

# Regulatory Triage Assessment

<b>Title of Measure</b>	The South Dorset Marine Conservation Zone (Specified Area) Bottom Towed Fishing Byelaw 2022
<b>Lead Department/Agency</b>	Marine Management Organisation (MMO)
<b>Expected Date of Implementation</b>	June 2022
<b>Origin (Domestic or International)</b>	Domestic
<b>Date of Assessment</b>	04/03/2022
<b>Lead Departmental Contact</b>	Marine Conservation Team, Marine Management Organisation, Lancaster House, Hampshire Court, Newcastle, NE4 7YH, conservation@marinemanagement.org.uk
<b>Departmental Triage Assessment</b>	Low-cost regulation (fast track)

## Rationale for intervention and intended effects

Bottom towed fishing has the potential to hinder the conservation objectives of the South Dorset Marine Conservation Zone (MCZ), particularly in regard to the “recover to favourable condition” general management approach (GMA) assigned to the broadscale habitats: high energy circalittoral rock and moderate energy circalittoral rock, and the habitat of conservation importance: subtidal chalk. Additionally, the broadscale habitat subtidal coarse sediment has a “maintain in favourable condition” GMA. The site is a mosaic of sediment and rocky areas, with dispersed distribution of the designated features across the site. This byelaw ensures the site’s conservation objectives are furthered, by prohibiting bottom towed fishing across the whole site thereby protecting the four designated features.

## Viable policy options (including alternatives to regulation)

**Option 0.** Do nothing

**Option 1:** MMO byelaw to prohibit bottom towed fishing over entire site with appropriate buffering (whole site prohibition).

**Option 2:** MMO byelaw to prohibit bottom towed fishing over a proportion of the site (‘zoned management’).

**Option 3.** Management of activity through a statutory instrument, regulating order or fishing licence condition.

**Option 4.** No statutory restrictions. Introduce a voluntary agreement.

Option 1 is the preferred option.

## Description of Novel and Contentious Elements (if any)

- Use of new MMO byelaw making powers introduced by the Fisheries Act 2020.

### **Initial assessment of impacts on business**

Fishing activity data (VMS and landings data) indicates that 125 distinct UK bottom towed fishing gear vessels recorded fisheries landings from ICES rectangle 29E7, within which the South Dorset MCZ management area is situated, from 2016 to 2019, and thus may be directly affected by the management area. On average over this time period, 69 distinct UK fishing vessels used bottom towed gears in ICES rectangle 29E7 each year.

The impacts are likely to be ongoing as opposed to one-off but are expected to be mitigated by use of other available fishing grounds.

The estimated monetised total cost to UK businesses over ten years is £49,752 (2020 present value). The equivalent annual net direct cost to business (EANDCB) is £5,780 (2020 present value). This is based on analysis of fishing activity data (VMS and landings data) from 2016 to 2019. As the COVID-19 pandemic is likely to have suppressed fishing activity in 2020, 2020 fishing activity is unlikely to be representative of a typical year. Therefore, only 2016-2019 landings estimates have been used for the economic impact calculations.

There is potential for all affected fishing businesses to recover a proportion of their costs by fishing elsewhere.

Non-monetised costs include the potential impact of displaced fishing activity on habitats/areas outside of the MCZ and indirect costs to the fishing industry associated with displacement to other fishing grounds.

None of the expected benefits of the management measure have been monetised, however non-monetised benefits include the protection of designated features and the ecosystem services they provide including potential indirect benefits to the fishing industry resulting from spillover (movement/spread of marine resources from protected areas to adjacent fishing grounds), and diversification (including potting and static gears moving into the area), and the positive effect this may have for species of seabirds, marine mammals, fish and invertebrates; and potential benefits for endangered and critically endangered species and carbon storage and climate benefits.

### **Summary of monetised impacts**

- Estimated Net Present Value: -£49,752
- Estimated Business Net Present value: -£49,752
- Equivalent Annual Net Direct Cost to Business (EANDCB): £5,780
- Appraisal period: 10 years
- The Price Base Year and Present Value Base Year: 2019 and 2020
- **BIT status/score: 0.03**

The proposal is a Regulatory Provision as it relates to business activity (the fishing industry); it has a regulatory effect by prohibiting the use of bottom towed fishing gear within a specified area; and has effect by virtue of the exercise of a function conferred on a Minister of the Crown or a relevant regulator.

The proposal is a Qualifying Regulatory Provision as it does not fall within any of the administrative exclusions set out in the Business Impact Target written ministerial statement - HCWS574<sup>1</sup>.

### **Rationale for Triage rating**

The fast-track appraisal route is appropriate as this regulation falls under the “low cost” criteria - EANDCB is under £5m, as detailed in the initial assessment of impact on business above.

## **Supporting evidence**

### **1. The policy issue and rationale for Government intervention**

- 1.1. MMO have legal obligations in relation to Marine Conservation Zones (MCZ). Specifically, under the Marine and Coastal Access Act 2009<sup>2</sup>. MMO has the duty to exercise its functions in a way which best furthers the conservation objectives of MCZs. This includes the implementation of MMO byelaws to manage fishing activities to conserve marine habitats<sup>3</sup>. This regulatory triage assessment (RTA) considers measures to fulfil this duty, reduce the impacts of externalities and maintain/increase the level of public goods in the marine environment.
- 1.2. MMO has undertaken an assessment of the impact of fishing in South Dorset MCZ (see The South Dorset Marine Conservation Zone (MCZ) Marine Management Organisation (MMO) Fisheries Assessment)). This assessment determined that bottom towed fishing may be hindering the conservation objectives of the MCZ. The byelaw will further the conservation objectives of the MCZ by prohibiting bottom towed fishing across the whole site.
- 1.3. Figure 1 shows the boundary of the South Dorset MCZ and the distribution of the designated features: moderate energy circalittoral rock, high energy circalittoral rock, subtidal coarse sediment and subtidal chalk.
- 1.4. Bottom towed fishing has the potential to cause negative outcomes in the marine environment as a result of ‘market failures’. These failures can be described as:
  - Public goods and services: A number of goods and services are provided by the marine environment such as biological diversity are ‘public goods’ (goods

<sup>1</sup> <https://questions-statements.parliament.uk/written-statements/detail/2016-03-03/HCWS574>

<sup>2</sup> Section 125 of the Marine and Coastal Access Act 2009. Where it is not possible to further the conservation objectives, MMO has the duty to least hinder them.

<sup>3</sup> Section 129B of the Marine and Coastal Access Act 2009.

or services where no-one can be excluded from benefiting from them, but use of the goods does not diminish the goods being available to others)<sup>4</sup>. The characteristics of public goods, being available to all but belonging to no-one, mean that individuals do not necessarily have an incentive to voluntarily ensure the continued existence of these goods which can lead to under-protection/provision. With regard to bottom towed fishing, this means that fishers can benefit from the biological diversity of marine habitats through sale of sea fisheries resources caught while simultaneously damaging the habitat and reducing its biological diversity. While the habitat continues to provide benefits to fishers through the sale of sea fisheries resources there is no incentive to protect these habitats. A lack of ownership allows the activity to continue unchecked until such time biological diversity falls to the point where catches are no longer profitable and fishers move on to more productive grounds.

- Negative externalities: Negative externalities occur when the cost of damage to the marine environment is not fully borne by the users causing the damage. Bottom towed fishing can cause severe damage to fragile habitats which can reduce biodiversity and productivity and take many years to recover. The only cost borne by bottom towed gear fishermen of this damage is the eventual reduction in catches and the potential increase in fuel costs involved in moving to new fishing grounds. The availability of other fishing grounds lessen the cost associated with reduced catches and potentially increased fuel costs are not significant enough to dissuade fishermen from causing the damage in the first place.

1.5. In many cases no monetary value is attached to the goods and services provided by the marine environment and this can lead to more damage occurring than would occur if the users had to pay the price of damage. Even for those marine harvestable goods that are traded (such as wild fish), market prices often do not reflect the full economic cost of the exploitation or of any damage caused to the environment by that exploitation.

1.6. This byelaw aims to redress these sources of market failure in the marine environment through the following ways:

- Management measures will protect designated habitats of South Dorset MCZ to ensure negative externalities are reduced or suitably mitigated.
- Management measures will support continued existence of public goods in the marine environment, for example conserving the range of biodiversity in the sea area for which the MMO is responsible.

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<sup>4</sup> <https://www.gov.uk/government/publications/interim-report-the-dasgupta-review-independent-review-on-the-economics-of-biodiversity>

- Management measures will also support continued existence of common goods in the marine environment, for example ensuring the long-term sustainability of fish stocks in the UK exclusive economic zone (EEZ).

1.7. The South Dorset MCZ lies within the South Marine Plan Area. The South Marine Plan<sup>5</sup> was adopted in 2018. The decision to introduce the South Dorset Marine Conservation Zone (Specified Area) Bottom Towed Fishing Byelaw 2022 has been assessed against the South Marine Plan. This decision is in accordance with the following marine plan policies in the South Marine Plan<sup>5</sup>:

- |            |                |
|------------|----------------|
| – S-BIO-1  | – S-FISH-4     |
| – S-BIO-2  | – S-FISH-4-HER |
| – S-BIO-3  | – S-MPA-1      |
| – S-CO-1   | – S-MPA-2      |
| – S-EMP-2  | – S-MPA-4      |
| – S-FISH-1 | – S-SOC-1      |
| – S-FISH-2 | – S-TR-1       |
| – S-FISH-3 | – S-TR-2       |

1.8. The remaining policies in the South Marine Plan are not applicable to this decision.

1.9. In creating the South Dorset Marine Conservation Zone (Specified Area) Bottom Towed Fishing Gear Byelaw 2022, MMO have had regard to the UK Marine Strategy, as required by regulation 9 of the Marine Strategy Regulations 2010<sup>6</sup>.

## **2. Policy objectives and intended effects**

2.1. The policy objective pertinent to this byelaw is to further the conservation objectives of the South Dorset MCZ (Figure 1). This will be achieved by prohibiting bottom towed fishing across the whole site.

