



Landings Enriched Approach to Positional FISHerries data (LEAPFISH): 2024

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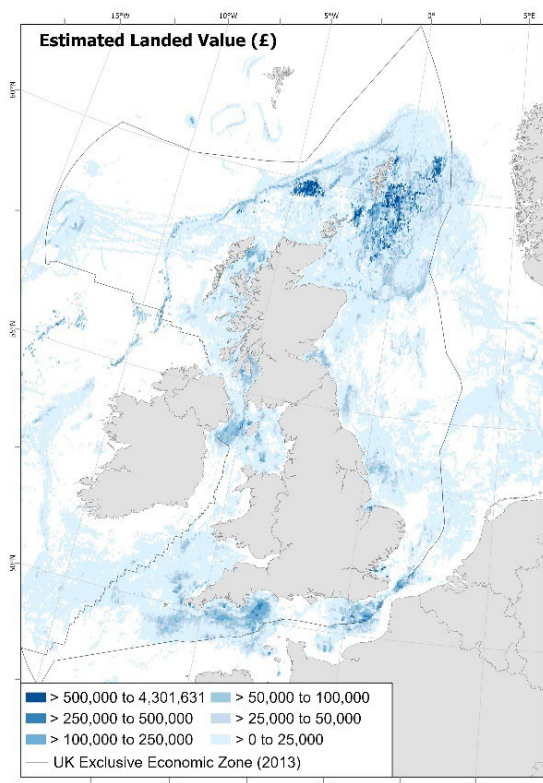
This Official Statistics in Development release presents information from the Landings Enriched Approach to Positional FISHerries Data (LEAPFISH) for 2024. LEAPFISH combines landings data for UK vessels and Crown Dependency vessels¹ that are 12 metres and over, with Vessel Monitoring System (VMS) information to provide a more detailed spatial understanding of fishing activity.

LEAPFISH provides estimates of weight, value, time spent at sea and fishing effort at 0.05 c-square resolution, providing finer spatial detail than landings data published in UK Sea Fisheries Statistics 2024.

Key findings

In 2024, UK and Crown Dependency vessels that are 12 metres and over spent approximately 65% of their time at sea actively fishing.

Estimated landed value (£) by 0.05 c-square grid cell, 2024²



In 2024, demersal trawls accounted for 56.1% (923,000 hours) of total fishing effort but only 18.9% (131,000 tonnes) of live weight and 31.7% (£311.6 million) of landed value.

Conversely, pelagic trawls accounted for just 0.9% (14,000 hours) of total fishing effort, compared with 67.7% (470,000 tonnes) of the live weight and 45.4% (£445.4 million) of landed value.

In 2024, of the four gear groups with the highest fishing effort, the landed value from fishing activity using dredging was the most spatially concentrated. Half of the associated landed value came from just 5.9% of the area covered by dredging. This was focused around the eastern and western English Channel and the Isle of Man.

LEAPFISH shows that fishing activity is concentrated in particular areas. For example, in rectangle 31F1 in the southern North Sea, 57.7% of landed value from demersal-trawl activity was estimated to come from the 6 to 12nm area. This makes up just 21.5% of the rectangle's sea area.

¹ Includes Isle of Man vessels, and vessels registered in Jersey and Guernsey when fishing English quota.

² © EuroGeographics for the administrative boundaries

Contents

Key findings	1
Background.....	3
About these data.....	3
How to interpret LEAPFISH results	4
Fishing activity by UK vessels in 2024	6
Spatial patterns by fishing method	9
Uncovering hidden spatial patterns	12
Accompanying data and methodology	15

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Background

In recent years, understanding the spatial distribution of fishing activity has become extremely important for management of the marine environment. For example, the spatial distribution of fishing activity has been utilised as key evidence within the development of Marine Protected Areas (MPAs) around the UK. It has also been used in assessing proposals for future offshore wind farm locations.

The MMO has previously published [Vessel Monitoring System \(VMS\) spatial layers covering UK vessels 15 metres and over in length](#)³. This release was discontinued in 2021, after data for 2020 was published, as areas of the methodology requiring review were identified.

Since 2021, the MMO has continued to explore a range of options to improve the provision of these data.

In October 2024, the MMO published an ad hoc [publication](#) of VMS and landings data covering 2020 to 2022, following a call for evidence from The Crown Estate on the [Future of Offshore Wind](#)⁴. This release further highlighted the need for a regular publication of VMS data that would provide a consistent timeseries for any future calls for evidence to help manage the marine environment.

Therefore, the MMO has developed the Landings Enriched Approach to Positional FISHerries Data (LEAPFISH) methodology.

