Regulatory Triage Assessment	
Title of measure	Dogger Bank Special Area of Conservation (Specified Area) Bottom Towed Fishing Gear Byelaw 2021
Lead Department/Agency	Marine Management Organisation (MMO)
Expected date of implementation	DRAFT
Origin	Domestic
Date	01/02/2021 (DRAFT)
Lead Department Contact	Marine Conservation Team, Marine Management Organisation, Lancaster House, Hampshire Court, Newcastle, NE4 7YH, conservation@marinemanagement.org.uk 0300 123 1032
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 Dogger Bank Special Area of Conservation (SAC) which aim to restore the qualifying 'Sandbanks which are slightly covered by sea water all the time (H1110)' feature to favourable condition. This byelaw is proposed to ensure the site's conservation objectives are furthered by prohibiting the damaging bottom towed fishing activities across the entire site.

Viable policy options (including alternatives to regulation)

Option 0. Do nothing.

Option 1. MMO byelaw to prohibit bottom towed gears over entire sandbank feature with appropriate buffering (whole site prohibition).

Option 2. An MMO byelaw to prohibit bottom towed gears over a proportion of the sandbank habitat ('zoned management').

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

Option 4. Management of the activity through a voluntary agreement.

Option 1 is the preferred option.

Description of Novel and Contentious Elements (if any)

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

Initial assessment of impact on business

Fishing activity data (VMS and landings data) indicates that 59 UK bottom towed gear fishing vessels have recorded fisheries landings from the proposed management area from 2014 to 2019, and thus would be directly affected by the proposed byelaw. On average over this time period, 18 UK fishing vessels used the site 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 expected to be £12,405,107 (2020 present value). This includes an equivalent annual net direct cost to business (EANDCB) of £1,441,166 (2020 present value). This is based on analysis of fishing activity data (VMS and landings data) from 2014 to 2019. In addition, significant scallop landings were recorded from this site for the first time from March to July 2020, and these have also been included in the figures. However, the overall figures provided are likely to be a considerable overestimate because it is very unlikely that the scallop landings recorded from March to July 2020 would be maintained at such a high level over the long-term. There is potential for all affected fishing businesses to recover a proportion of the costs by fishing elsewhere.

Non-monetised costs include the potential environmental impacts of displaced fishing activity on habitats/areas outside of the SAC.

Non-monetised benefits include the protection of the qualifying sandbank feature, therefore contributing to the achievement of the conservation objectives of the site; improved provision of ecosystem services by the habitat and it's biological communities, 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: -£12,405,107
- Estimated Business Net Present Value: -£12,405,107
- Estimated Equivalent Annualised Net Costs to Business: £1,441,166
- Appraisal period: 10 years
- The Price Base Year and Present Value Base Year: 2019 and 2020
- BIT status/score : 7.21

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[1].
Rationale for Triage rating The fast-track appraisal route is appropriate as this regulation falls under the "low cost" criteria - equivalent annual net direct cost to business (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. The MMO has duties under the Conservation of Offshore Marine Habitats and Species Regulations 2017 to protect European Marine Sites. This includes the implementation of byelaws to manage fishing activities to support the conservation objectives of European marine sites such as the Dogger Bank Special Area of Conservation (SAC). 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. The MMO has undertaken an assessment of the impact of fishing in the Dogger Bank SAC (see associated formal consultation documents). This assessment determined that bottom towed fishing (including semi-pelagic trawling and demersal seining) is not compatible with the conservation objectives of the site and may result in an adverse effect on site integrity. The proposed byelaw will further the conservation objectives of the SAC by prohibiting bottom towed fishing in the site allowing the sandbank habitat to return to favourable condition.

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 provided by the marine environment such as biological diversity are 'public goods' (no-one can be excluded from benefiting from them, but use of the goods does not diminish the goods being available to others)[2]. 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

[1] https://questions-statements.parliament.uk/written-statements/detail/2016-03-03/HCWS574

[2] https://www.gov.uk/government/publications/interim-report-the-dasgupta-review-independent-review-on-the-economics-of-biodiversity

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 lessens 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.

1.4. 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.

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

- Management measures will protect the qualifying habitat of the Dogger Bank SAC 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 Marine Management Organisation (MMO) is responsible.

- 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).

1.6. Dogger Bank SAC lies within the East Marine Plan Area. The East Marine Plan[3] was adopted in 2014. The decision to introduce the Dogger Bank Special Area of Conservation (Specified Area) Bottom Towed Fishing Gear Byelaw 2021 decision has been made in accordance with the East Marine Plan.

1.7. In particular, the following marine plan policies in the East Marine Plan are relevant to this decision:

- Policy BIO1
- Policy EC1
- Policy EC2
- Policy FISH1
- Policy GOV2
- Policy GOV3
- Policy MPA1

[3] https://www.gov.uk/government/publications/east-inshore-and-east-offshore-marine-plans

- Policy SOC1
- Policy TR1
- Policy TR3

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

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

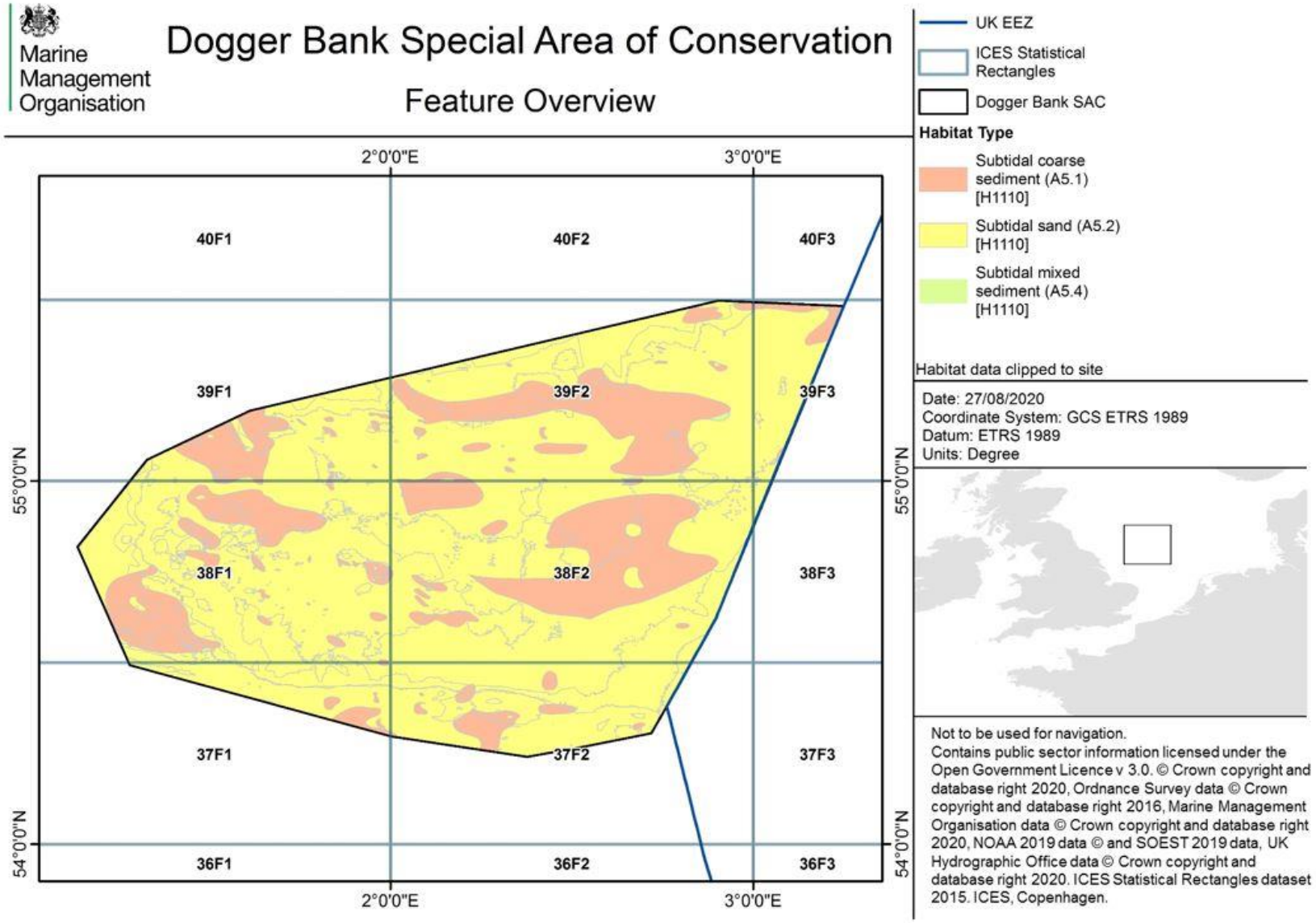
2. Policy objectives and intended effects

2.1. The policy objective pertinent to this RTA is to prevent adverse effects to site integrity of Dogger Bank SAC by ensuring that the protected feature: Sandbanks slightly covered by seawater all of the time (Figure 1); is safeguarded against the risk of damage from bottom towed gears.

