



Marine
Management
Organisation

**Social and Economic
Impact Assessments
for Fisheries
Management Decisions
– Annex B: Case Study
(MMO1384)**



...ambitious for our seas and coasts



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Report prepared for:
Marine Management Organisation

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B Case Study

This annex provides the results of the hypothetical case study that was undertaken to test the application of the SEIA guidance and the use of the template for supporting evidence. The case study relates to a hypothetical closure of an area to mobile demersal gears. The area chosen was approximately 40 km by 30 km, and located around 40 km offshore.

Real fisheries data was used, but was anonymised in the reporting. Due to the hypothetical nature of the case study, specific locations were not referred to, and instead were anonymised (e.g. 'Port A', 'Port B'); ICES rectangles were referred to as 'XXXX'.

Vessel Monitoring System (VMS) data linked to logbook returns for over-12m vessels were used. The location of the closure area meant that the majority of impacts were on bigger vessels with a larger operating range. If the location were closer to shore, impacts on smaller vessels (under 12m length) would need to be considered in more detail.

B.1 Background

B.1.1 Policy issue and rationale for Government intervention

The Fisheries Act 2020 encompasses the legal framework to achieve “a more competitive, profitable and sustainable fishing industry across the whole of the UK” whilst at the same time protecting the wider environment. Fisheries Management Plans (FMPs) are the means to achieve the ambitions of the Fisheries Act 2020. The policies and measures associated with FMPs can be implemented through mechanisms such as statutory instruments, licensing conditions and/or voluntary measures. In addition, the Marine and Coastal Access Act 2009 is responsible for conserving UK marine habitats and the wider marine environment.

The MMO has statutory powers in fisheries management, via both the Fisheries Act 2020 and the Marine and Coastal Access Act 2009, to enhance sustainable fishing practices and to protect marine fauna and flora.

The MMO is now assessing and evaluating the impacts of closing a marine area to mobile demersal fishing gears, which is located outside of a designated Marine Protected Area (MPA), and instead, is located within an area which is actively fished. The area includes an important nursery and spawning ground for fisheries as identified in the relevant FMP. The intention is to improve the sustainability value of the fishing activities taking place in the area, whilst also protecting the marine environment.

B.1.2 Rationale for intervention and intended effects

The UK's marine environment is important with regards to biological diversity, but it also provides a variety of goods and services, contributing to social, economic and environmental wellbeing:

- recreation and tourism opportunities (and associated income and wellbeing) (Posford Duvivier, 1996; Kenter et al., 2013);
- the provision of marine products (for example, fish and shellfish) (Posford Duvivier, 1996; Luisetti et al., 2011);
- regulating services (for example, climate regulation, flood mitigation and coastal protection) (Luisetti et al., 2011)
- cultural and existence values (Ropars-Collet et al., 2015; Christie & Rayment, 2012).

However, certain fishing practices may detrimentally impact the marine environment. Previous assessments on the impact of fishing activities (for example, within Marine Protected Areas, MPAs) have concluded that mobile demersal fishing gears, are antagonistic to conserving the marine environment and may damage particular nursery and spawning ground habitats. MMO has therefore implemented byelaws on the prohibition of bottom towed fishing gear within specified MPAs. Most recently, this has resulted in the production of the Marine Protected Areas Bottom Towed Fishing Gear Byelaw 2023 (coming into force on 22 March 2024) to prohibit bottom towed fishing activities within specified areas of 13 offshore MPAs in English waters. The MMO would now like to extend such prohibitions on mobile demersal fishing gears into areas outside of MPAs where necessary and identified in FMPs.

Fishing activities may produce negative consequences in the marine environment due to 'market failures'. Such failures can be associated with:

- **Public goods and services:** The marine environment provides benefits to fishers via sales of fisheries resources, but there may be little incentive to protect marine habitats, and associated public good and services, from their fishing activities.
- **Negative externalities:** Some of the potential costs borne by fishers employing mobile demersal gear are reduction in catches, and increased fuel costs (associated with moving to new fishing grounds). The availability of alternative fishing grounds can reduce the cost associated with diminished catches, whilst increased fuel costs may not be significant enough to deter fishers from employing fishing practices which may detrimentally impact marine habitats.

B.1.3 Marine Plan Assessment

This section has not been completed for the case study, because the focus of the case study was on testing the guidance for assessing social and economic impacts. This section of the template is the same as in the existing template, and may be required for MMO evidence statements.

B.1.4 Marine Strategy Regulations

This section has not been completed for the case study, because the focus of the case study was on testing the guidance for assessing social and economic impacts. This section of the template is the same as in the existing template, and may be required for MMO evidence statements.

B.2 Policy objectives and intended effects

Both the Fisheries Act 2020 and the Marine and Coastal Access Act 2009 aim to enhance sustainable fishing practices and protect marine fauna and flora within the UK. The MMO has statutory powers in fisheries management to support both of these Acts and as such, the MMO is currently assessing and evaluating the impacts of implementing a ban on potentially-damaging mobile demersal fishing gears in one specific area which is currently actively fished.

Therefore, the overall policy objective is to use fisheries management measures to prohibit the use of mobile demersal fishing gears in areas outside of MPAs.

The intended effects are to increase the sustainability of UK fish stocks in combination with protecting the marine environment.

B.3 Policy options considered, including alternatives to regulation

B.3.1 Option 0: Do nothing

This option is not a viable option to achieve the objectives of improving the sustainability value of the fishing activities whilst also protecting the marine environment. All other options are compared to option 0.

B.3.2 Option 1: Voluntary measures

This option would involve the development of voluntary codes of practice to protect the area in question. MMO has considered this option in light of [Better Regulation](#), which requires that new regulation is introduced only as a last resort. However, the government's expectation is that management measures for commercial fishing in MPAs should be implemented through statutory regulation to ensure adequate protection is achieved.

B.3.3 Option 2: Removal of pressures via a whole area prohibition of bottom towed gears

Prohibiting the use of bottom towed gear within the proposed management area will protect the identified nursery and spawning ground and other marine habitats.

Option 2 is the preferred option. This is reflected in the assessment of costs and benefits.

The proposed management area is approximately 40 km by 30 km, and lies within ICES rectangles XXXX¹ and XXXX.

¹ 'XXXX' is used in place of the identification of an ICES rectangle; the ICES rectangles are not specified here, due to the hypothetical nature of the case study.

B.4 Rationale for De Minimis Rating

The intervention is anticipated to have a cost impact on business of below £10 million and therefore qualifies for a De Minimis Assessment (DMA).

B.5 Costs and Benefits

For the purposes of the hypothetical case study, only the costs for Option 2 have been assessed in detail.