This release presents information from LEAPFISH for 2024. It links landings data published in [UK Sea Fisheries Statistics 2024](#) (SFS24) with VMS positional information to provide a more detailed spatial understanding of fishing activity.

About these data

This release presents landings data from UK commercial vessels 12 metres and over (12m+), in all waters linked to VMS data. UK vessels include vessels registered in England, Wales, Scotland, Northern Ireland, as well as Jersey, Guernsey and Isle of Man⁵.

Landings data show the amount of fish landed by commercial fishing vessels, including the species, weight and value of the catch. They are based on administrative data collected through logbooks, landings declarations and sales notes for 12m+ UK vessels.

Landing data are an important part of reporting fishing activity in the UK. The volume and value of fish landed by vessels of each UK fishing authority is key for understanding fishing activity.

Landings by 12m+ UK vessels presented in this report represents 93.2% of the live weight and 84.7% of the landed value reported for all UK vessels in UK Sea Fisheries Statistics 2024.

Vessel Monitoring System (VMS) data provide information on the location and movement of commercial fishing vessels. Each position report, or 'ping', records the vessel's location at a point in time, along with information such as speed, course and timestamp. UK 12m+ vessels are required to transmit VMS positions at least every two hours.

This approach differs compared to other MMO data releases due to:

- Finer spatial allocation of weight and value
- VMS-derived measure of fishing effort (time spent at sea actively fishing);
- VMS-derived measure of time spent at sea

³ <https://environment.data.gov.uk/dataset/bf55694c-3330-4c1d-a48e-db6bbe82ad77>

⁴ <https://www.thecrownestate.co.uk/our-business/marine/future-offshore-wind>

⁵ Vessels from Jersey and Guernsey only included where they have fished from English quota pools.

How to interpret LEAPFISH results

Fishing activity can be described in multiple ways and different measures highlight specific aspects of fishing patterns and behaviour. Which measure is most relevant depends on the question, including whether the focus is biological, economic or environmental.

A more detailed spatial view of weight and value

Live weight: the quantity of the fish when taken from the water, before any processing takes place, measured in tonnes.

Landed value: the value of fish the first time it was sold, in pounds sterling (£). Values are not adjusted to account for changes in inflation or exchange rates. Where value is allocated to an area, this is the value of the fish caught in this area.

Statistics for these measures are first published in the UK Sea Fisheries Statistics.

Live weight provides an estimate of the volume of fish taken out of the sea. It is useful for understanding activity from a biological perspective. It is also crucial for managing fishing quotas, which set limits on how much fish can be caught over a given period.

Landed value tells us how much that fish sold for. It provides an understanding of the economic importance of fishing activity when considering management measures.

LEAPFISH assigns live weight and landed value to the area of the sea the fishing activity occurred. Landing records are linked to VMS data, allowing weight and value to be allocated to vessel positions and mapped at a finer spatial scale. For 2024 data, this approach presents 99.8% of total UK 12m+ live weight (694,059 tonnes) and 99.7% of total landed value (£981.7 million).

Producing effort measures from VMS data

The release introduces two new measures that are produced using the timestamp information in VMS data.

Time spent at sea: the estimated duration a vessel spends at sea in total, in hours.

This is different to the 'days at sea' effort measure in UK sea fisheries annual statistics. Days at sea covers over-10-metre vessels and uses departure and return times recorded in logbooks.

Fishing effort: the estimated duration a vessel spends at sea fishing, in hours.

Time spent at sea shows where vessels spend their time and includes fishing and non-fishing time. It captures the total time spent to catch fish, including travel to and from fishing grounds. This is an important economic and environmental consideration because of factors such as fuel use.

Fishing effort focuses on how much time vessels spent actively fishing. It shows where fishing activity is most intensive. This can be important for understanding potential environmental pressures, including interactions with the seabed. Comparing fishing effort with live weight provides a further biological perspective by showing how much fishing effort is required to catch a given quantity of fish.

Table 1: Comparison of measures in SFS24 and LEAPFISH 2024, UK and Crown Dependency 12 metres and over vessels, 2024

Measures	SFS24	LEAPFISH 2024
Live weight (tonnes)	695,770	694,059
Landed value (£m)	984.3	981.7
Time spent at sea (hours)	Not available	2,522,089
Fishing effort (hours)	Not available	1,645,161

Explaining the spatial distribution of fishing activity

Combining activity and effort metrics with spatial distribution measures provides a detailed picture of where fishing activity occurs. These measures are applied to the total UK 12m+ fleet, as well as by gear category.

Spatial distribution: describes where fishing activity occurs and how it is spread across an area. It includes spatial concentration and spatial extent.

