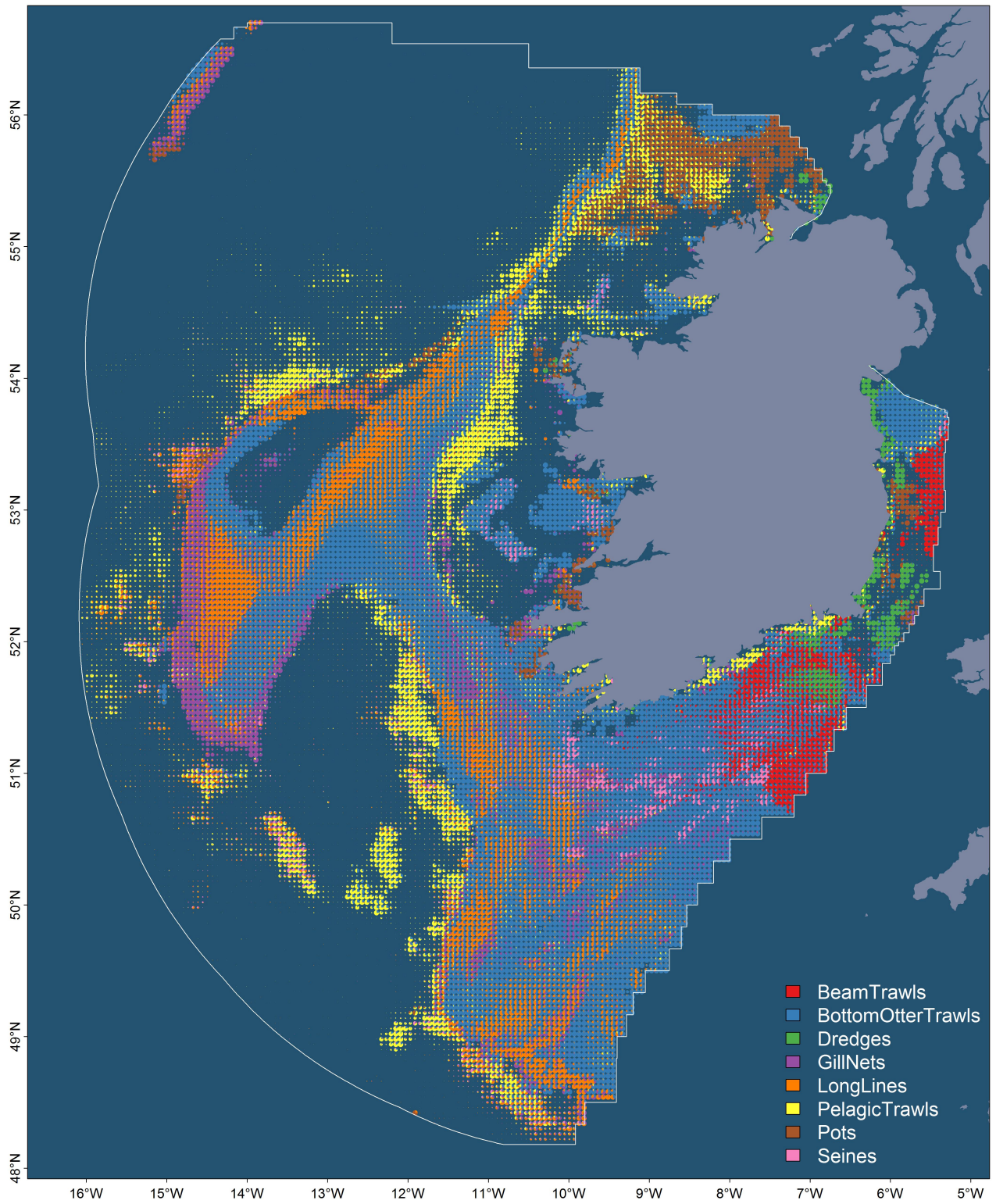


Figure 5: Distribution of international fishing effort in Irish EEZ by gear 2014-18

Key Points: International fishing effort

- Otter trawlers account for the majority (57%) of fishing effort inside Irish EEZ.
- The use of various fishing gears reflects the distribution of target species, regulations and bottom characteristics.



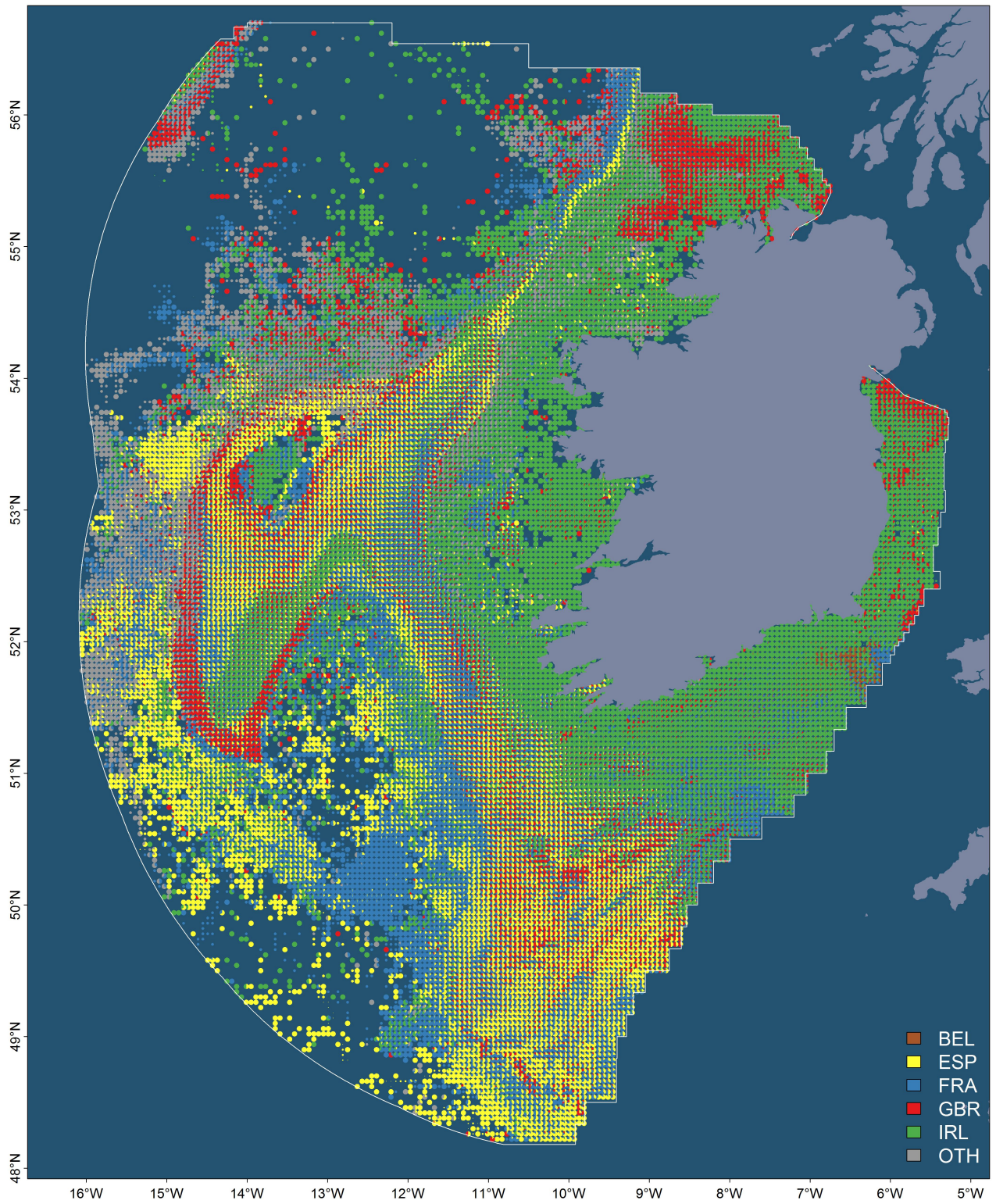


Figure 6: Distribution of international fishing effort in the Irish EEZ by country 2014-18

Key Points: International fishing effort by country

- The vast majority of fishing effort (77%) by Irish vessels takes place within Irish EEZ.
- Ireland is responsible for 45% of international fishing effort inside Irish EEZ followed by the UK (21%), France (18%), Spain (14%), Belgium and Germany (<1%).

## 5 Fishing effort and species composition

The spatial distribution of fishing effort results from complex interactions between species distributions, regulations, market forces, vessel characteristics and skippers' preferences. This section is intended to illustrate where the fishing effort of different gear types is carried out how the species composition of the landings varies across the fishing grounds.

### 5.1 Interpretation

Fishing effort is the time spent engaged in fishing operations or time spent at sea. It is usually expressed in fishing hours or days but because more powerful vessels can catch more fish, the fishing time is sometimes multiplied by the engine power of the vessel and expressed in kilowatt hours or kilowatt days. Fishing effort can also be expressed in terms of the amount of fishing gear that is deployed, e.g. length of gillnets, number of hooks on longlines or the number of pots and the soak time (length of time the gear is left in the water). For the purpose of this Atlas effort is always expressed in hours engaged in fishing operations. Therefore, any maps based on passive gear data are indicative of the general distribution pattern only and cannot be evaluated in a quantitative way. Similarly, effort maps of pelagic trawlers should be interpreted with care, as vessels targeting pelagic species tend to spend most of their time steaming and a relatively short time fishing. Additionally, it should be noted that the engine power of a pelagic trawler is on average around three times as large as that of a demersal trawler, so a small number of pelagic trawlers have much greater capacity for catching large amounts of fish than a large number of (smaller) demersal trawlers. Fishing gears have been classified into eight main groups: demersal otter trawls; beam trawls; demersal seines; gill and trammel nets; longlines; dredges; pots and pelagic trawls. For each fishing gear, four maps are presented:

- The international effort of each fishing gear inside the Irish EEZ.
- The breakdown of international effort of each fishing gear inside the Irish EEZ by country.
- The Irish effort of each fishing gear in all areas (also outside the Irish EEZ).
- The breakdown of Irish landings of each fishing gear by species.

*Table 1: Irish fishing effort (thousands of hours; vessels >12m) by gear type in 2014-18*

Gear Type	2014	2015	2016	2017	2018
Demersal Otter Trawls	326	316	345	345	332
Pots	108	107	137	144	158
Dredges	62	59	66	74	62
Beam Trawls	44	46	48	43	47
Gill Nets	35	33	37	36	33
Seines	22	17	18	17	18
Pelagic Trawls	10	7	9	8	7
Long Lines	2	2	1	1	2
Other	4	2	1	1	1



## 5.2 Demersal otter trawl effort

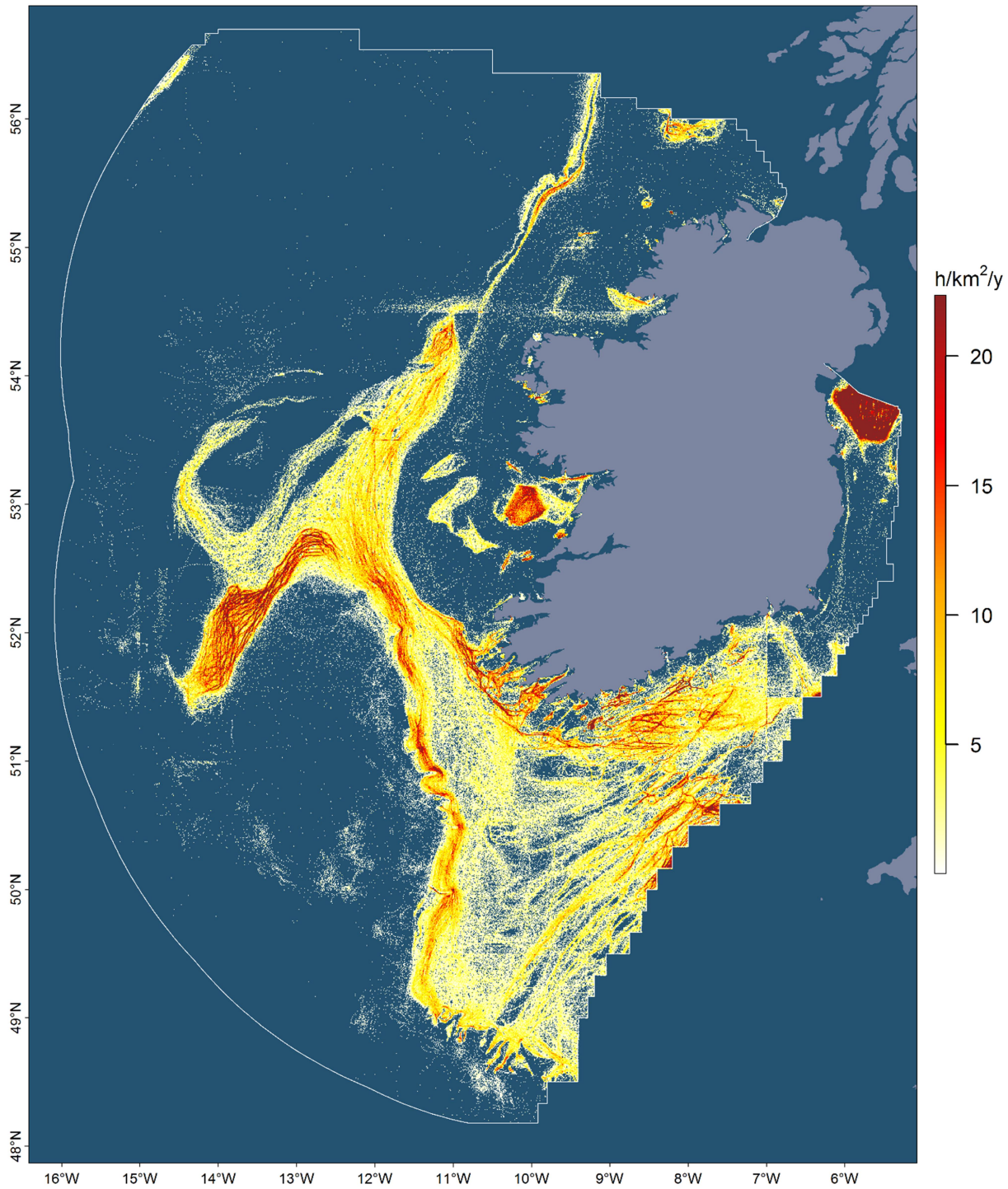


Figure 7: Distribution of international demersal otter trawl effort in the Irish EEZ in 2014-18

### Key Points: International demersal otter trawl effort

- Demersal otter trawlers operate on most of the continental shelf and slope.
- *Nephrops* grounds in the Irish Sea, Aran Islands and Porcupine Bank have high levels of fishing effort.

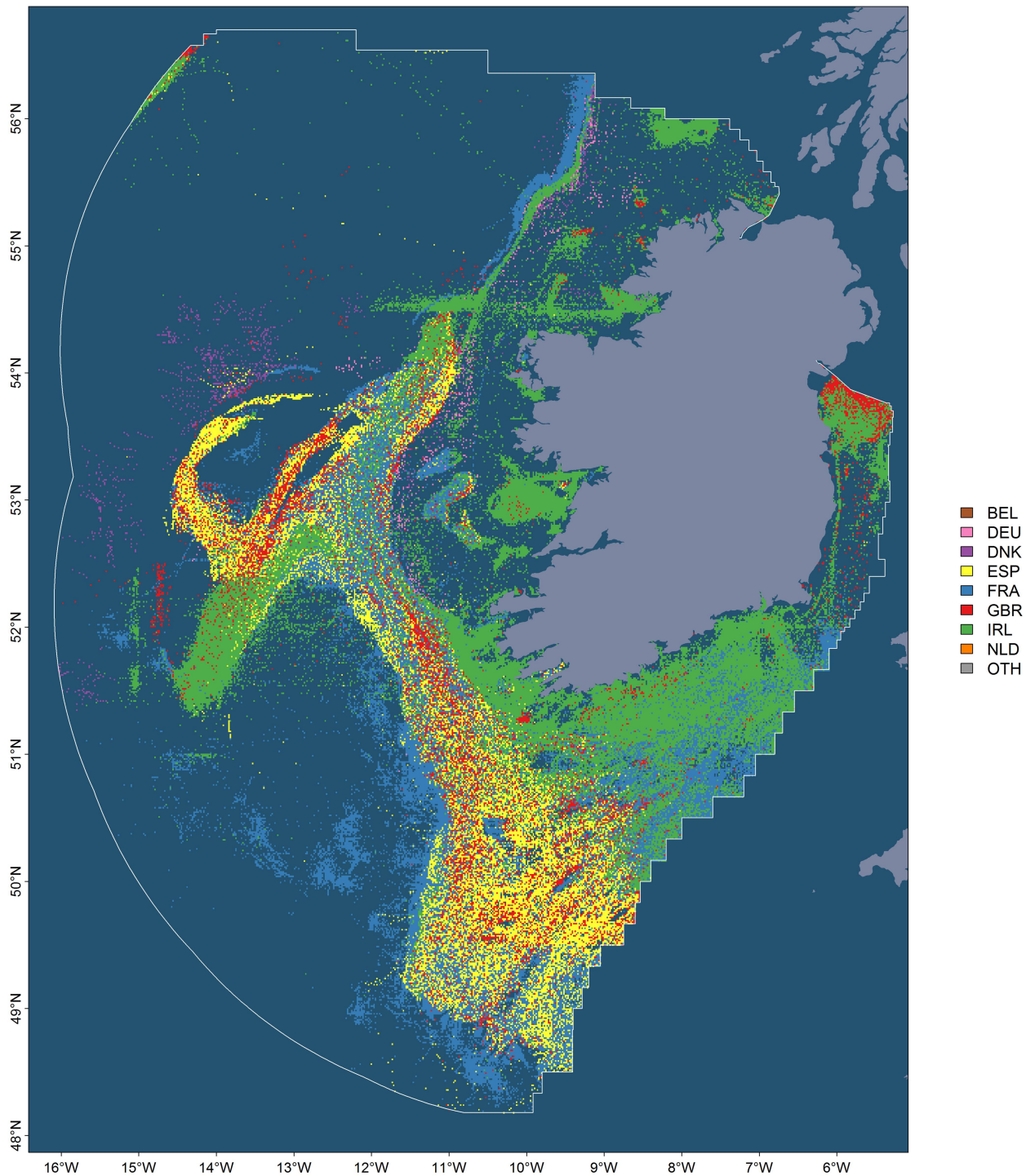


Figure 8: Distribution of international demersal otter trawl effort in the Irish EEZ by country in 2014-18

Key Points: International demersal otter trawl effort by country

- Ireland accounted for 44% of the otter trawl effort inside the EEZ.
- Some of the apparent French and Danish effort in deep water to the west of the continental shelf is likely to be misclassified pelagic effort.

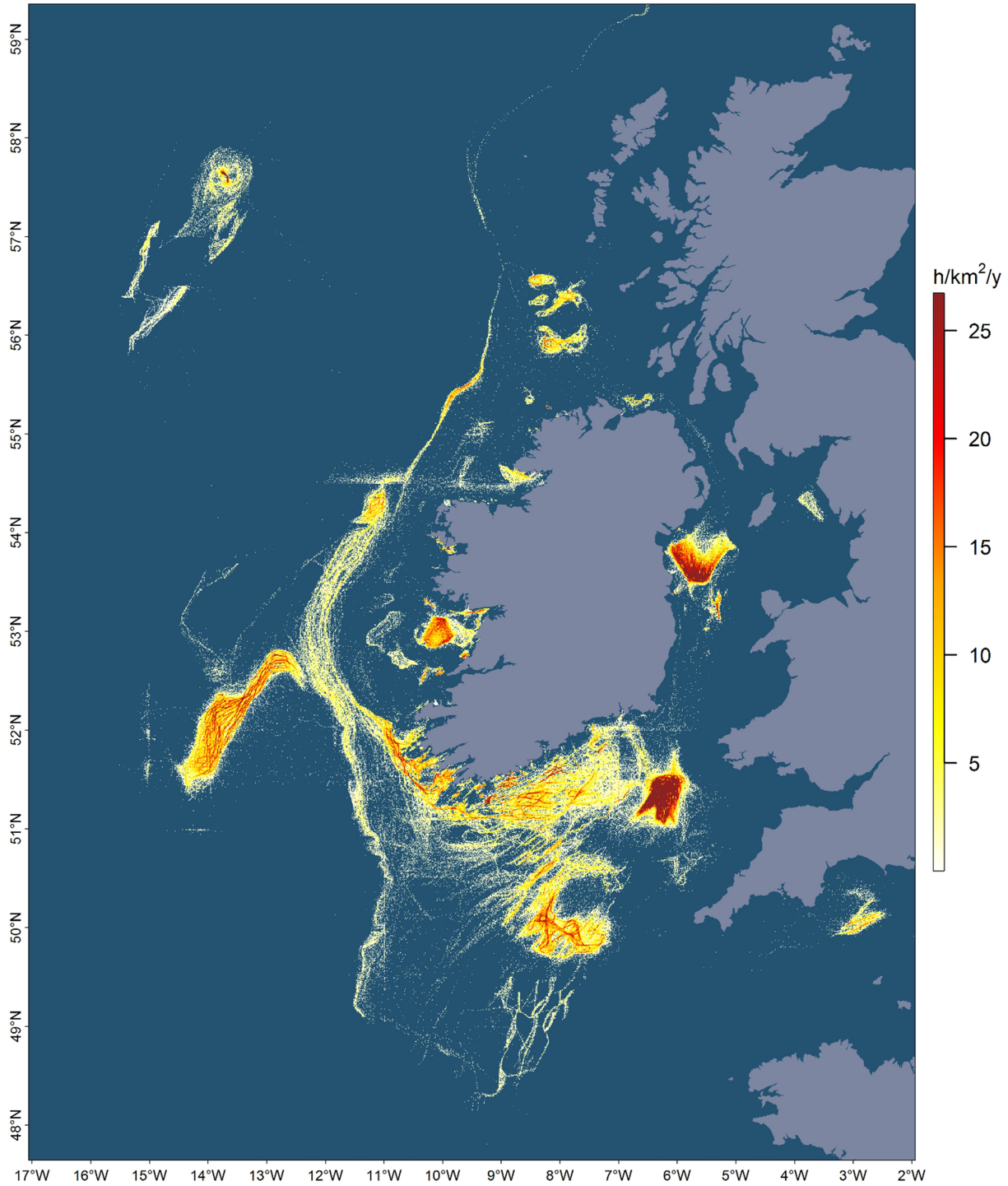


Figure 9: Distribution of Irish demersal otter trawl effort during 2014-2018

Key Points: Irish demersal otter trawl effort

- *Nephrops* fisheries in the Irish Sea, Aran Islands, Porcupine Bank and The Smalls have the highest fishing effort from demersal trawls.



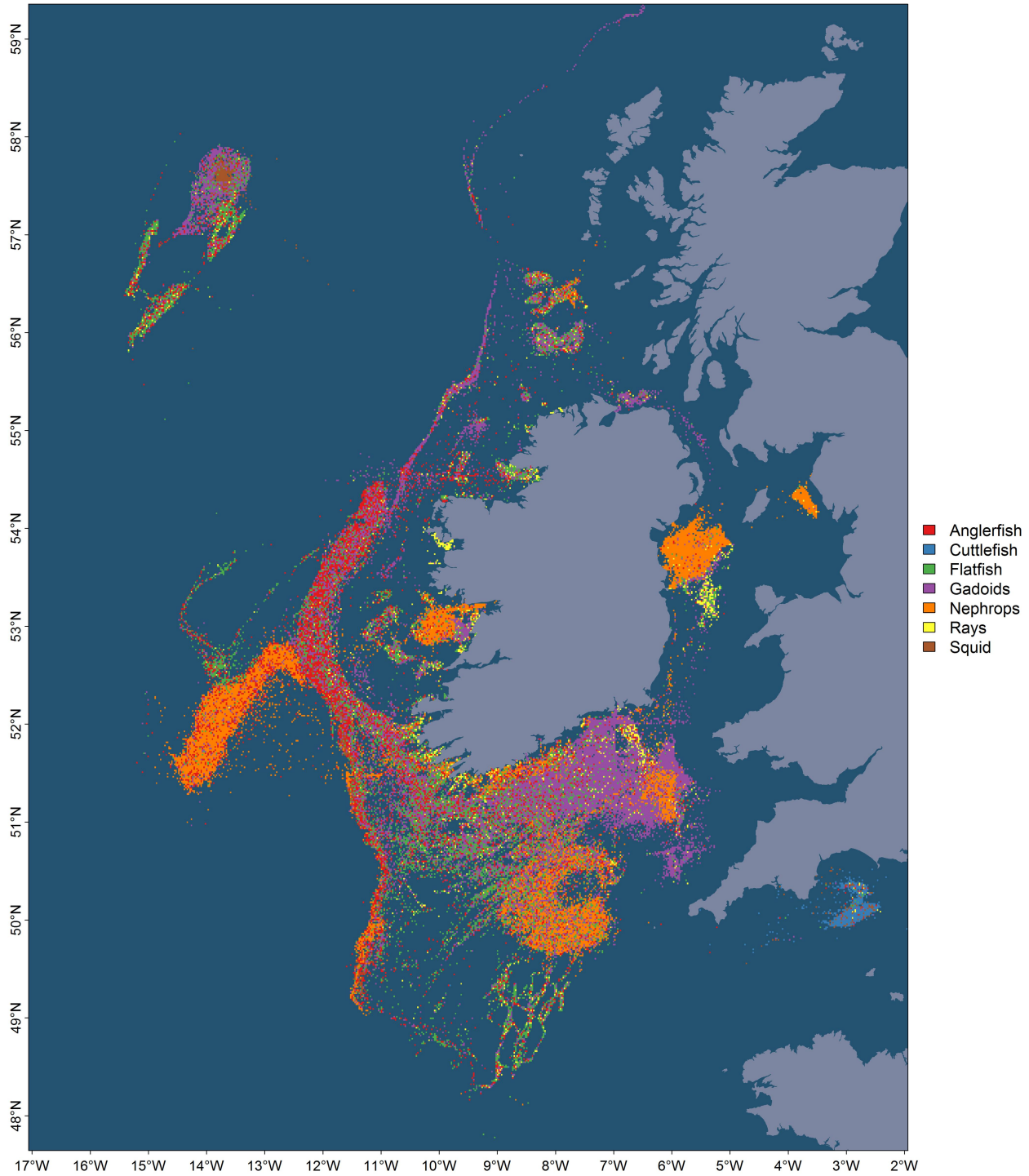


Figure 10: Species composition of demersal otter trawl vessels  $\geq 12\text{m}$  landing into Ireland in 2014-18

Key Points: Species composition of demersal otter trawl vessels

- *Nephrops* grounds are apparent in the Irish Sea, Aran Islands, Porcupine Bank and The Smalls.
- Anglerfish dominate along the shelf edge, flatfish dominate in the south-western Celtic Sea and Gadoids dominate in areas of the eastern Celtic Sea.

### 5.3 Beam trawl effort

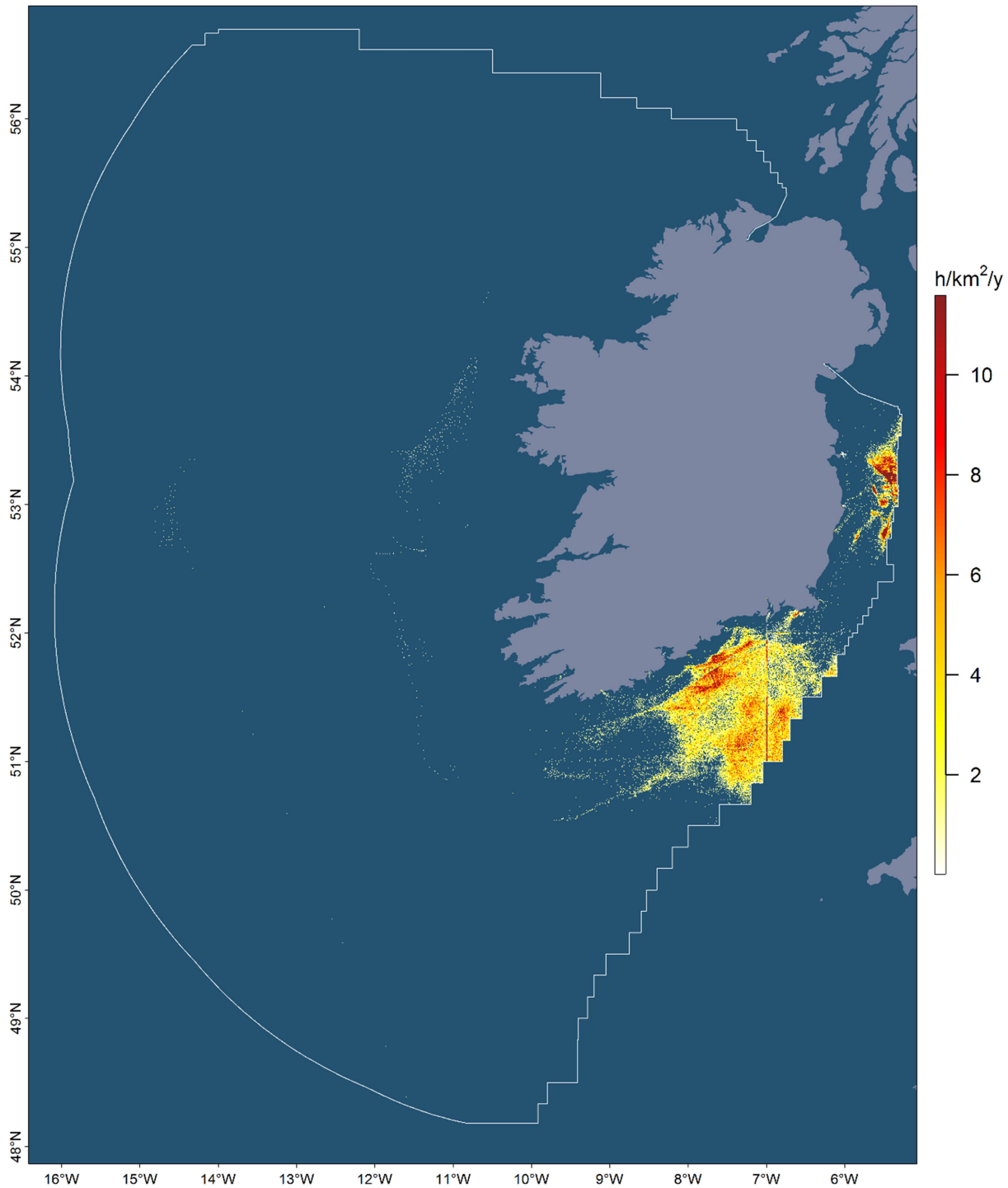


Figure 11: Distribution of international beam trawl effort in the Irish EEZ in 2014-18

#### Key Points: International beam trawl effort

- Beam trawl effort is more geographically restricted than otter trawls due to limitations on depth and bottom type.
- High levels of beam trawl effort are noticeable in northern Celtic Sea and central Irish Sea.