The costs and benefits assessed are:

- Impacts on the fishing industry
 - Reduction in value of landings of UK fishing vessels (direct)
 - Reduction in value of landings of non-UK fishing vessels (direct)
 - Reduction in profit of UK fishing businesses (direct)
 - Impacts of displacement of fishing effort (indirect)
 - Increased fishing opportunity (space) for static gears (indirect)
- Public sector costs
- Wider economic impacts
 - Reduction of employment on UK fishing vessels (direct)
 - Distribution of impacts by fleet segment and location
 - Impacts on home ports and ports of landings of vessels (identification of locations and assessment of significance) (indirect)
 - Reduction to GVA of the upstream supply chain (indirect)
 - Reduction to GVA of downstream supply chain (indirect)
- Social impacts
 - Distribution of economic impacts on social groups (direct/indirect)
 - Impacts on social values (indirect)
- Environmental impacts
 - Improved status of features of interest from exclusion of mobile demersal gears (direct)
 - Reductions in environmental quality and carbon emissions from displacement of fishing effort (indirect)

B.5.1 Impacts on the fishing industry

This DMA considers the economic impact to UK businesses and wider economic and social impacts. 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 relating to potential impacts on non-UK fishing vessels has been provided for context. All costs assessed are considered ongoing costs.

B.5.2 Impacts on landings (value, profit, GVA)

Over-12m vessels

Fisheries landings are reported at ICES statistical rectangle level (30 min latitude by one degree longitude in size, which is approximate 30 Nautical Miles (NM) by 30 NM, although the size varies with latitude due to the spheroid shape of the Earth).

Vessels over 12m in length are required to have a Vessel Monitoring System (VMS) which transmits the vessel's location, speed and direction at 2-hourly intervals.

Logbook data on reported landings (volume and value) are combined with VMS 'ping' data, with the landings from a trip distributed equally across the 'fishing pings'² within the relevant ICES rectangle. This provides an estimate of the spatial distribution of landings from within individual ICES rectangles. Limitations of these data include that it assumes each 'fishing' ping is equally important for catches on the fishing trip, whereas some hauls and areas may result in better catches than others. VMS pings are only at 2-hourly intervals, which limits the resolution of activity. This is mitigated by using five years of data, which should provide a reasonable overview of activity and variations in fishing patterns. The speed rules applied to determine 'fishing' activity may reflect actual fishing activity better for some gear types (e.g. mobile demersal gears) than for others (e.g. static gears).

To estimate the economic impacts of the proposed measure, fishing patterns of vessels using bottom-towed gear within the management area were analysed. The most recent five years of data available were used. Data from 2020 were excluded due to the effect of the Covid pandemic on fishing patterns during the year. The years included were 2017-2019 and 2021-2022. Values were updated to 2023 prices, using HM Treasury GDP deflators³.

Over the period 2017-2022 (excluding 2020), 112 over-12m UK vessels were active in the proposed management area (Table B1). Of these, 78 vessels had estimated annual landings from the proposed management area of £1,000 or more, 54 had estimated landings of £10,000 or more, and 15 had estimated landings of £100,000 or more (2023 prices).

Fishing activity mainly consists of beam trawls, followed by boat dredges and bottom otter trawls (Figure B1).

² VMS pings where the vessel speed is between greater than zero and less than 6 knots.

³ <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-december-2023-quarterly-national-accounts>

Figure B1: Number of over-12m UK vessels active in the proposed management area by gear type, 2017-2022 (excluding 2020).

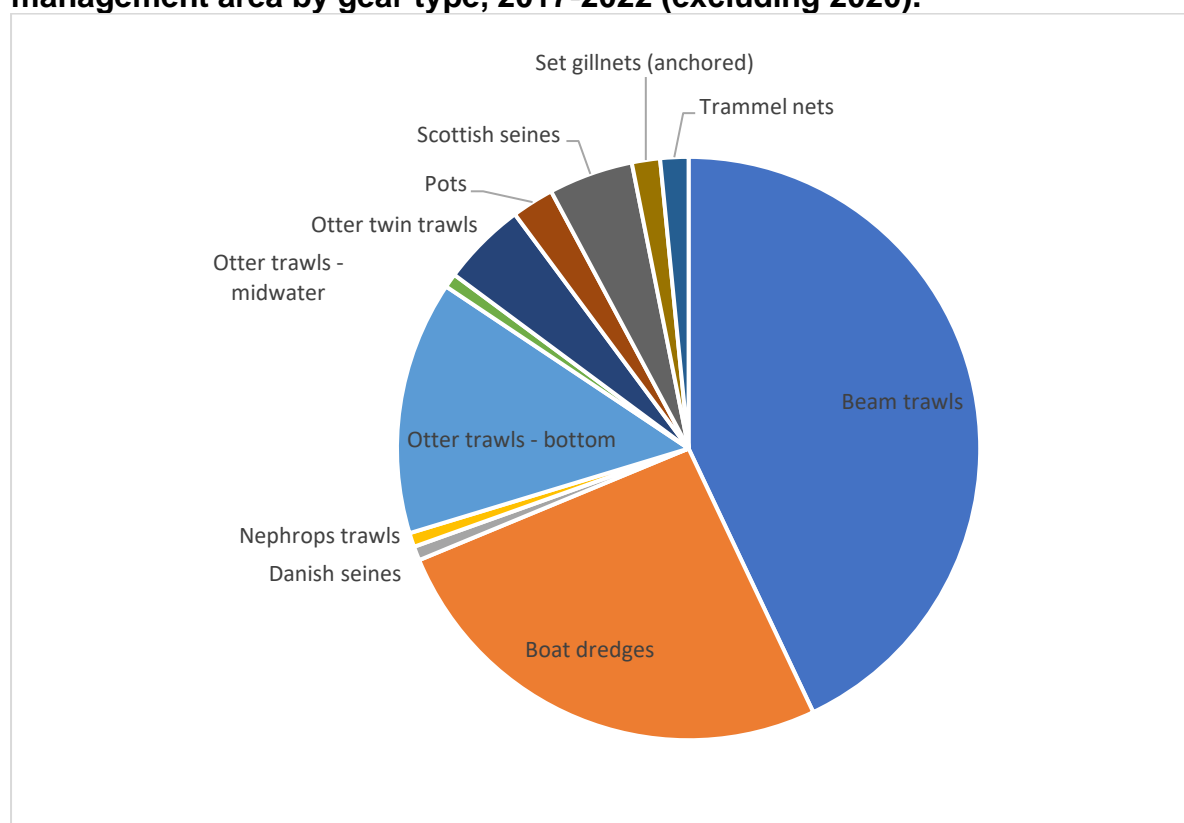


Table B1: Estimated number of over-12m UK vessels by gear type that were active in the proposed management area from 2017–2022 (excluding 2020).

Gear type	2017	2018	2019	2021	2022	Total
Beam trawls	45	45	45	36	40	55
Boat dredges	12	10	7	4	15	33
Danish seines	0	0	0	1	0	1
Nephrops trawls	1	0	0	0	0	1
Otter trawls - bottom	14	8	2	2	0	18
Otter trawls - midwater	1	0	0	0	0	1
Otter twin trawls	4	2	0	1	0	6
Pots	2	1	1	2	3	3
Scottish seines	0	0	0	4	2	6
Set gillnets (anchored)	2	1	1	1	1	2
Trammel nets	0	2	0	0	0	2
Total	74	64	54	50	61	112

Note: Totals do not sum across years or across gear types, as individual vessels may use more than one gear type.