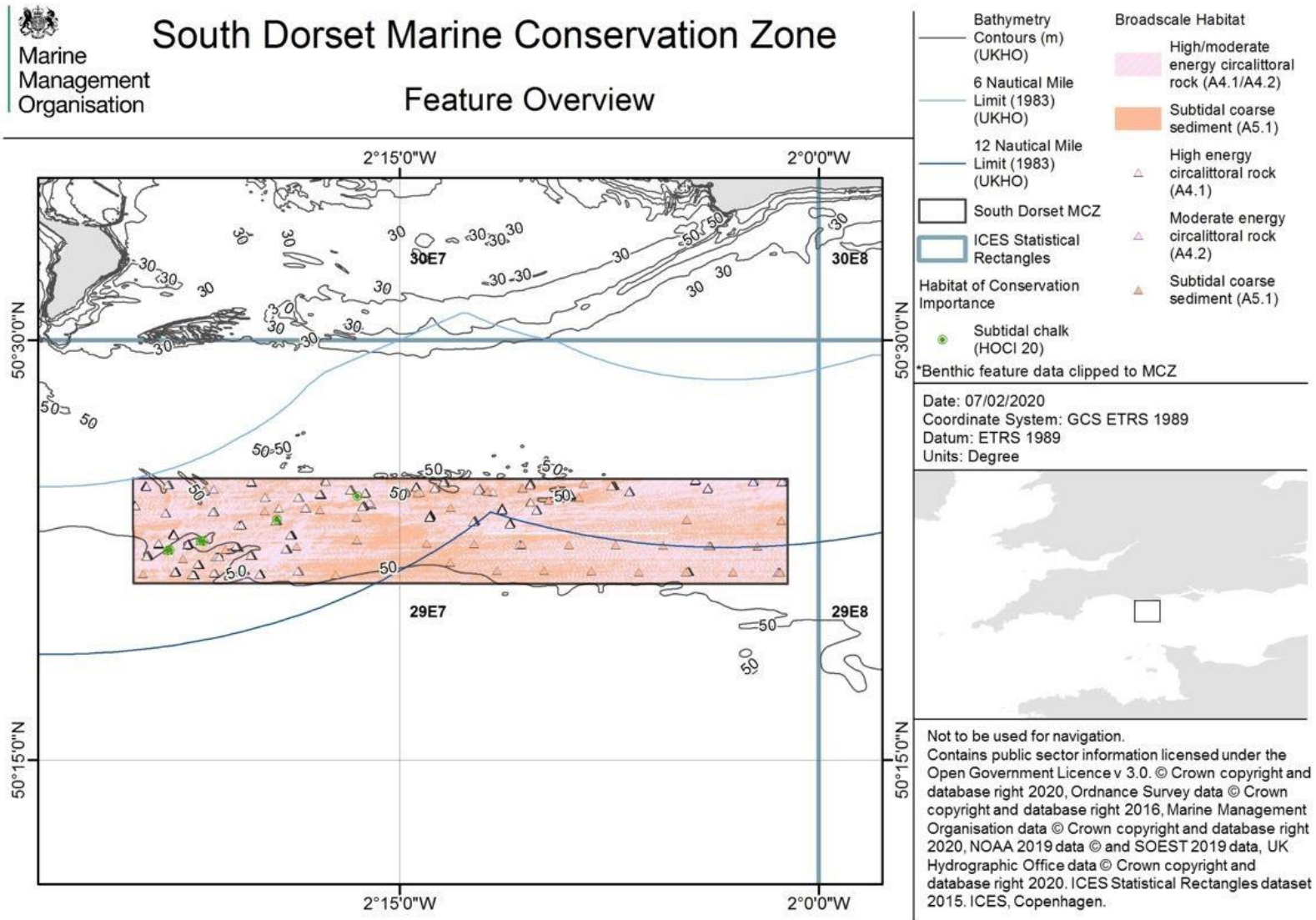
2.2. The intended effects are that the designated features will be returned to favourable condition where the feature condition is deemed unfavourable (high energy circalittoral rock, moderate energy circalittoral rock, and subtidal chalk) and maintained in favourable condition where the feature condition is deemed favourable (subtidal coarse sediment). This will allow compliance with MMO duties under the Marine and Coastal Access Act 2009<sup>2</sup>.

2.3. In addition, the social and economic impacts of management intervention will be minimised where possible.

<sup>5</sup> <https://www.gov.uk/government/collections/south-marine-plans>

<sup>6</sup> <https://www.legislation.gov.uk/ukxi/2010/1627/contents/made>

Figure 1: South Dorset MCZ Feature Map



### **3. Policy options considered, including alternatives to regulation**

3.1. The South Dorset Marine Conservation Zone (Specified Area) Bottom Towed Fishing Gear Byelaw 2022 will manage bottom towed fishing activities over the designated features within South Dorset MCZ. The options for which are detailed below:

#### ***Option 0. Do nothing.***

This option would not involve introducing any management measure. This option would mean that the risks to the site from damaging fishing activities would not be addressed and that duties under the Marine and Coastal Access Act 2009 with regard to furthering conservation objectives would not be met. All other options are compared to option 0.

#### ***Option 1. MMO byelaw to prohibit bottom towed fishing over entire site with appropriate buffering (whole site prohibition).***

Prohibiting the use of bottom towed gear across the whole site would allow MMO to ensure that no significant risk to the site's conservation objectives was occurring from fishing activities. This option provides suitable protection for the marine environment and will best further the conservation objectives of the MCZ, whilst allowing fishing activities considered less sensitive to continue.

#### ***Option 2. MMO byelaw to prohibit bottom towed fishing over all protected features in all areas of the site with an appropriate buffer.***

This option would remove some of the impact of bottom towed fishing across the designated features. However, this would continue to hinder the conservation objectives of the MCZ due to the dispersed distribution and sensitivity of the designated features across the site, which would make a zoning management approach difficult. Therefore this option is not viable to further the conservation objectives of the MCZ.

#### ***Option 3. Management of activity through a statutory instrument, regulating order or fishing vessel licence condition.***

These mechanisms for management are not appropriate in this instance. MMO byelaws, made under powers in the Marine and Coastal Access Act 2009<sup>5</sup> (including the powers for the English offshore region introduced by the Fisheries Act 2020<sup>6</sup>) are the most appropriate mechanism, providing the appropriate level of power, flexibility, consultation, and speed.

#### ***Option 4: No statutory restrictions. Introduce a voluntary agreement.***

This option would involve the development of voluntary codes of practice to protect features. MMO has considered this option in light of Better Regulation principles<sup>7</sup>, which require that new regulation is introduced only as a last resort. However, the government's expectation is that management measures for commercial fishing in marine protected areas (MPAs) should be implemented through statutory regulation to ensure adequate protection is achieved.

3.2. Option 1 is the preferred option. Options 2 to 4 are not considered appropriate as they are not deemed sufficient to best further the conservation objectives of the MCZ.

3.3. The boundaries of the management area include a buffer zone of 156 m to prevent direct damaging physical interactions between adjacent fishing activity and the designated features. Where the site features exist up to boundary of the MCZ, the buffer zone extends beyond the boundary of the MCZ. The buffer distance is based on generalised warp length to water depth ratios, thereby taking into account the water depth at the site and the possible location of mobile gear on the seabed relative to a vessel at the sea surface. This has been calculated using a warp length: depth ratio of 3:1 and the greatest depth in the MCZ (52 m).

#### **4. Expected level of business impact**

4.1. All costs analysed for option 1 are compared to option 0.

4.2. MMO has used the best available evidence to assess the impact of management option 1 however assumptions have been made in the development of this assessment:

- Limited VMS activity could be linked to landings from logbooks for this site. Therefore, estimates of UK landings derived from within the management area have been provided for the most recent five years available (2016 to 2020). Different methodologies were used to calculate landings associated with the management option for the different fleets (UK vessels over 12 m and UK vessels under 12 m).
- Evidence suggests that fishing activity by over 12 m vessels with bottom towed gears is present in the management area however no landings had been assigned to the VMS activity. To estimate landings via bottom towed gears for vessels over 12 m (Table 1 and Table 2), landings data available for ICES rectangle 29E7 was assigned to the South Dorset MCZ management area using the proportion of VMS reports (all gears) in the management area compared to ICES rectangle 29E7 (Figure 2, Table 3). All gears were used to calculate the proportion of VMS reports in the management area as data on gear type were not available for some VMS fishing activity within the site, which may still represent bottom towed gear activity. This method allowed us to assign some bottom towed gear landings to this potential bottom towed gear activity; however it is likely to be an overestimate as it assumes that all gear types fish equally inside and outside of the management area and landings are proportioned equally across VMS reports within the ICES rectangle. The assessment assumes that this VMS data captures the entirety of the over 12 m fishing fleet activity.
- Vessels under 12 m are not required to report using VMS and so limited vessel activity data is available. For under 12 m vessels, landings are recorded at ICES rectangle level, and so an area-based estimate was used to calculate the associated landings for the South Dorset management area. The



area-based approach uses the proportional area of the management area that intersects ICES 29E7 (Table 4) to estimate the landings attributed to the management area (Table 5). This assessment consequently assumes that for under 12 m vessels landings are equally distributed across the ICES rectangle and are proportional to the proportion of the rectangle coinciding with the management area.

- VMS data assumes fishing activity from speed of travel. Speeds greater than zero and up to and including six knots are considered fishing speed. This may be an over or underestimate as vessels may tow gear at speeds greater than six knots or may travel at speeds lower than six knots for reasons other than fishing (due to currents, tides etc.).
- Costs estimated for 2020 are unlikely to be representative of typical fishing activity due to the COVID-19 pandemic, which likely suppressed fishing activity.
- Economic costs are estimated using the 2016 to 2019 landings estimated for the South Dorset MCZ management area and the operating profit (provided by Seafish) of vessels fishing in the overlapping ICES rectangle (29E7). The costs calculated for the management area are therefore determined by the estimated share of the value of landings derived by vessels fishing in the management area versus the overall value of their landings. It should be noted however that these estimates work on the assumption that the costs of vessels are distributed the same way as earnings between all individual vessels' fishing grounds. Seafish produces the dataset by combining costs and earnings information from vessel accounts provided by vessel owners to the annual Seafish UK Fleet Survey with official effort, landings and capacity data for all active UK fishing vessels provided by the MMO.
- Evidence suggests that vessels use bottom towed gears within the management area, however the exact number of vessels is unknown. Conversely, the number of vessels with recorded bottom towed gear landings from within ICES 29E7 is known. Theoretically, all of these vessels could have derived their landings from the management area. As such, the number of vessels with bottom towed gear landings within ICES 29E7 has been used as a proxy for the number of vessels likely to be impacted by the management area. However, this is almost certainly a significant overestimate.
- Displacement is difficult to quantify, and it is impossible to predict where exactly activities will be displaced to.
- Spillover of fish (due to the management measures) to fishing grounds outside of the management area could provide increased opportunities for fishing outside of the MPA over the longer term; thus, further allowing vessels to offset the costs of lost revenue.
- Estimated costs to the fishing industry are likely to be an overestimate, as vessels are likely to offset some of their lost revenue by fishing in other areas.

#### 4.3. Information used to assess the impacts of the closure has been taken from:

- VMS data for UK vessels over 12 m in length from 2016 to 2019
- ICES Rectangle landings data from UK vessel log books

- Data from Seafish annual economic performance for the UK fishing fleet from 2016 to 2020<sup>7</sup>.
- Information gathered by MMO during the pre-consultation call for evidence October to December 2020 and formal consultation from 1 February to 28 March 2021.
- Local MMO marine officer knowledge.

4.4. Prohibition of the use of bottom towed fishing gear in the management area may result in the following costs:

- direct costs to the fishing industry from reduced access to fishing grounds;
- indirect costs to the fishing industry associated with displacement to other fishing grounds;
- environmental impacts related to possible increased damage to habitats in other areas due to displacement;

4.5. Direct costs to the fishing industry can be monetised and these estimated values have been collated and presented as part of this RTA (Table 2, Table 5 and Table 6).

4.6. Economic impacts to non-UK businesses and individuals, including fishing vessels registered outside of the UK, are not in scope for the headline cost figures however have been estimated from the data available, see Box 1.

4.7. Environmental costs due to possible increased damage of habitats due to displacement of fishing activity from the management area to other areas are difficult to value and are therefore described here as non-monetised costs.

4.8. Prohibition of the use of bottom towed fishing gear in the management area may result in the following benefits:

- environmental benefits related to the restoration of the habitat;
- indirect benefits to the fishing industry resulting from spillover; and,
- diversification of fishing including potting and static gears moving into the area.

4.9. The benefits associated with the management measures are difficult to value and are therefore described here as non-monetised benefits.

### **Costs to the UK fishing industry**

4.10. Fisheries landings are reported at ICES statistical rectangle level. ICES standardise the division of sea areas for statistical analysis. Each ICES statistical rectangle is '30 min latitude by one degree longitude' in size which is approximately 30 nautical miles by 30 nautical miles (size varies with latitude due to the spheroid shape of the Earth). The management area falls within ICES rectangle 29E7 (Figure 2).