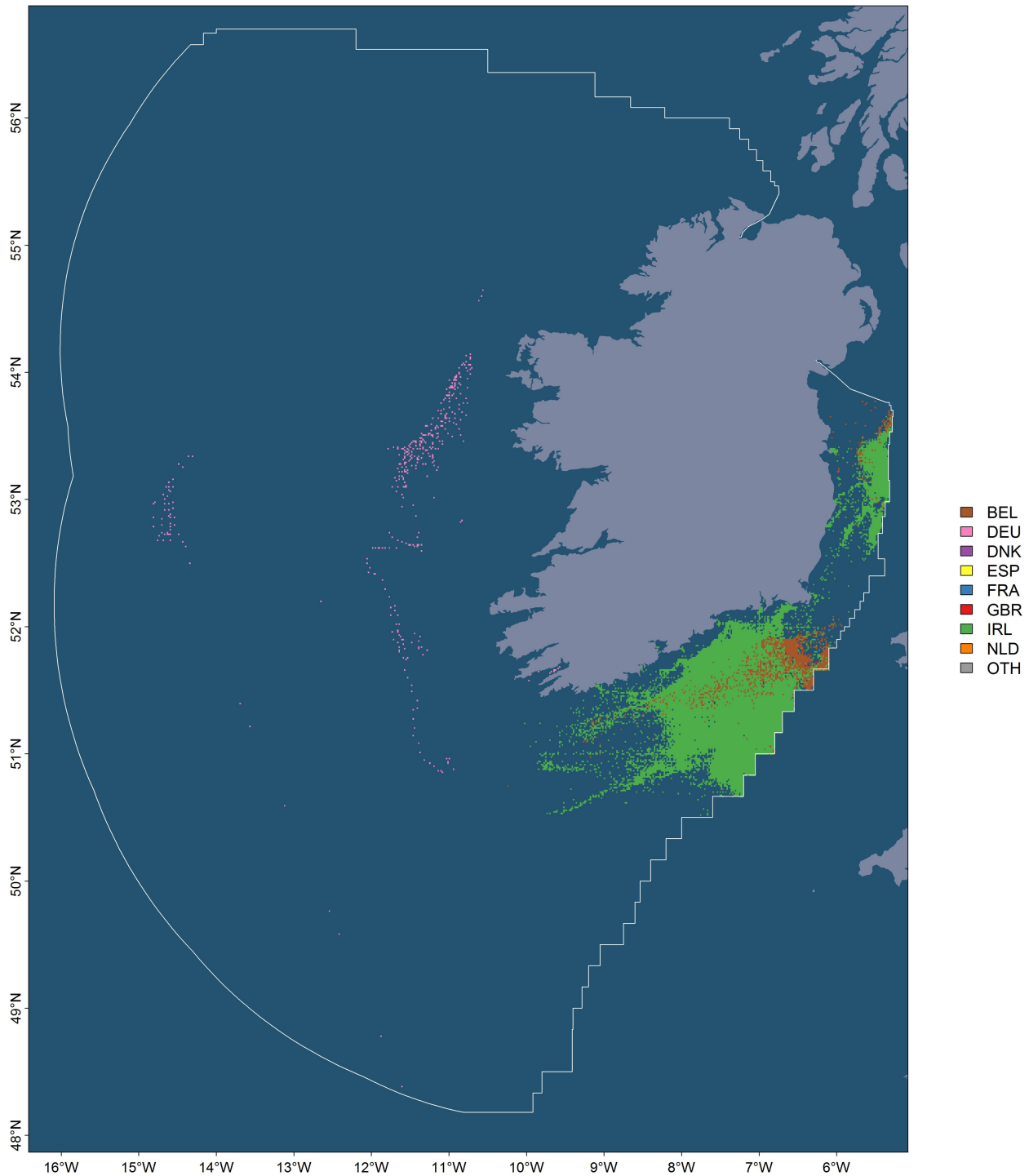


Figure 12: Distribution of international beam trawl effort in the Irish EEZ by country in 2014-18

Key Points: International beam trawl effort by country

- Ireland accounted for 89% of the total beam trawl effort inside the Irish EEZ.
- Apparent German beam trawl effort on the continental shelf edge may be due to a misclassification of the gear type and are more likely to be pelagic gears.



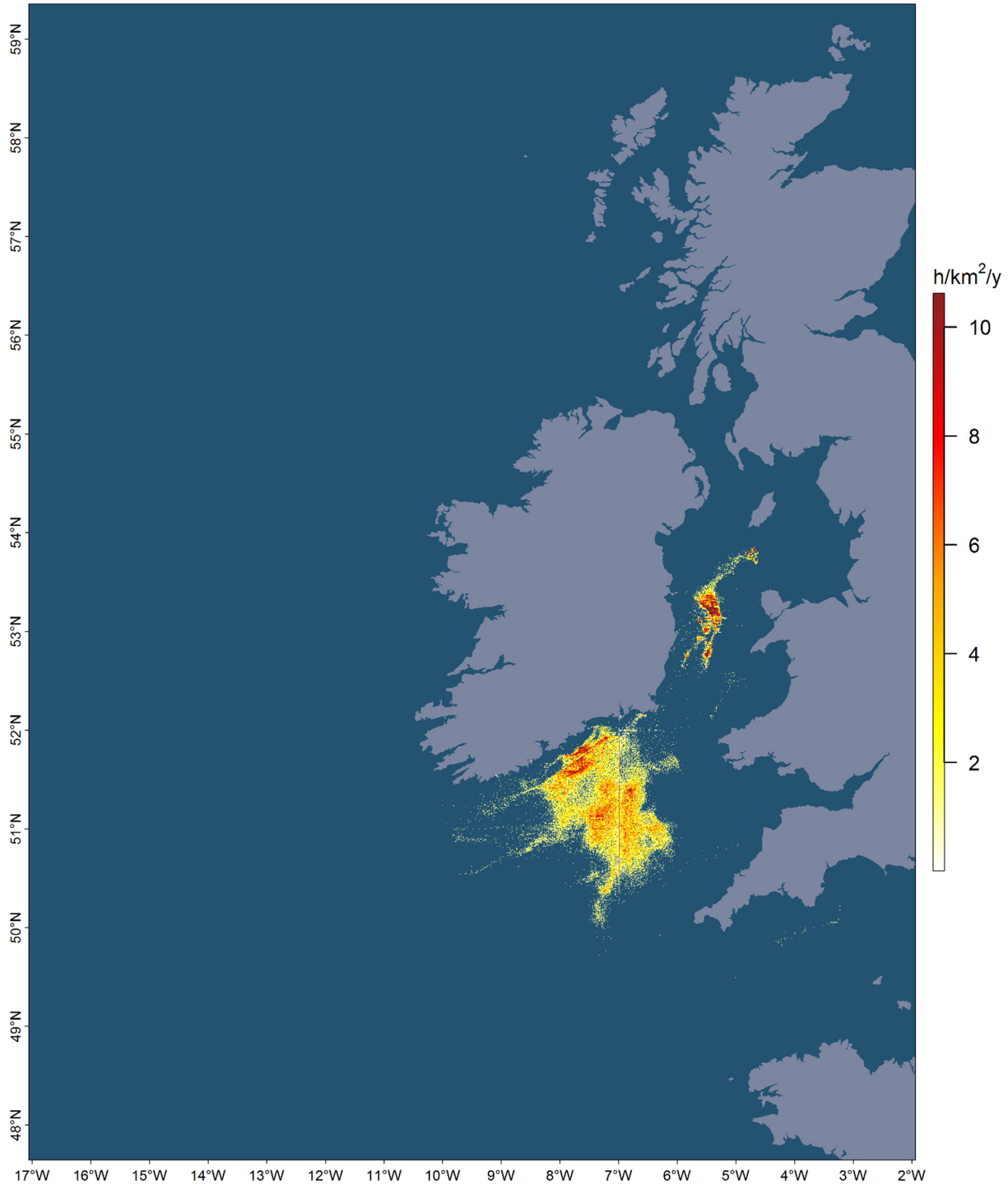


Figure 13: Distribution of beam trawl effort by Irish vessels  $\geq 12\text{m}$  during 2014-18

Key Points: Beam trawl effort by Irish vessels

- As Irish vessels account for the vast majority of beam trawl effort in the Irish EEZ this map is very similar to the international demersal beam trawl effort map in Figure 11.

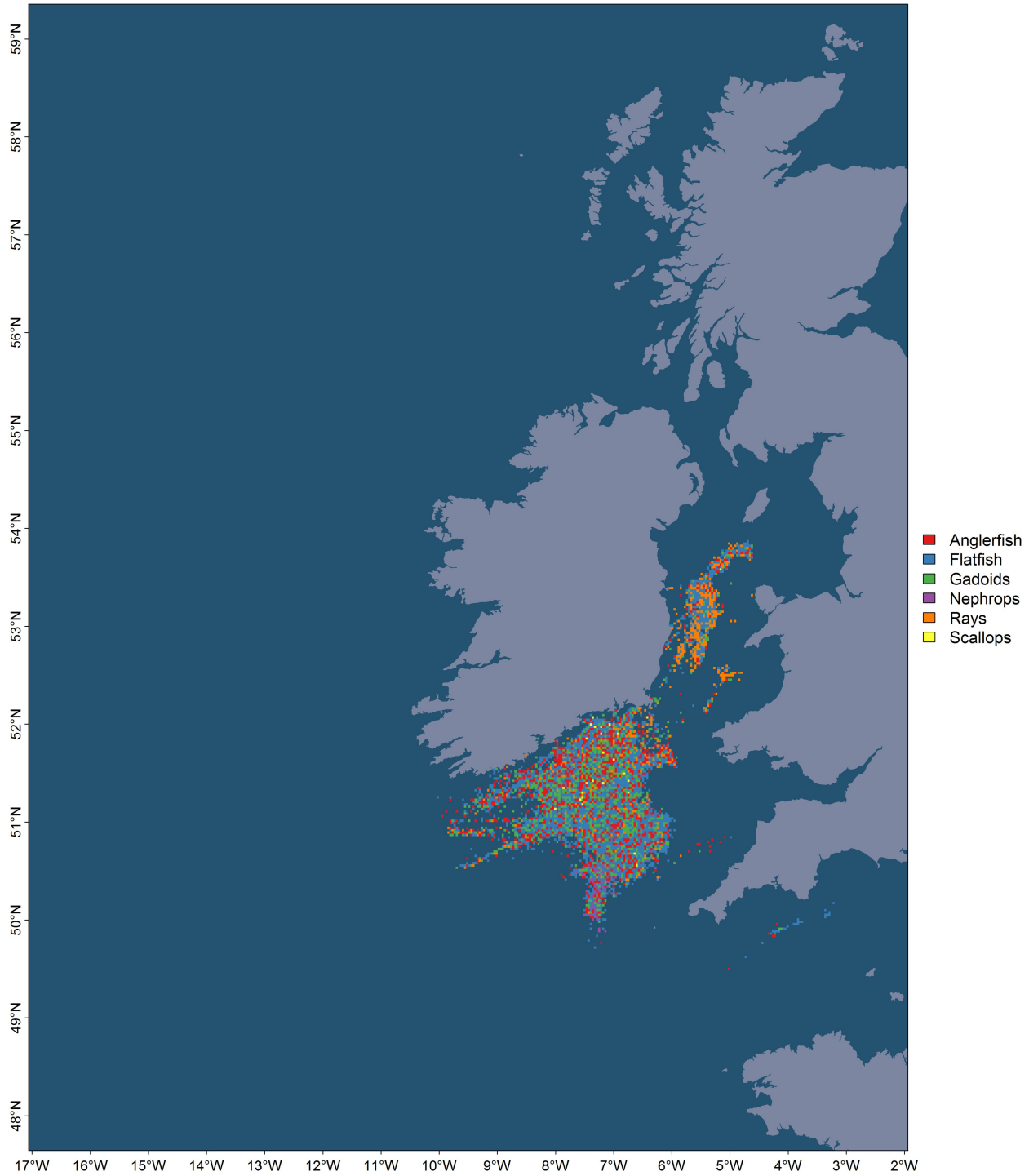


Figure 14: Species composition of the beam trawl vessels  $\geq 12\text{m}$  landing into Ireland in 2014-18

Key Points: Species composition of beam trawl vessels

- In the Celtic Sea the species composition from demersal beam trawls is highly mixed.
- In the Irish Sea and St George's Channel rays and flatfish dominate the landings.

## 5.4 Demersal seine effort

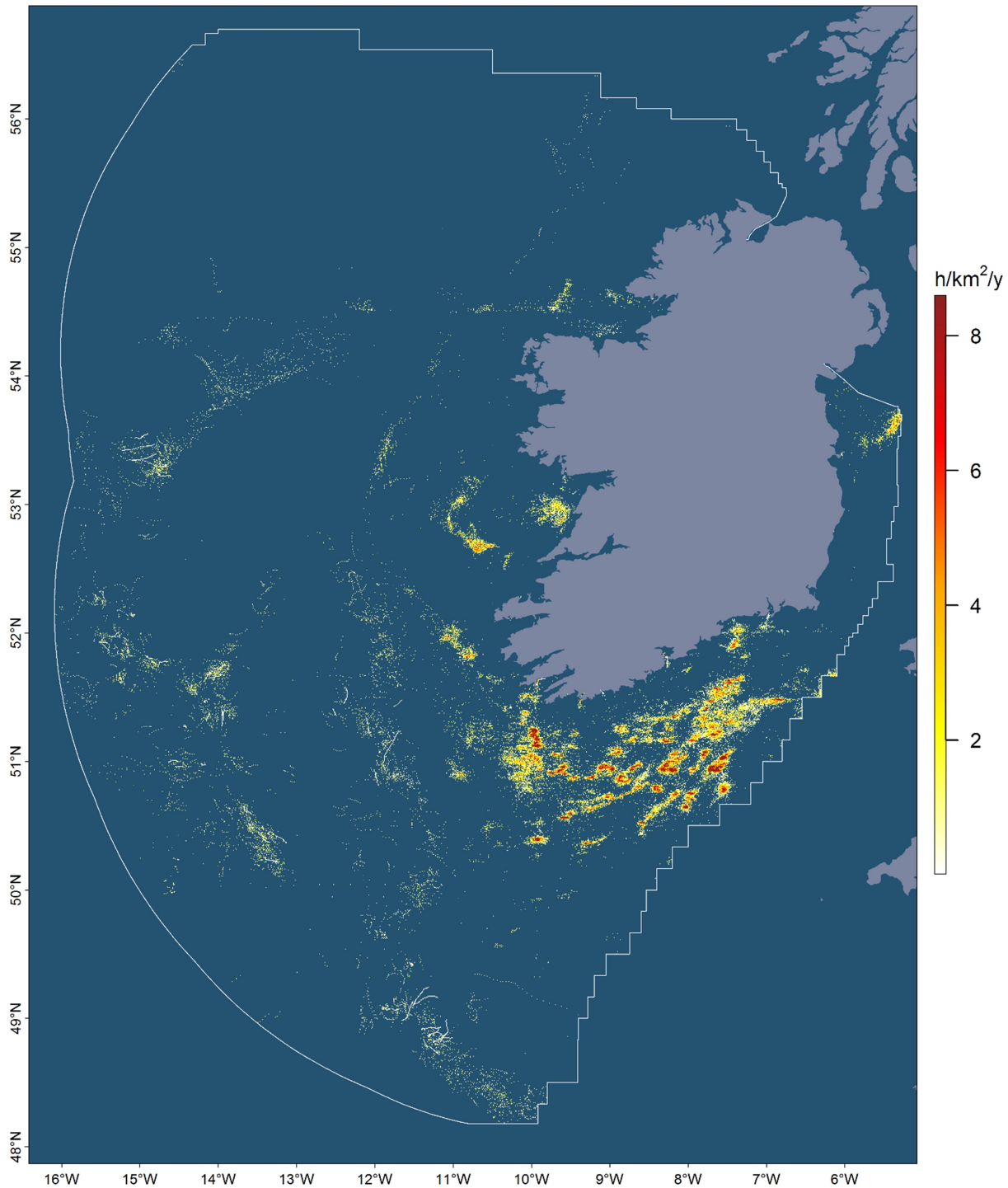


Figure 15: Distribution of international demersal seine effort in the Irish EEZ in 2014-18

### Key Points: International demersal seine effort

- International demersal seine effort is patchy but widely distributed on and off the continental shelf.
- Activity in deep water off the continental shelf may be misclassified pelagic fishing.

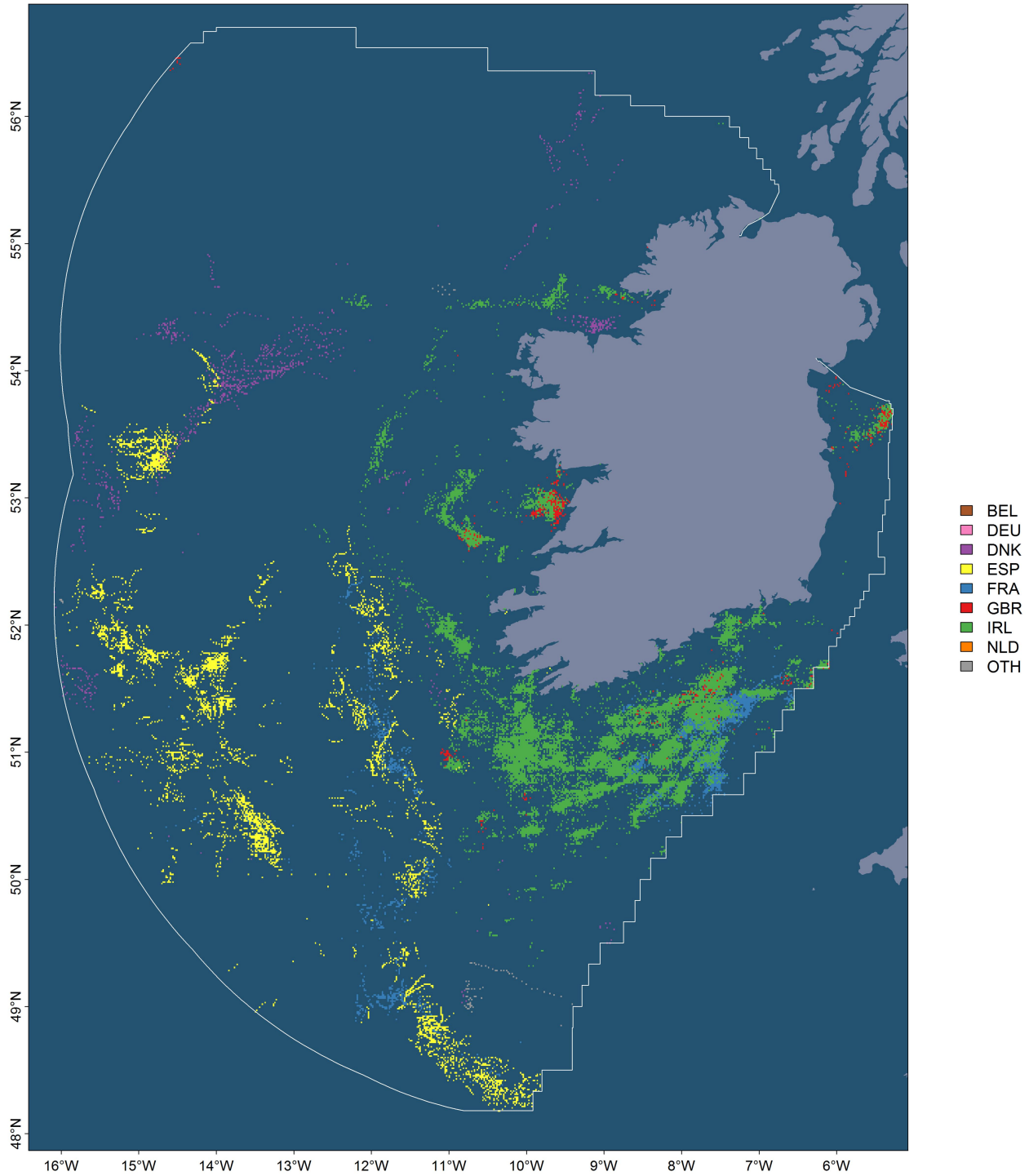


Figure 16: Distribution of international demersal seine effort in the Irish EEZ by country in 2014-18

Key Points: International demersal seine effort by country

- Ireland accounted for 82% of the total demersal seine effort inside the Irish EEZ.
- Activity in deep water off the continental shelf may be misclassified pelagic fishing.

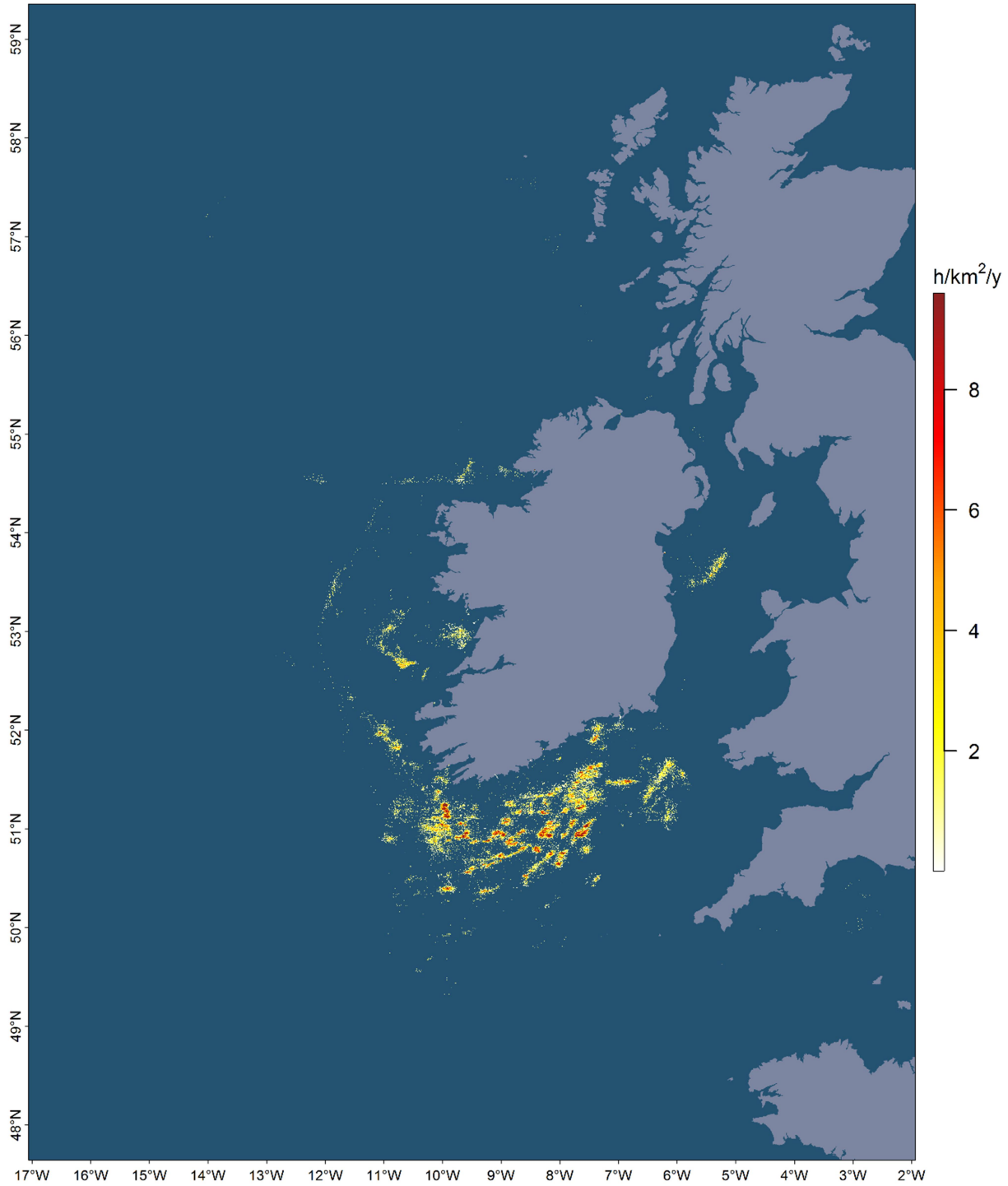


Figure 17: Distribution of demersal seine effort by Irish vessels  $\geq 12\text{m}$  during 2014-18

Key Points: Demersal seine effort by Irish vessels

- Although Irish vessels account for the vast majority of beam trawl effort in the Irish EEZ, the distribution of Irish effort is limited to the continental shelf area whereas international effort is in further offshore.

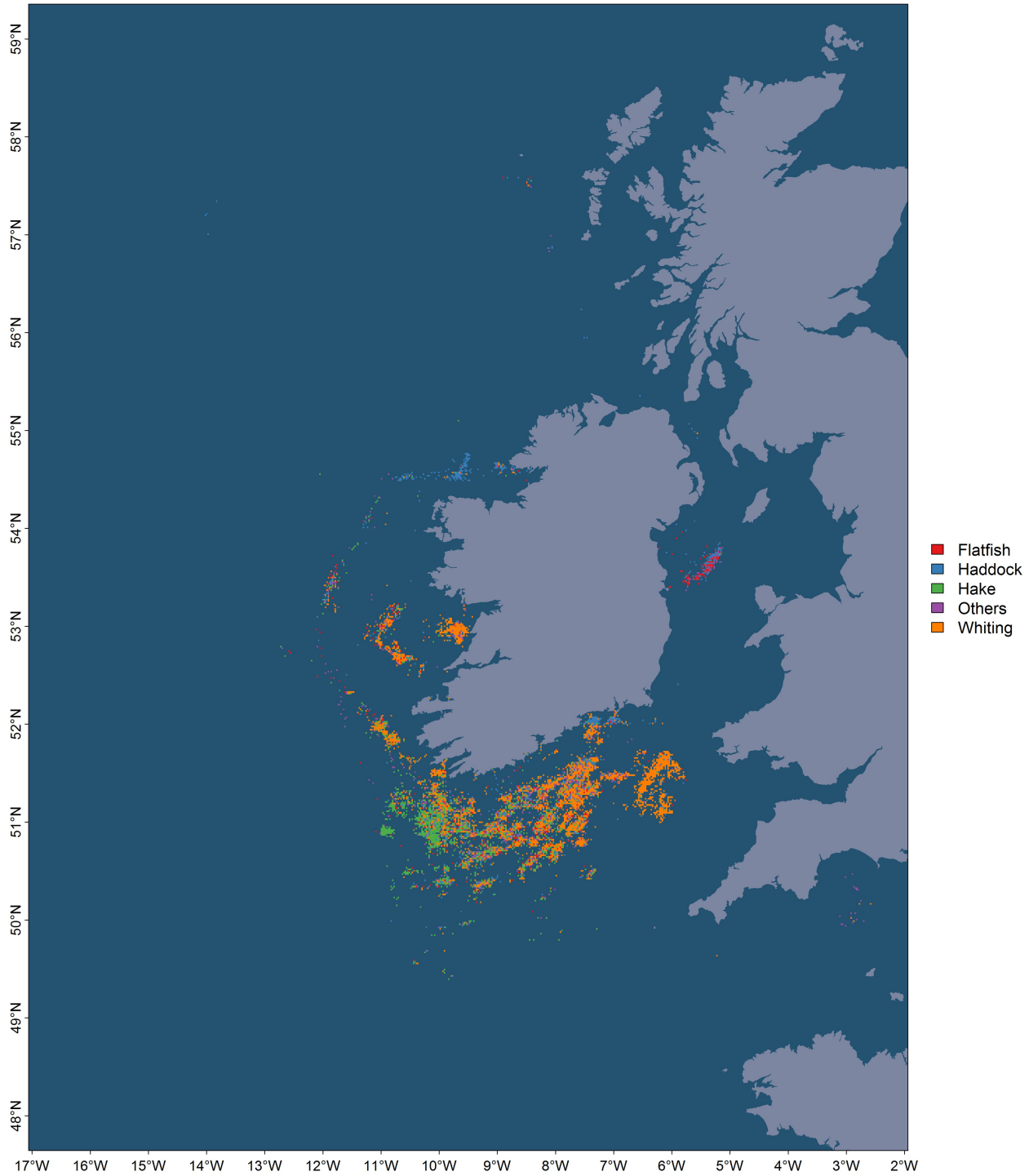


Figure 18: Species composition of the demersal seine vessels  $\geq 12\text{m}$  landing into Ireland in 2014-18

Key Points: Species composition of demersal seine vessels

- Whiting dominate in the seine catches in the Celtic Sea and West of Ireland while hake are targeted off the South West coast, haddock are caught off the North West and flatfish in the Irish Sea.



