

<b>Title:</b> Designation of the third tranche of Marine Conservation Zones  <b>IA No:</b> Defra/MAR/008  <b>RPC Reference No:</b> RPC17-DEFRA-4197(2)  <b>Lead department or agency:</b> Department for Environment, Food & Rural Affairs  <b>Other departments or agencies:</b>	<b>Impact Assessment (IA)</b>			
	<b>Date:</b> 15/02/2018			
	<b>Stage:</b> Final			
	<b>Source of intervention:</b> Domestic			
	<b>Type of measure:</b> Secondary legislation			
<b>Contact for enquiries:</b> Sophie Vickery (Sophie.Vickery@defra.gov.uk)				
<b>Summary: Intervention and Options</b>			<b>RPC Opinion:</b> Green-rated	

Cost of Preferred (or more likely) Option (in 2016 prices)			
Total Net Present Social Value	Business Net Present Value	Net cost to business per year	Business Impact Target Status
- £70.6m	- £9.9m	£0.7m	Non-Qualifying provision

**What is the problem under consideration? Why is government intervention necessary?**

A biologically diverse and thriving marine environment is of high value to society. Although recent evidence indicates some improvement in the quality of the UK marine environment, significant areas of concern remain. Market failure in the marine environment occurs because no monetary price is attached to many goods and services provided by habitats and species, and market mechanisms cannot ensure that actions are fully paid for by users. In such cases, individuals do not have an economic incentive to secure the continued existence of these goods and services. It is therefore necessary for government to intervene and designate sites to protect ecologically valuable habitats and species for the long term benefits to both users and non-users. This Impact Assessment concerns the designation of the 3rd tranche of Marine Conservation Zones in Secretary of State waters. Without this tranche it will not be possible to fill important gaps in the Marine Protected Areas network and deliver the government's 'Blue Belt' commitment.

**What are the policy objectives and the intended effects?**

The government aims to achieve 'clean, healthy, safe, productive and biologically diverse oceans and seas', and has committed to contributing to an ecologically coherent network of Marine Protected Areas (MPAs). Marine Conservation Zones (MCZs – a type of MPA) are an essential component of this network and the government has a legal duty to designate MCZs under the Marine and Coastal Access Act 2009 (MCAA). Following the designation of 50 MCZs in two previous tranches, the objective is to designate a third tranche of MCZs in Secretary of State waters to create a 'Blue Belt' of protected sites around our coasts.

**What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)**

Option 0 or the "do nothing option" – Do not designate any further MCZs. This is not a viable policy option because the MCAA places a legal obligation on government to contribute to a network of MPAs including MCZs. The 50 sites designated in the 1st and 2nd tranches would not meet this obligation. An ecologically coherent network of MPAs will also contribute to fulfilling international obligations, particularly the Oslo and Paris Convention for the Protection of the North East Atlantic commitments.

Option 1 (preferred) – Designate a 3rd tranche of 41 MCZs in 2019, alongside some additional features to sites designated in the 1st and 2nd tranches. These sites have been identified to fill ecological gaps in the network and have been rigorously appraised with strong stakeholder input. They will contribute to the English component of a network of MPAs to conserve or improve the UK's marine environment as required by the MCAA. This option balances ecological benefits and socioeconomic implications to deliver a proportionate and cost-effective contribution to the MPA network.

<b>Will the policy be reviewed?</b> It will be reviewed. <b>If applicable, set review date:</b> 12/2024					
Does implementation go beyond minimum EU requirements?			N/A		
Is this measure likely to impact on trade and investment?			No		
Are any of these organisations in scope?		<b>Micro</b> Yes	<b>Small</b> Yes	<b>Medium</b> Yes	<b>Large</b> Yes
What is the CO <sub>2</sub> equivalent change in greenhouse gas emissions? (Million tonnes CO <sub>2</sub> equivalent)			<b>Traded:</b> N/A		<b>Non-traded:</b> Unquantified

***I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.***

Signed by the responsible SELECT SIGNATORY: \_\_\_\_\_ Date: \_\_\_\_\_

# Summary: Analysis & Evidence Policy Option 1

Description:

## FULL ECONOMIC ASSESSMENT

Price Base Year 2016	PV Base Year 2019	Time Period Years 20	Net Benefit (Present Value (PV)) (£m)		
			Low: -106.3	High: -60.3	Best Estimate: -70.60

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	15.0	3.3	60.3
High	15.1	6.5	106.3
Best Estimate	15.0	4.0	70.6

### Description and scale of key monetised costs by 'main affected groups'

Best estimate average annual costs (undiscounted including transitional one-off costs): £4.792m. This includes industry costs arising from additional management measures and environmental assessments totalling £0.671m, comprising of annual costs to: commercial fisheries (£0.114m); ports and harbours (£0.117m); recreation (£0.287m); oil and gas (£0.140m); renewable energy (£0.005m); aggregate extraction (£0.006m); & cables (£0.002m), and annual public costs totalling £4.121m, comprising: ecological surveys (£2.460m); management (£1.658m); & national defence (£0.003).

### Other key non-monetised costs by 'main affected groups'

For sectors where the level of activity is expected to be small, or the occurrence of future projects is not predictable (e.g. archaeology), and/or where there is high level of uncertainty on future impacts and management required (e.g. aquaculture), costs have not been quantified. It has also not been possible to quantify impacts on local communities (as distinct from business) from the restriction and/or management of fisheries. Some public sector costs, such as: costs to inform users about MCZs, or advice to public authorities on impacts of proposed licensed activities on MCZs, and other costs to the public authorities following the advice, have not been monetised, as these responsibilities will be carried out under existing licensing and planning activities. Hence these costs are included as part of the business as usual scenario.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional	Optional	Optional
High	Optional	Optional	Optional
Best Estimate	Unquantified	Unquantified	Unquantified

### Description and scale of key monetised benefits by 'main affected groups'

A number of substantial expected benefits arising from the designation of the third tranche of MCZs have been monetised for illustrative purposes within this IA to demonstrate the importance and value of the designation of these sites. Due to uncertainty around the magnitude of benefits calculated, they have not been included in the summary sheets and hence they have not been compared with the costs of designation.

### Other key non-monetised benefits by 'main affected groups'

A combined area of approximately 4,522 mi<sup>2</sup> will be protected by the designation of the third tranche of MCZs (bringing the total area of MCZ protection to over 12,355 mi<sup>2</sup>) and 200 features (including features to be added to existing sites) will be covered. This protection will result in increased benefits supplied by ecosystem services and their components, such as increases in provisioning (e.g. fish and shellfish provision), regulating (e.g. climate regulation), supporting (e.g. nutrient cycling) and other cultural and recreational services. An ecologically coherent network of MPAs will also afford additional benefits, such as the conservation of marine and coastal biodiversity and will help the recovery of depleted stocks of exploited species.

<b>Key assumptions/sensitivities/risks</b>	<b>Discount rate (%)</b>	3.5%
It is assumed that following site designation, 75% of the affected fishing effort (landings value/GVA) will be displaced elsewhere, whilst 25% will be lost. In addition, the IA uses various sensitivity scenarios to provide high/low estimates related to future developments. It is assumed that licensed activities won't need to mitigate impacts on broad scale habitats in MCZs, as effects of activities are generally small compared to the area protected.		

## BUSINESS ASSESSMENT (Option 1)

<b>Direct impact on business (Equivalent Annual) £m:</b>			<b>Score for Business Impact Target (qualifying provisions only) £m: Unquantified</b>
<b>Costs: 0.7</b>	<b>Benefits: Unquantified</b>	<b>Net: - 0.7</b>	

# Evidence Base (for summary sheets)

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## List of acronyms

AT – Angling Trust  
BEIS - Department for Business, Energy & Industrial Strategy (formerly DECC, the Department for Energy & Climate Change)  
BMAPA – British Marine Aggregate Producers Association  
BSAC – British Sub Aqua Club  
BSH – Broad Scale Habitat  
CCS – Carbon Capture and Storage  
CEFAS – Centre for Environment, Fisheries and Aquaculture Science  
CFP – Common Fisheries Policy  
CVM – Contingent Valuation Method  
DEFRA – Department for the Environment, Food and Rural Affairs  
EANCB – Estimated Annual Net Cost to Business  
EIA – Environmental Impact Assessment  
EU – European Union  
FCERM – Flood and Coastal Erosion Risk Management  
GMA – General Management Approach  
GVA - Gross Value Added  
IA – Impact Assessment  
ICES – International Council for the Exploration of the Seas  
IFCA - Inshore Fisheries and Conservation Authority  
JNCC - Joint Nature Conservation Committee  
MCAA – Marine and Coastal Access Act 2009  
MCZ – Marine Conservation Zone  
MESAT – Maritime Environmental Sustainability Appraisal Tool  
MMO – Marine Management Organisation  
MoD – Ministry of Defence  
MPA – Marine Protected Area  
MSFD – Marine Strategy Framework Directive  
OSPAR – Oslo-Paris Convention for the Protection of the Marine Environment of the North-East Atlantic  
PV – Present Value  
RAMSAR sites - marine components of RAMSAR sites. Sites designated as Wetlands of International Importance under the Ramsar Convention (1971)  
RPC – Regulatory Policy Committee  
RYA – Royal Yachting Association  
SAC - Special Areas of Conservation  
SNCB – Statutory Nature Conservation Body (collective term for Natural England and the Joint Nature Conservation Committee)  
SPA - Special Protection Areas  
SSSIs - Sites of Special Scientific Interest  
UKMMAS - UK Marine Monitoring and Assessment Strategy  
VMS – Vessel Monitoring System, used to track the location of vessels  
WFD – Water Framework Directive

# 1. Policy background

- 1.1. With a mainland coastline of over 11,000 miles, the UK has a large marine area rich in marine life and natural resources. The UK's seas are not only important in terms of biological diversity, but they also provide us with a variety of goods and services such as recreation and tourism opportunities (and associated income and wellbeing), the provision of marine products (e.g. fish and shellfish), and certain "regulating" services (e.g. climate regulation, flood mitigation and prevention of coastal erosion). This makes the marine environment essential to our social, economic and environmental well-being.
- 1.2. To deliver the vision of 'clean, healthy, safe, productive, and biologically diverse oceans and seas', as set out in the 25 Year Environment Plan<sup>1</sup> and the UK Marine Policy Statement<sup>2</sup>, the Government and Devolved Administrations have committed to contributing to an ecologically coherent network of well-managed Marine Protected Areas (MPAs). The UK's MPA network will also contribute to fulfilling international commitments such as the Oslo and Paris Convention for the Protection of the North East Atlantic (OSPAR<sup>3</sup>), and the Convention on Biological Diversity<sup>4</sup>.
- 1.3. The UK's network will protect rare, threatened and nationally important habitats, species and geological features, with enough sites to conserve a range of major features vital for the health of our marine ecosystems. The network will be comprised of Special Protection Areas (SPAs)<sup>5</sup>, Special Areas of Conservation (SACs)<sup>6</sup>, RAMSAR sites<sup>7</sup>, Sites of Special Scientific Interest (SSSIs)<sup>8</sup> and Marine Conservation Zones (MCZs, see Box 1). Unlike other types of MPA, the designation and management of MCZs involves taking social and economic factors into account alongside conservation objectives. MCZs are designed to complement and not duplicate other types of designation and they are an essential component of the UK's MPA network. In the absence of MCZs, the full range of features present in the UK marine area would not be afforded protection.