The proposed management measures would prohibit the use of mobile demersal gears within the area. This means beam trawls, boat dredges, Danish seines, Nephrops trawls, bottom otter trawls, otter twin trawls and Scottish seines would not be able to operate within the area. It is assumed that the value of landings previously taken from the proposed management area, would be lost.

In the area, beam trawls are used predominantly to catch demersal fish (sole, plaice, monk) and molluscs (scallops), and boat dredges catch scallops. Pots are used to target crustaceans, and gillnets and trammel nets for demersal fish.

The estimated annual value of landings that would be affected, by gear type, by the proposed management measures at the site is £4.7 million per year, in 2023 prices (Table B2). The summary of impacts on value of fish landed, direct GVA, operating profit and net profit, including number of vessels affected, per year, is shown in Table B3.

Table B2: Estimated annual value of landings by over-12m UK vessels affected by the proposed management (2023 prices)

Gear type	Total over 5 years (£ 000)	Annual average (£ 000)
Beam trawls	22,702	4,540
Boat dredges	219	44
Seines (Danish & Scottish)	22	4
Otter trawls (bottom, Nephrops and twin trawls)	494	99
Grand Total	23,437	4,687

Note: Some gear types have been grouped together to avoid disclosing values that relate to fewer than five vessels.

Table B3: Summary of impacts on value of fish landed, direct GVA, operating profit and net profit (2023 prices).

Indicator	2017	2018	2019	2021	2022	Annual average
Number of vessels	70	61	52	47	57	57
Value of fish landed from the area (£'000)	5,779	4,287	2,968	4,672	5,734	4,688
Gross Value Added from the area (£'000)	2,751	1,729	1,246	1,966	1,751	1,888
Operating profit from the area (£'000)	1,136	556	458	767	523	688
Net profit from the area (£'000)	928	354	340	615	n.a.	559

Source: Seafish.

Under-12m vessels

Impacts on under-12m vessels have not been assessed in detail for the purposes of this case study. The area under consideration is 25 km offshore and therefore activity from under-12m vessels is low. Under-12m activity in the relevant ICES rectangles, by affected gear types is shown in Table B4. To give an indication of the potential scale of impact on under-12m vessels' landings, values have been pro-rated based on the area of the proposed management area as a proportion of the area of the ICES rectangles within which it sits. The potential impact on the value of landings of under-12m vessels is £23,257 per year.

Table B4: Value of landings by under-12m UK vessels from ICES rectangles 28E5 and 28E6, affected gears only. Annual average for 2018-2022 (excluding 2020) (2023 prices).

Gear type	Annual average value of landings from the ICES rectangles (£ 000)	Estimated annual average value of landings from the proposed management area (£ 000)
Beam trawl	3.7	0.6
Demersal trawls	64.9	10.3
Dredge	78.1	12.4
Grand Total	146.6	23.3

For the purposes of this case study, under-12m data has not been analysed further.

Non-UK vessels

Non-UK VMS data were not requested for the purposes of this case study and therefore have not been analysed. However, the SEIA guidance does not propose any change to the way that non-UK vessel activity has been assessed in the past and it is recommended that VMS data are used to analyse the nationalities of non-UK vessels and level of effort in the proposed management area.

An indication of the potential impact on EU vessels can be derived from the data collection framework (DCF) (Regulation (EU) 2017/1004). Fisheries Dependent Information (FDI) data calls. The data provided by EU Member States during the data calls are analysed by Scientific, Technical and Economic Committee for Fisheries (STECF) Expert Working Groups on FDI. MMO sea fisheries statistics also provide data on foreign landings into UK ports by ICES rectangle, although this does not capture non-UK activity where landings are made into non-UK ports.

Non-UK vessels which fish in the proposed management area are predominantly over-12m in length. The estimated annual average value of landings from the proposed management area by under-12m EU vessels is just €481 per year, whilst for over-12m vessels it is €2.4 million (2023 prices). These values are based on the landings from the two ICES rectangles within which the proposed management area lies, pro-rated by area. Table B5 and Table B6 present the estimated value of landings by affected gear type for EU vessels from the proposed management area.

Table B5: Estimated value of landings by under-12m EU vessels from the proposed management area, affected gears only. Annual average for 2017-2021 (excluding 2020) (2023 prices).

Gear type	Annual average value of landings from the ICES rectangles (€ 000)	Estimated annual average value of landings from the proposed management area (€ 000)
Beam trawl	0	0
Demersal trawls	0.4	0.1
Dredge	2.6	0.4
Grand Total	3.0	0.5

Source: STECF FDI data.

Table B6: Estimated value of landings by over-12m EU vessels from the proposed management area, affected gears only. Annual average for 2017-2021 (excluding 2020) (2023 prices).

Gear type	Annual average value of landings from the ICES rectangles (€ 000)	Estimated annual average value of landings from the proposed management area (€ 000)
Beam trawl	1,430	227
Demersal trawls	13,839	2,195
Dredge	34	5
Grand Total	15,303	2,427

Source: STECF FDI data.

B.5.3 Displacement of fishing effort

The potential for the effort affected by the proposed management to displace into the surrounding areas is assessed by comparing the value of landings affected with the value of landings from the ICES rectangles within which the proposed management area is located (Table B7). Where less than 10% of landings are affected, it is likely that the affected effort can displace to surrounding existing fishing grounds without significant impacts on the vessels, or the environment. Where more than 10% of landings are affected, it is more likely that there will be negative impacts on both the environment, on the vessels affected, and on other vessels. If effort is displaced, impacts are likely to be proportional to the amount of effort displaced, with greater impacts where the percentage of landings affected exceeds the threshold.

If fishing effort is displaced to the surrounding area:

- there may be additional seabed abrasion in surrounding areas
- affected vessels may have to steam further to reach fishing grounds
- affected vessels may have to fish on less productive grounds, fishing harder to maintain catches
- affected vessels may see a change in their cost and revenue profiles
- there may be increased conflict among the vessels displaced, and with other fleet segments (other gear types).

For those gear types that exceed the 10% threshold at the ICES rectangle level, the affected landings can be considered in the context of the wider region, to assess the potential for effort to be displaced to a wider area (Table B8). In this case, the region considered is ICES subdivision XX, and the threshold is 1% of the value of landings. Where the value of landings affected is less than 1% of the value of landings from the wider region (for the gear type), it is considered that there is potential for effort to be displaced within the wider region. However, the negative impacts on fleet segments in relation to steaming times, fuel costs etc., are likely to be greater compared to when effort can be displaced within the ICES rectangles.

Table B7: Displacement test – landings affected in the context of landings from the surrounding ICES rectangles.

Gear type	Annual average value impacted (£ 000, 2023 prices)	Annual average value from surrounding ICES rectangles (£ 000, 2023 prices)	% of activity impacted
Beam trawls	4,540	14,470	31%
Boat dredges	44	1,338	3%
Seines (Danish & Scottish)	4	6	77%
Otter trawls (bottom, Nephrops and twin trawls)	99	280	35%

Table B8: Displacement test – landings affected in the context of landings from the wider region.

