

Regulatory Triage Assessment

Title of Measure	The Inner Dowsing, Race Bank and North Ridge Special Area of Conservation (Specified Areas) Prohibited Fishing Gears Byelaw 2021
Lead Department/Agency	Marine Management Organisation (MMO)
Expected Date of Implementation	Draft
Origin (Domestic or International)	Domestic
Date of Assessment	01/02/2021 (DRAFT)
Lead Departmental Contact	Marine Conservation Team, Marine Management Organisation, Lancaster House, Hampshire Court, Newcastle, NE4 7YH, conservation@marinemanagement.org.uk
Departmental Triage Assessment	Low-cost regulation (fast track)
Rationale for intervention and intended effects	
<p>Bottom towed¹ fishing gear and static² fishing gears have the potential to have an adverse effect on integrity of Inner Dowsing, Race Bank and North Ridge Special Area of Conservation (SAC) which aim to restore qualifying “sandbank slightly covered by seawater at all times (H1110)” and “Annex 1 Reef” features to favourable condition status.</p> <p>The byelaw will ensure that there is no adverse effect on integrity of the SAC by prohibiting the use of bottom towed fishing gear over sandbank and reef as well as the use of static fishing gear over reef outside of 6 nautical miles (nm). The Eastern Inshore Fisheries and Conservation Authority (IFCA) will manage fishing in the SAC inside of 6 nm.</p>	
Viable policy options (including alternatives to regulation)	
<p>Option 0. Do Nothing.</p> <p>Option 1: Remove/avoid pressures (whole site prohibition). Use of demersal trawls, demersal seines and dredges (‘bottom towed fishing gear’), traps and anchored nets/lines (‘static gear’) will be prohibited in all areas of the site.</p> <p>Option 2: Reduce/limit pressures (whole feature prohibition). Zoned management will be introduced to prohibit use of all bottom towed fishing gear and static gear over the features of the site to ensure the achievement of the conservation objectives.</p>	

¹ trawls, seines, dredges and similar gear which are actively moved in the water by one or more fishing vessels or by any other mechanised system and which are designed and rigged to operate on or near the seabed

² any gear which is left on, or in contact with, the seabed for the purposes of fishing, this includes fixed nets, drift nets and pots.

Option 3: Reduce/limit pressures (zoned feature prohibition). Zoned management will be introduced to prohibit the use of bottom towed fishing gear and static gear over the most sensitive parts of the features of the site.

Option 4: Introduce a voluntary agreement.

Option 2 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 impacts on business

Available evidence suggests that the proposed management option will be directly affect a small number of fishing vessels and businesses by the restriction of bottom towed and static fishing gear outside of 6 nm within Inner Dowsing, Race Bank and North Ridge SAC. Vessel monitoring system (VMS) data has been used to estimate activity of vessels with VMS fitted (those over 12 metres length). All vessels with VMS transmit a data position every 2 hours at sea and the speed of the vessels indicates whether or not it is fishing. A VMS report (at fishing speed) therefore indicates 2 hours of fishing.

There were 218 VMS reports for UK vessels using bottom towed and static gears from 2014 to 2019 within the proposed management area. UK vessels over 12 metres length using non-bottom towed gear were mostly potting, with a total of 81 VMS reports from 2014 to 2019. Non-VMS data collected from the MMO catch app confirms that the site has limited activity, with 693 trips in 2020 to the International Council for the Exploration of the Sea (ICES) sub rectangles in which the proposed management area lies. For context, the SAC covers 30.69% of ICES rectangle 35F0 and 0.36% of 35F1.

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 £50,449 (2019 present value). The equivalent annual net direct cost to business (EANDCB) is £5,861 (2019 present value).

Non-monetised costs include the potential impact of displaced fishing activity on areas of the SAC within 6 nautical miles (nm) outside of the management areas, and on areas outside of the SAC. Given the level of activity from bottom towed and static gears occurring across the site however, this cost is not considered to be significant.

None of the expected benefits of the proposed management measure have been monetised, however non-monetised benefits include the protection designated features and the ecosystem services they provide including possible indirect benefits to the fishing industry resulting from spill over and diversification.

Summary of monetised impacts

- Estimated Net Present Value: -£50,449
- Estimated Business Net Present value: --£50,449
- Estimated Equivalent Annualised Net Costs to Business: £5,861

- Appraisal period: 10 years
- The Price Base Year and Present Value Base Year: 2019, 2020
- **BIT status/score: 0.03**

The proposal is a Regulatory Provision as it relates to business activity (commercial sea fishing); it has a regulatory effect by prohibiting certain types of fishing within a specified areas; 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 (QRP) as it does not fall within any of the administrative exclusions set out in the Business Impact Target written ministerial statement - HCWS574.

Rationale for producing an RTA (as opposed to an Impact Assessment)

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.

DRAFT

Supporting evidence

1. The policy issue and rationale for Government intervention

- 1.1. The MMO has duties under the Conservation of Habitats and Species Regulations 2017 and 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 Inner Dowsing, Race Bank and North Ridge 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 part of the Inner Dowsing, Race Bank and North Ridge SAC offshore of 6 nm. This assessment determined that the use of bottom towed fishing gears and static fishing gears are not compatible with the conservation objectives of the site and may result in an adverse effect on site integrity. The proposed byelaw will apply offshore of 6nm and will further the conservation objectives of the SAC by prohibiting bottom towed fishing over reef and sandbank, and prohibiting the use of static fishing gears over reef features.
- 1.3. The Eastern Inshore Fisheries and Conservation Authority (IFCA) has responsibility to manage fisheries within the 0 to 6 nm part of the SAC, and are will therefore introduce any management measures required in this part of the SAC.
- 1.4. Bottom towed fishing and static fishing gears have 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 diversity³. 'Public goods' can be defined as goods or services where no-one can be excluded from benefiting from them, but use of the goods does not diminish the goods being available to others). The characteristics of public goods, being available to all but belonging to no-one, mean that individuals do not necessarily have an incentive to voluntarily ensure the continued existence of these goods which can lead to under-protection/provision. With regard to bottom towed and static gear 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

³ <https://www.gov.uk/government/publications/interim-report-the-dasgupta-review-independent-review-on-the-economics-of-biodiversity>

diversity. While the habitat continues to provide benefits to fishers through the sale of sea fisheries resources there is no incentive to protect these habitats. A lack of ownership allows the activity to continue unchecked until such time biological diversity falls to the point where catches are no longer profitable and fishers move on to more productive grounds.

- Negative externalities: Negative externalities occur when the cost of damage to the marine environment is not fully borne by the users causing the damage. Bottom towed and static gear fishing can cause severe damage to the fragile biogenic reef structure created by colonies of *Sabellaria spinulosa* (Ross worms) which can reduce biodiversity and productivity and take many years to recover. The only cost borne by bottom towed gear fishers 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 fishers 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 conservation of designated features of the SAC, which will ensure negative externalities are reduced or suitably mitigated in the following ways:

- 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. Inner Dowsing, Race Bank and North Ridge SAC lies within the East Marine Plan Area. The East Marine Plan was adopted in 2014. The decision to introduce the Inner Dowsing, Race Bank and North Ridge SAC (Specified Area) Prohibited Fishing Gears Byelaw 2021 has been made in accordance with the East Marine Plan.

1.8. In particular, the following marine plan policies in the East Marine Plan⁴ 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

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

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

2. Policy objectives and intended effects

2.1. The policy objective pertinent to this RTA is to prevent adverse effect to site integrity and further the conservation objectives of the Inner Dowsing, Race Bank and North Ridge SAC by ensuring that the protected features: sandbanks slightly covered by seawater all of the time and reef (Figure 1); are safeguarded against the risk of damage from bottom towed and static fishing gears.

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

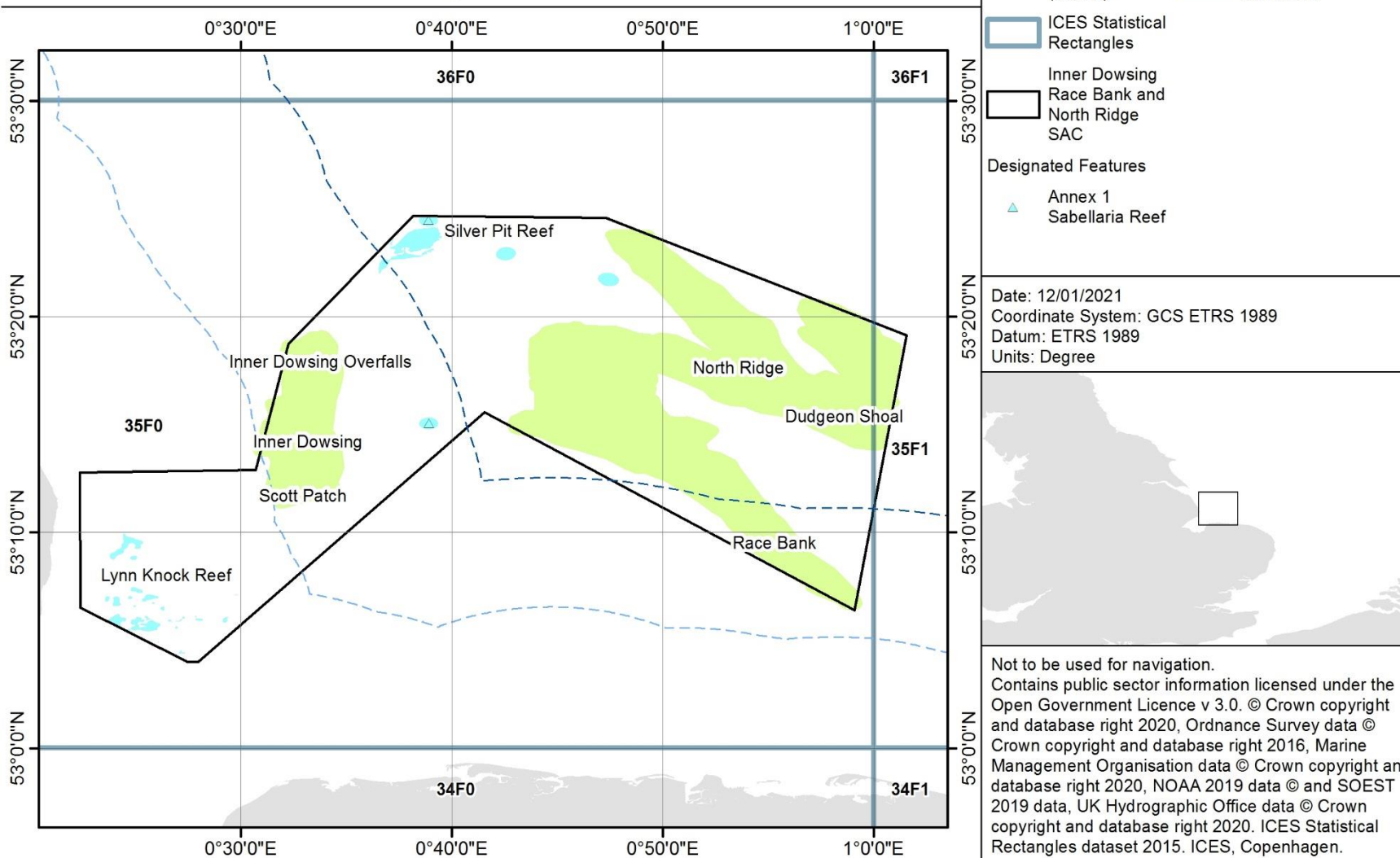
2.3. The social and economic impacts of management intervention will be minimised where possible.