## Box 1: MCZs, conservation objectives and management measures

MCZs are a type of Marine Protected Area (MPA) and are created under the Marine and Coastal Access Act (MCAA) 2009<sup>9</sup> in England and Wales. They protect areas that are nationally representative and important to conserving diversity and nationally rare or threatened habitats or species. The features listed for designation are habitats, species or geological features. Their designation will ensure that the range of marine biodiversity in the UK's seas is conserved, and that the condition of features is improved if they are currently in an unfavourable state and thus require additional management measures. Examples of features are intertidal mixed sediments (habitat), native oyster (species) and North Sea Glacial Tunnel Valleys (geological feature). Unlike for other types of MPA, for MCZs, social

<sup>1</sup> HM Government 2018. A Green Future: Our 25 Year Plan to Improve the Environment: <https://www.gov.uk/government/publications/25-year-environment-plan>

<sup>2</sup> HM Government 2011. UK Marine Policy Statement: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69322/pb3654-marine-policy-statement-110316.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf)

<sup>3</sup> The OSPAR Convention is the current legal instrument guiding international cooperation on the protection of the marine environment of the North-East Atlantic. Work under the Convention is managed by the OSPAR Commission, made up of representatives of the governments of 15 contracting parties and the European Commission, representing the European Union. <https://www.ospar.org/>

<sup>4</sup> The Convention on Biological Diversity: <https://www.cbd.int/convention/>

<sup>5</sup> Required by the Wild Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds).

<sup>6</sup> Required by the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna).

<sup>7</sup> Sites designated as Wetlands of International Importance under the Ramsar Convention (1971).

<sup>8</sup> Designated under the Wildlife and Countryside Act 1981 (as amended).

<sup>9</sup> HM Government 2009. Marine and Coastal Access Act 2009. Available at: [www.legislation.gov.uk/ukpga/2009/23/contents](http://www.legislation.gov.uk/ukpga/2009/23/contents)

and economic factors are taken into account alongside conservation objectives<sup>10</sup> when identifying and managing sites. For the purpose of the IA, the social and economic impact of designating MCZs is assessed based on the General Management Approach (GMA), which can be either a 'recover' or a 'maintain' approach depending on whether the feature is in a favourable or unfavourable condition. Features with a GMA of 'recover to favourable condition' are those that evidence suggests are in an unfavourable condition but, with MCZ designation and appropriate management, are able to recover to favourable condition over time. Features with a GMA of 'maintain in favourable condition' are those that evidence suggests are currently in a favourable condition. MCZ designation and continued appropriate management will protect the features against the risk of degradation from future, currently unplanned, human activities.

- 1.4. The Department for Environment, Food and Rural Affairs (Defra) is responsible for the designation of MCZs in waters where the Secretary of State is the "appropriate authority". These are English inshore waters (up to 12 nautical miles from the coastline) and offshore waters adjacent to England and Northern Ireland (12 to 200 nautical miles or to the agreed administrative boundary with neighbouring countries). The Devolved Administrations are responsible for designating MCZs within their own waters and these are not examined here.
- 1.5. In 2009 Defra invited the Statutory Nature Conservation Bodies (SNCBs), composed of the Joint Nature Conservation Committee (JNCC) and Natural England, to recommend potential MCZs with stakeholder support to the government. The SNCBs set up a project to give sea-users and stakeholder interest groups the opportunity to make recommendations through the establishment of four Regional MCZ Projects<sup>11</sup>. The SNCBs provided the Regional MCZ Projects with guidance on the criteria for selecting a network of MCZs in their regions (Ecological Network Guidance<sup>12</sup> based on the OSPAR network design principles<sup>13</sup>) and provided project delivery guidance setting out the process that should be followed to select site locations and to complete accompanying Impact Assessments (IA) for groups of sites.
- 1.6. In September 2011, recommendations for 127 MCZs were submitted to government. Whilst recognising that the recommendations had come from a stakeholder-led process, concerns were raised about the quality of the evidence base supporting the recommendations. As a result of these concerns, in November 2011 a written ministerial statement announced that MCZs would be designated in tranches, with the best-evidenced sites designated first.<sup>14</sup> A revised timetable for designation and additional funding to support further evidence gathering were also announced.
- 1.7. Following evaluation of the recommendations and IAs from the Regional MCZ Projects, formal advice from the SNCBs, and advice from an independent Science Advisory Panel<sup>15</sup>, 31 recommended sites were considered suitable for designation in the 1st tranche and were consulted on publicly in 2012.

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<sup>10</sup> See Natural England and JNCC's 2011 guidance on conservation objectives for further information: <http://jncc.defra.gov.uk/PDF/MCZ%20Project%20Conservation%20Objective%20Guidance.pdf>

<sup>11</sup> Further information about the Regional MCZ Projects is available at: <http://jncc.defra.gov.uk/page-2409>

<sup>12</sup> JNCC and Natural England 2010. The Ecological Network Guidance: [http://jncc.defra.gov.uk/pdf/100608\\_ENG\\_v10.pdf](http://jncc.defra.gov.uk/pdf/100608_ENG_v10.pdf)

<sup>13</sup> OSPAR 2006. Oslo and Paris Commission (Ospar) Guidance on Developing an Ecologically Coherent Network of Ospar Marine Protected Areas: <https://www.ospar.org/documents?d=32377>

<sup>14</sup> <https://www.gov.uk/government/news/written-ministerial-statement-on-marine-conservation-zones>

<sup>15</sup> Science Advisory Panel 2011. Assessment of the Marine Conservation Zone Regional Project final recommendations: <https://www.gov.uk/government/publications/science-advisory-panel-assessment-of-the-marine-conservation-zone-regional-project-final-recommendations>

- 1.8. After consideration of the responses and evidence received during the public consultation, 27 MCZs were designated in November 2013 as the 1st tranche. These sites covered an area of around 3,745 mi<sup>2</sup> and protected 162 features. The final supporting IA received a green opinion from the Regulatory Policy Committee (RPC).
- 1.9. At this time Defra also announced future plans for MCZs, which included a 2nd tranche in 2015 and a 3rd later tranche to complete the English component of the UK's network contribution. The 2nd tranche of MCZs was consulted on publicly in 2015, and a further 23 MCZs were designated in January 2016. The second tranche of sites covered an area of around 4,175 mi<sup>2</sup> and protected 234 features. Again, the supporting IA received a green opinion from the RPC.
- 1.10. Collectively, the 1st and 2nd tranches provide protection to an area of over 7,700 mi<sup>2</sup> within 50 sites and protect a total of 597 features.
- 1.11. Once an MCZ is designated, the regulators, including the Marine Management Organisation (MMO) and the Inshore Fisheries Conservation Authorities (IFCAs), are empowered to introduce appropriate management measures in MCZs to ensure their protection. This may include voluntary arrangements, codes of practice, extra license conditions or the introduction of byelaws. Any byelaw would be accompanied by an IA and would be subject to public consultation.
- 1.12. This IA considers the costs and benefits of designating the 3<sup>rd</sup> tranche of MCZs. All direct costs and benefits presented in this IA have been calculated in line with the HMT Green Book.<sup>16</sup>
- 1.13. Due to limited evidence behind environmental and economic benefits, it was not possible to select sites purely on a cost-benefit basis. Instead a balance between protecting key ecological features and minimising costs to sea-users has been adopted. Nonetheless, this choice is underpinned by scientifically robust evidence and focuses on prioritising designation where the risk of feature loss/damage is higher, as well as sites where the feature's uniqueness should be preserved. Hence, the methodology applied to this and previous tranches takes a hybrid approach with the objective of combining the best available option from a scientific perspective with the least associated cost. As a sense-check, the literature on economic benefits has been assessed to give a broad picture of the magnitude of benefits and indicative qualitative estimates to ensure that proposed approaches are proportionate (see Table 5).

## 2. Problem under consideration

- 2.1. A biologically diverse and thriving marine environment is of high value to society. Although recent evidence indicates some improvement in the quality of the UK marine environment, significant areas of concern remain. Government intervention to designate sites will protect ecologically valuable habitats and species for the long term benefits to both users and non-users. This IA concerns the designation of the 3rd tranche of MCZs in waters for which Defra's Secretary of State is responsible and additional features to be designated within existing 1st and 2nd tranche sites. Without this 3rd tranche it will not be possible to fill important gaps in the MPA network and deliver the government's 'Blue Belt' commitment. These new sites and additional features are being considered as one package within the 3rd tranche. This IA follows the same approach as the IAs for the 1st and 2nd tranches of MCZs, which both secured green-rated RPC opinions. Updated data

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<sup>16</sup> HMT Green Book 2018:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/685903/The\\_Green\\_Book.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf)

and prices are used, new information for the purpose of the assessment of costs and benefits is included where available, and methodologies have been amended to better reflect the conditions of the 3rd tranche when appropriate.