Gear type	Annual average value impacted (£ 000, 2023 prices)	Annual average value from wider region (£ 000)	% of activity impacted
Beam trawls	4,540	34,013	13%
Boat dredges	44	9,898	0%
Seines (Danish & Scottish)	4	278	2%
Otter trawls (bottom, Nephrops and twin trawls)	99	5,519	2%

There are potential benefits to static gear fishers (e.g. gillnets, trammel nets, pots) that have an additional area available to work their gear without fear of it being towed away. This may result in an increase in value and volume of landings for these gear types.

B.5.4 Other business costs

Other possible business costs include familiarisation costs (reading new regulations to familiarise with the requirements), gear modification costs, administration costs, and quota leasing/purchasing costs.

Familiarisation costs are considered unlikely to occur, based on consultation feedback from previous management interventions (Defra, 2023). Affected vessels are more likely to seek alternative fishing locations than to change their gear type or configuration, therefore gear modification costs are considered unlikely. Administration costs are not anticipated. Any fishing effort displaced is likely to move to fishing grounds in the surrounding area, within the same ICES division. Additional quota costs are therefore not likely to occur.

B.5.5 Public sector costs

MMO compliance action is intelligence-led and risk-based in accordance with the National Intelligence Model⁴ (NCPE, 2005). Where intelligence suggests non-

⁴ <https://library.college.police.uk/docs/npia/NIM-Code-of-Practice.pdf>

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. MMO will coordinate any joint operations. The principles by which MMO will regulate Marine Protected Areas are set out by the Legislative and Regulatory Reform Act 2006⁵ and the Regulators' Compliance Code⁶ and aim to ensure that MMO is proportionate, accountable, consistent, transparent and targeted in any compliance action it takes.

Compliance costs for the inspection of MPAs and associated byelaws [or fisheries management regulations] 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 are not considered here.

B.6 Wider impacts – economic

B.6.1 Distribution of economic impacts

The economic impacts identified in Section B.5 will be felt in different parts of the fishing fleet, as well as at different ports on land. The significance of the impacts will depend on the absolute impact, as well as the relative impact. For example, both the total value of landings affected, as well as whether this represents a large or small proportion of current landings, will affect how those impacts are experienced.

Impacts on fleet segments

The majority of the impacts fall on the over-12m beam trawl fleet, accounting for 97% of the impacts (see Table B2).

There were 106 over-12m vessels that were active in the proposed management area over the period 2017-2022 (excluding 2020) using gears that would be affected by the proposal.

A small number of vessels (15) had potentially over £100,000 of landings affected each. Over 10% of their total landings were affected, for all but two of these vessels. These vessels are substantially impacted by the proposed management, and the viability of their businesses may be affected. This may lead to businesses being closed, vessels stopping all activity (and hence a greater impact than that assessed being felt), and loss of jobs. However, these impacts may be mitigated if the vessels displace their activity to other areas to take compensatory landings from elsewhere, and/or their fishing opportunities are taken up by other vessels (see Section B.5.1).

Thirty-seven vessels are moderately impacted, with between £10,000 and £100,000 of landings affected. For some of these vessels (11), the landings affected represent over 10% of their total landings, and these vessels might be more noticeably

⁵ <https://www.legislation.gov.uk/ukpga/2006/51/contents>

⁶ <https://www.gov.uk/government/publications/regulators-code>

affected, as for the vessels above. For 18 vessels, between 5% and 10% of the value of their landings is affected, and for 8 vessels, less than 5% of the value of their landings is affected.

A number of the vessels affected were active in the area only in some years of the time period considered, and had a relatively low value of landings affected – 54 vessels had less than £10,000 of landings affected (annual average). In all but one case, this represented less than 3% of the total value of landings recorded for each vessel. These vessels are not expected to be significantly affected by the proposed measures.

Impacts by home port

The distribution of impacts by home port may provide an indication of where employment impacts are most likely to be felt. Table B9 shows the value of landings affected, by vessels registered to the home port, the total value of landings, and the percentage of landings affected. Note that these are landings by vessels registered to the home port, and the landings themselves may be made to other ports (ports of landing).

The largest impacts are felt on vessels registered to Port B as their home port, with £2.3 million landings affected (annual average, 2023 prices). This port also has the greatest proportion of impact (8.2%). Impacts of this magnitude are potentially significant for the home port and may result in impacts on employment being felt.

Port H has £1.6 million of landings affected, representing 6.3% of landings by vessels registered to the port. Port G has a much smaller absolute value of landings affected, £106,000 annually, however this represents 6.1% of total landings by vessels registered to the home port.

Table B9: Annual average value of landings affected, based on the registered home ports of the vessels affected (2023 prices).

Home port	Value of landings affected (£ 000)	Total value of landings by vessels registered to the home port (£ 000)	% of landings affected
Port B	2,315	28,212	8.2%
Port H	1,571	24,985	6.3%
Port K	321	7,924	4.1%
Port G	106	1,746	6.1%
Port L	44	2,626	1.7%
'Unknown'	289	N/a	N/a
Other	41		
Total	4,687		

Impacts by port of landing

The distribution of impacts by port of landing may provide an indication of where impacts on the ports and downstream supply chain (processing etc) are most likely to be felt.

The greatest impacts, both in terms of absolute value, and relative to the total value of landings to the port, are felt at Port B. Here, £2.7 million of landings annually may be affected, representing 6.1% of total value of landings to the port. Port H has £1.3 million of landings affected, representing 3.3% of landings to the port. Port K has £618 thousand of landings affected, representing 4.1% of landings to the port.

Port J has a smaller absolute value of landings affected, just £64 thousand. However, it is a much smaller port than the others, and the total value of landings to the port was not available. It is possible, therefore, that this represents large proportion of total landings to the port.

Table B10: Annual average value of landings affected, by port of landing (2023 prices).

Port of landing	Value of landings affected (£ 000)	Total value of landings to the port (£ 000)	% of landings affected
Port B	2,736	44,936	6.1%
Port H	1,254	37,506	3.3%
Port K	618	15,209	4.1%
Port J	64	N/A	N/A
Port M	8	N/A	N/A
Other – UK & CD	3		
Other – Non-UK	4		
Total	4,687		

N.B. Total value of landings to the port includes UK vessels only. There may be additional landings from non-UK vessels which are not included here.

B.6.2 Employment impacts

The reduction in turnover of the fleet may lead to a corresponding loss of jobs. The impact on employment has been estimated based on the value of landings affected, and the number of jobs in the UK fleet per £ million of landings (Table B11). Over the period 2017-2022 (excluding 2020), there was an average of 10.04 jobs in the UK fishing fleet per £ million of landings. It should be noted that this is not the same as full-time equivalent (FTE) jobs⁷.

⁷ An attempt was made to estimate FTEs per unit of turnover from the Seafish economic indicators, but the data were not considered reliable. It may be possible to derive alternative estimates of the impact on employment in discussion with Seafish.