2.2. The intended effects are that the sandbank habitat will be returned to favourable condition and meet MMO duties under the Conservation of Offshore Marine Habitats and Species 2017.

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

Figure 1: Dogger Bank SAC 'sandbanks that are slightly covered by seawater all the time'



3. Policy options considered, including alternatives to regulation

3.1. The principles of Better Regulation require that statutory regulation is introduced only as a last resort. However, the government's expectation is that management measures for commercial fishing in European marine sites should be implemented through statutory regulation to ensure adequate protection is achieved.

3.2. The Dogger Bank Special Area of Conservation (Specified Area) Bottom Towed Fishing Gear Byelaw 2021 is proposed to manage bottom towed fishing activities (including semi-pelagic trawling and demersal seining) over the sandbank feature within the Dogger Bank SAC. 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 activities would not be addressed and that MMO duties under the Conservation of Offshore Marine Habitats and Species 2017 would not be met. All other options are compared to option 0.

Option 1. MMO byelaw to prohibit bottom towed gears over the entire sandbank feature with appropriate buffering (whole site prohibition)

This option would remove the impact of bottom towed fishing from all areas of the site. This will help to achieve the conservation objectives of the site and give the best possible chance of restoring the qualifying sandbank habitat to favourable condition.

Option 2. An MMO byelaw to prohibit bottom towed gears over a proportion of the sandbank habitat ('zoned management').

This option would prohibit bottom towed gears from a proportion of the site but would maintain areas 'open' to bottom towed fishing. There is currently not sufficient evidence to allow identification of areas where ongoing bottom towed fishing can continue without undermining the site's conservation objective. This option may also increase levels of bottom towed fishing activity in open areas due to displacement from 'closed' areas. This would increase impacts from bottom towed fishing in the open areas increasing the risk of undermining the conservation objectives of the Dogger Bank SAC.

Option 3. Management of activity through a statutory instrument, regulating order or fishing 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[4] (including the powers for the English offshore region introduced by the Fisheries Act 2020[5]) are the most appropriate mechanism, providing the appropriate level of power, flexibility, consultation and speed.

[4] https://www.legislation.gov.uk/ukpga/2009/23/contents

[5] https://www.legislation.gov.uk/ukpga/2020/22/contents/enacted

Option 4. Management of the activity through 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[6], 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.

3.3. Option 1 is the preferred option as options 2-4 are not considered appropriate in this instance, as they are not deemed to be sufficient to protect the Dogger Bank SAC from negative impacts caused by fishing. As such, option 1 is considered in the costs and benefits analysis.

3.4. The boundaries of the management area proposed under Option 1 include an appropriate buffer zone. The buffer zone aims to prevent damaging physical interactions between adjacent fishing activity and the sandbank feature. Where the sensitive site features exist up to the boundary of the SAC, the buffer zone extends beyond the boundary of the SAC where possible.

4. Expected level of business impacts

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

4.2. The 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:

- Costs are based on estimates of UK landings values derived from within the management area. Bottom towed gear landings information are determined from electronic logbooks and apportioned evenly to vessel monitoring system (VMS) fishing records for the corresponding fishing trip. Therefore, they may not represent the true landings derived from each fishing record.

- The MMO do not currently have landings data linked to the 2020 scallop dredge VMS data. Landings for scallop dredge activity has therefore been determined by the proportion of VMS activity in the International Council for the Exploration of the Sea (ICES) rectangle (for which we have landings data) compared with that in the portion of the proposed management area coinciding with the ICES rectangle (Figure 2). This assumes landings are derived equally from across all VMS reports which is unlikely to be the case.

- During the call for evidence consultation from October to December 2020, the MMO received Dogger Bank scallop landings figures from the fishing industry. These figures detailed boat dredges landing 700 tonnes of scallops on and within the vicinity of Dogger Bank SAC by 25 vessels from late May 2020 for approximately seven weeks. This is

6 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/317555/betterregulationassessment2014.pdf

broadly consistent with the figures estimated from MMO VMS and landings data for 2020 scallop activity from within the proposed management area detailed in Table 3, where nearly 20 weeks of activity from March 15th to July 30th resulted in an estimated 1,700 tonnes of scallop landings from a total of 30 vessels.

- The MMO data regarding scallop landings appears to correspond well with figures provided by industry (industry figures approximate 100 tonnes per week compared with 85 tonnes per week for MMO data), albeit over a different time period. Therefore, the MMO data has been used for the cost analysis as it covers the entire time period in which the scallop dredging activity occurred.

- VMS data assumes fishing activity from the speed of travel. Speeds greater than zero and up to 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 (currents, tides etc.).

- All fishing vessels greater than 12 metres (m) in length require VMS. There is no evidence to suggest vessels smaller than 12 m in length fish in Dogger Bank SAC proposed management area, and the distance from shore makes this unlikely. This assessment therefore assumes that VMS data captures the entirety of the fishing fleet working within Dogger Bank SAC and therefore costs are estimated only for fishing vessels greater than 12 m.

- The costs attributed to scalloping activity are derived from a small window of very high intensity activity. The costs estimates from scalloping activity assume that the landings derived from this period would be sustained over the long-term, however this is likely to be a significant overestimate. The ongoing sustainability of this stock is currently unknown, and it is far from certain that scalloping activity of this intensity could maintain a viable stock.

- Costs are estimated using the landings obtained from the Dogger Bank SAC management area and operating profit of those vessels, provided by Seafish. The costs calculated for the management area are therefore determined by the 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.

- Displacement is difficult to quantify, and it is impossible to predict where exactly activities will be displaced to.

- Spillover of fish (due to the proposed management) to fishing grounds outside of the management area could provide increased opportunities for fishing outside of the MPA; 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 the lost revenue by fishing in other areas. It is also possible that the increased environmental status of the habitat within the management area could lead to spillover and more abundant fishing grounds outside of the management area; thus further allowing vessels to offset the costs of lost revenue.