- 2.2. To inform the selection of site options for the 3rd tranche, Defra asked JNCC to carry out an assessment of the progress made towards completing an ecologically coherent network in Secretary of State waters. This provided us with an analysis of the remaining gaps in the network that needed to be filled through the 3rd tranche.
- 2.3. JNCC's report<sup>17</sup> recommended that, in addition to considering Regional MCZ Project sites and protecting additional features in existing MCZs, to fill the remaining gaps in the network it would be necessary to identify a small number of new site options.
- 2.4. New site options were developed by JNCC and Natural England to address the remaining ecological gaps in the network while minimising any socioeconomic impacts on sea-users. The approach taken to identify potential new site options is set out in a published report<sup>18</sup>. Twelve candidate sites were identified and these were discussed with stakeholders during the pre-consultation engagement period (see Section 7.2).
- 2.5. Suitable site options for the 3rd tranche were therefore selected from two sources:
  - **Sites recommended by the Regional MCZ Projects in 2011 but not designated or removed from consideration in the 1st and 2nd tranches:** Due to the length of time since the original recommendations, JNCC and Natural England provided updated scientific advice on these sites, incorporating data from surveys conducted in the intervening period. Additionally, socioeconomic information was updated using the best available data sources and evidence gathered during pre-consultation discussions with stakeholders.
  - **New site options developed by JNCC and Natural England in 2016:** JNCC and Natural England provided scientific advice on the ecological importance and conservation objectives for these sites. Socioeconomic information was collected to understand the likely impact of designation and stakeholders were consulted to provide views and evidence.
- 2.6. Regardless of their origin, the process for considering sites for the 3rd tranche followed similar principles to the 1st and 2nd tranches. Each of the candidate sites was considered in terms of its potential contribution towards completing an ecologically coherent network and the associated social and economic costs and benefits of designation.
- 2.7. In addition to identifying suitable new sites, consideration was also given to filling gaps in the network by designating additional features within existing 1st and 2nd tranche MCZs, where this was the least-cost option for filling those gaps. These are features that were not supported by sufficient scientific evidence during previous tranches, but for which subsequent survey data has become available and supports designation. Consideration was given to any additional socioeconomic impacts that designating new features within an existing site might have.

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<sup>17</sup> JNCC 2016. Assessing progress towards an ecologically coherent MPA network in Secretary of State Waters in 2016: Results: [http://jncc.defra.gov.uk/pdf/JNCC\\_NetworkProgressInSoSWaters2016\\_Results\\_Final.pdf](http://jncc.defra.gov.uk/pdf/JNCC_NetworkProgressInSoSWaters2016_Results_Final.pdf)

<sup>18</sup> JNCC and Natural England 2016a. Identifying potential site options to help complete the Marine Protected Area network in the waters around England. [http://jncc.defra.gov.uk/pdf/Identifying\\_options\\_MPA\\_network\\_Final.pdf](http://jncc.defra.gov.uk/pdf/Identifying_options_MPA_network_Final.pdf)



- 2.8. During 2016 and early 2017, Defra, JNCC and Natural England undertook a programme of pre-consultation engagement with local, national and, where appropriate, international stakeholders to better understand the potential socioeconomic impacts of the sites being considered for the 3rd tranche. This was an opportunity to obtain views, further evidence and to identify compromise solutions where appropriate (e.g. boundary changes). Further information is provided in Section 7.2.
- 2.9. In addition to considering sites and features to contribute to an ecologically coherent network, Defra also considered the case for MCZs to protect highly mobile species such as dolphins, birds, fish, sharks and rays. Many highly mobile species are already protected under existing legislation and it is recognised that due to their mobile nature, spatial protection measures are often not the most effective means of conserving these species. However some highly mobile species have been protected in existing MCZs, and other types of MPAs, where specific locations are critical for their lifecycle (e.g. spawning or nursery grounds), and so are suitable for area-based protection measures, such as MCZs. In 2016, in response to requests from NGOs, they were invited to propose sites where there was clear evidence that an MCZ would provide effective protection for a highly mobile species. JNCC and Natural England developed principles for identifying the suitability of MCZ protection for a highly mobile species and provided guidance to assist those proposing suitable sites<sup>19</sup>.
- 2.10. Twenty-one proposals were received, covering seabirds, fish species and white-beaked dolphin. The scientific case and socioeconomic costs of each proposal was assessed and five proposals were considered suitable to take forward to public consultation.
- 2.11. Following consideration of the remaining Regional MCZ Project sites, the new site options and the proposals for highly mobile species, Defra identified a total of 41 sites that were suitable to take forward to public consultation. Thirty were Regional MCZ Project recommendations (from the original 127 sites recommended), nine were new site options and two sites were for protecting highly mobile species.
- 2.12. Defra also identified 29 additional features in 12 existing 1st and 2nd tranche sites that were suitable for inclusion in the consultation alongside the proposed 3rd tranche sites.
- 2.13. The formal public consultation on the 3rd tranche of MCZs was published on June 8th 2018 to test support for the proposed sites, to gather additional information and to test the cost estimates and methodologies presented in the consultation IA. Details of the consultation and the decisions taken following analysis of consultation responses are summarised in Section 3 below.

### **3. Summary of formal public consultation and outcomes**

- 3.1. The formal public consultation on the 3rd tranche of MCZs was launched on June 8th 2018 and ran for six weeks. The consultation was widely publicised: Defra directly notified almost 2000 stakeholders with an interest in MCZs on the day of the launch, a press announcement was published by many national and local newspapers and there was widespread coverage of the consultation on national and local radio and television and on social media.

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<sup>19</sup> JNCC and Natural England 2016b. Identifying possible Marine Conservation Zones for highly mobile species: Principles for third-party proposals. [http://jncc.defra.gov.uk/pdf/20160525\\_AnnexA\\_Selection\\_criteria\\_proposed\\_by\\_JNCC\\_and\\_Natural\\_England\\_v4.0.pdf](http://jncc.defra.gov.uk/pdf/20160525_AnnexA_Selection_criteria_proposed_by_JNCC_and_Natural_England_v4.0.pdf)

- 3.2. The 3rd tranche consultation IA (Impact Assessment Defra/MAR/008) received a green-rated opinion from the RPC and was published on the main consultation website.<sup>20</sup> This IA included the preferred policy option (Option 1) of designating the 3rd tranche of 41 new MCZs alongside adding some additional features to 12 sites designated in the 1st and 2nd tranches. This allowed consultees to compare this option against the government's baseline of not designating further MCZs.
- 3.3. The consultation was used to test support for designating the proposed sites, to gather additional information and to test the cost estimates and methodologies presented in the consultation IA. Over 48,500 consultation responses were received, with the majority of respondents expressing support for designating MCZs. A full government response to the consultation, outlining the evidence received and explaining the decisions taken on each site will be published at designation.<sup>21</sup>
- 3.4. All consultation responses were considered in full. Responses that included information relevant to the ecology of the sites (e.g. evidence relating to the presence, extent or condition of features to be protected or to activities taking place in the vicinity of the proposed MCZs) were also shared with Natural England and JNCC. All new and verifiable information directly relevant to the MCZs under consultation was fed into the SNCB's post-consultation scientific advice reports<sup>22</sup>. Alongside this information, Natural England and JNCC obtained additional information, such as updated survey data, through more general evidence updates to ensure that their final post-consultation ecological advice was complete and comprehensive.
- 3.5. Responses that included information relevant to determining the socioeconomic impact of designating sites (e.g. relating to the costings or methodologies presented in the consultation IA or providing evidence of activities taking place in the vicinity of the proposed MCZs) were shared with Defra economists. All information was considered in full and new and verifiable evidence was fed into the calculation of post-consultation socioeconomic costings. All updated costings have been incorporated into this IA and Section 7 describes in greater detail where cost estimates have changed following consultation responses.
- 3.6. Following consideration of the consultation responses received, the updated scientific advice provided by the SNCBs and the updated socioeconomic costings, Defra have concluded that all 41 new sites and the additional features to be added to existing sites (as set out in the tranche 3 consultation) are suitable for designation. Minor changes have been made to the following sites:
- **Studland Bay MCZ** – Natural England's post-consultation advice for this site was that the evidence for the presence and extent of one of the features consulted on, subtidal coarse sediment, was no longer sufficient to support designation. On this basis, the site will be designated for all other features consulted on, but not for subtidal coarse sediment.
  - **Bembridge MCZ** – In response to concerns raised about future navigational dredging within the small Bembridge harbour section of the site, the boundary for this MCZ has been adjusted to remove the harbour area. This change will not have an impact on achieving the ecological targets for the network.
- 3.7. The SNCB's updated scientific advice also advised changes to the GMA for six features within five sites. The specific situation for each of these features was considered in full to understand whether there were likely to be any differences in management implications

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<sup>20</sup> <https://consult.defra.gov.uk/marine/consultation-on-the-third-tranche-of-marine-conser/>

<sup>21</sup> This document will be published at: [https://www.gov.uk/government/publications?departments%5B%5D=department-for-environment-food-rural-affairs&publication\\_filter\\_option=consultations](https://www.gov.uk/government/publications?departments%5B%5D=department-for-environment-food-rural-affairs&publication_filter_option=consultations)

<sup>22</sup> These documents will be published at designation and can be accessed via links provided in the government response document.

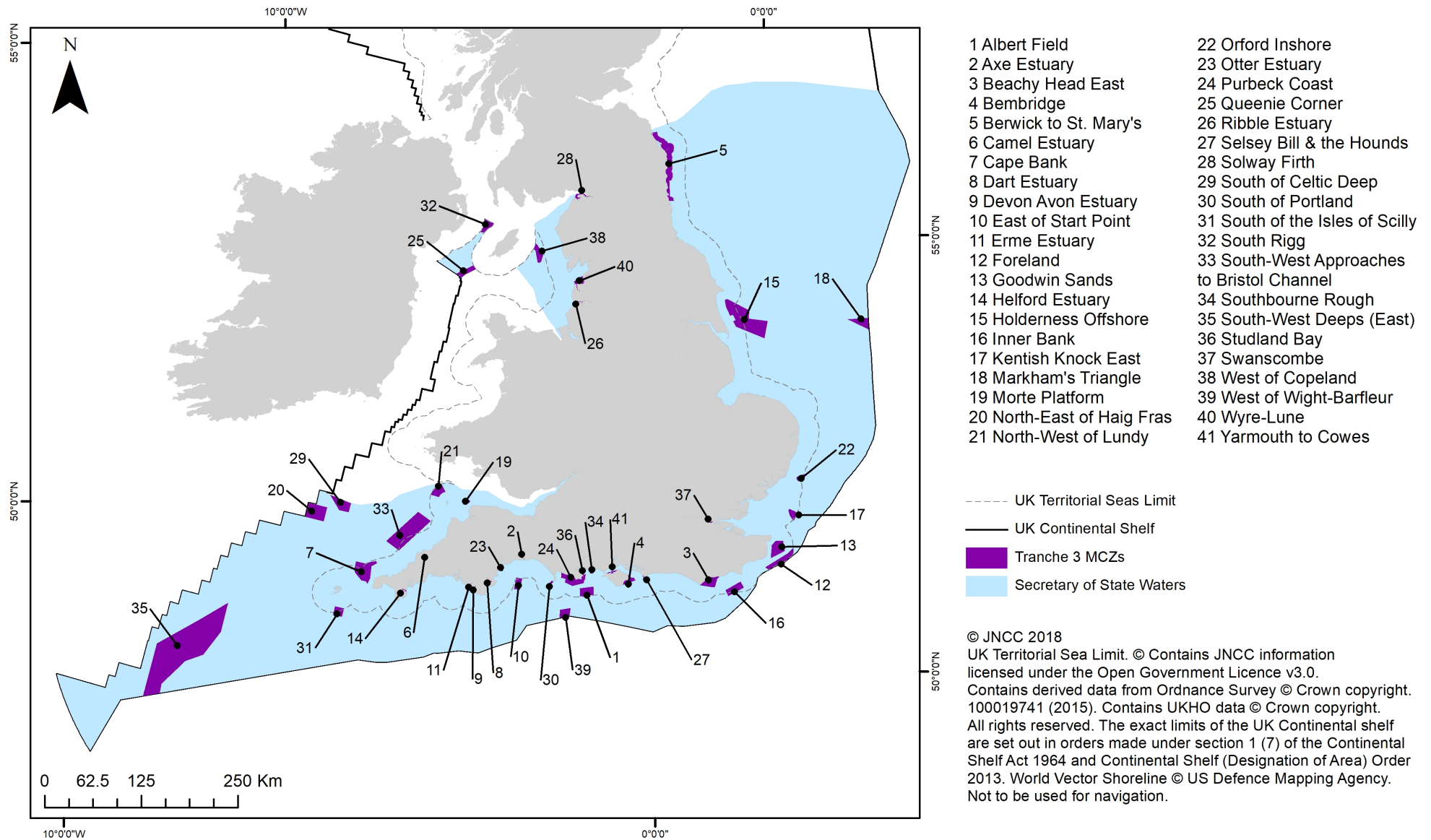
and associated site costings. This assessment identified that no changes to management implications or costings were anticipated as a result of these GMA changes.

