

Regulatory Triage Assessment

Title of measure	Dogger Bank Special Area of Conservation (Specified Area) Bottom Towed Fishing Gear Byelaw 2022
Lead Department/Agency	Marine Management Organisation (MMO)
Expected date of implementation	June 2022
Origin	Domestic
Date	04/03/2022
Lead Department 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 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 aims 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 to bottom towed gears).

Option 2. 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. No statutory restrictions. Introduce 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 (vessel monitoring system and landings data) indicates that 23 distinct UK bottom towed gear fishing vessels have recorded fisheries landings from the management

area from 2016 to 2019, and thus would be directly affected by the management area. On average over this time period, 16 distinct 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 £4,127,885 (2020 present value). This includes an equivalent annual net direct cost to business (EANDCB) of £479,558 (2020 present value). This is based on analysis of fishing activity data (VMS and landings data) from 2016 to 2019. Significant scallop landings were recorded from this site for the first time from March to July 2020. However, the figures provided are likely to be a considerable overestimate because it is very unlikely that scallop landings at the scale recorded from March to July 2020 could be maintained over the long-term. Similarly, the COVID-19 pandemic is likely to have suppressed fishing activity in 2020. As a result, 2020 fishing activity is unlikely to be representative of a typical year. As such 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 environmental impacts of displaced fishing activity on habitats/areas outside of the SAC and indirect costs to the fishing industry associated with displacement to other fishing grounds.

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 its 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: -£4,127,885
- Estimated Business Net Present Value: -£4,127,885
- Estimated Equivalent Annualised Net Costs to Business: £479,558
- Appraisal period: 10 years
- The Price Base Year and Present Value Base Year: 2019 and 2020
- **BIT status/score: 2.4**

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 - 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.

Supporting evidence

1. The policy issue and rationale for Government intervention

- 1.1. MMO have legal obligations in relation to European marine sites (EMS) including special areas of conservation (SAC). Specifically, under the Conservation of Offshore Marine Habitats and Species Regulations 2017, Regulation 6 to secure compliance with the requirements of the Habitats Directive. Of particular relevance to marine conservation is section 6(2): to avoid the deterioration of habitats and disturbance of designated species. This includes the implementation of byelaws to manage fishing activities to support the conservation objectives of EMSs such as the Dogger Bank 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. MMO has undertaken an assessment of the impact of fishing in Dogger Bank SAC. 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 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. Figure 1 shows the boundary of the Dogger Bank SAC. The designated sandbank feature extends throughout the entire site. Figure 1 also shows the different types of sediment which make up the sandbank feature.
- 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 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

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>

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 as 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 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.

1.5. 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 the qualifying habitat of 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 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).

1.7. Dogger Bank SAC lies within the East Marine Plan Area. The East Marine Plan³ was adopted in 2014. The decision to introduce the Dogger Bank Special Area of Conservation (Specified Area) Bottom Towed Fishing Gear Byelaw 2022 has been made in accordance with the East Marine Plan.

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

1.8. 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
- Policy SOC1
- Policy TR1
- Policy TR3

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

1.10. In creating the Dogger Bank Special Area of Conservation (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 2010⁴.

2. Policy objectives and intended effects

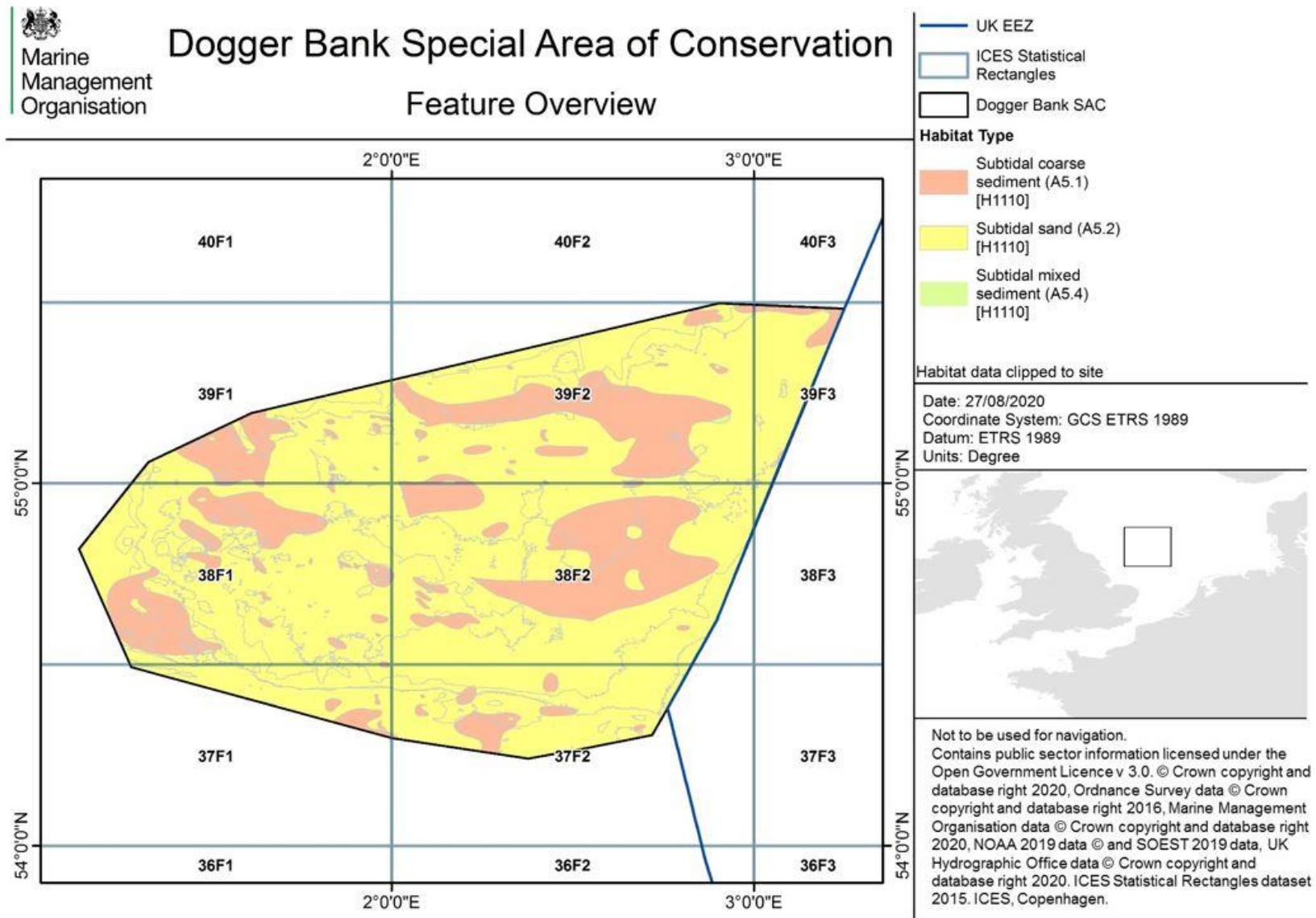
2.1. The policy objective pertinent to this RTA is to prevent adverse effects to site integrity of Dogger Bank SAC by ensuring that the protected feature: Sandbanks slightly covered by seawater all of the time (Figure 1); is safeguarded against the risk of damage from bottom towed gears.

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 Regulations 2017.

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

⁴ <https://www.legislation.gov.uk/ukxi/2010/1627/contents/made>

Figure 1: Dogger Bank SAC 'sandbanks which are slightly covered by seawater all of the time' (H1110)



3. Policy options considered, including alternatives to regulation

- 3.1. The Dogger Bank Special Area of Conservation (Specified Area) Bottom Towed Fishing Gear Byelaw 2022 will 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 measures. 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 Regulations 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 to bottom towed gears).

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 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 2009⁵ (including the powers for the English offshore region introduced by the Fisheries Act 2020⁶) are the most appropriate mechanism, providing the appropriate level of power, flexibility, consultation, and speed.

⁵ <https://www.legislation.gov.uk/ukpga/2009/23/contents>

⁶ <https://www.legislation.gov.uk/ukpga/2020/22/contents/enacted>

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 principles⁷, 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 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.
- 3.3. The boundaries of the management area 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. 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.

4. Expected level of business impacts

- 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:
 - Estimates of UK landings derived from within the management area have been provided for the most recent five years available (2016 to 2020). Bottom towed gear landings information is determined from electronic logbooks and apportioned evenly to vessel monitoring system (VMS) fishing records for the corresponding date and ICES rectangle. Therefore, it may not represent the true landings associated with each fishing record.
 - VMS data assumes fishing activity from the 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.).
 - 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 the Dogger Bank SAC 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

⁷https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/317555/betterregulationassessment2014.pdf

Dogger Bank SAC and therefore costs are estimated only for fishing vessels greater than 12 m.

- Costs estimated for 2020 are unlikely to be representative of typical fishing activity due to the COVID-19 pandemic, which likely suppressed fishing activity, and the occurrence of scalloping activity at likely unsustainable intensity levels. As a result, only figures from the years 2016 to 2019 have been used for economic impact calculations. Landings derived from scalloping activity in 2020 were derived from a small window of very high intensity activity. Cefas (Silva et al., 2021) have determined that the Offshore North scallop stock, where the majority of fishing activity occurred in 2020, has low larval retention compared to other areas and linkages between coastal scallop beds is relatively weak. As a result, the scallop stock in this area is likely to have low resilience to fishing and the intensity of activity seen in 2020 is unlikely to maintain a viable stock.
- Economic costs are estimated using the 2016 to 2019 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 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 the lost revenue by fishing in other areas.