⁴ East Marine Plan - <https://www.gov.uk/government/publications/east-inshore-and-east-offshore-marine-plans>

Figure 1: Inner Dowsing, Race Bank and North Ridge SAC feature map



Inner Dowsing, Race Bank and North Ridge Special Area of Conservation Designated Features



3. Policy options considered, including alternatives to regulation

3.1. The Inner Dowsing, Race Bank and North Ridge Special Area of Conservation (Specified Areas) Prohibited Fishing Gears Byelaw 2021 will be introduced to manage bottom towed gear and static gear fishing activities within the Inner Dowsing, Race Bank and North Ridge SAC. All options will include the continuation of the annual monitoring and control plan. The options are detailed below:

Option 0. Do nothing.

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 Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 would not be met. All other options are compared to option 0.

Option 1: Remove/avoid pressures (whole site prohibition). Use of demersal trawls, demersal seines and dredges ('bottom towed fishing gear'), traps and anchored nets/lines ('static gear') will be prohibited in all areas of the site.

Prohibiting the use of bottom towed and static fishing gears throughout the whole of the site outside of 6 nm would allow MMO to ensure that no risk to the site's conservation objectives was occurring from fishing activities. However, it would prohibit fishing in parts of the site where the MMO assessment has concluded that it is not causing an adverse effect on site integrity. This would therefore introduce unnecessary and disproportionate costs to the fishing industry.

Option 2: Reduce/limit pressures (whole feature prohibition). Zoned management will be introduced to prohibit use of all bottom towed fishing gear and static gear over the features of the site to ensure the achievement of the conservation objectives.

This option protects the reef and sandbank features from fishing gears in management areas where the MMO assessment has concluded that these may be causing an adverse effect on integrity of the SAC without unnecessarily restricting fishing activities in other parts of the site.

Option 3: Reduce/limit pressures (zoned feature prohibition). Zoned management will be introduced to prohibit the use of bottom towed fishing gear and static gear over the most sensitive parts of the features of the site.

This option would prohibit bottom towed and static gear fishing over only the most sensitive parts of the features of the site. Bottom towed and static gear

would be prohibited over all reef features as these features are sensitive to impacts from these gear types. Bottom towed fishing gear fishing would be prohibited only over certain parts of the sandbank feature, based on sensitivity. The MMO assessment concluded that it was not possible to identify areas of sandbank where an adverse effect on site integrity from bottom towed fishing could be ruled out. Therefore this option is not suitable as it will not provide the level of protection required.

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 principles⁵, 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.

Option 2 is the preferred option. Options 1, 3 and 4 are not considered appropriate in this instance as they are not deemed sufficient to protect the site from negative impacts caused by fishing in the site.

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

4. Expected level of business impact

4.1. All costs analysed for option 2 are compared to option 0.

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

- Cost estimates are based on estimates of UK landings values derived from within the management areas. Landings information is determined as a proportion of landings related to ICES rectangles 35F0 and 35F1. They

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

may not therefore represent the true landings derived from each fishing trip.

- Different methodologies were used to calculate landings associated with the proposed management option for the different fleets (vessels over 12 m, 10 – 12 m vessels and vessels under 10 m).
- To estimate landings for vessels over 12 m, the proportion of VMS reports in the proposed management areas compared to 35F0 and 35F1 in total (Table 4 and Table 5) was used to provide an estimate of landings in each rectangle. This assessment assumes that this VMS data captures the entirety of the over 12 m fishing fleet activity.
- Vessels under 12 m are not required to report using VMS and so limited vessel activity data is available. For 10 – 12 m vessels landings are recorded at ICES rectangle level, and so an area-based estimate was used to calculate the associated landings for the proposed management option (Table 6). The area-based approach uses the percentage of 35F0 and 35F1 that intersects the proposed management areas (Table 6) to estimate the landings attributed to the proposed management areas. This assessment consequently assumes that for 10 – 12 m vessels the landings for each rectangle are proportional to the percentage of the rectangle coinciding with the proposed management area.
- For under 10 m vessels, data from the MMO catch recording project for vessels under 10 m in length has been used at ICES sub-rectangle level. This data is only preliminary information which has been tested from January – November 2020 and does not include the full fleet and is not being used currently for compliance measures. There are also known issues with data quality which includes but is not limited to areas of catch, species and gears used.
- VMS data assumes fishing activity from speed of travel. Speeds of up to six knots are considered fishing speed. Some vessels can fish at speeds greater than six knots which may lead to an underestimate of fishing activity. Some vessels may be travelling at speeds lower than six knots for reasons other than fishing (currents, tides etc.), this may lead to an overestimate of fishing activity. Data from fishing vessels acting as guardship vessels for offshore windfarms (and therefore not fishing) may have to be removed from the data.
- Profit ratios have been determined and summarised from a range of bottom towed gears and ocean areas using Seafish fleet segments⁶ which are drawn from larger areas than the Inner Dowsing, Race Bank and North Ridge SAC proposed management areas. They may not therefore be a true representation of the operating profits of fishing within the proposed management areas.

⁶ <https://www.seafish.org/document/?id=3A58469B-530D-4BA3-A465-2B287767EB8D>

- Displacement is difficult to quantify, and it is impossible to accurately predict where exactly activities will be displaced to.
- 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 proposed closure has been taken from:

- VMS data for UK and non-UK vessels from 2014 to 2019 taken from entered log book and sales note data provided by MMO statistics;
- landings data for UK vessels under and over 12m in length;
- non-UK landings data for vessels over 12m in length;
- data from the MMO catch recording project for vessels under 10m in length;
- data from Seafish annual economic performance for the UK fishing fleet from 2014 to 2018;
- information gathered from stakeholders by the MMO during the call for evidence which sought additional information from stakeholders from 28 October to 15 December 2020;
- local MMO marine officer knowledge.

4.4. Prohibition of the use of bottom towed and static fishing gear in the proposed management areas 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 in other areas due to displacement.

4.5. Costs to the UK fishing industry have been monetised and these estimated values have been collated and presented as part of this RTA (Table 7 to Table 11).

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

4.7. The benefits associated with the proposed management are difficult to value and are therefore described under non-monetised benefits.

Costs to the UK fishing industry

4.8. This RTA considers the economic impact to UK businesses and individuals. Economic impacts to non-UK businesses and individuals, including fishing

vessels registered outside of the UK, are not in scope for the headline cost figures. However, evidence for non-UK fishing vessels have been provided for context in Box 1.

- 4.9. Fisheries landings are reported at ICES statistical rectangle level. ICES standardise the division of sea areas for statistical analysis. Each ICES statistical rectangle is '30 min latitude by 1 degree longitude' in size which is approximately 30 nautical miles by 30 nautical miles (size varies with latitude due to the spheroid shape of the Earth). The proposed management areas fall within ICES rectangles 35F0 and 35F1 (Figure 2).
- 4.10. To estimate the economic impacts of the proposed management, fishing patterns of vessels using bottom towed gear and static gear within the proposed management areas were analysed. The most recent six years of VMS data available (2014 - 2019) was used for this analysis. For vessels larger than 12 m that require a vessel monitoring system (VMS), their VMS data has been used. For vessels over 10 m landings data is derived from vessel log books. For smaller vessels, the MMO has made use of UK landings data as well as preliminary data from the MMO catch recording project for vessels under 10 m in length from 1 January to 30 November 2020 at ICES sub-rectangle level.
- 4.11. The VMS data for UK vessels indicate the amount of fishing activity has occurred in Inner Dowsing, Race Bank and North Ridge SAC and the proposed management area (option 2) by over 12 m vessels from 2014 to 2019 (Table 1 and Table 2; Figure 3 to Figure 8). Fishing by UK vessels with bottom towed gear had 218 VMS fishing reports within the proposed management area over the five years. Fishing by UK vessels with static gear was mostly potting with a total of 81 reports from 2014 to 2019. Preliminary data for vessels under 10 m also indicates relatively limited bottom towed gear activity, with 12 fishing trips recorded within ICES rectangle 35F0 during 2020 (Table 12), there was no bottom towed gear activity within 35F12, the only sub rectangle which contains sandbank feature in 35F1. Overall in 2020 there were 693 trips by under 10 m vessels within the sub-rectangles where the proposed management area intersects, however, due to the small proportion of the proposed management area compared to the ICES sub-rectangles, this is estimated to be equivalent to less than one fishing trip and a total catch weight of 291 kg by under 10 m vessels in 2020 from within the proposed management areas.
- 4.12. Over the five years, an average of 66% of UK VMS fishing reports within the proposed management area are associated with landings, these are displayed in Table 2 for the proposed management area. Due to the majority of VMS reports not having associated landings, landings related to the ICES rectangle 35F0 and 35F1 have also been included. The most recent six years of landings available (2014-2019) reported by UK vessels in ICES rectangles 35F0 and 35F1 are

displayed in Table 7 and Table 8 based on the size of the vessels and the type of fishing gear used.

- 4.13. The landings data indicate for vessels under 12 m, the average value of landings per year from 2014 to 2019 was £5,392 for the reef proposed management areas and £19,014 for the sandbank proposed management areas. For vessels over 12 m, the average value of landings per year from 2014 to 2019 was £2,971 for the reef proposed management areas and £9,443 for the sandbank proposed management areas.
- 4.14. The closure of fishing grounds can lead to significant displacement of fishing effort which can result in a range of costs. Displacement is dependent on the intensity and distribution of fishing activities within the site before the closure and on external factors (such as fish distribution, total allowable catch/quota, fuel prices). Bottom towed and static gear fishing effort from within the proposed management areas is relative limited as detailed by VMS and landings data. The prohibition of bottom towed and static gear in the proposed management areas is therefore not believed to result in a significant displacement of fishing activity and therefore increased costs to businesses.

Box 1. Non-UK fishing vessels

Non-UK vessel activity recorded just 14 VMS records between 2014 and 2019. French vessels are present in the site, but in small numbers and rarely over features, with only 19 bottom towed gear fishing VMS reports over the five years and no static fishing gear reports over the same period (Table 10 -Table 11; Figure 9 to Figure 14).

Landings originating from ICES rectangle 35F0 and 35F1 from non-UK vessels are shown in Table 10 and Table 11. There are only two occurrences of VMS reports within the proposed sandbank management area in 2014, with an estimate value of landings of £701.59 (Table 10). For the reef proposed management areas there are 12 VMS reports from 2014 – 2017, with an annual average value of landings of £1,064 (Table 11).

Figure 2: Inner Dowsing, Race Bank and North Ridge SAC and the proposed management option (option 2).