- 3.8. Of the 41 new MCZs to be designated in 2019 (preferred Option 1), 39 are in English waters and two are within Northern Irish offshore waters<sup>23</sup>. The total area covered by the new sites is 7278 mi<sup>2</sup>: approximately 2,138 mi<sup>2</sup> in the inshore area and 5139 mi<sup>2</sup> in the offshore area. Following designation, around 40% of English inshore and offshore waters will be protected, and the total for the UK as a whole will be almost 25%.
- 3.9. The names and locations of the 41 sites are shown below in Chart 1. Further details of these new sites are provided in Annex G and details of existing MCZ sites where additional features will be designated are provided in Annex F.

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<sup>23</sup> All are in waters where the Secretary of State is the 'appropriate authority'.

**Chart 1: Map of the 41 tranche 3 Marine Conservation Zones**



## 4. Rationale for government intervention

- 4.1. A biologically diverse marine environment is of high value to society through the services that it provides and as a basis for human health and livelihoods (OSPAR 2010). Fish and shellfish landings and marine aquaculture have a clear market value, but the marine environment also provides non-traded services including carbon sequestration, natural hazard protection, recreation, research and education. Aside from its economic value to society, the natural environment also has intrinsic or 'non-use' value<sup>24</sup>. Work by the National Ecosystem Assessment Follow-On project<sup>25</sup> and more recent literature (see Annex B) supports this and in particular highlights the significant importance of ecosystem services, including less tangible cultural benefits, derived from a good quality marine environment.
- 4.2. Human activities are having a detrimental effect on the extent and condition of many diverse marine habitats and their ecosystems. OSPAR's 2010 Quality Status Report<sup>26</sup> noted that a reduction in the decline in biodiversity is still a long way off, and that combined pressures from human activities are not fully understood and need to be carefully managed to avoid undesirable impacts. Although OSPAR's 2017 Intermediate Assessment<sup>27</sup> identified some positive indications of change, such as reduced contaminant pollution and signs of recovery of fish communities in some areas, significant areas of concern remain. The most threatened marine and coastal habitats in the UK, as identified in the UK Biodiversity Action Plan (JNCC 2010)<sup>28</sup> are continuing to decline, and maintaining or increasing the extent and condition of priority habitats is more difficult in coastal and marine areas than in the terrestrial environment. It is important that appropriate measures are introduced in order to protect our marine ecosystems before it is too late. The most recent comprehensive assessment of the UK marine environment (UKMMAS 2010)<sup>29</sup> showed that there are still key externalities to the marine environment to be addressed both in the short and long term.
- 4.3. There is a need for government intervention to address market failures associated with public goods and negative externalities to protect valuable features of the marine environment. Market failures occur when the market has not and cannot in itself be expected to deliver an efficient outcome (HMT Green Book 2018). In the context of the marine environment these can be described as:
  - Public goods – A number of goods and services provided by the marine environment such as climate regulation and biological diversity are 'public goods'. The defining features of a public good are that no-one can be excluded from benefiting from these services and that consumption of the service does not diminish the service being available to others. These characteristics mean that individuals do not necessarily have an economic incentive to voluntarily contribute effort or money to ensure the continued existence of these goods, they can "free ride". This can lead to undersupply or, in this case, under-protection and consequent degradation.

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<sup>24</sup> There are two forms of intrinsic value: anthropocentric and non-anthropocentric. Anthropocentric value is the intrinsic value assigned by humans to nature, which has practical implications for policy. Non-anthropocentric value is the value that nature has 'in itself'. As explained in Defra (2007), "While it is recognised that the natural environment has intrinsic value i.e. is valuable in its own right, such non-anthropocentric value is, by definition, beyond any human knowledge".

<sup>25</sup> <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=2&ProjectID=18081>

<sup>26</sup> OSPAR 2010. Quality Status Report: <https://qsr2010.ospar.org/en/index.html>

<sup>27</sup> OSPAR 2017. Intermediate Assessment Report: <https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/>

<sup>28</sup> JNCC 2010. The UK Biodiversity Action Plan: Highlights from the 2008 reporting round:

[http://jncc.defra.gov.uk/pdf/pub2010\\_UKBAPHighlightsReport2008.pdf](http://jncc.defra.gov.uk/pdf/pub2010_UKBAPHighlightsReport2008.pdf). Please note that the UK BAP has been superseded by the UK Post-2010 Biodiversity Framework: <http://jncc.defra.gov.uk/page-6189>

<sup>29</sup> UKMMAS 2010. Charting Progress 2: <http://webarchive.nationalarchives.gov.uk/20141203181034/http://chartingprogress.defra.gov.uk/>

- Negative externalities – Negative externalities occur when damage to the marine environment is not fully accounted for by users and no compensation payment is foreseen. In many cases no monetary price is attached to marine goods and services therefore the cost of damage is not directly priced by the market. Even for those goods that are traded (such as wild fish), market prices often do not reflect the full economic cost, as prices exclude costs borne by other individuals and by society.

4.4. Government intervention is required to address both of these sources of market failure in the marine environment and supply alternative adequate solutions. The designation of MCZs and adoption of management measures to protect features of conservation importance will ensure negative externalities are reduced or suitably mitigated by restricting activities and pressures that prevent features recovering to a favourable condition. Designation will also support the continued provision of public goods in the marine environment, for example the features protected will ensure the range of marine biodiversity in our seas is conserved.

## **5. Policy objective and intended effects**

- 5.1. To deliver the vision of ‘clean, healthy, safe, productive, and biologically diverse oceans and seas’, as set out in the 25 Year Environment Plan and the UK Marine Policy Statement, the government has committed to contributing to an ecologically coherent UK network of well-managed MPAs. However, neither English waters nor UK waters are a single ecological entity within a biogeographic context. Our aim therefore is for the UK MPAs to contribute to an ecologically coherent network on a biogeographic basis and as a UK contribution to the wider OSPAR network. A coherent network will provide more benefits than an individual area would on its own, and will protect multiple habitats and species.
- 5.2. MCZs are an essential component of the MPA network and government has a legal duty to designate MCZs under the MCAA 2009 in order to contribute to the network. The sites and features to be designated in the 3rd tranche are needed to meet this legal obligation. The designation of MCZs will help to ensure that the conservation of habitats and species is given increased priority in the regulation and management of human activities, enabling features to be protected and conservation objectives achieved.
- 5.3. Following the designation of 50 MCZs in two previous tranches, the current policy objective is to designate a 3rd tranche of MCZs to complete a ‘Blue Belt’ of protected sites in the waters that the Secretary of State is responsible for.
- 5.4. Unlike for other types of MPA, the MCAA 2009 allows for the consideration of socioeconomic impacts when designating MCZs. The sites selected for the 3rd tranche are those that best meet the remaining ecological gaps in the MPA network whilst minimising any negative socioeconomic impacts on sea-users. This approach follows the same rationale used for the 1st and 2nd tranches.

## 6. Descriptions of options considered

### Overview of Baseline Option

- 6.1. The baseline (Option 0) or the 'do nothing option' encompasses all current protection and legislation. This includes protection for features already recognised within European Union (EU) or national lists<sup>30</sup>, and the existing network of MPAs, including the 50 MCZs designated in the 1st and 2nd tranches.
- 6.2. This is not a viable policy option because Section 123 of the MCAA places a legal obligation on government to contribute to a network of MPAs to protect nationally important habitats, species and geological features. The 50 sites designated within the 1st and 2nd tranches would not meet this obligation. An ecologically coherent network of MPAs is also required to fulfil existing international obligations, such as meeting our OSPAR commitments. Ministers have committed to designating MCZ sites in tranches and not proceeding with the 3rd tranche of MCZs would leave the network incomplete.
- 6.3. The 'do nothing option' provides the baseline against which the costs and benefits of the 3rd tranche of MCZs are calculated (in line with IA guidance and the HMT Green Book 2018). As with previous tranches, this baseline is assumed to be static rather than dynamic and assumes that in the absence of MCZ designation, features will remain in their current condition. It therefore does not take into consideration future pressures taking place in the marine environment and the assumption is that these pressures will be addressed as part of the licensing and wider regulations in place. The approach of assuming a static baseline is not ideal but it would not be possible to calculate costs in line with a deteriorating baseline due to the high level of uncertainty around when, and to what extent, deterioration would occur. Table 1 describes costs to private industry and public bodies that are already accounted for as part of the baseline scenario.
- 6.4. When possible, assumptions on future activities from different sectors (for example, licence applications for renewable energy developments) were included on a sector-by-sector basis and validated with industry and government bodies as appropriate.