## 5.5 Gill net effort

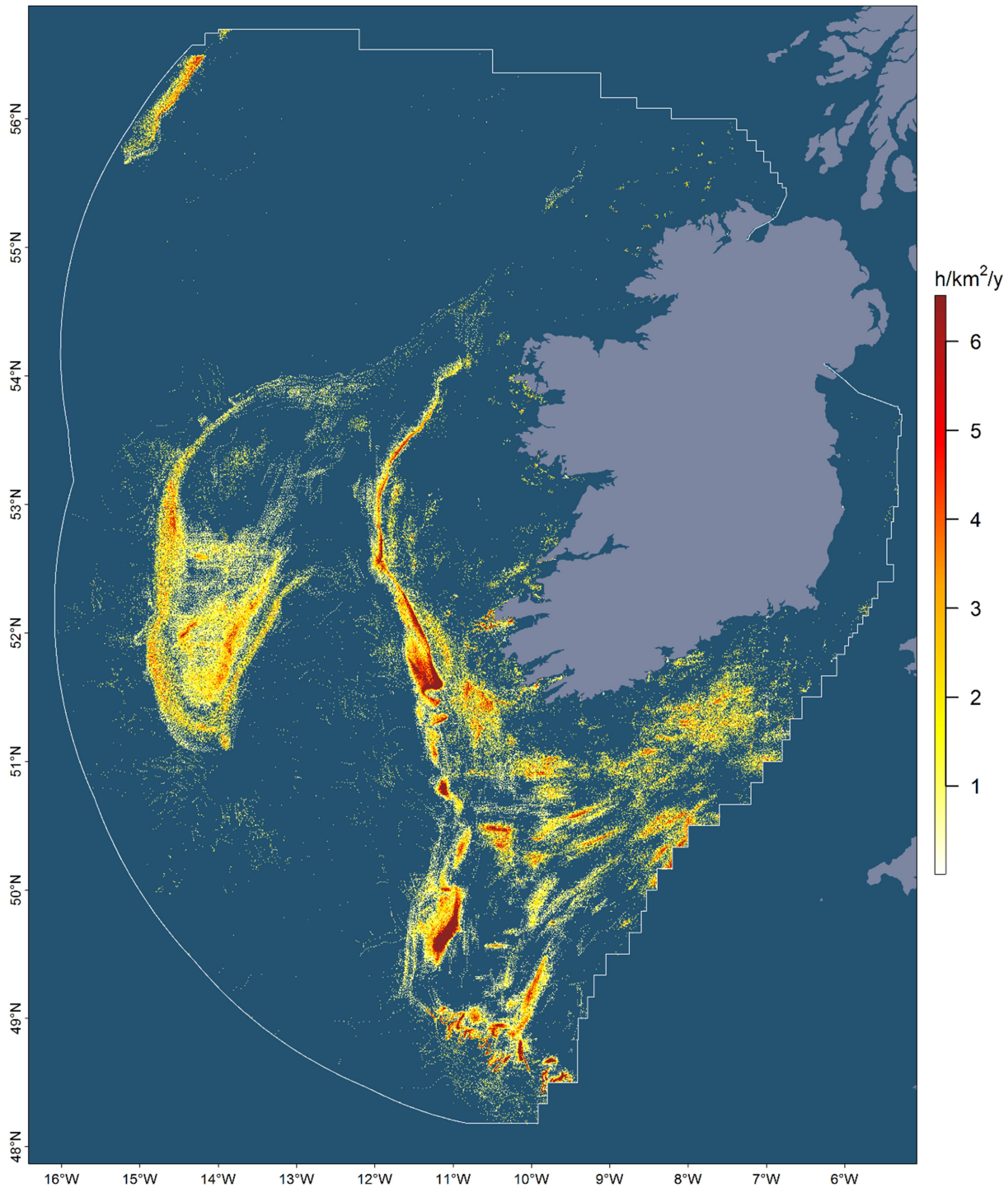


Figure 19: Distribution of international gill net effort in the Irish EEZ in 2014-18

### Key Points: International gill net effort

- International gill net effort is widely distributed both on and off the continental shelf.
- Areas of high fishing effort are noticeable along the continental shelf edge.

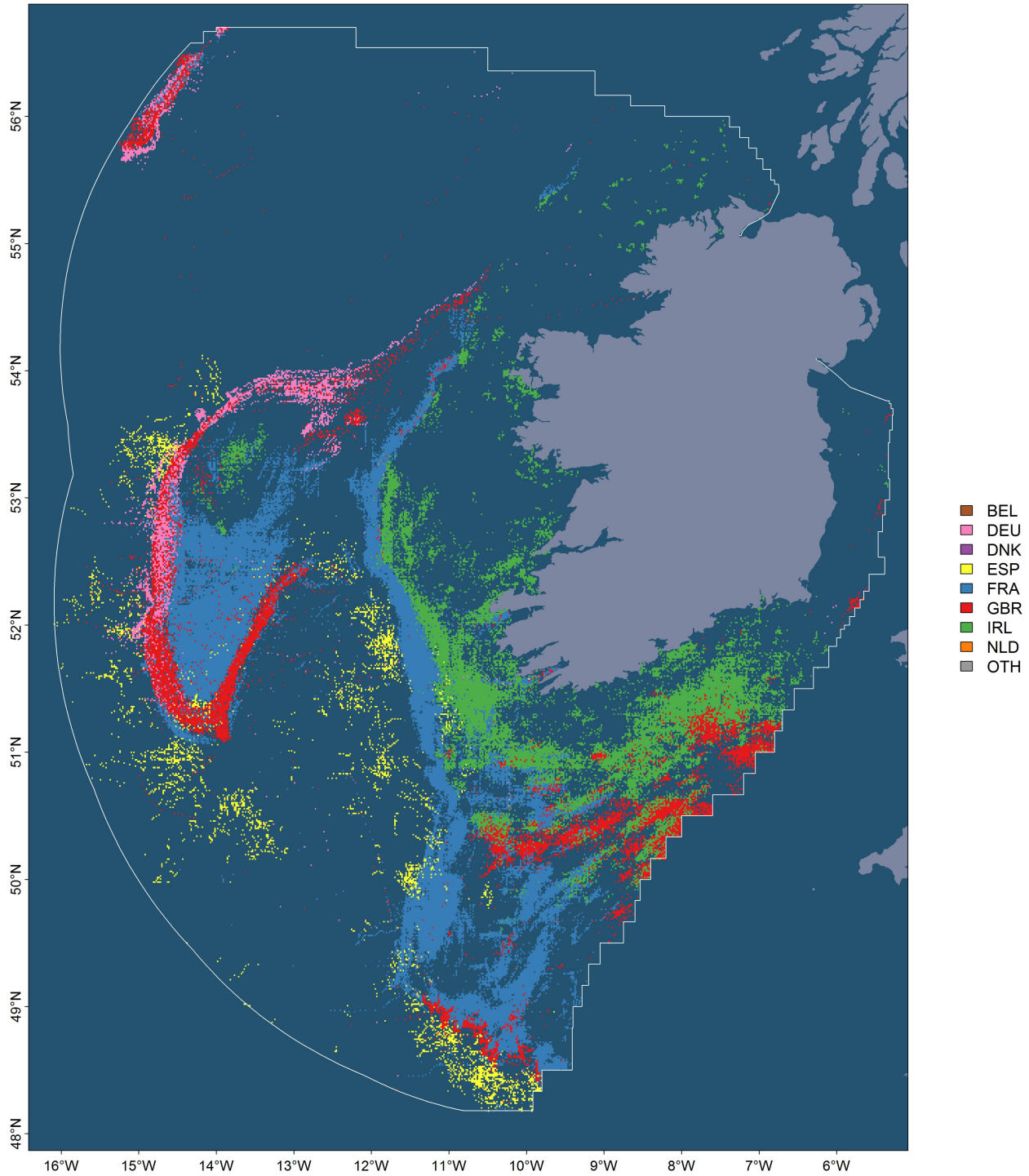


Figure 20: Distribution of international gill net effort in the Irish EEZ by country in 2014-18

Key Points: International gill net effort by country

- Ireland accounted for 38% of the total gill net effort inside the Irish EEZ.
- Irish gill net effort is mostly confined to the continental shelf area to the south and west of Ireland, whereas the international effort is located in more offshore areas.

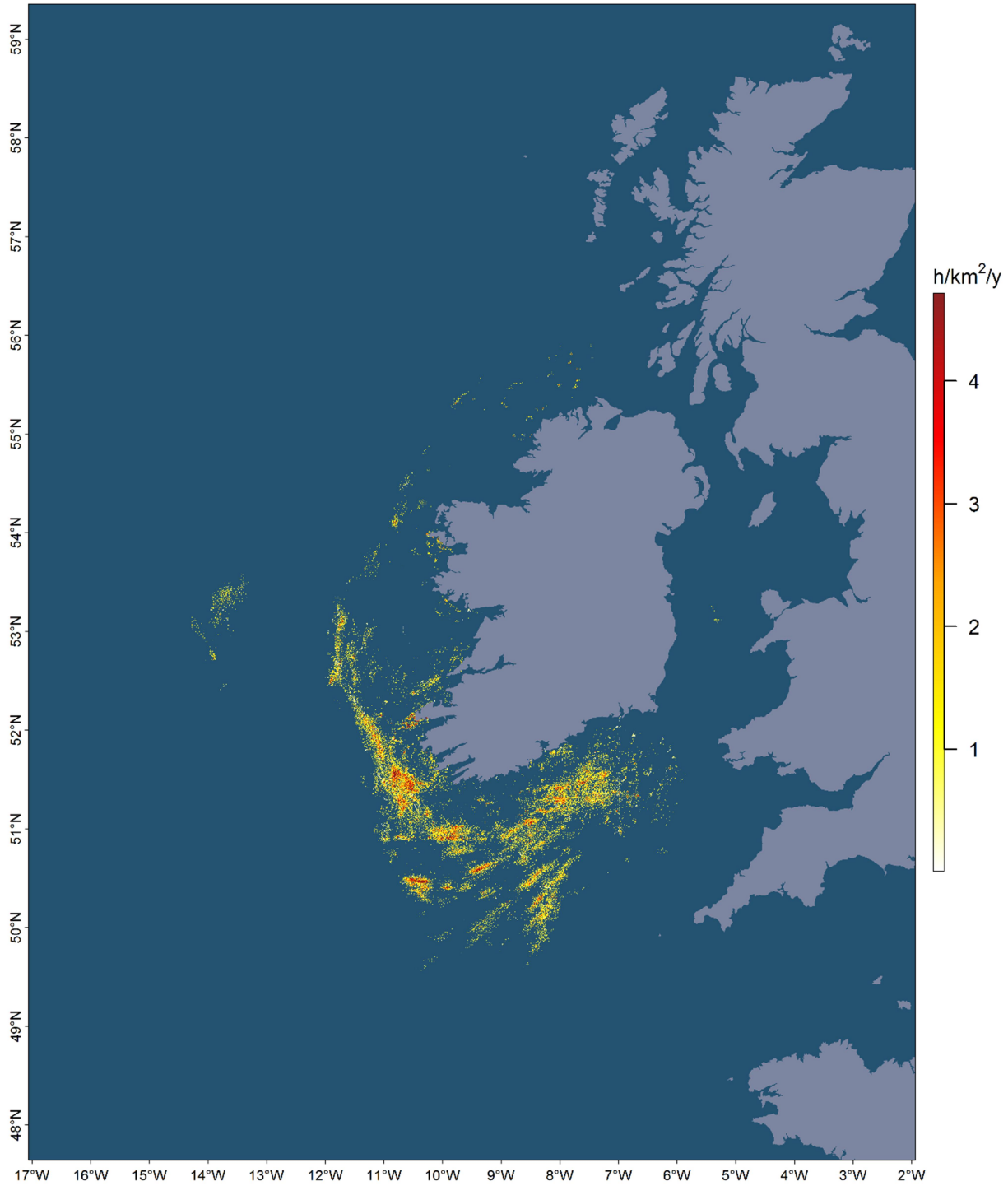


Figure 21: Distribution of gillnet effort by Irish vessels  $\geq 12\text{m}$  during 2014-18

Key Points: Gillnet effort by Irish vessels

- Smaller vessels (without VMS) account for a significant portion of the Irish gillnet effort.
- Gillnet effort by Irish vessels is distributed widely over the continental shelf with small areas of high effort in the south and south west.

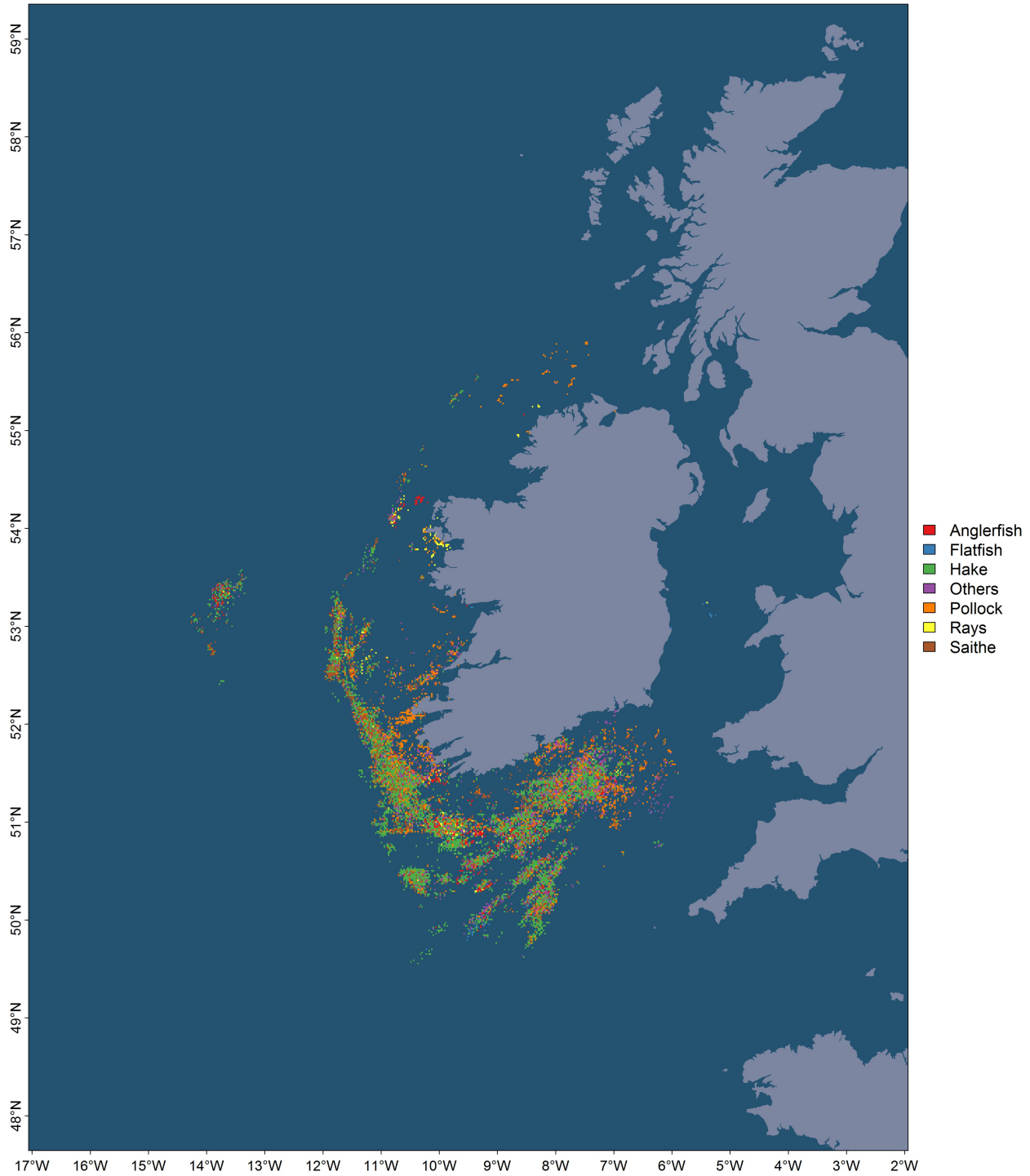


Figure 22: Species composition of the gillnet vessels  $\geq 12m$  landing into Ireland in 2014-18

Key Points: Species composition of the gillnet vessels

- Hake dominate landings from Irish gillnet vessels on most of the continental shelf.
- Pollack dominate the gillnet landings closer to shore.



## 5.6 Longline effort

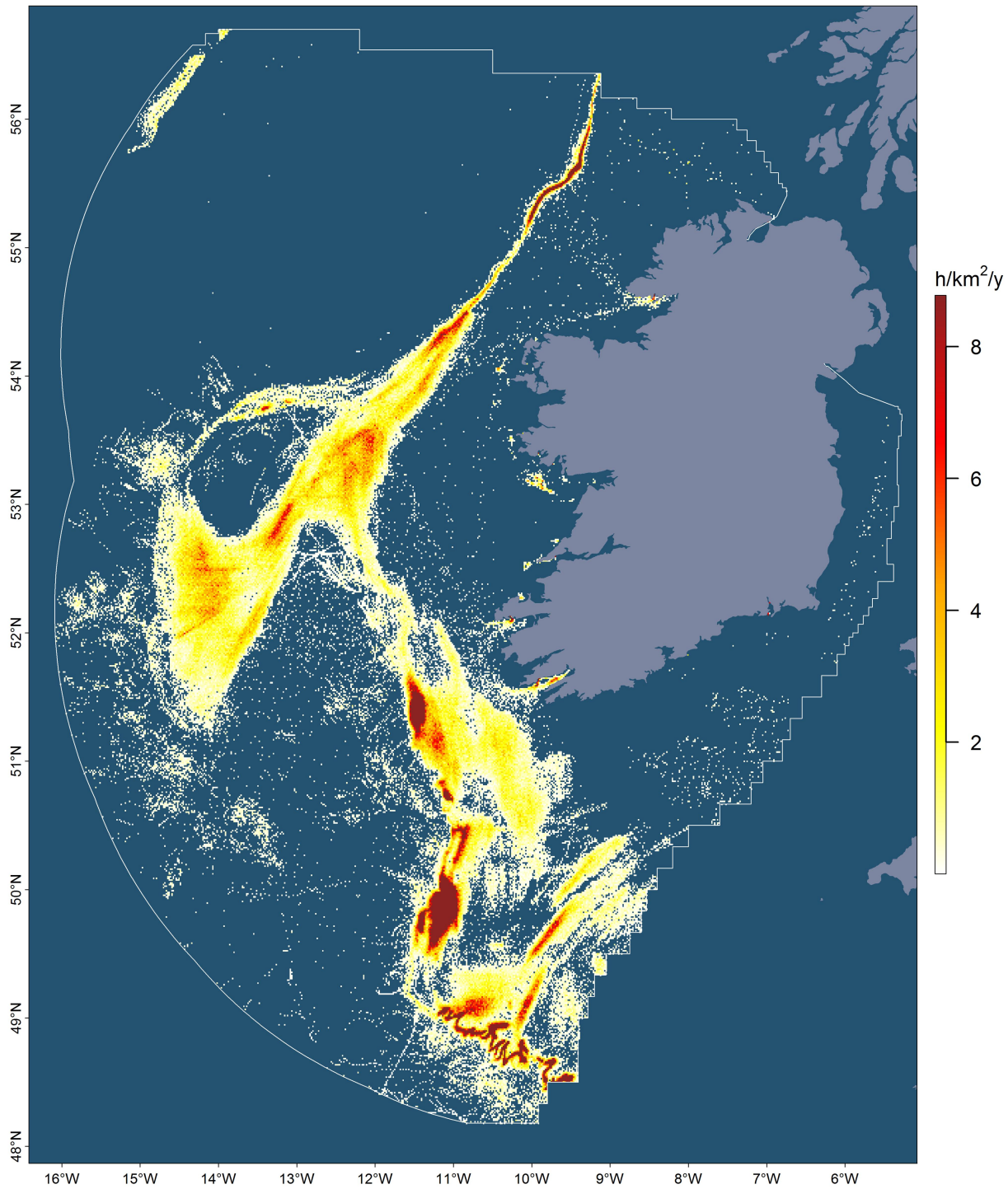


Figure 23: Distribution of international longline effort in the Irish EEZ

### Key Points: International longline effort

- International longline effort is mainly distributed in deeper waters off the continental shelf.
- Areas of high longline effort can be found in narrow bands off the northwest and southwest coast.

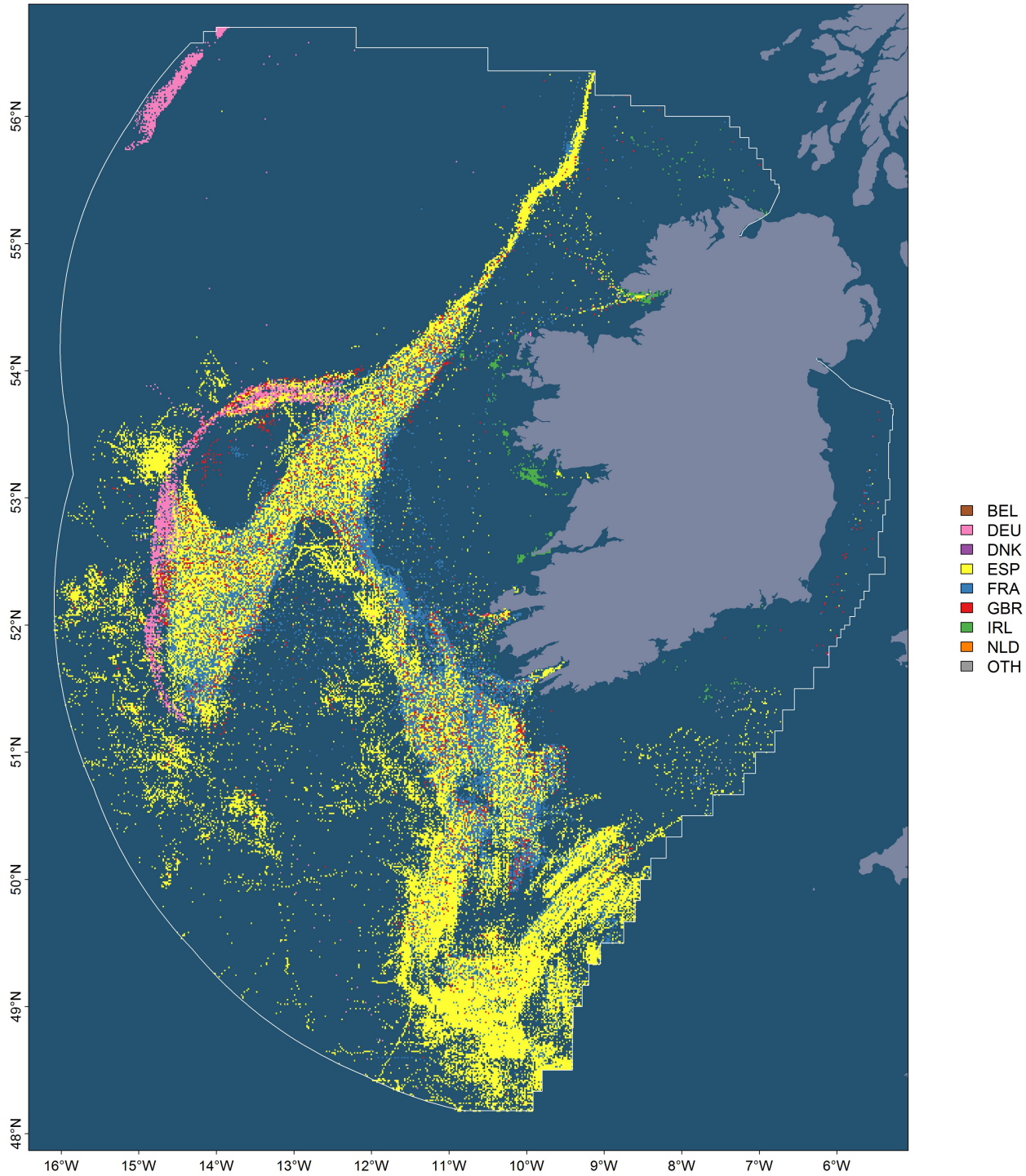


Figure 24: Distribution of international longline effort in the Irish EEZ by country in 2014-18

Key Points: International longline effort by country

- Ireland accounted for 1% of the total effort inside the EEZ.
- Spain is responsible for the vast majority of longline effort in Irish waters.

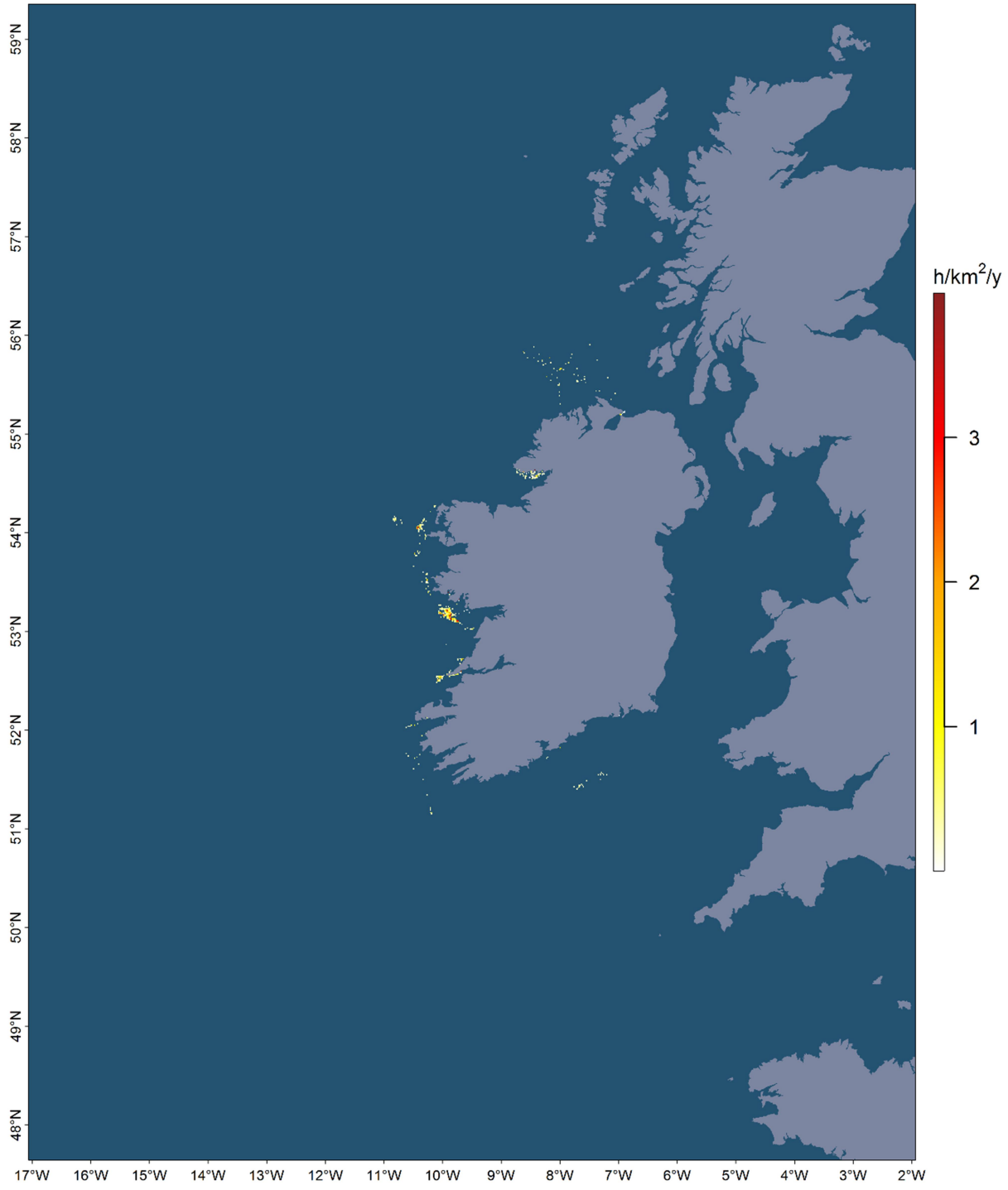


Figure 25: Distribution of longline effort by Irish vessels  $\geq 12m$  during 2014-18

Key Points: Longline effort by Irish vessels

- Irish longline activity is very minor and constrained to inshore areas.

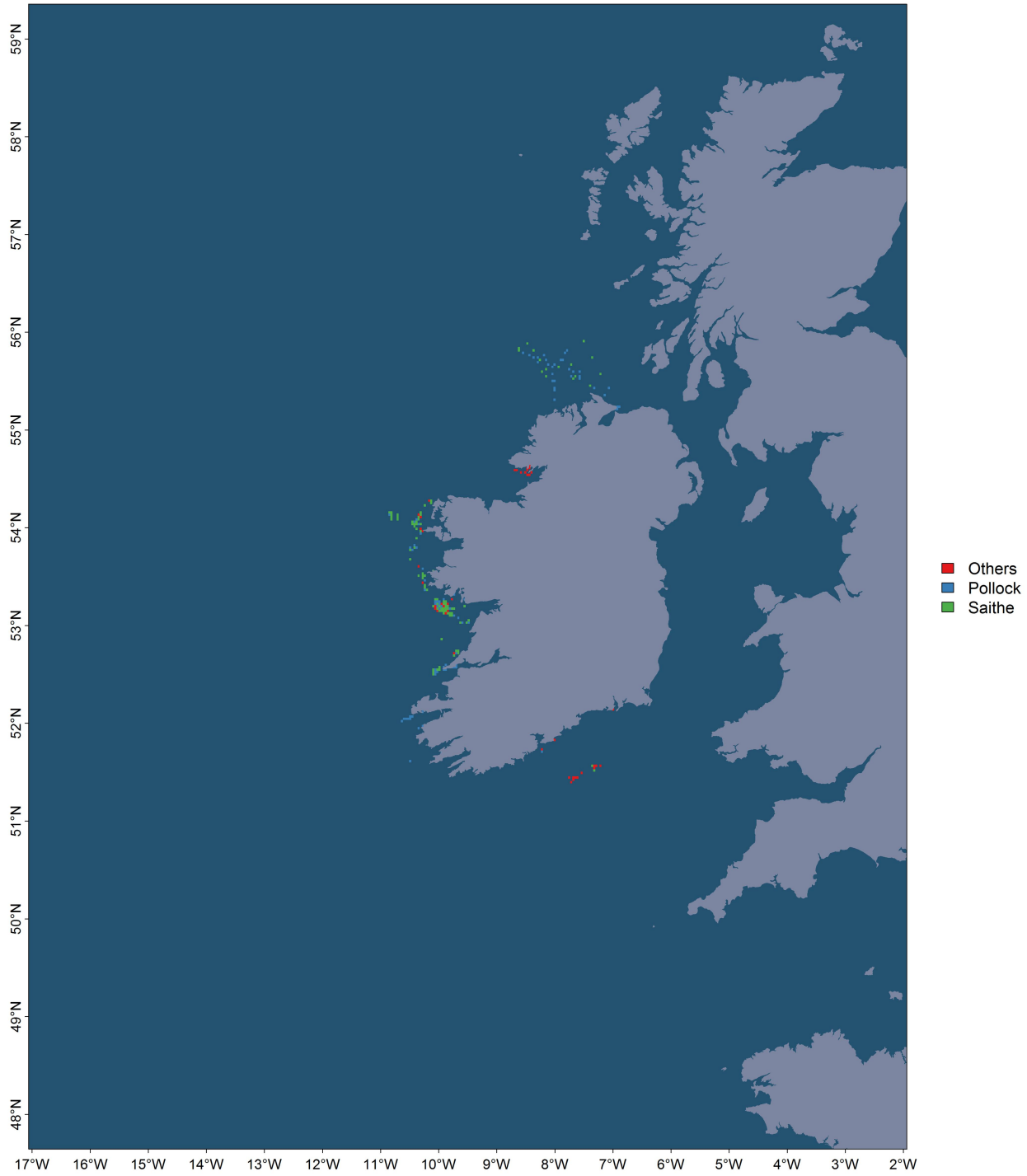


Figure 26: Species composition of the longline vessels  $\geq 12\text{m}$  landing into Ireland in 2014-18

Key Points: Species composition of longline vessels

- The vast majority of longline catches in Irish EEZ are not landed into Ireland.
- Longline landings into Ireland are dominated by Pollack and Saithe.