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

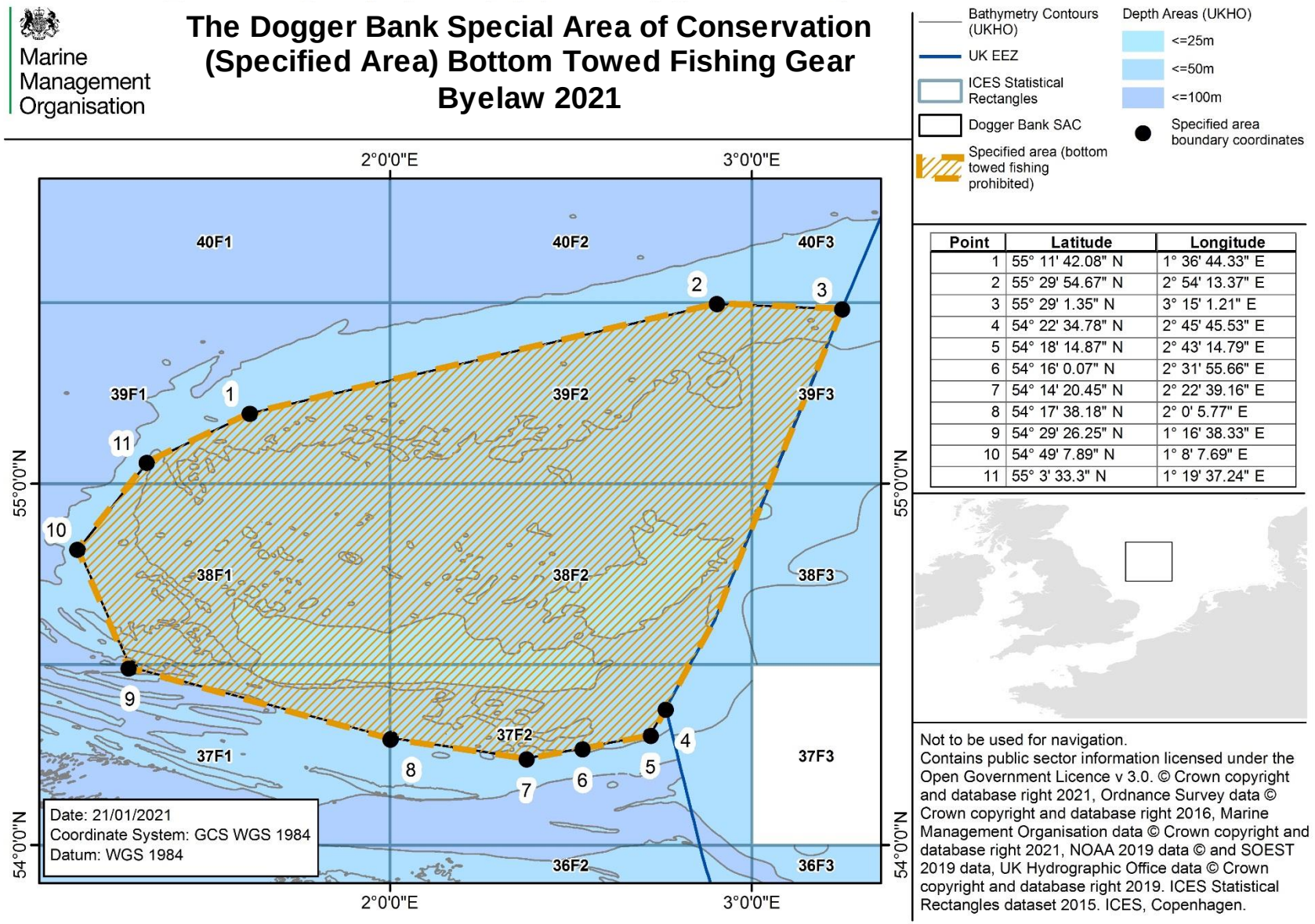
- VMS and landings data for vessels from 2014 to 2019 taken from entered logbook and sales note data provided to MMO;
- VMS data for boat (scallop) dredge activity and corresponding ICES rectangle boat (scallop) dredge landings data (March to July 2020);
- Data from Seafish annual economic performance for the UK fishing fleet from 2014 to 2018[7];
- Information gathered by the MMO during the call for evidence October to December 2020; and
- Local MMO marine officer knowledge.

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; and,
- environmental impacts related to possible increased damage to habitats or species outside of the management area due to displacement.

[7] https://public.tableau.com/profile/seafish#!/vizhome/FleetEnquiryTool/1Overview

Figure 2: The proposed management area for Dogger Bank SAC



Point	Latitude	Longitude
1	55° 11' 42.08" N	1° 36' 44.33" E
2	55° 29' 54.67" N	2° 54' 13.37" E
3	55° 29' 1.35" N	3° 15' 1.21" E
4	54° 22' 34.78" N	2° 45' 45.53" E
5	54° 18' 14.87" N	2° 43' 14.79" E
6	54° 16' 0.07" N	2° 31' 55.66" E
7	54° 14' 20.45" N	2° 22' 39.16" E
8	54° 17' 38.18" N	2° 0' 5.77" E
9	54° 29' 26.25" N	1° 16' 38.33" E
10	54° 49' 7.89" N	1° 8' 7.69" E
11	55° 3' 33.3" N	1° 19' 37.24" E

4.5. Costs to the fishing industry have been monetised and these estimated values have been collated and presented as part of this RTA (Table 4).

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 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.

4.8. The benefits associated with the proposed management are difficult to value and are therefore described here as non-monetised costs.

Costs to the UK fishing industry

4.9. 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.

4.10. To estimate the economic impacts of the proposed management, fishing patterns of vessels using bottom towed gear within the proposed management area were analysed. The most recent six years of VMS data available (2014-2019) was used for this analysis (Figure 3 - Figure 8).

4.11. Little to no dredging activity occurred in the proposed management area during this time, however during the spring of 2020 a scallop stock was discovered, part of which was within the Dogger Bank SAC. The stock was then subject to a temporary closure of the area to allow data gathering and better understanding of the shellfish stock. VMS data and landings information is available for UK scallop dredging activities (mid-March to the end of July 2020) (Figure 9). These data have therefore been included in the economic impact assessment.

4.12. VMS data indicate that there is considerable bottom towed gear fishing occurring within the proposed management area from vessels of 12 m length or more (Figure 3- Figure 8).

4.13. The VMS data show 64 different UK bottom towed gear vessels travelling at fishing speed in the Dogger Bank SAC proposed management area between 2014 and 2019. However, the majority of these were not regular visitors with approximately 56% (36 vessels) averaging less than one fishing record per month and many (33% or 21 vessels) with less than 1 record per year between 2014 and 2019.

4.14. The 2014-2019 UK VMS landings data also show a shift in gear use with landings in 2014 and 2015 being shared approximately equally between beam trawls and bottom otter trawls. However, from 2015 onwards landings derived from beam trawls decline considerably while landings from bottom otter trawls increase (Table 2).

4.15. For UK vessels, landings data is linked to VMS fishing records through electronic logbooks. The landings data derived from VMS data reveal that between 2014 and 2019, 29 vessels have landings data linked to their fishing activity within the Dogger Bank SAC proposed management area. This aligns with the analysis of paragraph 4.13 that suggests of the 64 vessels with recorded fishing activity in the site, approximately half are not frequent visitors and are unlikely to be substantially impacted by the proposed closure.

4.16. The 29 vessels with recorded bottom towed gear landings between 2014 and 2019 landed approximately 13,500 tonnes of fish and shellfish in the management area (Table 1) worth nearly £19.5 million (Table 2).

4.17. Between 2014 and 2019 bottom towed gear landings from the management area averaged 2,253 tonnes (£3,201,415) but have ranged from 530 tonnes (£804,999) in 2019 to 3,575 tonnes (£4,589,969) in 2015 (Table 1 and Table 2).

4.18. The VMS data available for 2020 dredging activities reveal an additional 30 UK vessels active in the proposed management area. All of these vessels recorded landings using boat dredges in the ICES rectangles intersecting with the proposed management area but these have not as yet been linked to each vessel's VMS data.

4.19. Estimates of boat dredge landings were made using the landings recorded for ICES rectangles and the proportion of VMS fishing activity in that ICES rectangle which overlaps with the proposed management area (Table 3). It is estimated the 30 scallop dredgers landed approximately 1,700 tonnes of fish and shellfish worth £2.8 million between 15 March 2020 and 30 July 2020 within the proposed management area (Table 3).Landings again vary between vessels. As landings are not as yet linked to the VMS data, figures for individual vessels cannot currently be provided for the proposed management area. However, over the eight ICES rectangles with 2020 data available, landings per vessel ranged from approximately £9,500 and £290,000 in the four and half month period.