4.3. Information used to assess the impacts of the management measures has been taken from:

- VMS and landings data (Table 1) for vessels from 2016 to 2019 taken from entered logbook and sales note data provided to MMO;
- Data from Seafish annual economic performance for the UK fishing fleet from 2016 to 2020⁸;
- Information gathered from stakeholders by MMO during the call for evidence October to December 2020 and formal consultation from 1 February to 28 March 2021; and

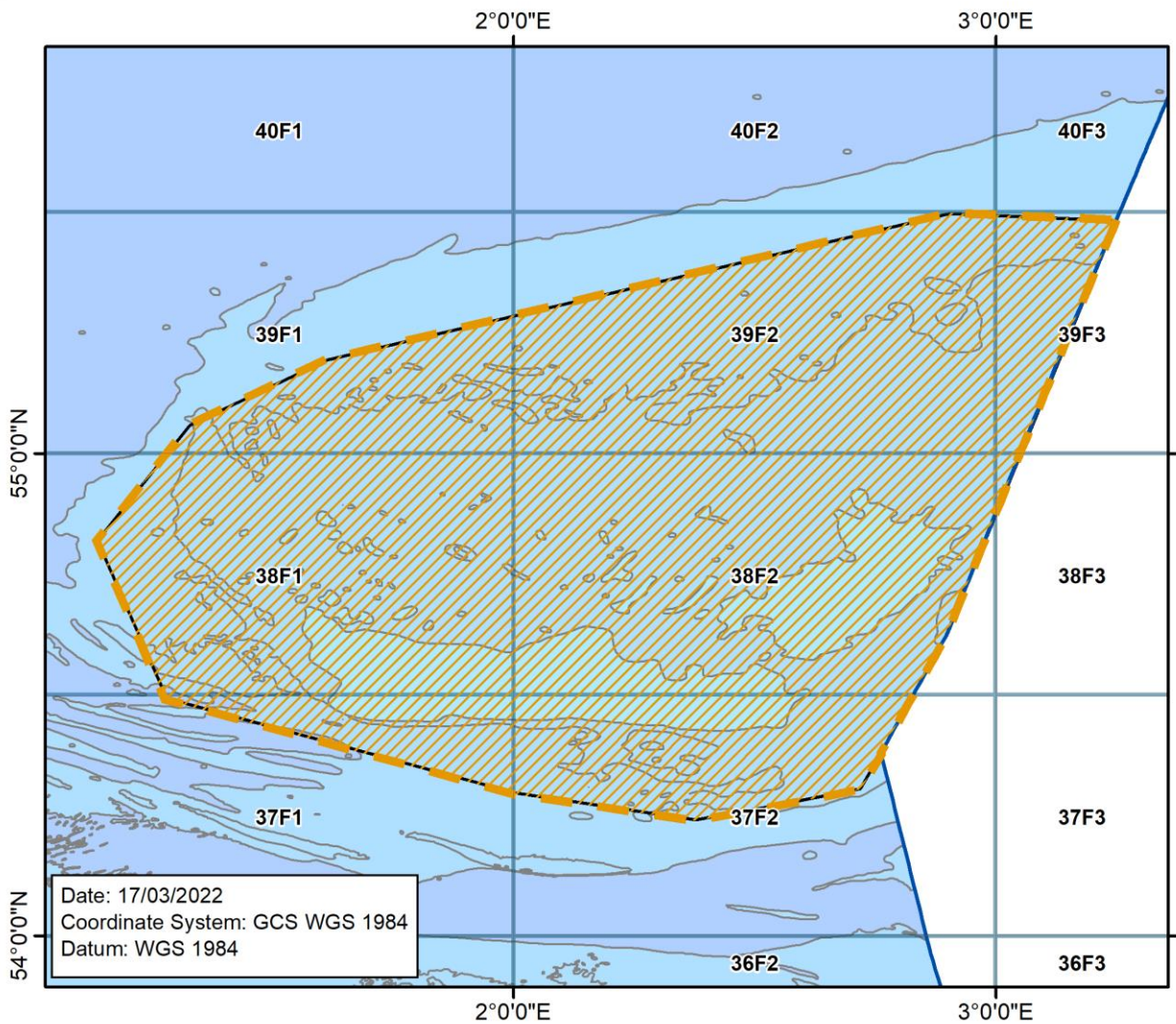
⁸ <https://public.tableau.com/profile/seafish#!/vizhome/FleetEnquiryTool/1Overview>

- 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; and
 - environmental impacts related to possible increased damage to habitats or species outside of the management area due to displacement.
- 4.5. Direct costs to the fishing industry have been monetised and these estimated values have been collated and presented as part of this RTA (Table 2).
- 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.

Figure 2: The management area for Dogger Bank SAC

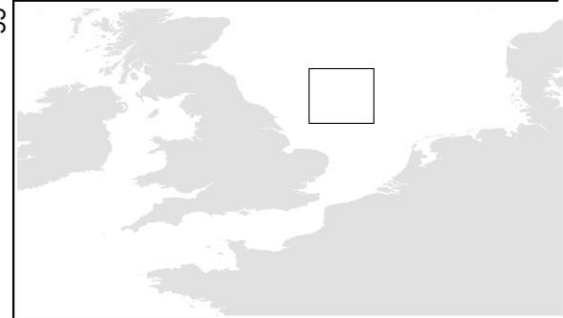


Dogger Bank Special Area of Conservation (Specified Area) Bottom Towed Fishing Gear Byelaw 2022



Date: 17/03/2022
Coordinate System: GCS WGS 1984
Datum: WGS 1984

- Bathymetry Contours (UKHO)
 - UK EEZ
 - ICES Statistical Rectangles
 - Dogger Bank SAC
 - Specified area (bottom towed fishing prohibited)
- Depth Areas (UKHO)**
- <=25m
 - <=50m
 - <=100m



Not to be used for navigation.
Contains public sector information licensed under the Open Government Licence v 3.0. © Crown copyright and database right 2022, Ordnance Survey data © Crown copyright and database right 2016, Marine Management Organisation data © Crown copyright and database right 2022, NOAA 2019 data © and SOEST 2019 data, UK Hydrographic Office data © Crown copyright and database right 2019. ICES Statistical Rectangles dataset 2015. ICES, Copenhagen.

Costs to the UK fishing industry

- 4.10. To estimate the economic impacts of the management measures, fishing patterns of vessels using bottom towed gear within the management area were analysed. The most recent five years of VMS data available (2016-2020) (Figure 3 to Figure 12) 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
- 4.11. Little to no dredging activity occurred in the management area until the spring of 2020 when a scallop stock was discovered, part of which was within the Dogger Bank SAC. The stock was then subject to a temporary closure to allow data gathering and better understanding of the shellfish stock. The scallop landings derived from this dredging activity in 2020 far outweighed that of any other bottom towed gear (Table 1 and Table 2) but as detailed previously the stock is unlikely to withstand such highly intensive dredging activity and therefore the landings and value of bottom towed gear fishing activity in 2020 is likely to be significantly higher than that which can be fished sustainably.
- 4.12. VMS data indicate that there is considerable bottom towed gear fishing occurring within the management area from vessels of 12 m length or more (Figure 3 to Figure 7).
- 4.13. The VMS data show 23 distinct UK bottom towed gear vessels with landings attributed to fishing activity in the Dogger Bank SAC management area between 2016 and 2019 (Table 3).
- 4.14. The 2016-2020 UK VMS landings data also show a gradual decline in the weight and value of landings derived via bottom towed gears from the management area. While gross weight and landings via all bottom towed gears in 2020 appears to buck this trend, this is solely due to the scallop dredging activity. For other bottom towed gears the decline in landings seen from 2016-2019 continues (Table 1 and Table 2).
- 4.15. The 23 UK vessels with recorded bottom towed gear landings between 2016 and 2019 (Table 3) landed approximately 7,500 tonnes of fish and shellfish in the management area (Table 1) worth nearly £11.7 million (Table 2).
- 4.16. Between 2016 and 2019 bottom towed gear landings from the management area averaged 1,891 tonnes (£2,920,463) annually but have ranged from 530 tonnes (£804,999) in 2019 to 3,086 tonnes (£4,397,231) in 2016 (Table 1 and Table 2).
- 4.17. In terms of operating profit, between 2016 and 2019 vessels fishing with bottom towed gears within the Dogger Bank SAC management area are estimated to have earned approximately £1,918,232 with an annual average of £479,558 (Table 2).
- 4.18. 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 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

Fishing vessels registered in countries other than the UK ('non-UK vessels') may also have access to fish in Dogger Bank SAC and may incur costs as a result of the measures (Table 4 to Table 6).

It is estimated that 92 non-UK vessels fished regularly in the Dogger Bank SAC management area with bottom towed gears between 2016 and 2019 (Table 7).

Non-UK landings data are only available for vessels from EU member states. Landings cannot be estimated for other nations such as European Free Trade Association (EFTA) member states (Iceland, Liechtenstein, Norway, and Switzerland) and have therefore not been included. For non-UK, non-EU nations, MMO only has VMS evidence for Norwegian and Faroe Island activity within the Dogger Bank SAC management area. It is unclear what fishing gears these vessels are using but activity from these nations is very low (Table 7).