## 5.7 Dredge effort

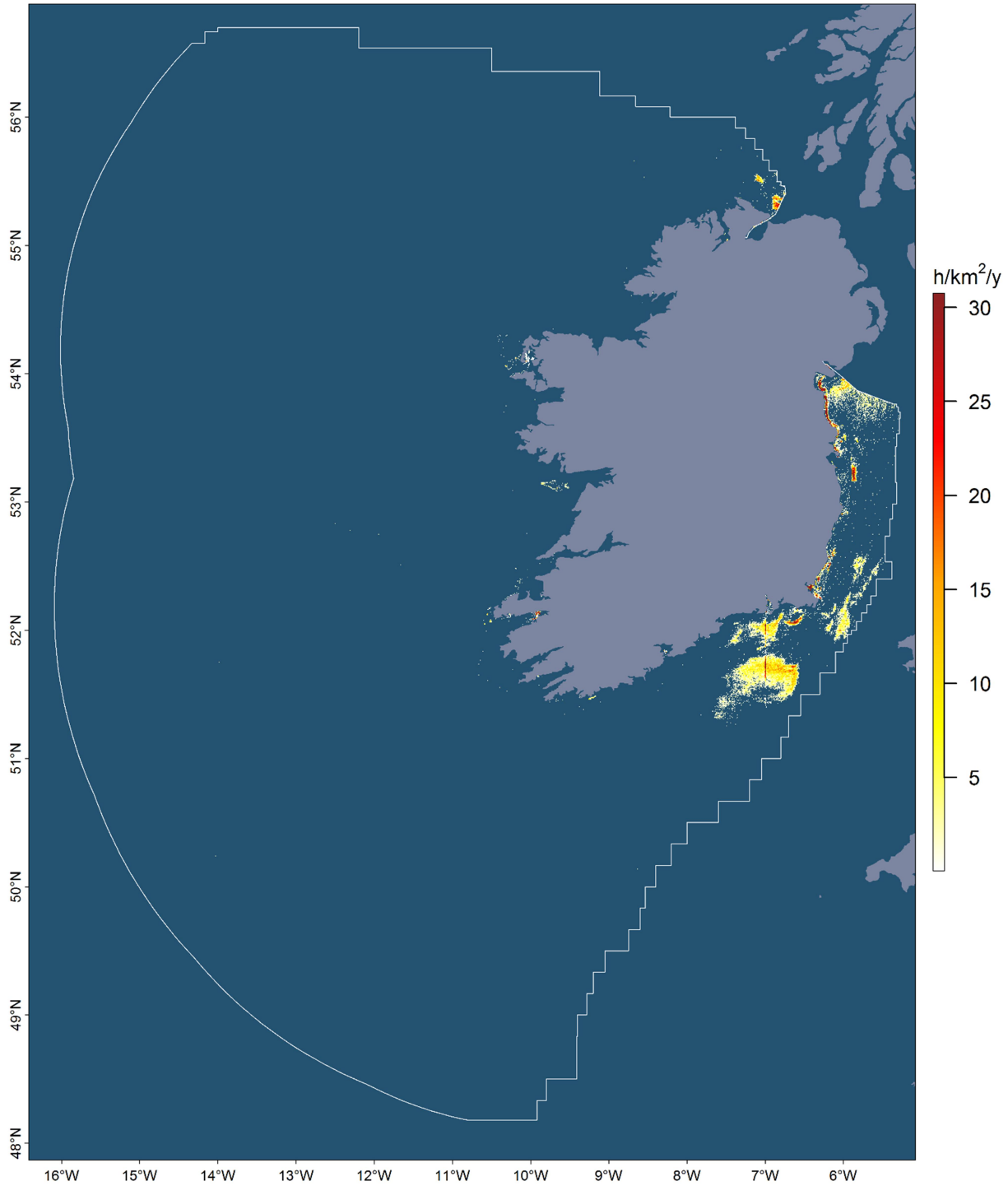


Figure 27: Distribution of international dredge effort in the Irish EEZ in 2014-18

### Key Points: International dredge effort

- The vast majority of international dredge effort is located on the east and southeast coast.
- Small areas of high effort are noticeable in Dundalk Bay and Irish Sea.

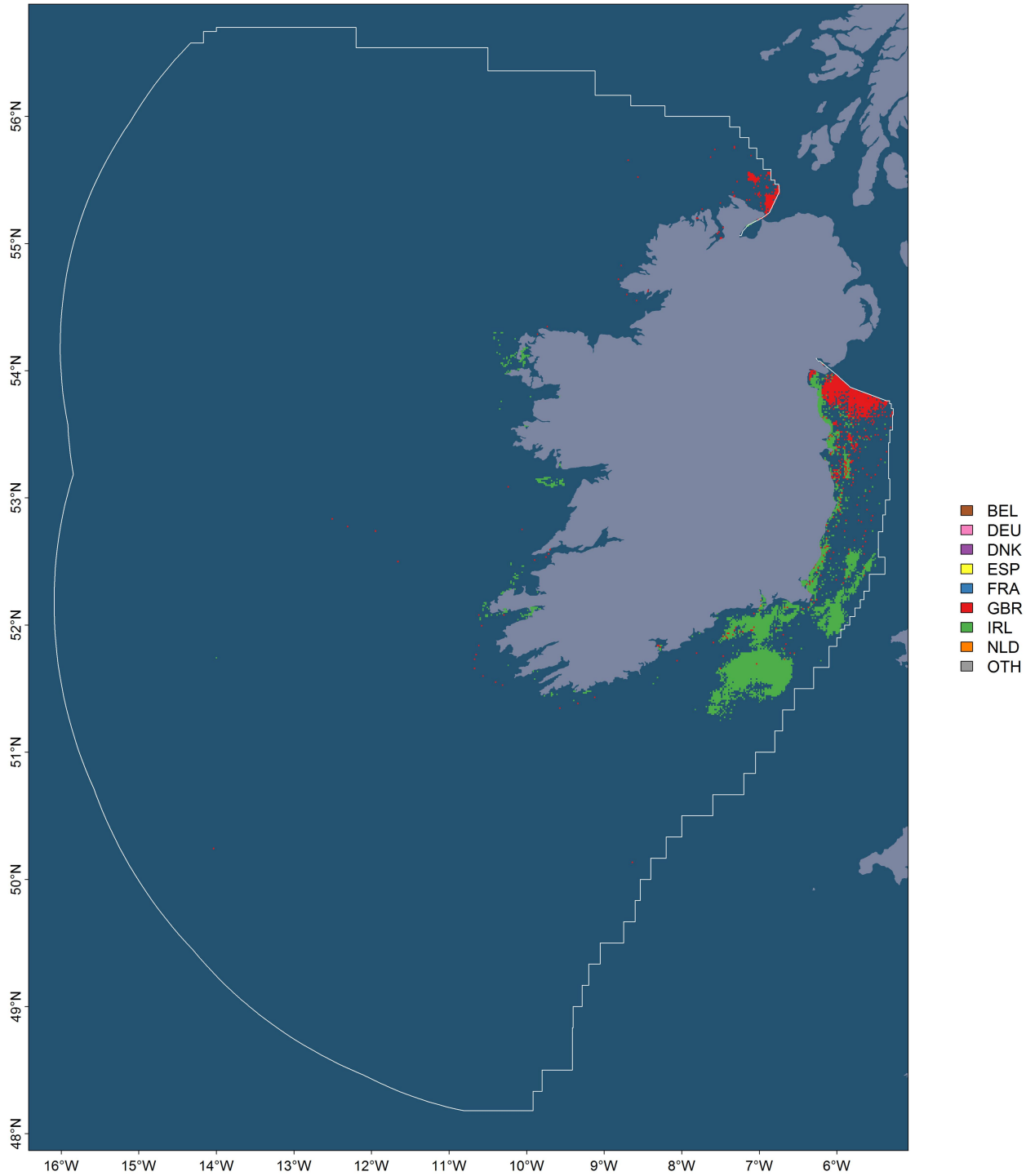


Figure 28: Distribution of international dredge effort in the Irish EEZ by country in 2014-18

Key Points: International dredge effort by country

- Ireland accounted for 58% of the total dredge effort inside the Irish EEZ.
- Majority of Irish dredge effort is located in Celtic Sea fishing grounds.

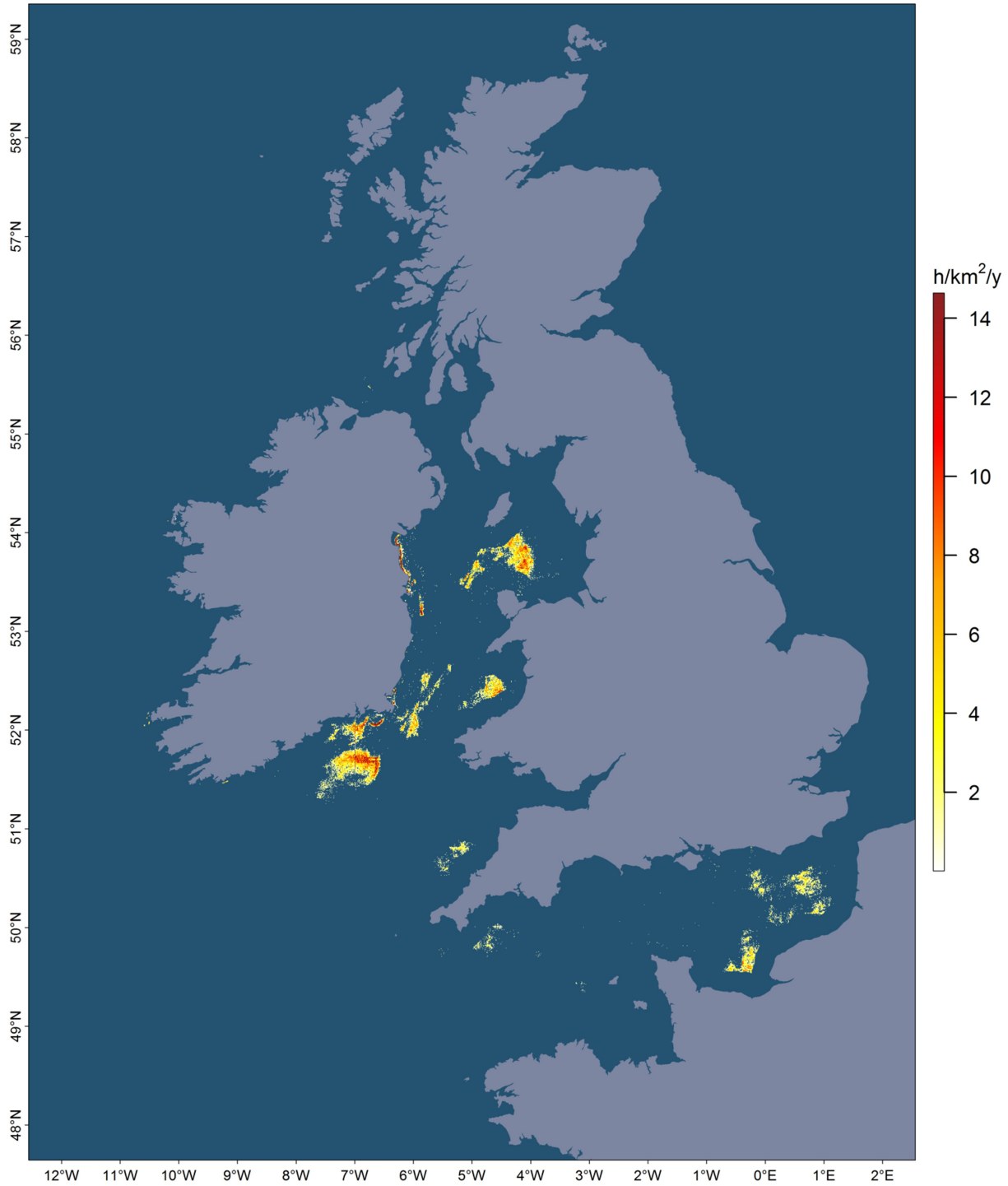


Figure 29: Distribution of dredge effort by Irish vessels  $\geq 12\text{m}$  during 2014-18

Key Points: Dredge effort by Irish vessels

- Smaller vessels  $< 12\text{m}$  (without VMS) account for a significant proportion of the Irish dredge effort.
- Some Irish dredge vessels expend fishing effort in the eastern English Channel.

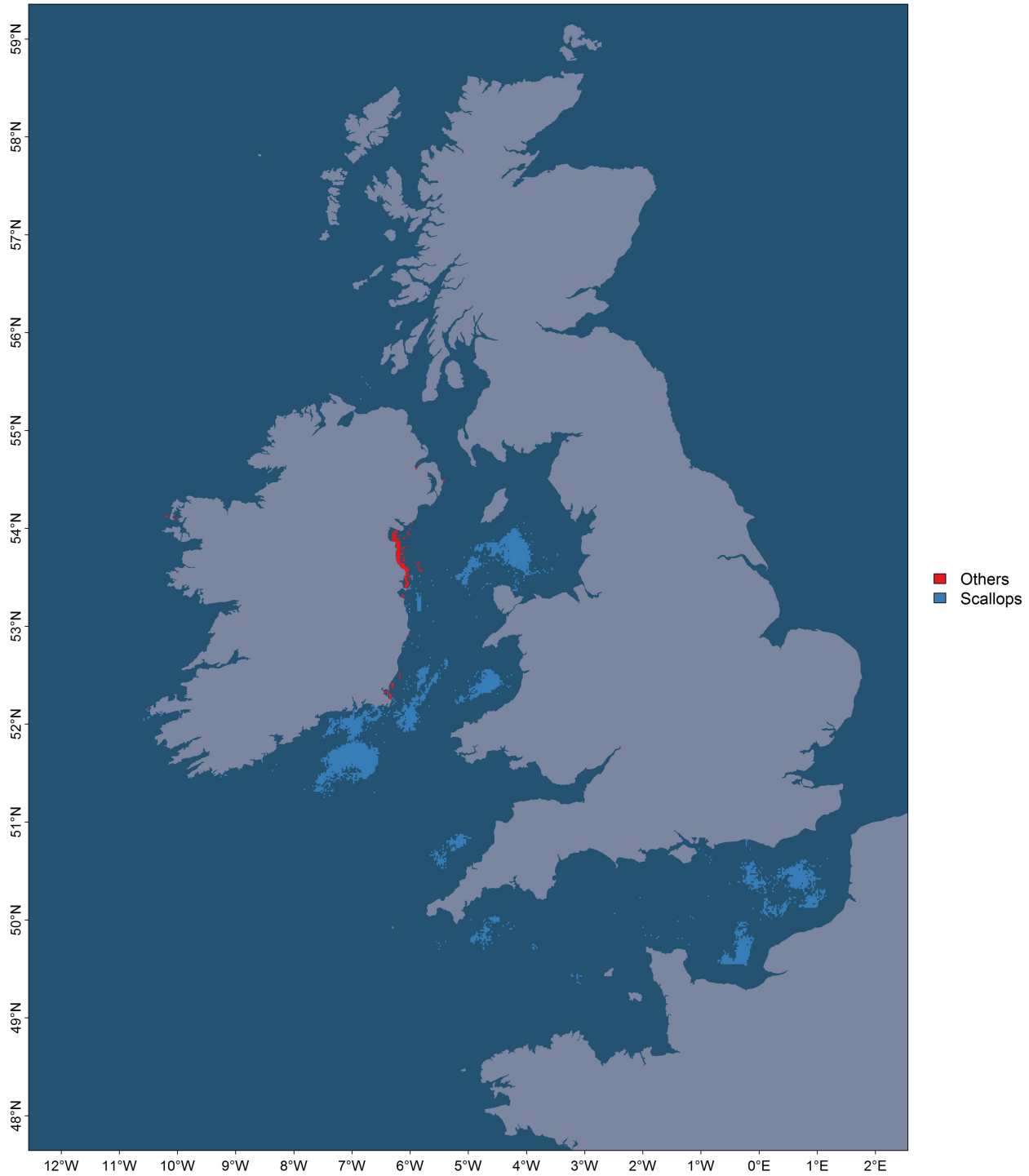


Figure 30: Species composition of the dredge vessels  $\geq 12m$  landing into Ireland in 2014-18

Key Points: Species composition of dredge vessels

- Scallops dominate the landings into Ireland by dredge vessels.
- Mussels and razor shells are caught along the east coast of Ireland.



## 5.8 Potting effort

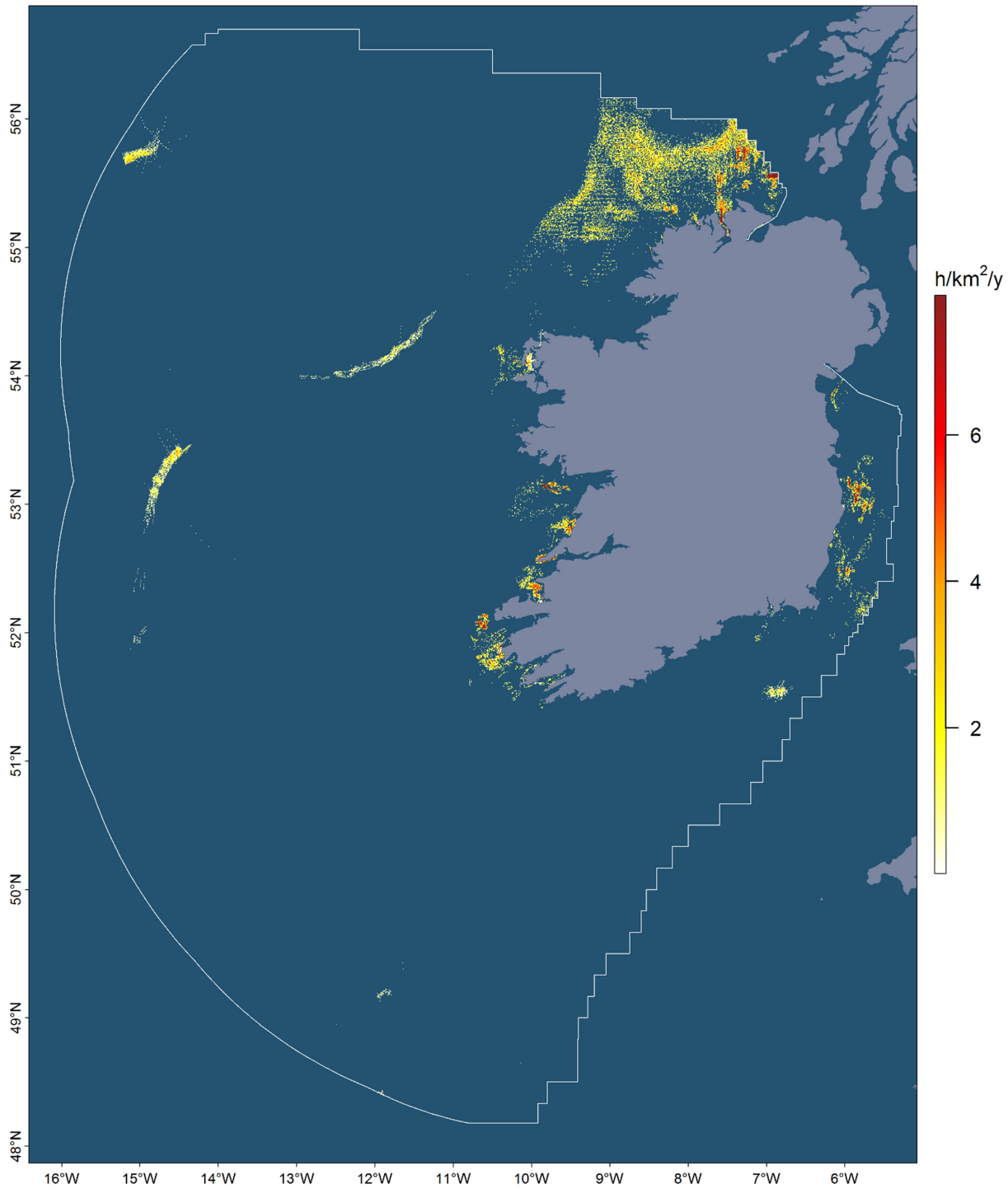


Figure 31: Distribution of international potting effort in the Irish EEZ in 2014-18

### Key Points: International potting effort

- Potting effort is mostly confined to inshore areas apart from the northwest where it extends to the edge of the continental shelf.
- Some international potting effort is noticeable in deeper waters around the Porcupine Bank.

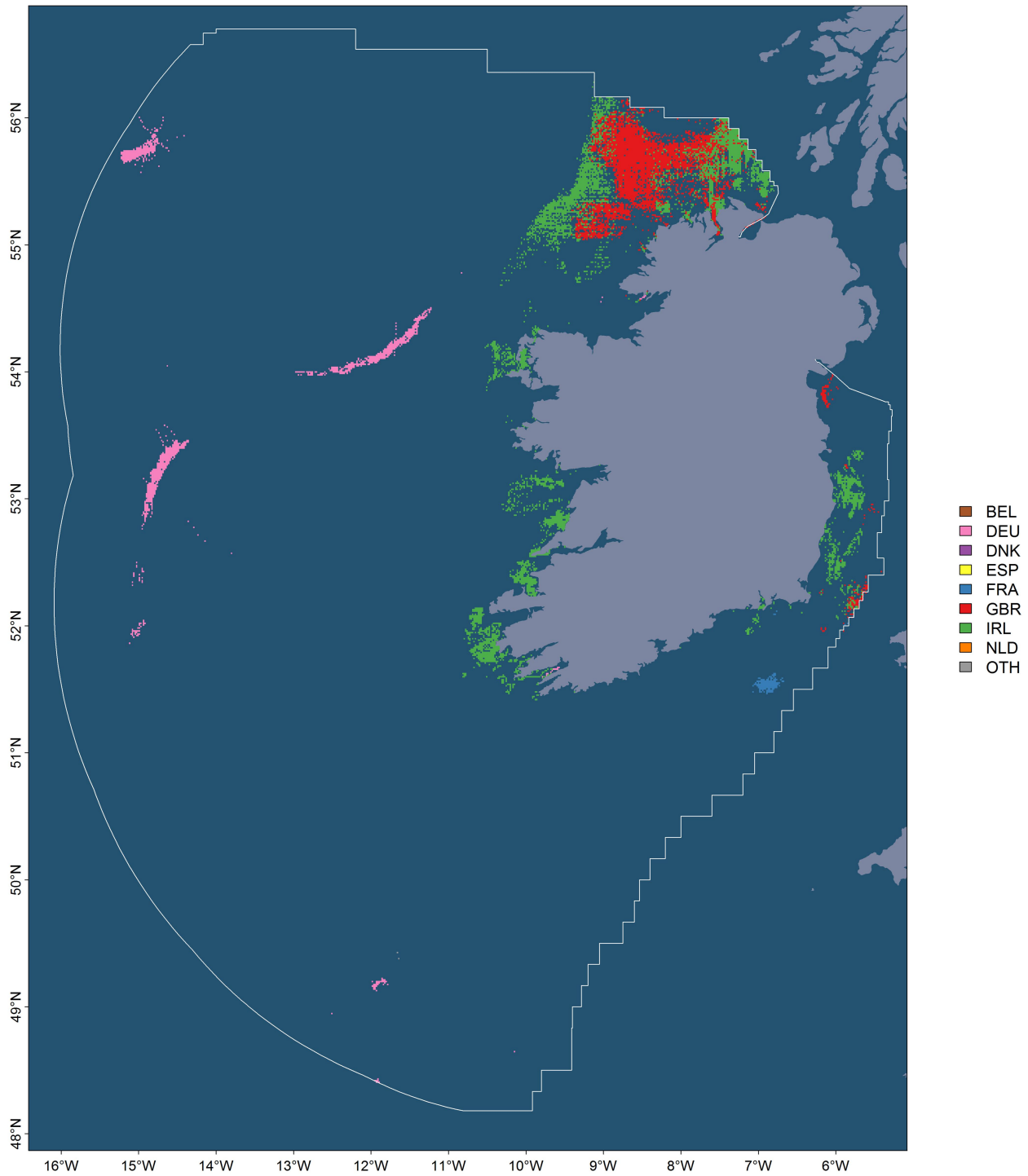


Figure 32: Distribution of international potting effort in the Irish EEZ by country in 2014-18

Key Points: International potting effort

- Ireland accounts for 88% of the total potting effort inside the Irish EEZ.
- UK effort is mainly in the northwest while German effort is located at the edge of Porcupine Bank.

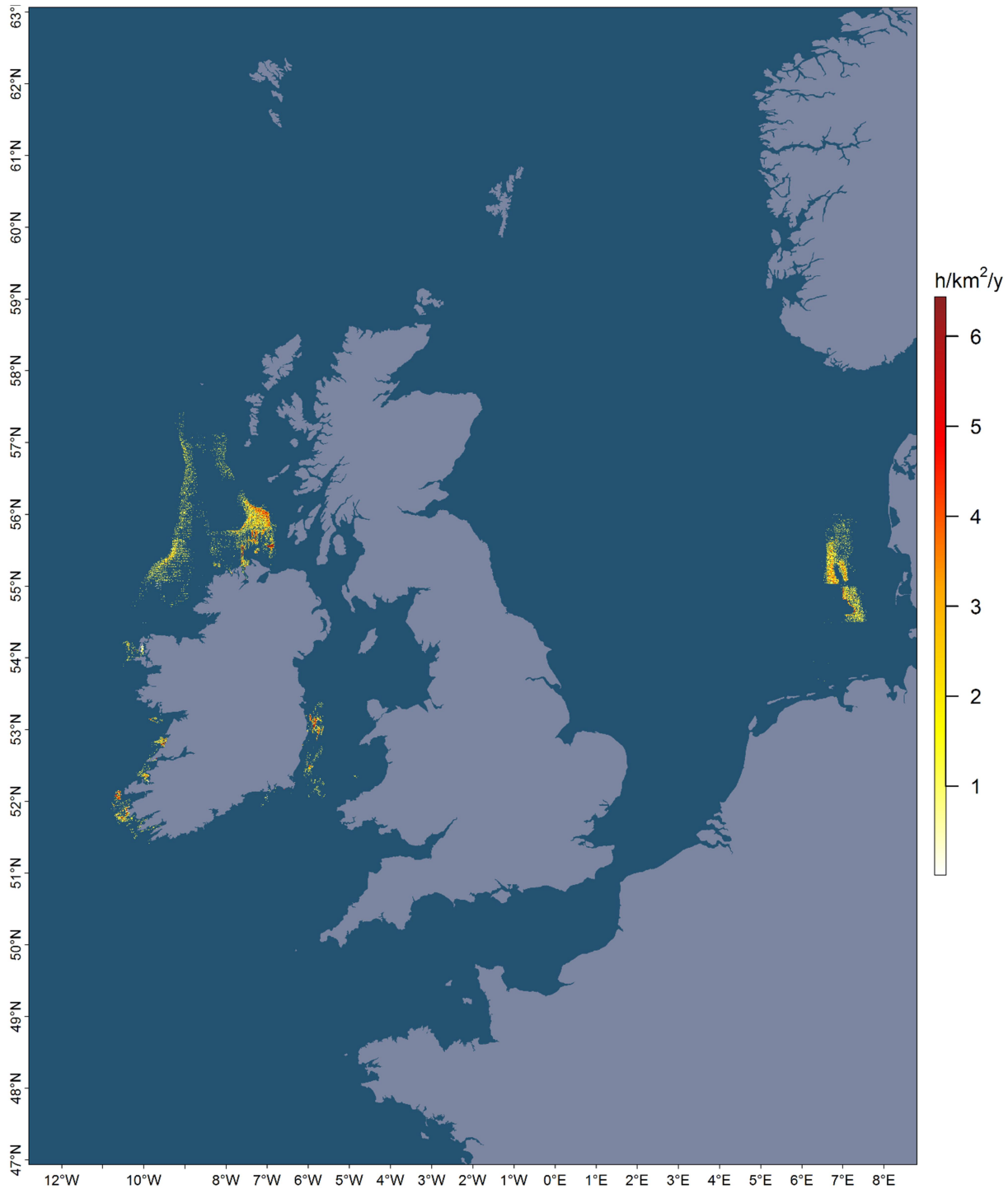


Figure 33: Distribution of potting effort by Irish vessels  $\geq 12\text{m}$  during 2014-18

Key Points: Potting effort by Irish vessels

- Smaller vessels  $< 12\text{m}$  (without VMS) account for a significant proportion of the Irish potting effort.
- Some Irish vessels target crab in the North Sea.

