

Regulatory Triage Assessment

Title of Measure	The South Dorset Marine Conservation Zone (Specified Area) Bottom Towed Fishing Byelaw 2021
Lead Department/Agency	Marine Management Organisation (MMO)
Expected Date of Implementation	DRAFT
Origin (Domestic or International)	Domestic
Date of Assessment	01/02/2021 (DRAFT)
Lead Departmental Contact	Marine Conservation Team, Marine Management Organisation, Lancaster House, Hampshire Court, Newcastle, NE4 7YH, conservation@marinemanagement.org.uk
Departmental Triage Assessment	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. Although subtidal coarse sediment is sensitive to bottom towed gear, due to the mosaic nature of the site the need for management was not further assessed. This byelaw is proposed to ensure 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 through a zoned management approach and/or limiting the activity/intensity of these activity types. Option 2: MMO byelaw to prohibit bottom towed fishing across the whole site. Option 3. Management of the activity through a voluntary agreement. Option 2 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 Available evidence suggests limited UK fishing vessels/businesses are likely to be directly affected by the prohibition of bottom towed gear use across the South Dorset MCZ management area. From 2014-2019 there were only 52 vessel monitoring system (VMS) reports at fishing speed from UK vessels using bottom towed gear. In comparison, for non-UK vessels, French vessels fished the most in the MCZ, with 369 VMS reports associated with bottom towed gear fishing over the six years.	

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 £28,301 (2020 present value). The equivalent annual net direct cost to business (EANDCB) is £3,288 (2020 present value).

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 proposed 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. Spillover, which is the net movement of fish across the boundary of a management area into fished ground, may occur due to an increase in fish biomass within the management area.

Summary of monetised impacts

- Estimated Net Present Value: -£28,301
- Estimated Business Net Present value: -£28,301
- Equivalent Annual Net Direct Cost to Business (EANDCB): £3,288
- Appraisal period: 10 years
- The Price Base Year and Present Value Base Year: 2019, 2020
- **BIT status/score: 0.02**

The proposal is a Regulatory Provision as it relates to business activity (commercial sea fishing); 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 - HCWS574¹.

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.

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

Supporting evidence

1. The policy issue and rationale for Government intervention

- 1.1. The MMO has the duty to exercise its functions in a way which best furthers the conservation objectives of MCZs². MMO also has the power to make byelaws to manage fishing for the conservation of marine habitats and species in the English inshore³ and offshore⁴ regions.
- 1.2. The MMO has undertaken an assessment of the impact of fishing in South Dorset MCZ (see associated formal consultation documents). This assessment determined that bottom towed fishing may be hindering the conservation objectives of the MCZ. The proposed byelaw will further the conservation objectives of the MCZ by prohibiting bottom towed fishing across the whole site.
- 1.3. 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 diversity⁵. 'Public goods' can be defined as goods 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. 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.
 - 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

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

³ Section 129A of the Marine and Coastal Access Act 2009

⁴ Section 129B of the Marine and Coastal Access Act 2009

⁵ <https://www.gov.uk/government/publications/interim-report-the-dasgupta-review-independent-review-on-the-economics-of-biodiversity>

economic cost of the exploitation or of any damage caused to the environment by that exploitation.

1.4. This byelaw aims to redress these sources of market failure in the marine environment through conservation of designated features of the MCZ, which will ensure negative externalities are reduced or suitably mitigated.

1.5. The decision to introduce the South Dorset Marine Conservation Zone (Specified Area) Byelaw 2021 has been assessed against the South Marine Plan. This decision is in accordance with the following marine plan policies in the South Marine Plan⁶:

- | | |
|------------|----------------|
| – 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 |

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

1.6. In creating this draft byelaw, MMO has had regard to the UK Marine Strategy, as required by regulation 9 of the Marine Strategy Regulations 2010.

2. Policy objectives and intended effects

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

2.2. The social and economic impacts of management intervention will be minimised where possible.

3. Policy options considered, including alternatives to regulation

3.1. 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^{3,4} would not be met. All other options are compared to option 0.

3.2. Option 1. MMO byelaw to prohibit bottom towed fishing through a zoned management approach and/or limiting the activity/intensity of these activity types.

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.

⁶ <https://www.gov.uk/government/collections/south-marine-plans>

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

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.

3.4. Option 3. Management of the activity through a voluntary agreement

The principles of Better Regulation⁷ require that statutory regulation is introduced only as a last resort. However, the government's expectation is that management measures for commercial fishing in MCZs should be implemented through statutory regulation to ensure adequate protection is achieved⁸. As noted in option 1, due to the dispersed distribution and sensitivity of the designated features across the site, all areas of the site require a bottom towed gear prohibition to suitably protect the marine environment and best further the conservation objectives of the MCZ. It is anticipated that voluntary agreements preventing bottom towed gear from all areas of the site are unlikely to be adhered to.

3.5. Option 2 is the preferred option. Options 1 and 3 are not considered appropriate as they are not deemed sufficient to best further the conservation objectives of the MCZ.

3.6. The boundaries of the proposed 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 2 are compared to option 0.

4.2. The MMO has used the best available evidence to assess the impact of management option 2 however assumptions have been made in the development of this assessment:

- Cost estimates are based on estimates of UK landings values derived from within the management area. The bottom towed gear landings information are determined as a proportion of landings related to the ICES rectangle 29E7. They may not therefore represent the true landings derived from each fishing trip.
- VMS data assumes fishing activity from speed of travel. Speeds of up to six knots are considered fishing speed. Some vessels can tow gear at speeds greater than six knots which may lead to an underestimate of fishing activity. Some vessels may be travelling at speeds lower than six knots for reasons other than fishing (currents, tides etc.), this may lead to an overestimate of fishing activity.
- Data from the MMO catch recording service for English and Welsh flag vessels under ten metres (m) in length which fish in UK waters has been used at International

⁷ <https://www.gov.uk/government/publications/better-regulation-framework>

⁸ Revised approach to the management of commercial fisheries in European marine sites - overarching policy and delivery

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/345970/REVISED_APPROACH_Policy_and_Delivery.pdf

Council for the Exploration of the Sea (ICES) sub-rectangle level. This data is only preliminary information which has been collected from 1st January – 30th November 2020 (data obtained 02/12/2020). The location of catch (ICES sub-rectangles) are self-selected by users when submitting their data and weights are submitted by users estimated within 10%. The data does not include the full fleet and is not being used currently for compliance measures. There are also known issues with data quality which includes but is not limited to areas of catch, species and gears used.

- Profit ratios have been determined and summarised from a range of bottom towed gears and ocean areas using a Seafish segment⁹ (Area VII BCDEFGHK trawlers 10-24m) which is larger than the South Dorset MCZ proposed management area. They may not therefore be a true representation of the profit ratio of fishing within the proposed management area.
- Displacement is difficult to quantify, and it is impossible to predict where exactly activities will be displaced to.
- Costs to the fishing industry based on the proposed management option are likely to be an overestimate, as vessels are likely to offset some of their lost revenue by fishing in other areas. Further, the environmental benefits related to the restoration of the habitat could also increase the abundance of target species as a result of spillover.

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

- VMS data for UK and non-UK vessels from 2014 to 2019
- Landings data from log books for UK vessels over 10 m in length
- STECF landings¹⁰ for non-UK vessels over 12 m in length
- Data from the MMO catch recording service for English and Welsh flag vessels under 10m in length
- Data from Seafish annual economic performance for the UK fishing fleet from 2014 to 2019¹¹.
- Information gathered by the MMO during the pre-consultation call for evidence October to December 2020.

4.4. Prohibition of the use of bottom towed fishing gear in the proposed 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;
- compliance costs for the inspection of MPAs and associated byelaws.

4.5. Costs to the fishing industry can be monetised and these estimated values have been collated and presented as part of this RTA (Table 7, Table 8 and Table 12).

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

4.7. Prohibition of the use of bottom towed fishing gear in the proposed 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

⁹ <https://www.seafish.org/document/?id=3A58469B-530D-4BA3-A465-2B287767EB8D>

¹⁰ <https://stecf.jrc.ec.europa.eu/dd/fdi>

¹¹ <https://public.tableau.com/profile/seafish#!/vizhome/FleetEnquiryTool/1Overview>

environmental benefits related to the restoration of the habitat. These benefits are difficult to value and are therefore described under non-monetised benefits.