Estimates of fisheries landings values from EU 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 EU VMS fishing activity (based on number of VMS reports) occurring in Dogger Bank SAC management area for those eight rectangles. This provided an estimate of EU bottom towed gear landings derived from the management area for each ICES rectangle for the years 2016 – 2019 (Table 4 and Table 5). Landings data for 2020 are not currently available for EU vessels.

Between 2016 and 2019, an annual average of approximately £3,532,185 was estimated to be derived from the management area by EU vessels using bottom towed gear (Table 5). 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 EU vessels is estimated to be £30,403,941.

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 5), 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, Table 2, Table 4 and Table 5.

For completeness, Table 6 presents best and worst-case landings scenarios where the best-case scenario assumes no bottom towed gear landings from within the ICES rectangles were derived from the management area and the worst-case scenario assumes all bottom towed gear landings from the ICES rectangles were derived from within the management area.

Figure 3: 2016 VMS UK and non-UK fishing activity by gear type in Dogger Bank SAC

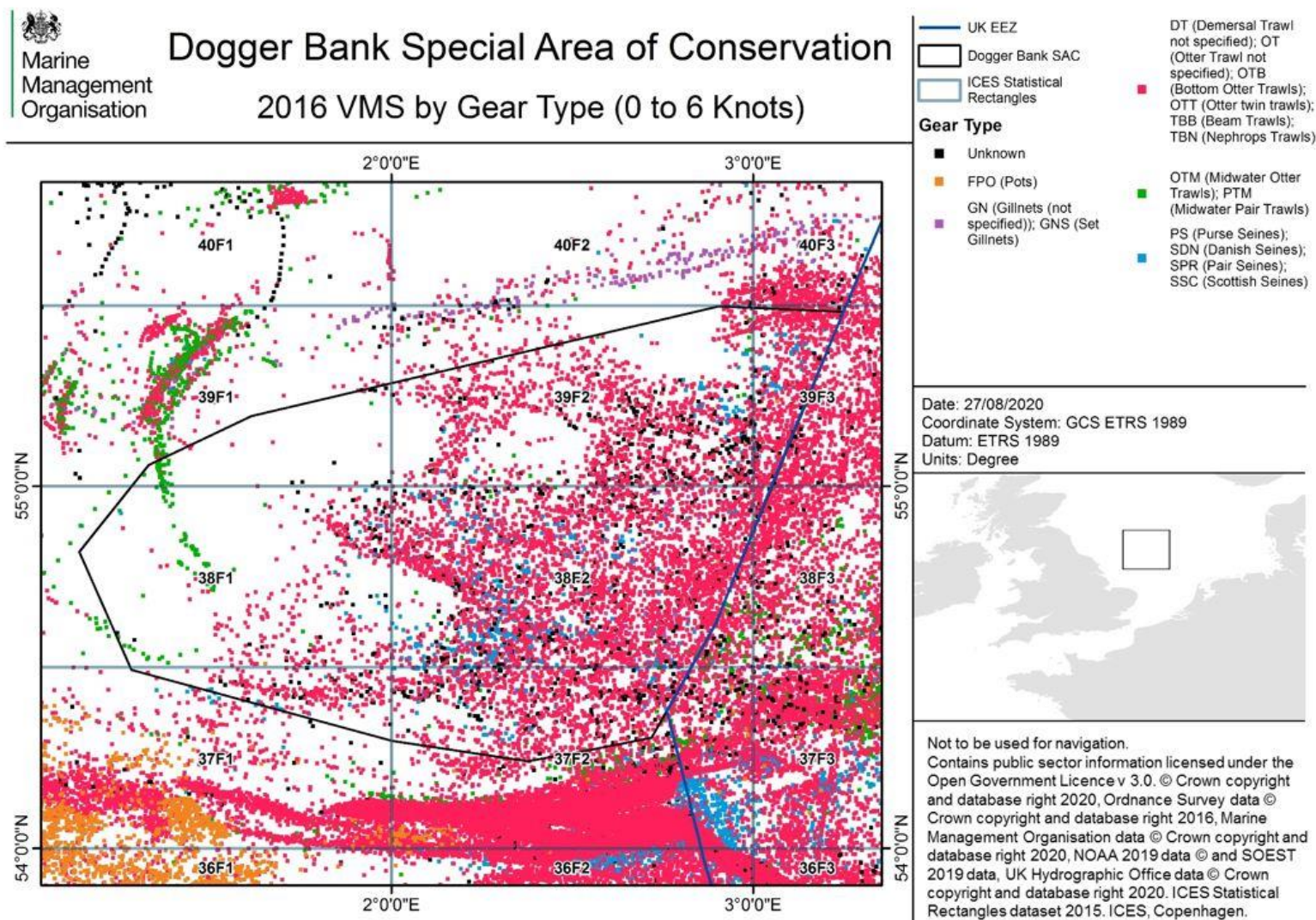


Figure 4: 2017 VMS UK and non-UK fishing activity by gear type in Dogger Bank SAC

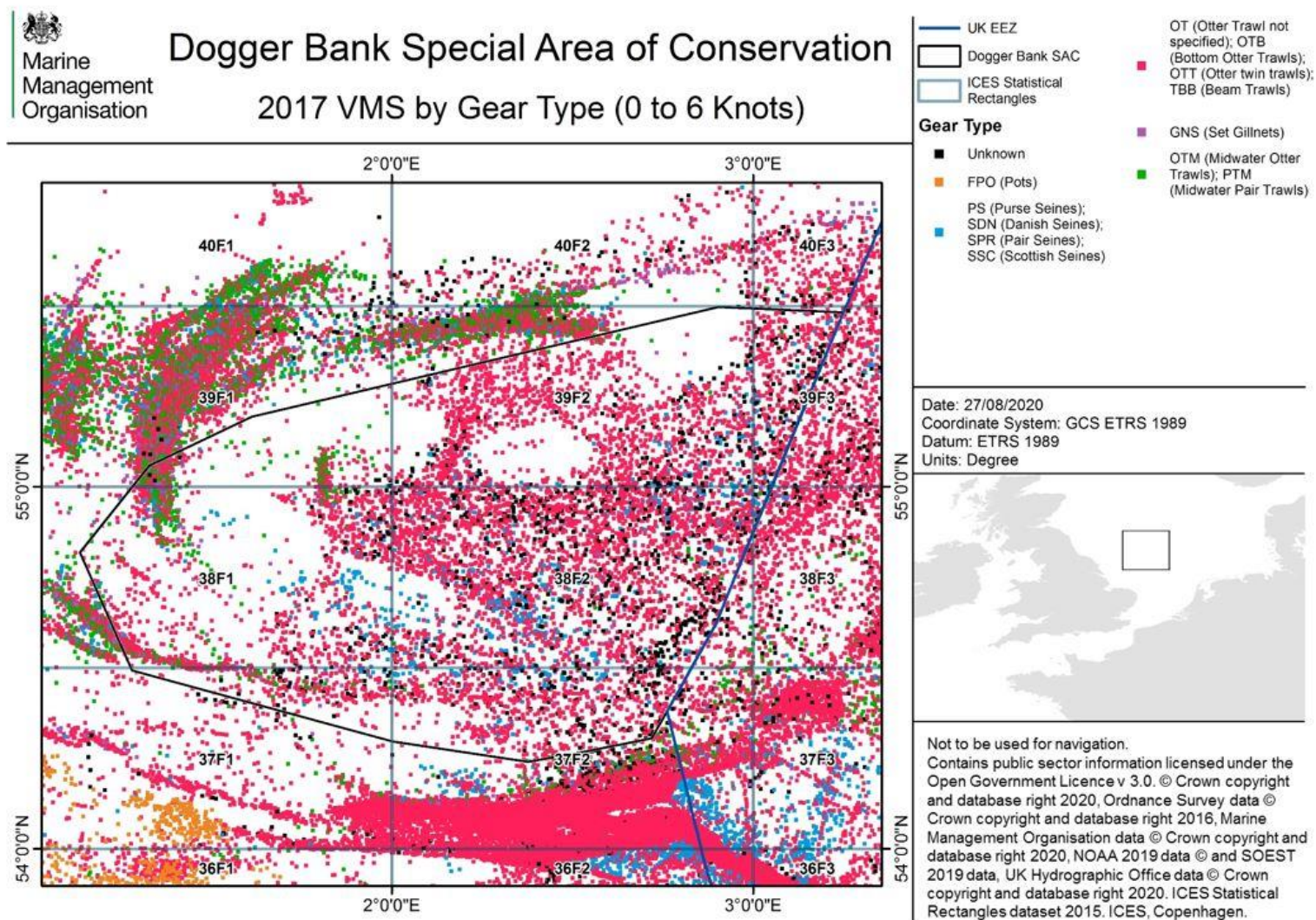


Figure 5: 2018 VMS UK and non-UK fishing activity by gear type in Dogger Bank SAC