4.20. Extrapolated over 12 months, the scallop fishing in the proposed management area is estimated to be worth approximately £7.4 million from 4,500 tonnes of landings. However, this is likely to be a considerable overestimate as it is far from certain that the stock will be able to endure such intense activity over a sustained period of time.

4.22. The closure of fishing grounds can lead to significant displacement of fishing effort which can result in various costs (see non-monetised costs section below). 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 high, as detailed by VMS data. The prohibition of bottom towed gears within the management area is therefore likely to lead to considerable displacement of fishing activity, however it is not possible to accurately predict the location (and thus the associated environmental costs) of displaced fishing activity. The potential impact of displacement does not remove the requirement to ensure that fishing is managed to further the conservation objectives of the site.

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 Dogger Bank SAC.

Estimates of fisheries landings values by non-UK vessels using bottom towed gear were determined using landings data provided by the European Commission Scientific, Technical and Economic Committee for Fisheries (STECF) for the eight ICES rectangles over which Dogger Bank SAC overlaps (Figure 1) and the proportion of VMS fishing activity occurring in Dogger Bank SAC management area for those eight rectangles. This provided an estimate of non-UK bottom towed gear landings derived from the proposed management area for each rectangle for the years 2014 – 2018 (2019 data is not currently available).

Between 2014 and 2018, an annual average of approximately £5,214,102 was estimated to be derived from the proposed management area by non-UK vessels using bottom towed gear. Annual landings derived from the proposed management area by non-UK vessels using bottom towed gear were £5,906,917 in 2014, £8,683,250 in 2015, £2,345,254 in 2016, £4,946,350 in 2017 and £4,188,738 in 2018.

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 £43,363,628.

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.

Figure 3: 2014 VMS UK and non-UK fishing activity by gear type in Dogger Bank SAC

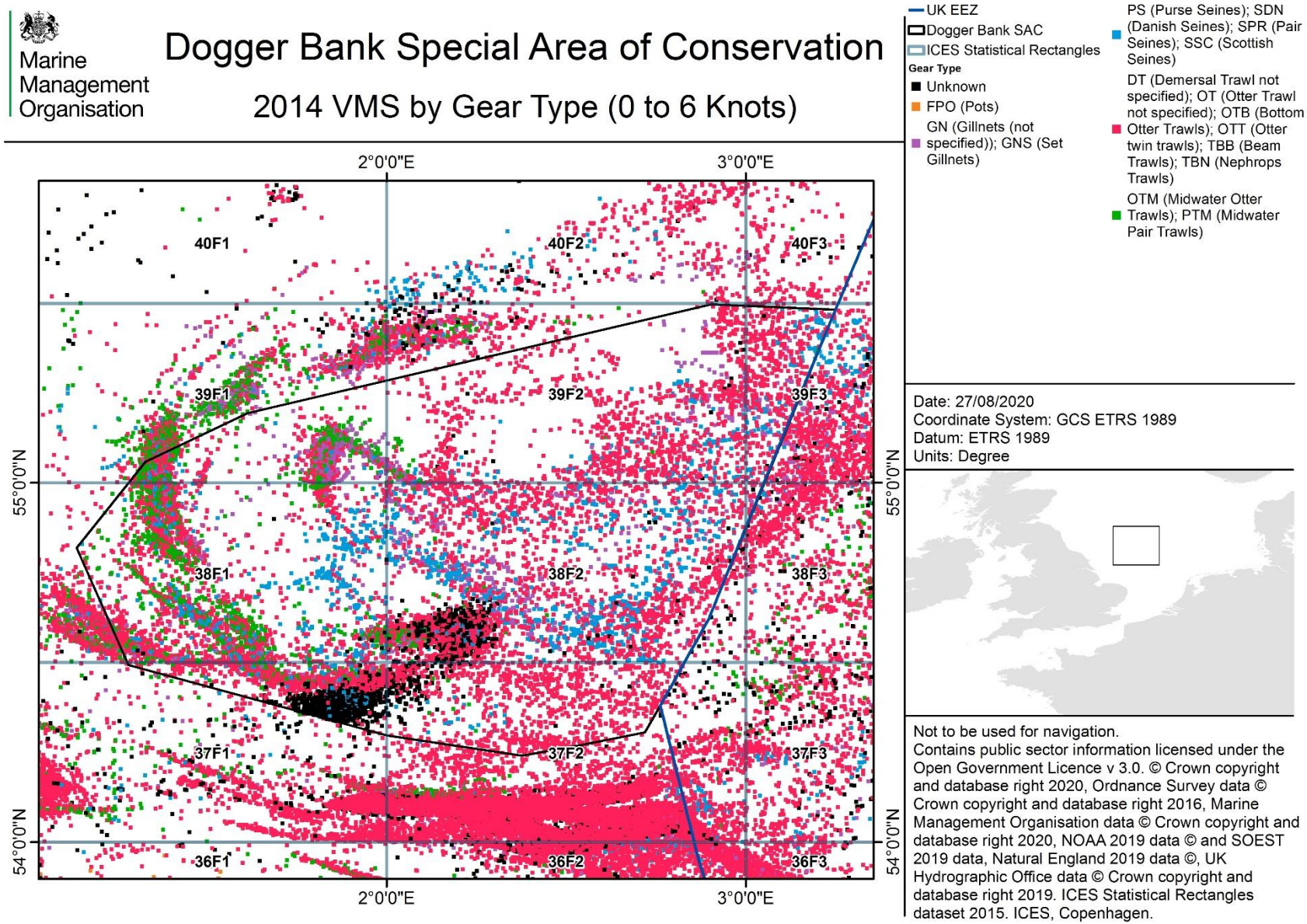


Figure 4: 2015 VMS UK and non-UK fishing activity by gear type in Dogger Bank SAC