4.11. To estimate the economic impacts of the management, fishing patterns of vessels using bottom towed gear (option 2) were analysed. The most recent five

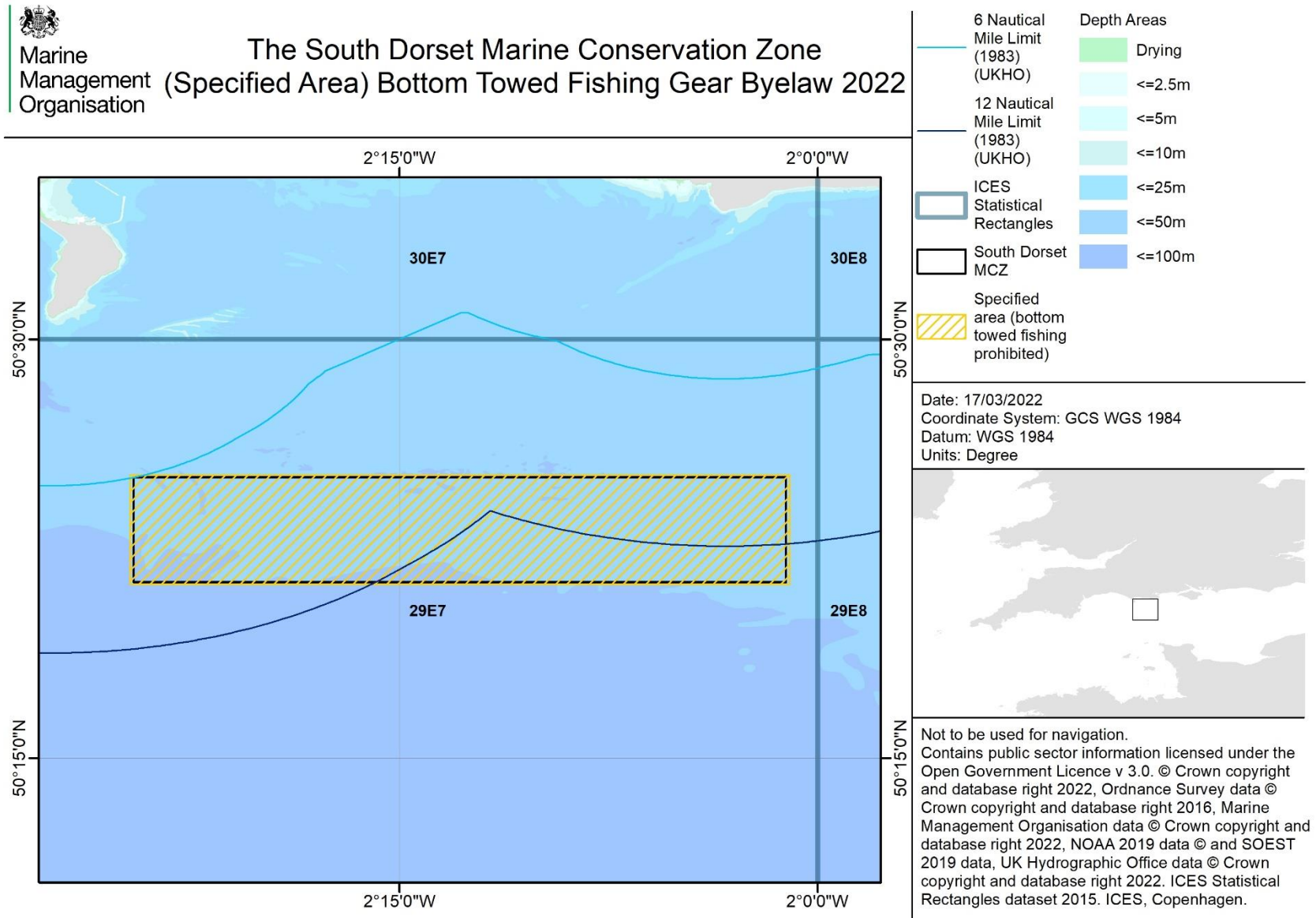
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<sup>7</sup> <https://public.tableau.com/profile/seafish#!/vizhome/FleetEnquiryTool/1Overview>

years of VMS data and landings (2016-2020) are provided, however, as detailed previously, only years 2016 to 2019 were considered to be suitably representative and therefore are used for the economic analysis. For vessels larger than 12 m that require a vessel monitoring system (VMS) their VMS data has been used. UK landings from logbooks are associated to VMS reports using vessel ID, date and location. However it was not possible to link landings directly to the VMS reports for this site. Therefore landings values for UK vessels over 12 m were estimated based on the proportion of VMS reports (all gears) from ICES rectangle 29E7 that were within the management area and via bottom towed gears where evidence was available for their use within the site (Table 3). For smaller vessels (under 12 m in length), MMO has made use of UK landings data reported to ICES rectangles, with landings values for under 12 m vessels estimated using the proportion of ICES rectangle 29E7 that intersects the management area (Table 4).

- 4.12. Both the VMS and landings data indicate that limited UK bottom-towed fishing activity occurred in South Dorset MCZ from 2016 to 2020 (Table 6; Figure 3 to Figure 12).
- 4.13. The 125 vessels fishing with bottom towed gears in ICES 29E7 are estimated to have landed approximately 28 tonnes of fish and shellfish in the management area worth £70,584 (Table 6) between 2016 and 2019.
- 4.14. Between 2016 and 2019 bottom towed gear landings from the management area averaged 7.1 tonnes (£17,646) but have ranged from 4.6 tonnes (£10,035) in 2017 to 10.3 tonnes (£28,824) in 2019 (Table 6).
- 4.15. In terms of operating profit, between 2016 and 2019 vessels fishing with bottom towed gears within the South Dorset MCZ management area are estimated to have earned approximately £23,119 with an annual average of £5,780 (Table 6).
- 4.16. The closure of fishing grounds can lead to significant displacement of fishing effort which can result in both monetised and non-monetised costs. Displacement is dependent on the intensity and distribution of fishing activities within the site before the closure and on external factors (such as fish distribution, total allowable catch/quota, fuel prices). Bottom towed gear fishing effort from within the management area is relatively limited as detailed by VMS and landings data. The closure of the MCZ to bottom towed gear is therefore not believed to result in a significant displacement of UK fishing activity and therefore increased costs to businesses.

**Figure 2:** South Dorset MCZ and the management option (option 2)



### **Box 1. Non-UK fishing vessels**

Fishing vessels registered in countries other than the UK ('non-UK vessels') may also have access to fish in South Dorset MCZ.

It is estimated that 6 non-UK vessels - all from France - regularly fished in the South Dorset MCZ management area with bottom towed gears between 2016 and 2019 (Table 12).

Estimates of fisheries landings values by EU vessels using bottom towed gear were determined using landings data provided by the European Scientific, Technical and Economic Committee for Fisheries (STECF) for the single ICES rectangle (29E7) over which the South Dorset MCZ overlaps (Figure 1). VMS was used to estimate the proportion (%) of EU VMS fishing activity (based on number of VMS fishing reports) from bottom towed gear types in the management area compared to ICES rectangle 29E7. This provided an estimate of EU landings derived from the management area for the years 2016 – 2019 (Table 9 and Table 10). Landings data for 2020 are not currently available for EU vessels.

Between 2016 and 2019, an annual average of approximately £15,463 was estimated to be derived from the management area by EU vessels using prohibited gear (Table 10). Using the scenario that 100% of these landings are lost, and applying a discounting rate of 3.5%, the net present value cost over the 10-year life of the RTA to non-UK vessels is estimated to be £133,100.

It is important to note that in contrast to the estimated costs to UK fishing vessels, estimated costs to EU vessels are based on the value of fish landed (Table 10), rather than vessel operating profit, which was not available for EU vessels. The costs to EU vessels are therefore considerably overestimated as the costs are based solely on revenue from landings rather than operating profit. Furthermore, as per UK vessels, EU vessels are likely to offset some of their lost revenue by fishing in other areas.

For comparison of impacts between UK and EU nations the most appropriate figures are contained in the weight and value columns of Table 1 and Table 2, and Table 9 and Table 10.

For completeness, Table 11 presents best- and worst-case landings scenarios where the best-case scenario assumes no bottom towed gear landings from within the ICES rectangle were derived from the management area and the worst-case scenario assumes all bottom towed gear landings from the ICES rectangle were derived from within the management area.

**Table 1: 2016 – 2020 UK landings (metric tonnes) by >12 m vessels using bottom towed gear in South Dorset MCZ management area** (DRB – Boat Dredge, OTB – Bottom Otter Trawl, TBB – Beam Trawl). No landings were recorded for other bottom towed gears (derived from UK VMS). 2020 data has not been included in annual averages, as due to the COVID-19 pandemic, 2020 is unlikely to represent a typical year of fishing activity. As VMS activity could not be linked to landings from logbooks for this site, landings have been calculated by applying the proportion (%) of VMS reports (number of fishing pings) from within the management area compared to ICES rectangle 29E7 (Table 3) to the landings, which are reported to the ICES rectangle. Only bottom towed gears where evidence is available for their use within the management area has been included.

Gear	Year					Annual average (2016 – 2019)	Total (2016 – 2019)
	2016	2017	2018	2019	2020		
DRB	1.0	0.9	0.4	0.9	0.9	0.8	3.3
OTB	0.3	0.2	0.5	0.8	0.4	0.4	1.7
TBB	2.8	0.8	1.0	3.4	2.5	2.0	8.0
Total	4.0	1.9	1.9	5.1	3.7	3.3	13.0

**Table 2: 2016 – 2020 UK landings by value (£) and operating profit (£) for >12 m vessels using bottom towed gear in South Dorset MCZ management area** (DRB – Boat Dredge, OTB – Bottom Otter Trawl, TBB – Beam Trawl). No landings were recorded for other bottom towed gears (derived from UK VMS). 2020 data has not been included in annual averages, as due to the COVID-19 pandemic, 2020 is unlikely to represent a typical year of fishing activity. As VMS activity could not be linked to landings from logbooks for this site, landings have been calculated by applying the proportion (%) of VMS reports (number of fishing pings) from within the management area compared to the ICES rectangle 29E7 (Table 3) to the landings, which are reported to the ICES rectangle. Only bottom towed gears where evidence is available for their use within the management area has been included.