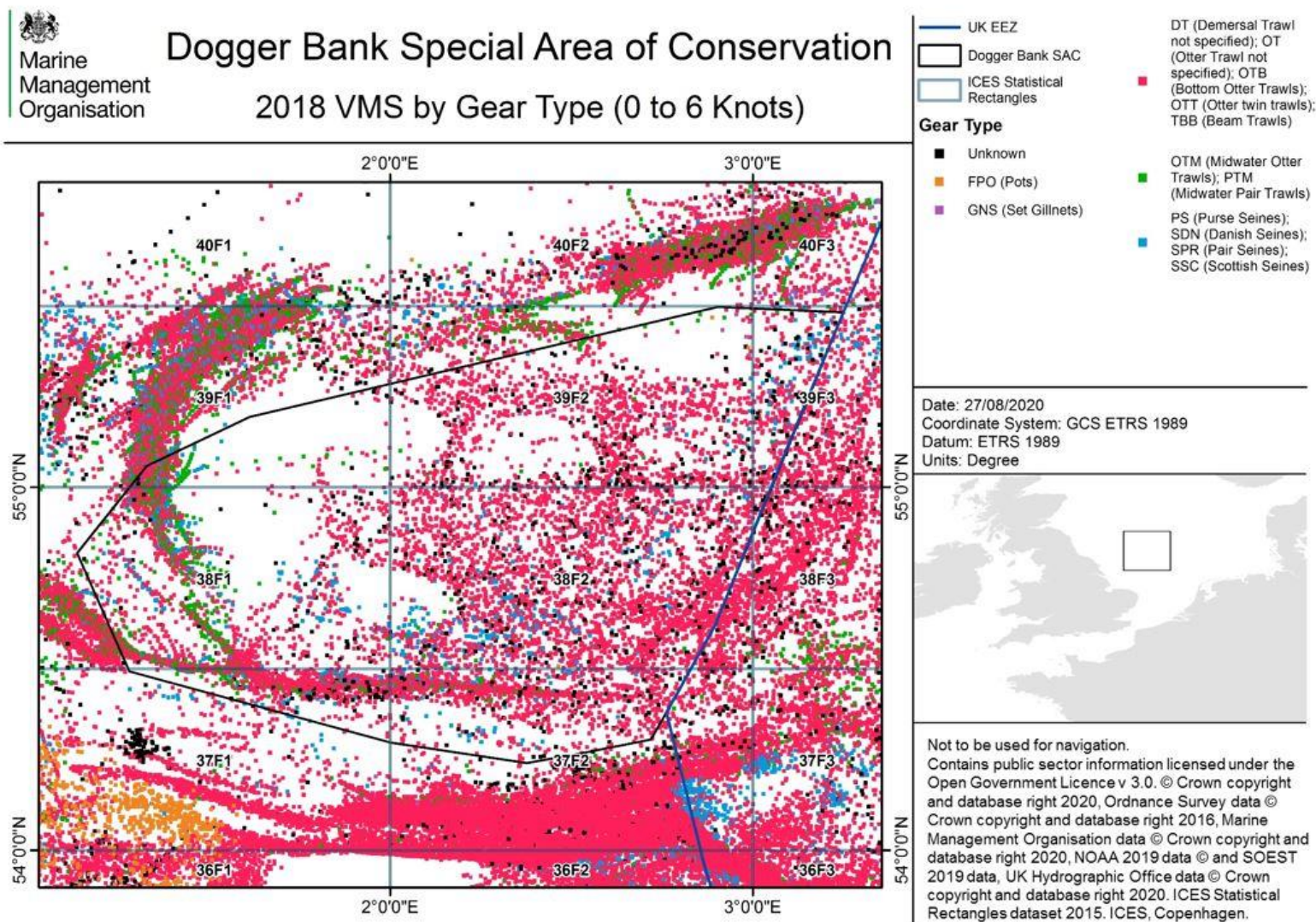


Figure 6: 2019 VMS UK and non-UK fishing activity by gear type in Dogger Bank SAC

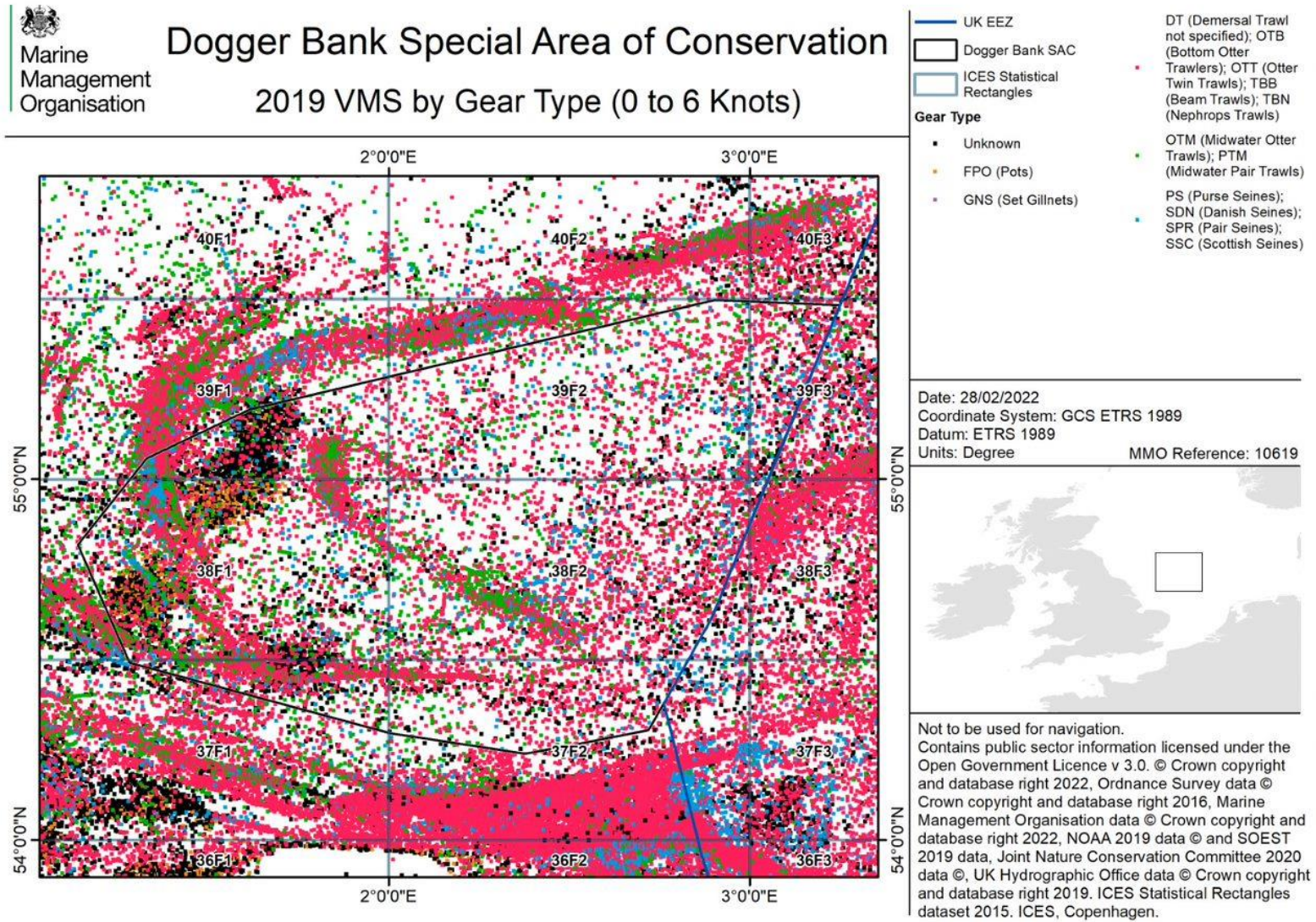


Figure 7: 2020 VMS UK and non-UK fishing activity by gear type in Dogger Bank SAC