### Overview of the preferred Option 1

- 6.5. Option 1 (our preferred option) involves designating all sites for which there is sufficient ecological and socioeconomic evidence to support designation in the 3rd tranche. Although there is only one policy option other than the baseline policy option, the final compilation of sites and features to be designated has been refined following consideration of environmental and socioeconomic information gathered prior to consultation and received during the formal tranche 3 consultation. Other policy options were not considered for this 3rd tranche since the process was already established before designating the 1st tranche. The same process of best option selection applies to this 3rd tranche. Due to limited economic evidence on the benefits of designating specific sites, the selection of sites was primarily based on a balance between protecting key ecological features and minimising the costs to marine users.
- 6.6. Option 1 involves designating 41 MCZs in 2019, alongside designating some additional features within 12 existing sites. These sites and features were identified to fill the

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<sup>30</sup> Features may be subject to one or more of the following national and multi-lateral agreements: (1) OSPAR List of Threatened and/or Declining Species - features that are considered to be under threat or in decline, and may be rare or particularly sensitive; (2) UK BAP Priority Habitats and Species - features of international importance, at high risk or in rapid decline, as well as habitats that are important for key species (UK BAP priority habitats and species are now referred to as Habitats or Species of Principle Importance under the UK Post-2010 Biodiversity Framework); and (3) Wildlife and Countryside Act, Schedule 5 - species likely to become extinct from the UK unless conservation measures are taken, and species subject to an international obligation for protection.

remaining ecological gaps in the MPA network whilst minimising the impacts on sea users. This option balances the ecological benefits of designation with the socioeconomic implications to deliver a proportionate and cost-effective contribution to the MPA network.

- 6.7. Some features located inside the MCZs' boundaries already have protection under existing environmental legislation (see Section 6.1). The costs and benefits relating to the protection of these features under current legislation are therefore not included in Option 1. The costs and (when possible) benefits included are those that flow from the additional management required.

## 7. Costs under the baseline and preferred option

### Costs under the baseline scenario

- 7.1. The baseline includes a number of costs relating to existing marine protection and regulation, including the costs from the 27 1st tranche and the 23 2nd tranche MCZs designated in 2013 and 2016 respectively. These costs are not attributed to the designation of 3rd tranche MCZs because they have already been incurred or will be incurred in the absence of any further MCZ designations<sup>31</sup>. They include:

- Costs of marine licence applications – applicants for marine developments and some activities have to carry out an assessment of the environmental impact that they would impose on already designated features, or to comply with existing related legislation. Costs of Environmental Impact Assessments (EIAs) vary depending on project size; a study of 18 EU examples found EIA costs range from 0.01% to 2.56% of the total development cost with the average being 0.5%<sup>32</sup>.
- Mitigation actions – where a particular development or activity is identified to have an adverse impact on existing protected features, the respective individuals or licensed operators may have to take actions to mitigate these impacts (e.g. amending location, adding cushioning for cables, micro-siting around features, etc.).
- Costs to fisheries – commercial fisheries may incur costs in the baseline due to existing closed areas, quota and effort and/or gear restrictions.
- Public sector costs – the costs covered by public expenditure including the monitoring of vessels, catches and species stocks, the management of existing licence applications and protected areas, and national defence.
- Some costs are fixed as they occur because of the existence of an MCZ network, rather than due to any particular tranche. Consequently these costs are not dependent on additional sites being designated and were fully represented in previous tranches of MCZs.

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<sup>31</sup> Note that, consistent with Impact Assessment guidance, we assume that these previous policies have been effectively implemented.

<sup>32</sup> Costs in excess of 1% of capital costs were the exception, and occurred in relation to particularly controversial projects in sensitive environments, or where good EIA practice had not been followed. See: <http://ec.europa.eu/environment/eia/eia-studies-and-reports/eia-costs-benefit-en.htm>



<b>Table 1: Summary of baseline costs to private industry and public bodies (all acronyms are explained on page 4)</b>	
<b>Impacted Private Sector</b>	<b>Description of baseline costs – no figures included because it is not proportionate or useful to decision making to monetise baseline costs and benefits</b>
Aggregate extraction	<ul style="list-style-type: none"> <li>- Existing costs of obtaining a licence for aggregate extraction.</li> <li>- Mitigation costs may be incurred to avoid damage to features protected under existing legislation and/or designations (conditions restricting where and how operation is carried out).</li> <li>- Costs incurred by the BMAPA to produce biodiversity action plans. This cost is due to the existence an MCZ network, rather than any tranche in particular. This cost is fully represented in the 1st tranche IA.</li> </ul>
Cables	<ul style="list-style-type: none"> <li>- Licence application costs for activity within 12nm of the shoreline, including assessment of environmental impact on existing features. Industry undertakes this voluntarily in areas outside of 12nm as there is no legal requirement to do so, except in cases where cable protection is required where burial has not been possible<sup>33</sup>. Mitigation activities may be required for some features protected under existing lists, such as micro-siting around features.</li> </ul>
Coastal Development	<ul style="list-style-type: none"> <li>- Licence application costs, including costs of EIA to consider impact on existing features.</li> <li>- Mitigation may be required (such as moving planned location, using different materials) to avoid damage to existing protected features.</li> </ul>
Commercial Fisheries	<ul style="list-style-type: none"> <li>- Existing fisheries regulations (i.e. the Common Fisheries Policy (CFP) within the EU or the national equivalent) e.g. limits on commercial fishing of quota stocks, discard bans and effort &amp; gear restrictions.</li> <li>- Existing UK fisheries management measures, e.g. IFCA byelaws, voluntary codes of conduct.</li> </ul>
Flood and Coastal Erosion Risk Management	<ul style="list-style-type: none"> <li>- Licence application costs, including costs of assessment of environmental impact to consider impact on previously designated features.</li> <li>- Mitigation may be required (such as moving planned location or restrictions on construction activities) to avoid damage to existing protected features.</li> </ul>
Heritage Assets <sup>34</sup>	<ul style="list-style-type: none"> <li>- Current costs for licence applications, including licence applications for archaeological activities on Historic Protected Wrecks.</li> <li>- Depending on the scale and type of activity, the MMO or Natural England may advise that an assessment of environmental impact is undertaken.</li> <li>- Historic England requires that records of all sites of historic or archaeological interest are considered in any licence application.</li> <li>- In some areas, vessel anchoring is considered in the baseline through restrictions or codes of conduct in place to protect any sensitive features including archaeological sites.</li> </ul>
Oil & Gas	<ul style="list-style-type: none"> <li>- Licence application costs, including costs of assessment of</li> </ul>

<sup>33</sup> See 'MMO Subsea Cables Desk Note' <https://www.escaeu.org/news/?newsid=71>

<sup>34</sup> Previously referred to as 'Archaeological Heritage' in the 3rd tranche consultation IA.

	<p>environmental impact to consider impact on previously designated features.</p> <ul style="list-style-type: none"> <li>- Mitigation activities may be required (such as pipeline routes, chemical release) to avoid damage to existing protected features.</li> </ul>
Ports, Harbours, Commercial Shipping and Disposal Sites	<ul style="list-style-type: none"> <li>- Licence application costs, including costs of EIA to consider impact on previously designated features.</li> <li>- Mitigation may be required (such as moving planned location, using different materials, seasonal restrictions) to avoid damage to existing protected features, in relation to activities such as dredging, disposal, laying and maintenance of moorings and development/expansion.</li> </ul>
Recreation	<ul style="list-style-type: none"> <li>- Cost incurred from management and best practice advice in relation to potentially damaging activities such as anchoring and wildlife watching.</li> <li>- Specific management of activities in MPAs.</li> </ul>
Renewable Energy	<ul style="list-style-type: none"> <li>- Licence application costs, including costs of EIA to consider impact on features.</li> <li>- Mitigation may be required (such as adjusting planned cable routes, using different turbine foundations, seasonal restrictions on activity), to avoid damage to existing protected features.</li> </ul>
<b>Impacted Public Sector</b>	<b>Description of baseline costs</b>
National Defence	<ul style="list-style-type: none"> <li>- Costs of adjusting electronic tools and charts.</li> <li>- Annual costs of maintaining tools and charts to include existing MPA sites in the absence of MCZs.</li> <li>- Additional planning considerations for existing protected sites.</li> </ul>
Marine Management	<ul style="list-style-type: none"> <li>- Costs to the MMO and IFCA's to monitor existing protected features and sites, enforce national fisheries regulations (i.e. the CFP within the EU or the national equivalent) and the administration of the marine licensing process.</li> </ul>
Ecological Surveys and Monitoring	<ul style="list-style-type: none"> <li>- SAC and SSSI monitoring;</li> <li>- Biodiversity monitoring by Natural England and JNCC to meet existing legal requirements and for 1st and 2nd tranche sites.</li> </ul>

## Stakeholder engagement process

- 7.2. Box 2 below provides information on how stakeholder engagement has informed the development of potential management scenarios and the consequent calculation of industry costs for the 3rd tranche of MCZs. In 2011 the Regional MCZ Projects collected information from stakeholders about the level and type of human activity in each MCZ (or group of sites). This informed the identification of potential management scenarios and possible and preferred management measures.
- 7.3. For the purpose of the 3rd tranche, during 2016 and 2017, Defra, Natural England and JNCC carried out pre-consultation stakeholder engagement to seek stakeholder views and to gather any relevant information held on the Regional MCZ Project candidate sites and the new site options being considered. Potential sites were discussed with stakeholders at a number of local and national events and meetings. In November 2016, JNCC held a two-day workshop to discuss the tranche 3 offshore sites and new site options. Several alternative proposals were made by stakeholders during this event and these were investigated in full and taken forward where appropriate. The workshop was followed up by a webinar in February 2017 to present and allow for comment on the final

offshore new site options that had been developed. Again this provided an opportunity for stakeholders to provide information and register any concerns. Reports were written up and published from both the workshop and webinar to capture stakeholder views<sup>35</sup>. The information collated in previous tranches as well as during the pre-consultation engagement exercise enabled Defra to verify whether the sites proposed were the most viable ones.

- 7.4. A full public consultation was carried out on the 3rd tranche of MCZs between June 8th and July 20th 2018 to provide stakeholders with an opportunity to comment on all sites proposed and to provide any additional information. Further details about the tranche 3 consultation and the responses received are provided in Section 3.