Gear	Year					Annual average (2016 – 2019)	Total (2016 – 2019)
	2016	2017	2018	2019	2020		
DRB	2,322	926	1,074	3,511	1,876	1,958	7,833
OTB	816	519	1,134	1,714	901	1,045	4,182
TBB	9,142	3,139	3,813	11,510	8,014	6,901	27,603
Total	12,280	4,584	6,020	16,735	10,791	9,905	39,618
Operating profit	3,222	1,298	1,195	3,030	1,446	2,186	8,745

**Table 3: Number of UK VMS reports (2016 – 2020) (all gears) in the South Dorset MCZ management area and ICES rectangle 29E7, as well as the proportion (%) of VMS reports within the management area. Only VMS reports occurring at fishing speed (up to 6 knots) were included.**

Year	Number of VMS reports in management area	Number of VMS reports in 29E7	Percentage (%) VMS reports in management area
2016	55	17,679	0.31
2017	16	22,152	0.07
2018	26	16,134	0.16
2019	56	17,927	0.31
2020	38	14,070	0.27

**Table 4: Area (km<sup>2</sup>) of the South Dorset MCZ management area and ICES rectangle 29E7, plus the percentage of 29E7 that intercepts the management area. Management area and ICES rectangle figures have been rounded to zero decimal places. The proportion calculation has been based on the actual figures.**

Management area (km <sup>2</sup> )	ICES rectangle 29E7 area (km <sup>2</sup> )	% of management option occupied in 29E7
204	3,967	5.13

**Table 5: 2016 - 2020 UK landings by weight (metric tonnes), value (£) and operating profit (£) for UK <12 m vessels from bottom towed gear in the management area (DRB - Bottom Dredge; OT – Unspecified Otter Trawl; OTB – Bottom Otter Trawl; OTT- Otter Twin Trawl; TBB – Beam Trawl). No landings were recorded in 29E7 for other bottom towed gears. These landings have been calculated by applying the percentage of ICES rectangle 29E7 that intercepts the management area (Table 4) to the landings, which are reported to an ICES rectangle level. 2020 data has not been included in annual averages, as due to the COVID-19 pandemic, 2020 is unlikely to represent a typical year of fishing activity Operating profit is provided per year across all gear types.**

Gear	2016		2017		2018		2019		2020		Annual average (2016 – 2019)		Total (2016 – 2019)	
	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)
DRB	0.2	540	1.3	2,778	1.5	3,264	1.4	3,092	0.8	1,346	1.1	2,419	4.4	9,674
OT	1.5	2,441	0.5	960	0.0	0	0.0	0	0.0	0	0.5	850	2.1	3,402
OTB	0.0	38	0.8	1,496	3.7	5,374	2.8	5,721	0.8	1,267	1.8	3,157	7.2	12,629
OTT	0.0	0	0.0	0	0.5	1,675	1.1	3,277	1.9	4,005	0.4	1,238	1.6	4,952
TBB	0.0	0	0.1	216	0.0	92	0.0	0	0.0	0	0.0	77	0.1	308
Total	1.7	3,020	2.7	5,451	5.6	10,405	5.2	12,090	3.5	6,617	3.8	7,741	15.3	30,966
Operating profit	-	1,238	-	4,554	-	5,116	-	3,466	-	885	-	3,593	-	14,373



**Table 6: 2016 - 2020 UK landings by weight (metric tonnes), value (£) and operating profit (£) for all UK vessels from bottom towed gear in the management area (DRB - Bottom Dredge; OT – Unspecified Otter Trawl; OTB – Bottom Otter Trawl; OTT- Otter Twin Trawl; TBB – Beam Trawl). This table combines the over 12 m landings figures from Table 1 and Table 2 and under 12 m figures from Table 5. 2020 data has not been included in annual averages, as due to the COVID-19 pandemic, 2020 is unlikely to represent a typical year of fishing activity Operating profit is provided per year across all gear types.**

Gear	2016		2017		2018		2019		2020		Annual average (2016 – 2019)		Total (2016-2019)	
	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)
<b>DRB</b>	1.2	2,863	2.3	3,704	1.9	4,338	2.3	6,603	1.7	3,221	1.9	4,377	7.6	17,508
<b>OT</b>	1.5	2,441	0.5	960	0.0	0	0.0	0	0.0	0	0.5	850	2.1	3,402
<b>OTB</b>	0.3	854	0.9	2,015	4.2	6,508	3.5	7,435	1.2	2,168	2.2	4,203	8.9	16,811
<b>OTT</b>	0.0	0	0.0	0	0.5	1,675	1.1	3,277	1.9	4,005	0.4	1,238	1.6	4,952
<b>TBB</b>	2.8	9,142	0.9	3,355	1.0	3,905	3.4	11,510	2.5	8,014	2.0	6,978	8.1	27,911
<b>Total</b>	5.8	15,300	4.6	10,035	7.6	16,425	10.3	28,824	7.2	17,409	7.1	17,646	28.3	70,584
<b>Operating profit</b>	-	4,460	-	5,852	-	6,311	-	6,496	-	2,331	-	5,780	-	23,119

**Table 7: 2016-2020 best-case and worst-case UK landings (all vessels) by weight (metric tonnes) and value (£).** The best-case scenario assumes that no landings attributed to the ICES rectangle (for bottom towed gears) were derived from the South Dorset MCZ management area. The worst-case scenario assumes that all landings from bottom towed gears from within the ICES rectangle are derived from the management area. Both scenarios contrast with the estimated management area landings in Table 6.

Scenario	Gear	2016		2017		2018		2019		2020		Annual average (2016 - 2019)		Total (2016 - 2019)	
		Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)
Worst-case	DRB	311	759,640	1,378	1,377,249	297	734,476	328	1,192,650	335	720,831	578	1,016,004	2,314	4,064,016
	OT	29	47,421	11	18,656	0	0	0	0	0	0	10	16,519	40	66,078
	OTB	85	263,808	245	770,166	411	812,898	298	664,021	157	358,395	260	627,723	1,039	2,510,894
	OTT	191	640,734	333	1,165,377	73	223,514	219	511,618	97	191,287	204	635,311	816	2,541,243
	TBB	913	2,949,030	1,172	4,488,489	595	2,384,683	1,109	3,712,752	916	2,968,201	947	3,383,738	3,790	13,534,954
	<b>Grand Total</b>	1,530	4,660,633	3,139	7,819,938	1,377	4,155,572	1,954	6,081,041	1,505	4,238,714	2,000	5,679,296	7,999	22,717,184
Best-case	All gears	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Table 8: Number of distinct UK fishing vessels using bottom towed gears in ICES 29E7 (2016 – 2020) and thus may be impacted by the South Dorset MCZ management area.** (All < 12 m vessels using bottom towed gears have been included whereas only > 12 m vessels using DRB, OTB, and TBB bottom towed gear types have been included as there is no evidence of other bottom towed gears being used in the management area by vessels greater than 12 m in length)

	Size Category	Year					Annual average (2016 – 2019)	Total (2016 – 2019)
		2016	2017	2018	2019	2020		
Number of vessels	> 12 m	53	73	55	57	50	60	107
	< 12 m	5	6	12	12	10	9	18
	Total	58	79	67	69	60	69	125

**Table 9: 2016 – 2019 EU landings by weight (metric tonnes) from different nationalities in the South Dorset MCZ management area.** Landings were estimated using the percentage of VMS fishing activity (number of pings) occurring in the management area versus the ICES rectangle (for a given year and gear type). The estimate assumes all VMS activity data is reported at two hourly intervals. Values represent landings by bottom towed gear types. Gear codes are assigned to EU landings using the primary licence gear listed on the fleet register, thus, the gear listed on the fleet register is assumed to represent the gear type used.

Nationality	Landings (t) by year				Annual average landings from 2016 – 2019 (t)	Total landings from 2016 – 2019 (t)
	2016	2017	2018	2019		
Belgium	0	0	0	0	0	0
France	6	10	7	11	8	32
Ireland	0	0	0	0	0	0
Netherlands	0	0	0	0	0	0
All EU	6	10	7	11	8	32

**Table 10: 2016 – 2019 EU landings by value (£) from different nationalities in the South Dorset MCZ management area.** Values represent landings by bottom towed gear types. Landings were estimated using the percentage of VMS fishing activity (number of pings) occurring in the management area versus the ICES rectangle (for a given year and gear type). The estimate assumes all VMS activity data is reported at two hourly intervals. Values represent landings by bottom towed gear types. Gear codes are assigned to EU landings using the primary licence gear listed on the fleet register, thus, the gear listed on the fleet register is assumed to represent the type used. Values were converted from euros (€) to pounds sterling (£) using annual average exchange rates, and are not adjusted for inflation (i.e., landing represent the value of fish at the time of landings). Landings values (£) are present for some nations where Table 9 reports zero landings (t), this is due to minimal landings being reported which are not apparent in weight (t) when rounded to zero decimal places.

Nationality	Landings (£) by year				Annual average landings from 2016 – 2019 (£)	Total landings from 2016 – 2019 (£)
	2016	2017	2018	2019		
Belgium	0	0	214	0	53	214
France	8,759	20,084	11,745	20,877	15,366	61,465
Ireland	0	0	1	0	0	1
Netherlands	0	0	173	0	43	173
All EU	8,759	20,084	12,132	20,877	15,463	61,852

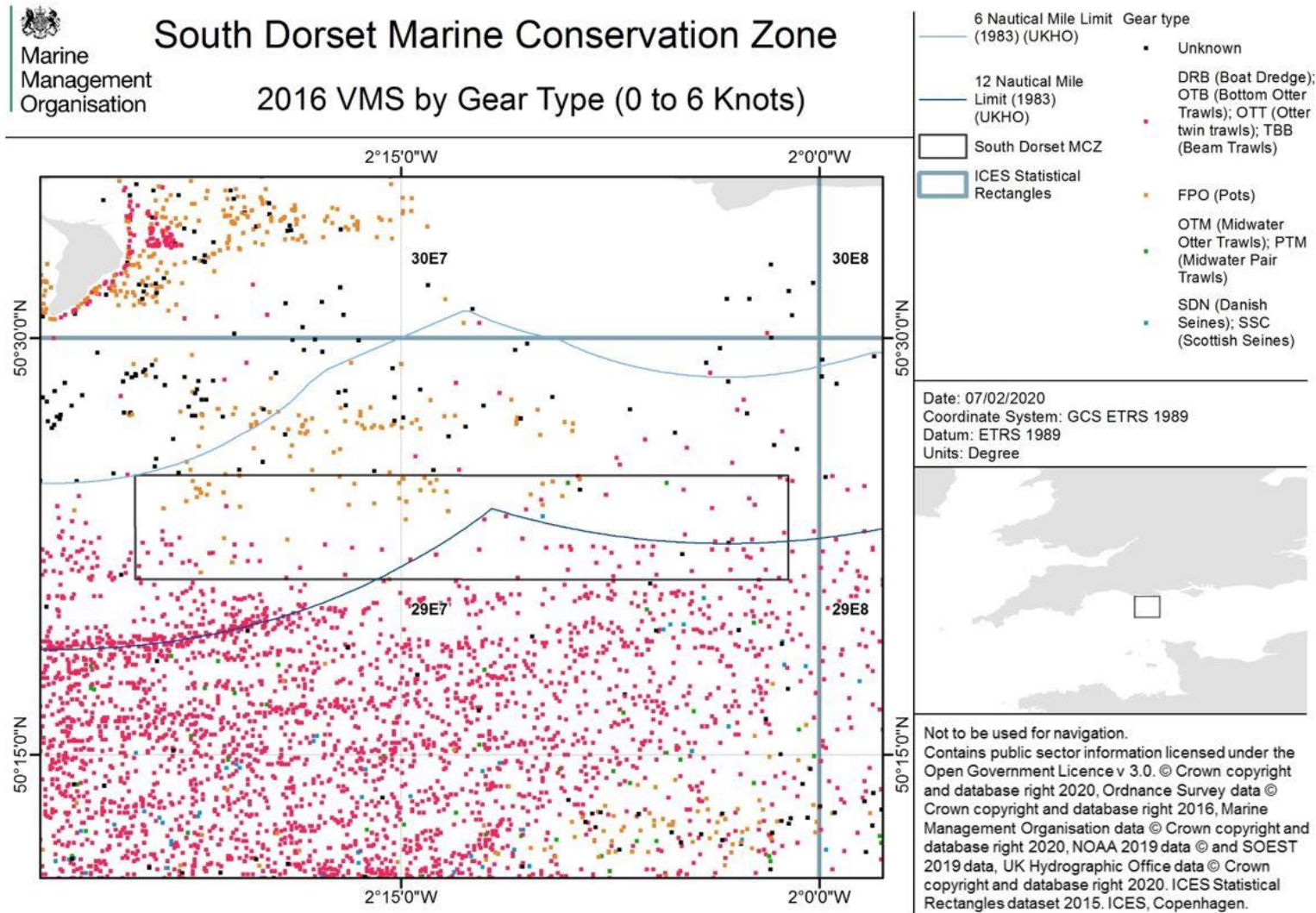
**Table 11: 2016-2019 best-case and worst-case EU landings by weight (metric tonnes) and value (£).** The best-case scenario assumes that no landings attributed to ICES rectangle 29E7 (for bottom towed gears) were derived from the South Dorset MCZ management area. The worst-case scenario assumes that all landings via bottom towed gears recorded in ICES rectangle 29E7 were derived from the management area. Both scenarios contrast with Table 9 and Table 10 (landings estimated using the proportion of VMS fishing activity in the management area versus the rectangle). Values represent landings by bottom towed gear types for all non-UK countries.