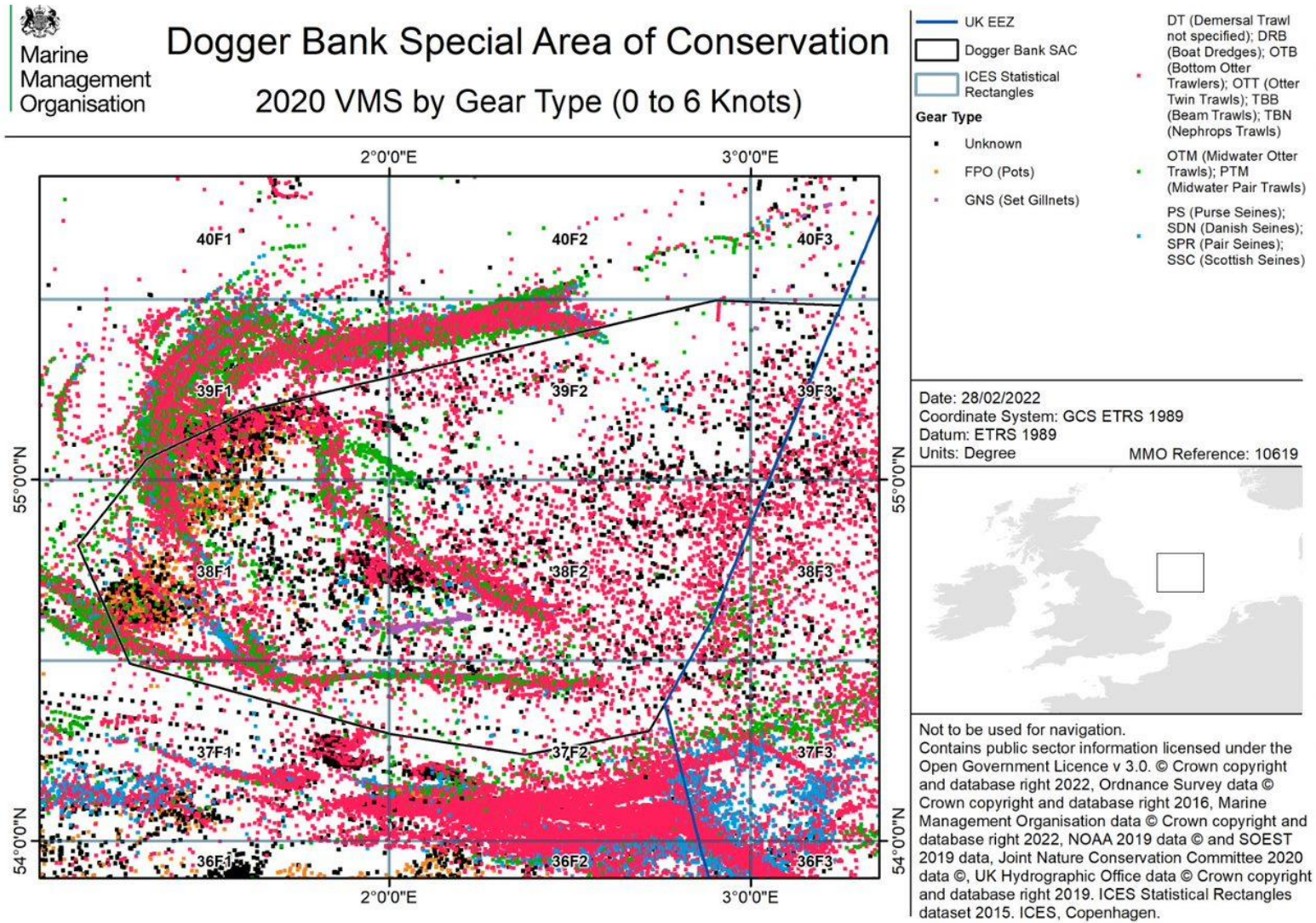


Figure 8: 2016 VMS fishing activity by nationality in Dogger Bank SAC

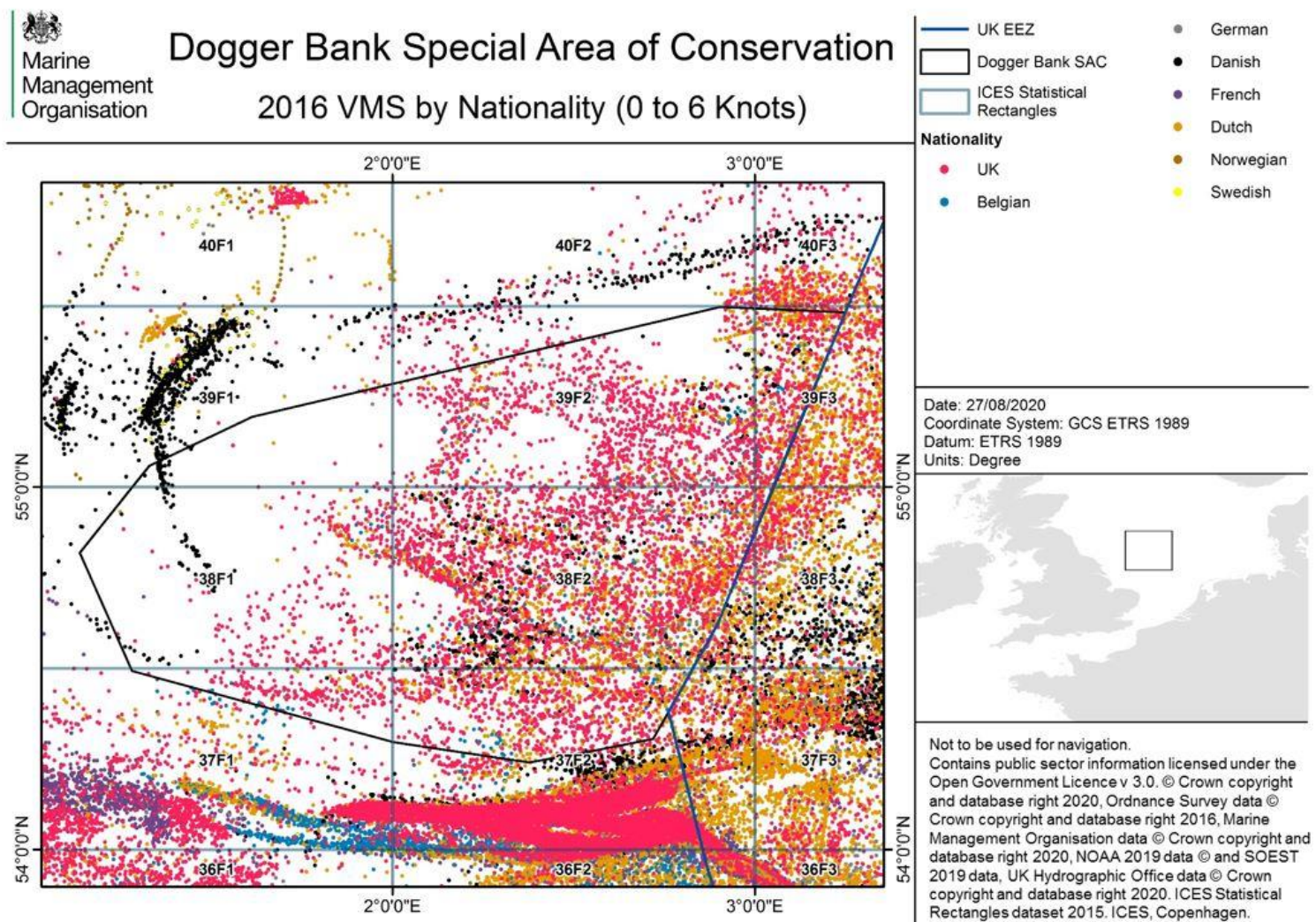


Figure 9: 2017 VMS fishing activity by nationality in Dogger Bank SAC

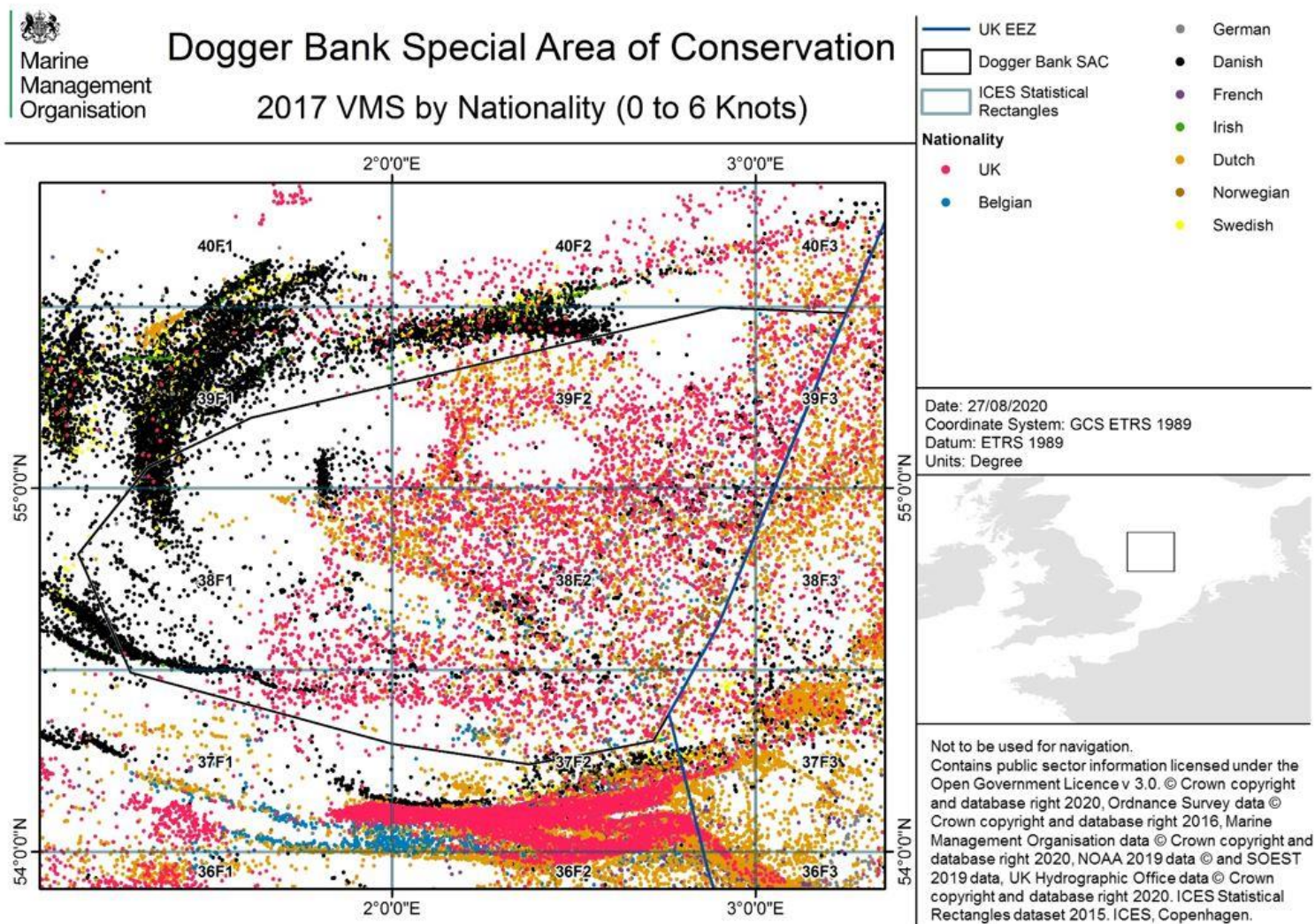