Costs to the UK fishing industry

- 4.8.** This RTA considers the economic impact to UK businesses and individuals. 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 see Box 1.
- 4.9.** 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 proposed management area falls within ICES rectangle 29E7 (Figure 1).
- 4.10.** To estimate the economic impacts of the proposed management, fishing patterns of vessels using bottom towed gear within the proposed management area (option 2) were analysed. The most recent six years of VMS data and landings available (2014-2019) were used for this 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 majority of VMS reports for this site. Therefore landings values were estimated based on the proportion of VMS reports from ICES rectangle 29E7 that were within the proposed management area. For smaller vessels, the MMO has made use of UK landings data derived from the ICES rectangle for vessels under 12 m, as well as preliminary data from the MMO catch recording project for vessels under 10 m in length from 1st January – 30th November 2020 at ICES sub-rectangle level.
- 4.11.** The VMS data for UK vessels indicates that limited fishing activity occurred in South Dorset MCZ from 2014 to 2019 (Table 1; Figure 2 to Figure 7). Pots are the main fishing activity by UK vessels within the MCZ, with 125 VMS fishing reports, and fishing with bottom towed gear had only 52 VMS fishing reports over the six years. Preliminary data for UK vessels under 10 m also indicates relatively limited bottom towed gear activity, with 45 fishing trips estimated to have occurred within the proposed management option (option 2) during January to November 2020 (Table 3).
- 4.12.** Landings associated with VMS for UK vessels within the MCZ are displayed in Table 4. Landings data for vessels of 12 m and over are recorded at ICES rectangle level and landings values were estimated based on the proportion of VMS reports from ICES rectangle 29E7 that were within the proposed management area. The most recent six years of landings available (2014-2019) reported by UK vessels using bottom towed gears in ICES rectangle 29E7 are displayed in Table 7 and Table 8 based on the size of the vessels and the type of fishing gear used. A different methodology was used to calculate landings associated with the proposed management option for vessels under and over 12 m. VMS was used to estimate the proportion (%) of VMS reports in the proposed management area compared to 29E7 (Table 5) for UK vessels over 12 m. For vessels under 12 m which do not have VMS, an area based estimate was used to calculate the associated landings for the proposed management option (Table 6). This estimate is the percentage of 29E7 that intercepts the area of the proposed managed option and is calculated to be 5.13%.
- 4.13.** For context, landings originating from ICES rectangle 29E7 via non bottom towed gears have also been included for UK vessels (Table 9 and Table 10). However, this

information has not been included when calculating costs to the UK industry as they will not be directly affected by the proposed management.

- 4.14.** The landings data indicate that there may be relatively limited UK bottom towed gear activity occurring in the MCZ, with the annual average weight of fish caught from 2014 to 2019 being 3.47 tonnes (t) for UK bottom towed gear compared with 8.21 t for UK non-bottom towed gear types for vessels under 12 m (Table 9). For vessels over 12 m, landings are similar for bottom towed gear at an annual average over the five years of 2.8 t, and 1.4 t for non-bottom towed gear (Table 8 and Table 10). Preliminary data for UK vessels under 10 m also indicates relatively limited bottom towed gear activity, with 2050 kg of catch estimated to have been caught within the proposed management option during January to November 2020 (Table 3).
- 4.15.** 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 proposed management area is relative 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.

Box 1. Non-UK fishing vessels

Although the focus of this RTA are the impacts on UK businesses and public bodies, vessels registered in in other countries ('non-UK vessels') may also have access to fish in South Dorset MCZ.

Estimates of fisheries landings values by non-UK vessels using bottom towed gear were determined using landings data provided by the EU Scientific, Technical and Economic Committee for Fisheries (STECF). VMS was used to estimate the proportion (%) of VMS reports in the proposed management area compared to the ICES rectangle 29E7 (Table 5) which intersects South Dorset MCZ.

French vessels fish the most in the MCZ, with 369 bottom towed gear fishing VMS reports from 2014 to 2019 (Table 2; Figure 8 to Figure 13). The annual average of landings from non-UK vessels using bottom towed gear was estimated to be 14.76t weight with a value of £24,520 from 2014 to 2018 (Table 11).

Using the worst-case 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 £203,923.

It is important to note that in contrast to the estimated costs to UK fishing vessels, estimated costs to non-UK vessels are based on the values of fish landed, rather than operating profit. The costs to non-UK vessels are therefore considerably overestimated as the costs are based solely on revenue from landings rather than operating profit. Furthermore, as per UK vessels, non-UK vessels are likely to offset some of their lost revenue by fishing in other areas.

Table 1: Number of UK fishing VMS reports within the proposed management option (option 2) from 2014 – 2019 (FPO – pots; HMD – hand mechanised dredge; OTB – otter bottom trawl; DRB – bottom dredge, TBB – beam trawl; PTM – midwater otter trawl).

Year	Unknown	Pots/Traps	Bottom towed gear				Pelagic PTM
		FPO	HMD	OTB	DRB	TBB	
2014	3	12	7	2	2	2	2
2015	5	7	3	4	6	1	-
2016	3	42	-	1	7	5	-
2017	1	11	-	-	4	-	-
2018	0	18	-	1	5	2	1
2019	0	35	-	-	-	-	-
Total	12	125	10	8	24	10	3

Table 2: Number of non-UK fishing VMS reports related to bottom towed gear within South Dorset MCZ from 2014 – 2019. The other EU countries include Belgium, Ireland and Lithuania

Year	France	Other EU countries
2014	114	2
2015	-	1
2016	48	-
2017	71	1
2018	54	1
2019	82	5

Table 3: The number of fishing trips and total weight of catch (kg) across gear types for under 10 m vessels from 1st January – 30th November 2020, within ICES sub-rectangles 29E74 and 29E77 where South Dorset MCZ is located. An estimate of the associated trips and weight of catch has been calculated based on the area of the proposed management option within the sub-rectangle. For 29E74 this was calculated as 9% and for 29E77 this was calculated as 38%.

Gear type	29E74		MCZ in 29E74		29E77		MCZ in 29E77		MCZ Total	
	Trips	Weight (kg)	Trips	Weight (kg)	Trips	Weight (kg)	Trips	Weight (kg)	Trips	Weight (kg)
Bottom towed gear	0	0	0	0	118	5394	45	2050	45	2050
Hooks and lines	102	4473	9	403	86	4857	33	1846	42	2248
Gillnets	8	1022	1	92	0	0	0	0	1	92
Pots/traps	18	2741	2	247	295	32054	112	12181	114	12427

Table 4: South Dorset MCZ UK landings by weight (tonnes) and value (£) based on VMS reports from 2014-2019, including the percentage of VMS fishing reports without associated landings.

Year	Gear	Weight (t)	Value (£)	% VMS reports with null landings
2014	FPO	2.78	6,385	70
2015	FPO	1.52	3,641	77
	OTB	0.17	155.21	-
2016	FPO	3.55	10,514	33
2017	FPO	0.96	3,331	73
2018	FPO	1.49	3,608	81
2019	FPO	6.71	17,897	55

Table 5: Number of UK and non-UK fishing VMS reports in the proposed management option (South Dorset MCZ) from 2014 - 2019, the ICES rectangle 29E7 and the proportion of VMS reports within the MCZ as a percentage of those within 29E7.

Year	VMS reports in MCZ		VMS reports in 29E7		% VMS reports in MCZ compared to 29E7	
	UK	Non-UK	UK	Non-UK	UK	Non-UK
2014	29	148	12,433	17,813	0.23	0.83
2015	26	71	14,798	16,580	0.18	0.43
2016	55	49	17,679	14,321	0.31	0.34
2017	16	89	22,152	15,457	0.07	0.58
2018	26	58	16,134	14,820	0.16	0.39
2019	56	87	17,927	19,188	0.32	0.45

Table 6: Area (kilometres²) of proposed management option (option 2) and its parent ICES rectangle 29E7 and the percentage of 29E7 that intercepts the area of the proposed managed option.

Proposed management area (km ²)	ICES rectangle 29E7 area (km ²)	% of management option occupied in 29E7
203.67	3967	5.13

Table 7: Associated UK landings by weight (metric tonnes) and value (£) for <12m vessels from bottom towed gear from 2014-2019. This has been calculated as 5.13 % of landings in ICES rectangle 29E7 (Table 6). No landings were recorded for other bottom towed gears (DRB - Bottom Dredge; OT – Unspecified Otter Trawl; OTB – Bottom Otter Trawl; OTT- Otter Twin Trawl; TBB – Beam Trawl).

Gear	2014		2015		2016		2017		2018		2019		Annual average	
	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)
DRB	0.60	921.15	-	-	0.21	538.52	1.32	2,768	1.48	3,252	1.35	3,081	0.83	1,760
OT	1.80	3,214	3.20	6,430	1.51	2,433	0.54	957.06	-	-	-	-	1.17	2,172
OTB	-	-	-	-	0.02	38.01	0.77	1,491	3.56	5,134	2.83	5,921	1.20	2,097
OTT	-	-	-	-	-	-	-	-	0.45	1,669	1.09	3,265	0.26	822
TBB	-	-	-	-	-	-	0.06	215.48	0.04	91.55	-	-	0.02	51
Total	2.39	4,135	3.20	6,430	1.73	3,009	2.69	5,431	5.53	10,147	5.27	12,267	3.47	6,903

Table 8: Associated UK landings by weight (metric tonnes) and value (£) for >12 m vessels from bottom towed gear from 2014 - 2019. This has been calculated as a proportion (%) of VMS reports in the proposed management area compared to ICES rectangle 29E7 (Table 5). Bottom towed gear types with associated VMS reports were used to estimate landings in the MCZ management area.

Gear	2014		2015		2016		2017		2018		2019		Annual average	
	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)
DRB	0.90	1,699	0.49	1,014	0.95	2,322	0.95	926.30	0.43	1,074	0.97	3,624	0.78	1,777
OTB	0.01	16.07	0.26	353.73	0.26	815.51	0.16	518.78	0.54	1,134	0.78	1,769	0.34	767.83
TBB	1.36	3,679	1.10	2,846	2.82	9,093	0.83	3,158	0.95	3,813	3.55	11,860	1.77	5,741
Total	2.27	5,394	1.85	4,213	4.03	12,231	1.93	4,603	1.93	6,020	5.29	17,254	2.88	8,286

Table 9: Associated UK landings by weight (metric tonnes) and value (£) for <12 m vessels from non-bottom towed gear from 2014-2019. This has been calculated as 5.13 % of landings in ICES rectangle 29E7 (Table 6), (GN – Gillnets; GNS – Driftnets; LHP – handlines & polelines; hooks and lines; OTM – Midwater otter trawl).