Scenario	2016		2017		2018		2019		Annual average landings 2016 – 2019		Total landings 2016 - 2019	
	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)
Worst-case	1,894	3,279,288	2,088	4,617,243	2,325	5,282,493	2,753	6,305,817	2,265	4,871,210	9,060	19,484,841
Best-case	0	0	0	0	0	0	0	0	0	0	0	0

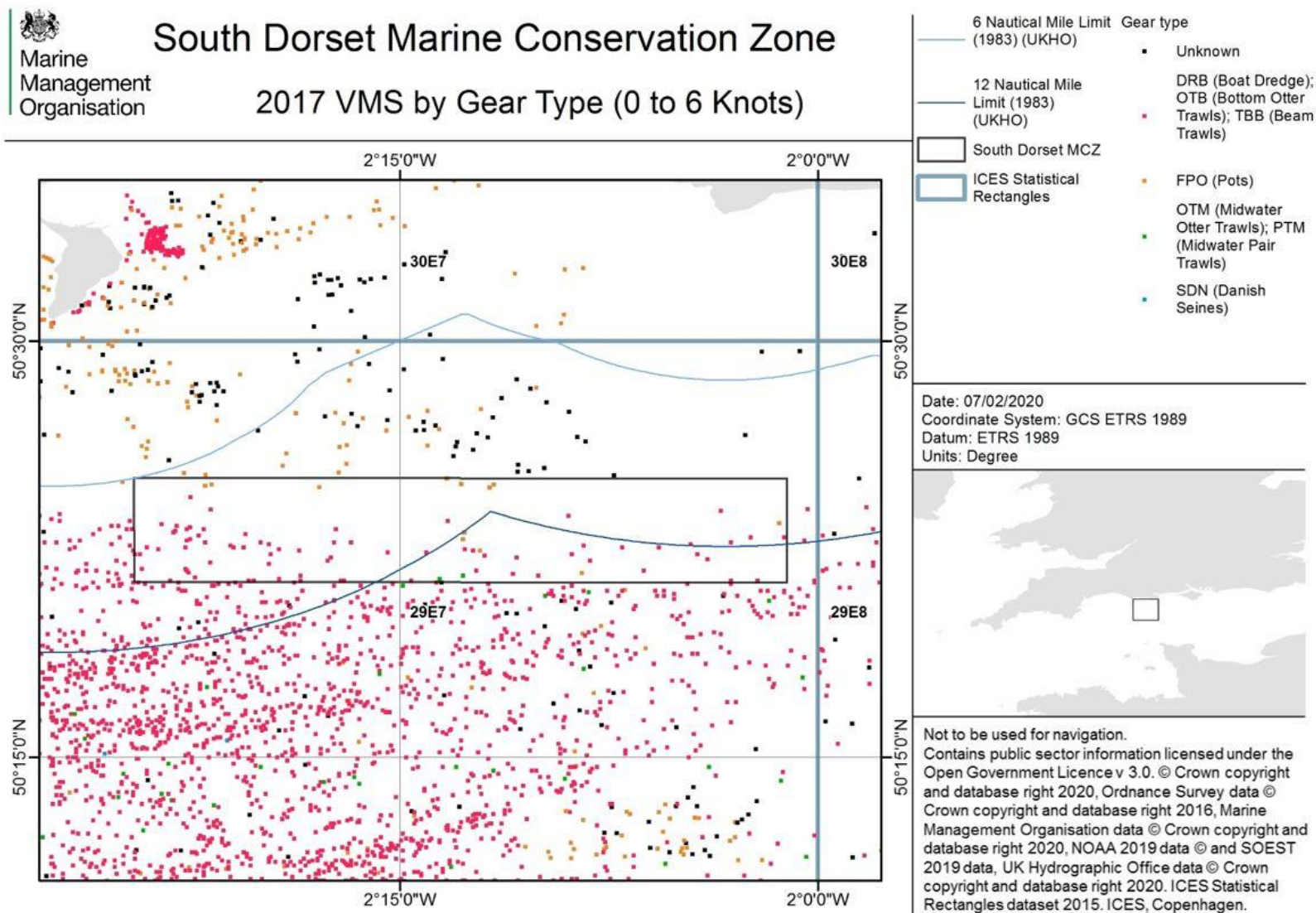
**Table 12: 2016-2020 Number of unique non-UK vessels with regular fishing activity using bottom towed gears in the South Dorset MCZ management area.** Vessels with regular fishing activity are considered as those with more than 12 VMS reports in a year. Gear codes are assigned to EU landings using the primary licence gear listed on the fleet register, thus, the gear listed on the fleet register is assumed to represent the type used. No activity was reported for non-EU nations, such as Norway and the Faroe Islands. For comparison with UK data, 2020 has not been included in the annual average data column.

Nationality	Year					Total (2016 – 2019)	Annual average (2016 – 2019)
	2016	2017	2018	2019	2020		
France	1	4	2	5	1	6	3
Total	1	4	2	5	1	6	3