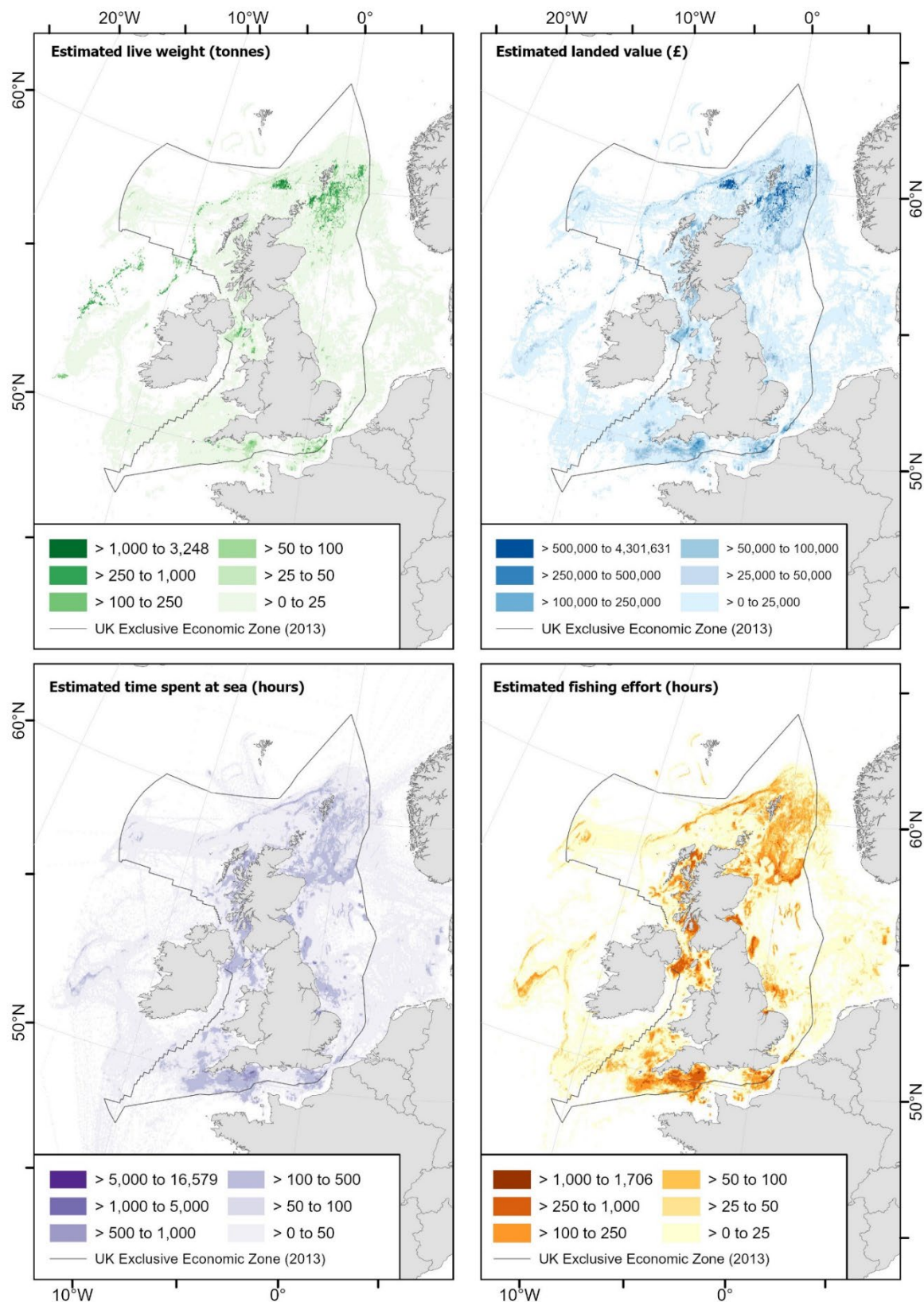
Spatial concentration: the number of c-squares that account for 50% of the total for each measure. Activity or effort is more concentrated the fewer c-squares that account for 50% of the total.

Spatial extent: the total number of c-squares that any activity occurs in. Activity has a greater extent the more c-squares that activity occurs in.

Fishing activity by UK vessels in 2024

In 2024, UK 12m+ vessels spent an estimated 2.52 million hours at sea. Of this, 65.2% (1.65 million hours), were classified as fishing effort. This indicates that vessels spent around two-thirds of their time at sea actively fishing.

Figure 1: Fishing activity by measure and 0.05 c-square grid cell, 2024



In 2024, live weight was allocated to 37,964 c-squares. Half of the total live weight was concentrated in 667 c-squares (1.8% of c-squares with allocated live weight).