Gear Type	2014		2015		2016		2017		2018		2019		Annual average	
	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)
Pots (FPO)	7.22	6,769	7.56	7,152	5.33	9,366	6.12	15,834	13.23	28,545	4.63	15,190	7.35	13,809
Gillnets (GN & GNS)	0.29	1,239	0.39	1,054	0.30	1,053	0.09	322.02	0.02	189.38	0.27	1,024	0.23	813.65
Hand fishing (HF)	0.16	367.49	0.25	389.04	0.23	371.51	0.04	88.16	-	-	-	-	0.11	202.70
Hooks and lines (LHP & LX)	1.07	10,682	0.89	8,983	0.41	4,774	0.33	3,606	0.25	2,614	0.20	2,360	0.53	5,503
Pelagic gear (OTM)	-	-	-	-	-	-	0.02	27.06	-	-	-	-	0.00	4.51
Total	8.74	19,058	9.09	17,578	6.27	15,565	6.59	19,877	13.49	31,348	5.10	18,574	8.21	20,333

Table 10: Associated UK landings by weight (metric tonnes) and value (£) for >12m vessels from non-bottom towed gear from 2014- 2019. This has been calculated as a proportion (%) of VMS reports in the proposed management option compared to ICES rectangle 29E7 (Table 5). Non-bottom towed gear types with associated VMS reports were used to estimate landings in the MCZ management area.

Gear Type	2014		2015		2016		2017		2018		2019		Annual average	
	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)
Pots (FPO)	0.93	2,315	1.14	2,426	1.75	4,367	0.32	849.96	0.84	2,328	2.55	6,140	1.00	2,457
Pelagic gear (OTM)	1.02	344.87	0.68	233.99	0.33	98.28	-	-	-	-	-	-	0.40	135.43
Total	1.95	2,660	1.82	2,660	2.08	4,465	0.32	849.96	0.84	2,328	2.55	6,140	1.40	2,593

Table 11: Associated non-UK landings by weight (metric tonnes) and value (£) for bottom towed gear. This has been calculated as a proportion (%) of VMS reports in the proposed management option compared to ICES rectangle 29E7 (Table 5).

Year	Weight (t)	Value (£)
2014	35.19	35,173
2015	10.62	23,188
2016	6.56	13,221
2017	12.26	30,087
2018	9.15	20,935
Annual average	14.76	24,520

Table 12: UK fishing income and operating costs (which include vessel and fishing costs) are based on economic Seafish data¹¹ for the Seafish segment⁹ Area VIIBCEFGHK trawlers 10-24 m. Operational profit was calculated by subtracting operating costs from fishing income. This was calculated as a percentage to estimate the profit margin. Total landings are based on UK landings using bottom towed fishing gear for <12m and >12m length vessels within the South Dorset management area (Table 7 and Table 8). The profit margin was applied to the total landings to determine the annual profit of UK landings (£) associated with South Dorset management area from 2014 – 2019.

Year	Fishing income (£'000)	Operating costs (£'000)	Operating profit (£'000)	Profit margin (%)	Total landings (£)	Profit of landings (£)
2014	206	158	48	23.35	9,529	2,225
2015	184	150	34	18.40	10,644	1,958
2016	216	164	53	24.30	15,240	3,704
2017	220	167	53	24.19	10,035	2,428
2018	223	175	48	21.63	16,167	3,497
2019	218	169	49	22.37	29,521	6,603
Annual average (£):						3,403

Figure 1: South Dorset MCZ and the proposed management option (option 2)