**Figure 3: 2016 VMS Fishing Activity by gear type in South Dorset MCZ**

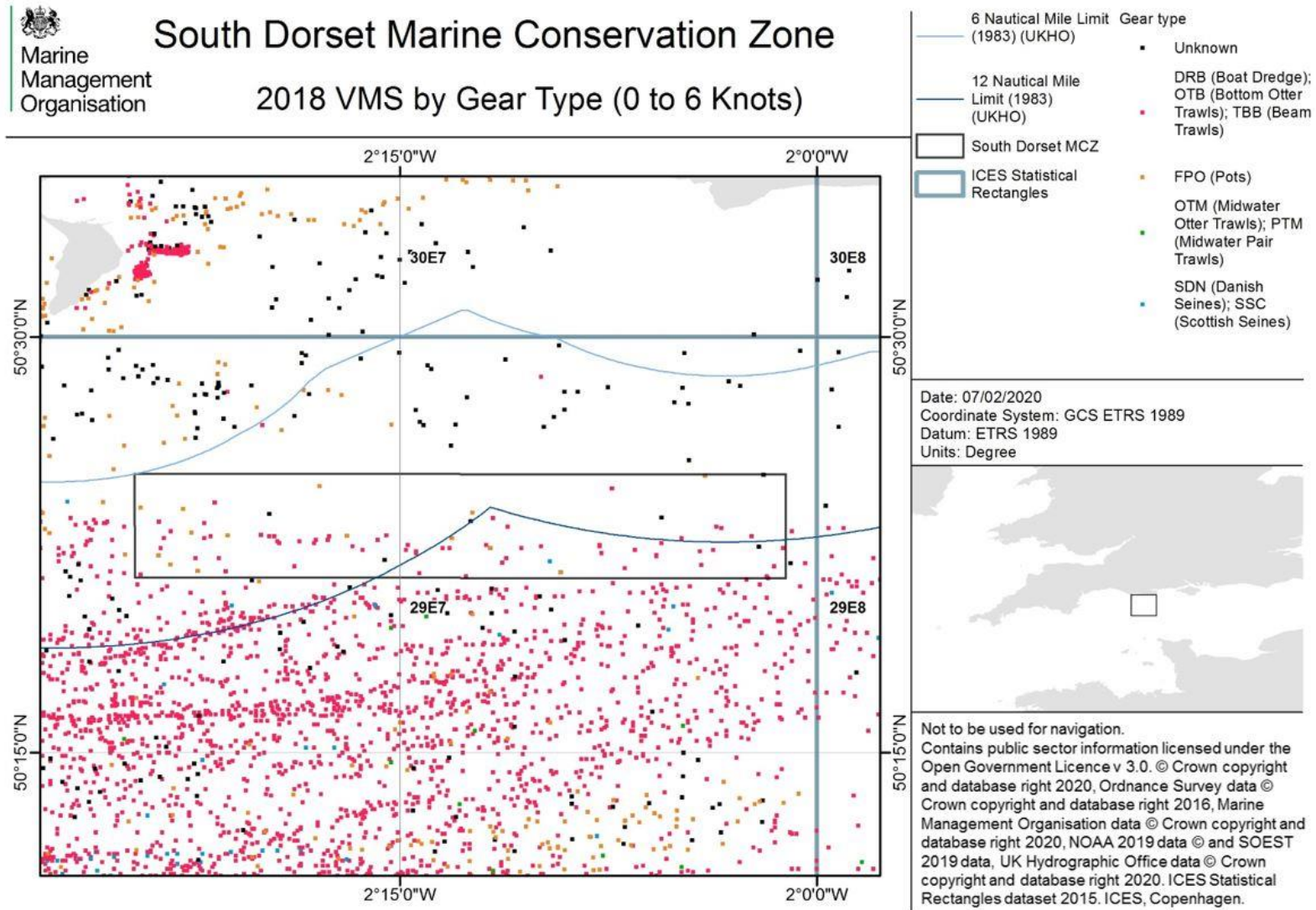


**Figure 4: 2017 VMS Fishing Activity by gear type in South Dorset MCZ**

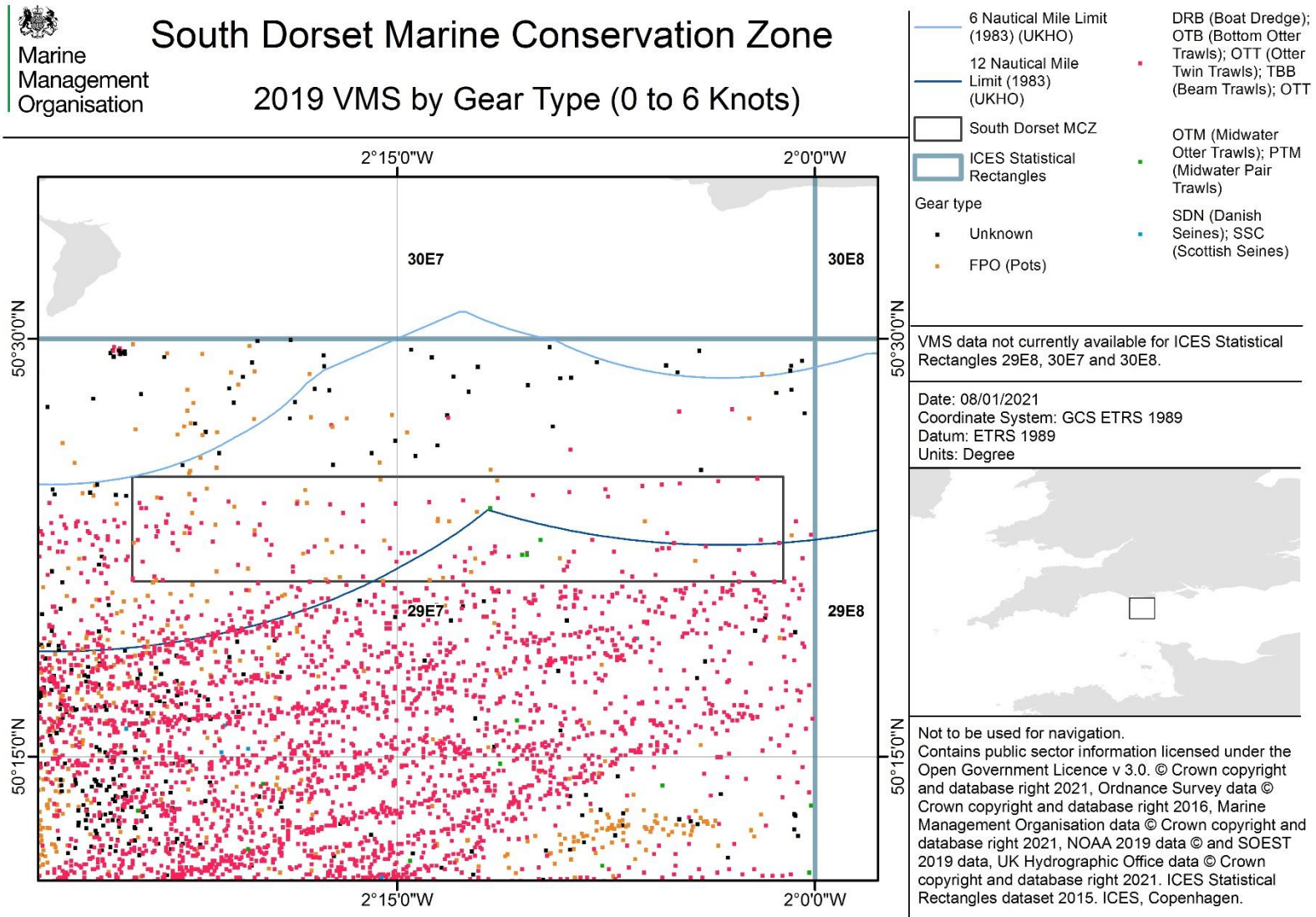




**Figure 5: 2018 VMS Fishing Activity by gear type in South Dorset MCZ**

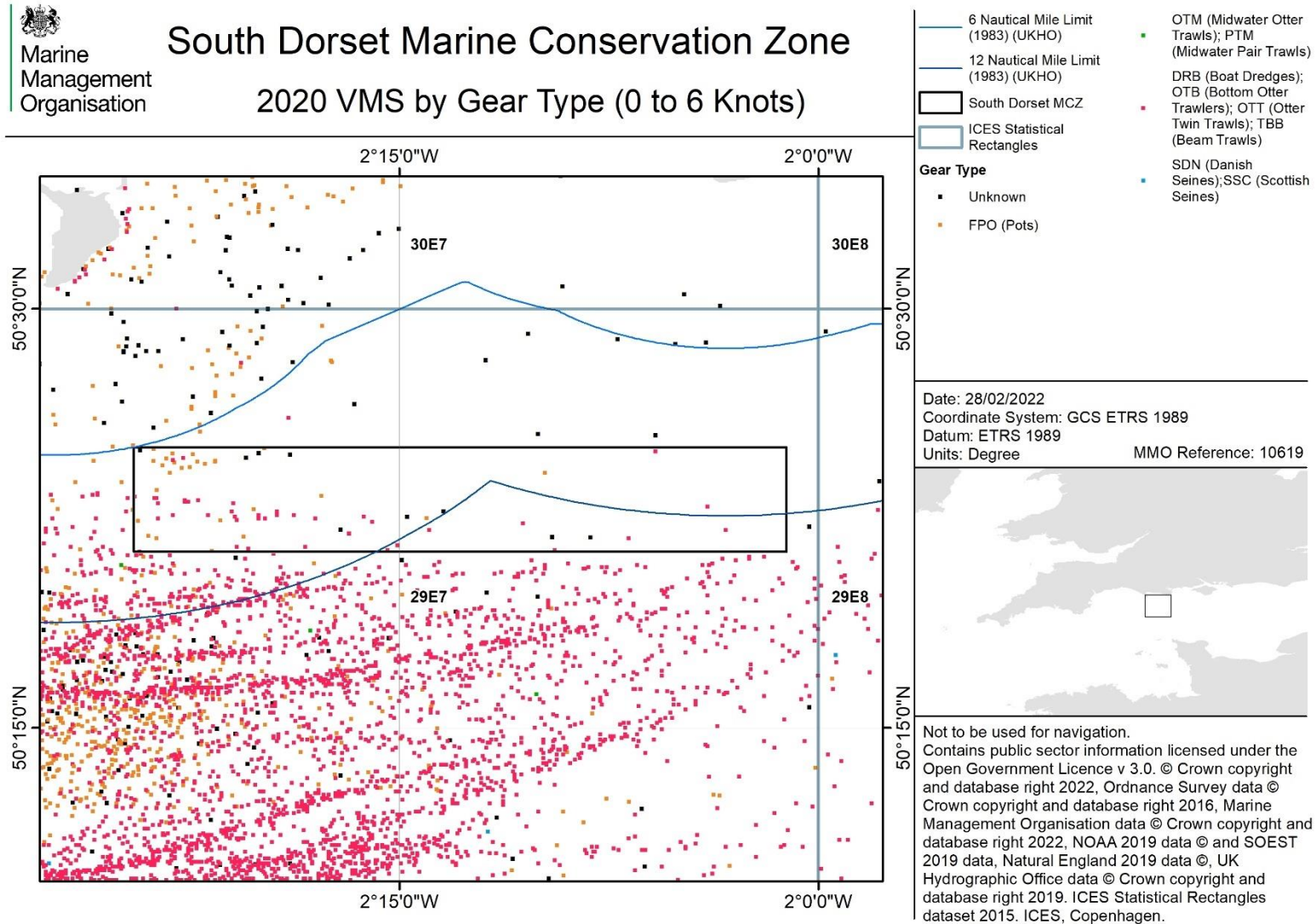


**Figure 6: 2019 VMS Fishing Activity by gear type in South Dorset MCZ**

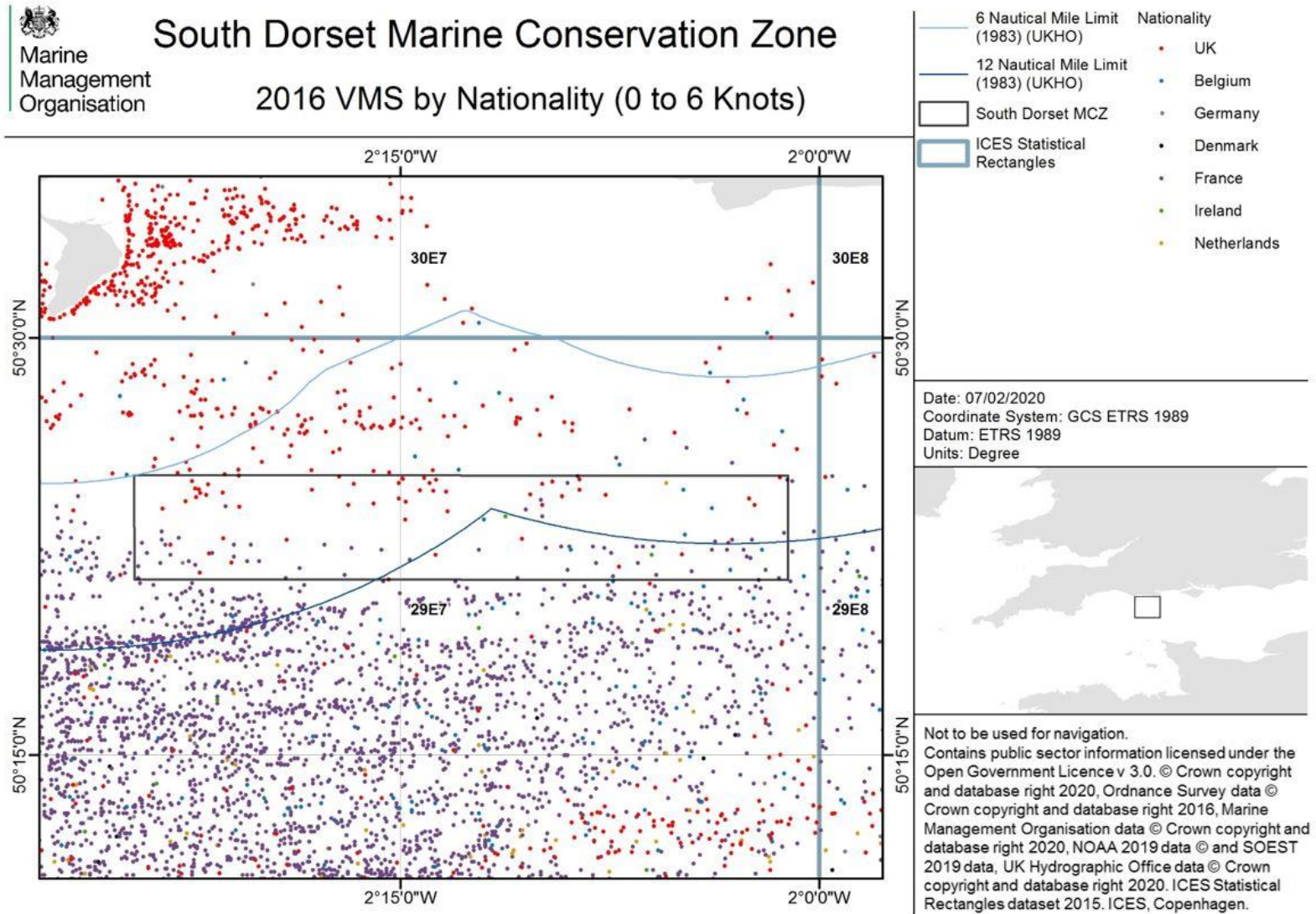




**Figure 7: 2020 VMS Fishing Activity by gear type in South Dorset MCZ**

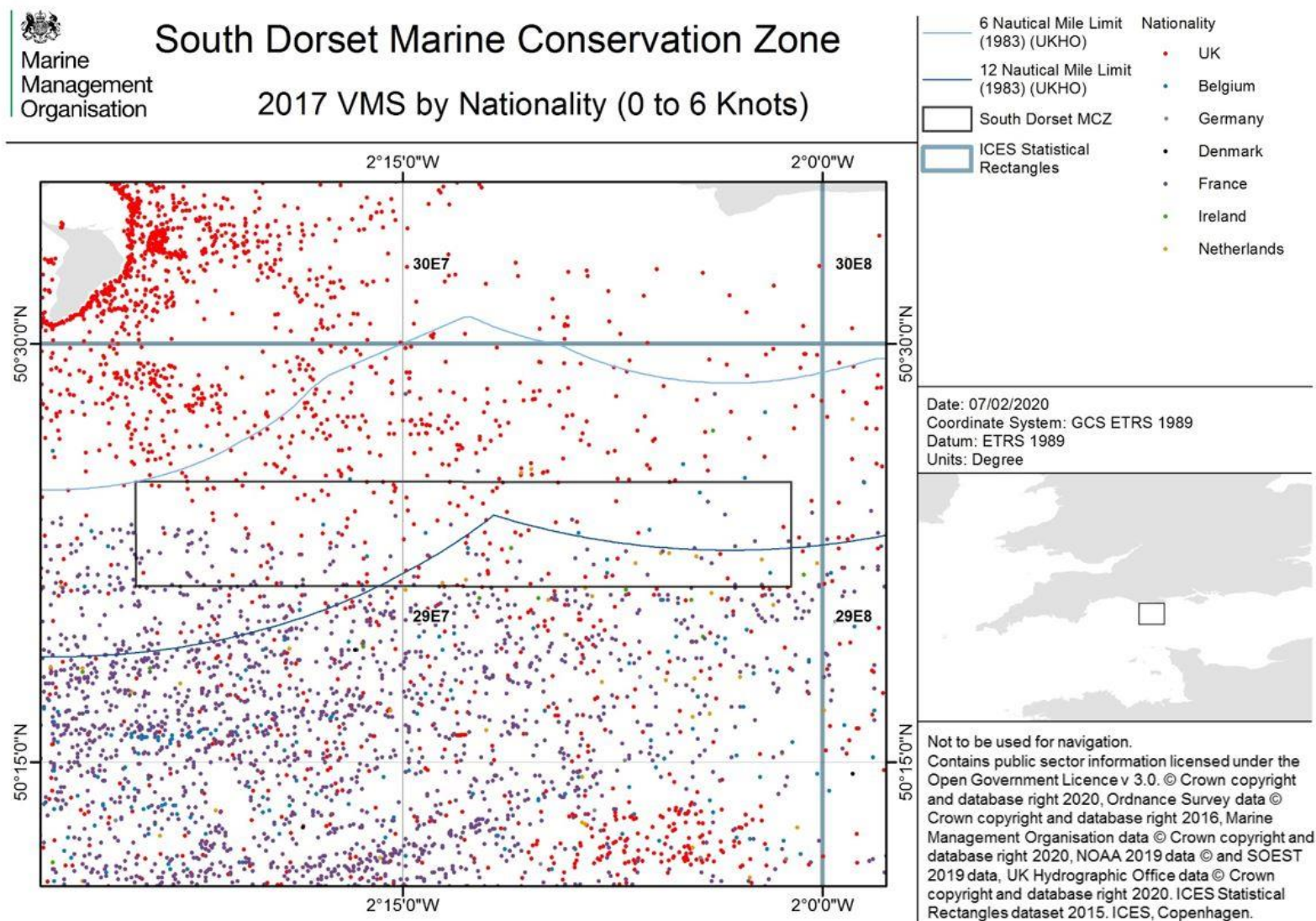


**Figure 8:** 2016 VMS Fishing Activity by nationality in South Dorset MCZ

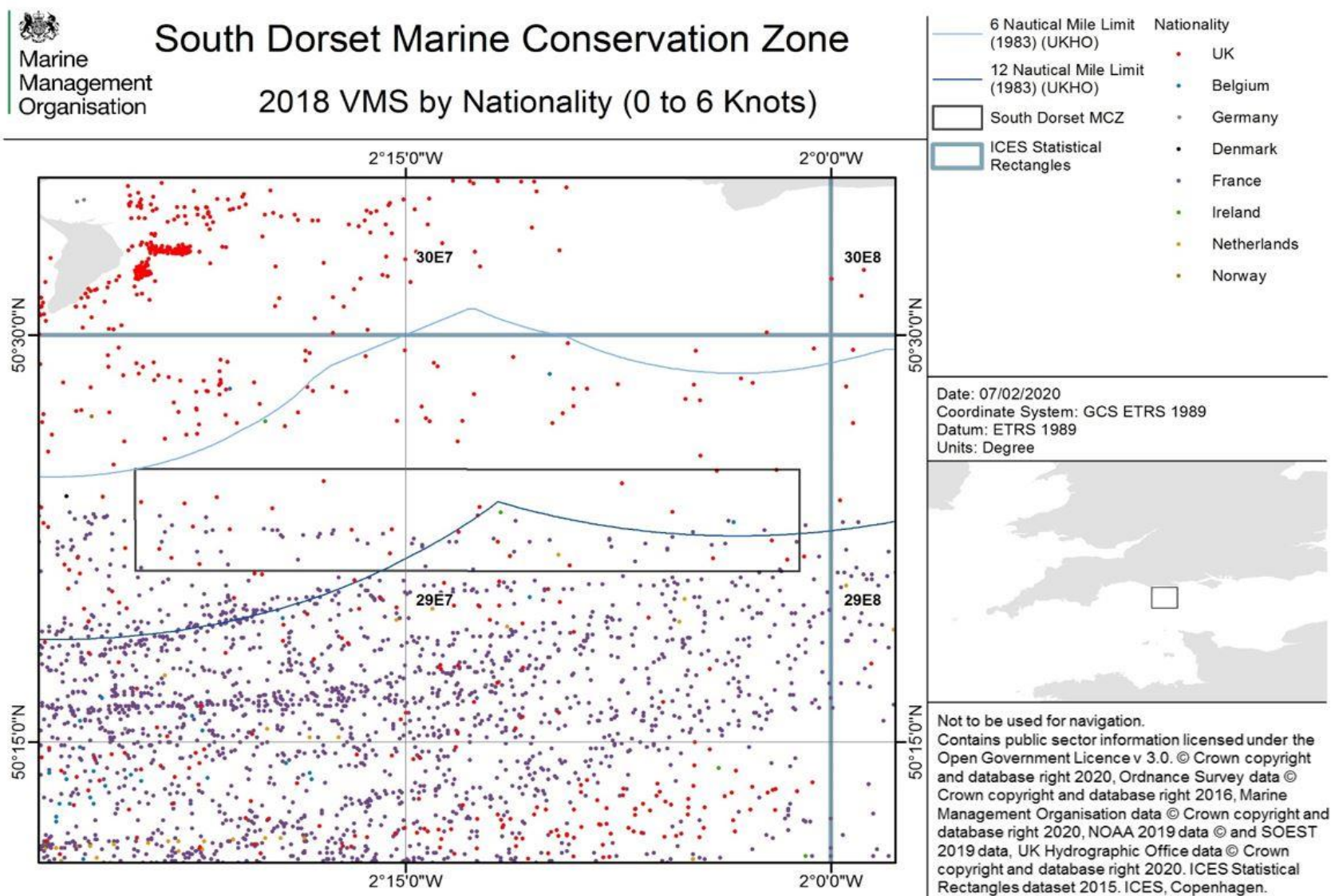




**Figure 9:** 2017 VMS Fishing Activity by nationality in South Dorset MCZ

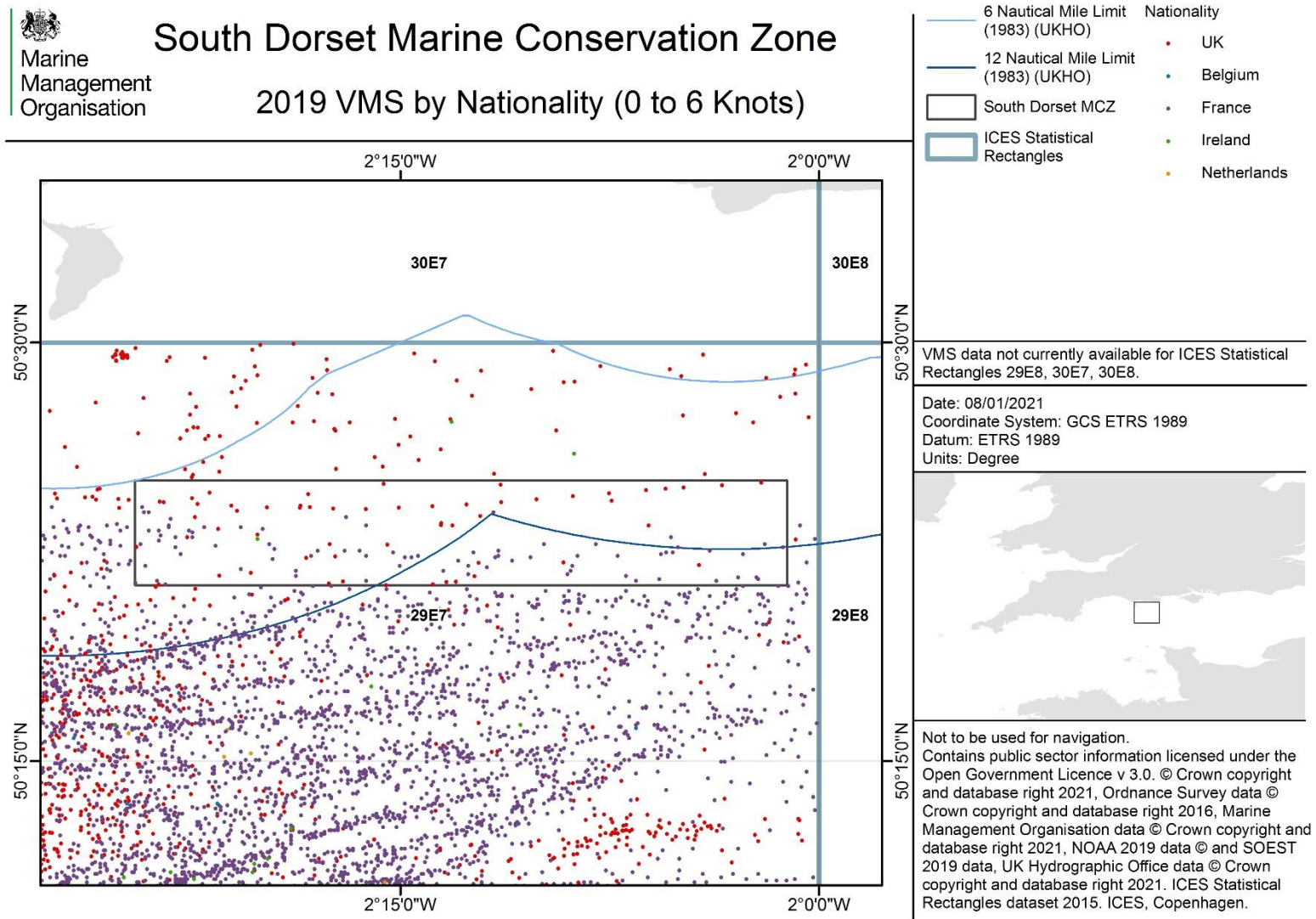


**Figure 10:** 2018 VMS Fishing Activity by nationality in South Dorset MCZ

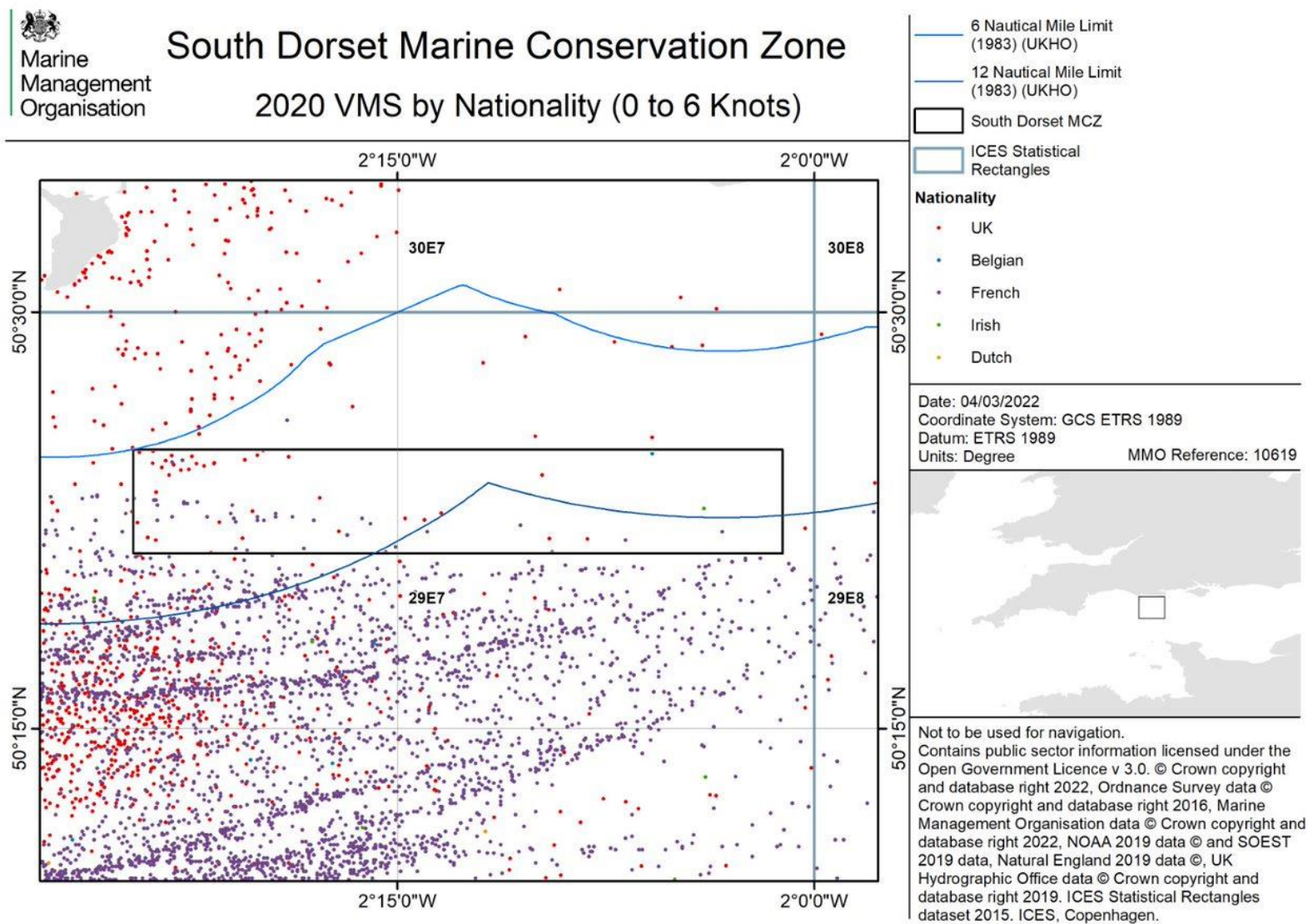




**Figure 11: 2019 VMS Fishing Activity by nationality in South Dorset MCZ**



**Figure 12: 2020 VMS Fishing Activity by nationality in South Dorset MCZ**



## Compliance costs

- 4.17. MMO compliance action is intelligence-led and risk-based in accordance with the National Intelligence Model<sup>8</sup>. Where intelligence suggests non-compliance or a risk of non-compliance with the byelaw, compliance resources will be deployed accordingly. This may include a Royal Navy fisheries patrol vessel presence, MMO fisheries patrol vessel presence or joint operations with other agencies (for example the inshore fisheries and conservation authorities (IFCAs), Border Force or the Environment Agency). Joint operations are not monetised here as they are requested on an *ad hoc* basis and costs can vary. MMO will coordinate any joint operations. The principles by which MMO will regulate marine protected areas are set out by the Legislative and Regulatory Reform Act 2006<sup>9</sup> and the Regulators' Compliance Code<sup>10</sup> and aim to ensure that MMO is proportionate, accountable, consistent, transparent and targeted in any compliance action it takes.
- 4.18. Compliance costs for the inspection of MPAs and associated byelaws do not represent an additional cost. MPA inspections take place under the standard operating procedure of Royal Navy/MMO fisheries patrol vessels. MPA and byelaw inspection costs are therefore absorbed by existing fisheries compliance systems and will not be considered here.

## Total monetised costs

- 4.19. The economic impacts of the management area are estimated as the loss of profitability of fishing effort at the site. For UK vessels, the total monetised costs are informed by data on fishing activity using bottom towed gear within the management area and from the 2016-19 Seafish data on the profitability of fishing<sup>11</sup>. This operating profit combines cost and earning information provided by the vessel owners to the annual Seafish UK Fleet Survey with official landings and capacity data for vessels assumed to be actively fishing within the management area provided by the MMO.
- 4.20. To estimate the total monetised cost over ten years for the 125 UK vessels which may be affected, an estimation has been made of the annual value of their bottom towed gear landings derived from the management area (Table 2 and Table 5) and the estimated operating profit earned from these landings as provided by Seafish.
- 4.21. A discount rate of 3.5% was applied to calculate the present value and 2019 was used as the price base year. The best estimate of highest net 2020 present value cost over 10 years to the UK fishing industry of introducing management is estimated to be £49,752.

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<sup>8</sup> Association of Chief Police Officers (2005) Guidance on the national intelligence model.

<sup>9</sup> <https://www.legislation.gov.uk/ukpga/2006/51/contents>

<sup>10</sup> <https://www.gov.uk/government/publications/regulators-code>