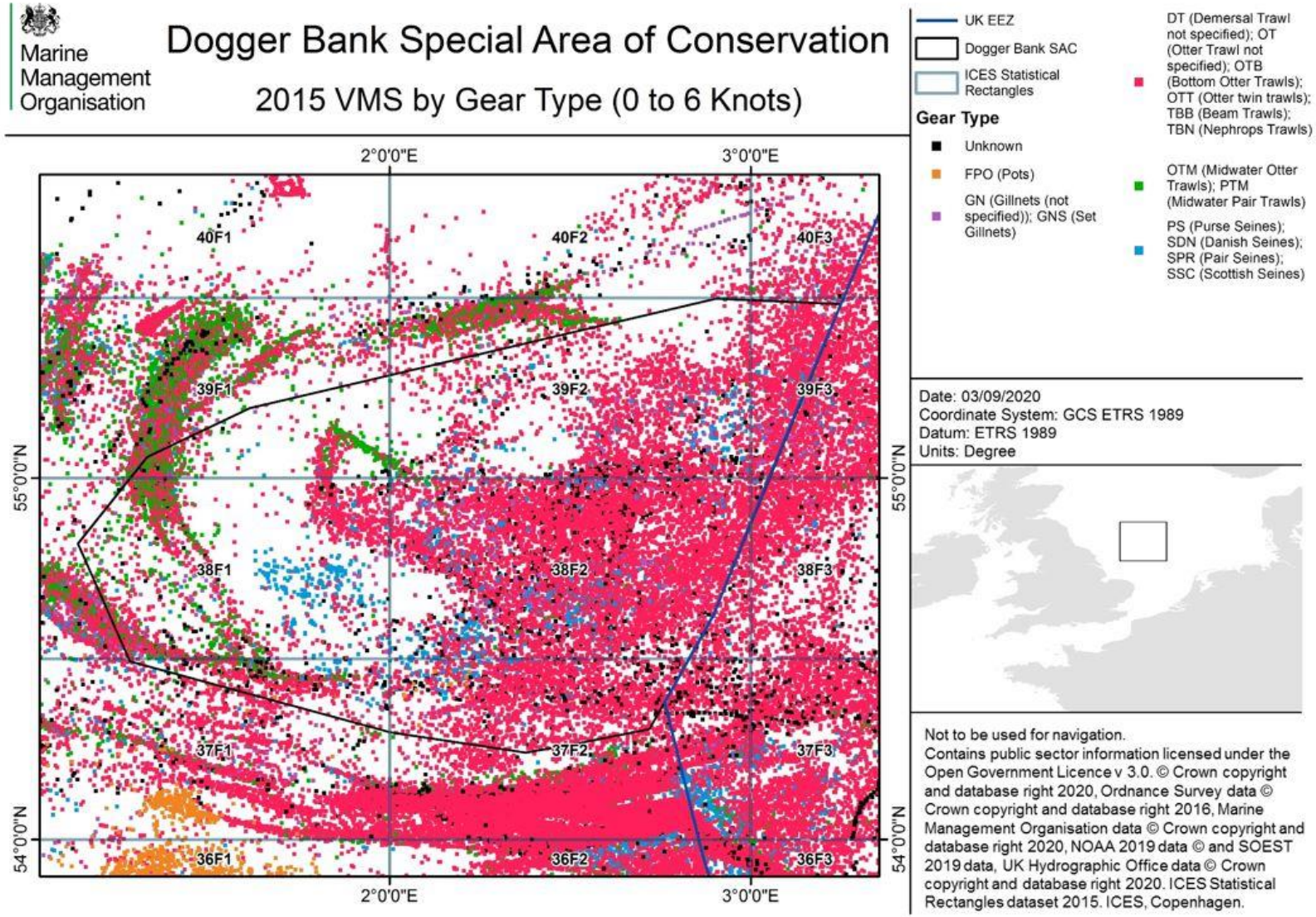


Figure 5: 2016 VMS UK and non-UK fishing activity by gear type in Dogger Bank SAC

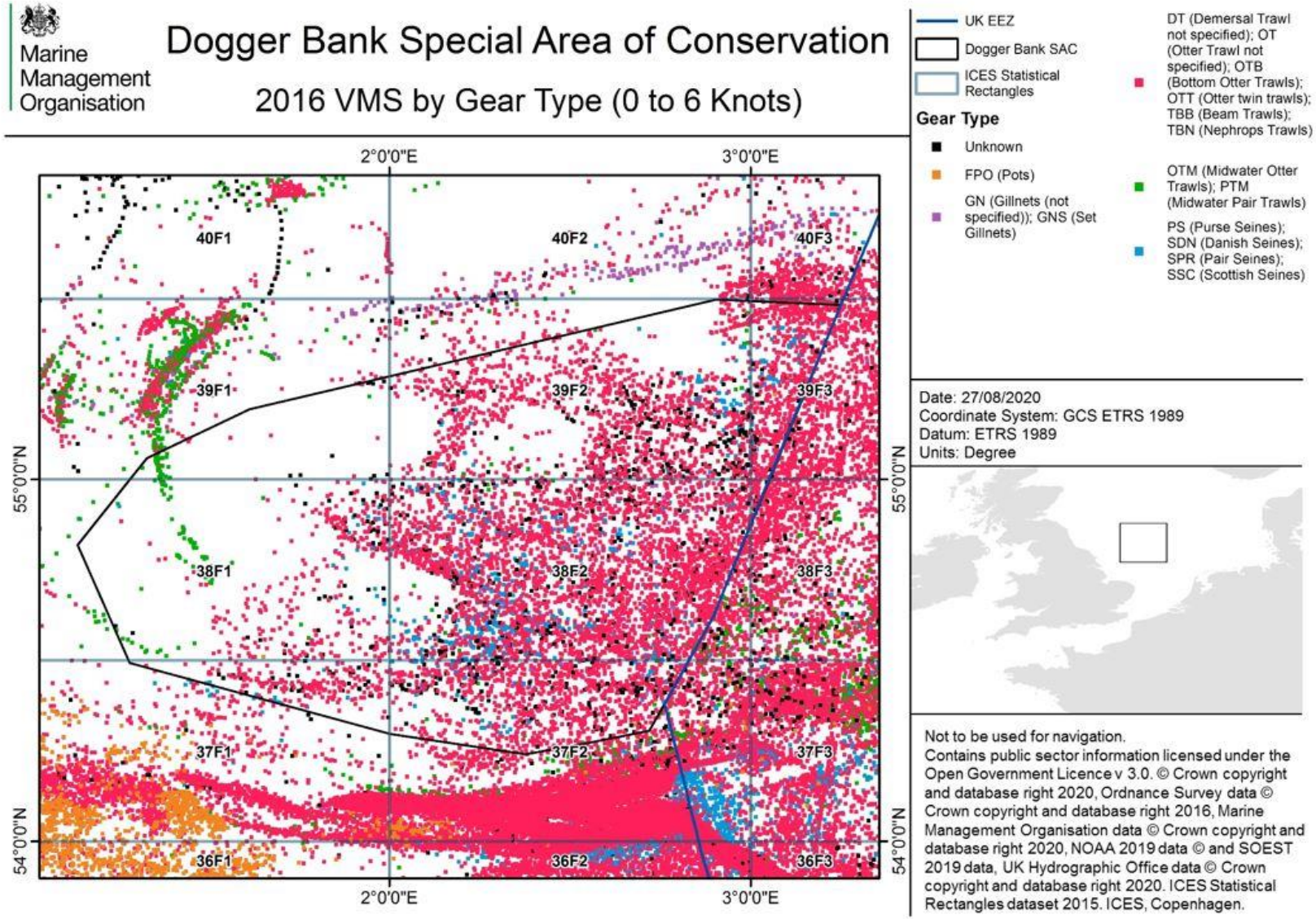


Figure 6: 2017 VMS UK and non-UK fishing activity by gear type in Dogger Bank SAC