Table B11: UK fishing industry turnover and number of jobs, 2017-2022 (excluding 2020).

Indicator	2017	2018	2019	2021	2022
UK fishing industry turnover (£ million, nominal values) ⁸	921.3	1,002.8	986.8	830.9	921.3
UK fishing industry turnover (£ million, 2023 prices)	1,132.7	1,209.5	1,165.7	932.0	1,036.8
UK industry employment (number of jobs, includes part-time and full-time) ⁹	11,692	11,961	12,043	11,298	10,724
Number of jobs per £ million turnover (2023 prices)	10.32	9.89	10.33	12.12	10.34

In total, an estimated 47 jobs in the UK fishing fleet that may be lost due to the proposed management (Table B12). These jobs are considered to be year-on-year estimates, as it is likely that the same jobs would be affected in each year of the assessment period.

Table B12: Number of jobs affected year-on-year.

Gear type	Number of jobs affected (year-on-year)
Beam trawls	46
Boat dredges	0
Otter trawls (bottom, Nephrops and twin trawls)	1
Seines (Danish & Scottish)	0
Total	47

This impact on jobs assumes all affected landings are lost, and not compensated for by fishing elsewhere. This has been assessed as a worst-case scenario. However, in reality vessels are likely to displace their effort to other locations and take compensatory landings from elsewhere. This will reduce the impact on landings, and also consequently on jobs and employment in the fishing sector.

B.6.3 Supply chain impacts (upstream)

The impact on landings from affected vessels has the potential to affect their level of output and therefore the level of spending on inputs to their business. These upstream supply chain impacts, or indirect impacts, include impacts on vessel maintenance, fuel supplies, and financial services. The impact is assessed in terms of the GVA impact on those upstream businesses, using the GVA multiplier for the 'Fish and other fishing products; aquaculture products; support services to fishing' sector in the ONS Input-Output Analytical Tables applied to the change in direct GVA. The impact on GVA (indirect) is estimated at £440,000 annually.

B.6.4 Supply chain impacts (downstream)

⁸ <https://www.gov.uk/government/statistics/uk-sea-fisheries-annual-statistics-report-2022> and <https://www.gov.uk/government/statistics/uk-sea-fisheries-annual-statistics-report-2021>. Section 2 'Landings' tables (spreadsheet). Table 2.1.

⁹ <https://www.gov.uk/government/statistics/uk-sea-fisheries-annual-statistics-report-2022> and <https://www.gov.uk/government/statistics/uk-sea-fisheries-annual-statistics-report-2021>. Section 1 'Fleet' tables (spreadsheet). Table 1.6a.

The reduction in fish landed at ports in the UK has the potential to reduce supply and affect the activity of downstream supply chain services such as fish auctions, transport and distribution, processing, and supply to wholesale, retail and export markets. The downstream supply chain impacts are assessed using the Type I Leontief Inverse tables from the ONS Input-Output Analytical Tables. The impact on the downstream supply chain is estimated at £0.6 million annually (turnover).

B.7 Wider impacts – social

B.7.1 Social baseline

The social baseline has been developed for those port areas which are identified as where the majority of impacts fall, both in terms of home ports of the vessels affected, and ports of landing for the catches. Social baseline data are difficult to source and there are some uncertainties surrounding the locations that might be affected, for example, as fishers may live in locations away from the ports themselves. Data are not always available at a scale or level of detail that is useful for impact assessments at port or regional level. Some contextual data (e.g. on age of fishers, income levels) relate to the UK as a whole, and specific locations may differ.

Port B

Port B is a major commercial fishing port and has a fish market/auction, located 55 km from the proposed management area. Approximately £45 million of landings are made to the port annually by UK vessels, mostly of demersal fish and shellfish species. There are 127 vessels with their registered home port there, of which 66 are 10m and under, and 61 are over-10m in length. These vessels made £28 million of landings annually (not necessarily to Port B). Key gear types are beam trawl, scallop dredge, and inshore netting, lining and potting.

There are a range of both upstream and downstream supply chain businesses linked to the fisheries sector there, including fishing vessel maintenance and supply businesses, fish wholesalers based at the auction, transport businesses, local fishmongers, and local restaurants serving both locals and tourists.

The area around the port is relatively deprived (**Error! Reference source not found.**). Of the local population, only 45% are economically active (lowest quintile), and only 27% of people have Level 4 education or above (2nd quintile). The area has a low level of social housing (6% of households, lowest quintile) (data for the Middle Super Output area around the port, ONS 2021 Census data¹⁰).

The fishing port is a key feature of the town and its identity, providing sense of place and tourism values. The port generates significant economic value for the area, supporting livelihoods and employment. Fishing has a strong cultural identity, with the area being historically linked to the development of pioneering new fishing techniques. The fishing community has a strong sense of identity.