Figure 10: 2018 VMS fishing activity by nationality in Dogger Bank SAC

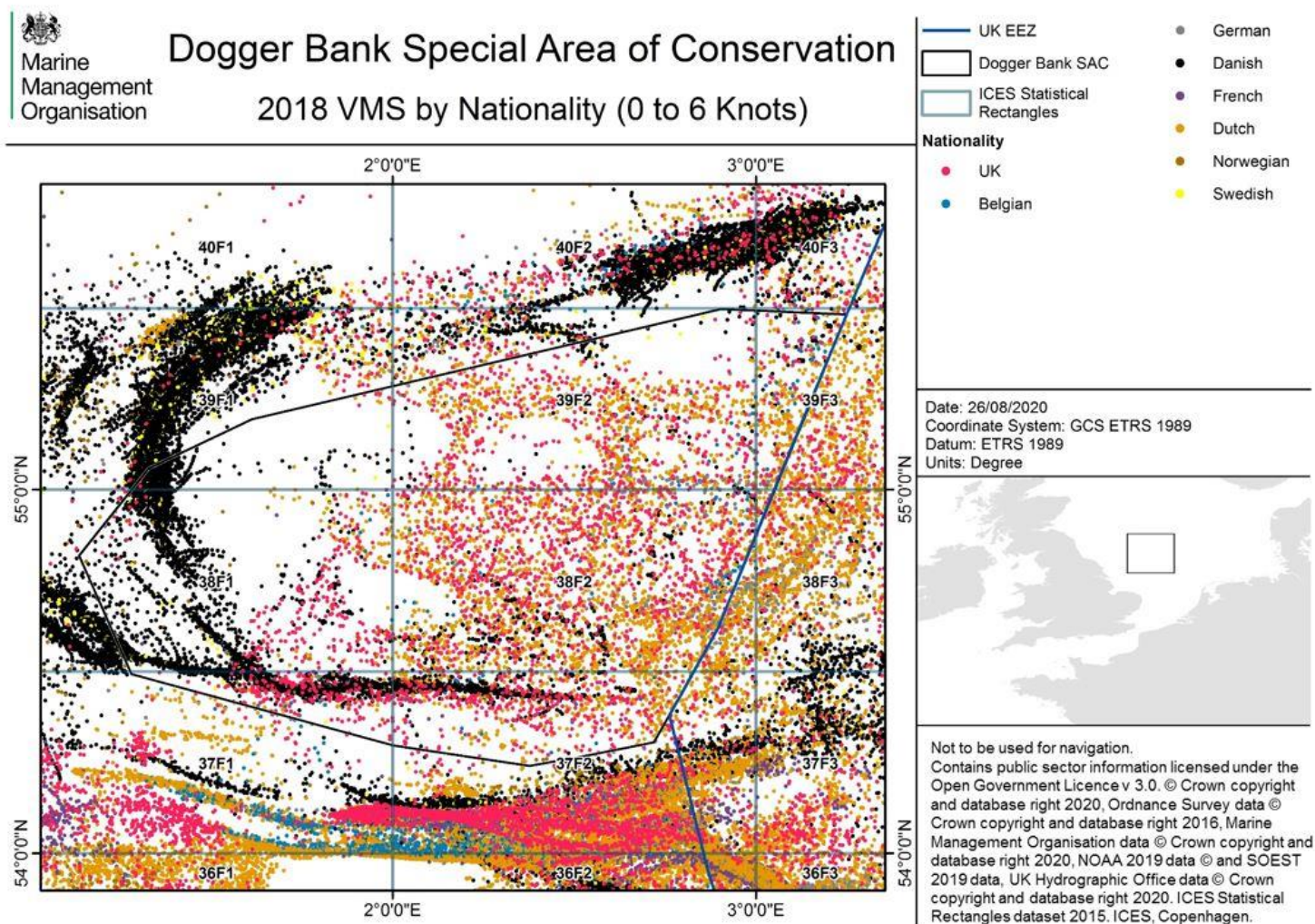


Figure 11: 2019 VMS fishing activity by nationality in Dogger Bank SAC

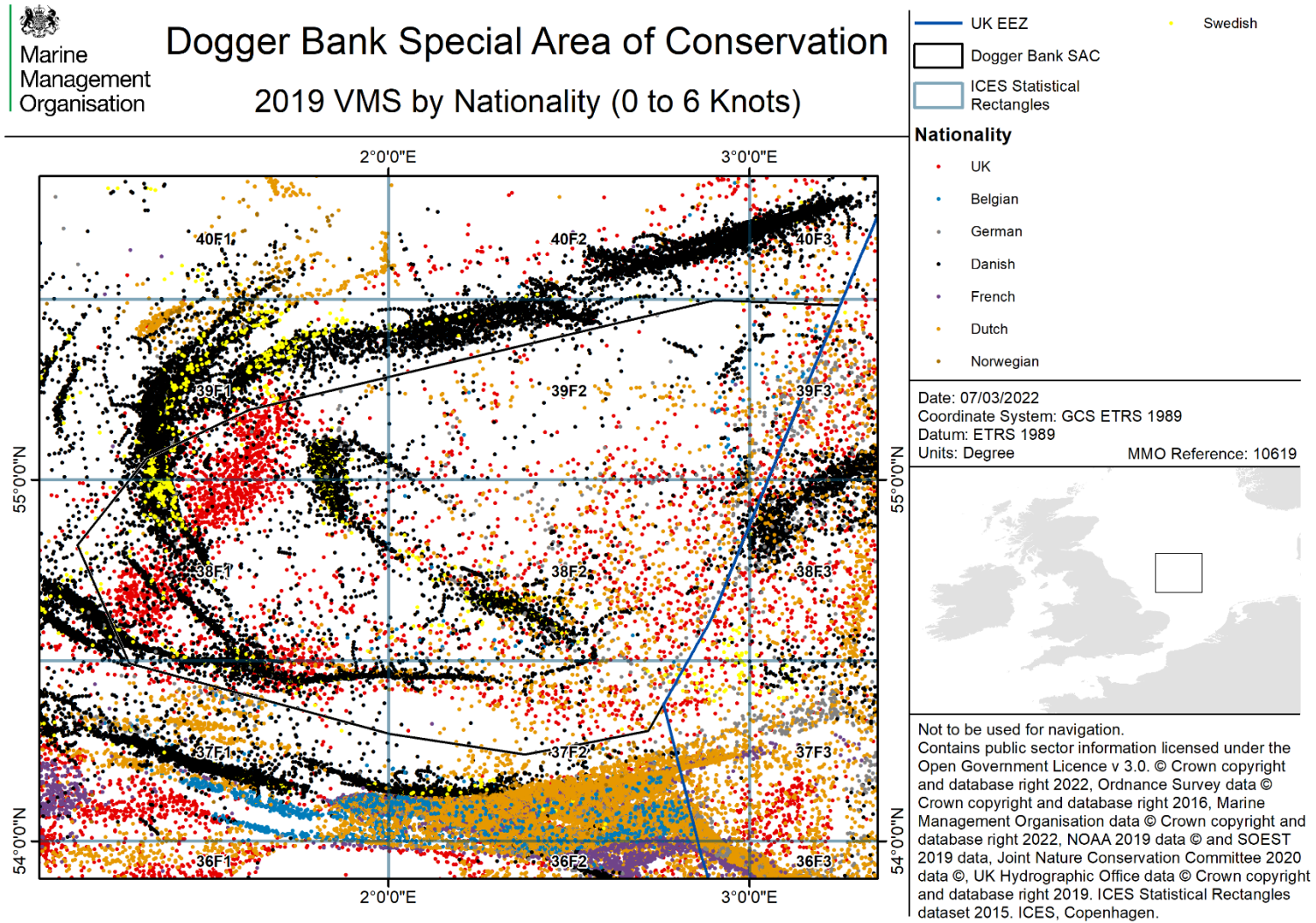
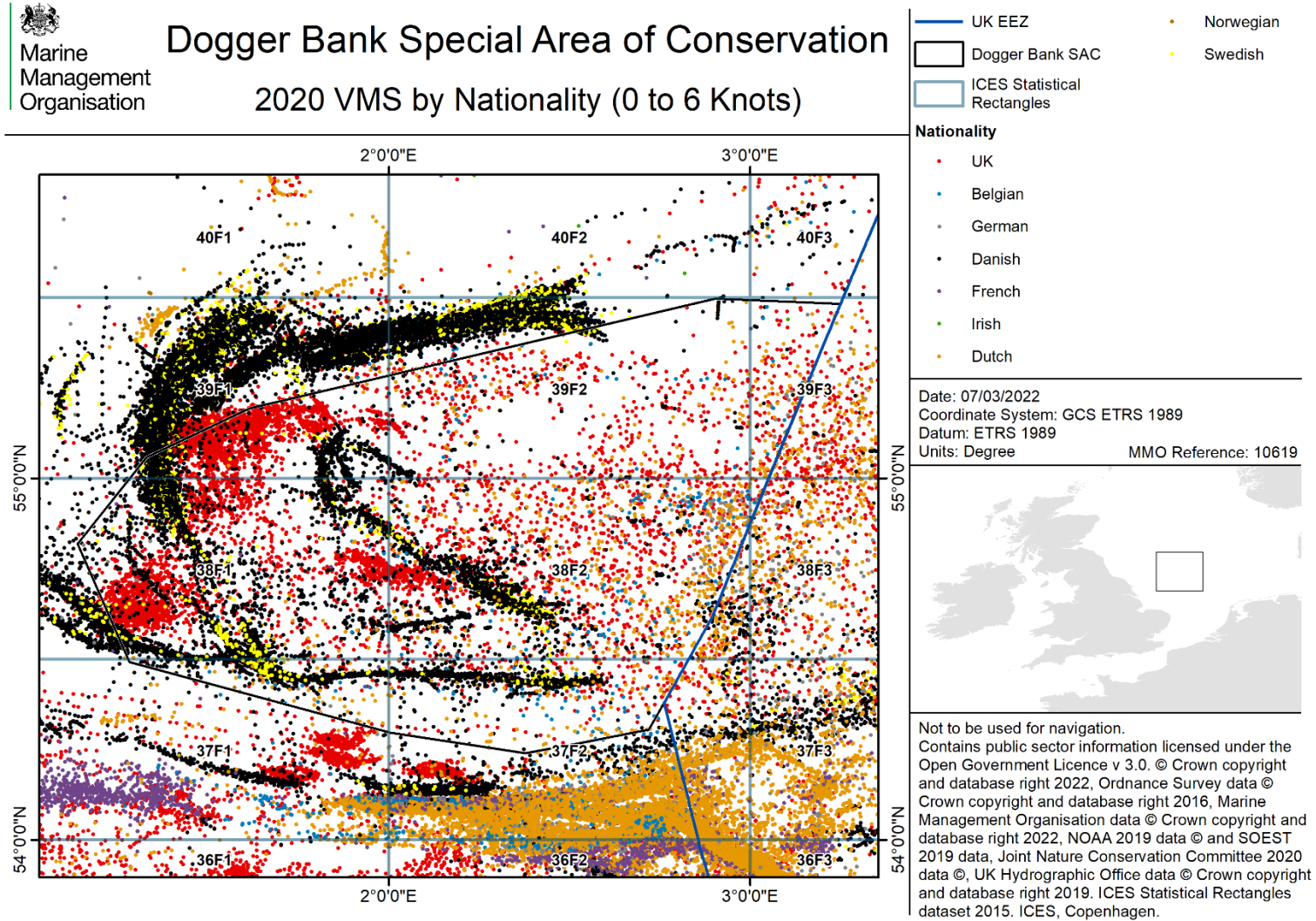