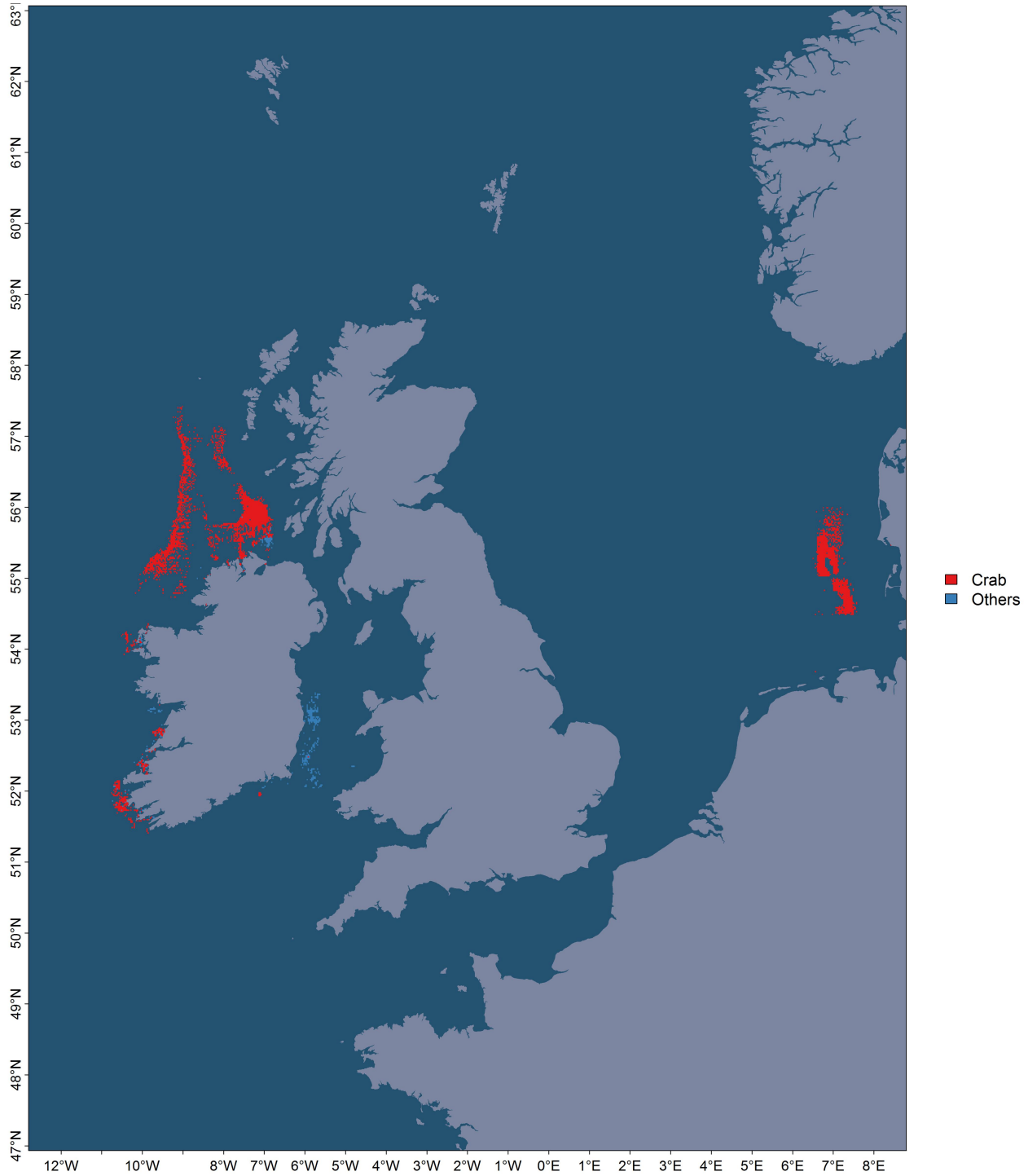


Figure 34: Species composition of the potting vessels  $\geq 12m$  landing into Ireland in 2014-18

Key Points: Species composition by potting vessels

- Crabs dominate the landings but whelks are also landed from an area off the Wicklow coast.



## 5.9 Pelagic trawl effort

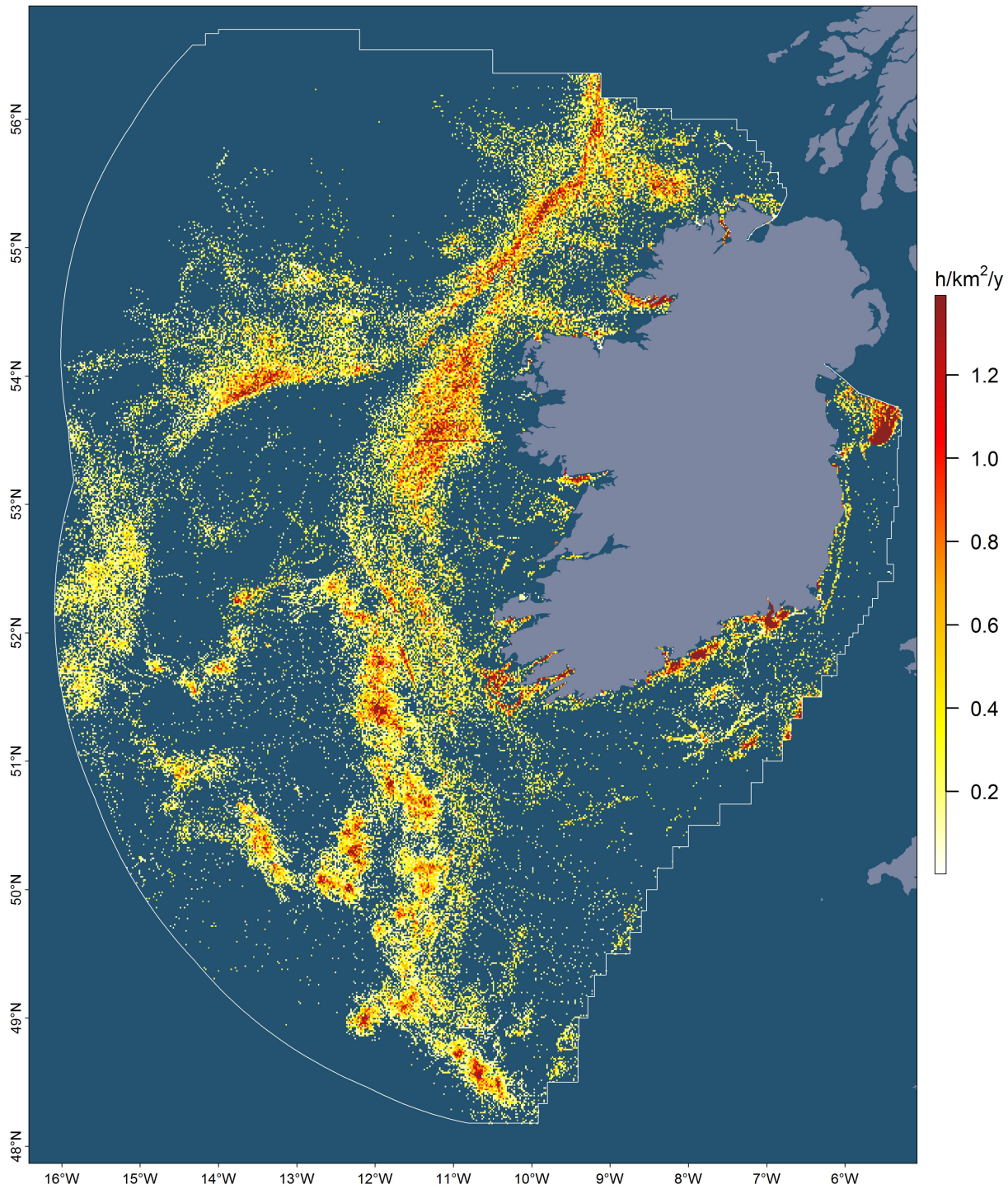


Figure 35: Distribution of international pelagic trawl effort in the Irish EEZ in 2014-18

### Key Points: International pelagic trawl effort

- Pelagic trawl effort is widely distributed both on and off the continental shelf.
- Small areas of high effort are noticeable in inshore locations along the south coast.

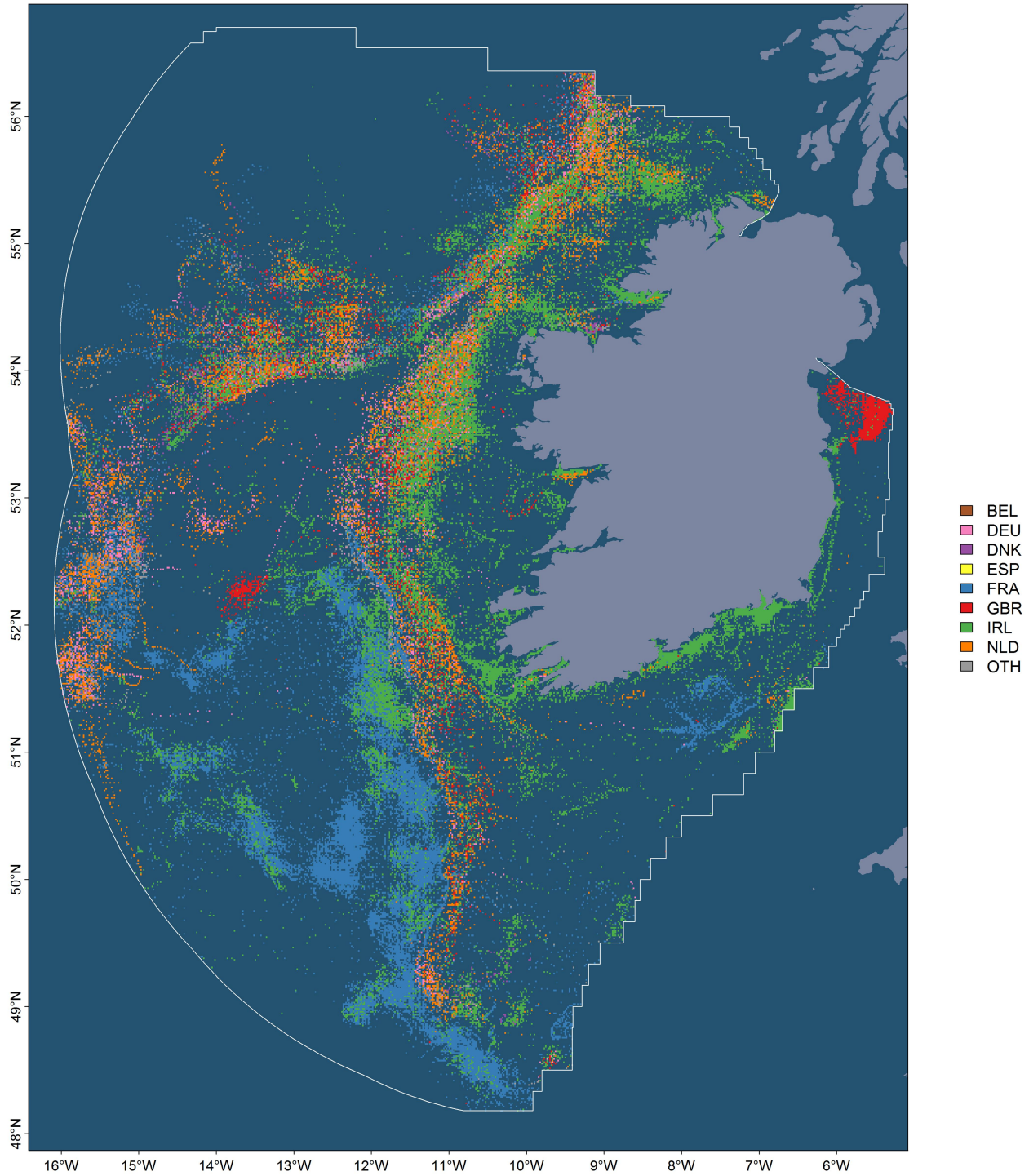


Figure 36: Distribution of international pelagic trawl effort in the Irish EEZ by country in 2014-18

Key Points: International pelagic trawl effort by country

- Ireland accounted for 57% of the total pelagic effort inside the EEZ.
- France and the Netherlands account for the majority of non-Irish pelagic effort inside the EEZ.

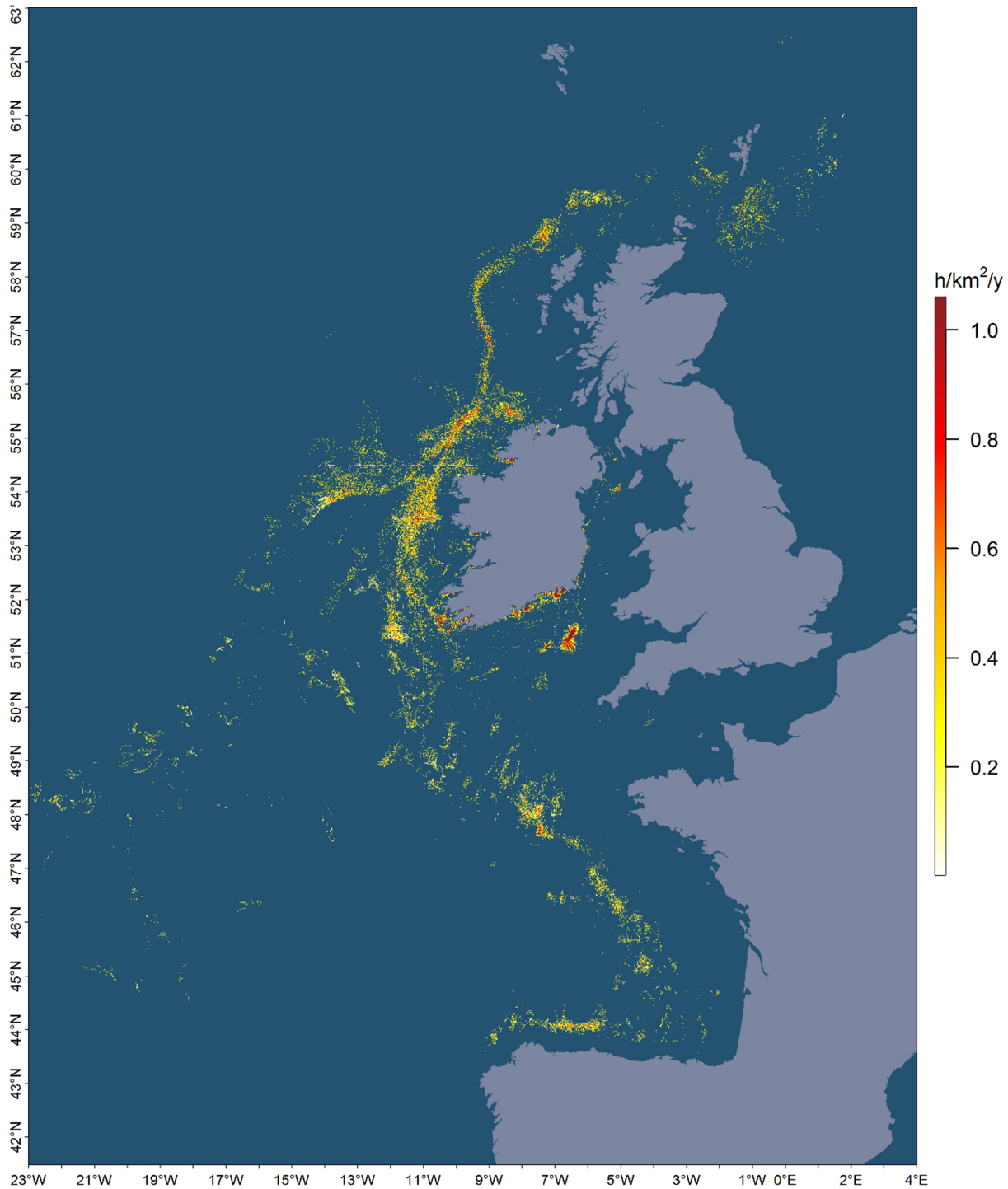


Figure 37: Distribution of pelagic trawl effort by Irish vessels  $\geq 12m$  during 2014-18

Key Points: Pelagic trawl effort by Irish vessels

- Small pelagic vessels  $< 12m$  (without VMS) account for additional effort off the south east coast.
- Effort by Irish pelagic vessels extends outside the EEZ into the Bay of Biscay and northern North Sea.



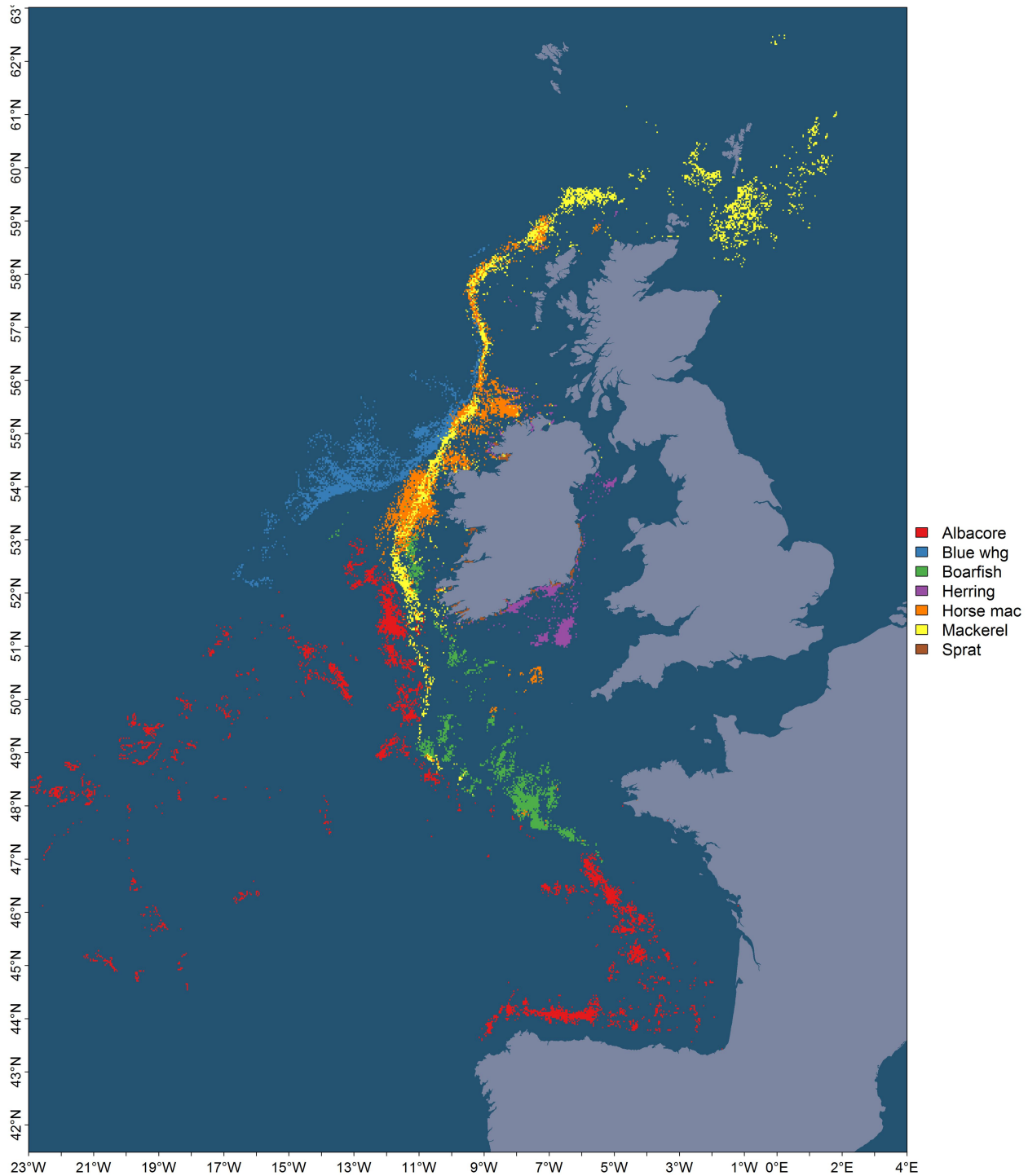


Figure 38: Species composition of the pelagic trawl vessels  $\geq 12\text{m}$  landing into Ireland in 2014-18

Key Points: Species composition of the pelagic trawl vessels

- Blue whiting dominate the offshore landings north of 52°N; tuna dominate offshore south of 52°N.
- Mackerel and horse mackerel are caught along the continental shelf edge.
- Boarfish dominate the landings in the western Celtic Sea and herring dominate inshore.



## 6 Landings of key commercial species

This chapter provides an overview of Irish landings of the key commercial species from the waters around Ireland. Landings are the result of a complex interaction between the spatial distribution and catchability of each species, fishing gear and the regulations and market forces that drive the distribution of fishing effort.

### 6.1 Interpretation

The maps in this chapter show the fine-scale distribution of Irish landings by vessels  $\geq 12\text{m}$  over the period 2014-18 and are based on Irish VMS and logbooks data (see the Data chapter for details). It is important to note that these maps cannot be interpreted as species distribution maps. For example, species may occur in areas where they are not caught (or caught but not landed). On the other hand, species may be caught in large bulk in certain areas without being particularly abundant, simply because the fishing effort is very high in those areas. Note that discard data are not included in the maps and plots in this chapter because discard data are only available for a relatively small number of fishing trips.

*Table 2: Landings (live weight, kilotons) and value (€ millions) by Irish vessels in 2014-18*

Species	2014	2015	2016	2017	2018
Albacore tuna	2.5kt (€5.0)	2.4kt (€5.2)	2.3kt (€6.2)	2.5kt (€6.5)	3.1kt (€7.9)
Black sole	0.2kt (€1.8)	0.2kt (€1.8)	0.2kt (€2.0)	0.2kt (€1.6)	0.2kt (€1.5)
Blue Whiting	21.5kt (€10.1)	24.8kt (€10.3)	26.5kt (€6.0)	43.2kt (€7.0)	49.9kt (€9.4)
Boarfish	34.6kt (€3.8)	16.3kt (€1.8)	16.0kt (€1.9)	15.5kt (€2.3)	9.5kt (€1.5)
Cod	1.4kt (€3.4)	1.5kt (€3.8)	1.0kt (€2.4)	0.7kt (€2.0)	0.9kt (€2.6)
Haddock	3.4kt (€5.7)	3.1kt (€5.4)	3.9kt (€6.4)	3.9kt (€7.0)	3.6kt (€6.6)
Hake	2.6kt (€6.3)	2.7kt (€6.7)	3.5kt (€8.5)	3.5kt (€9.5)	3.4kt (€9.1)
Herring	24.1kt (€7.1)	19.4kt (€7.1)	19.8kt (€9.8)	16.6kt (€5.6)	10.0kt (€3.3)
Horse mackerel	32.8kt (€20.7)	21.7kt (€12.3)	26.1kt (€14.1)	23.6kt (€10.7)	26.2kt (€16.1)
John dory	0.2kt (€1.0)	0.2kt (€1.1)	0.3kt (€1.3)	0.2kt (€1.2)	0.2kt (€1.1)
Lemon sole	0.5kt (€1.2)	0.4kt (€1.3)	0.5kt (€1.5)	0.4kt (€1.4)	0.4kt (€1.3)
Ling	0.6kt (€0.7)	0.5kt (€0.7)	0.8kt (€1.0)	0.7kt (€1.0)	0.5kt (€0.8)
Mackerel	103.4kt (€78.7)	88.9kt (€71.1)	74.0kt (€49.9)	85.0kt (€58.9)	67.0kt (€51.8)
Megrim	2.8kt (€8.3)	3.0kt (€9.5)	3.3kt (€10.5)	3.2kt (€10.1)	2.9kt (€9.2)
Monkfish	3.9kt (€12.9)	3.8kt (€13.4)	4.5kt (€15.5)	4.2kt (€14.2)	4.2kt (€14.9)
Nephrops	8.9kt (€49.8)	8.3kt (€50.0)	9.6kt (€64.7)	8.1kt (€55.4)	7.2kt (€56.2)
Plaice	0.3kt (€0.5)	0.4kt (€0.7)	0.7kt (€1.2)	0.6kt (€1.2)	0.4kt (€0.9)
Pollack	1.1kt (€2.0)	1.1kt (€2.3)	1.2kt (€2.4)	0.9kt (€1.9)	0.8kt (€1.8)
Rays and skates	1.1kt (€1.8)	1.1kt (€1.7)	1.0kt (€1.6)	1.0kt (€1.7)	1.1kt (€1.7)
Saithe	1.2kt (€1.3)	0.7kt (€0.9)	0.9kt (€1.2)	0.8kt (€1.0)	0.6kt (€0.7)
Sprat	3.0kt (€0.6)	11.1kt (€2.6)	5.4kt (€1.4)	4.5kt (€1.2)	3.6kt (€1.0)
Whiting	7.0kt (€8.1)	6.6kt (€8.3)	7.9kt (€9.9)	6.4kt (€8.8)	4.8kt (€6.8)
Witch	0.6kt (€1.0)	0.5kt (€1.0)	0.6kt (€1.0)	0.6kt (€1.0)	0.7kt (€1.2)

## 6.2 Albacore tuna landings

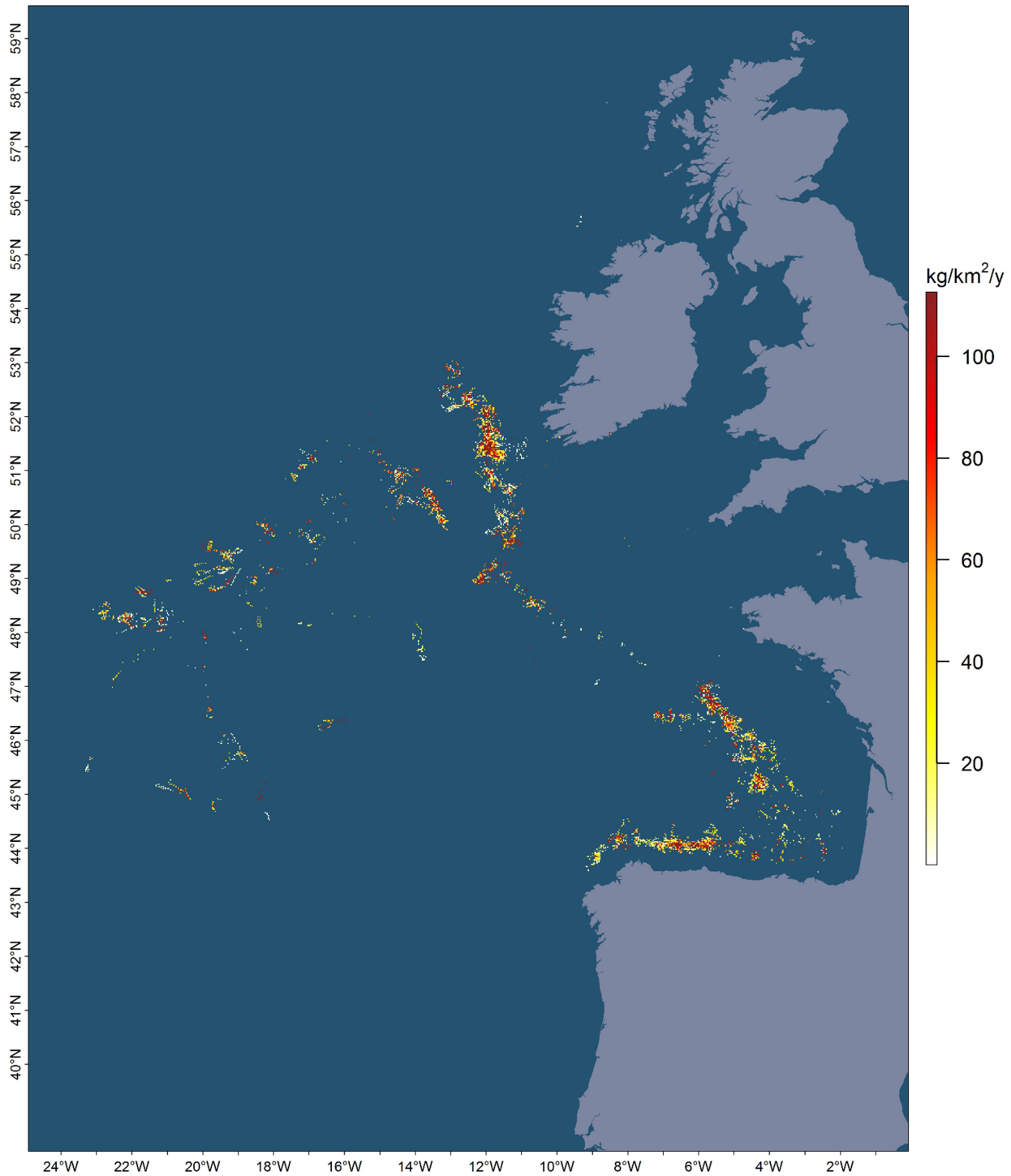


Figure 39: Distribution of albacore tuna landings by Irish vessels  $\geq 12m$  during 2014-18 (all gears)

### Key Points: Albacore tuna landings by Irish vessels

- Vessels  $< 12m$  did not land albacore tuna.
- Most of the albacore tuna fishery takes place from July to September.

### 6.3 Anglerfish landings

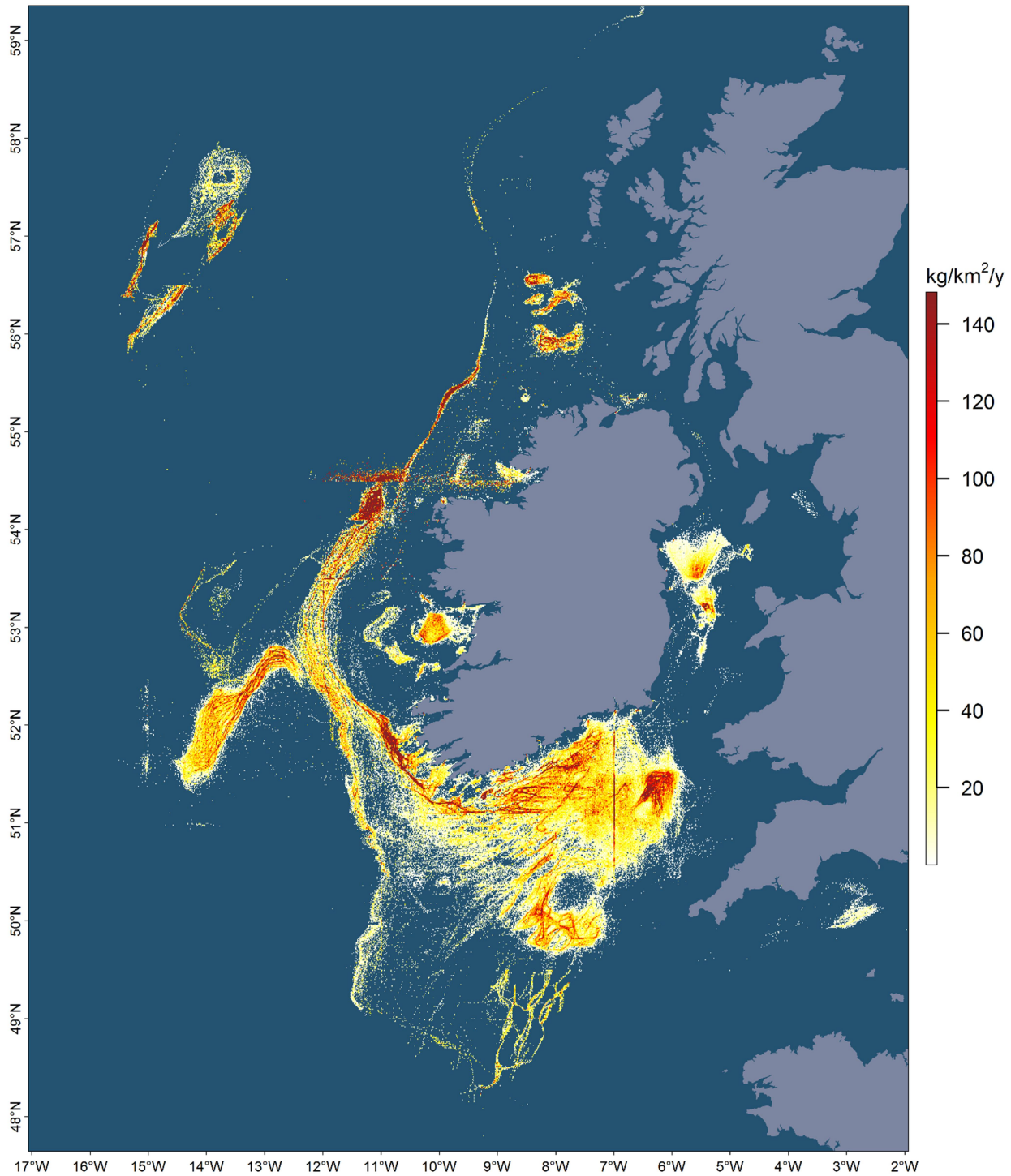


Figure 40: Distribution of anglerfish landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears)

#### Key Points: Anglerfish landings by Irish vessels

- Most anglerfish catches are taken from depths between 50 and 200m.
- Highest anglerfish catch rates occur along the shelf edge at depths between 50 and 350m.