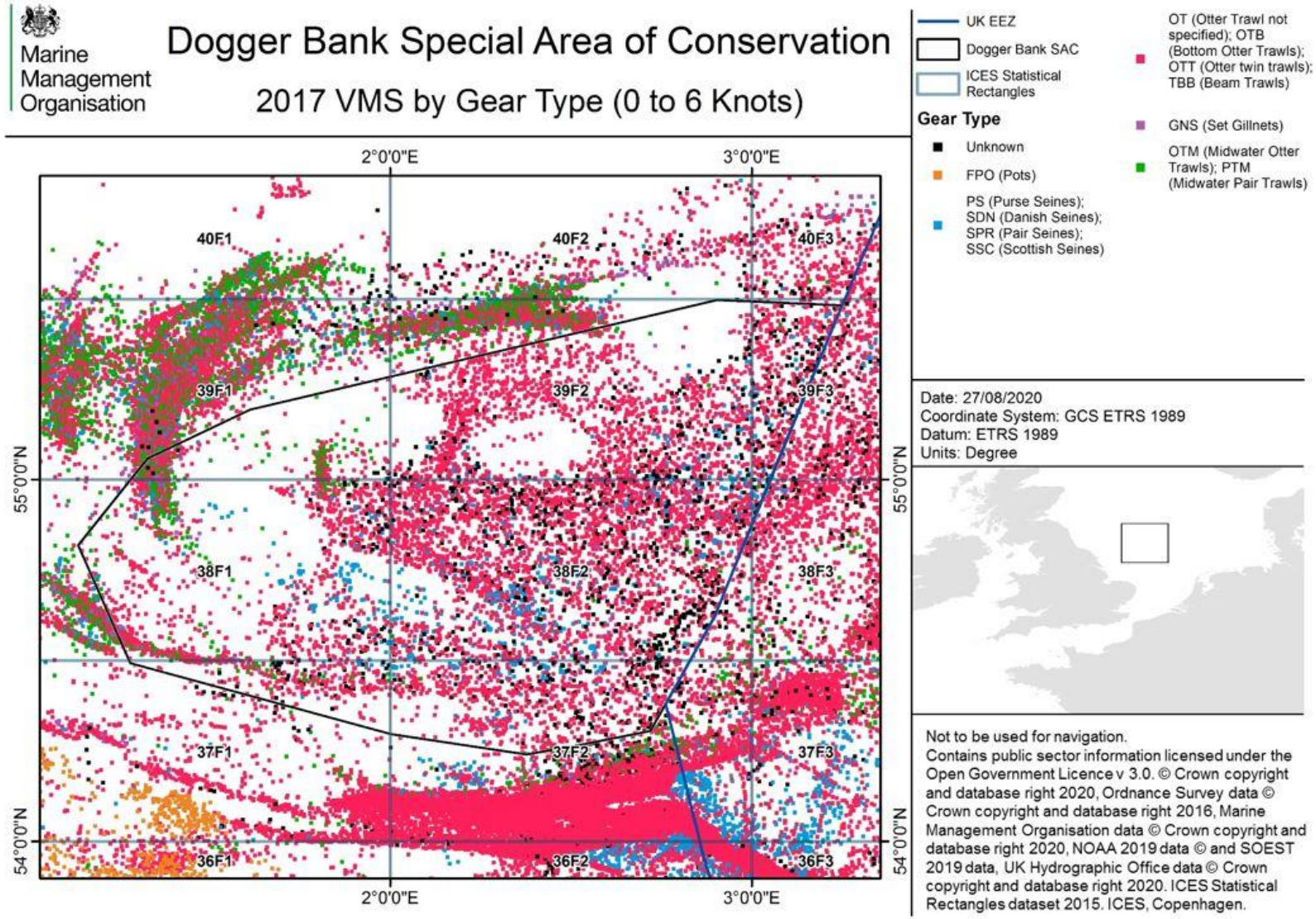


Figure 7: 2018 VMS UK and non-UK fishing activity by gear type in Dogger Bank SAC

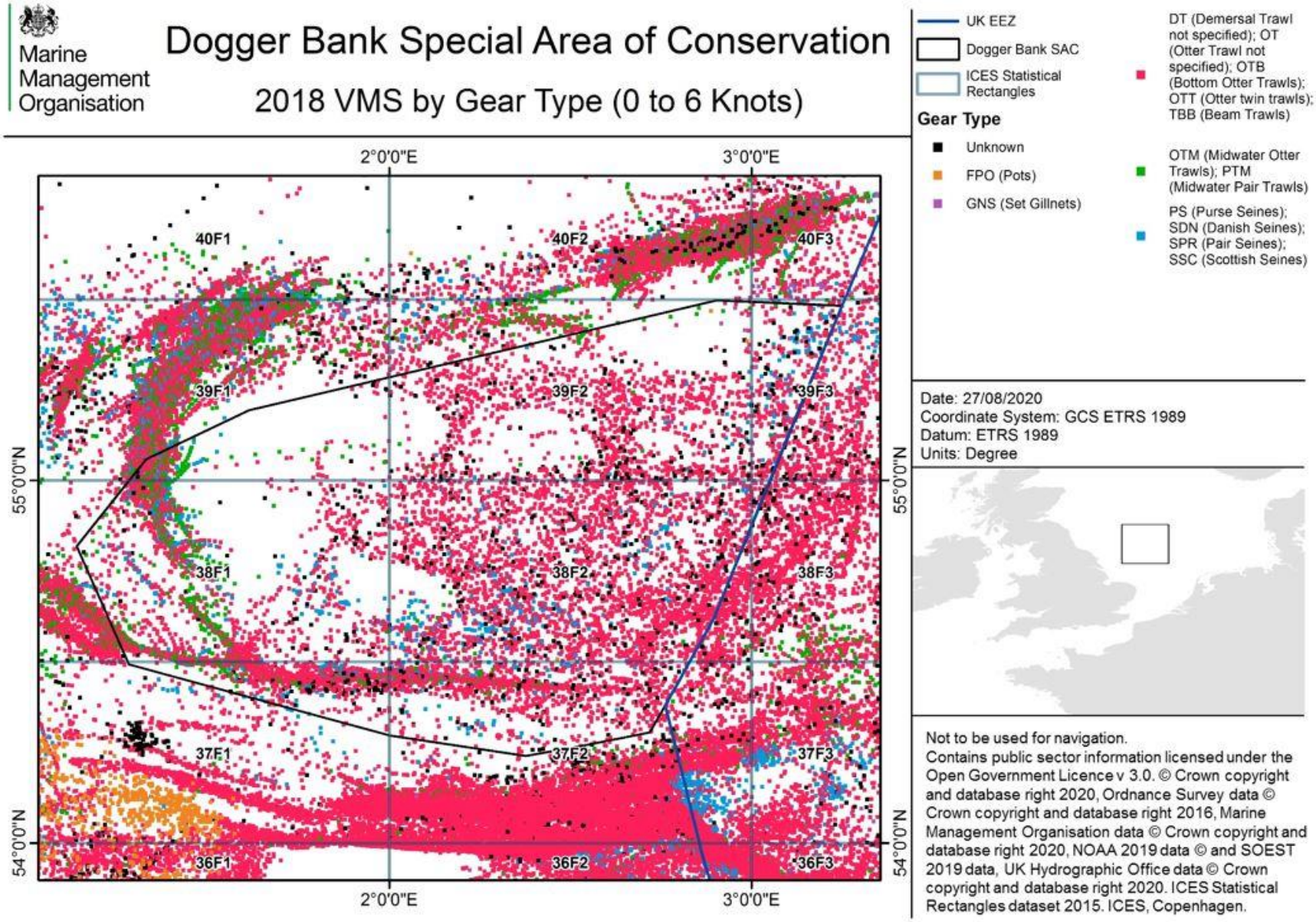


Figure 8: 2019 VMS UK and non-UK fishing activity by gear type in Dogger Bank SAC