In comparison, landed value was allocated to 37,909 c-squares in 2024, with 1,391 c-squares accounting for half the total landed value (3.7% of c-squares with allocated landed value).

Fishing effort was allocated to 42,324 c-squares in 2024. Of this, 3,069 accounted for half of all fishing effort (7.3% of c-squares with allocated fishing effort). This compares to 60,635 c-squares allocated time spent at sea, with 3,512 accounting for half of all time spent at sea (5.8% of c-squares with allocated time spent at sea).

This means that live weight is more spatially concentrated than other measures in 2024, with fishing effort the least spatially concentrated.

As expected, time at sea has a greater spatial extent than the other measures, as it includes travel to and from fishing areas. Landed value had the smallest spatial extent in 2024.

Fishing activity within UK waters

Fishing activity with UK waters accounted for 78.5% of live weight (545,000 tonnes). This is compared to 84.9% of landed value (£833.8 million) and 85.7% of fishing effort (1.41 million hours).

Within UK waters, there are notable hotspots where activity is particularly concentrated. For example, there are hotspots of live weight and value around northern and northeastern Scotland. Whereas, landed value is more prominent than live weight in parts of the western English Channel.

All four measures show comparatively limited activity across the central English Channel, including low levels of time spent at sea. This may reflect the location of productive fishing grounds, operating costs and constraints from restrictions and other uses of marine space such as shipping.

Activity by fishing gear groups⁶

Fishing gear refers to the equipment used to catch fish.

Fishing gears are designed to catch different fish and operate at different depths, including on or above the seabed.

Gears can be grouped to bring together gears with similar characteristics and fishing methods. This release uses nine gear groups: demersal trawls, dredges, beam trawls, pots and traps, drift and fixed nets, longlines, demersal seine, pelagic trawls, and other gears

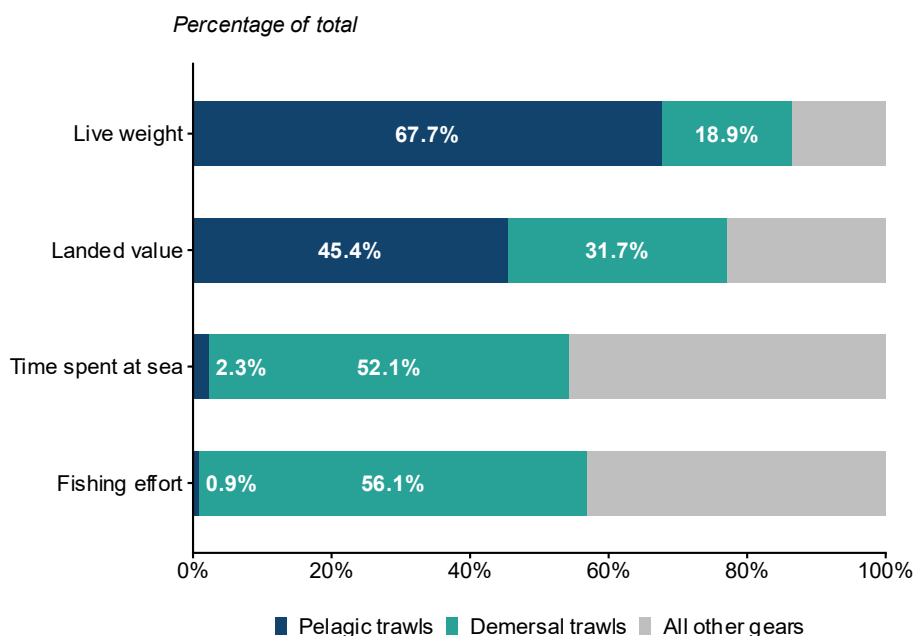
More information on commercial fishing gears can be found on the [fishing gear database](#).

In 2024, pelagic trawling accounted for just 0.9% of fishing effort (14,000 hours) but accounted for 67.7% (470 thousand tonnes) of the live weight and 45.5% (£445.4 million) of the landed value of all UK 12m+ vessels.

In comparison, demersal trawls accounted for over half of the total fishing effort (56.1%, 923 thousand hours) but only accounted for 18.9% (131 thousand tonnes) of live weight and 31.7% (£311.6 million) of landed value in 2024.

Beam trawling also accounted for a larger share of fishing effort than landings. It accounted for 11.1% (183 thousand hours) of fishing effort, but only 1.7% (11.6 thousand tonnes) of live weight and 5.1% (£50.4 million) of landed value.