## 6.4 Black sole landings

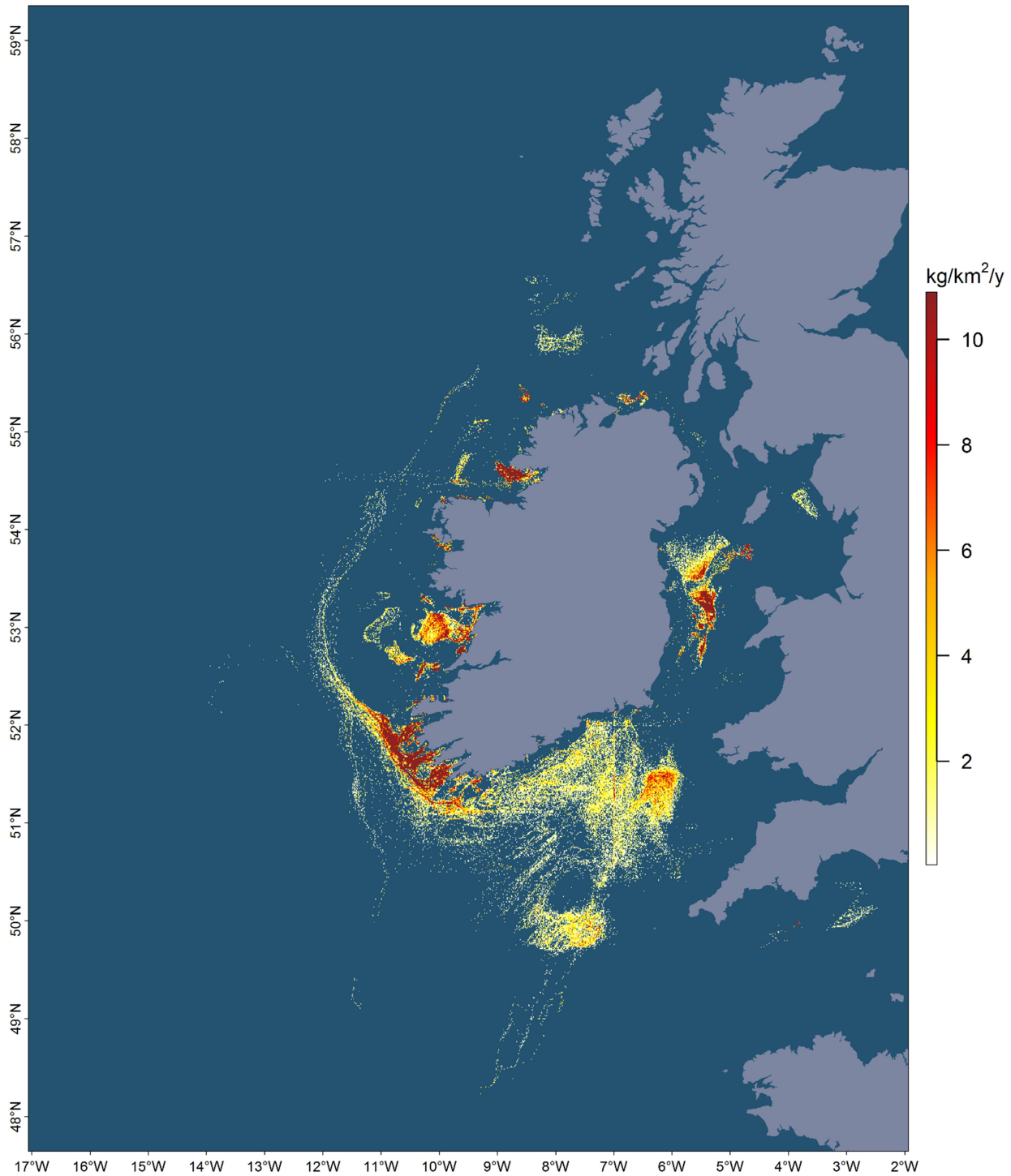


Figure 41: Distribution of black sole landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears)

### Key Points: Black sole landings by Irish vessels

- Smaller vessels (<12m; no VMS) contribute 10% of the total black sole landings.
- These smaller vessels are mainly distributed inshore off west and southwest coasts and the Irish Sea.



## 6.5 Blue whiting landings

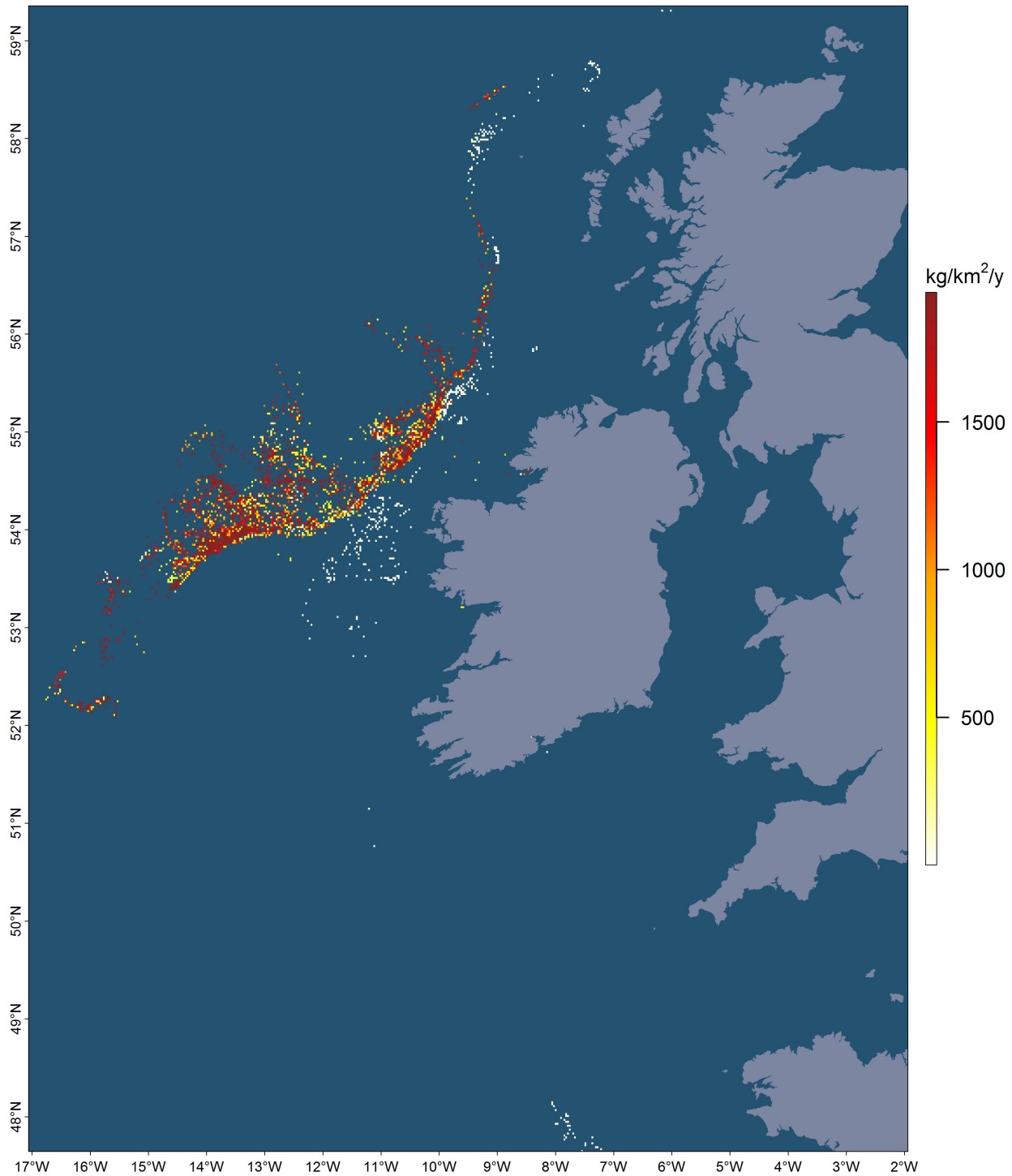


Figure 42: Distribution of blue whiting landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears)

### Key Points: Blue whiting landings by Irish vessels

- Main fishery for blue whiting takes place during February and March.
- Highest blue whiting catch rates occur in deep waters off the shelf edge in the northwest.

## 6.6 Boarfish landings

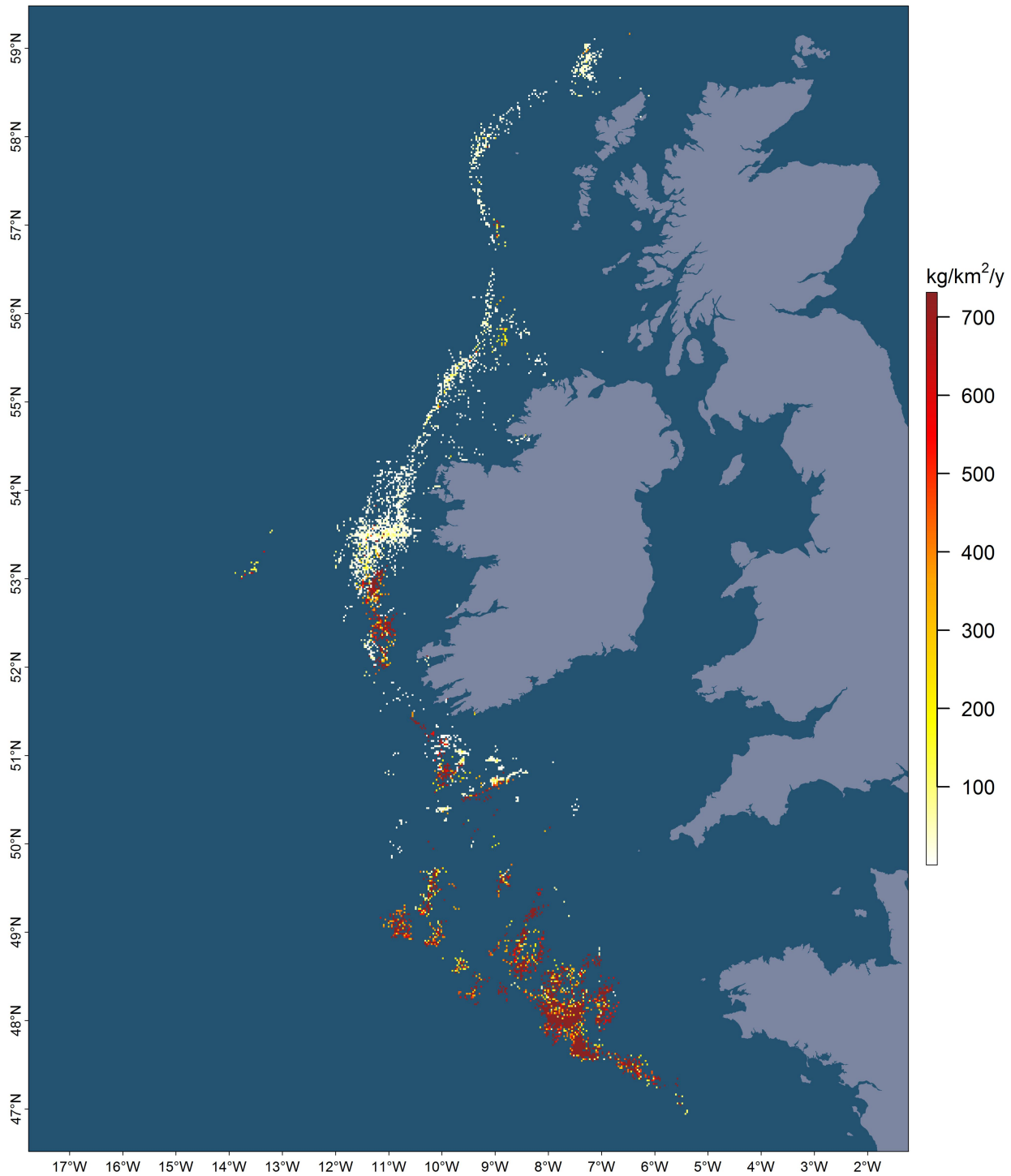


Figure 43: Distribution of boarfish landings by Irish vessels  $\geq 12m$  during 2014-18 (all gears)

### Key Points: Boarfish landings by Irish vessels

- Most boarfish landings are taken in the Celtic Sea at depths between 100 and 200m.
- Boarfish form dense aggregations above banks and ridges.

## 6.7 Cod landings

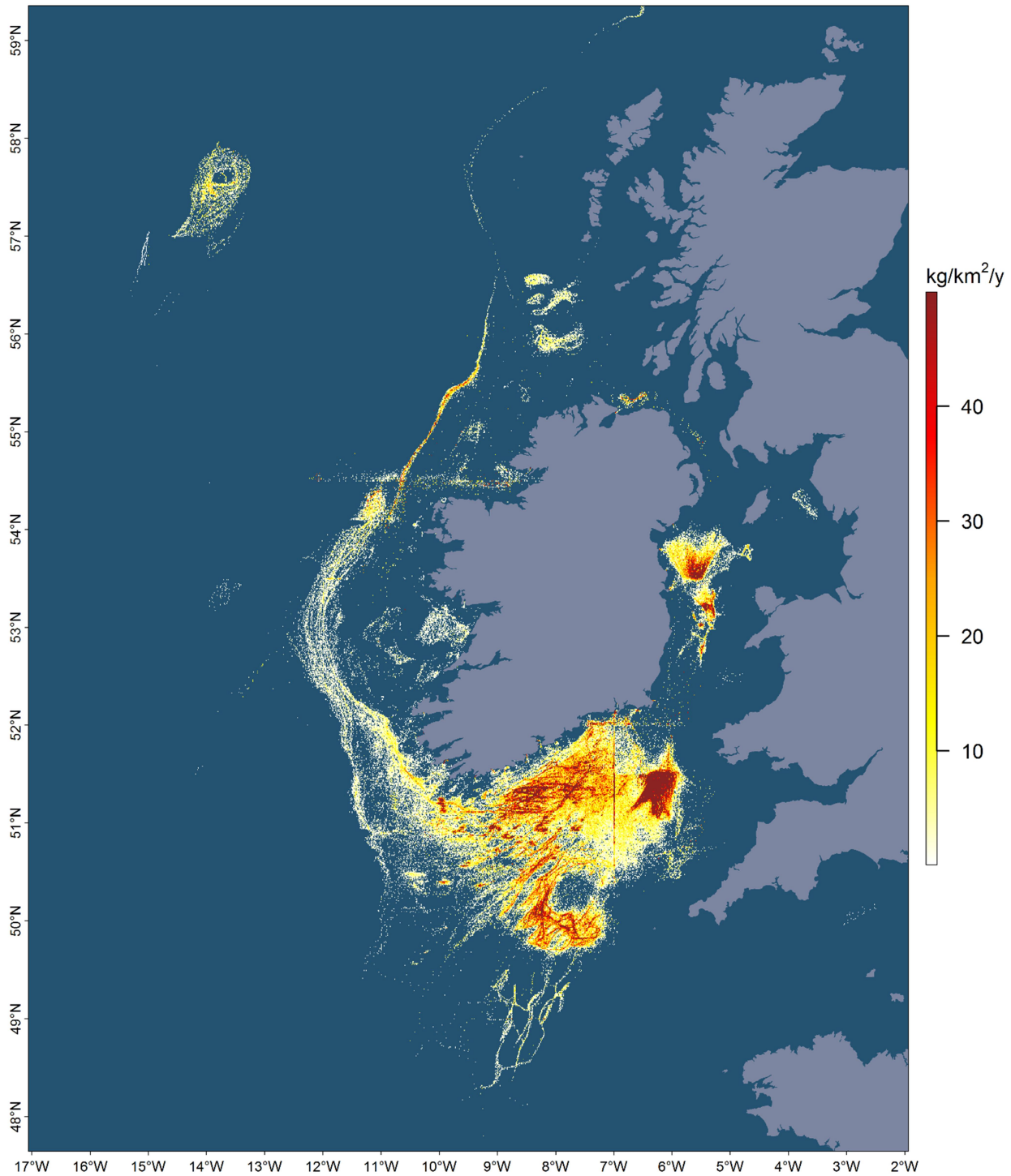


Figure 44: Distribution of cod landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears)

### Key Points: Cod landings by Irish vessels

- Smaller vessels (<12m; no VMS) contribute around 7% of the total cod landings.
- These smaller vessels operate mainly along south coast of Ireland.

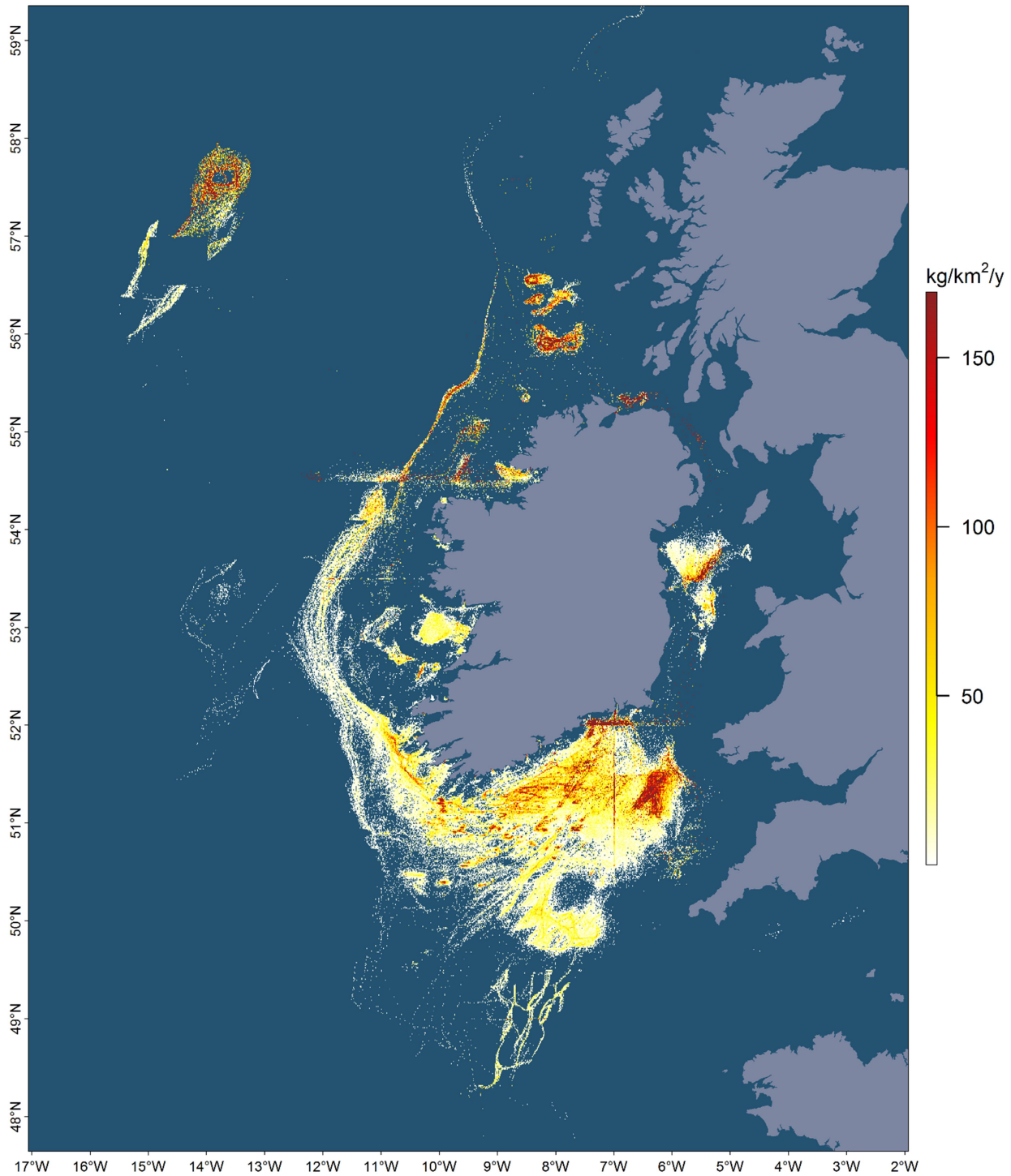


Figure 45: Distribution of haddock landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears).

Key Points: Haddock landings by Irish vessels

- Haddock are caught in most areas of continental shelf between 50 and 200m depth.
- Areas of high haddock catches are noticeable off north coast (Stanton) and in Celtic Sea (Smalls).

## 6.9 Hake landings

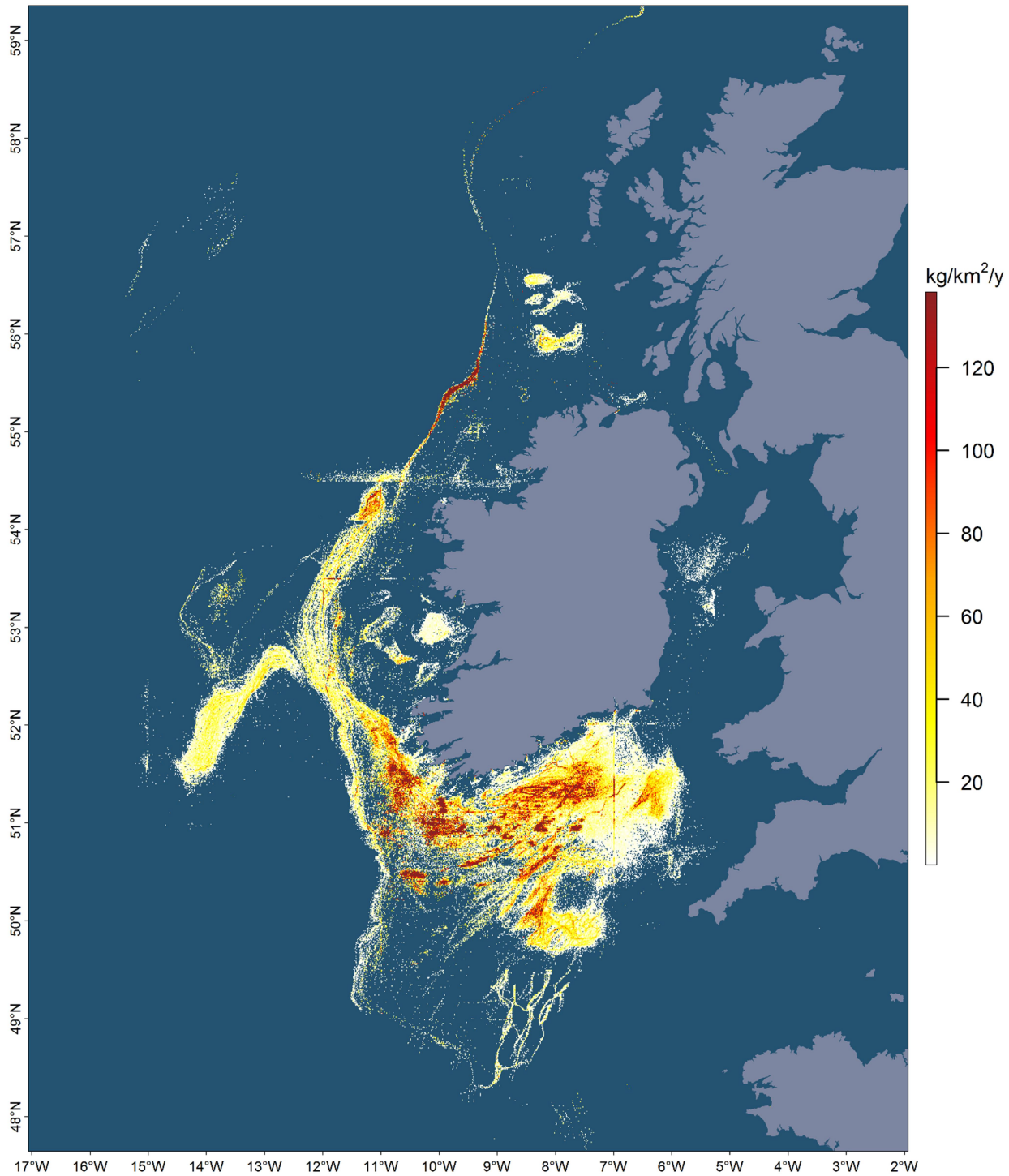


Figure 46: Distribution of hake landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears).

### Key Points: Hake landings by Irish vessels

- Smaller vessels (<12m; no VMS) contribute around 9% of the total hake landings.
- Hake are widely distributed along the continental shelf, most catches are taken at depths of less than 200m but the highest catch rates are at depths between 600 and 800m, particularly in the northwest.



## 6.10 Herring landings

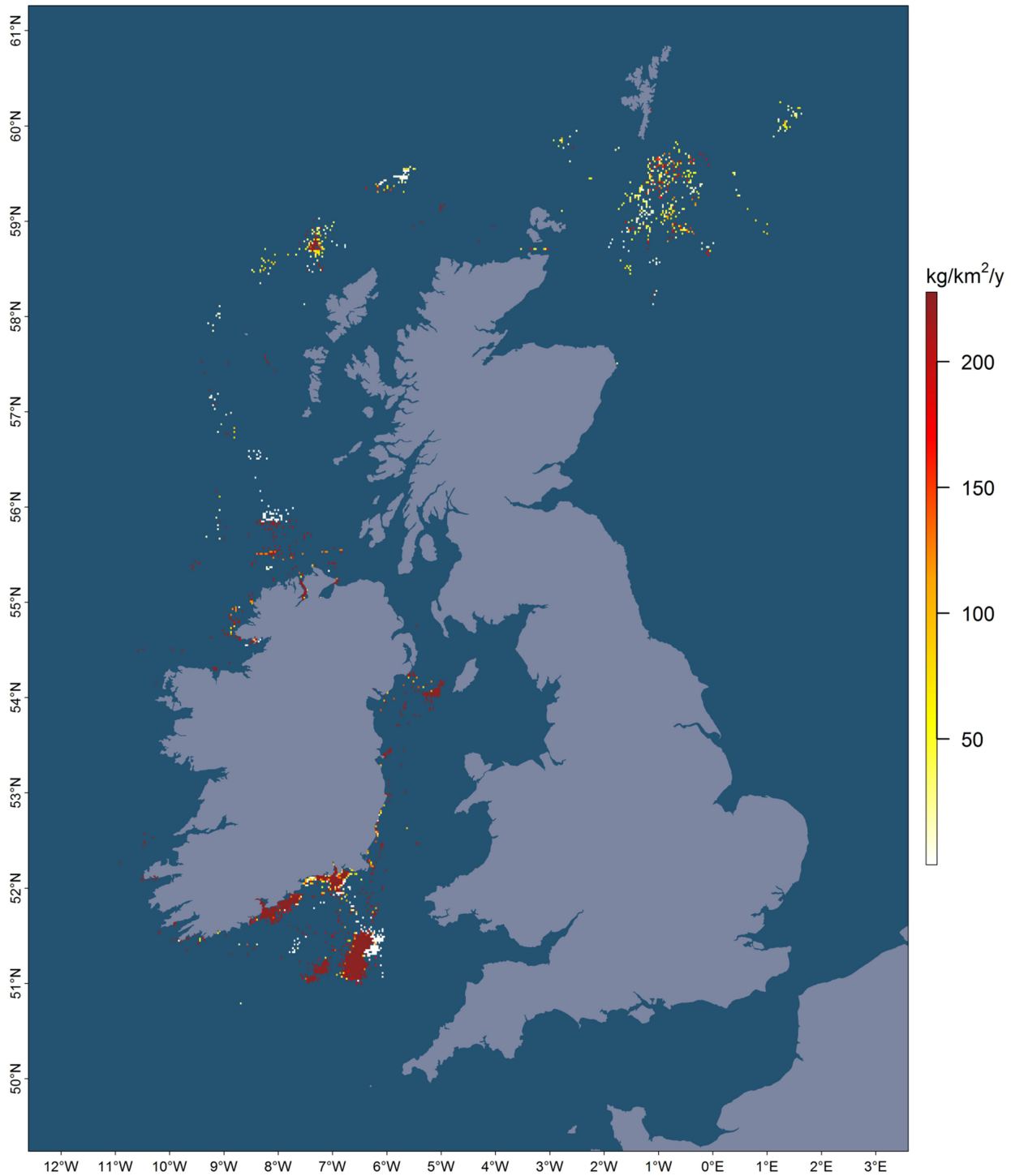


Figure 47: Distribution of herring landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears)

### Key Points: Herring landings by Irish vessels

- Smaller vessels (<12m; no VMS) contribute 5% of the total herring landings, these vessels mainly operate inshore in the northern Celtic Sea.
- Majority of herring landings are taken in the central Celtic Sea.