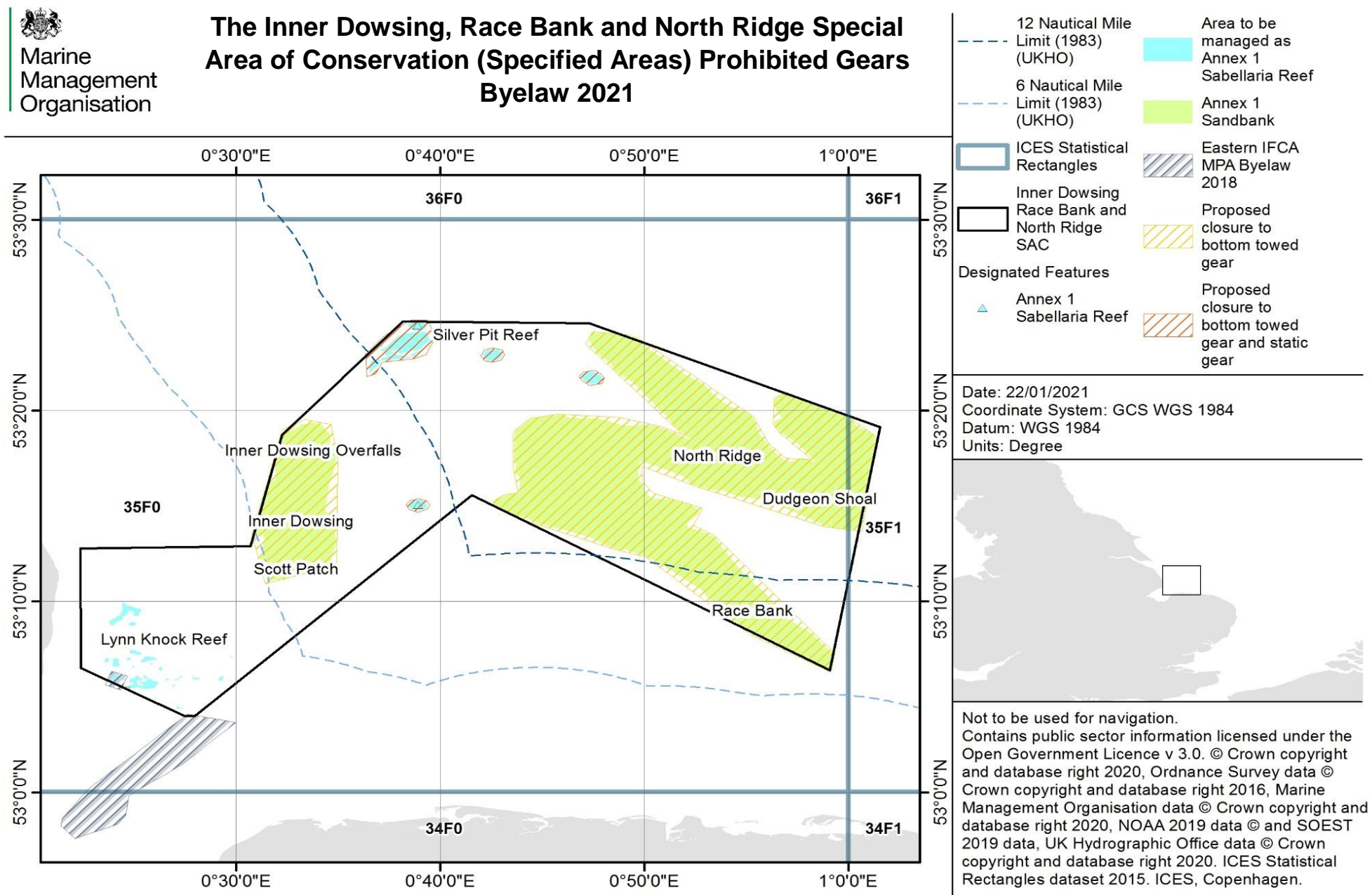


Table 1: Number of VMS reports for UK fishing vessels of length > 12 m within the proposed management area (PMA) (option 2) in Inner Dowsing, Race Bank and North Ridge SAC. No landings have been associated with VMS reports apart from pots. (DRB – Boat Dredge; OTB – Bottom Otter Trawl; TBB – Beam Trawl; FPO – Pots/traps ; GN – Gillnets; GNS – Set Gillnets; SDN – Danish Seines; MIS – Miscellaneous Gear).

Year	DRB	OTB	TBB	FPO	GN	GNS	SDN	MIS	Unknown
2014	-	16	3	1	349	1	-	-	2
2015	-	5	-	22	-	-	36	3	5
2016	1	1	-	38	1	-	-	-	2
2017	1	2	-	24	-	-	-	-	1
2018	1	-	1	16	-	-	-	-	4
2019	-	-	-	38	-	-	-	-	56

Table 2: UK landings by weight (tonnes, t) and value (£) by potting gear based on VMS reports from 2014 - 2019 within the PMA (option 2), including the percentage of VMS fishing reports with associated landings. No landings were recorded for other gears.

Year	Weight (t)	Value (£)	% of VMS fishing reports with associated landings
2014	-	-	-
2015	1.13	7,284.50	87
2016	2.48	1,4473.54	85
2017	2.15	10,125.74	67
2018	2.46	12802.13	58
2019	0.9	7,136.88	32
Annual Average	1.82	10,364.56	66

Table 3: Number of UK VMS fishing reports for vessels > 12 m within the proposed reef and sandbank (SB) PMA for the prohibition of static and bottom towed gear (BTG).

Year	FPO		GN		OTB		DRB		SDN		TBB		Unknown		Total	
	Reef	SB	Reef	SB	Reef	SB	Reef	SB	Reef	SB	Reef	SB	Reef	SB	Reef	SB
2014	-	N/A	1	N/A	4	12	-	-	-	-	-	3	-	2	5	17
2015	15	N/A	-	N/A	-	5	-	-	-	36	-	-	-	5	15	46
2016	20	N/A	-	N/A	-	1	-	1	-	-	-	-	-	2	20	4
2017	15	N/A	-	N/A	-	2	-	1	-	-	-	-	1	-	16	3
2018	12	N/A	-	N/A	-	-	-	1	-	-	-	1	2	1	14	3
2019	19	N/A	-	N/A	-	-	-	-	-	-	-	-	-	56	19	56

Table 4: Proportion (%) of UK VMS reports that intersect the PMA within the SAC within ICES rectangles 35F0 and 35F1. The UK VMS reports within the PMA are split into those that cover BTG (BTG, reef and sandbank area) and those that cover both BTG and static gear (reef area).

Year	UK VMS fishing reports in 35F0	VMS fishing reports in PMA sandbank within 35F0	Percentage (%)	UK VMS fishing reports in 35F1	VMS fishing reports in PMA sandbank within 35F1	Percentage (%)	VMS fishing reports in PMA reef within 35F0	Percentage (%)
2014	2927	367	12.54	731	0	0	5	0.17
2015	2814	56	1.99	815	0	0	15	0.53
2016	3124	23	0.74	3378	0	0	20	0.64
2017	4873	11	0.23	3320	1	0.03	16	0.33
2018	5221	6	0.11	3093	1	0.03	15	0.29
2019	2196	65	2.96	2048	10	0.49	19	0.87

Table 5: Proportion of UK VMS reports as a percentage that intersect the PMA within Inner Dowsing, Race Bank and North Ridge SAC from those within ICES rectangles 35F1.

Year	VMS fishing reports in 35F1	VMS fishing reports in proposed management area within 35F1	Percentage (%)
2014	731	0	N/A
2015	815	0	N/A
2016	3378	0	N/A
2017	3320	1	0.03
2018	3093	1	0.03
2019	2048	10	0.49

Table 6: Area (km²) of PMA (option 2) and its parent ICES rectangles and the percentage of 35F0 and 35F1 that intercepts the area of the PMA (option 2).

ICES Rectangle	Sea area (km ²)	BTG and Static Prohibition (reef area)		BTG Prohibition (reef and sandbank areas)	
		Closure in rectangle (km ²)	Area cover	Closure in rectangle (km ²)	Area cover (%)
35F0	2710.35	14.96	0.55%	339.38	12.52%
35F1	3714	0.00	0.00%	11.76	0.32%

Table 7: Associated UK landings by value (£) for < 12 m vessels from BTG and static gear within the PMA for ICES rectangles 35F0 for reef area and 35F0 and 35F1 for sandbank area, calculated using the area based proportion (reef - 0.55%, SB 35F0 – 12.52%, 35F1- 0.32%) method (Table 6).

Gear	2014		2015		2016		2017		2018		2019	
	Reef	SB	Reef	SB	Reef	SB	Reef	SB	Reef	SB	Reef	SB
DRB	18.74	0	0	0	0.00	0	260.32	0	17.14	0	35.20	0
DRH	1,423	0	233.21	0	584.25	0	0	0	0	0	0	0
FPO	2,726	N/A	2475	N/A	3,567	N/A	3,318	N/A	5,120	N/A	7,524	N/A
GN	6.54	N/A	30.23	N/A	3.23	N/A	0	N/A	0	N/A	0	N/A
OT	44.96	1,025	1.82	41.44	9.50	216.19	0	0.00	0	0	0	0
OTB	26.75	608.87	20.33	462.78	25.12	571.89	19.40	441.52	25.56	581.75	15.18	345.59
OTT	0	0	1.41	31.99	0	0	0	0	0	0	0.00	0
PTB	0	0.58	0	0.00	0	0	0	0	0	0	0	0
TBB	672.71	15,313	269.69	6,139	967.55	22,029	1058	24,055	1,652	37,598	202.95	4,622
Total	4,919	16,948	3,032	6,675	5,157	22,817	4,654	24,496	6,814	38,179	7,777	4,968

Table 8: Associated UK landings by value (£) for > 12 m vessels from BTG and static gear within the PMA for reef areas and SB areas, calculated using the VMS proportion method (Table 4). FPO is the only gear type in VMS data found to be interacting with the PMA in 30F1 and is not being restricted as it's the SB PMA so only 30F0 included for SB figures.

Gear	2014		2015		2016		2017		2018		2019	
	Reef	SB	Reef	SB	Reef	SB	Reef	SB	Reef	SB	Reef	SB
DRB	0	0	221.83	828.15	0	0	89.53	61.55	8.98	3.59	12.38	42.36
FPO	603.94	N/A	1,240	N/A	1,293	N/A	832.67	N/A	509.25	N/A	2,490	N/A
MIS	610.69	44,825	3,275	12,227	0	0	0	0	0	0	0	0
OTB	0.87	63.51	0	0	156.52	180.00	66.84	45.95	130.24	52.10	58.79	201.12
PTB	0	0	0	0	5.68	6.53	5.28	3.63	0	0	0	0
TBB	623.24	45,746	1,080	4,034	1,432	1,646	1,349	927.72	1,025	409.98	703.85	2,408
Total	1,839	45,809	5,817	4,862	2,887	1,833	2,344	1,039	1,673	465.67	3,265	2,651

Table 9: Estimated annual profit for UK landings (£) associated with the PMA, based on economic Seafish data⁵ for the following Seafish segments⁶: North Sea beam trawl under and over 300 kW; North Sea and West of Scotland demersal trawl over 24 m, demersal pair trawls and

seines, demersal seiners, demersal trawl under 24 m under and over 300 kW, UK demersal trawls and seines under 10 m; UK hooks under 10 m; UK scallop dredge under and over 15 m; for sandbank management area, plus UK pots and traps under 10 m, 10 m - 12 m and over 12 m; UK drift and fixed nets under 10 m for Reef management area. (Figures for 2019 have been calculated using provisional figures for operating profit).