Figure 2: Share of live weight (tonnes), landed value (£), time spent at sea (hours) and fishing effort (hours) for pelagic and demersal trawls, 2024



⁶ <https://www.seafish.org/responsible-sourcing/fishing-gear-database/>

Spatial patterns by fishing method

Where fishing happens depends on how vessels catch fish

Where fish are found, water depth, seabed and fishing restrictions all influence where gears are used. This means they can show distinct spatial patterns.

This section considers four key gear groups; demersal trawls, dredges, beam trawls and pots and traps. Together, fishing using these gears accounted for 1.49 million hours, or 91% of total fishing effort.

Demersal trawlers target fish on or near the seabed using a funnel-shaped net towed behind one or two vessels.

Beam trawlers target fish on or near the seabed by towing nets held open by a rigid beam. Larger vessels commonly tow two beam trawls, one from either side.

Dredges are rigid structures that are towed along the seabed by a boat. They are used to target shellfish species such as scallops and oysters

Pots and traps are set on the seabed to attract and retain primarily shellfish before being hauled back to the vessel.

Spatial distribution of landed value by gear group

This section focuses on landed value to compare spatial patterns across gear groups from an economic perspective. It shows the value of the fish caught in an area, rather than where the greatest quantity of fish is caught or the most time is spent fishing. Together, the selected four gear groups accounted for £470.8 million, or 48.0% of total landed value.

Table 2: Landed value share, spatial extent and concentration by selected gear group, 2024

Gear Group	Share of Landed Value	Spatial extent		Spatial concentration	
	%	c-squares	c-squares	% of spatial extent	
Demersal trawls	31.7	24,776	2,806	11.3	
Beam trawls	5.1	3,657	246	6.7	
Dredges	6.4	4,758	282	5.9	
Pots and traps	4.7	6,538	637	9.7	

The value associated with fishing using demersal trawls had the greatest spatial extent, covering the largest area in 2024. Landed value for demersal trawls was allocated across 24,776 c-squares (65.4% of all c-squares with an allocated value), compared with 6,538 (17.2%) for pots and traps, 4,758 (12.6%) for dredges and 3,657 (9.6%) for beam trawl.

However, landed value from fishing using demersal trawls was the least spatially concentrated of the four gear groups. Half of landed value from fishing using demersal trawls occurred across 2,806 c-squares, representing 11.3% of the c-squares in which demersal trawl value was allocated.

Landed value from fishing using dredges was the most spatially concentrated of the four gear groups. Half the landed value from fishing using dredges comes from activity in just 5.9% of c-squares where dredging activity occurred.

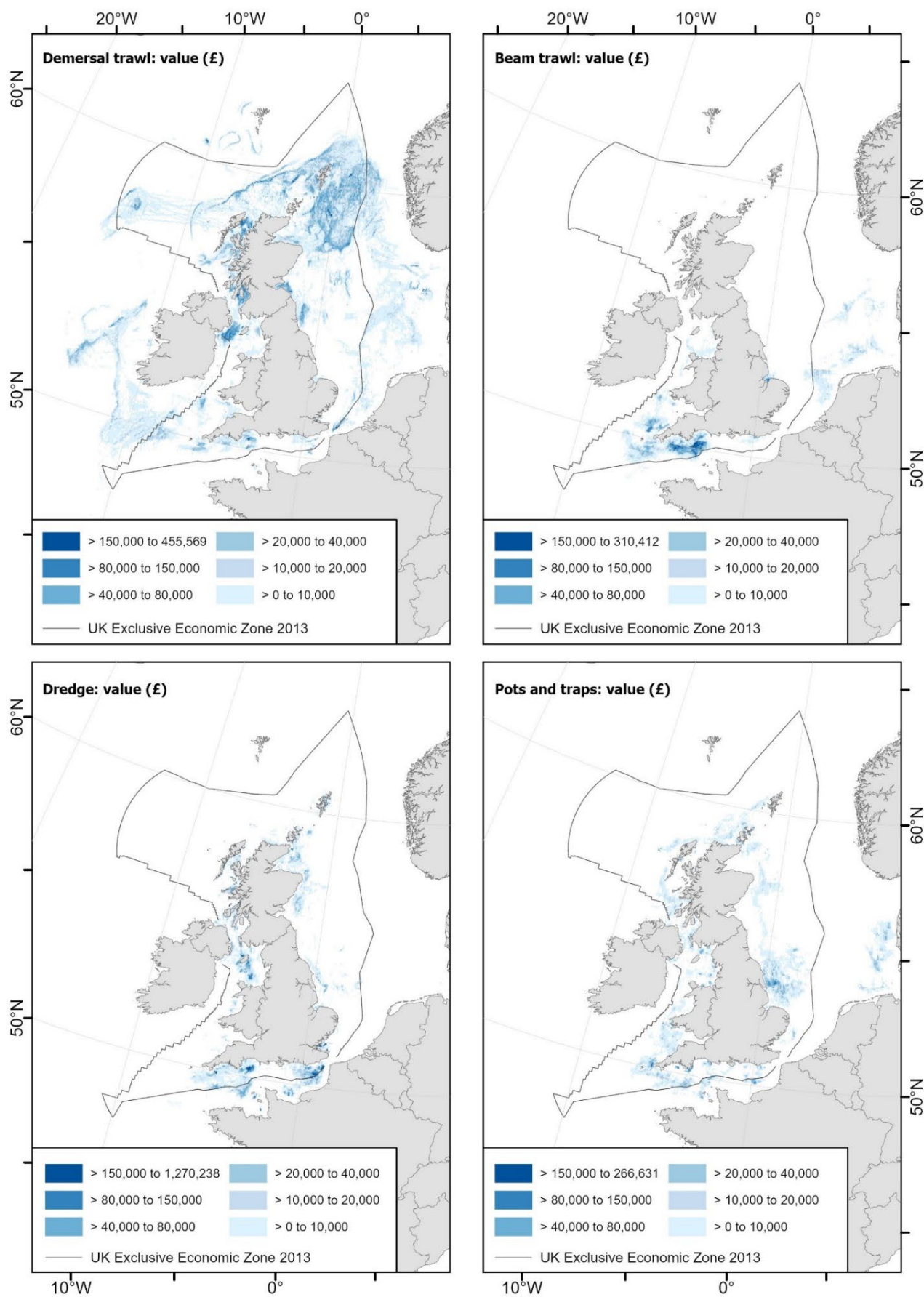
Landed value for dredges was concentrated around the eastern and western English Channel and the Isle of Man (Figure 4). King scallops accounted for over 90% of the landed value from UK 12m+ dredges in these areas⁷.