¹⁰ <https://www.ons.gov.uk/census/maps/choropleth>

Port H

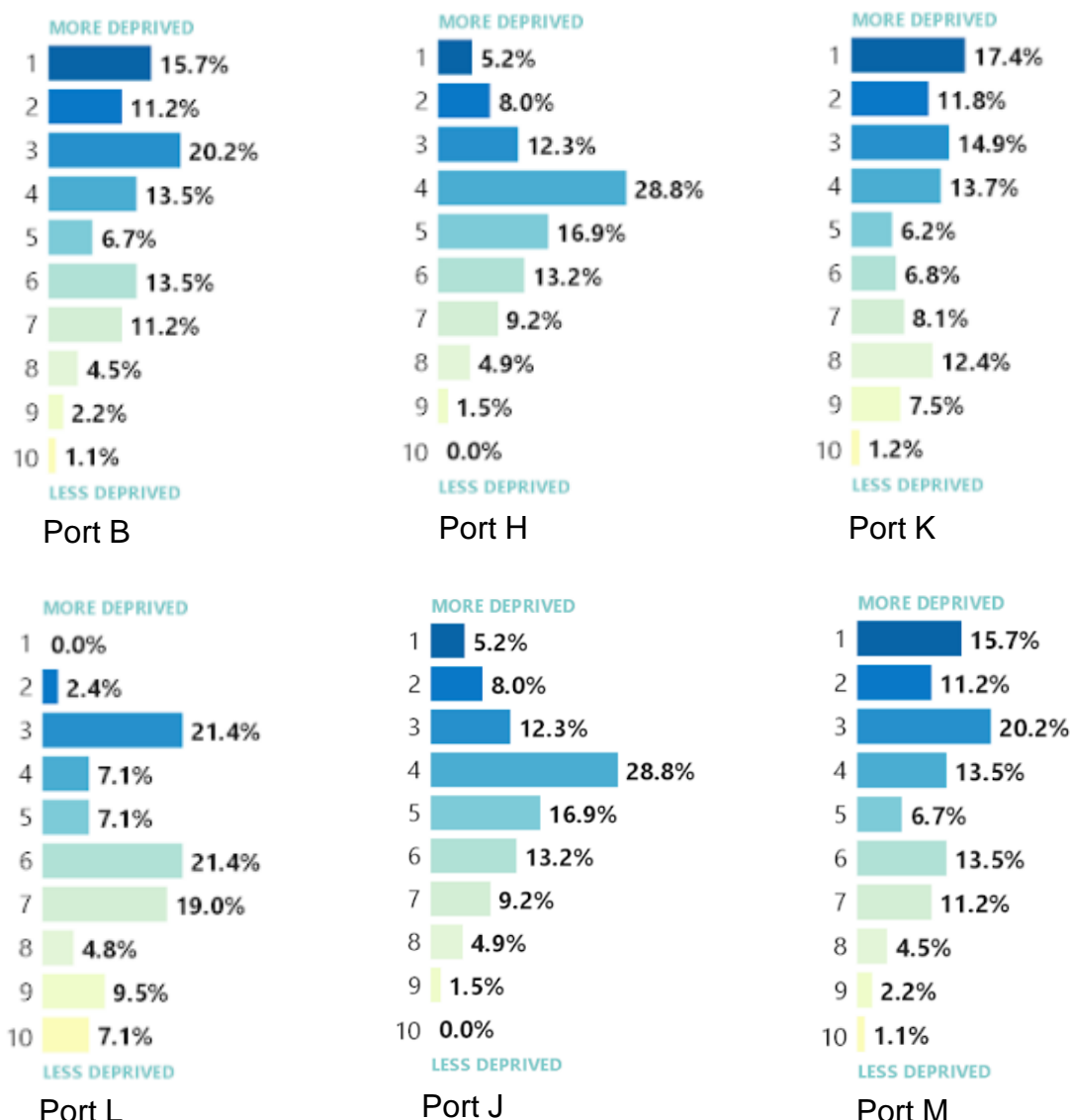
Port H is a major commercial fishing port with a market/fish auction, located approximately 95km from the proposed management area. Multiple processors and wholesalers are based around the port, which often act as a hub for smaller local harbours to get their landings transported and sold. Approximately £38 million of landings are made to the port annually by UK vessels, predominantly of demersal fish, followed by shellfish and a small amount of pelagic landings. There are 178 vessels with their registered home port there, of which 128 are 10m and under in length, and 50 are over-10m. These vessels made £25 million of landings annually (not necessarily to Port H). Key gear types are gillnets, ringnets, beam trawl, pots and inshore lines and pots.

There are a range of both upstream and downstream supply chain businesses linked to the fisheries sector there, including fishing vessel maintenance and supply businesses, fish wholesalers, transport businesses, local fishmongers, and local seafood restaurants. There are several online wholesalers based there that supply orders across the UK, and two fisheries based at Port H are MSC-certified.

The wider area around the port is moderately deprived (**Error! Reference source not found.**), although this relates to a much wider area than the port and its surroundings. Of the local population, only 50% are economically active (lowest quintile), and 34% of people have Level 4 education or above (2nd quintile). The area has a very high level of social housing (29% of households, 4th quintile) (data for the Middle Super Output area around the port, ONS 2021 Census data¹⁰).

The fishing port is a key feature of the town and its identity, providing a sense of place and tourism values. The port generates significant economic value for the area, supporting livelihoods and employment. Fishing and the fishing community has an extremely strong sense of cultural identity, with important ties to previous generations, and strong social bonds amongst current fishers.

Figure B2. Local deprivation profiles for key locations.



Note¹¹: Data show the percentage of LSOAs in each national deprivation decile, for the relevant local authority area. Dark blue colours represent more deprived areas, and yellow represents less deprived areas. Note that the local authority area for Port J covers a much wider area than the port and its surroundings.

Port K

Port K is an important commercial fishing port with a market, as well as wider port services (e.g. ferry port, cruise services), located approximately 45km from the proposed management area. There are several processors based around the port area. Approximately £15 million of landings are made to the port annually, mostly of

¹¹ This figure shows a possible visual summary of deprivation in the wider area around the ports. It shows the % of Lower Super Output Areas (LSOAs) in each national deprivation decile. These are available for English Local Authority areas from the Ministry of Housing, Communities and Local Government, 2019. However, there may be some sensitivity to describing areas as 'deprived' and the Defra HPMA DMA preferred to use more neutral language referring to levels of employment, education and housing. Available at <https://www.gov.uk/guidance/english-indices-of-deprivation-2019-mapping-resources> (local authority maps). Accessed 7 March 2024.

shellfish and demersal fish. There are 112 vessels with their registered home port there, of which 84 are 10m and under in length, and 28 are over-10m. These vessels made £8 million of landings annually (not necessarily to Port K). In addition the area is important for recreational fishing, and other recreational activities (e.g. sailing).

There are a number of upstream and downstream supply chain businesses linked to the port, including vessel maintenance, fish wholesalers and processors.

The area around the port is relatively deprived (**Error! Reference source not found.**). Of the local population, 57% are economically active (2nd quintile), and 34% of people have Level 4 education or above (2nd quintile). The area has a relatively low level of social housing (12% of households, 2nd quintile) (data for the Middle Super Output area around the port, ONS 2021 Census data¹⁰).

The fishing port is part of a wider port infrastructure in the town and does not form a key part of its identity. However, it is the base for a large number of vessels, supporting employment and livelihoods in the area.

Port G

Port G is a minor commercial fishing port, located approximately 300km from the proposed management area (steaming distance). It no longer has a fish market/auction, with landings having to be transported to other auctions, or sold to local wholesalers. The port also provides ferry services, cargo, and a marina. Approximately £4 million of landings are made to the port annually, mostly of shellfish and demersal fish. There are 47 vessels with their registered home port there, of which 32 are 10m and under in length, and 15 are over-10m. These vessels made £2 million of landings annually (not necessarily to Port G).

Upstream supply chain services are provided through the port, as well as external bunkering companies. There are a number of downstream fish wholesalers and suppliers in the wider area.

The area around the port is relatively deprived (deprivation profiles were not available for the local authority area). Of the local population, 52% are economically active (2nd quintile), and only 25% of people have Level 4 education or above (lowest quintile). The area has a relatively high level of social housing (27% of households, 3rd quintile) (data for the Middle Super Output area around the port, ONS 2021 Census data¹⁰).

The fishing port is part of a wider port infrastructure in the town and does not form a key part of its identity.

Port L

Port L is an important commercial fishing port, located approximately 270km from the proposed management area (steaming distance). There is no fish auction, but a local merchant buys landings to supply the UK wholesale industry, catering and hospitality industry and retail. Approximately £18 million of landings are made to the port annually, mostly of shellfish. There are 44 vessels with their registered home port there, of which 37 are 10m and under in length, and 7 are over-10m. These vessels made £3 million of landings annually (not necessarily to Port L).

There are a number of upstream businesses supporting and supplying the fishing vessels.

The area around the port has relatively low levels of deprivation (**Error! Reference source not found.**). Of the local population, 59% are economically active (2nd quintile), 27% of people have Level 4 education or above (2nd quintile). The area has a low level of social housing (27% of households, lowest quintile) (data for the Middle Super Output area around the port, ONS 2021 Census data¹⁰).