## **Box 2: The role of stakeholder engagement in identifying potential management scenarios and costs**

- 1) The management scenarios used in the analysis for the IA were identified using information about the sensitivity of species and habitats recommended for protection in each MCZ as well as information about the level and type of human activities in each site collected from stakeholders.
- 2) The management scenarios were also informed by advice provided by Natural England and JNCC on the mitigation that is likely to be needed. This advice does not pre-judge the advice that Natural England and JNCC will provide (as Statutory Nature Conservation Body advisers) for specific licence applications or for any future site-specific licensing decision.
- 3) Specialists in Natural England and JNCC provided site-specific advice on the mitigation that is likely to be needed for proposed plans and projects that are not yet consented and could impact on MCZ features. Natural England and JNCC engaged with stakeholders for specific sites to try to alleviate any concerns and to be informed of any local specific issues.
- 4) Defra economists collaboratively developed potential management scenarios that reflected the mitigation that was likely to be needed, based on the information provided in (1) (2) and (3) above. Activities, and where possible management scenarios, were updated as part of the pre-consultation engagement process. Additional information submitted by stakeholders during the formal consultation period has also been considered by appropriate experts in Defra, Natural England, JNCC, the MMO and Cefas.
- 5) To ensure that the management scenarios do not underestimate the costs of mitigation that would be required, a sensitivity analysis is carried out for all sectors which includes high cost management scenarios where appropriate. Pre-consultation with industry and stakeholder engagement has informed this analysis and new information submitted during the formal consultation has been considered in order to reduce uncertainties.
- 6) For all management scenarios, unit costs are used and the assumptions are appropriately informed by advice from SNCBs and regulators. The best estimate scenario for sectors was informed by an assessment of whether the low or high cost scenarios were the more likely. The IA analyses include cost estimates by government departments, Natural England, JNCC, stakeholder representatives and internal experts in environmental economics.
- 7) The cost estimates and methodologies were tested during consultation and

<sup>35</sup> JNCC's reports are available at: <http://jncc.defra.gov.uk/page-7325>

revised where relevant. This included where consultation responses mentioned activities that had not been considered in the consultation IA, or where responses challenged the methodologies with evidence. Section 7 describes in greater detail where cost estimates have changed following consultation responses.

## **Costs of the preferred option (option 1)**

- 7.5. The preferred option to designate 41 MCZs can be considered in the context of correcting market failures in the marine environment, as discussed in Section 4.3. In particular, management measures adopted to conserve features will help address the problem of environmental damage not being taken into account by users, individuals and businesses alike. The options selection process in identifying optimal size and type of sites began in 2011 - as part of the Regional MCZ Project - which led to a preferred option to designate 127 sites in three different tranches. Since that time, further steps have been taken to refine site selection, for example, the consideration of remaining gaps in the network and the development of new site options (see Section 2).
- 7.6. In line with HMT Green Book guidance, only additional costs and benefits related to designation of features in the 3rd tranche MCZs are included. Consequently this option only represents the costs resulting from the additional designation and the benefits flowing from the additional protection.
- 7.7. Features not included in the designation process of the 3rd tranche of MCZs, which are located inside the MCZ boundary and already benefit from protection, are considered part of the baseline as discussed above. Hence the costs and benefits relating to the protection of features under current legislation are not included.
- 7.8. As with the 1st and 2nd tranches, impacts are assessed over a 20-year period. The costs and benefits of designation are long term in nature, hence a 20-year appraisal was considered appropriate. Annex D provides a breakdown of the costs each year and it shows that the majority repeat annually or periodically beyond 10 years; meaning a shorter appraisal period would omit several significant industry impacts (e.g. the 15 year licence renewal assumption for aggregates). Furthermore, the Regional MCZ Projects, which informed the 1st and 2nd tranche impact assessments and engaged with stakeholders, used a 20-year appraisal period; therefore using the same timeframe will ensure consistency with the work previously delivered.
- 7.9. Studies used to inform benefits in this IA (e.g. RPA 2013 & Kenter et al. 2013) also assessed over a 20-year period or longer. Due to the nature of ecosystem service processes and functions, many significant benefits from designation (e.g. improvement in the condition of a feature if currently unfavourable) will not be realised until beyond 10 years, particularly within the marine environment. Therefore, a shorter time period would not capture the full extent of recreational benefits to tourists, anglers & divers and non-use values to the wider public as many features would still be recovering or may not have improved at all due to time lags. Monetised benefits, despite large uncertainties, are better represented over a 20-year appraisal period and especially when compared to costs for the reasons described in Section 7.8.
- 7.10. While the MCZ designations can reasonably be expected to generate costs and substantial benefits beyond 20 years, uncertainty beyond this point makes further analysis challenging. All costs have been subject to sensitivity analysis, calculated on a sector-specific basis using the best available evidence, in order to account for these uncertainties. All values are presented as 2016 prices (present value base year 2019)

and projected values are given in constant prices. The present value of the costs and benefits has been calculated using a discount rate of 3.5% as per the HMT Green Book guidance.

7.11. The costs of the preferred option are made up of private and public sector costs. The private costs can be separated into two distinct categories; activities where limited or no additional mitigation is required; and activities where additional mitigation is required, hence certain management measures will be put in place by the relevant authorities. Further explanation of the two private cost categories and public sector costs are as follows:

- **Private sector costs relating to activities where limited or no *additional mitigation is required*.** This situation occurs when a maintain GMA is in place but there are additional costs to obtain a licence due to the need to assess the environmental impact of an activity on a protected feature. This includes activities for which an operator has to apply for a licence (to the MMO, BEIS, etc.) such as aggregate extraction, navigational dredging and disposal, oil and gas-related activities, port and harbour developments and renewable energy developments. For certain activities, these additional costs also include familiarisation costs. This is because a business applying for a licensable activity would have to become familiar with new protected areas in proximity to the proposal. A business would only need to become familiar with a designation if it wishes to apply for a licence which requires an appropriate assessment. Existing baseline licensable activity already has consent conditions attached to it which would continue even without designation in place. Familiarisation costs have not been monetised here. In the case of management of commercial fishing activity, management of a particular site is decided by regulators and where a new byelaw is introduced there will be an accompanying impact assessment, including stakeholder engagement, to inform vessel operators of any new restrictions. Not all fishermen would need to become familiar with management measures for all MCZs so any familiarisation costs would be accounted for within local IAs. The same assumptions applied for both the 1st and 2nd tranches and they were widely accepted. More detailed information about how these extra costs were derived and associated assumptions are found in Annex D.
- **Private sector costs relating to activities where management/mitigation is required.** This situation occurs when there is a recover GMA in place and specific changes need to be made to protect the designated feature(s) within the MCZ. This primarily affects the fishing and recreational sectors, since most other sectors are already required to mitigate impacts on MCZ habitats and species that are recognised within EU or national lists (see Section 6.1). Management of activities for fisheries and recreation will be put in place by regulators once sites are formally designated. Management requirements will be determined on a site-by-site basis to meet the site's conservation objectives (based on advice from the SNCBs) whilst minimising the impact on sea users. For example, a particular type of fishing gear might be known to damage a feature and would therefore be managed over the specific area of the feature in order to allow the feature to recover to a favourable condition. This IA therefore assesses costs based on the most likely management scenarios, informed by advice from Natural England, JNCC and relevant stakeholders. More specific local management measures requiring interventions such as byelaws will be subject to separate IAs. The extra costs associated with site designation will account for uncertainty and a best estimate is provided. Site-specific management scenarios for commercial fisheries and recreation are presented in Annex A and an overview of sector costs and assumptions is provided in Annex D.

For all sectors where additional mitigation is required, this has been assessed on a case-by-case basis. In situations where MCZ designation results in mitigation costs that are prohibitively expensive, and where other conditions are met, the MCAA (2009) Public Benefit Test will apply<sup>36</sup>. This means that the MMO will determine whether the benefit to the public of proceeding with the proposed development clearly outweighs the risk of damage to the environment that will be created by proceeding with it<sup>37</sup>. If the benefit to society outweighs the ecological cost, it is unlikely that the activity will be restricted. Such conflicts are not expected to arise as a result of the designation of this 3rd tranche of sites because sites were not taken forward where this was likely to be an issue.

- **Public sector costs.** There are potential costs to the Environment Agency for additional monitoring relating to Flood and Coastal Erosion Risk Management (FCERM) but an assessment of known current and planned developments indicates that this is unlikely to be the case for the sites proposed for designation in the 3rd tranche (Environment Agency pers. comm. 2014. Additionally, no site-level concerns were raised by the Environment Agency in their July 2018 consultation response). There are costs to the Ministry of Defence (MoD), IFCAs, the MMO and other regulators for considering impacts on MCZs, MCZ management, monitoring and enforcement, as well as the costs to Defra of ecological surveys and to SNCBs for monitoring and reporting progress to favourable condition.<sup>38</sup> These are not included in the Estimated Annual Net Costs to Business (EANDCB) figures but are summarised in Table 2 below as well as in Annex D.

## Summary of Sector Cost Methodologies

7.12. For each sector potentially impacted by the designation of MCZs we have a method to assess additional costs relative to the baseline. As part of the Regional MCZ Project process, detailed methodology papers were written in conjunction with the relevant regulators, experts and industry representatives. These methodologies were followed for the 1st and 2nd tranche IAs, the IA prepared before the consultation on this tranche, and are followed in this IA using the best and most up-to-date data available. The costs presentation is organised as follows:

- The paragraphs below summarise methodologies linking to the relevant methodology papers as mentioned above, whilst also providing details of any changes to methodology where relevant. The best estimate undiscounted average annual cost is stated, where relevant, which includes any transitional costs.
- Table 2 provides costs by sector, presenting undiscounted annual average costs and average present value costs per year for the best, low and high cost scenarios.
- Details of assumptions, actual calculations of unit costs, the time profile of costs used and, when relevant, transitional costs are given in Annex D. Transition costs are classed as one-off costs due to the implementation of the policy and do not recur beyond a certain date. Therefore, all periodic costs, such as additional application costs, are not classed as transitional because they occur regularly and are applicable beyond the 20-year IA period with future applications.

<sup>36</sup> See s.126(7)(b) and (c) of the MCAA (2009) and the MMO's assessment process for MCZ licence applications: <https://www.gov.uk/guidance/marine-licensing-impact-assessments>

<sup>37</sup> If so, the applicant must satisfy the MMO that they will undertake or make arrangements for the undertaking of measures of equivalent environmental benefit to the damage which the act will or is likely to have in or on the MCZ. To weigh up societal and ecological costs, the MMO will use information supplied by the applicant with the licence application, advice from the SNCBs, other government departments, Local Authorities, Local Enterprise Partnership, the Marine and Coastguard Agency and others where appropriate.

<sup>38</sup> Estimated costs from management and ecological surveys have been subject to confirmation from relevant bodies. JNCC/NE/MMO pers. comm. 2019.

- Resulting changes to cost estimates following consultation are discussed both below and in Annex D.
- Note that the pre-consultation figure has been updated to 2016 prices and therefore differs from the pre-consultation IA.