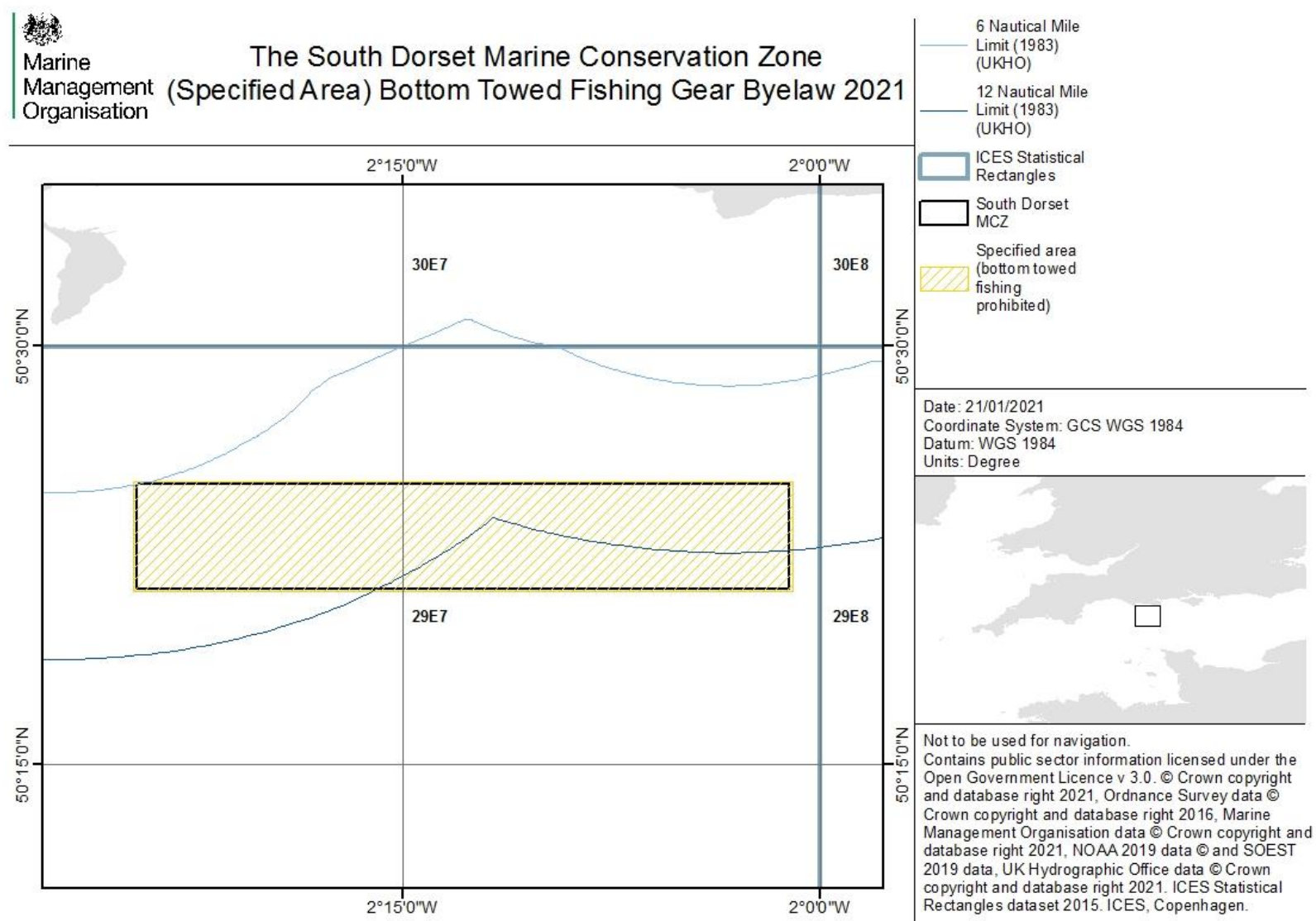


Figure 2: 2014 VMS Fishing Activity by gear type in South Dorset MCZ

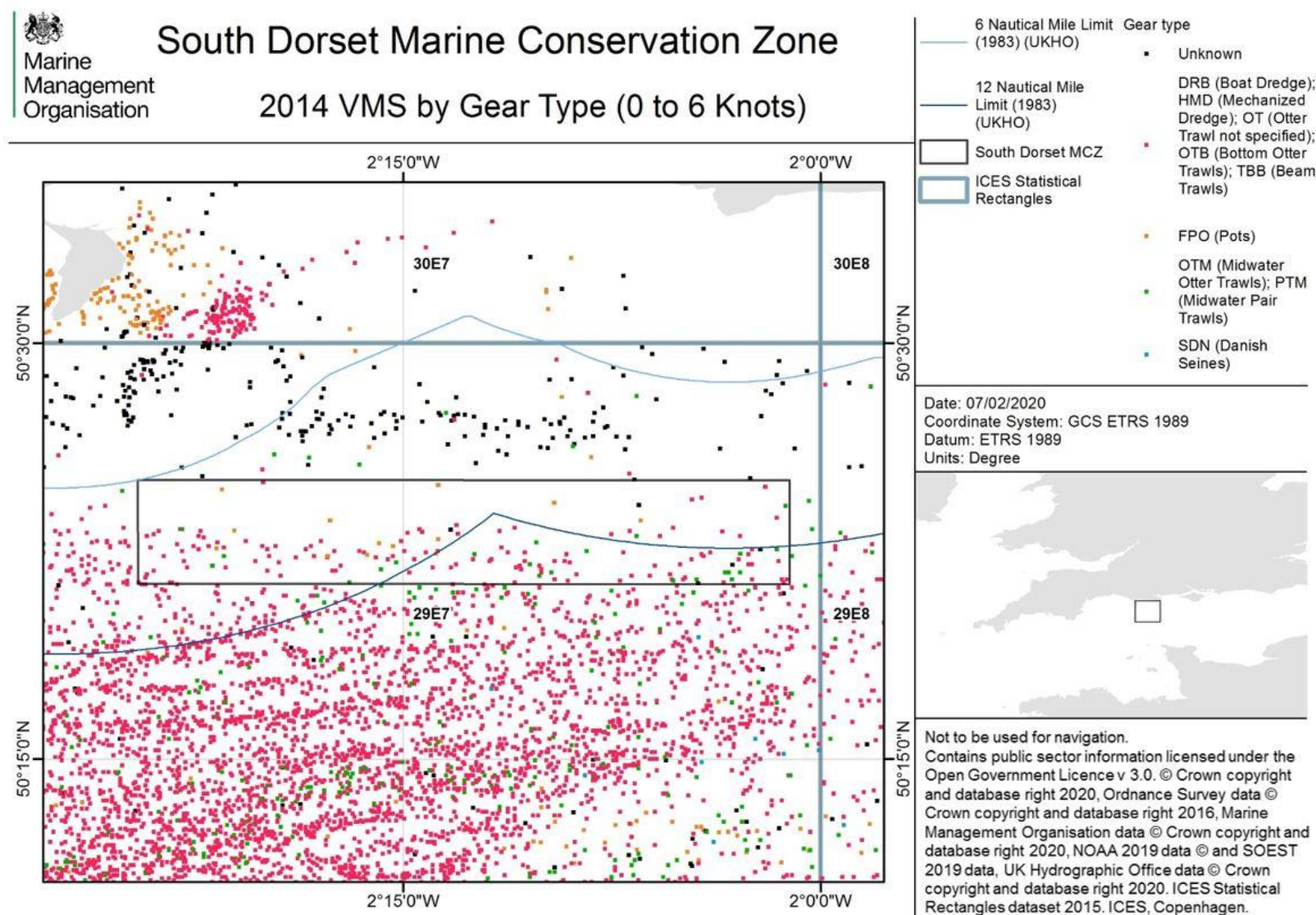


Figure 3: 2015 VMS Fishing Activity by gear type in South Dorset MCZ

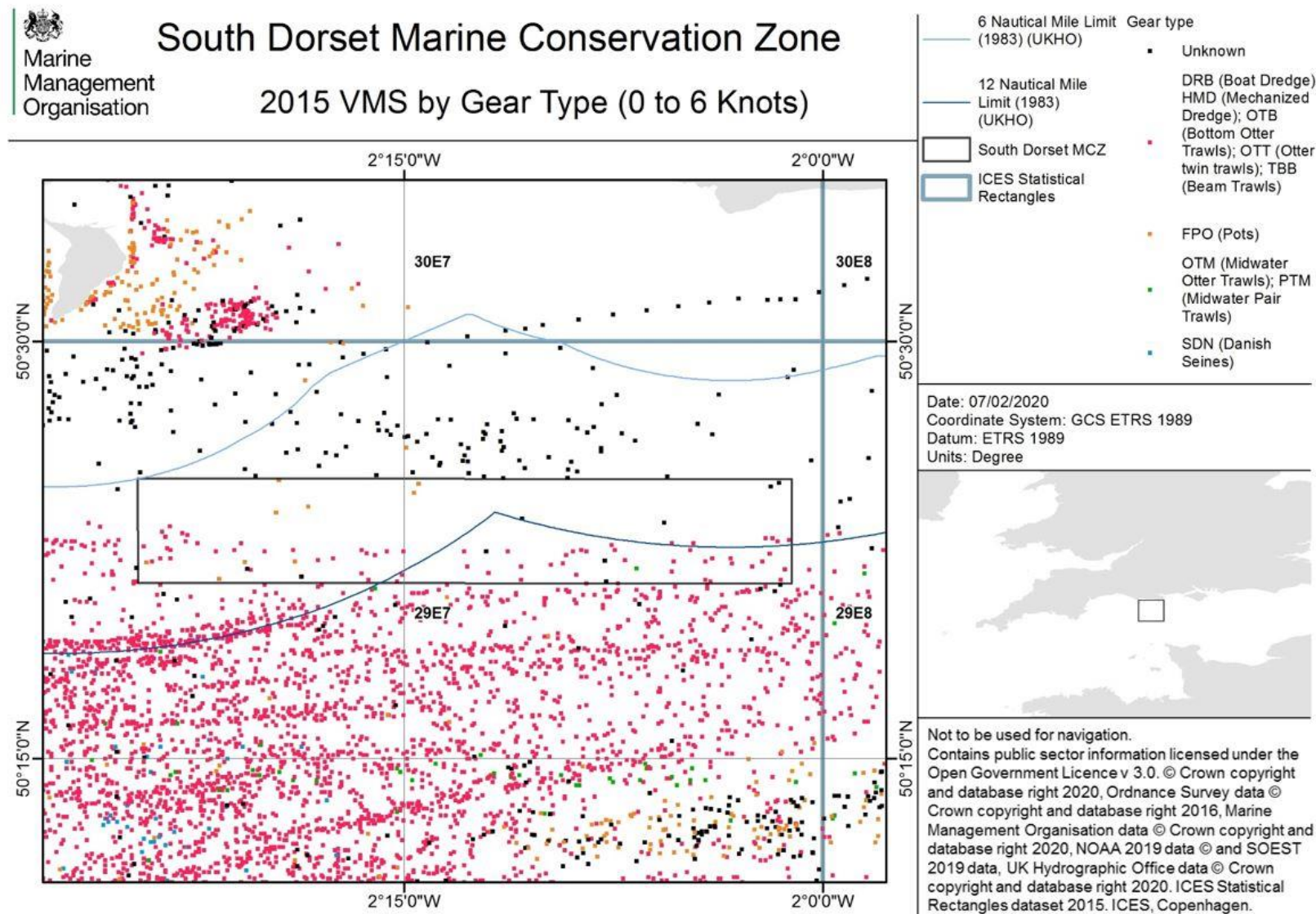


Figure 4: 2016 VMS Fishing Activity by gear type in South Dorset MCZ

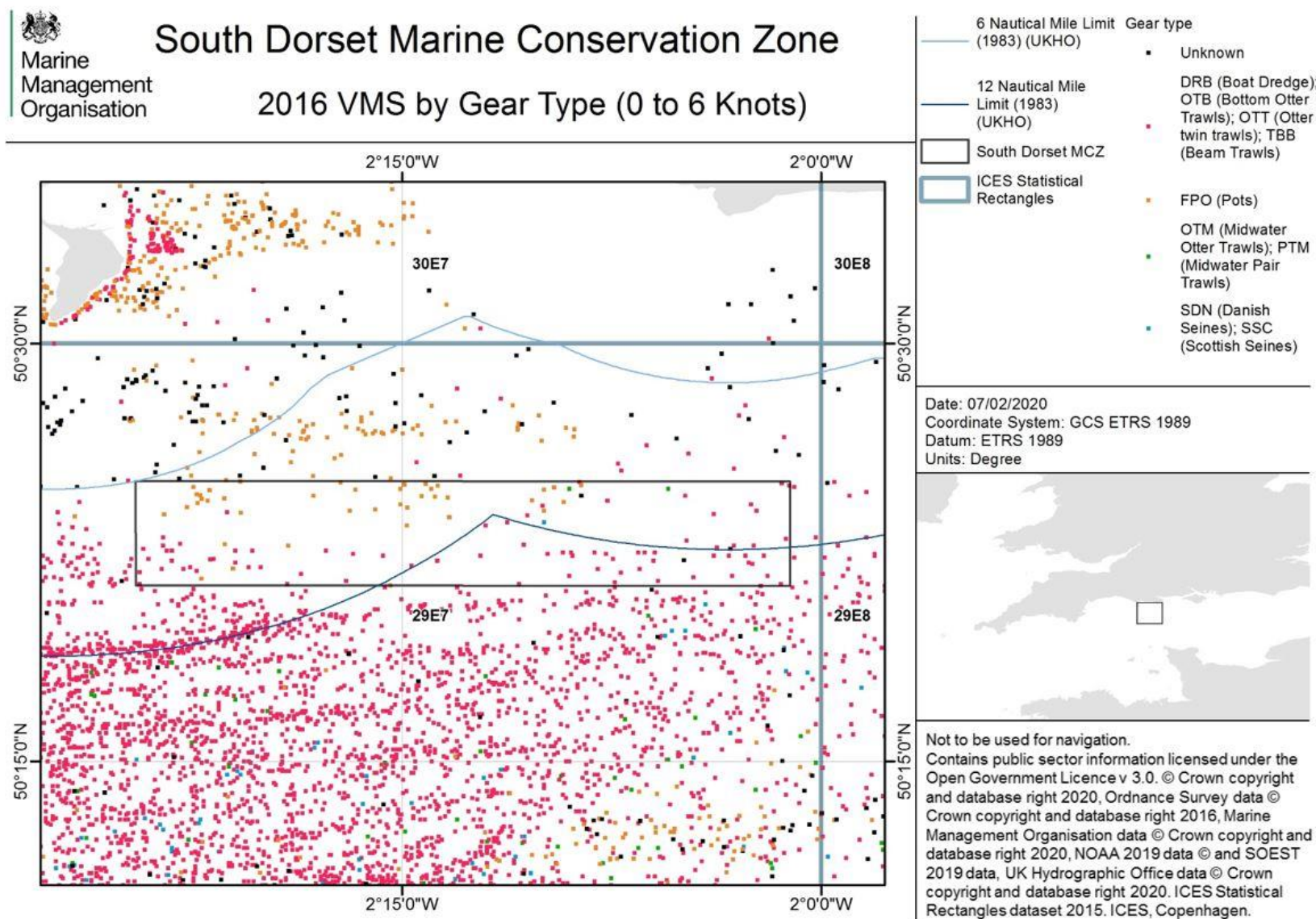


Figure 5: 2017 VMS Fishing Activity by gear type in South Dorset MCZ

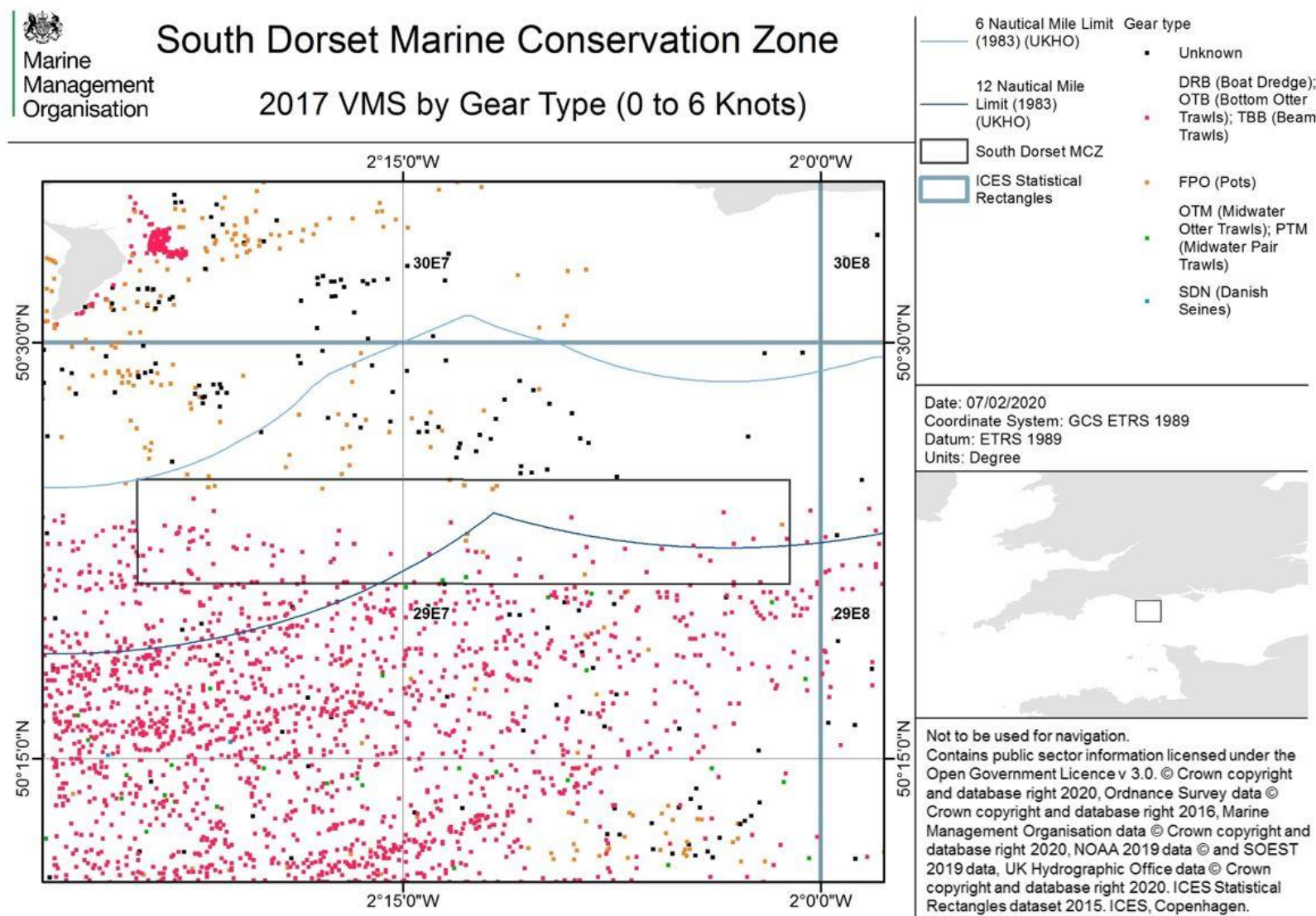


Figure 6: 2018 VMS Fishing Activity by gear type in South Dorset MCZ

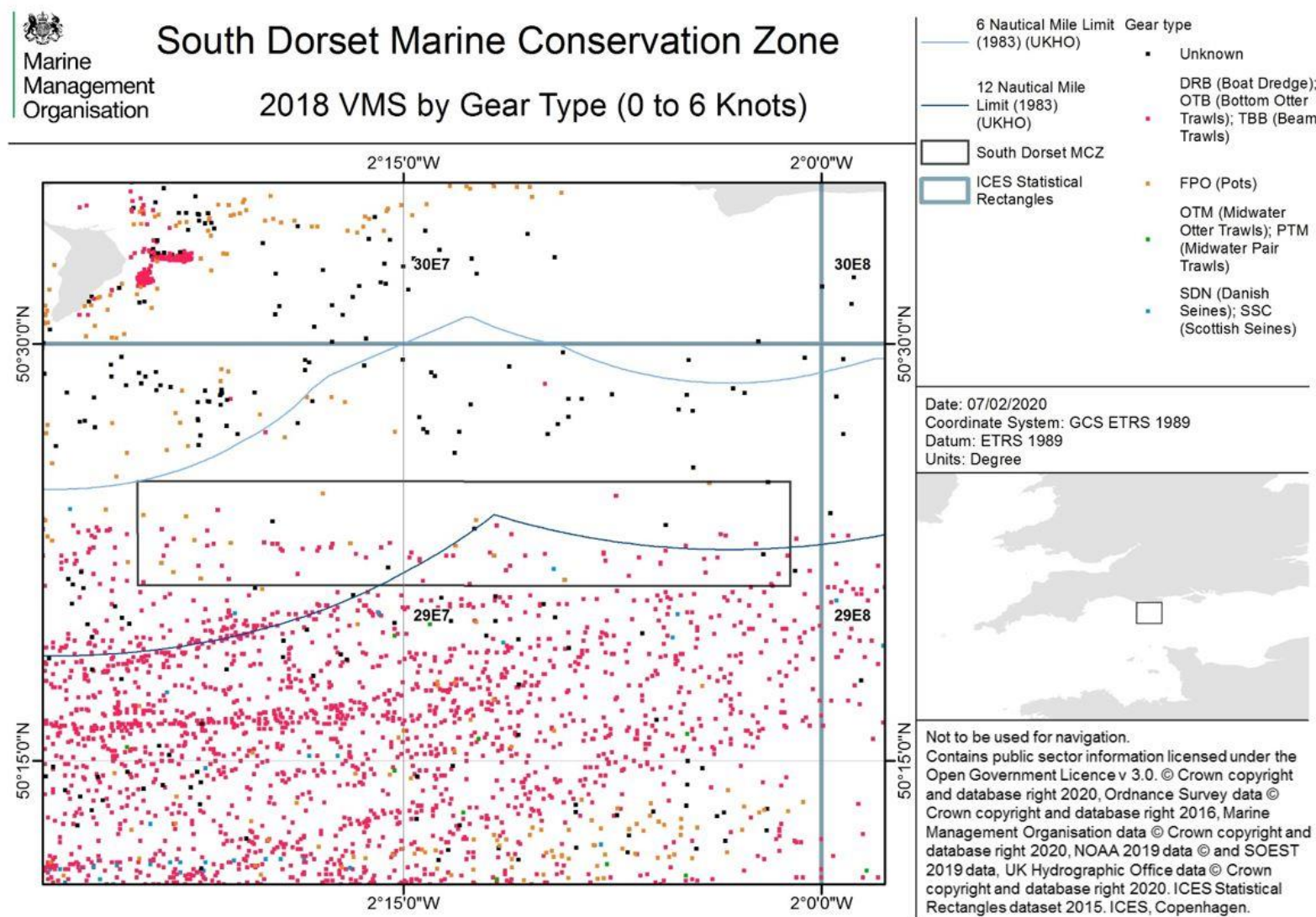


Figure 7: 2019 VMS Fishing Activity by gear type in South Dorset MCZ

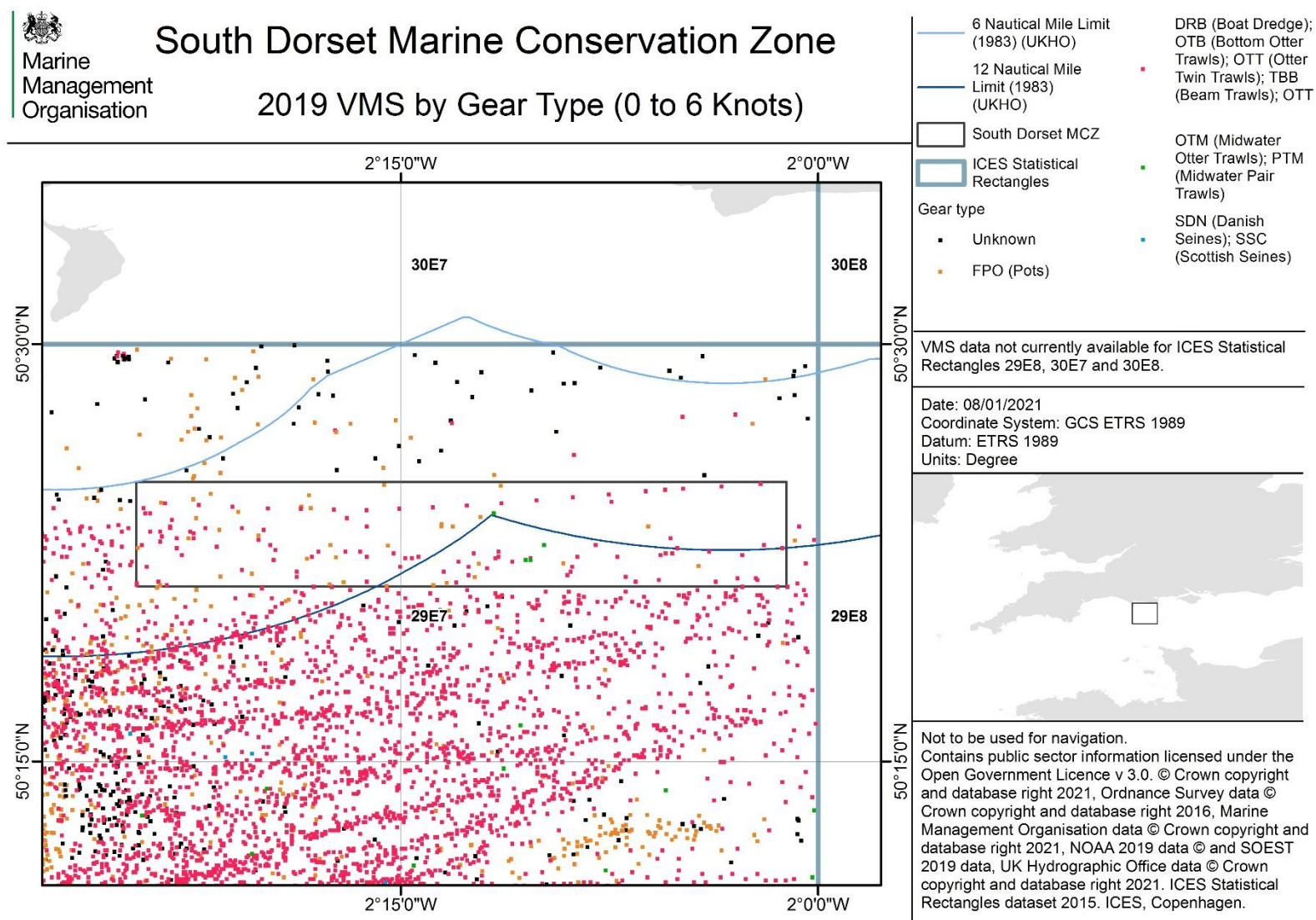


Figure 8: 2014 VMS Fishing Activity by nationality in South Dorset MCZ