## 6.11 Horse mackerel landings

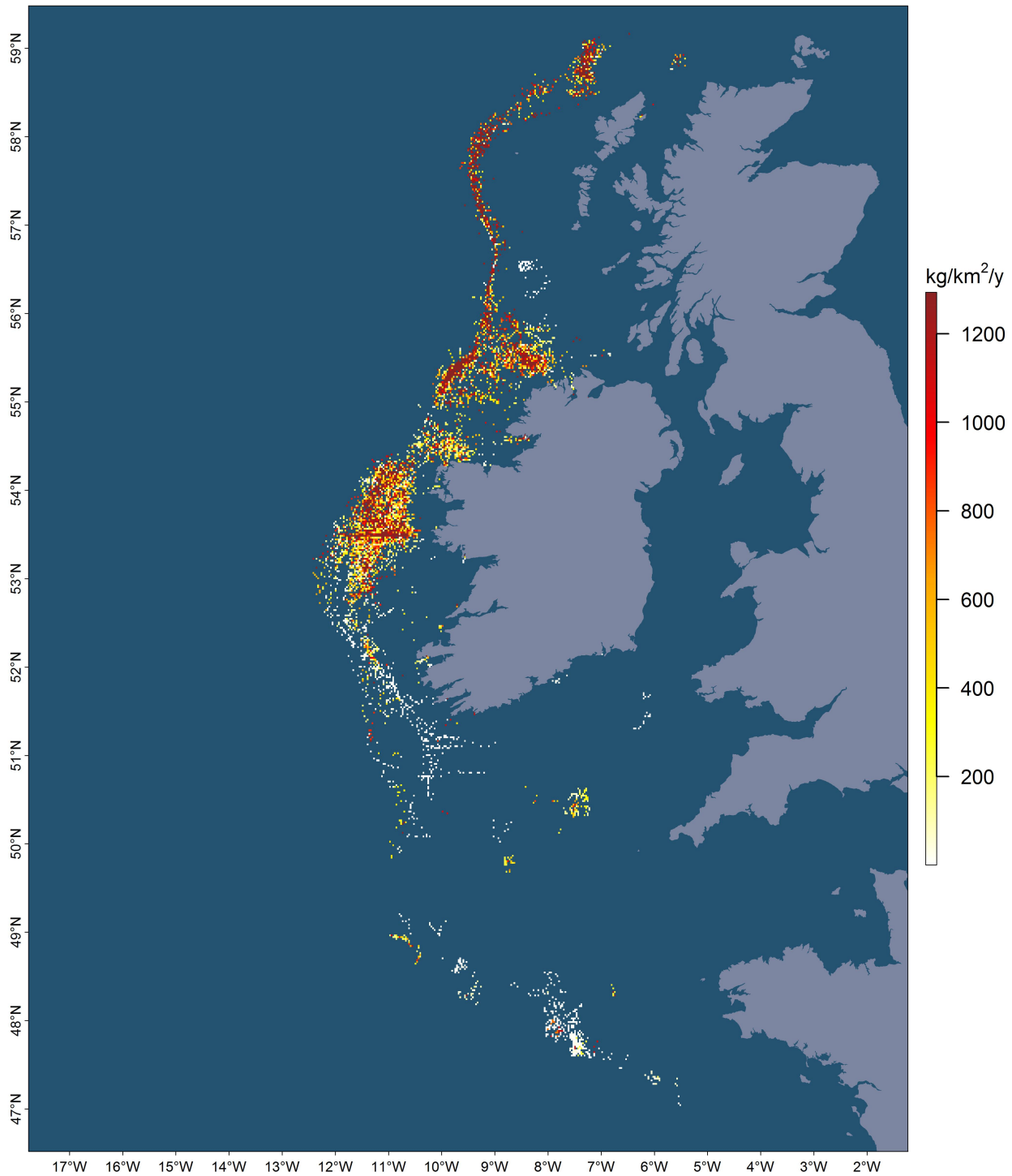


Figure 48: Distribution of horse mackerel landings by Irish vessels  $\geq 12m$  during 2014-18 (all gears)

### Key Points: Horse mackerel landings by Irish vessels

- Main catches of horse mackerel are taken on the continental shelf edge around the 200m depth contour from west of Scotland to west of Ireland with smaller catches further south.

## 6.12 John Dory landings

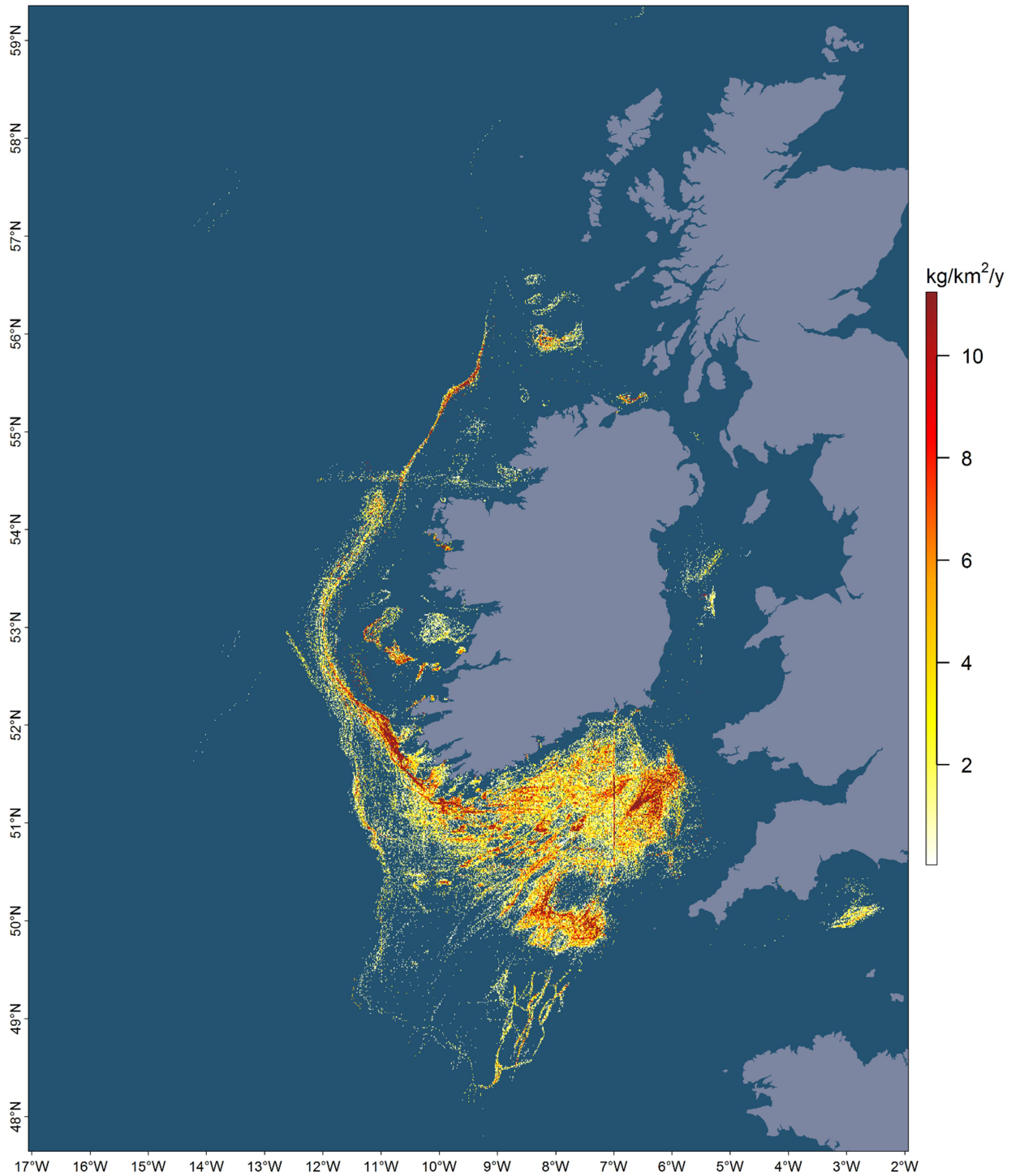


Figure 49: Distribution of John Dory landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears).

### Key Points: John Dory landings by Irish vessels

- John Dory landings are widely distributed in the Celtic Sea and along the continental shelf.

6.13 Lemon sole landings

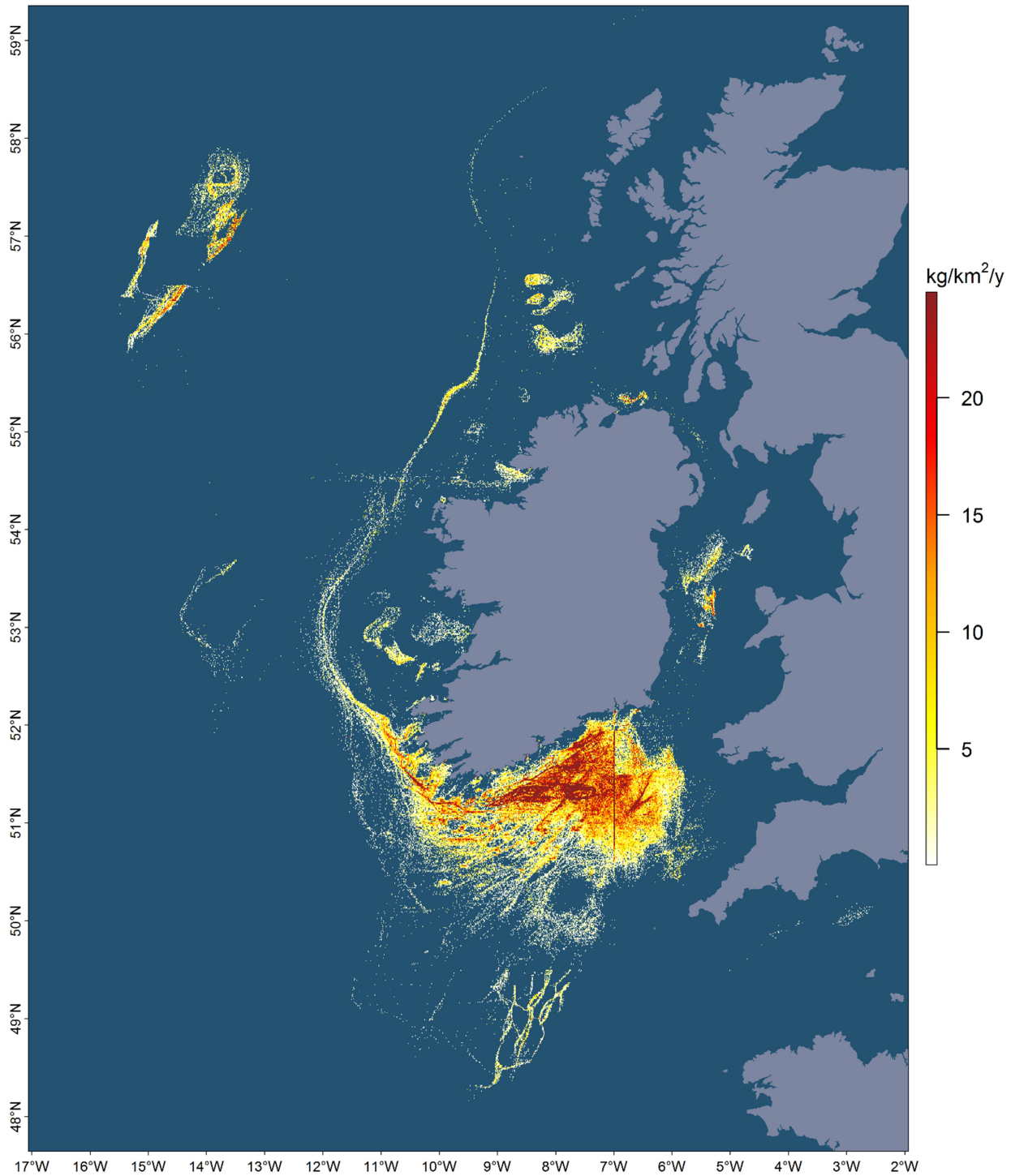


Figure 50: Distribution of lemon sole landings by Irish vessels  $\geq 12m$  during 2014-18 (all gears)

Key Points: Lemon sole landings by Irish vessels

- Lemon sole are mainly caught in the Celtic Sea.

## 6.14 Ling landings

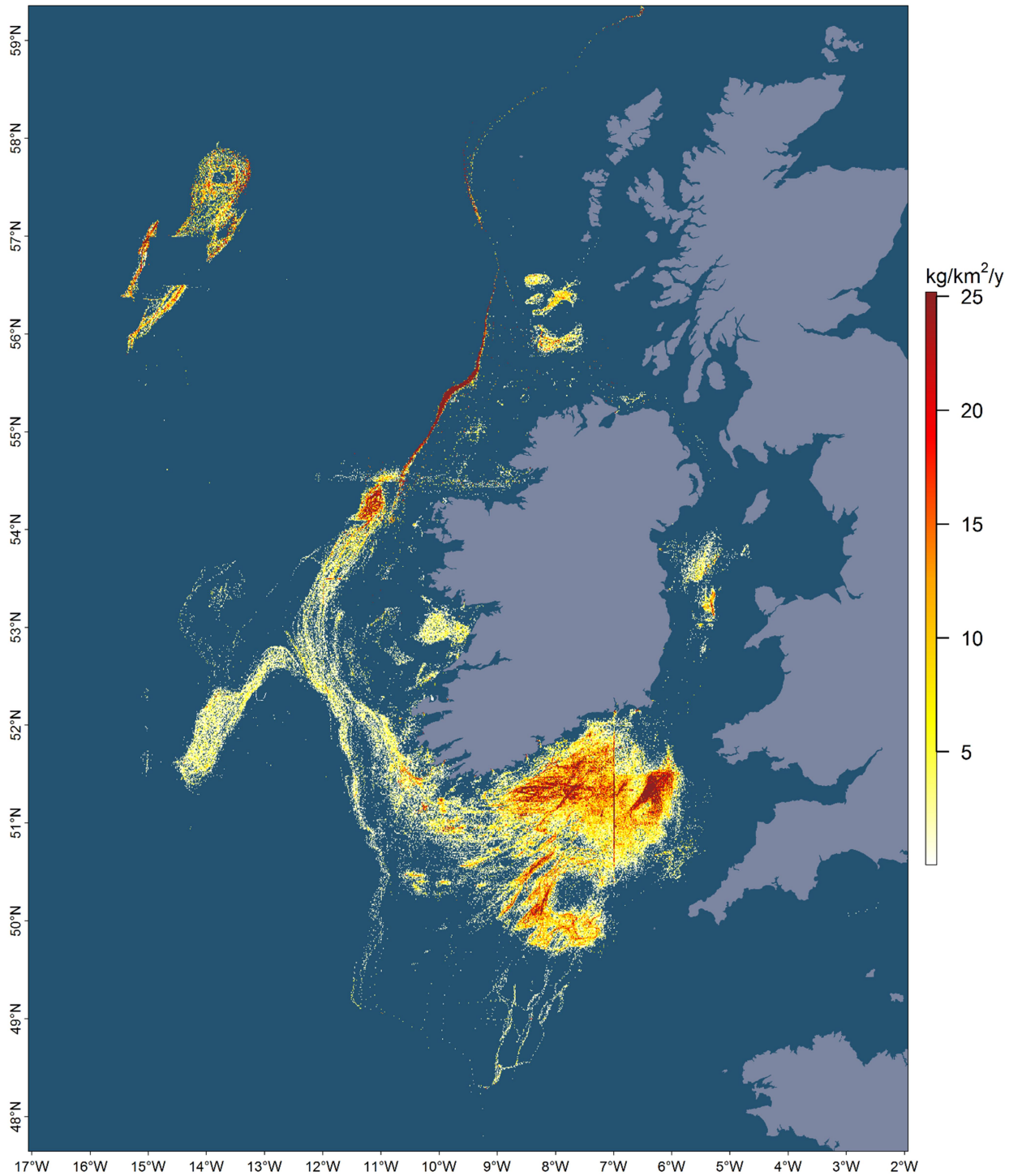


Figure 51: Distribution of ling landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears)

### Key Points: Ling landings by Irish vessels

- Smaller vessels (<12m; no VMS) contribute 9% of the total ling landings from inshore south coast.
- The highest catch rates of ling are along the continental shelf edge between 200 and 300m but they are also widely distributed along the rest of the continental shelf.



## 6.15 Mackerel landings

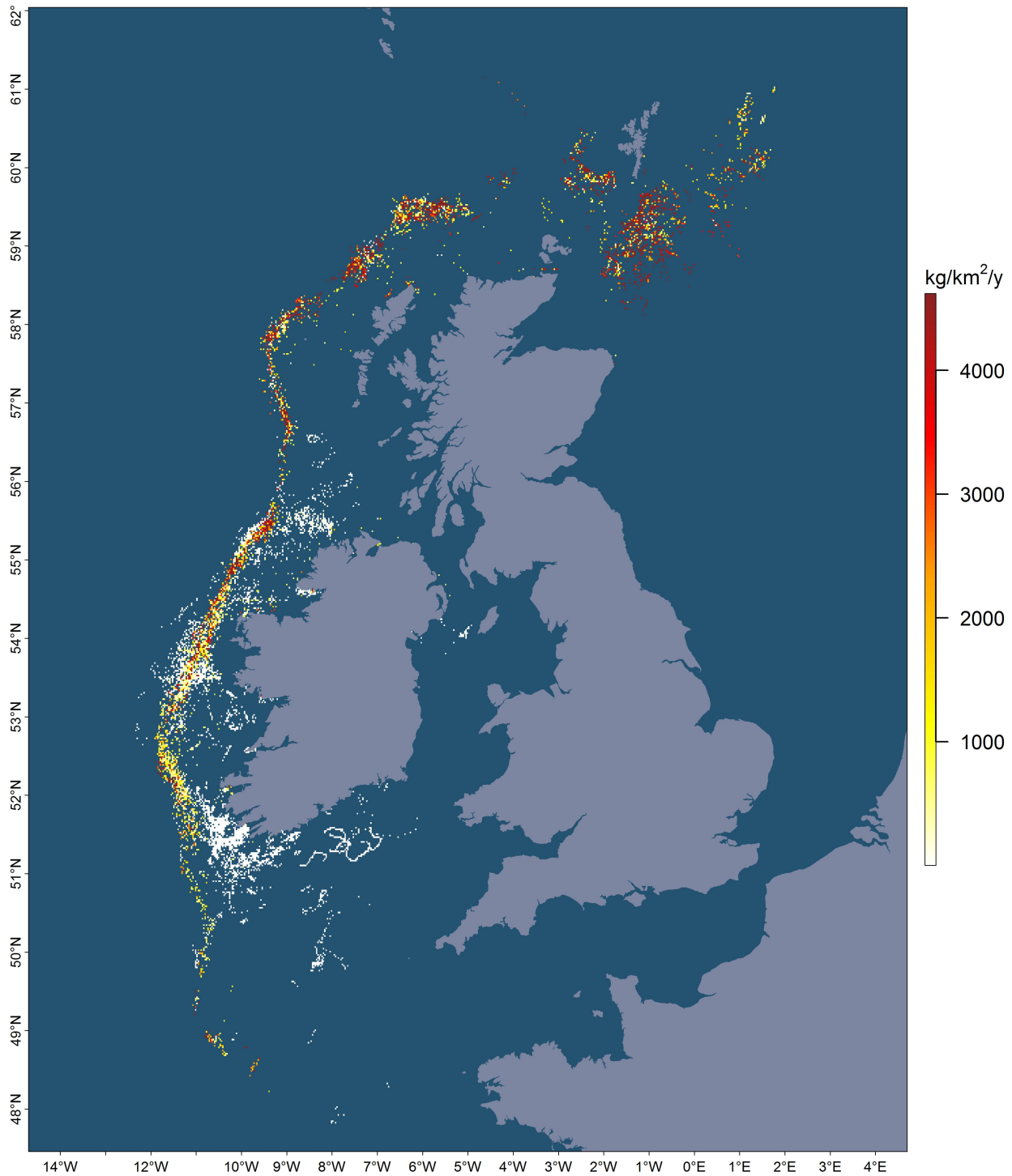


Figure 52: Distribution of mackerel landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears)

### Key Points: Mackerel landings by Irish vessels

- Main mackerel catches are around the 200m depth contour from the northern North Sea to southwest of Ireland.

## 6.16 Megrim landings

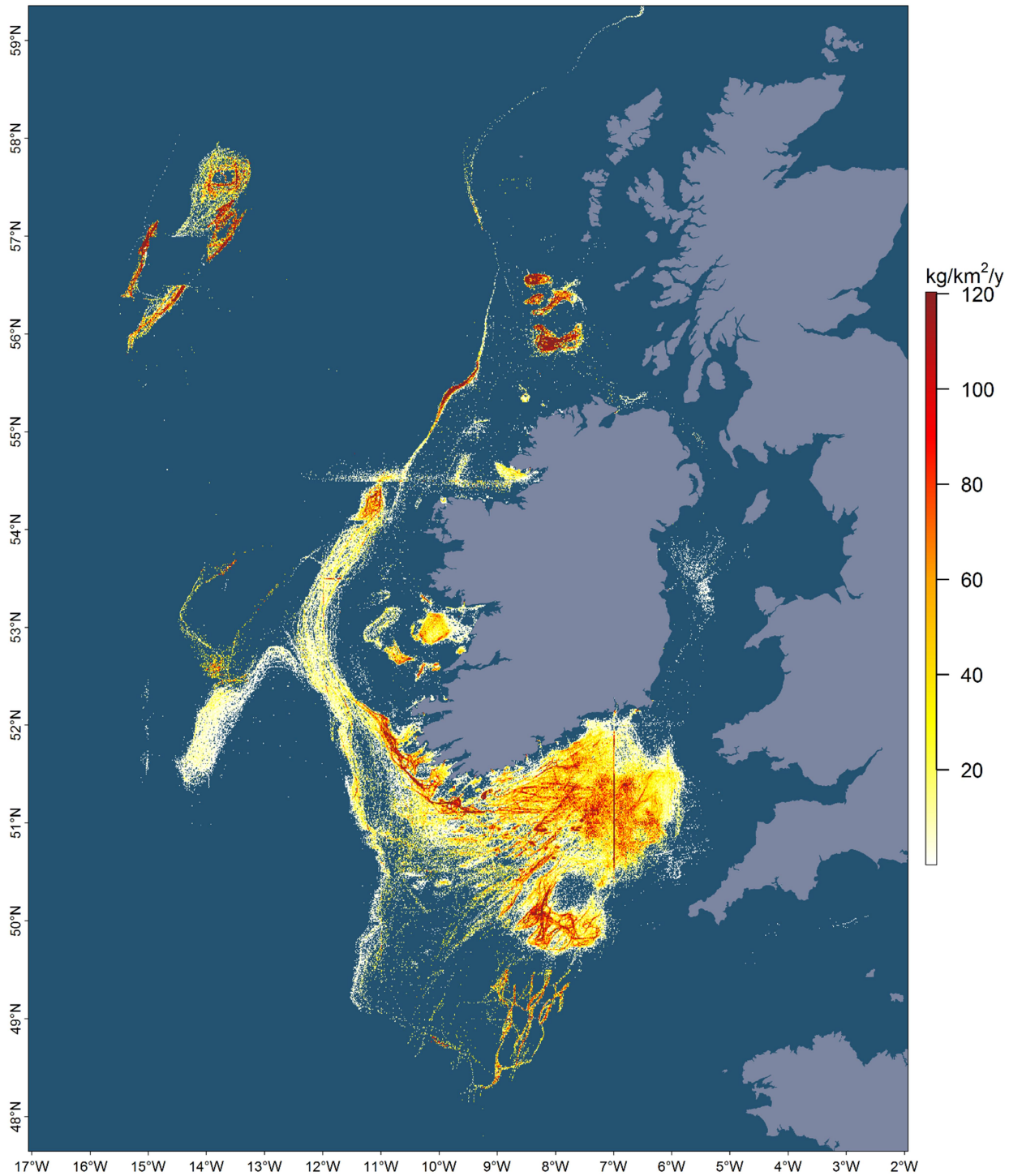


Figure 53: Distribution of megrim landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears)

### Key Points: Megrim landings by Irish vessels

- Megrim are widely distributed on the continental shelf but the highest catch rates are in the south-western Celtic sea where there is relatively little Irish fishing effort.

6.17 *Nephrops* landings

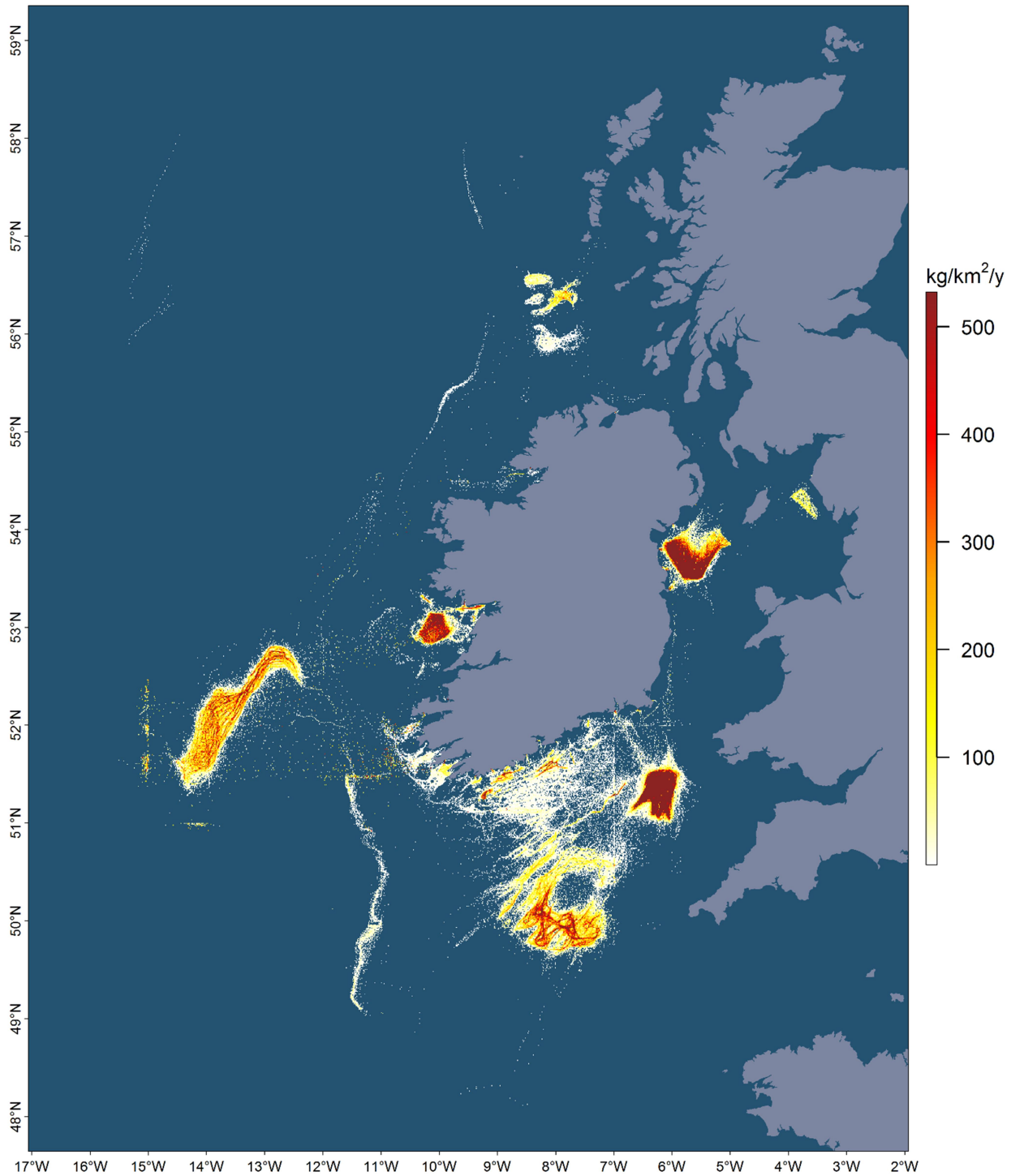


Figure 54: Distribution of *Nephrops* landings by Irish vessels ≥12m during 2014-18 (all gears)

Key Points: *Nephrops* landings by Irish vessels

- *Nephrops* require muddy habitats and therefore catches are limited to well-defined fishing grounds e.g. the Porcupine Bank, Aran Islands, Labadie/Jones banks, The Smalls, Irish Sea and Stanton banks.

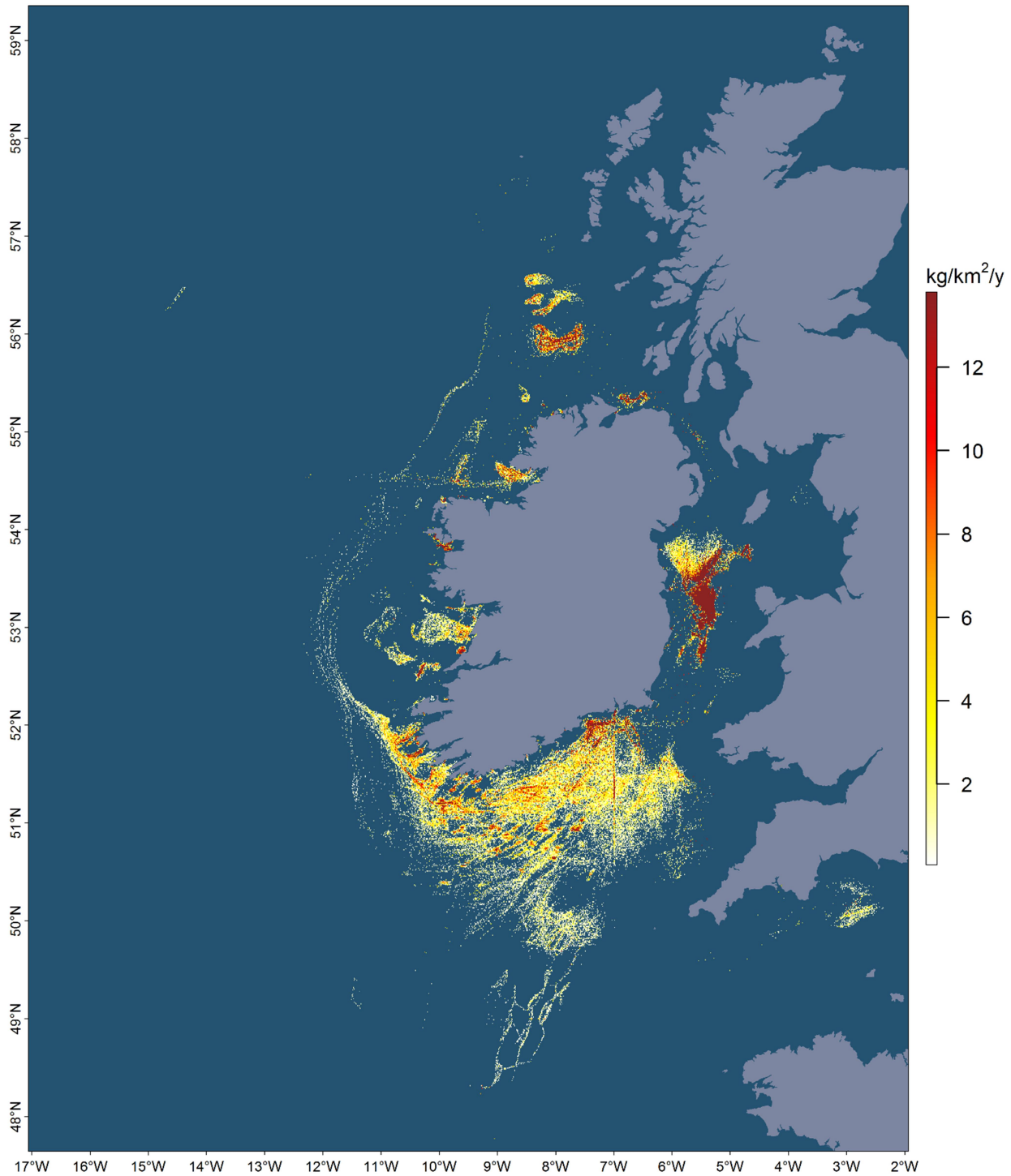


Figure 55: Distribution of plaice landings by Irish vessels  $\geq 12m$  during 2014-18 (all gears)

Key Points: Plaice landings by Irish vessels

- Most plaice are caught on localised sandy patches in relatively shallow areas.
- Highest catch rates of plaice are found in the Irish Sea.