### **Aggregate Extraction – Best estimate undiscounted average annual cost £0.006m**

- 7.13. Firms engaging in aggregate extraction are subject to additional costs due to assessment of environmental impacts undertaken in support of future licence applications. It is assumed that the impact of aggregate extraction on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO.
- 7.14. Two scenarios were developed for the IA: a low cost scenario (also used as best estimate) and a high cost scenario<sup>39</sup>. The assumptions for each scenario are summarised below.
- 7.15. The low cost scenario considers licence applications in areas which have already been granted approval for development, known as existing production and option licence areas. There is an additional one-off cost to operators for future licence/licence renewal applications in existing production licence areas within 0.6 miles (1 km) of an MCZ. This is based on the need to assess the impacts on features protected by an MCZ. The high cost scenario considers one-off additional impact assessment costs for all future licence applications only in strategic Resource Areas which have yet to be granted approval for development and are identified as overlapping or being ‘in close proximity’ to an MCZ. More information on how the costs were ascertained is provided in Annex D.
- 7.16. During consultation, no new issues were raised concerning the estimation of costs to the aggregates sector. Therefore, the same assumptions have been applied as pre-consultation and costs have not changed, bar updating to the relevant base year.

### **Aquaculture – No extra costs quantified**

- 7.17. Where relevant, management scenarios have been identified for MCZs based on assumptions about the management of aquaculture that may be required in order to achieve the conservation objectives of features protected. When possible, these scenarios have been used for the purposes of the IA, in order to estimate the potential magnitude of the effects on the sector of designating MCZs<sup>40</sup>.
- 7.18. Of the sites in the 3rd tranche only one, the Dart Estuary, was identified as likely to require management of aquaculture activities. The remaining sites do not have aquaculture activity in close proximity or have no expected impact from aquaculture on protected features. For the Dart Estuary, aquaculture management is likely to consist of the monitoring and removal of feral oysters. Costs have not been quantified because it is difficult to specify the extent of additional management at this stage without a baseline assessment, however costs are likely to be low.
- 7.19. During consultation, no new issues were raised concerning the estimation of costs to aquaculture. Therefore, the same assumptions have been applied as pre-consultation and costs have not changed.

<sup>39</sup> Annex H2 Approach for assessing impacts on aggregate extraction, <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>40</sup> Annex H3 Approach for assessing impacts on aquaculture: <http://publications.naturalengland.org.uk/publication/1940011>.

## Heritage Assets – No extra costs quantified

- 7.20. It is assumed that the potential impact of archaeological activities on features protected by MCZs will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO. Based on the advice of Historic England and the MMO, all licence applications to Historic England and the MMO for archaeological activities proposed within MCZs will require additional work to be completed in support of the application in regards to broad scale habitats. This is because impacts on the other habitat and species features are already currently assessed without MCZs, but specific impacts on broad scale habitats are not (JNCC and Natural England 2011a).<sup>41</sup>
- 7.21. Due to lack of information about future licence applications (where the assets/activities will be, what they will comprise and when they will take place) or suitable historical data with which to forecast future activities, it has not been possible to quantify the impacts of MCZs on archaeological activities. Costs may arise through the mitigation of impacts of future archaeological activities on MCZ features where required, but these are expected to be small since the impacts will be addressed as part of the licensing system currently in place. Moreover, increased costs may be incurred for future licence applications to undertake activities. However as the footprint of archaeological activity is small compared to the size of broad scale habitats, any additional licence costs are expected to be minimal. It is assumed that any additional costs will be incurred by the licence applicant (mainly archaeological bodies and research institutions such as universities), the licensing bodies (Historic England and MMO) and the SNCBs.
- 7.22. During consultation, no new issues were raised concerning the estimation of costs to heritage assets. Therefore, the same assumptions have been applied as pre-consultation and costs have not changed.

## Cables (Interconnectors and Telecommunication) – Best estimate undiscounted average annual cost £0.002m

- 7.23. The cable sector includes the transmission (power) and telecommunications (telecom) cables sector. The sector is subject to additional costs due to assessment of environmental impacts undertaken in support of future licence applications. It is assumed that the impact of cable laying on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO. There will be an additional cost to an operator to conduct an appropriate EIA of future cable installation on broad scale habitats protected by an MCZ. Additional assessment costs will only be incurred for inshore MCZs (from mean high water out to 12nm) as there is no legal requirement to do an assessment of impacts beyond 12nm other than marine licences for very specific activities, such as rock protection. Due to the rarity under which these circumstances occur in the offshore environment within the vicinity of an MCZ, and the unavailability of robust scientific evidence, it has not been possible to monetise these costs but we expect them to be low. No additional mitigation of impacts on features protected by MCZs have been identified. It is also assumed that additional mitigation of impact will not be required for the repair and replacement of existing and future cables beyond 12nm as the footprint of cables is very small compared to broad scale habitats and there is no legal requirement to mitigate impacts beyond 12nm<sup>42</sup>.

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<sup>41</sup> Annex H4 Approach for assessing impacts on archaeological heritage: <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>42</sup> Annex H6 Approach for assessing impacts on cables (interconnectors and telecom cables), <http://publications.naturalengland.org.uk/publication/1940011>



- 7.24. The specific locations of all future cable routes are not known. Therefore the estimated cost to the cables sector is not based on specific projects; instead an estimate of the number of potential licence applications over the 20-year IA period was agreed with the UK Cable Protection Committee (UKCPC) during the 1st tranche IA. This estimate was maintained for the 2nd tranche IA as well as for the 3rd tranche IA but uprated to the relevant base year. For the 1st tranche IA, the costs were calculated for all potential MCZs and then scaled down proportionally for the sites proposed for designation under the 1st tranche. The same approach was taken for the IAs for the 2nd and 3rd tranches. Sensitivity analysis is conducted which varies the assumed quantity of applications over the IA period.
- 7.25. Three consultation respondents highlighted that the exemption to assessments of impacts beyond 12nm does not apply to some activities (e.g. cable protection, unexploded ordnance removal). Due to the rarity under which these circumstances occur within the vicinity of an MCZ, and the unavailability of robust scientific evidence, it has not been possible to monetise these costs but we expect them to be low.
- 7.26. The same assumptions have been applied as pre-consultation and costs have not changed, bar uprating to the relevant base year.

### **Coastal Development – Costs monetised elsewhere**

- 7.27. Costs associated with some developments are covered under sector-specific costs elsewhere (e.g. ports and harbours and renewables). The coastal development sector primarily covers maritime structures such as slipways, jetties and marinas and also coastal flooding and defence structures such as seawalls and weirs. It is assumed that the impact of coastal development on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO. Impacts of designation on planned but yet to be consented coastal developments could include additional licence application costs, including additional analysis costs within the EIA to consider the impact on MCZ features and mitigation (such as moving planned location, using different materials and the costs of creating compensatory habitats). Costs have not been quantified for this sector, since, after consulting with some of the competent authorities, they were not in the position to anticipate the types and number of licence applications within a proposed MCZ or in close proximity. However these costs are not expected to be significant since the standard planning applications would cover the required regulatory framework.
- 7.28. During consultation, no new issues were raised concerning the estimation of costs to coastal development. Therefore, the same assumptions have been applied as pre-consultation.

### **Commercial Fisheries (UK Vessels) – Best estimate undiscounted average annual cost £0.114m**

- 7.29. Firms engaging in commercial fishing may be subject to additional costs due to restricted access to potential fishing areas caused by the 3rd tranche of MCZs. To estimate the economic impact on commercial fisheries it is first necessary to estimate the baseline fisheries activity at each site. For vessels over 15 metres, activity can be determined through satellite tracking (Vessel Monitoring System [VMS]) which provides revenues per MCZ for each broad gear type<sup>43</sup> based on intensity of fishing in those areas as a

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<sup>43</sup> The term 'gear type' refers to the type of commercial fishing equipment used. These are grouped into categories: (1) static fishing gear refers to gears such as pots and set nets; and (2) mobile fishing gear refers to gear that is towed through the water such as demersal towed nets.

proportion of fishing in the entire ICES rectangle area<sup>44</sup>. Revenues for these areas are known as they are derived from an established methodology based on combining landing values and fishing efforts. For under 15 metre vessels, which tend to fish inshore areas, data coverage is poorer. For these vessels, fishing activity level was instead estimated from IFCA and MMO sightings and surveillance data, following the method used to support previous advice on the distribution of inshore fishing activity as documented in the MB0117 report<sup>45</sup>. Using this data, baseline revenues for each MCZ have been estimated based on a five year average. For vessels over 15 metres, updated landing revenues for the years 2013-2017 have been employed. For vessels under 15 metres, existing (pre-consultation) landing revenues for the years 2010-2014 have been employed as the later data is not available. Landing revenues have then been converted to gross added value figures using Seafish average GVA ratios<sup>46</sup> for each gear type in each region. Hence the economic impact estimates presented in this IA are not equivalent to lost revenue; but instead represent the lost value that commercial fisheries contribute to society. Taking this approach enables comparison with other sectors.

- 7.30. Management scenarios for each MCZ have been developed based on the GMA for features to be protected (see Box 1). These outline the potential management needed to recover protected features to a favourable condition. The SNCBs have published a management advice document<sup>47</sup> that specifies a range of possible management scenarios for each broad gear type (mobile and static) and for each feature<sup>48</sup>. Management scenarios were refined using stakeholder knowledge and input during the Regional MCZ Projects process, refreshed as necessary based on pre-consultation engagement with stakeholders in 2016 and 2017 and updated SNCB advice on features to be designated, and tested at consultation in June 2018. Consequently the scenarios are used to estimate the potential economic impact of MCZ designation. Full details of the management scenarios used for the purposes of the IA are given in Annex A.
- 7.31. To represent the uncertainty in the level of management needed, a range of scenarios were developed for each site. Where the likelihood between the lowest and highest cost scenario was not known, the best estimate was taken as halfway between the low and high cost estimate. This is the case for all bottom-abrading mobile gears for sites in the 3<sup>rd</sup> tranche, which is consistent with the methodology applied to previous tranches. Where the high cost scenario was considered unlikely (based on SNCB advice and consultation with stakeholders) the best estimate was 25% of the range between the low and high cost scenarios. This is the case for all static gears (pots and traps, nets, hooks and lines). Site specific management assumptions are given in Annex A and sector assumptions and calculations are given in Annex D.
- 7.32. As there is likely to be displacement of fishing activity to areas outside of the proposed MCZs, rather than a complete loss of activity, a displacement assumption of 75% has been applied (25% of GVA assumed lost) to the best cost management scenario and no displacement assumed (100% of GVA assumed lost) for the high cost management scenario. The 75% assumption is based on an analysis carried out by Cefas prior to designating the 1st tranche of MCZs on the extent of overlap between fishing activity and the original Regional MCZ Project recommended sites<sup>49</sup>. This found that the Regional

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<sup>44</sup> ICES use statistical rectangle areas for the gridding of data to make simplified analysis and visualisation of fishing effort, landings and revenues.