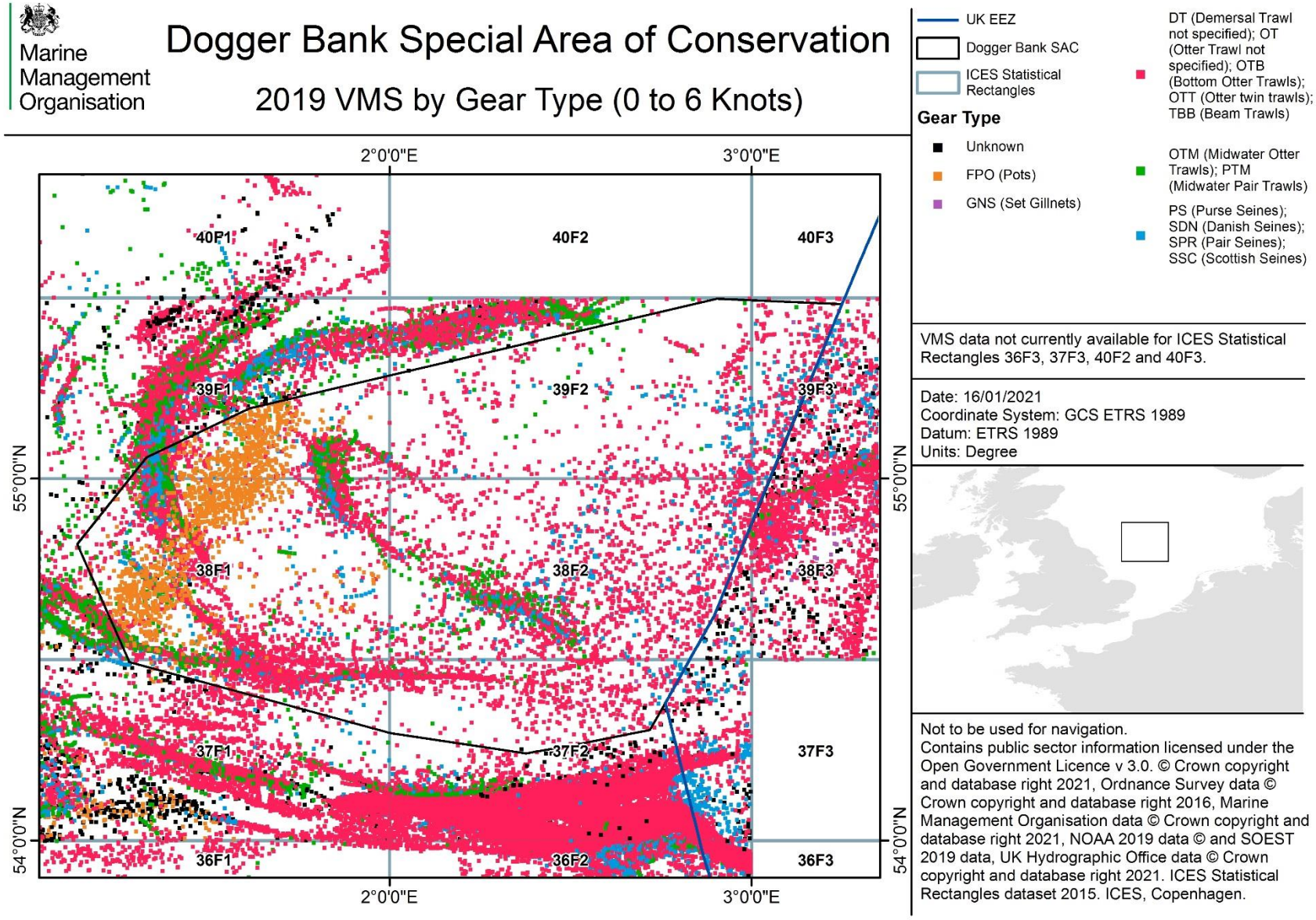
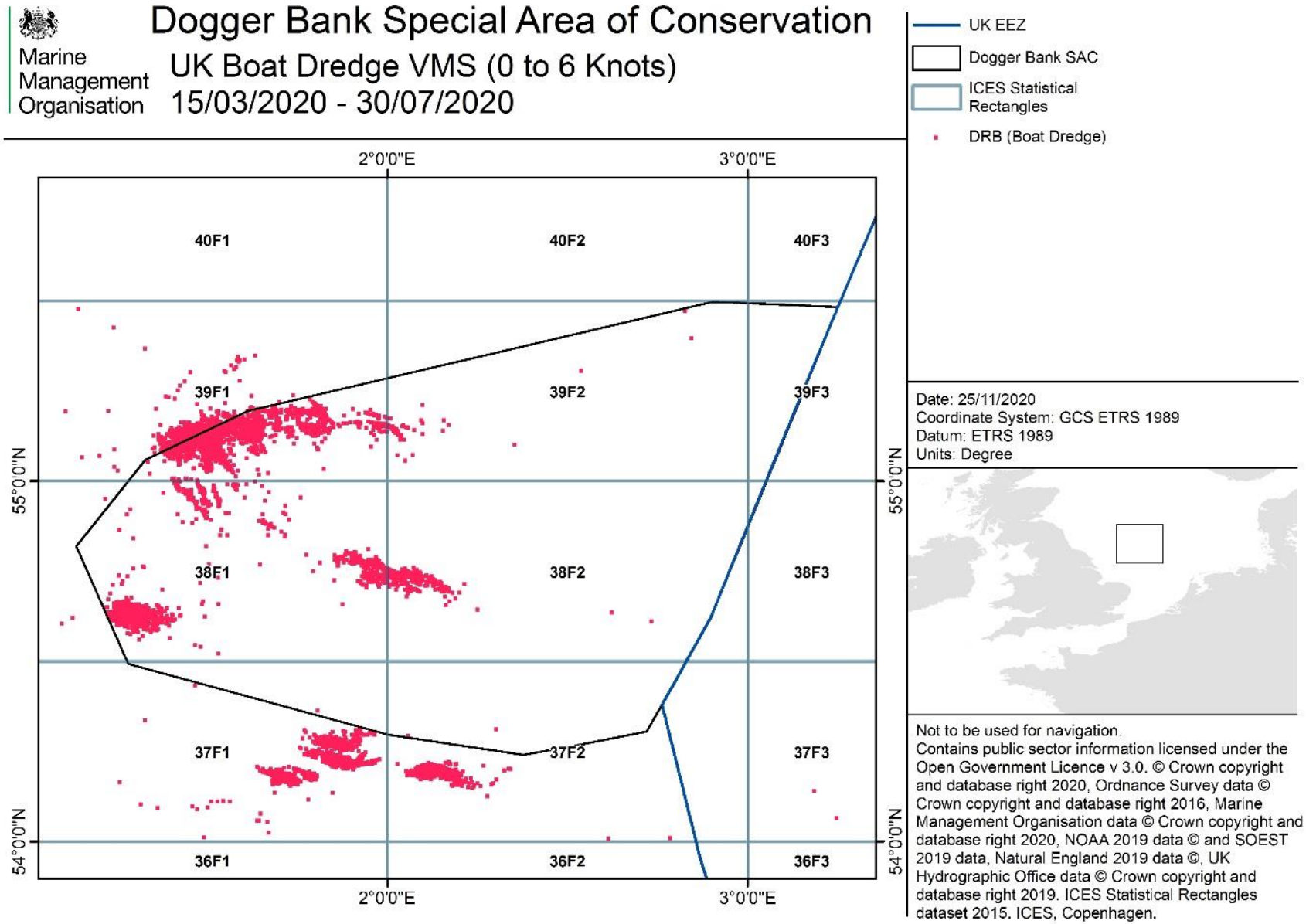


Figure 9 UK boat dredge VMS Fishing Activity in Dogger Bank SAC between 15 March and 30 July 2020



Compliance costs

4.23. MMO compliance action is intelligence-led and risk-based in accordance with the National Intelligence Model[8]. 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 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 2006[9] and the Regulators' Code[10] and aim to ensure that the MMO is proportionate, accountable, consistent, transparent and targeted in any compliance action it takes.

4.24. 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

4.25. The economic impacts of the proposed management are estimated as the loss of profitability of fishing effort at the site. This is informed by data from the MMO on potential activity within the area and from the 2014-18 Seafish data on the profitability of fishing[11]. 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 actively fishing within the management area provided by the MMO.

4.26. Seafish profitability statistics are not available for 2019 or 2020 and therefore the average operating profit margin between 2014 and 2018 has been used as a proxy to determine the cost of the proposed management on the boat dredge (15.96%) and bottom towed gear fleet (8.82%).

4.27. To estimate the total monetised cost over ten years for the 29 vessels likely to be affected, an estimation has been made of the annual value of their bottom towed gear landings derived from the proposed management area (Table 2 and Table 3) and the estimated operating profit earned from these landings as provided by Seafish.

4.28. Given the recent boat dredging activity that had not occurred in the 2014-2019 VMS, a 2020 extrapolated value and operating profit of boat dredge activity has been added to the annual average value and operating profit of bottom towed gear landings between 2014-2019 in order to estimate an updated annual average value and operating profit of all bottom towed gear fishing activity in the proposed management area (Table 4).

[8] Association of Chief Police Officers (2005) Guidance on the national intelligence model.
[9] https://www.legislation.gov.uk/ukpga/2006/51/contents
[10] https://www.gov.uk/government/publications/regulators-code
[11] https://public.tableau.com/profile/seafish#!/vizhome/FleetEnquiryTool/1Overview

- 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 net 2020 present value cost over ten years to the UK fishing industry of introducing management is estimated to be £12,405,107

Table 1: 2014 – 2019 UK landings (metric tonnes) from bottom towed gear in Dogger Bank SAC management area (OTB – Bottom Otter Trawl; OTT – Twin Otter Trawl, TBB – Beam Trawl, SDN – Danish Seine, SSC - Scottish Seine). No landings were recorded for other bottom towed gears (derived from UK VMS).