Year	Total income (£'000)		Net profit (£'000)		Profit margin (%)		Total landings (£)		Profit of landings (£)		Operating profit of landings (£)		Total PMA operating profit of landings (£)
	Reef PMA	SB PMA	Reef PMA	SB PMA	Reef PMA	SB PMA	Reef PMA	SB PMA	Reef PMA	SB PMA	Reef PMA	SB PMA	
2014	181.22	430.20	20.27	40.00	11.19	9.30	6,147.37	62,757.10	687.66	5,835.16	1,102.44	9,700.95	10,803.39
2015	183.33	421.60	18.86	32.00	10.29	7.59	5,573.74	11,537.16	573.29	875.69	982.00	1,702.11	2,684.11
2016	206.73	523.20	36.25	72.00	17.54	13.76	8,043.33	24,649.95	1,410.46	3,392.19	1,754.72	4,442.83	6,197.55
2017	210.17	535.50	35.13	76.00	16.72	14.19	6,998.15	25,535.24	1,169.77	3,624.05	1,568.31	4,868.62	6,436.94
2018	211.45	540.40	25.91	40.00	12.25	7.40	8,487.57	38,645.05	1,039.91	2,860.48	1,605.63	5,284.73	6,890.36
2019	205.40	530.70	27.28	52.00	13.60	10.45	11,042.36	7,618.92	1,501.21	796.08	2,182.67	1,095.39	3,278.06
Annual average	199.72	496.93	27.28	52.00	13.60	10.45	7,715.42	28,457.24	976.22	3,317.51	1,529.82	4,536.40	6,066.21

Table 10: Estimated non-UK landings (t) and value (£) within Inner Dowsing, Race Bank and North Ridge SAC SB PMA based on the proportion of VMS reports within the PMA. There are no Non-UK VMS reports in the portion of the site within 35F1.

Year	Nat	Gear	VMS reports in PMA	VMS reports in 35F0	Proportion of VMS reports in PMA	35F0 landings (t)	35F0 landings (£)	Estimate of landings from PMA (t)	Estimate of landings from PMA (£)
2014	FRA	OTB	2	177	1.13%	55.01	62,088	0.62	701.59
2015	Null	-	0	-	N/A	N/A	N/A	N/A	N/A
2016	Null	-	0	-	N/A	N/A	N/A	N/A	N/A
2017	Null	-	0	-	N/A	N/A	N/A	N/A	N/A
2018	Null	-	0	-	N/A	N/A	N/A	N/A	N/A

Table 11: Estimated non-UK landings (t) and value (£) within Inner Dowsing, Race Bank and North Ridge SAC reef PMA based on the proportion of VMS reports within the PMA. There are no Non-UK VMS reports in the portion of the site within 35F1.

Year	Nat	Gear	VMS reports in PMA	VMS reports in 35F1	Proportion of VMS reports in PMA	35F1 landings (t)	35F1 landings (£)	Estimate of landings from PMA (t)	Estimate of landings from PMA (£)
2014	FRA	OTB	10	177	5.65	55.01	62,088	3.11	3,508
2015	Null	OTB	1	113	0.88	43.56	55,915	0.39	494.82
2016	Null	-	0	-	-	N/A	N/A	0	0
2017	Null	OTB	1	47	2.13	4.48	11,852	0.10	252.18
2018	Null	-	0	-	0	N/A	N/A	0	0

Table 12: The number of fishing trips and catch weight (kg) based on gear type derived from the MMO catch app of under 10 m vessels using bottom towed gear (includes beam trawl and shrimp trawl) and static gear (includes handlines, polelines and pots). No other gear was recorded in the 35F0 sub-rectangles which the PMA covers. There are no vessels operating the specified gears in ICES sub rectangle 35F12, the only sub rectangle of 35F1 which contains feature. An estimate for the number of trips and catch weight (kg) was also calculated using an area based proportion method.

ICES sub-rectangle s	Bottom towed gear		Static gear		% PMA/sub rectangle		SB PMA		Reef PMA	
	No. of fishing trips	Weight (kg)	No. of fishing trips	Weight (kg)	Reef PMA	SB PMA	No. of fishing trips	Weight (kg)	No. of fishing trips	Weight (kg)
35F04	1	1,095	18	10,465	0.30	NA	N/A	NA	0.06	34.46
35F05	11	13,350	181	54,593	0.03	1.54	0.17	209.81	0.06	21.40
35F07	0	0	90	34,548	0.07	0.87	0	0	0.07	25.39
35F08	0	0	144	155,575	N/A	5.78	0	0	N/A	N/A
35F09	0	0	260	213,475	N/A	0.54	0	0	N/A	N/A

4.15. The landings presented in tables 1 to 8 were calculated using the proportion of UK VMS fishing reports within ICES rectangles 35F0 and 35F1 that intersect Inner Dowsing, Race Bank and North Ridge SAC proposed management areas. Since there are a large amount of null gear codes within the VMS data at ICES rectangle level, percentages for each year were applied across all gears. This data can be compared with the landings data from vessels with VMS.

Compliance costs

4.16. MMO compliance action is intelligence-led and risk-based in accordance with the National Intelligence Model. 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 IFCA, Border Force or the Environment Agency). Joint operations cannot be monetised at present 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 and the Regulators' Compliance Code and aim to ensure that the MMO is proportionate, accountable, consistent, transparent and targeted in any compliance action it takes.

4.17. Compliance costs for the inspection of MPAs and associated byelaws do not represent an additional cost. MPA inspections take place under standard operating procedure of Royal Navy/MMO fisheries patrol vessels. MPA and byelaw inspection costs are therefore absorbed by existing compliance systems and will not be considered here.

Total monetised costs

4.17 The total monetised costs are informed by data from the MMO on fishing activity using bottom towed and static gear within the management areas and from the 2014 - 19 Seafish data on the profitability of fishing⁵. This shows that for the fleet segments⁶ concerned (North Sea beam trawl under and over 300 kW; North Sea and West of Scotland demersal trawl over 24 m, demersal pair trawls and seines, demersal seiners, demersal trawl under 24 m under and over 300 kW; UK pots and traps under 10 m, 10 m - 12 m and over 12 m; UK demersal trawls and seines under 10 m; UK drift and fixed nets under 10 m; UK hooks under 10 m; UK scallop dredge under and over 15 m) that the net profit margin ranges from 7.40% to 14.19% for sand bank proposed management area and 10.29% to 17.54% for reef proposed management area across 2014 - 2019 (Table 9).

4.18 Seafish data indicates that the average annual value of UK landings is estimated to be £28,457 for the sandbank proposed management area and £7,715 for the reef proposed management area (Table 9).

4.19 To estimate the highest total monetised cost (management option 2) over ten years to the UK vessels likely to be affected, the estimated profit earned from UK landings in accordance with profit ratios calculated in Table 9 was used, and an estimate of £5,861 has been made for the annual average. This equates to an equivalent annual net direct cost to business (EANDCB) of £5,861 (present value).

4.20 A discounting rate of 3.5% was applied to calculate the present value (2020) and 2019 was used as the price base year. The best estimate of highest net present value cost over 10 years to the UK fishing industry of introducing management is estimated to be £50,449.

Non-monetised costs

4.21 The prohibition of bottom towed and static fishing gears within the specified areas of the SAC could lead to the displacement of these fishing activities increasing pressure on protected habitats in inshore areas of the site and on habitats outside of the site. The MMO fisheries assessment of Inner Dowsing, Race Bank and North Ridge SAC indicates that bottom towed and static fishing gears are adversely affecting the designated features. As such, the potential impact of displacement to areas outside of the SAC does not remove the requirement to ensure that fishing is managed to further the conservation objectives of the SAC. Further, there is minimal activity from these gears occurring in the portion of the site beyond 6 nm and therefore this cost may not be significant.

4.22 There are potential indirect economic costs associated with whole site prohibition of bottom towed and static fishing gears in the SAC. For example, costs to the suppliers, fuel costs and time costs associated with sourcing new suppliers, travelling to and utilising alternative fishing grounds. However, this information cannot be easily quantified and, as detailed above, bottom towed and static gear fishing effort in the proposed closed area is relatively limited. As such, indirect economic costs have not been explored further.

Non-monetised benefits

4.23 Prohibition of the use of bottom towed gear, pots and anchored nets and lines over the proposed management area will contribute to the protection of the designated features. This in turn will protect the ecosystem services provided by those features/sub-features (Fletcher *et al.*, 2012):

- Biogeochemical cycling – Subtidal sediments have an important role in the global cycling of many elements, including carbon and nitrogen. At a local scale, nitrogen and phosphorus remineralization provide a significant contribution to the nutrients required by primary producers in the water column

- (Burdige, 2006). Subtidal sediments may provide either temporary or permanent sinks for pollutants, particularly toxic metals (Burdige, 2006);
- Erosion control - The presence of microalgae in subtidal sediment ecosystems plays a role in stabilisation of the habitat which in turn can reduce incident wave energy and reduce erosion (Ziervogel and Forster, 2006);
 - Formation of a physical barrier – Biogenic reefs can reduce incident wave energy (McManus, 2001);
 - Food web dynamics – Subtidal sediment is an important area for crabs and other epifauna, in particular echinoderms (Jones, Hiscock and Connor 2000). Sandeels present in the area can also attract sea birds such as puffin, razorbill, guillemot and terns (Fletcher *et al.*, 2012). *S. spinulosa* can provide an important food source for the pink shrimp (*Panadalus montagui*);
 - Species diversification and formation of species habitat – Biogenic *S. spinulosa* reefs have a rich associated infauna and epifauna. The reefs provide firm substrate for attachment and support a diverse array of species such as polychaetes, sponges, cnidarians and bryozoans (JNCC 2010). *S. spinulosa* reef habitats are of greatest nature conservation significance as they occur on predominantly sediment or mixed sediment areas (Fletcher *et al.*, 2012). These enable a range of epibenthic species with their associated fauna and a specialised 'crevice' infauna, which would not otherwise be found in the area, to become established (Maddock, 2008). Mobile sandbanks are colonised by infaunal/epifaunal small crustaceans, polychaetes and molluscs adapted to this dynamic environment; such species include *Nephtys cirrosa* and *Microphthalmus similis* (Jones, Hiscock and Connor 2000). Polychaetes such as *Lanice conchilega* can provide additional structure to otherwise soft sediment subtidal habitats (Van Hoey *et al.*, 2008). In offshore subtidal sediment communities macrofaunal abundance is lower, but exhibits high species richness (Denis and Desroy, 2008). The spatial distribution of species within and upon subtidal sediments is significantly influenced by particle size distribution, organic content and chemical composition (Fletcher *et al.*, 2012);
 - Primary biomass production - a significant proportion of primary production sinks to the sea floor and is assimilated into the subtidal sediment (Jensen *et al.*, 2003);
 - Secondary biomass production – Biogenic reefs are important secondary producers through growth of epibiotic organisms including sponges and tunicates. Subtidal sediment is an important area for crab species as well as sandeel which attracts birds such as Atlantic puffin, razorbill, guillemot and terns (Jones, Hiscock and Connor 2000);
 - Fisheries – Subtidal sediment is an important nursery area for many commercially important species such as flatfishes and bass and biogenic reefs provide habitat for shellfish and fish (Fletcher *et al.*, 2012; Holt *et al.*, 1998). Improved protection of the site could lead to spill over where there is an increase in/ movement of species in surrounding fishing grounds,

potentially benefitting commercial fisheries. There may also be opportunities for diversification of fishing, for example, where vessels using static gear move in where mobile gears are prohibited;

- Environmental resilience - Subtidal sediment habitats are more resilient than other habitats as they can be easily affected by wave and tidal displacement of sediment (Fletcher *et al.*, 2012). Recovery of habitats following a disturbance is dependent on physical, chemical and biological processes and can be a more rapid process than in other areas (Bishop *et al.*, 2006);
- Regulation of pollutants - Nematode species present in subtidal sediment habitats can be good indicators of environmental conditions and muddy subtidal sediment habitats can act as sinks for radionuclides (Gheskiere *et al.*, 2005; Finnegan *et al.*, 2009); and
- Climate Regulation - Subtidal biogenic reefs play a major role in the global carbon cycle and act as a major store of carbon (Fletcher *et al.*, 2012).