<sup>11</sup> <https://public.tableau.com/app/profile/seafish/viz/FleetEnquiryTool/1Overview>

## Non-monetised costs

4.22. The prohibition of bottom towed gears across South Dorset MCZ could lead to the displacement of these fishing activities increasing pressure on habitats outside of the site. However, it is not possible to accurately predict the location (and thus the associated environmental costs) of displaced fishing activity. The MMO fisheries assessment of South Dorset MCZ indicates that bottom towed gears are hindering the conservation objectives of the site. As such the potential impact of displacement to areas outside of South Dorset MCZ does not remove the requirement to ensure that fishing is managed to further the conservation objectives of South Dorset MCZ. Further, there is relatively limited activity from both UK and non-UK vessels using bottom towed gears occurring across the site and therefore this cost may not be significant.

## Non-monetised benefits

4.23. Prohibition of the use of bottom towed fishing gear over the whole site will contribute to the protection of a number of features designated in the site. This in turn will protect the ecosystem services provided by those features and will ensure the conservation objectives of the site are met. The high and moderate energy circalittoral rock, subtidal chalk and subtidal coarse sediment contribute towards (Fletcher *et al.*, 2012):

- Biogeochemical cycling – Subtidal sediments have an important role in the global cycling of many elements, including carbon and nitrogen (Burdige, 2006). At a local scale, nitrogen and phosphorus remineralization provide a significant contribution to the nutrients required by primary producers in the water column (Burdige, 2006). Subtidal sediments may provide either temporary or permanent sinks for pollutants, particularly toxic metals (Burdige, 2006).
- Erosion control - The presence of microalgae in subtidal sediment ecosystems plays a role in stabilisation of the habitat which in turn can reduce incident wave energy and reduce erosion (Ziervogel and Forster, 2006).
- Formation of a physical barrier – Circalittoral rock can reduce incident wave energy.
- Larval/gamete supply – larvae species pertaining to circalittoral rock enter the plankton mass (Jones, Hiscock and Connor, 2000). The benthic communities typical of subtidal sediment; ecosystems do not commonly have planktonic larval stages but release young at an early stage of adult life (Boeckner *et al.*, 2009).
- Food web dynamics – Subtidal sediment is an important area for crabs and other epifauna, in particular echinoderms (Jones, Hiscock and Connor, 2000). Sandeels (*Ammodytes* spp.) present in the area can also attract sea birds such as puffin, razorbill, guillemot and terns.
- Species diversification and formation of species habitat – circalittoral rock provide firm substrate for attachment and support a diverse array of species such as polychaetes, sponges, cnidarians and bryozoans (Jones, Hiscock and Connor, 2000). Subtidal chalk is often bored by bivalve molluscs, such as the common piddock (*Pholas dactylus*) and the empty bore holes provide habitat for a range of crevice dwelling animals such as anemones, crabs and worms (Hill *et al.*, 2010).



In offshore subtidal sediment communities macrofaunal abundance is lower, but exhibits high species richness (Denis and Desroy, 2008). The spatial distribution of species within and upon subtidal sediments is significantly influenced by particle size distribution, organic content and chemical composition.

- Primary biomass production - Circalittoral communities are largely generated from phytoplankton which supports benthic and pelagic organisms at higher trophic levels (Jones, Hiscock and Connor, 2000). Also a significant proportion of primary production sinks to the sea floor and is assimilated into the subtidal sediment (Jensen *et al.*, 2003).