Year	GEAR					
	OTB	OTT	SDN	SSC	TBB	Total landings
2014	879	122	211	67	1,104	2,382
2015	1,717	117	117	-	1,625	3,575
2016	2,182	313	-	-	591	3,086
2017	2,091	377	-	-	230	2,699
2018	984	199	-	-	64	1,247
2019	428	83	-	1	19	530
Annual average	1,380	202	164	34	606	2,253

Table 2: 2014 – 2019 UK landings by value (£) and operating profit (£) from bottom towed gear in Dogger Bank SAC management area (OTB – Bottom Otter Trawl; OTT – Twin Otter Trawl, TBB – Beam Trawl, SDN – Danish Seine, SSC - Scottish Seine). No landings were recorded for other bottom towed gears (derived from UK VMS). As 2019 profit data is not currently available the average operating profit percentage from 2014-2018 (8.82%) has been used to estimate the operating profit for the landings obtained in 2019.

Year	GEAR					Total landings	Operating Profit
	OTB	OTT	SDN	SSC	TBB		
2014	1,112,129	149,705	262,747	75,430	1,337,816	2,936,669	89,734
2015	2,022,634	137,337	129,520	-	2,300,480	4,589,969	514,905
2016	3,148,414	431,483	-	-	817,334	4,397,231	689,251
2017	2,872,378	582,992	-	-	317,604	3,772,974	465,571
2018	2,094,176	488,025	-	-	124,450	2,706,650	49,105
2019	661,410	107,229	-	2,106	34,253	804,999	71,004
Annual average	1,985,190	316,128	196,133	38,768	821,989	3,201,415	313,262

Table 3: **Landings by live weight (tonnes), value (£) and profit (£) (using 15.96% average operating profit margin) derived from boat dredges (DRB) in the Dogger Bank SAC proposed management area (PMA) in the 4.5 month period between 15th March 2020 and 30 July 2020. Profit (total weight and value figures are calculated using the sum of each rectangle data).**

			No. of VMS pings indicative of fishing	% of fishing pings in PMA	Live Weight	Value	Profit
ICES Rectangle	37F1	Rectangle	1,677		172.37	336,676	53,734
		PMA	1	0.06%	0.10	201	32
	37F2	Rectangle	526		14.42	29,536	4,714
		PMA	2	0.38%	0.05	112	18
	38F1	Rectangle	1,127		437.50	702,923	112,186
		PMA	1,124	99.73%	436.34	701,051	111,888
	38F2	Rectangle	407		128.64	187,583	29,938
		PMA	407	100%	128.64	187,583	29,938
	39F1	Rectangle	3,010		1,426.59	2,350,016	375,063
		PMA	2,360	78.41%	1,118.53	1,842,538	294,069
	39F2	Rectangle	52		23.63	37,182	5,934
		PMA	52	100%	23.63	37,182	5,934
	39F3	Rectangle	1		0.00	0	0
		PMA	0	0%	0.00	0	0
Total		All rectangles	6,800		2,203	3,643,917	581,569
		PMA	3,931	58%	1,700	2,756,957	441,879

Table 4. Updated bottom towed gear costs for Dogger Bank SAC proposed management area (BTG = Bottom Towed Gear, DRB = Boat dredge)

Extrapolated 2020 DRB value profit (£)	Annual average BTG profit 2014-2019 (£)	Estimated annual BTG value including DRB activity
1,178,345	313,262	1,491,607

Non-monetised costs

4.29. The prohibition of bottom towed gears from the Dogger Bank SAC could lead to displacement of fishing activities to sensitive habitats elsewhere in the North Sea. Displacement of fishing to other sensitive habitats could therefore reduce the overall conservation benefits of Option 1 (Hiddink *et al*., 2006). However, the location (and thus the associated environmental costs) of displaced fishing activity is unclear. The MMO fisheries assessment of Dogger Bank SAC indicates that bottom towed gears are adversely affecting the sandbank feature. As such, the potential impact of displacement to areas outside of Dogger Bank SAC does not remove the requirement to ensure that

fishing is managed to further the conservation objectives of the Dogger Bank SAC.

Non-monetised benefits

4.30. Prohibition of bottom towed gears from the Dogger Bank SAC will contribute to the protection of the qualifying sandbank feature, helping achieve the site's conservation objectives. This in turn will protect the ecosystem services provided by the designated feature/sub-features (Fletcher *et al*., 2012):

- Biomass production – primary and secondary production (food provision for commercially viable species such as sandeels, *Ammodytes* spp.).
- Larval/gamete supply – an important nursery area for fish, including commercially viable species such as plaice *Pleuronectes platessa*, and the recruitment of polychaetes and crustaceans.
- Increased biomass stock is a factor in increased breeding success of mobile species such as seabirds, turtles and pinnipeds and is a vital food source (Carroll *et al*., 2017; Wakefield *et al*., 2017).
- Food web dynamics – large numbers of sandeels at the site are an important food source for seabirds and marine mammals, including grey seals *Halichoerus grypus*, common seals *Phoca vitulina* and harbour porpoises *Phocoena phocoena*, which are all Annex II species. Approximately 52% of Dogger Bank SAC overlaps with the Southern North Sea SAC (designated to protect harbour porpoise). The sandeels may also provide an important food source for breeding populations of black-legged kittiwakes *Rissa tridactyla* (Carroll *et al*., 2017).
- Less disturbance to common skate and angelshark (both critically endangered) and Atlantic halibut (endangered), plus native oysters.
- Will increase sea-floor integrity and food webs.
- Formation of species habitat – Dogger Bank SAC is unique for a UK sandbank in containing substantial areas of coarse sediments, which provides habitat for species not normally found in UK sandbanks, such as burrowing sea urchins *Echinocardium cordatum* and dead man's fingers *Alcyonium digitatum* (Diesing *et al*., 2009).
- Species diversification – the site's coarse sediments increase species richness by providing micro-niches for infaunal species including polychaetes. The sub-features also support an array of epifaunal assemblages, including commercial species such as plaice and sole *Solea solea* (Diesing *et al*., 2009).
- Biogeochemical cycling – carbon preservation and remineralisation processes occurring in the upper layers of marine sediments have an important role in global carbon and nitrogen cycling. Anthropogenic sediment reworking has a sizeable impact on the carbon cycle and mineralisation in cohesive sediments on continental shelves (van de Velde *et al*., 2018).
- Reduced trawling may help maintain sediment nutrient fluxes. Observations within the North Sea confirm that bottom trawling reduces the density of bioturbators, whose activity can determine if the seabed acts as a source or sink of nitrogen nutrients (Olsgard *et al*., 2008).

- Continue to help act as an important site for carbon storage, reducing carbon being released from the seabed (Luisetti *et al*., 2019)
- Bioremediation of waste - the removal and metabolism of pollutants through storage and burial.
- Contribution to UK MPA network - Dogger Bank SAC comprises more than 70% of the UK's Annex I sandbank resource, and thus the site is particularly important in terms of its contribution as part of an ecologically coherent network of well-managed MPAs (JNCC, 2013).
- Research / education – this area is included in SCANS (Small Cetaceans in European Atlantic waters and the North Sea) international projects mapping the distribution and abundance of small cetaceans in the North Sea (e.g. Hammond *et al*., 2017). The area is also subject to studies of fisheries impacts (Centre for Environment, Fisheries and Aquaculture Science, CEFAS, 2007), the possible role of the site in climate change mitigation (Hannis *et al*., 2013) and a range of academic research (e.g. Callaway *et al*., 2002; Diesing *et al*., 2009).

Recommended Management Option

Following the above assessment, the recommended management option is Option 1: MMO byelaw to prohibit bottom towed gears over entire sandbank feature with appropriate buffering (whole site prohibition).

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