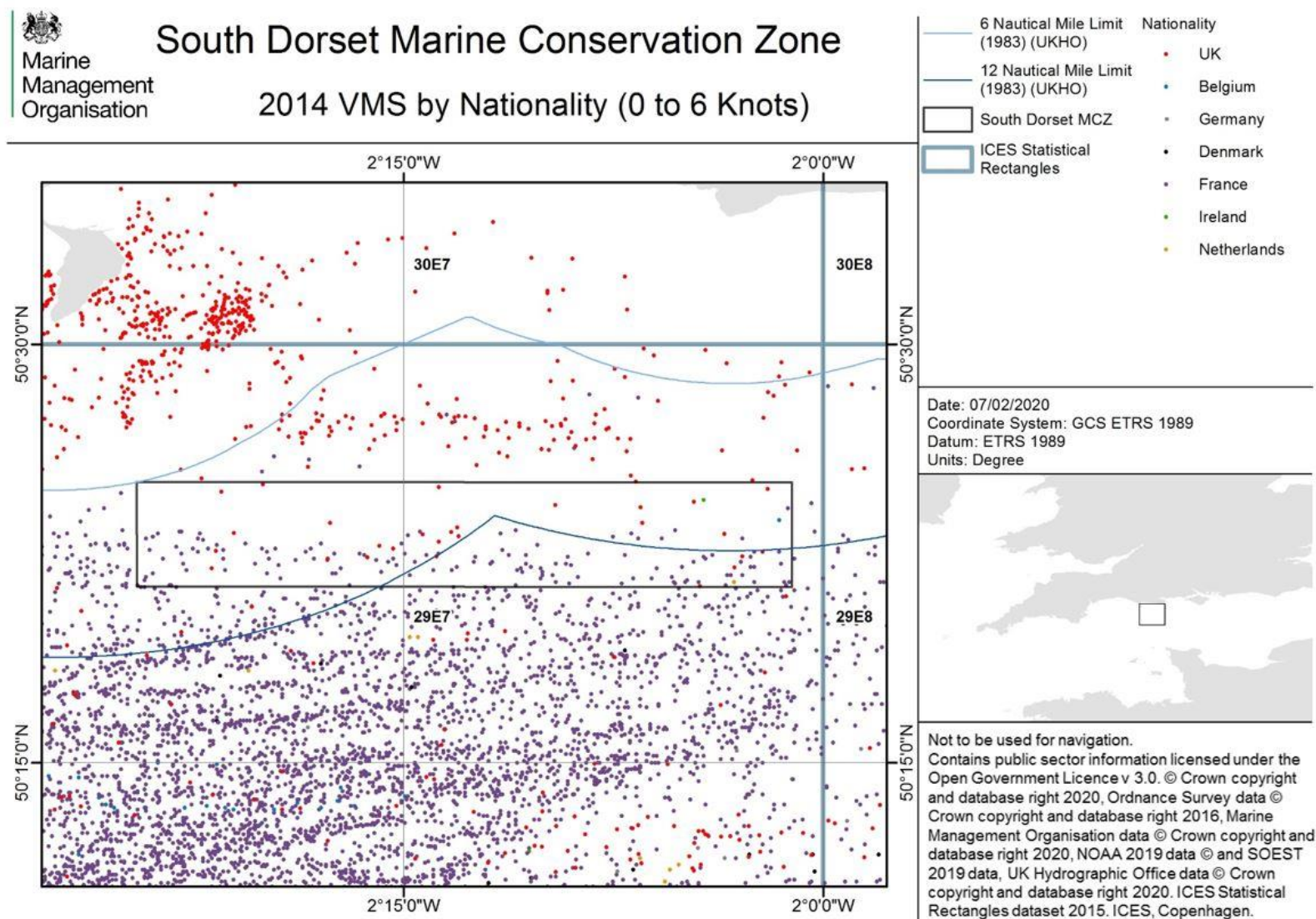


Figure 9: 2015 VMS Fishing Activity by nationality in South Dorset MCZ

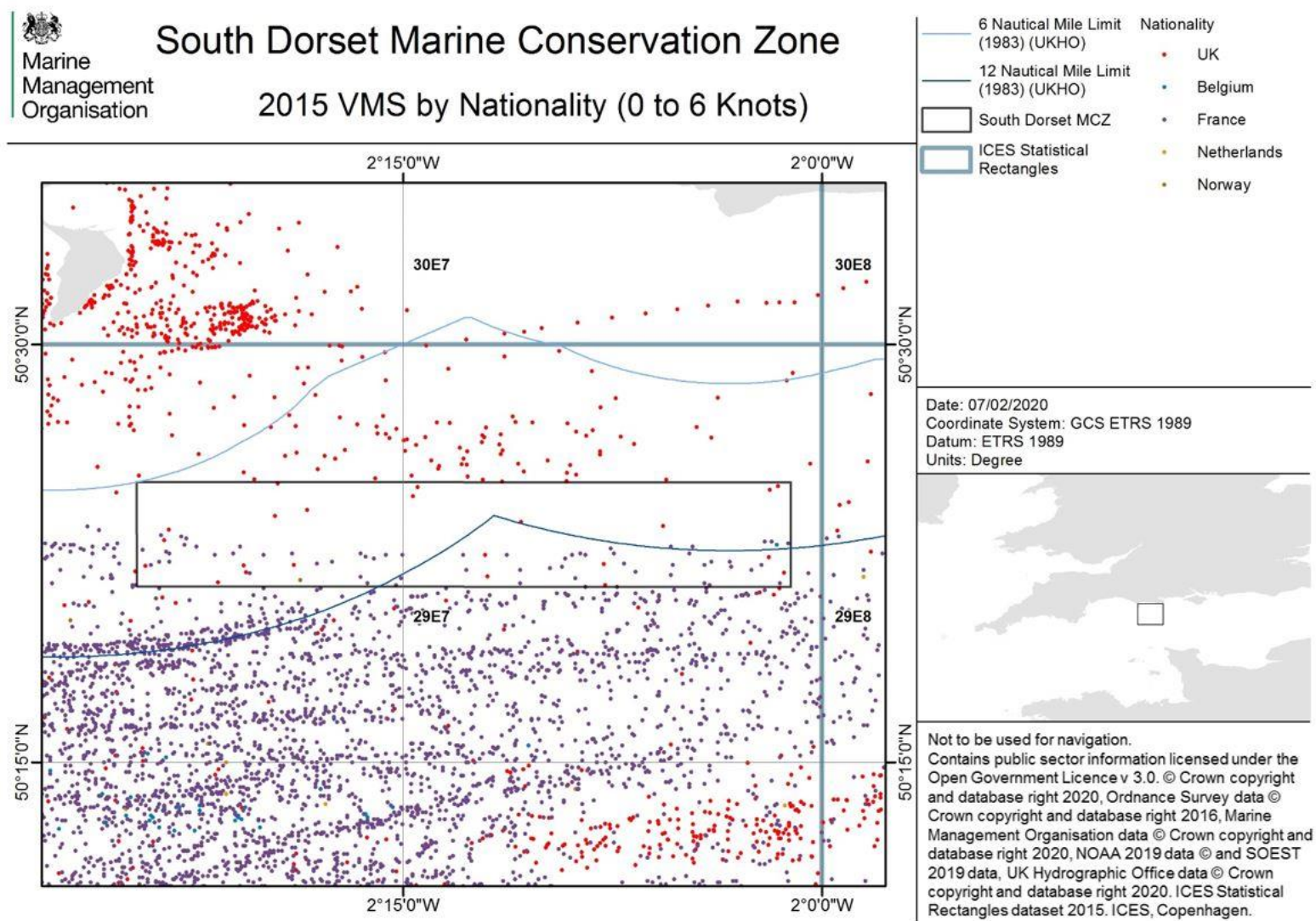


Figure 10: 2016 VMS Fishing Activity by nationality in South Dorset MCZ

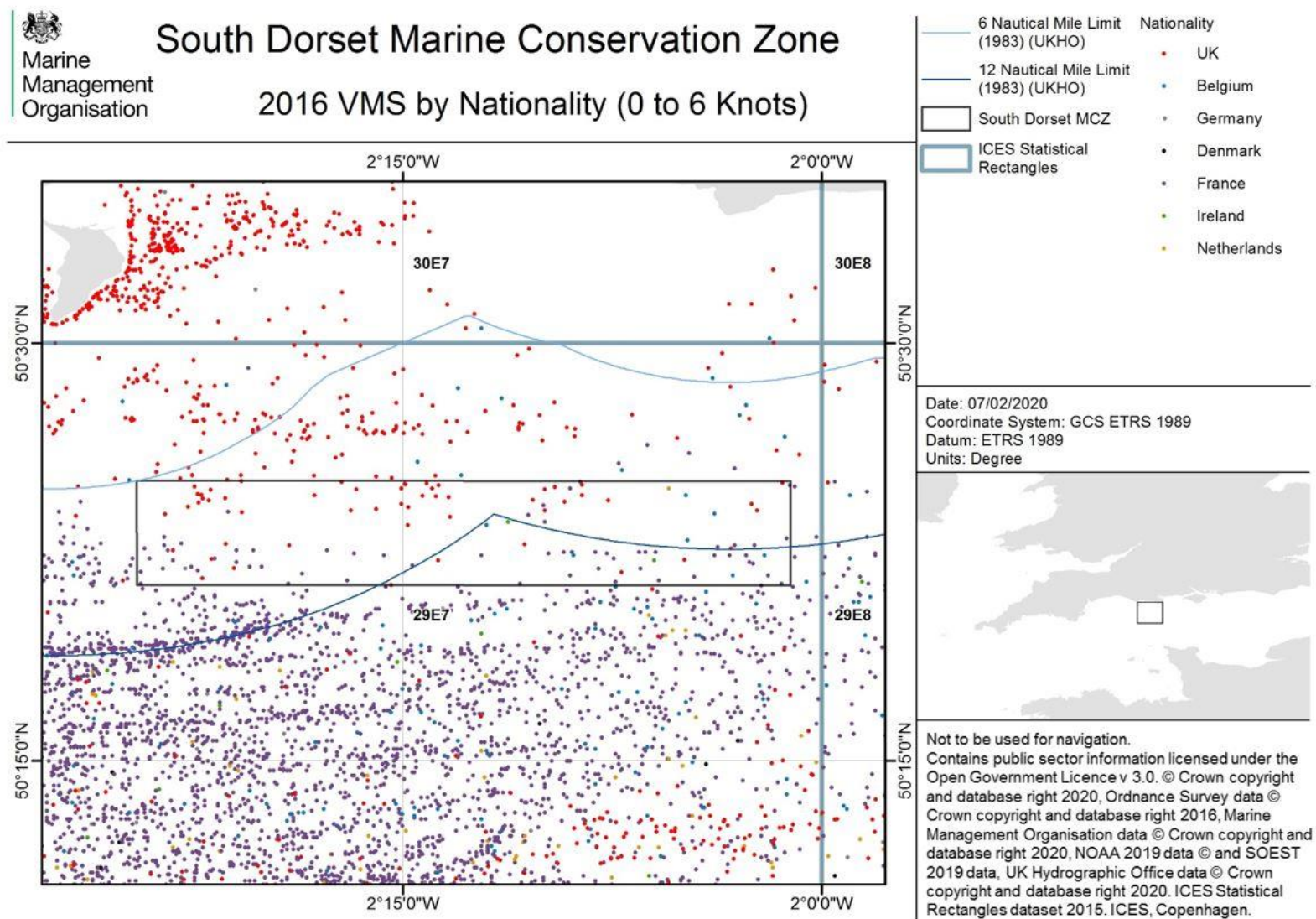


Figure 11: 2017 VMS Fishing Activity by nationality in South Dorset MCZ

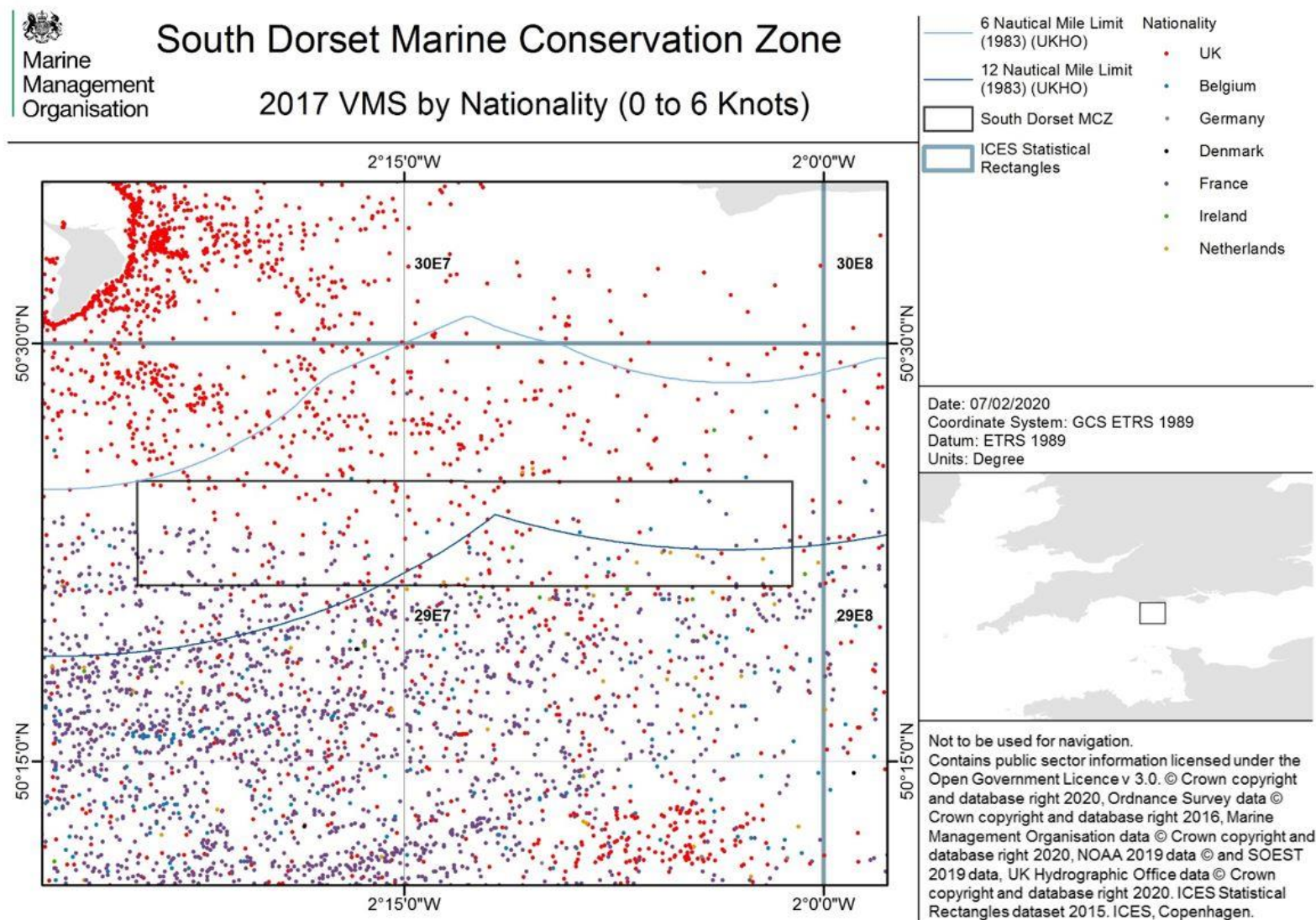


Figure 12: 2018 VMS Fishing Activity by nationality in South Dorset MCZ

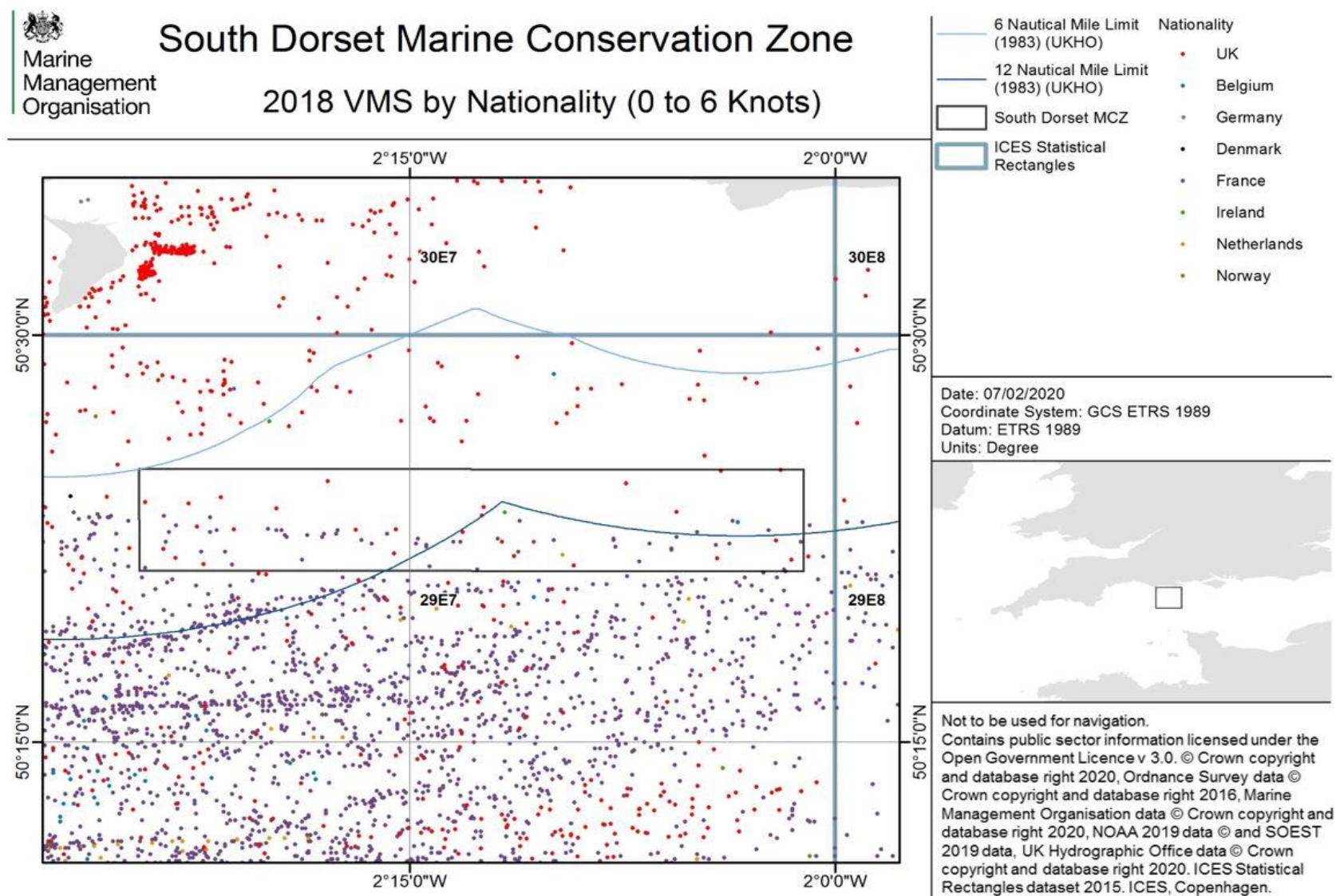
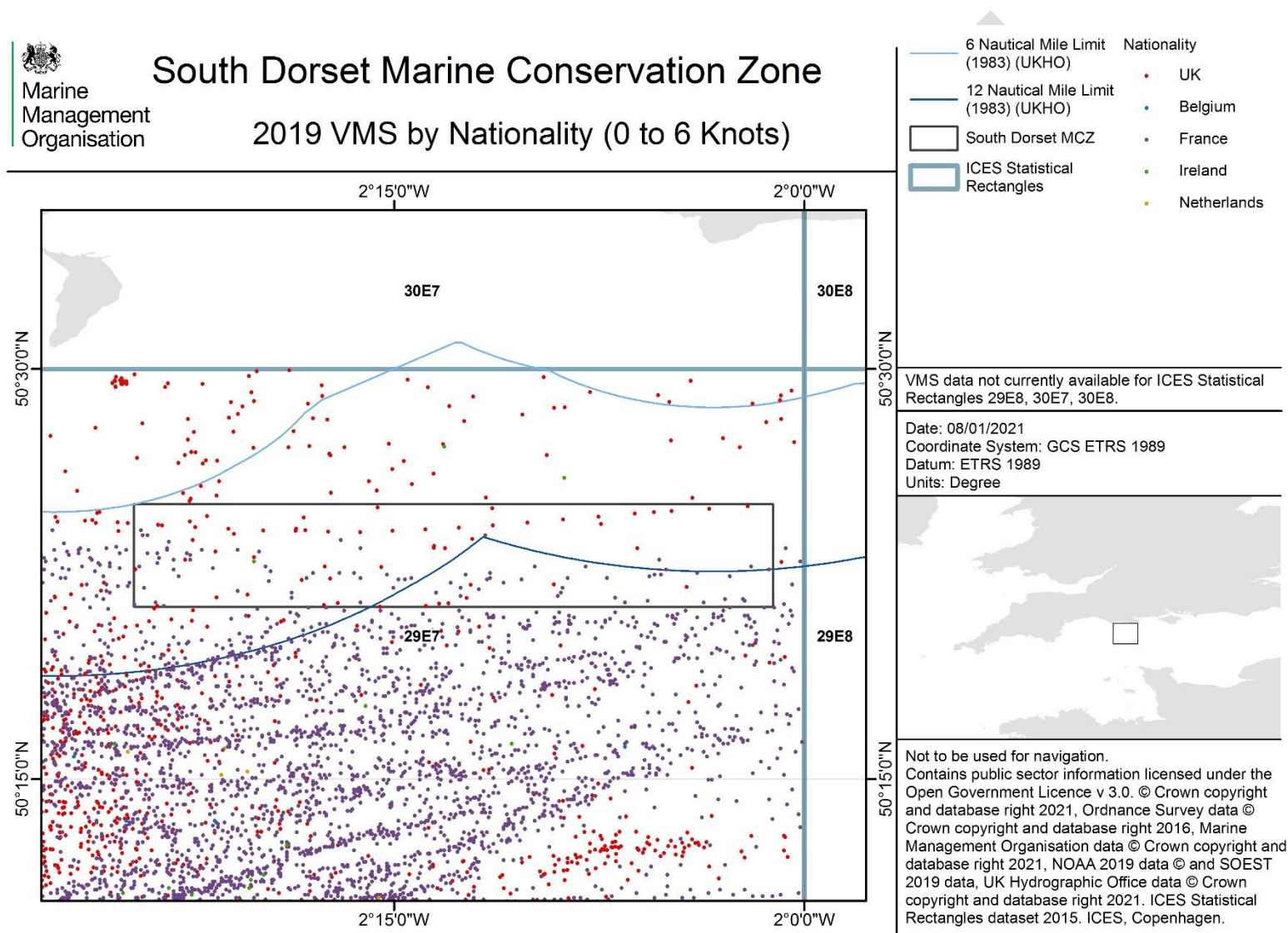


Figure 13: 2019 VMS Fishing Activity by nationality in South Dorset MCZ



Compliance costs

- 4.16.** MMO compliance action is intelligence-led and risk-based in accordance with the National Intelligence Model¹². Where intelligence suggests non-compliance