- Secondary biomass production – Circalittoral communities are important secondary producers through growth of epibiotic organisms including sponges and tunicates (Jones, Hiscock and Connor, 2000). Subtidal sediment is an important area for crab species as well as sandeel which attracts birds such as puffin, razorbill, guillemot and terns (Jones, Hiscock and Connor, 2000).
- Tourism/recreation – Circalittoral rock is a potential location for SCUBA diving and angling due to the high concentration of animal life.
- Fisheries – As subtidal sediment is an important nursery area for many species such as flatfishes and bass, improved protection of the site could lead to spillover, potentially benefitting commercial fisheries.
- Environmental resilience - Subtidal sediment habitats are more resilient than other habitats as they can be easily affected by wave and tidal displacement of sediment. Recovery of habitats following a disturbance is dependent on physical, chemical and biological processes and can be a more rapid process than in other areas (Bishop *et al.*, 2006).
- Regulation of pollutants - Nematode species present in subtidal sediment habitats can be good indicators of environmental conditions and muddy subtidal sediment habitats can act as sinks for radionuclides (Finnegan *et al.*, 2009).

### **Recommended Management Option**

Following the above assessment the recommended management option is Option 1: MMO byelaw to prohibit bottom towed fishing over all protected features across all areas of the site, with an appropriate buffer.

### **Conclusion**

Within this RTA, the MMO have considered the impacts on commercial fishing vessels of the closure to bottom towed gear. Based on operating profits, within South Dorset MCZ management area, the equivalent annual net direct cost to business (EANDCB) for UK vessels is £5,780. Costs to UK vessels were estimated using area based and VMS based estimates of ICES rectangle landings data and operating profit calculations from Seafish.

Estimates of fisheries landings values by EU vessels using bottom towed gear were determined using landings data provided by the EU STECF. VMS was used to estimate the proportion of VMS reports in the management area compared to ICES rectangle 29E7 (Table 3) which intersects the South Dorset MCZ management area. The 2016 to 2019 annual average of landings value from EU vessels using bottom towed gear was estimated to be £15,463. It should be noted that the costs presented

for EU vessels are not directly comparable to the costs presented for UK vessels, and are likely to be an overestimate, as they are based on total value landed rather than operating profit. For comparison of impacts between UK and EU nations the most appropriate figures are contained in the weight and value columns of Table 1, Table 2, Table 9 and Table 10.

As outlined in sections 1.1 and 1.2, the MMO have legal responsibilities to further, or least hinder, the conservation objectives of MCZs. The MMO assessment of fishing activities within South Dorset MCZ determined that management measures to prohibit the use of bottom towed gear across the whole site are required to further the conservation objectives of the site. Due to the dispersed and mosaic nature of the most sensitive habitats across the site, zoned bottom towed gear prohibitions are not feasible and therefore a whole site closure is the most appropriate way to fulfil the MMO's statutory duties.

Given the conservation objectives of the MCZ, MMO has concluded that the measures are the most appropriate way to manage fishing in the MCZ. As outlined in section 4.8, prohibition of the use of bottom towed fishing gear in the management area may result in indirect benefits to the fishing industry resulting from spillover and opportunities for other fisheries such as the static gear fleet, as well as other environmental benefits related to the restoration of the habitat.

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