5. Recommended Management Option

Following the above assessment the recommended management option is Option 2: MMO byelaw to prohibit bottom towed fishing over all the protected features and to prohibit static fishing gear over reef feature outside of the 6 nm portion of the site, with appropriate buffering.

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Appendix 1 – Additional Figures

Figure 3: 2014 VMS fishing activity by gear type in Inner Dowsing, Race Bank and North Ridge SAC.

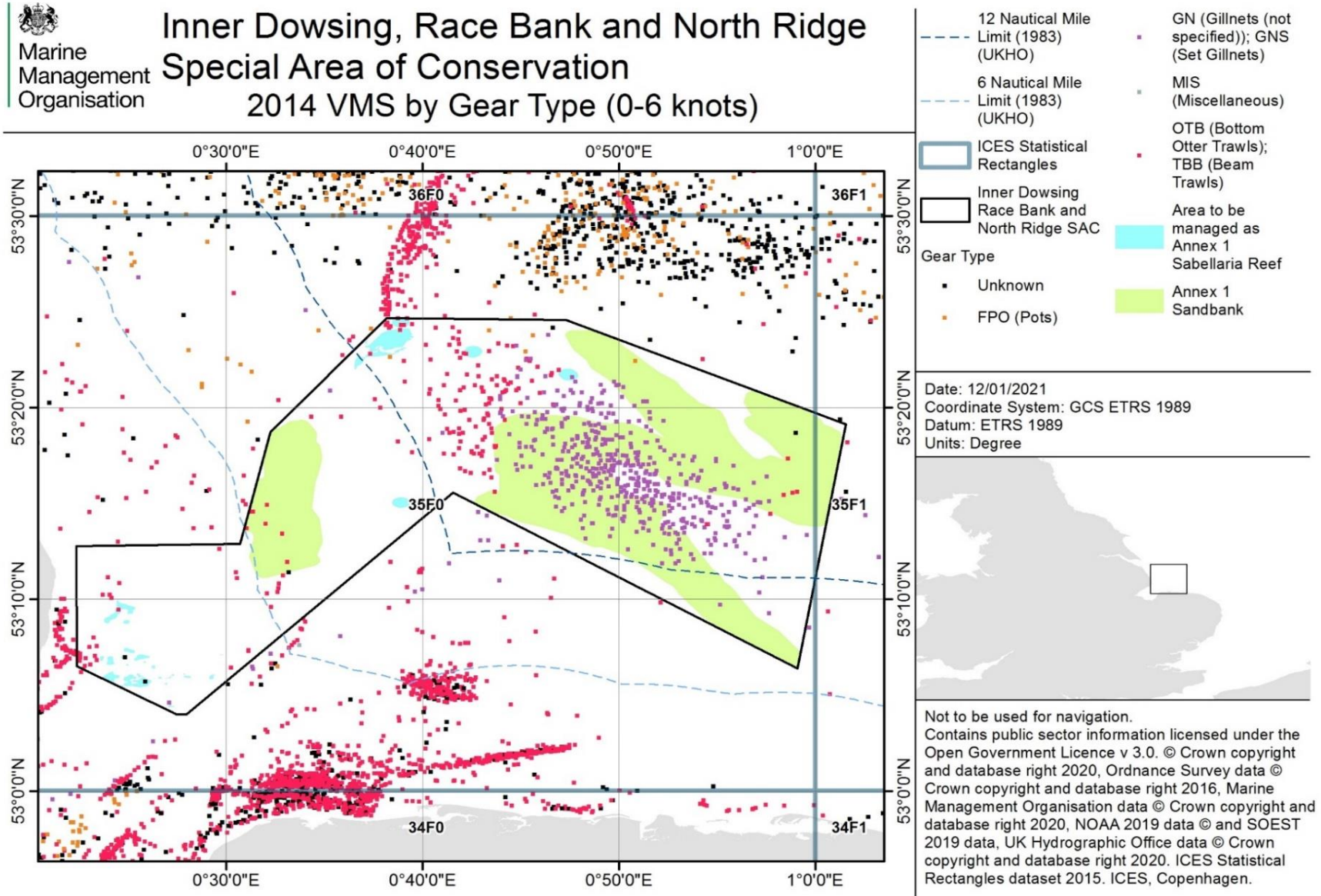


Figure 4: 2015 VMS fishing activity by gear type in Inner Dowsing, Race Bank and North Ridge SAC.

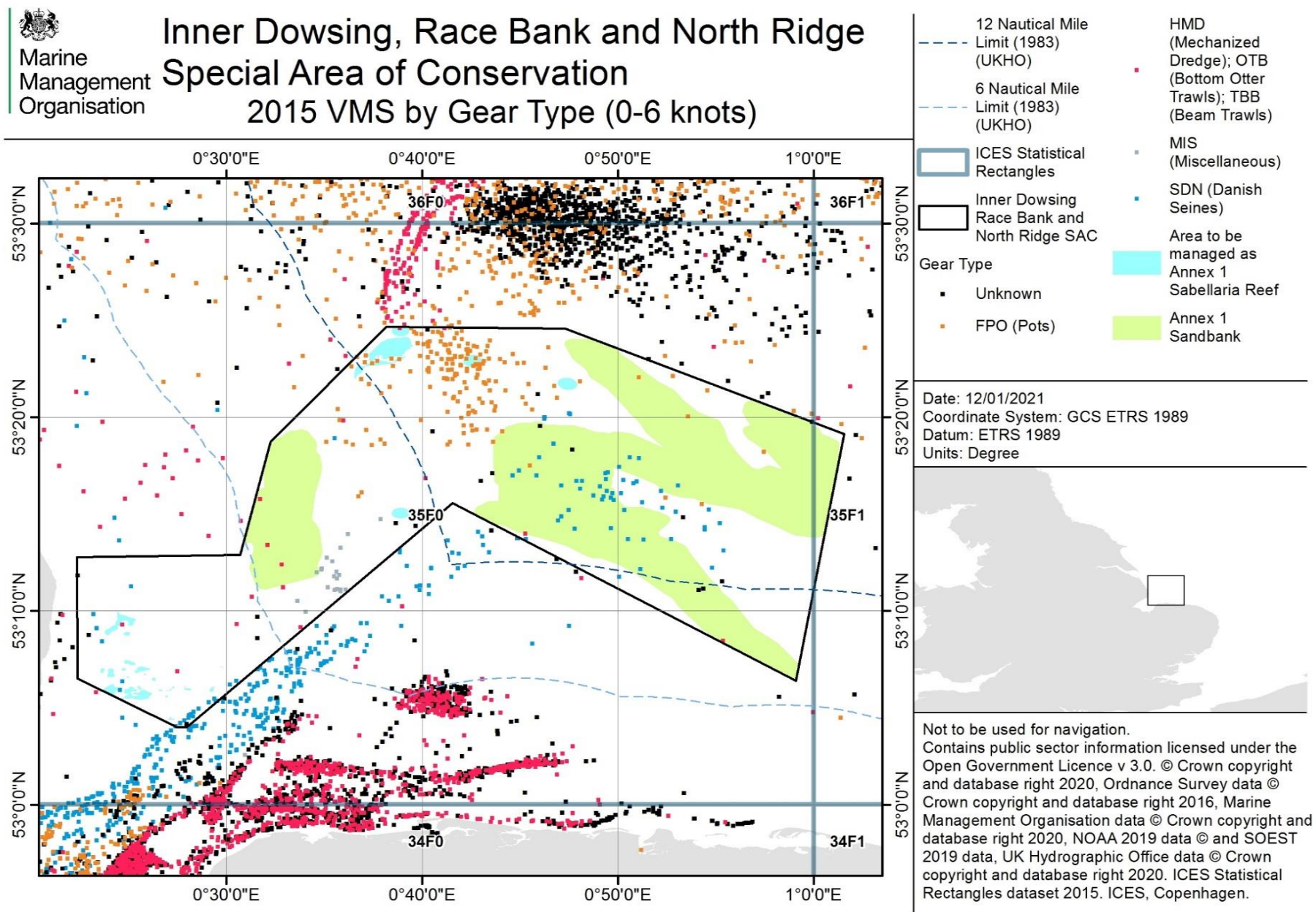


Figure 5: 2016 VMS fishing activity by gear type in Inner Dowsing, Race Bank and North Ridge SAC