Beam trawls were the second most spatially concentrated of the four gear groups. Landed value from beam trawling was focused primarily around southwest England, including the western English Channel. Beam trawling is particularly important in the western English Channel in value terms, accounting for 46.9% of landed value compared with 29.4% of live weight. This partly reflects landings of relatively high-value species such as sole, turbot and brill.

Spatial extent and spatial concentration do not necessarily follow the same pattern. Landed value from dredging had a wider spatial extent than beam trawling, occurring across 4,758 c-squares compared with 3,657. However, dredging was more concentrated within that extent, with half of dredge value occurring in 5.9% of c-squares compared with 6.7% for beam trawls.

⁷ Source: MMO Sea Fisheries Statistics 2024 (published 2 December 2025)

Figure 3: Landed value (£) of four key gear types by 0.05 c-square grid cell, 2024



Uncovering hidden spatial patterns

Fishing activity is not distributed evenly within ICES rectangles

Fishing vessels 12 metres and over report their fishing activity through [electronic logbooks](#). This must include the ICES statistical rectangle where most catch was taken each day⁸. These rectangles divide the sea into a grid used by the International Council for the Exploration of the Sea (ICES). They provide an internationally consistent spatial unit for recording fishing activity.

The MMO annual [UK Sea Fisheries Statistics release](#) presents data at ICES rectangle level. However, each rectangle covers several thousand square kilometres, which may also include land. Fishing activity may be concentrated in only part of a rectangle.

LEAPFISH allocates landings across Vessel Monitoring System (VMS) positions, which are reported automatically. Results are published in 0.05-degree [c-squares](#)⁹. These are geographic grid cells used to divide the sea into small areas. Each ICES rectangle contains 200 c-squares. This finer resolution shows a more detailed view of where fishing activity happens within an ICES rectangle.

Table 3: Comparing spatial resolution between ICES rectangle and 0.05 c-square, UK waters

Spatial resolution	ICES rectangle	0.05 c-square
Typical spatial unit area	~3,000-4,000 km ²	~15-20 km ²
Cells per ICES rectangle	1	200

Overall, c-square data shows where fishing activity is concentrated in particular areas.

The difference in understanding spatial distributions between ICES rectangles and c-squares can be illustrated using a single ICES rectangle.

Spatial distribution within ICES rectangle 31F1

ICES rectangle 31F1 is located off the eastern coast of Kent and covers [key shipping routes between England and France, including from Dover](#)¹⁰. In 2024, LEAPFISH allocated £6.3 million of landed value to ICES rectangle 31F1.