Figure 12: 2020 VMS fishing activity by nationality in Dogger Bank SAC



Compliance costs

- 4.18. MMO compliance action is intelligence-led and risk-based in accordance with the National Intelligence Model⁹. 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 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 2006¹⁰ and the Regulators' Code¹¹ and aim to ensure that the MMO is proportionate, accountable, consistent, transparent and targeted in any compliance action it takes.
- 4.19. 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

- 4.20. The economic impacts of the management measures are estimated as the loss of profitability of fishing effort at the site. For UK vessels, this is informed by data on activity within the area and from the 2016-2019 Seafish data on the profitability of fishing¹². 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 MMO.
- 4.21. To estimate the total monetised cost over ten years for the 23 UK vessels likely to 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 the estimated operating profit earned from these landings as provided by Seafish.
- 4.22. 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 £4,127,885.

⁹ Association of Chief Police Officers (2005) Guidance on the national intelligence model.

¹⁰ <https://www.legislation.gov.uk/ukpga/2006/51/contents>

¹¹ <https://www.gov.uk/government/publications/regulators-code>

¹² <https://public.tableau.com/profile/seafish#!/vizhome/FleetEnquiryTool/1Overview>

Table 1: 2016 – 2020 UK landings (metric tonnes) from bottom towed gear in the Dogger Bank SAC management area (DRB – Boat Dredge, OTB – Bottom Otter Trawl; OTT – Twin Otter Trawl, SSC - Scottish Seine, 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 and the scalloping activity it is unlikely to represent a typical year of fishing activity.

Gear	Year					Annual average landings from 2016-2019 (t)	Total landings from 2016-2019 (t)
	2016	2017	2018	2019	2020		
DRB	0	0	0	0	1,564	0	0
OTB	2,182	2,091	984	428	1,195	1,421	5,686
OTT	313	377	199	83	29	243	971
SSC	0	0	0	1	0	0	1
TBB	591	230	64	19	1	226	905
Total	3,086	2,699	1,247	530	2,789	1,891	7,563

Table 2: 2016 – 2020 UK landings by value (£) and operating profit (£) from bottom towed gear in the Dogger Bank SAC management area (DRB – Boat Dredge, OTB – Bottom Otter Trawl; OTT – Twin Otter Trawl, SSC - Scottish Seine, 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 the scalloping activity it is unlikely to represent a typical year of fishing activity.

Gear	Year					Annual average landings from 2016-2019 (£)	Total landings from 2016-2019 (£)
	2016	2017	2018	2019	2020		
DRB	0	0	0	0	2,549,733	0	0
OTB	3,148,414	2,872,378	2,094,176	661,410	866,248	2,194,094	8,776,378
OTT	431,483	582,992	488,025	107,229	27,821	402,432	1,609,729
SSC	0	0	0	2,106	0	527	2,106
TBB	817,334	317,604	124,450	34,253	1,032	323,410	1,293,640
Total	4,397,231	3,772,974	2,706,650	804,999	3,444,835	2,920,463	11,681,853
Operating Profit*	1,043,207	821,537	36,029	17,459	565,517	479,558	1,918,232

*Operating profit values are recalculated to real 2020 price level

Table 3: Number of distinct UK fishing vessels using bottom towed gears in the Dogger Bank SAC management area 2016-2020.

	Year					Grand Total (2016 – 2019)	Annual average (2016-2019)
	2016	2017	2018	2019	2020		
Number of vessels	17	19	14	15	43	23	16

Table 4: 2016 – 2019 EU landings by weight (metric tonnes) from different nationalities in Dogger Bank SAC 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. Landings values were not available for European Free Trade Association member states (such as Norway) hence only EU member state landings provided here.

Nationality	Landings (t) by year				Annual average landings from 2016 – 2019 (t)	Total landings from 2016 – 2019 (t)
	2016	2017	2018	2019		
Belgium	69	588	115	3	193	774
Germany	242	1,058	213	706	555	2,219
Denmark	294	15,830	11,139	10,557	9,455	37,819
France	0	39	13	0	13	51
Netherlands	1,167	4,730	1,110	167	1,794	7,175
Sweden	0	0	89	13	26	103
All EU	1,772	22,244	12,678	11,446	12,035	48,141

Table 5: 2016 – 2019 EU landings by value (£) from different nationalities in Dogger Bank SAC 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 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 were not available for European Free Trade Association member states (such as Norway) hence only EU member state landings provided here.

Nationality	Landings (£) by year				Annual average landings from 2016 – 2019 (£)	Total landings from 2016 – 2019 (£)
	2016	2017	2018	2019		
Belgium	94,488	549,097	94,335	6,172	186,023	744,091
Germany	250,675	460,694	94,639	257,862	265,968	1,063,870
Denmark	331,397	2,465,748	2,961,589	3,037,837	2,199,143	8,796,570
France	0	17,749	6,586	0	6,084	24,335
Netherlands	1,120,016	1,062,817	1,127,929	158,254	867,254	3,469,016
Sweden	0	0	27,949	2,910	7,715	30,859
All EU	1,796,576	4,556,105	4,313,026	3,463,035	3,532,185	14,128,742

Table 6: 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 the ICES rectangle (for bottom towed gears) were derived from the Dogger Bank management area. The worst-case scenario assumes that all landings from bottom towed gears from within the ICES rectangles are derived from the management area. Both scenarios contrast with Table 1 and Table 2 (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 EU countries. Landings values were not available for European Free Trade Association member states.

	2016		2017		2018		2019		Annual average landings from 2016 – 2019		Total landings from 2016 – 2019	
	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)	Weight (t)	Value (£)
Worst-case	18,672	10,139,251	169,712	29,923,679	64,803	20,757,456	42,785	17,472,593	73,993	19,573,245	295,972	78,292,979
Best-case	0	0	0	0	0	0	0	0	0	0	0	0

Table 7: 2016-2020 Non-UK VMS proportional activity (%) and number of unique vessels with regular fishing activity via bottom towed gears in the Dogger Bank SAC management area. Vessels with regular fishing activity are considered as those with more than 12 VMS reports in a year. Proportions were estimated using the (number of pings) occurring in the management area per nationality (for a given year). The estimate assumes all VMS activity data is reported at two hourly intervals.. 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. Gear codes are not assigned to non-EU nations therefore for Norwegian and Faroese activity all VMS reports are assumed to be via bottom towed gears. For comparison with UK data, 2020 has not been included in total and the annual average data columns.