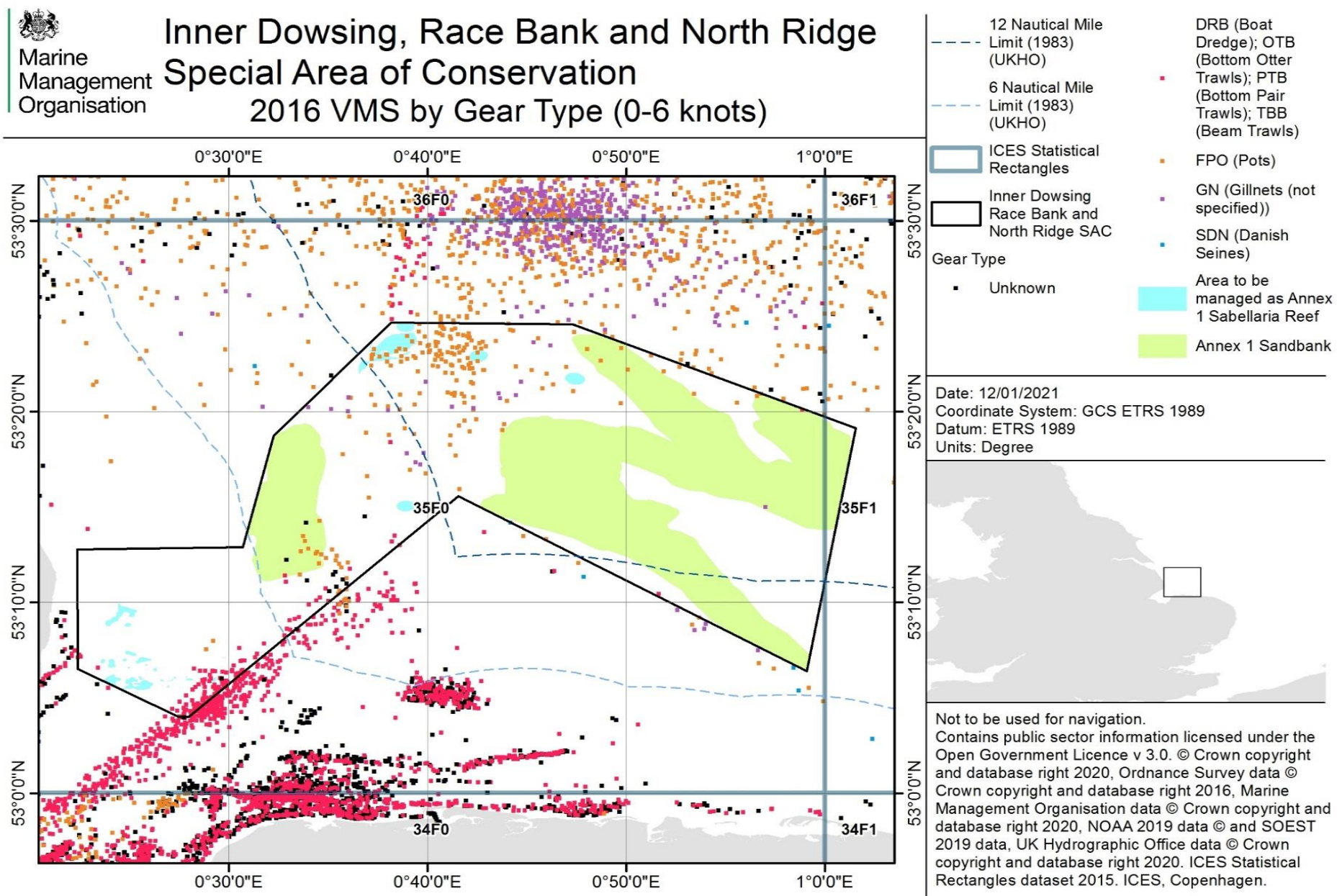


Figure 6: 2017 VMS fishing activity by gear type in Inner Dowsing, Race Bank and North Ridge SAC.

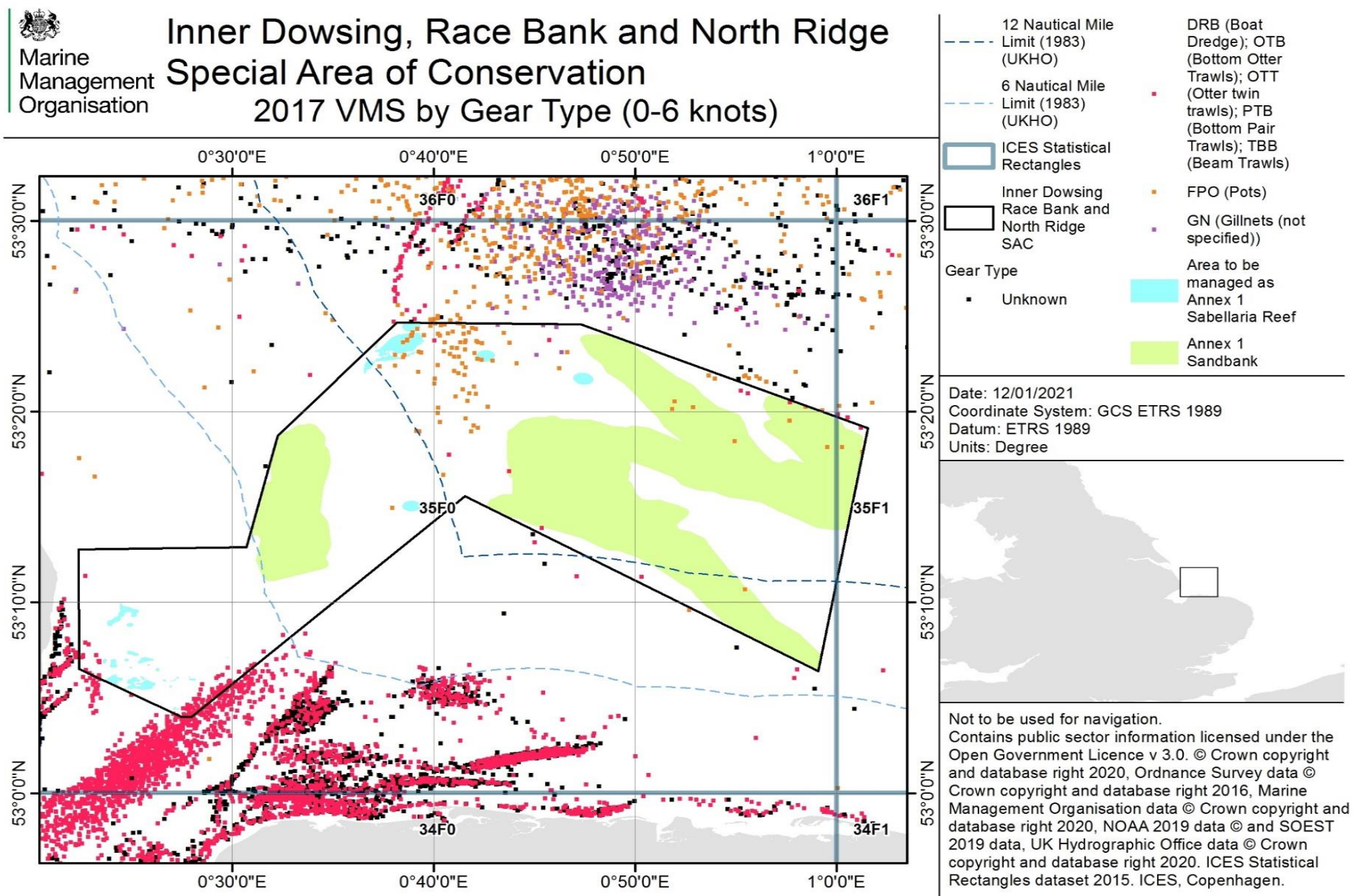


Figure 7: 2018 VMS fishing activity by gear type in Inner Dowsing, Race Bank and North Ridge SAC.

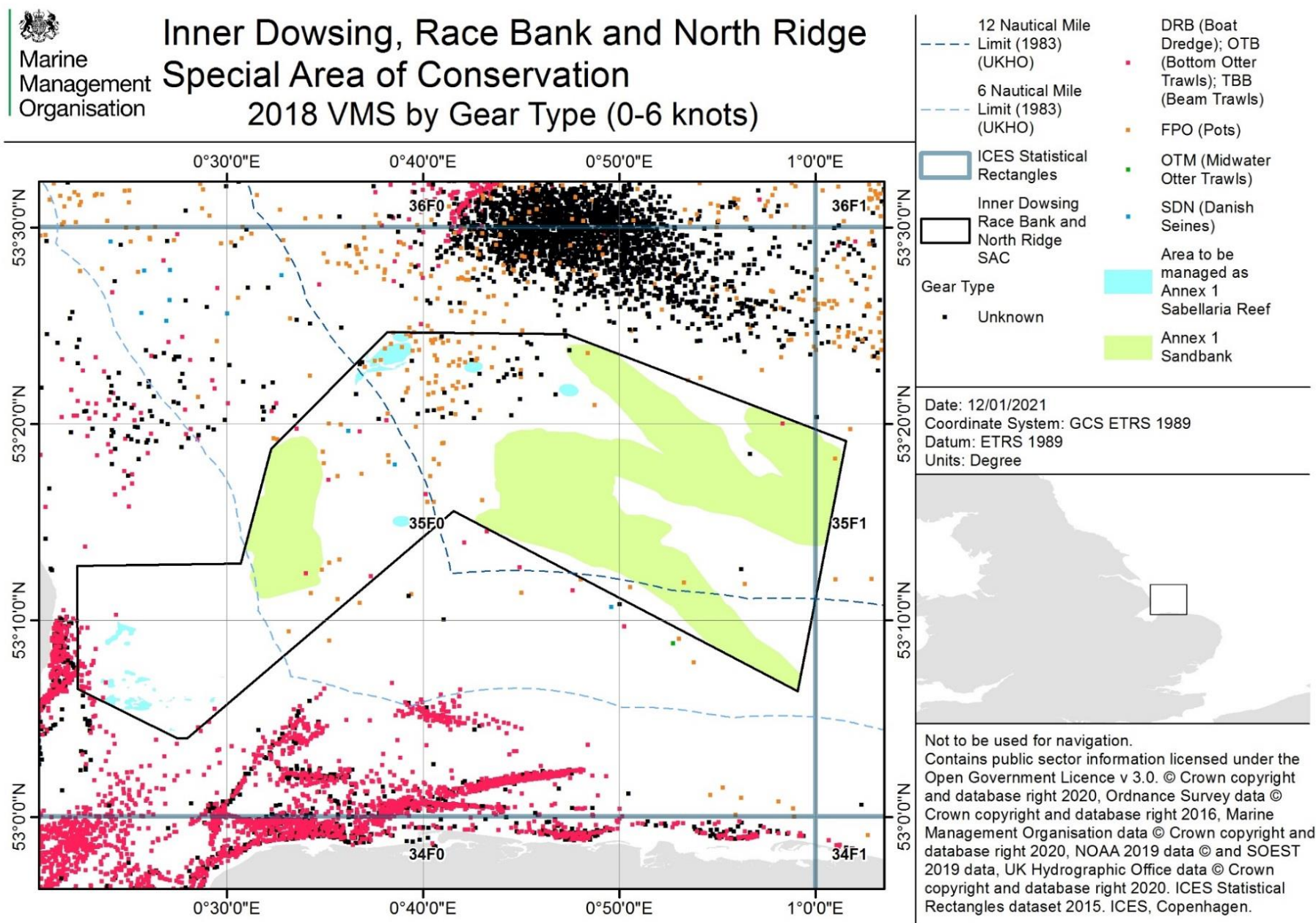


Figure 8: 2019 VMS fishing activity by gear type in Inner Dowsing, Race Bank and North Ridge SAC