Port J

Port J is a minor harbour, located approximately 90km from the proposed management area. Landings data are not published for the port, as it is not a major fish landing centre. Although some landings may be made to the harbour, they would be transported on for sale at other nearby fish auctions (e.g. Port H). There are only 10 vessels with their registered home port there, of which 9 are 10m and under.

Fishing is not a key feature of the port and the area, although it is important to the wider region. Of the local population, 52% are economically active (2nd quintile), and 32% of people have Level 4 education or above (2nd quintile). The area has a relatively high level of social housing (20% of households, third quintile) (data for the Middle Super Output area around the port, ONS 2021 Census data¹⁰). The wider area around the port is moderately deprived (**Error! Reference source not found.**), although this relates to a much wider area than the port and its surroundings.

Port M

Port M is a harbour located approximately 60km from the proposed management area. There is no fish auction; landings are likely to be made directly to the nearby larger port with auction (Port B), or any small amount of landings made to the harbour would be transported to the auction for sale. There are only 4 vessels with their registered home port there, of which 3 are 10m and under. Fishing is not a key feature of the port and the area, although it is important to the wider region.

The area is a popular holiday destination, with a waterfront area and marina, within which the commercial fishing boats are based. Despite this, the local authority area is relatively deprived (**Error! Reference source not found.**). The area around the port has 55% of people economically active (2nd quintile), and only 23% of people holding Level 4 qualifications or above (lowest quintile). The area has a low level of social housing (10% of households, lowest quintile) (data for the Middle Super Output area around the port, ONS 2021 Census data¹⁰).

B.7.2 Distribution of economic impacts on social groups

The economic impacts identified in Section B.5.1 and B.6, are likely to fall on different locations, and on different social groups. The distribution of impacts on employment is described in relation to the value of landings by vessels registered to a home port. Employment has been calculated as jobs per £ million of turnover

affected, so the reduction in landings from the proposed management area would be expected to have a corresponding reduction in associated jobs in fishing.

Location

The majority of impacts on employment are expected to be felt in Port B and Port H. In both cases, the value of landings affected represents over 6% of the total value of landings by vessels registered to the home port. Both ports are important fishing ports, where the fishing industry forms an integral part of the location and town.

The absolute impacts on Port K and Port G are lower, however the impact represents a relatively high percentage of the total value of landings by vessels from the home port in both cases (4.1% and 6.1% respectively). As a result, the impact on employment may be noticeable by those involved in the sector, although not at community level.

Age

Jobs affected are likely to be among people of working age. A survey of the UK fishing fleet that sampled 268 vessels and 788 workers found the age of fishers in the sample 40, with deckhands 34 years old, and vessel owners 50 years old (Seafish, 2022a). People of pensionable age are therefore unlikely to be affected. Children and young people are not expected to be directly affected, but could be indirectly affected if the money-earner in a family loses their job,

Income

The salary for a deckhand on a fishing vessel is £21,000–£30,000 a year, or up to £45,000 for a skipper (National Careers Service, 2024), compared to the UK median salary of £34,963 in 2023 (ONS, 2023). This means that impacts are likely to fall predominantly on those of average income, although in some cases lower paid workers may be affected.

Gender

The majority of direct employment impacts are likely to fall on men. A sample of workers on UK fishing vessels found that 99% of the sample were male (Seafish, 2022a).

Jobs affected in the upstream and downstream supply chains may fall more equally on males and females. Females make up 21% of roles associated with fishing, such as onshore workers and administering business records (Seafish, 2022a), and 29% of employees in the processing sector in England (52% of employees are male and for 19% gender was not reported) (Seafish, 2022b). Women's role in fisheries is often hidden and not fully recognised in data (Zhao *et al.*, 2013; Gustavsson, 2021).

The impact is not anticipated to be specifically related to groups of particular sexual orientation or gender reassignment.

Social groups (ethnic minorities, with disability or long-term sick)

The direct employment impacts on the fishing sector are likely to fall predominantly on UK workers. However, there may be some impacts on ethnic minorities and non-UK citizens. The survey of employment in the UK fishing fleet indicated that 80% of workers on UK fishing vessels are from the UK. On the sample of English vessels, 72% of workers were from the UK, with non-UK workers coming from Latvia (15%), the Philippines (5%), and 'other' (9%) (Seafish, 2022a).

In the seafood processing sector in England, most employees are from the UK (44%) and EU (28%), with 4% from 'other' countries, and 23% unreported (Seafish, 2022b).

Other protected characteristics

Groups with other protected characteristics (pregnancy and maternity, religion or belief) are not anticipated to be affected specifically by the proposed management.

B.7.3 Impacts on social values and wellbeing outcomes

Port B, Port H and Port K are the top three ports impacted both in terms of value of landings by home port of the vessels affected, and in terms of value of landings to the ports.

Impacts on employment may lead to consequential social impacts relating to:

- individual wellbeing of those affected, with consequences for their careers and incomes
- family wellbeing of the families of individuals affected by loss of employment
- loss of a sense of identity of the individuals involved with potential impacts on mental wellbeing, depending on alternative employment opportunities available to them.

These impacts are unlikely to lead to changes in community sustainability. In the UK, economic dependency on fisheries is at the level of families and individuals, not at the community level, in part because of the decline of fishing (Reed et al., 2011).

Fishers whose activity is prohibited from the proposed management area may experience lower subjective wellbeing, due to the disruption in their normal working patterns. On the contrary, static gear fishers that have an additional area available to work their gear without fear of it being towed away, may experience an increase in subjective wellbeing (Renn *et al.*, 2024).

The way in which the proposed management is implemented, and the level of engagement and support from those likely to be affected by it, is likely to influence the impact on feelings of empowerment or disempowerment of those affected, and levels of trust in management and decision-making systems (Renn *et al.*, 2024). This underlines the importance of effective and meaningful engagement with stakeholders. Stakeholder engagement was not undertaken for the purposes of this case study.

The proposed management is not anticipated to affect security and safety of individuals or life at sea. The vessels affected are mostly over 12m in length and individual fishing trips last 3-5 days. Therefore, if activity is displaced to different areas, this is most likely to be within the region, and is unlikely to affect the overall duration of individual fishing trips.

The reduction in value of landings and turnover of associated supply chain businesses, may have the potential to affect connected businesses that support the fishing fleet, as well as local processors, transport operators and wholesalers that use the catch. This is particularly the case in Port B, Port H and Port K, where the impacts are large in both absolute and relative terms, and there are associated upstream and downstream supply chains.

A reduction in landings, and potentially number of vessels operating from Port B and Port H is unlikely to affect the cultural identity and place-based values of the location. It is a significant port, and it is likely there would still be substantial fisheries-related activity at the port.

Engagement with affected individuals and communities has not been undertaken as it was beyond the scope of this case study. However, this would be recommended depending on the proposal and potential scale of anticipated impacts. This would help refine the identification of communities affected, identify where employment impacts and supply chain impacts might be felt, and better understand potential impacts on social values.