Nationality	2016		2017		2018		2019		2020		2016-2019		
	Activity %	Number of Vessels	Activity %	Number of Vessels	Activity %	Number of Vessels	Activity %	Number of Vessels	Activity %	Number of Vessels	Annual average activity %	Total Number of Vessels	Annual Average Number of Vessels
Belgium	19	2	21	4	17	5	2	1	17	4	15	7	3
Germany	25	4	23	4	15	5	31	3	14	4	24	11	4
Denmark	20	1	21	23	18	22	35	22	21	19	24	33	17
France	0	0	9	1	7	0	0	0	8	0	4	1	0
Faroese*	0	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	36	19	26	13	25	20	13	10	21	12	25	37	16
Norway	0	0	1	4	0	1	0	0	0	0	0	5	1
Sweden	0	0	0	0	16	1	18	0	19	1	9	1	0
Total	-	26	-	49	-	54	-	36	-	40	-	92	41

*Some minor activity from Faroe Island vessels in 2016 (0.01%) and 2018 (0.06%) which is not apparent when rounded to zero decimal places. These vessels were not considered “regular” visitors hence 0 Faroe Island vessels.

Non-monetised costs

- 4.23. 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, Vaughan, 2017). 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.
- 4.24. Displacement may also have adverse impacts upon marine heritage assets due to the potential for new or increased risk of fishing-heritage interactions in alternative fishing grounds as a result of increased localised fishing effort (Firth et al., 2013).

Non-monetised benefits

- 4.25. 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).
 - Increased biodiversity - fishing is considered the biggest driver of marine biodiversity loss¹³.
 - Food web dynamics – large numbers of sandeels at the site are an important food source for seabirds (RSPB STAR project) 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).
 - There is good evidence that some kittiwake populations in the North Sea are negatively affected by sandeel removal by commercial fisheries¹⁴ (Ruffino et al.,

¹³ https://www.ipbes.net/sites/default/files/2020-02/ipbes_global_assessment_report_summary_for_policymakers_en.pdf

¹⁴ <https://data.jncc.gov.uk/data/c563bfa5-8177-4dc0-bcb3-4aeafef24b59/JNCC-Report-651-FINAL-WEB.pdf>

2020; Carroll et al., 2017; Lynama et al., 2017; Cook et al., 2014). The management measures may therefore see an increase in sandeel availability, an important food source for breeding populations of black-legged kittiwakes *Rissa tridactyla* (Carroll et al., 2017). The potential increase in sandeel availability may therefore improve the overall condition status of the conservation features of the Flamborough and Filey SPA. Similarly, increased sandeel availability may help reduce declines in seabird breeding abundance and failures¹⁵

- The UK Marine Strategy Target on Marine Bird Population Condition has not been met in the Greater North Sea where 35% of seabird species, especially 'surface feeders' on small fish, have recently experienced frequent, widespread breeding failures. The management measures may result in an increased availability of sandeels on which seabirds feed.
- 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., 2009)
- 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

¹⁵ <https://www.gov.uk/government/publications/marine-strategy-part-one-uk-initial-assessment-and-good-environmental-status>

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 to bottom towed gears).

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 the Dogger Bank SAC management area, the equivalent annual net direct cost to business (EANDCB) for UK vessels is £479,558. Costs to UK vessels were estimated by combining landings data with vessel monitoring system data (for vessels over 12 m in length) 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 the ICES rectangles which intersect Dogger Bank SAC and the management area. The 2016 to 2019 annual average of landings value from EU vessels using bottom towed gear was estimated to be £3,532,185. 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 4 and Table 5.

As outlined in sections 1.1 and 1.2, the MMO have legal responsibilities to avoid the deterioration of habitats and disturbance of designated species of EMS. The MMO assessment of fishing activities within Dogger Bank SAC determined that management measures to prohibit the use of bottom towed gear across the whole site are required to avoid adverse effect on site integrity.

Given the conservation objectives of the SAC, MMO has concluded that the measures are the most appropriate way to manage fishing in the SAC. As outlined in section 4.7, 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.

References

- Callaway, R., Alsvåg, J., De Boois, I., Cotter, J., Ford, A., Hink, H., Jennings, S., Kröncke, I., Lancaster, J., Piet, G., Prince, P. and Ehrich, S. 2002. Diversity and community structure of epibenthic invertebrates and fish in the North Sea. *ICES Journal of Marine Science*, 59, 1199-1214.
- Carroll M., Bolton M., Owen E., Anderson G., Mackley E., Dunn E., Furness R. 2017. Kittiwake breeding success in the southern North Sea correlates with prior sandeel fishing mortality. *Aquatic Conservation: Marine and Freshwater Ecosystems*. 27(6), 1164-75.
- CEFAS 2007. Multispecies Fisheries Management: A Comprehensive Impact Assessment of the Sand eel Fishery along the English East Coast. CEFAS Contract Report MF0323/01.
- Cook, A.S.C.P., Dadam, D., Mitchell, I., Ross-Smith, V.H. and Robinson, R.A. 2014. Indicators of seabird reproductive performance demonstrate the impact of commercial fisheries on seabird populations in the North Sea. *Ecological Indicators* 38, 1-11.
- Diesing, M., Ware, S., Foster-Smith, R., Stewart, H., Long, D., Vanstaen, K., Forster, R. & Morando, A. 2009. Understanding the marine environment - seabed habitat investigations of the Dogger Bank offshore draft SAC. Joint Nature Conservation Committee, Peterborough. JNCC Report No. 429, 89pp., 5 Appendices.
- Firth, A., McAleese, L., Anderson, R., Smith, R., and Woodcock, T. 2013. Fishing and the Historic Environment. EH6204. Prepared for English Heritage.
- Fletcher, S., Saunders, J., Herbert, R., Roberts, C. & Dawson, K. 2012. Description of the ecosystem services provided by broad-scale habitats and features of conservation importance that are likely to be protected by Marine Protected Areas in the Marine Conservation Zone Project area. Natural England Commissioned Reports, Number 088.
- Hammond, P.S., Lacey, C., Gilles, A., Viquerat, S., Boerjesson, P., Herr, H., Macleod, K., Ridoux, V., Santos, M., Scheidat, M. and Teilmann, J. 2017. Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys. Wageningen Marine Research.
- Hannis, S., Bricker, S. and Williams, J. 2013. Effects of faults as barriers or conduits to displaced brine flow on a putative CO² storage site in the Southern North Sea. European Geosciences Union General Assembly, pp. EGU2013-9491.
- Hiddink, J.G., Hutton, T., Jennings, S., and Kaiser, M.J. 2006. Predicting the effects of area closures and fishing effort restrictions on the production, biomass and species richness of North Sea benthic invertebrate communities. *ICES Journal of Marine Science* 63, 822-830.

JNCC Joint Nature Conservation Committee, 2019. Dogger Bank MPA Conservation Advice. Available at: <https://jncc.gov.uk/our-work/dogger-bank-mpa/#conservation-advice> [accessed 17th November 2020].

JNCC Joint Nature Conservation Committee, 2013. Progress towards the completion of the UK network of marine Special Areas of Conservation for Annex I qualifying features. JNCC 13 P03 (v1.1). Available from: <https://hub.jncc.gov.uk/assets/ab711067-5fc2-43f4-b690-4d6f277d5346> [accessed 14/07/2020]

Luisetti, T., Turner, R. K., Andrews, J. E., Jickells, T. D., Kröger, S., Diesing, M., Paltriguera, L., Johnson, M. T., Parker, E. R., Bakker, D. C. E. and Weston, K. 2009. Quantifying and valuing carbon flows and stores in coastal and shelf ecosystems in the UK. *Ecosystem Services*, 35, 67-76.

Lynama, C.P., Lloped, M., Möllmann, C., Helaouët, P., Bayliss-Brown G.A. and Stenseth, N.C. 2017. Interaction between top-down and bottom-up control in marine food webs. Available at <https://www.pnas.org/content/pnas/114/8/1952.full.pdf>

Olsford, F., Schaanning, M. T., Widdicombe, S., Kendall, M. and Austen, M. C. 2008. Effects of bottom trawling on ecosystem functioning. *Journal of Experimental Marine Biology and Ecology*. 366, 123-133.
<https://doi.org/10.1016/j.jembe.2008.07.036>

RSPB STAR (Seabird Tracking and Research) project. Data available: <http://www.seabirdtracking.org/>

Ruffino L., Thompson, D. & O'Brien, S. 2020. Black-legged kittiwake population dynamics and wider drivers of population change in the context of offshore wind development, JNCC Report No. 651, JNCC, Peterborough, ISSN 0963-8091.

Silva, T.A.M., Fernand, L., Bell, E., Lawler, A. and Stott, S. 2021. BX0008, Simulated Scallop larvae dispersal in the Southern North Sea. Cefas Project Report for DEFRA, 39 pp

Van de Velde, S., Van Lancker, V., Hidalgo-Martinez, S., Berelson, W. M. and Meysman, F. J. 2018. Anthropogenic disturbance keeps the coastal seafloor biogeochemistry in a transient state. *Scientific Reports*, 8, 5582.
<https://doi.org/10.1038/s41598-018-23925-y>

Vaughan, D. 2017. Fishing effort displacement and the consequences of implementing Marine Protected Area management – An English perspective. *Marine Policy*, 84, 228-234

Wakefield, E.D., Owen, E., Baer, J., Carroll, M.J., Daunt, F., Dodd, S.G., Green, J.A., Guilford, T., Mavor, R.A., Miller, P.I., Newell, M.A., Newton, S.F., Robertson, G.S., Shoji, A., Soanes, L.M., Votier, S.C., Wanless, S. and Bolton, M. 2017. Breeding density, fine-scale tracking, and large-scale modeling reveal the regional distribution of four seabird species. *Ecological Applications*, 27, 2074-2091.
<https://doi.org/10.1002/eap.1591>