This £6.3 million was allocated to just 84 c-squares within the ICES rectangle 31F1, or 42% of the area of the ICES rectangle. Just 10 c-squares, or 5% of the ICES rectangle, accounted for half the total landed value allocated to 31F1.

The same can be seen when considering individual fishing methods. In 2024, demersal trawls accounted for £1.55 million of the total value landed allocated to ICES rectangle 31F1. This value was allocated to 42 c-squares, accounting for 21.0% of the ICES rectangle. Half this value was concentrated in just six c-squares, or 3.0% of the ICES rectangle.

⁸ <https://www.gov.uk/government/publications/how-to-report-fishing-activities-using-an-electronic-logbook-software-system/elss-reports>

⁹ <https://www.cmar.csiro.au/csquares/>

¹⁰ <https://environment.data.gov.uk/explore-marine-plans>

Table 4: Spatial extent and concentration of demersal-trawl landed value within ICES rectangle 31F1, 2024

Measure	Value
C-squares within ICES rectangle	200
C-squares with allocated landing value	42
C-squares accounting for half of landed value	6
Highest-value c-square	11.7%
Five highest-value c-squares	46.1%

This is not an isolated example. In other high-value rectangles, as few as two to six c-squares accounted for half of the landed value. For example, in 48E6 (North of Orkney), just six of 190 c-squares accounted for half of its £18.4 million.

Estimating across spatial boundaries

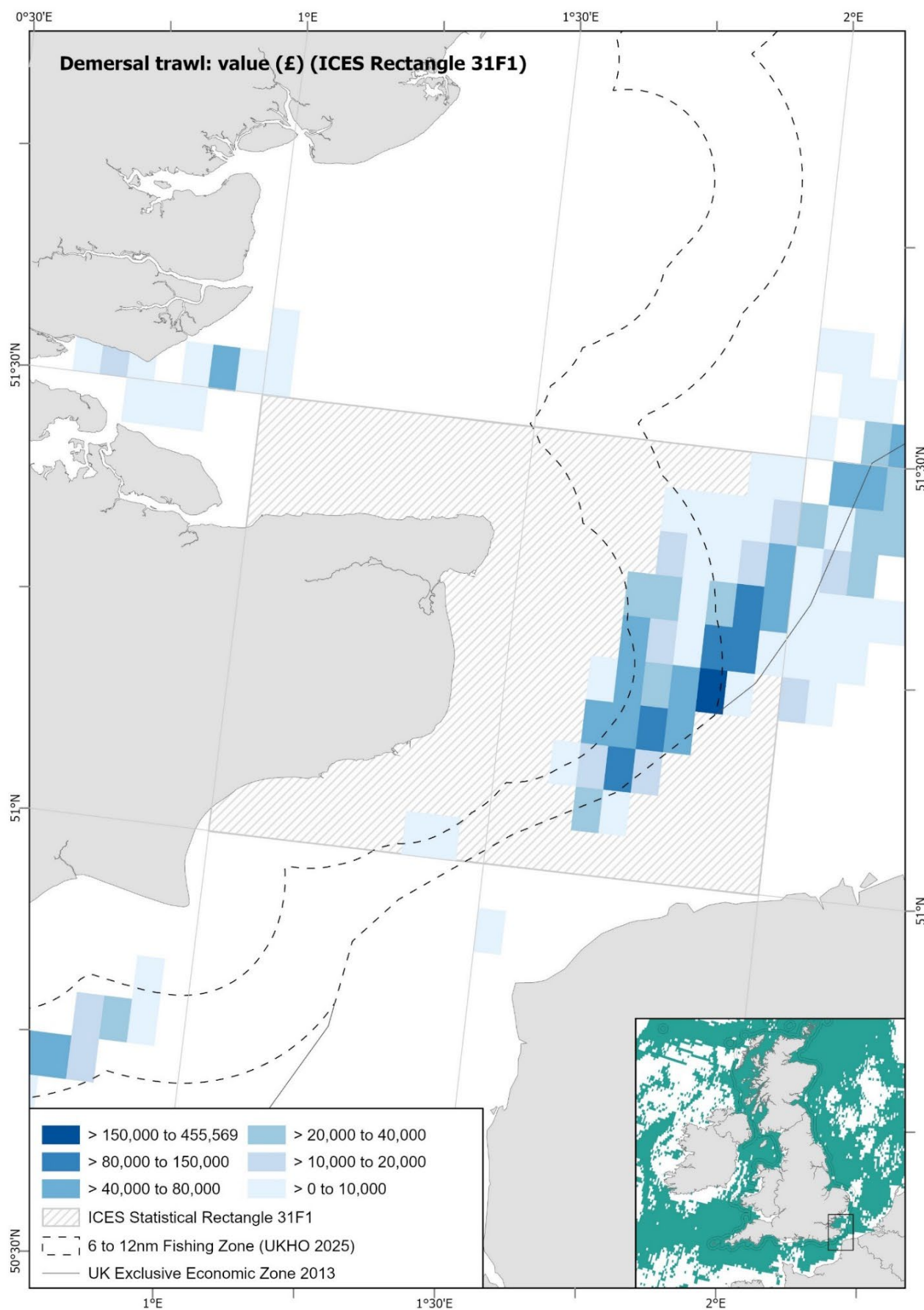
ICES rectangles can extend across Exclusive Economic Zone (EEZs) boundaries, or other spatial boundaries such as the 6 to 12 nautical mile zone. These definitions are important for UK fisheries management and in policy development.