or a risk of non-compliance with the proposed 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. The MMO will coordinate any joint operations. The principles by which the MMO will regulate marine protected areas are set out by the Legislative and Regulatory Reform Act 2006¹³ and the Regulators' Compliance Code¹⁴ and aim to ensure that the MMO is proportionate, accountable, consistent, transparent and targeted in any compliance action it takes.
- 4.17.** 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

- 4.18.** The economic impacts of the proposed management area are estimated as the loss of profitability of fishing effort at the site. The total monetised costs are informed by data from the MMO on fishing activity using bottom towed gear within the management area and from the 2014-19 Seafish data on the profitability of fishing⁹. This shows that for the fleet segment¹¹ concerned (Area VIIBCEFGHK trawlers 10-24 m) that the operational profit ratio ranges from 18.40% to 24.19 across 2014 to 2019 (Table 12).
- 4.19.** An estimate of £15,189 has been made for the average value of bottom towed gear UK landings derived from the proposed management area from 2014 – 2019 (Table 7 and Table 8). In comparison, a comparable figure for UK non-bottom towed gear landings is estimated to be £23,517 (Table 9 and Table 10).
- 4.20.** To estimate the monetised cost (management option 2) over ten years for the UK vessels likely to be affected, the approximate profit earned from UK landings in accordance with profit ratios calculated in Table 12 was used, provide an estimate of £3,403 for annual value (Table 12).
- 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 £29,292. This results in a estimated business net present value of £28,301.

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

¹² Association of Chief Police Officers (2005) Guidance on the national intelligence model.

¹³ <https://www.legislation.gov.uk/ukpga/2006/51/contents>

¹⁴ <https://www.gov.uk/government/publications/regulators-code>

assessment of South Dorset MCZ indicates that bottom towed gears are resulting in an adverse effect on the integrity 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 2: MMO byelaw to prohibit bottom towed fishing over all protected features across all areas of the site, with an appropriate buffer.

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