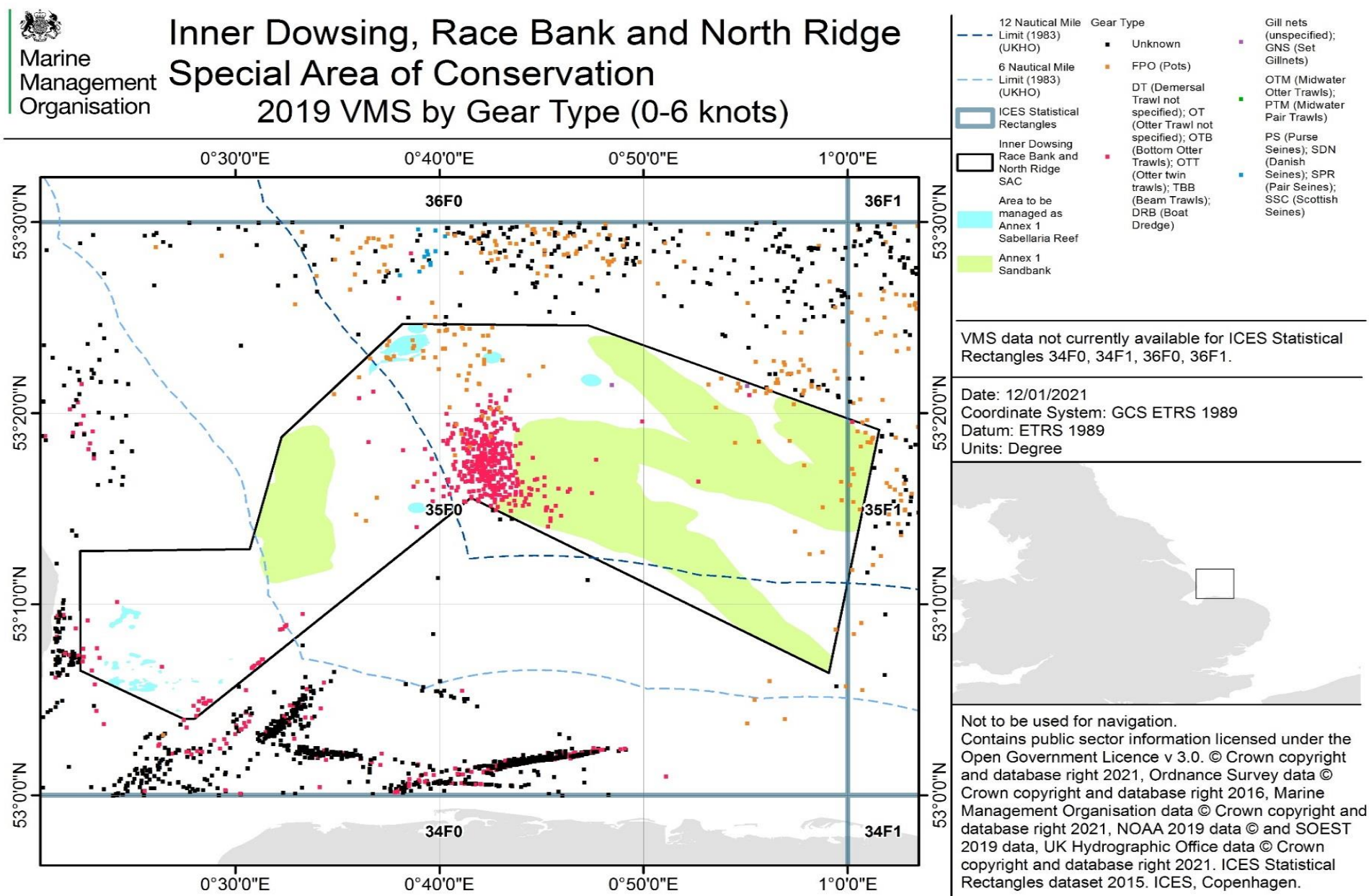


Figure 9: 2014 VMS fishing activity by nationality in Inner Dowsing, Race Bank and North Ridge SAC

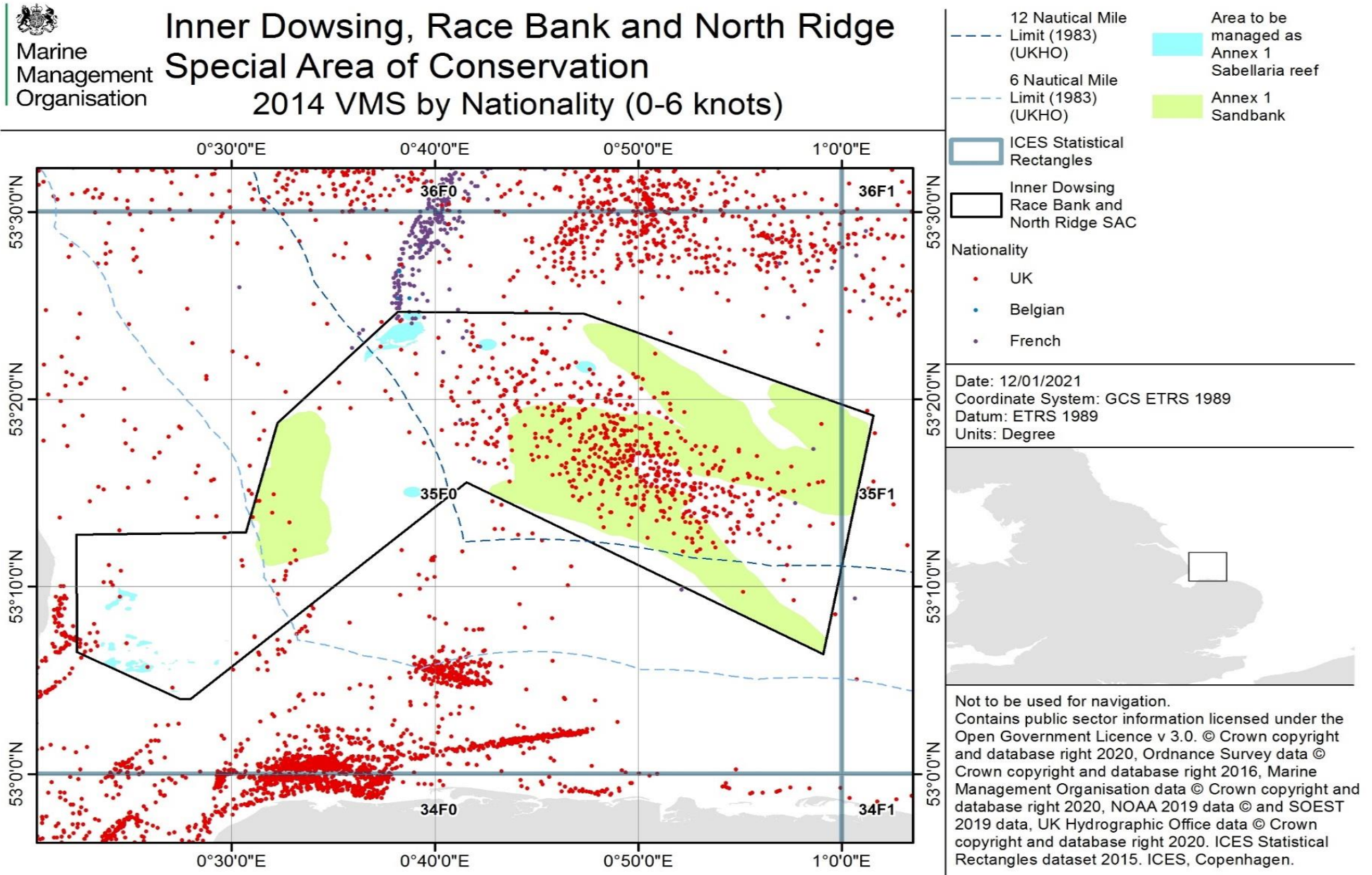


Figure 10: 2015 VMS fishing activity by nationality in Inner Dowsing, Race Bank and North Ridge SAC

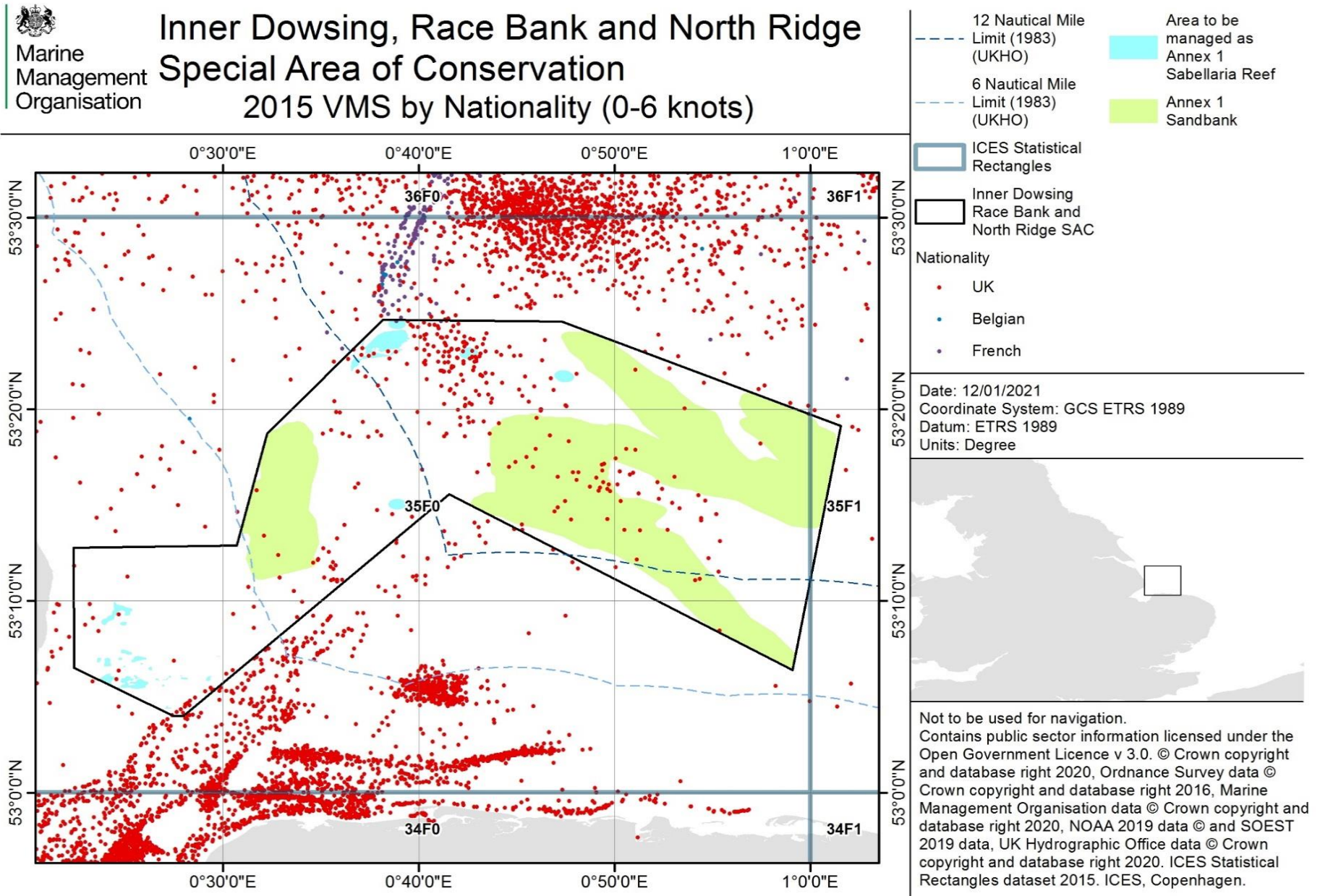


Figure 11: 2016 VMS fishing activity by nationality in Inner Dowsing, Race Bank and North Ridge SAC