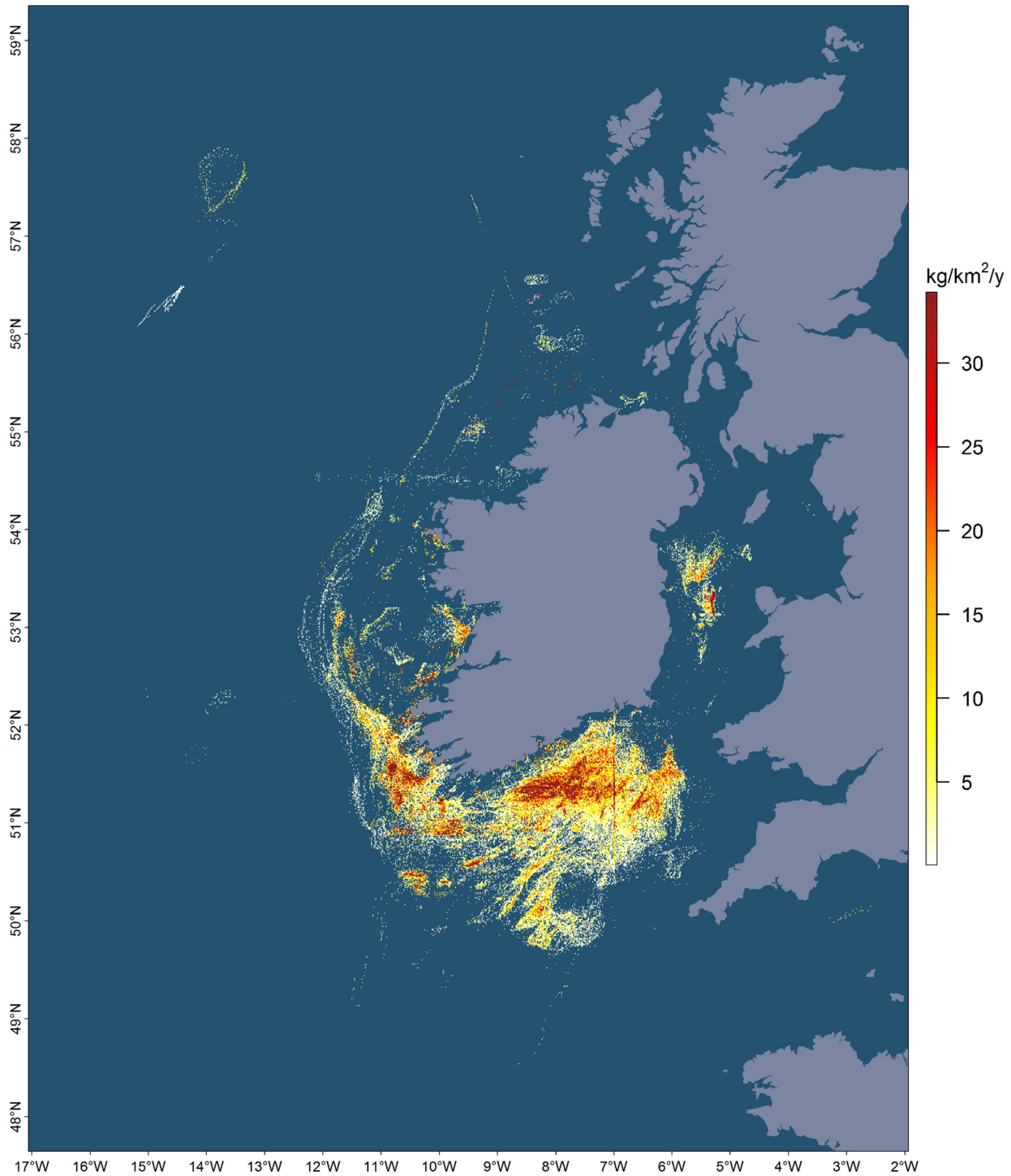


Figure 56: Distribution of pollack landings by Irish vessels  $\geq 12m$  during 2014-18 (all gears)

Key Points: Pollack landings by Irish vessels

- Smaller vessels (<12m; no VMS) contribute 42% of the total pollack landings, these vessels mainly operate inshore off the south and southwest coast of Ireland.
- Pollack are caught on hard ground, often around wrecks.



## 6.20 Rays and Skates landings

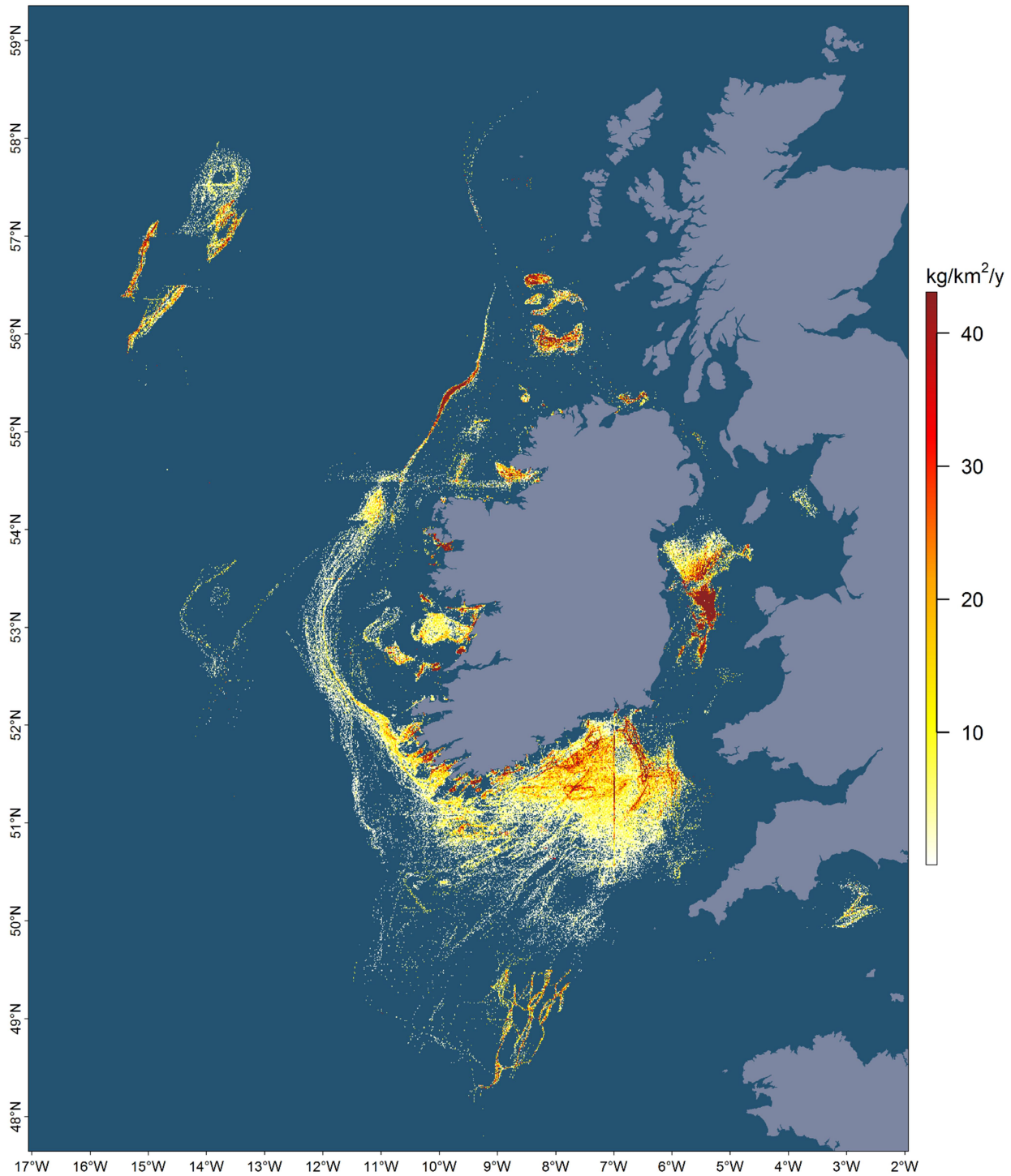


Figure 57: Distribution of rays and skates landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears)

### Key Points: Rays and skates landings by Irish vessels

- Smaller vessels ( $< 12\text{m}$ ; no VMS) contribute 12% of the total landings mostly from inshore areas.
- Highest catch rates of rays and skates are on sandy grounds in the southern Irish Sea and St. George's Channel.

## 6.21 Saithe landings

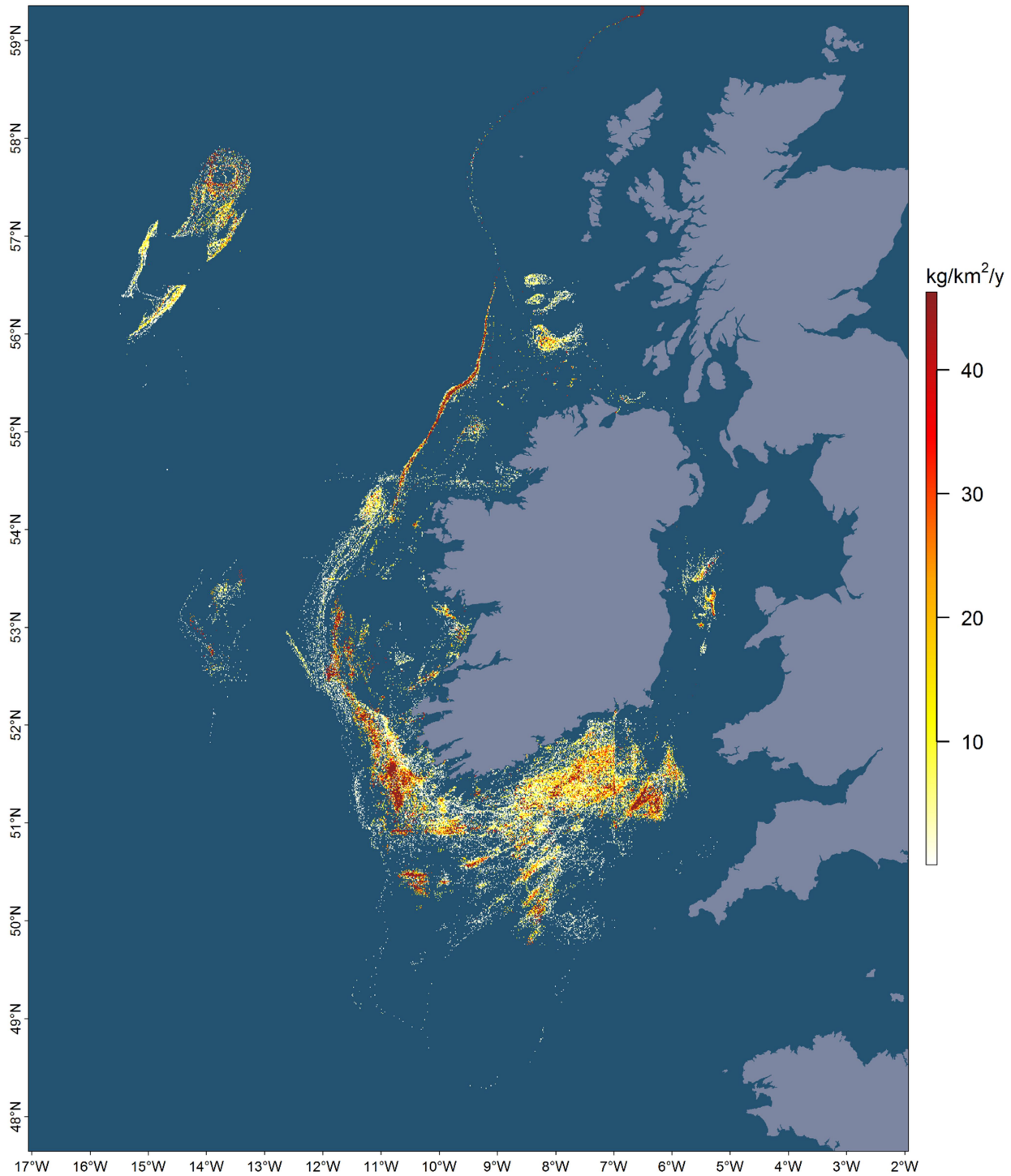


Figure 58: Distribution of saithe landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears)

### Key Points: Saithe landings by Irish vessels

- Smaller vessels ( $<12\text{m}$ ; no VMS) contribute 18% of the total saithe landings; these vessels mainly operate inshore off the south and southwest coast of Ireland.
- Saithe are mainly caught along the continental shelf edge between 100 and 350m.

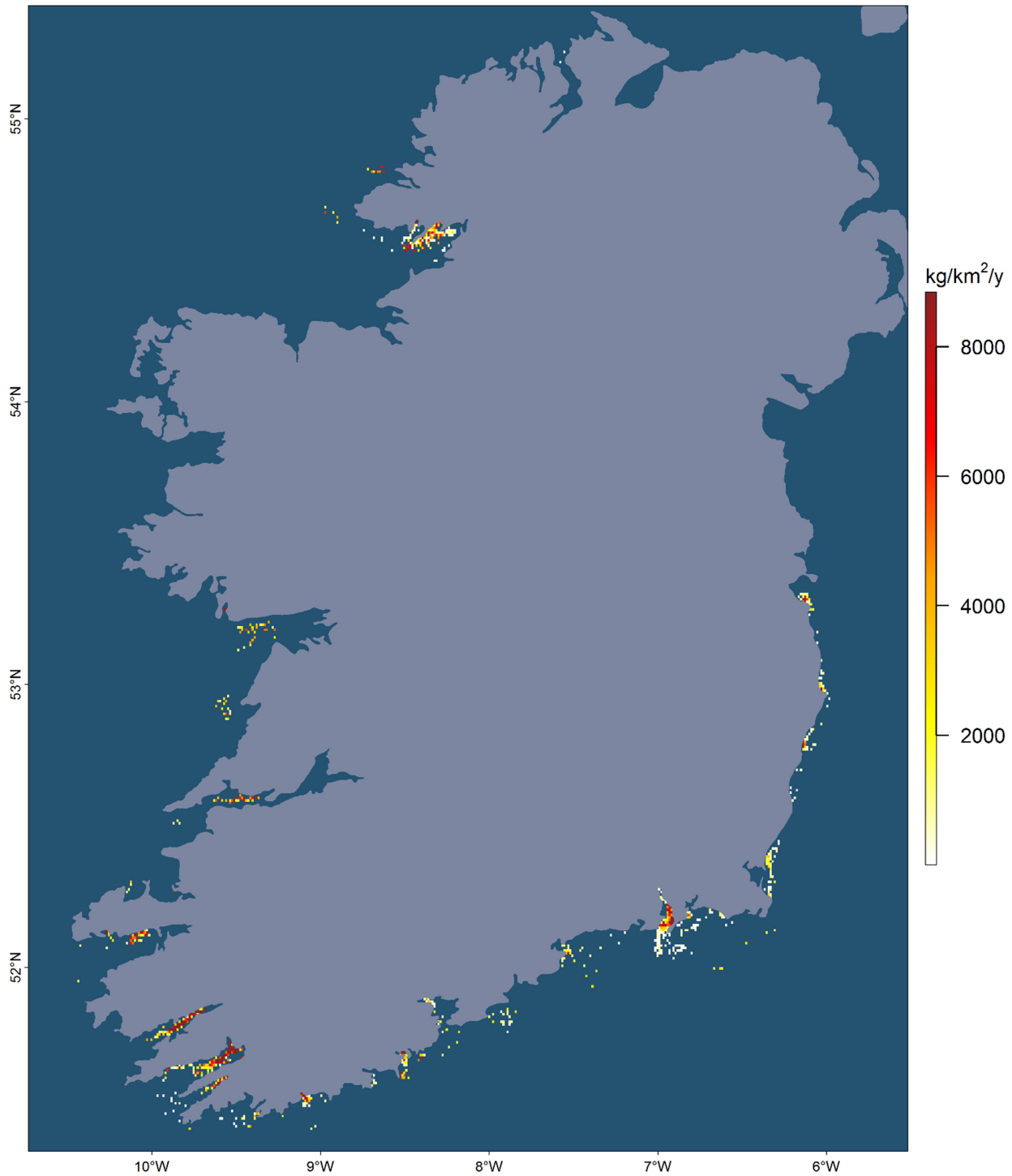


Figure 59: Distribution of sprat landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears).

Key Points: Sprat landings by Irish vessels

- Smaller vessels (<12m; no VMS) contribute 25% of the total sprat landings.
- Catches of sprat are highly localised and mainly take place inside bays.
- Sprat are targeted during the winter months.

## 6.23 Whiting landings

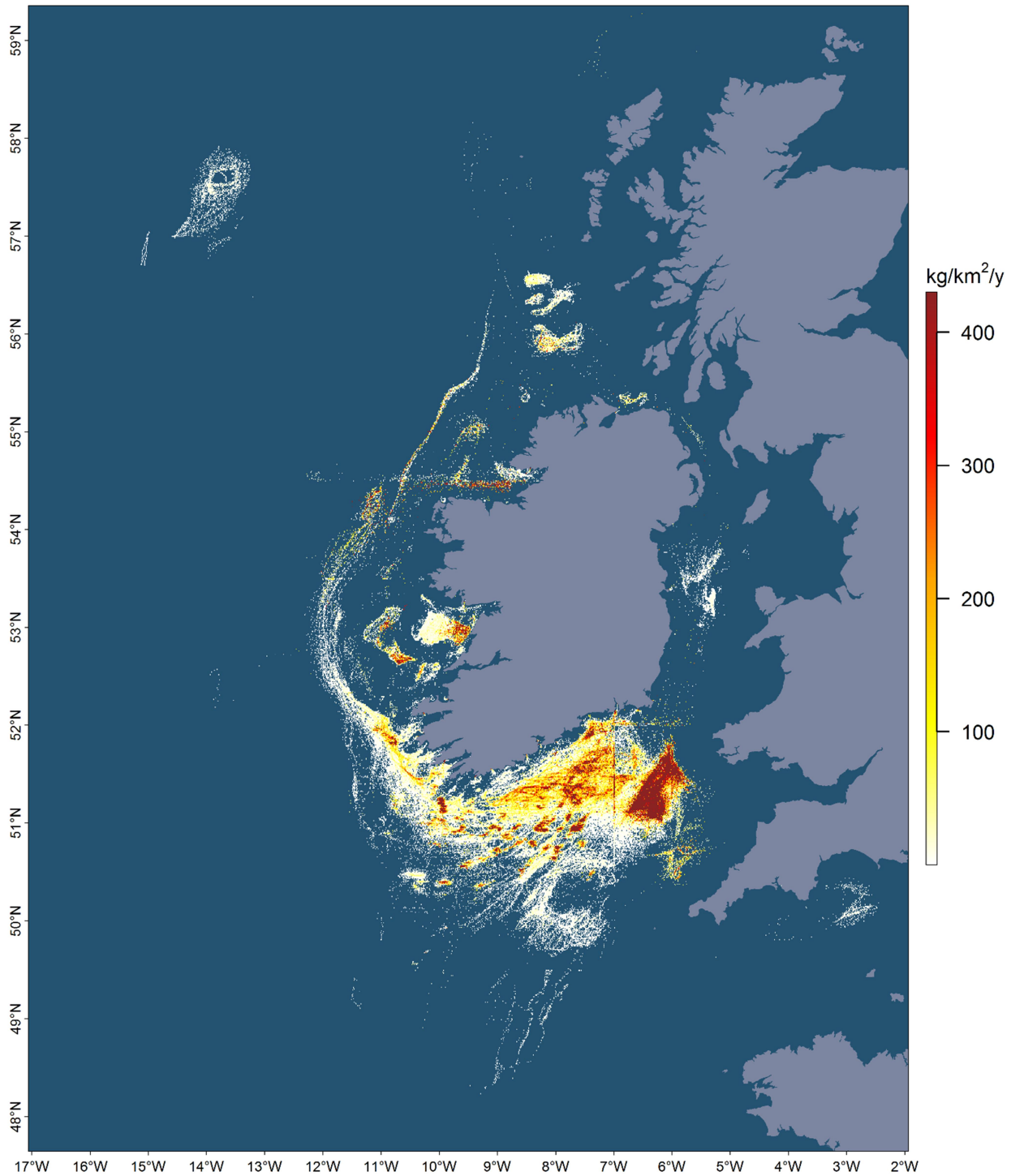


Figure 60: Distribution of whiting landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears)

### Key Points: Whiting landings by Irish vessels

- Whiting landings are widely distributed over the continental shelf.
- Areas of high catch rates are noticeable in the Celtic Sea and The Smalls.

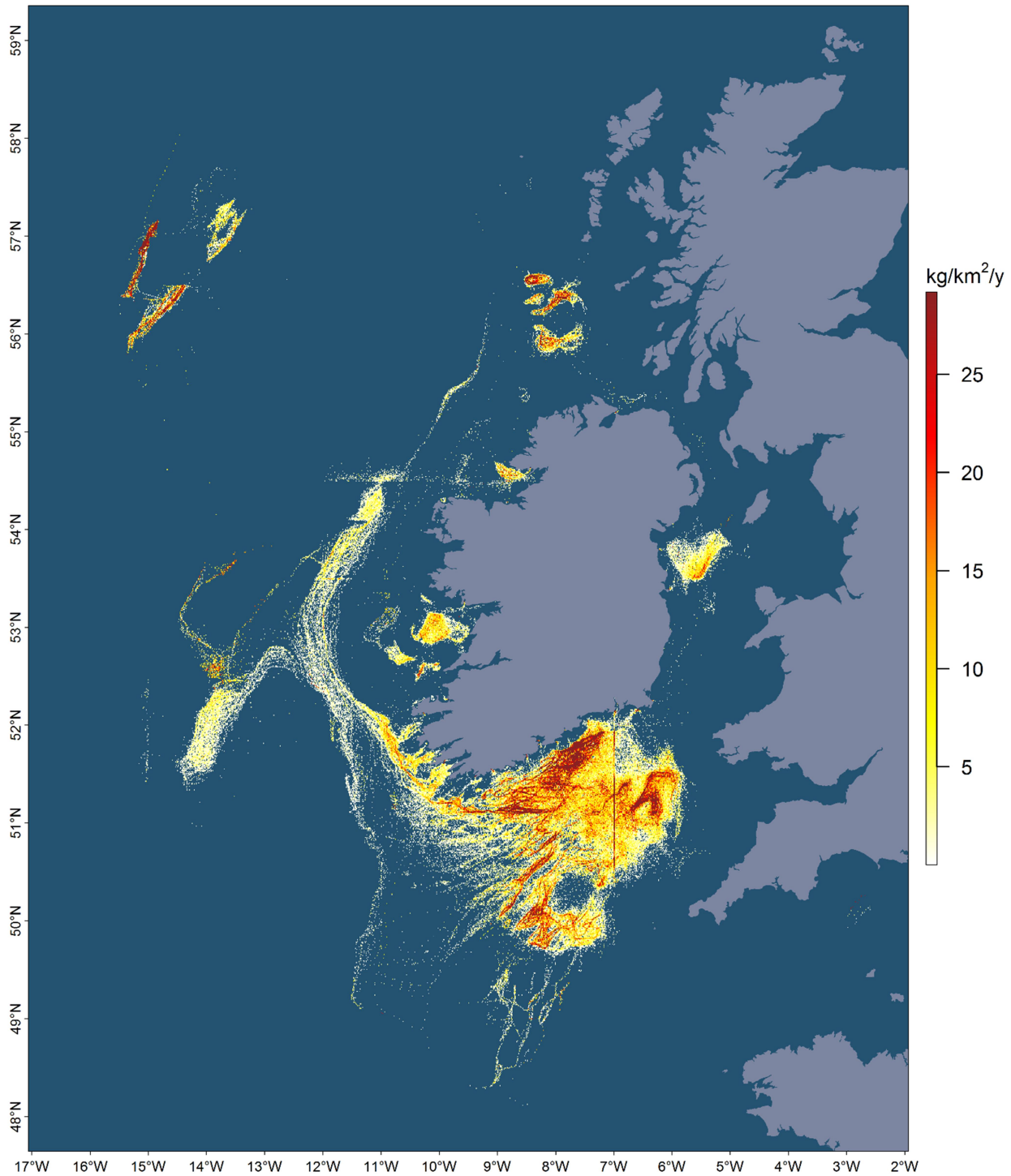


Figure 61: Distribution of witch landings by Irish vessels  $\geq 12\text{m}$  during 2014-18 (all gears)

Key Points: Witch landings by Irish vessels

- Smaller vessels (<12m) contribute 1% of the total witch landings, these vessels mainly operate inshore.
- Witch landings are widely distributed along the continental shelf.



**Bathymetry:** The depth profile of the seabed

**Beam trawl:** A net which is held open by a horizontal beam and dragged along the bottom. Often used to target flatfish.

**Catchability:** The extent to which fish are susceptible to being caught by a certain fishing gear. E.g.: “The catchability of young fish is reduced by increasing the mesh size”.

**Celtic Sea:** The sea area between southern Ireland and south-western England (see Figure 3).

**Continental Shelf:** The part of the seabed that gently slopes down from the shore, typically ending around 200m depth (the shelf edge) after which the seabed forms a steep slope down to the ocean floor (see Figure 3).

**Demersal:** Associated with the seabed. Demersal fish live near the bottom of the sea and demersal fishing gear is deployed on or near the seabed.

**Demersal otter trawl:** A net which is held open by otter boards or trawl doors and dragged along the bottom. Mainly used to target demersal fish species and Nephrops.

**Demersal seine:** A net which surrounds fish, it is usually set from a vessel. Long lines on either side of the net are used to herd the fish and haul the net. Mainly used to target demersal fish species.

**Discards:** The part of the catch that is discarded (thrown back to sea).

**Dredge:** A frame with a holding bag which is dragged along the bottom. Mainly used to target shellfish.

**EEZ (Exclusive Economic Zone):** The sea area around a nation in which it has special rights over the use of marine resources. It extends up to 200nm offshore.

**Effort:** See ‘Fishing effort’

**Fishing effort:** The time spent engaged in fishing operations or time spent at sea, this time may be multiplied by a measure of fishing capacity, e.g. engine power. In this Atlas, fishing effort is always expressed in fishing hours.

**Gill net:** A single wall of netting hung vertically. Fish generally get trapped by their gills. Mainly used to target demersal fish species.

**Kn / Knot:** 1 nautical mile per hour.

**kt / Kilotonne:** 1,000 tonnes, or 1,000,000 kg.

**Landings:** The part of the catch that is retained (not discarded) and landed.

**Logbook:** Records of fishing activity and landings. The master of each fishing vessel  $\geq 10\text{m}$  is required to record its fishing effort and landings [8]. The Sea Fisheries Protection Agency has access to the logbook data from all Irish vessels and from EU vessels landing into Ireland.

**Longline:** A mainline with hooked and baited branch lines. Very few Irish vessels use longlines, Spanish and UK vessels use longlines in the waters around Ireland, mainly to target hake.

**Marine Institute:** The Marine Institute is the Irish national agency responsible for Marine Research, Technology Development and Innovation ([www.marine.ie](http://www.marine.ie)).

**Nm / Nautical mile:** 1.852km.

**Otter trawl:** See Demersal otter trawl

**Pelagic:** Associated with open water. Pelagic species live in the water column and pelagic fishing gear is deployed in midwater.

**Pelagic trawl:** A net which is held open by otter boards or trawl doors and deployed in midwater.

**Pot:** A trap, usually baited. Mainly used to target crab, lobster and whelk.

**Seine:** See Demersal seine

**Shelf edge:** The beginning of a steep slope from the continental shelf towards oceanic depths, typically around 200m depth (See Figure 3).

**t / Tonne:** 1,000 kg.

**Trammel net:** A wall of a number of layers of netting hung vertically. Fish get entangled between the layers of netting. Mainly used to target demersal species.

**VMS / Vessel Monitoring Systems.** EU vessels  $\geq 12$ m are obliged to transmit their position and speed at least every two hours [Ref.5]. VMS transmit these data via satellite to the competent authorities. The Irish Naval Service has access to all VMS data from Irish Vessels and VMS data from international vessels inside the Irish EEZ.

## 8 References

- [1] Gerritsen H, Minto C and Lordan C. (2013) How much of the seabed is impacted by mobile fishing gear? Absolute estimates from Vessel Monitoring System (VMS) point data. *ICES Journal of Marine Science* 70(3):523–531, 2013.
- [2] Davie S and Lordan C. (2011) Definition, dynamics and stability of métiers in the Irish otter trawl fleet. *Fisheries Research* 111(3):145–158, 2011.
- [3] Anon. (2009) Atlas of the commercial fisheries around Ireland.
- [4] Gerritsen H and Lordan C. (2014) Atlas of the commercial fisheries around Ireland, second edition.
- [5] EC. Commission Regulation (EC) No. 2244/2003 of 18 December 2003 laying down detailed provisions regarding satellite-based vessel monitoring systems. *Official Journal of the European Union*, L 333:17–27, 2003.
- [6] Gerritsen H and Lordan C. (2011) Integrating vessel monitoring systems (VMS) data with daily catch data from logbooks to explore the spatial distribution of catch and effort at high resolution. *ICES Journal of Marine Science: Journal du Conseil*, 68(1):245–252, 2011.
- [7] R Core Team (2019). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
- [8] EEC. Commission Regulation (EEC) No 2807/83 of 22 September 1983 laying down detailed rules for recording information on Member States' catches of fish. *Official Journal of the European Union*, L 276:1–18, 1983.

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