B.7.4 Trade impacts

The proposed intervention would not affect any terms of trade.

Around 60–80% of UK fish landings are exported (House of Commons Library, 2022), in particular to France, the Netherlands and Spain (MMO, 2023). Part of the landings affected by the proposed management may have otherwise been exported. A reduction in the value of landings may therefore result in a small reduction in the volume/value of exports in fish and fisheries products from the UK.

B.8 Environmental impacts

The proposed management is anticipated to improve environmental quality in the area of the closure to mobile demersal gears, due to a reduction in seabed abrasion from these gears. Full consideration of the impact on environment would be included in a separate Environmental Assessment report.

There is likely to be an increase in static gears operating within the area, as a result of mobile demersal gears being restricted. This may cause some seabed abrasion (from anchors, ropes, pots etc), however, this would be expected to be less than previously.

If the mobile demersal effort is displaced to other areas, there is likely to be an increase in effort in areas outside of the proposed management area (Renn *et al.*, 2024), which may increase seabed abrasion and have a negative impact on environmental quality in those areas. If vessels have to steam further or fish harder

to achieve the same level of catches, due to fishing on less favourable fishing grounds, there may be an increase in carbon emissions from fuel use.

B.9 Summary of impacts

B.9.1 Total monetised costs and benefits

The economic impacts of the proposed management are estimated over a ten year period, using 2023 prices. Future costs/benefits are discounted to present values using a 3.5% discount rate (the standard social time preference rate) and presented in 2024 present value.

The economic impacts of the proposed management are estimated as:

- the loss of profitability from fishing effort at the site (impacts on business)
- direct and indirect GVA impacts (to reflect wider impacts on the economy)
- potential downstream impacts (to reflect potential impact on fish processing and the onward sale of fish).

The estimate of operating profit combines cost and earning information provided by vessel owners to the annual Seafish UK Fleet Survey with official landings and capacity data provided by MMO for vessels actively fishing within the proposed management area.

It is assumed that the economic impacts are incurred for each year of the appraisal period.

Estimates of the impact on business operating profit, indirect GVA (upstream supply chain) and downstream supply chain turnover are provided in Table B13.

Table B13: Impact on profit, GVA and downstream supply chain (present value, 2023 prices).

Indicator	Total impact over 10 years (£ million)	Annualised impact (£ million)
Loss of operating profit	5.9	0.7
Indirect GVA	19.8	2.3
Downstream impacts (turnover)	5.4	0.6

Note: the values in the reflect different measures in relation to operating profit, GVA and turnover.

The relevant data for the summary of monetised impacts are presented in Table B14. Note that there are likely to be non-monetised impacts that may offset some of these costs.

Table B14: Summary of monetised impacts.

Indicator	Value (£)
Estimated net present value	–£30.2 million
Estimated business net present value	–£5.7 million
Estimated equivalent annualised net direct costs to business	£0.7 million
Appraisal period	10 years
Price base year and present value base year	2023 and 2024

This table corresponds to the ‘Summary of monetised impacts’ in the DMA template.

B.9.2 Non-monetised costs

Employment

The reduction in turnover of the fishing fleet may lead to a corresponding loss of jobs. An estimated 47 jobs in the UK fishing fleet may be lost due to the proposed management. These jobs are considered to be year-on-year estimates, as it is likely that the same jobs would be affected in each year of the assessment period. This assumes all affected landings are lost, and not compensated for by fishing elsewhere. In reality vessels are likely to displace their effort to other locations and take compensatory landings from elsewhere. This will reduce the impact on landings, and also consequently on jobs and employment in the fishing sector. Employment impacts are most likely to be felt in Port B, Port H and Port K, which are the home ports for the majority of the vessels affected.

Displacement impacts

Where the fishing activity affected is displaced, rather than lost, this will have the effect of reducing the economic impacts on the fishing fleet, however there may be additional impacts in relation to:

- greater steaming distances to reach fishing grounds, leading to higher fuel use and increased carbon emissions
- reduced profitability due to fishing on less productive grounds
- increased conflict among the vessels displaced, and with other fleet segments (other gear types).

In terms of potential environmental impacts arising from displacement of fishing effort, these are:

- additional seabed abrasion in surrounding areas from displaced effort
- additional seabed abrasion due to vessels fishing harder on less productive grounds to maintain catches
- potential increase in effort of static gear within the proposed management area, due to the prohibition of mobile demersal gear from the area.

Wider impacts (economic and social)

The majority of wider economic and social impacts are likely to be felt in three ports (Port B, Port H and Port K). These ports are important commercial fishing ports and

have well-developed associated supply chains which service the fishing industry and deal with onward purchase, processing and transport of fish catches. They have the greatest value of landings affected in absolute terms, and relative to their total value of landings, both in terms of being a port of landing and in terms of the value of landings from vessels based at the home port. This may affect the turnover and output of associated supply chain businesses in those areas.

The direct impacts fall mostly on males of working age, although females may also be affected in associated onshore roles and in the processing sector.

There may be social impacts relating to individual wellbeing of those affected, family wellbeing, and loss of sense of identity and mental wellbeing.

B.9.3 Non-monetised benefits

The proposed management measure is anticipated to improve environmental quality in the area of the closure to mobile demersal gears, due to a reduction in seabed abrasion from these gears. This is expected to improve the quality of the nursery and spawning ground identified there, which is expected to have positive effects on recruitment and productivity of fish stocks. However, there are uncertainties around these effects due to numerous other sources of natural and human-induced mortality of juvenile fish.

Operators of static gears (gillnets and trammel nets, and pots) are likely to experience benefits from mobile gears being restricted in the area, providing additional area in which they can fish with less risk that their gears will be towed away. This may lead to an increase in subjective wellbeing of these fishers.

B.10 Recommended management option

The recommended management option is Option 2 – closure of the area to mobile demersal gears. This achieves the fisheries management/environmental objectives identified. The potential social and economic impacts of the option are set out in this SEIA.

B.11 Post implementation review

The proposed measure is not anticipated to require post-implementation review. The consequences of the proposed management, and whether the potential impacts assessed here materialise or not, could be investigated through future monitoring and/or surveys.

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B.13 Annex: Tables and figures

Table B15: UK activity affected by year, by gear type, over-12m vessels only (2023 prices).

Gear	2017	2018	2019	2021	2022	Annual average
Beam trawls	5,474	4,072	2,906	4,637	5,613	4,540
Boat dredges	13	70	8	19	109	44
Seines (Danish & Scottish)	0	0	0	10	13	4
Otter trawls (bottom, Nephrops and twin trawls)	288	145	54	6	0	99
Grand Total	5,775	4,287	2,968	4,672	5,734	4,687

Table B16: EU27 affected activity by year, by gear type (€ 000, 2023 prices).

Gear	2017	2018	2019	2021	Annual average
Dredge	1	1	3	18	6
Bottom trawl	3310	1972	1996	1503	2,195
Beam trawl	175	348	159	226	227
Total	3487	2320	2158	1747	2,428