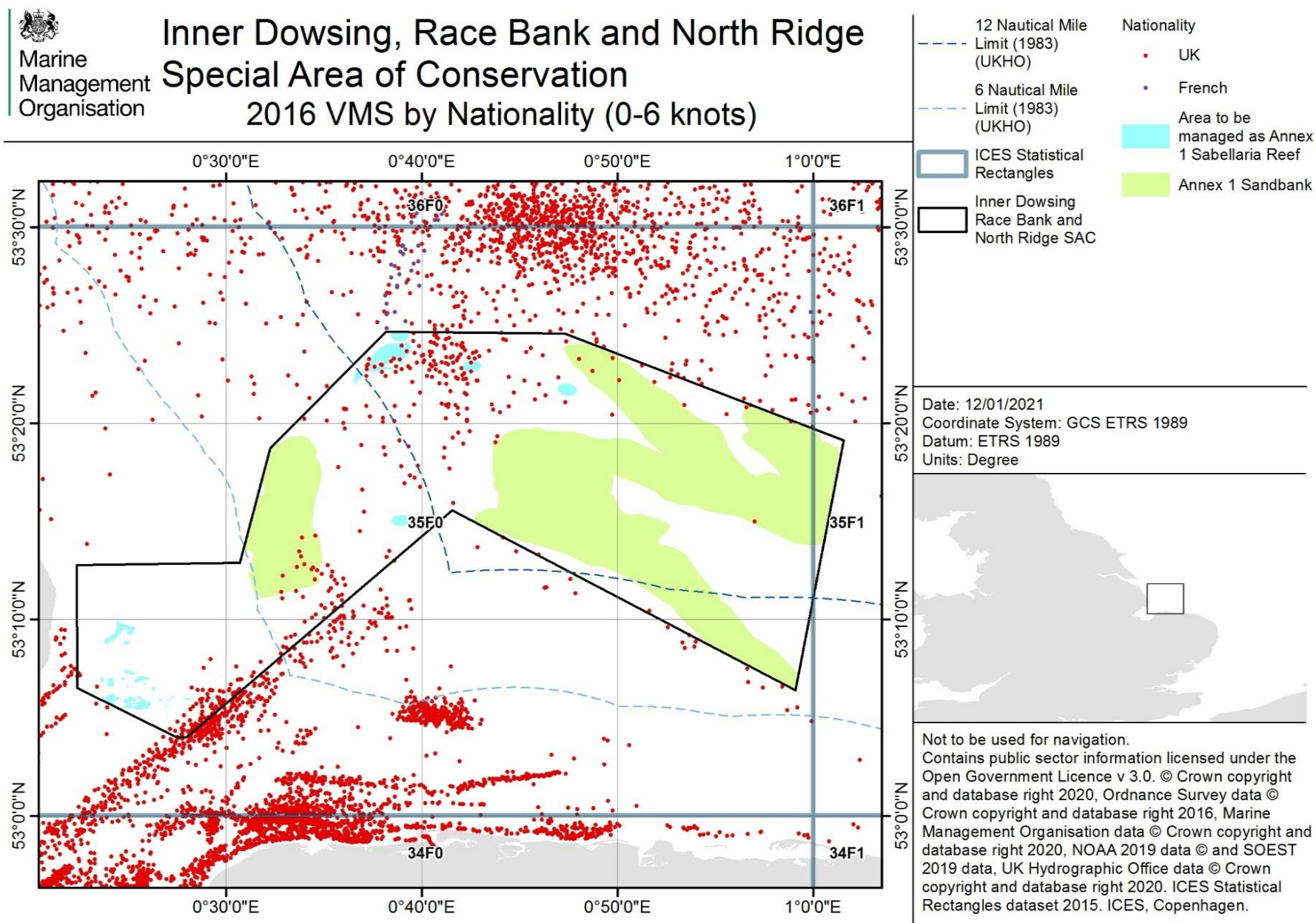


Figure 12: 2017 VMS fishing activity by nationality in Inner Dowsing, Race Bank and North Ridge SAC

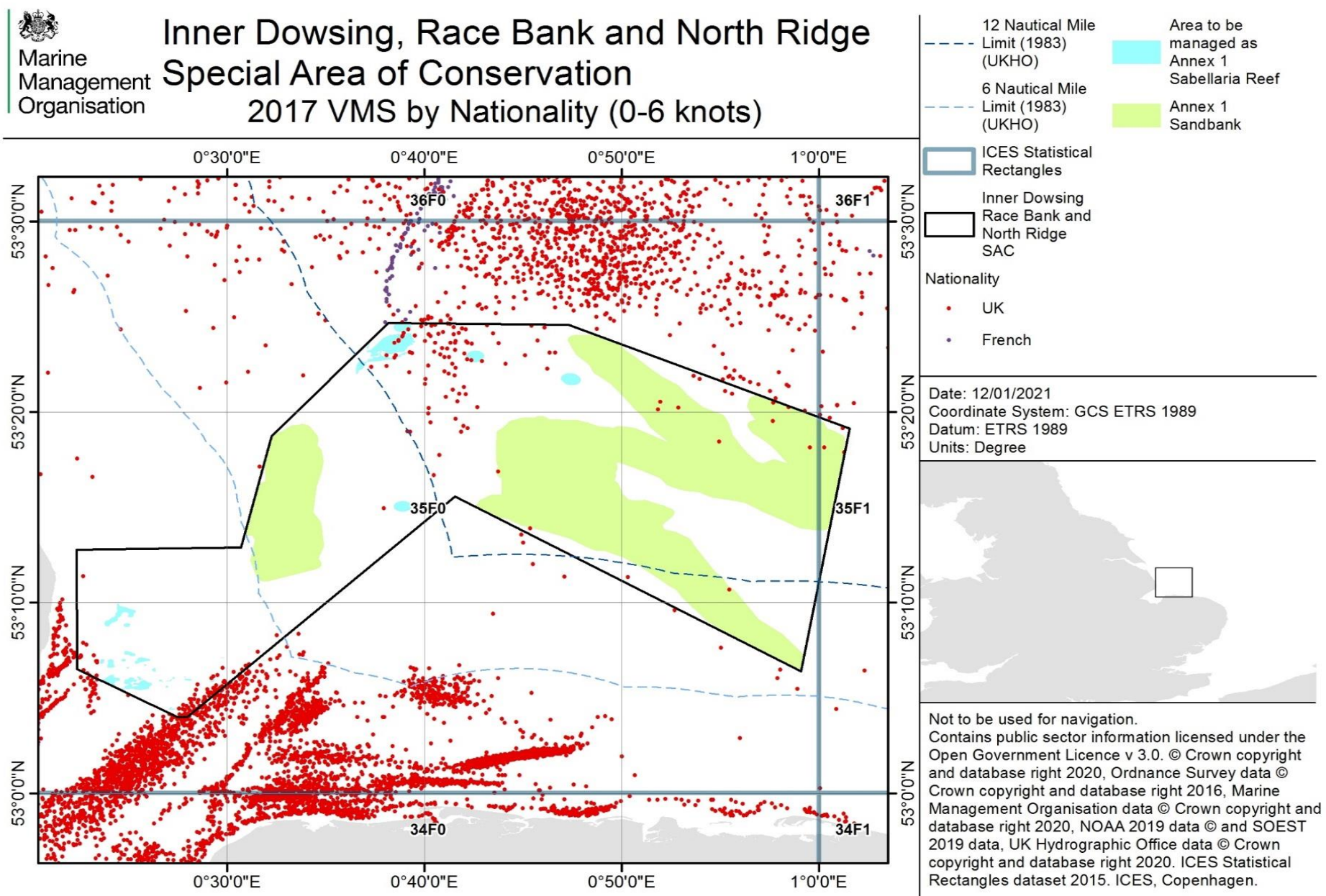


Figure 13: 2018 VMS fishing activity by nationality in Inner Dowsing, Race Bank and North Ridge SAC

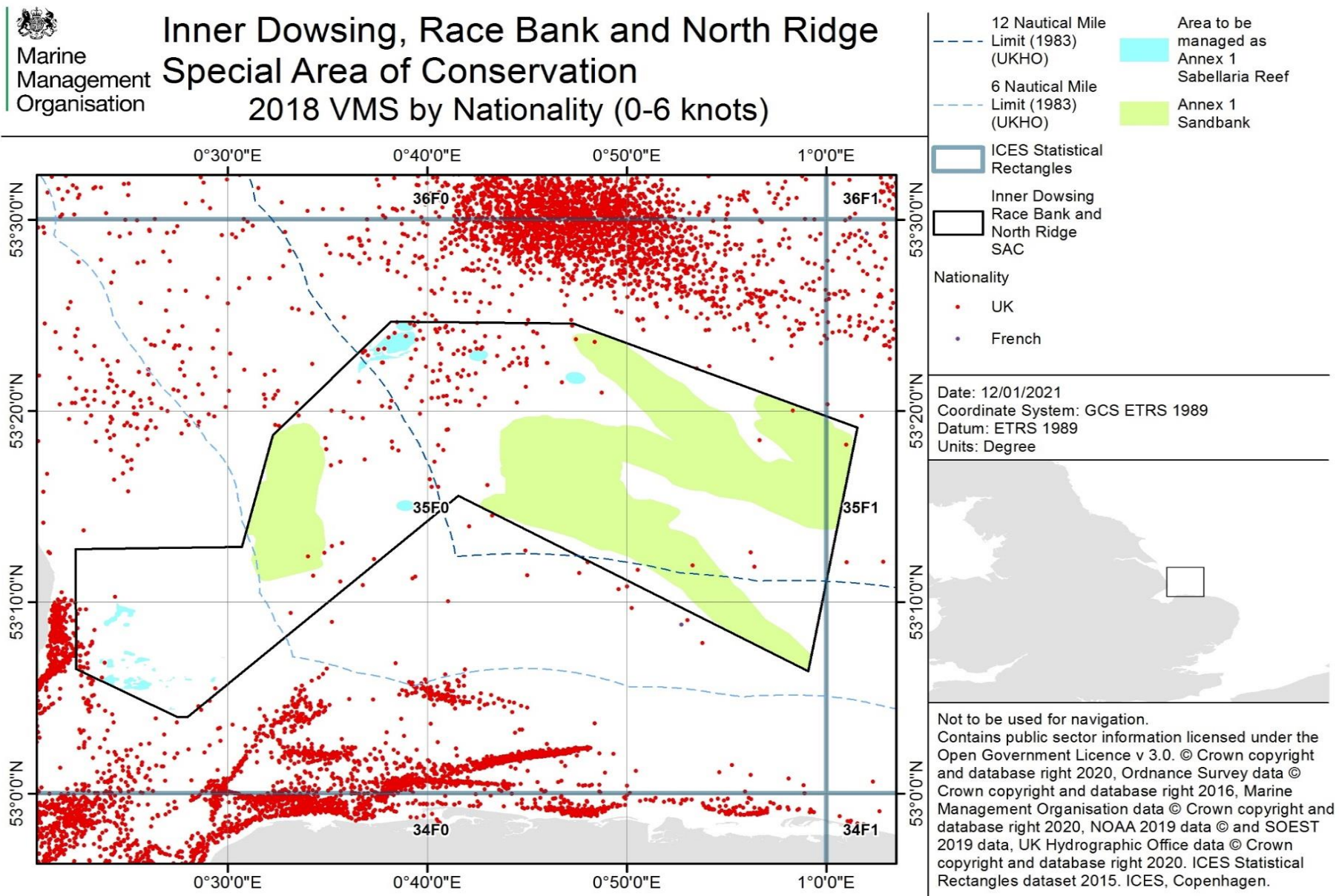


Figure 14: 2019 VMS fishing activity by nationality in Inner Dowsing, Race Bank and North Ridge SAC