Again, using ICES rectangle 31F1 to illustrate the difference, the UK 6 to 12 nautical mile zone covers 21.5% of the sea area of ICES rectangle 31F1 ([UKHO, 2025¹¹](#)). If value was assumed to be evenly distributed across 31F1, in 2024, the 6 to 12 nautical mile zone would be allocated around £334,000 of the landed value from demersal trawling activity (21.5% of £1.55 million).

Because LEAPFISH enables a more precise understanding of spatial concentration, it is possible to show that the relevant fishing activity likely occurred within a much smaller area. Therefore, £897,000 of landed value from demersal trawling activity is allocated to the 6 to 12 nautical mile zone. This is equal to 57.7% of the total landed value from demersal trawl activity allocated to ICES rectangle 31F1.

¹¹ [UK Hydrographic Office Maritime Limits and Boundaries | ADMIRALTY Marine Data Portal](#)

Figure 4: Demersal trawl landed value (£) in ICES rectangle 31F1 by 0.05 c-square grid cell, 2024



Accompanying data and methodology

A downloadable dataset and four spatial layers are available with this release.

The dataset is provided in OpenDocument Spreadsheet (ODS) format. It includes data on live weight, landed weight, landed value, time spent at sea and fishing effort for UK and Crown Dependency vessels 12 metres and over. The data are grouped into 0.05 c-square areas and by gear group. The matching ICES rectangle is also included.

The four spatial layers show live weight, landed value, time spent at sea and fishing effort. Each layer provides totals for each 0.05 c-square, as well as separate values for each gear group.

What you should understand about the approach

This approach estimates where fishing takes place and allocates landings to that activity. Users should consider the following:

1. **Fishing activity is estimated from VMS positions.** Positions classified as fishing are used to estimate activity within each c-square, but do not confirm fishing at that exact location or time.
2. **Fishing classification contains uncertainty.** LEAPFISH uses speed, location and reported activity information to classify VMS positions as fishing or non-fishing. Positions with missing, zero or low speeds can still be classified as fishing where other classification rules are met. Fishing can occur above the modelled fishing-speed threshold, while low-speed activities such as drifting, waiting or sheltering can be misclassified as fishing. VMS positions are required to be reported at two-hour intervals, so shorter fishing operations between positions may not be captured.
3. **Fishing effort is estimated from positions classified as fishing.** Fishing effort only includes positions classified as fishing, while time spent at sea includes both fishing and non-fishing activity. Fishing effort is still counted where no landings are allocated. For static gears, vessel time does not capture other aspects of fishing effort, such as the amount of gear deployed or how long the gear remains in the water.
4. **Landings are allocated to fishing positions based on time.** Landings are shared across matched positions in proportion to fishing time, although catches may in practice be concentrated in particular hauls or locations.
5. **Uncertainty in landings allocation varies by matching stage.** Later matching stages use less trip, date or location information and generally have more uncertainty. Where no matching fishing positions are found, landings may be allocated using less detailed information. As a result, LEAPFISH figures may not exactly match reported landings, including those in SFS statistics.
6. **Reported ICES rectangles can affect where landings are allocated.** Vessels are only required to record the ICES rectangle where the majority of catch was taken that day. This can concentrate matched landings in one rectangle even where fishing occurred across several.

For more information on the methodology, data quality, limitations, disclosure control and field definitions please see the [LEAPFISH Methodology and Quality Statement](#).

Download the accompanying data:

- [Tabular dataset \(ODS\)](#)
- Spatial data layers will be available through Defra Data Services Platform shortly after the statistics release

User feedback

LEAPFISH is published as Official Statistics in Development. The MMO is committed to improving and developing these statistics to ensure they meet user needs.

We welcome your feedback on these statistics, including the methodology, accompanying data and suggestions for future development. Please share your feedback: [LEAPFISH 2024 Feedback Survey](#).

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