<sup>45</sup> Defra-funded research project to understand inshore fishing activities:

<http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=1&ProjectID=18126>

<sup>46</sup> <https://www.seafish.org/article/fleet>. Gross value added is the value generated by any unit engaged in the production of goods and services.

<sup>47</sup> [http://www.naturalengland.org.uk/Images/MCZ-fish-impacts\\_tcm6-26384.pdf](http://www.naturalengland.org.uk/Images/MCZ-fish-impacts_tcm6-26384.pdf)

<sup>48</sup> Annex H7 Approach for assessing impacts on commercial fisheries, <http://publications.naturalengland.org.uk/publication/1940011>

<sup>49</sup> Defra-funded research project:

<http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=18799>

Projects recommended MCZs impinged on less than 8.5% of the fishing areas used by any UK or non-UK >15m fleet. For just UK towed gears, the corresponding value was always less than 4%. For the inshore area (predominantly <15m boats) the Regional Projects recommended MCZs impinged on between <1% and 29% of the fished areas in each Regional Project area (considering trawls and dredges). This shows that the 75% displacement assumption is a conservative approach likely to underestimate the amount of displacement in most cases (as the overlap with core fishing grounds is usually significantly less than 25%). There was one substantive challenge to this assumption in tranche 3 consultation responses, but our assessment is that the issue raised did not justify an alternative approach that would be more reliable (see Section 7.38).

- 7.33. The displacement assumptions for both the best and high cost management scenarios are based on a prudent and cautious approach and validated during the 1st and 2nd tranches of MCZs. Whilst a small number of respondents to the tranche 3 consultation questioned these assumptions, no alternative verifiable method has been proposed, therefore the original assumptions apply.
- 7.34. As discussed in Section 7.11, familiarisation costs to fishers have not been calculated as the mandatory additional management measures for a specific site are decided and implemented if needed by regulators (MMO and IFCAs) following designation. Regulators would produce IAs with any byelaws to take account of the impacts of any closures or restrictions and to inform stakeholders.
- 7.35. One consultation respondent highlighted the availability of new VMS data for the period 2013-2017. This updated data has been used to replace data for >15m vessels in our analysis. For <15m vessels, iVMS data were only available for the period 2015-2017. To ensure a five-year average and thus continuity in our method, IFCA sightings data for the period 2010-2014 has been retained for vessels <15m. More recent IFCA sightings data was not available.
- 7.36. As a result of using more recent landing revenues for vessels over 15m (explained above), the best estimate annual costs for some sites changed from pre-consultation figures. These changes were verified with Cefas and are primarily due to fluctuations in the type of fishing gear used, target species, species value and the use of specific fishing areas. The main changes to sites are summarised below:
- **Cape Bank MCZ:** increase in best estimate annual cost from £670 pre-consultation to £4,446 post-consultation.
  - **Holderness Offshore MCZ:** increase in best estimate annual cost from £5,759 pre-consultation to £11,675 post-consultation.
  - **South Rigg MCZ:** decrease in best estimate annual cost from £20,079 pre-consultation to £6,241 post-consultation.
  - **West of Copeland MCZ:** decrease in best estimate annual cost from £2,383 pre-consultation to £155 post-consultation.
  - **West of Wight Barfleur MCZ:** decrease in best estimate annual cost from £2,658 pre-consultation to £37 post-consultation.
- 7.37. A small number of respondents highlighted the need to consider impacts to fleets fishing outside of MCZs that are affected by fleets being displaced into their usual fishing grounds. These impacts have not been quantified because there is no robust, verifiable scientific evidence and it is too speculative for a robust methodology to be developed to enable this to be calculated.

- 7.38. Two consultation respondents challenged our cost estimates for the South Rigg and Queenie Corner MCZs on the basis that the Total Allowable Catch (TAC) for nephrops could be affected by designation. They suggested that designation of the sites may be considered to reduce the total area of seabed mud available to fishing, which could affect the stock estimate and TAC for this species, leading to higher costs to the industry than currently estimated. We have opted to not adapt the cost estimates in response to this issue for two reasons. Firstly, although advice from fisheries experts is that the stock estimate and TAC might be reduced in this manner, this has not happened as yet, despite 9.3% of the region's mud already being incorporated into MPAs. Any possible loss of TAC in relation to these two sites would just be in proportion to the 2.8% of the region's mud that they contain. Secondly, only 74% of the original TAC for this nephrops fishery has been utilised by the average annual catch during the years 2013-17. As such, even if in future the calculation of the TAC were to take into account areas of MPAs closed to fishing, any reduction to the TAC is unlikely to have an impact on the amount of nephrops caught, unless fishing patterns change significantly.
- 7.39. After consideration of the above consultation responses and updated fisheries data, the best estimate undiscounted average annual cost for commercial fisheries (UK) has risen from £0.111m pre-consultation to £0.114m post-consultation.

### **Commercial Fisheries (Non-UK Vessels) – See Annex E**

- 7.40. Impacts of management measures on non-UK vessels have been taken into account in decision making. This has particularly been the case for offshore sites as, within membership of the EU, offshore management measures have to be agreed at the EU level in conjunction with the CFP. However these impacts are not included in the assessment of costs of designation in the summary sheets. This is because costs and benefits of regulatory changes to other countries are not considered in UK IAs and this is consistent with IA methodology and guidance. In addition, it is not possible or proportionate to assess lost GVA for other countries as each country will have different GVA ratios for different gear types and this information is not easily accessible.
- 7.41. Efforts have been made during the pre-consultation period to engage with the authorities and commercial stakeholders in affected member states. This has resulted in estimates of non-UK baseline revenues by gear type for each offshore and inshore site. Actual impacts on non-UK vessels will depend on profits obtained from MCZ areas and the ability of vessels to displace to surrounding areas in the event of management. A discussion of the likely impacts of each site on non-UK vessels is given in Annex E.
- 7.42. During consultation, four responses were received from authorities and commercial stakeholders in the affected member states. Some responses provided updated activity information but no updated cost estimates were provided and no specific issues were raised concerning the assumptions and methods used to calculate costs. Therefore, the same assumptions have been applied as pre-consultation and costs have not changed.

### **Oil and Gas and other energy (including Carbon Capture and Storage [CCS] at sea) – Best estimate undiscounted average annual cost £0.140m**

- 7.43. The oil and gas sector is subject to additional costs due to assessment of environmental impacts undertaken in support of future licence applications. The 3rd tranche of MCZs includes sites which may be in areas of future oil and gas exploration (not current consented activity). Following informal preliminary consultation with relevant parties, the impact of oil, gas and CCS on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by BEIS. As already highlighted in Section 7.11, the IA assumes that there will be an additional cost in

future licence applications due to the presence of MCZs which are the 'nearest environmentally designated area' for oil and gas licensable activity seeking consent. Different estimates of the number of future licence applications over the IA period were used to estimate low, best (or midpoint) and high cost estimates for the IA. This reflects uncertainty in the number of future licence applications that could come forward in blocks, with no known discoveries over the IA period, as identified through discussions with relevant parties. The estimates of future licences have not changed since previous IA tranches as regulatory authorities indicated they are content with these assumptions. Annex D provides more details on how costs for the 3rd tranche were derived.

- 7.44. For the purposes of the IA it is assumed that MCZ habitats and species that are already recognised within EU or national lists (see Section 6.1) are already protected and mitigated for outside of MCZs. Additional mitigation would be required for broad scale habitats, which are not protected under other legislation. The footprint of oil and gas and CCS developments and their pipelines and cables are unlikely to significantly impact on the overall condition of the broad scale habitat, therefore it is assumed that no additional mitigation required for this sector.
- 7.45. The number of applications that will be submitted during the 20-year IA period will be dependent on the number of blocks offered during oil and gas licensing rounds, and the stages of development that are carried out in each of those blocks over the 20-year IA period. For the 1st tranche IA, costs were scaled down based on the number of 1st tranche MCZs as a proportion of the whole suite of potential MCZs. The same approach was taken for the 2nd and 3rd tranches, but with some minor changes in assumptions. The main differences in the 3rd tranche apply to assumptions made behind the 26<sup>th</sup>, 27<sup>th</sup>, 28<sup>th</sup>, 29<sup>th</sup>, 30<sup>th</sup> and 31<sup>st</sup> rounds blocks. Annex D provides detailed information regarding the way in which these costs were ascertained. Also for this tranche, only two scenarios are envisaged and relative assumptions, consistent with the previous tranches, are described in Annex D (best and low cost scenarios). Consultation responses did not highlight any issues associated with the derivation of these costs, and further liaison with relevant departments, i.e. Oil and Gas Authority (OGA), confirmed their satisfaction with the existing assumptions used (pers. comm. 2019).
- 7.46. Given the increased number of licensing rounds assumed to be affected, best estimate undiscounted average annual cost for oil and gas have risen from £0.091m pre-consultation to £0.140m post-consultation. Note that the pre-consultation figure has been updated to 2016 prices and therefore differs from the pre-consultation IA.

### **Ports, Harbours, Commercial Shipping and Disposal Sites – Best estimate undiscounted average annual cost £0.117m**

- 7.47. The ports and harbours sector is subject to additional costs due to assessment of environmental impacts undertaken in support of future licence applications. The 3rd tranche of MCZs contains sites that encompass ports and harbours, sites that include areas under ports and harbours operational jurisdictions and/or sites overlapping or in close proximity to disposal sites and navigational dredging activity. It is assumed that the impact of ports activity on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO.
- 7.48. The IA assumes that there will be an additional cost to licence applications due to MCZs, with four scenarios developed to capture the range of likely costs. Such costs are associated with seeking consent for future ports and harbour activities including navigational dredging, disposal of dredge material at sea, and port and harbour developments. The scenarios vary in terms of estimates of future disposal activity and different numbers of future Marine Dredging Protocols, to give low and high cost

estimates. After consultation with the MMO and Cefas, it has been agreed that the best estimate is the midpoint of the two lowest cost scenarios, which in their view is most realistic based on the regulatory experience of the number of historical applications received. Annex D gives further details.

- 7.49. For disposal sites, the low cost assumes that an individual applicant will incur a maximum of one additional cost per calendar year to consider potential effects on MCZ broad scale habitats (per disposal site). This is because several disposal sites are frequently used by the same business, meaning additional assessment costs per application is not a realistic assumption as information on the MCZ would only have to be gathered once and then updated periodically. This is considered more realistic due to economies of scale, as businesses with multiple applications will only have to collect information on the MCZ once per year and use it again. Consequently the average number of annual future licence applications that would incur an additional cost, was assumed to be the same as the average number of licence applicants per year received over the period 2005 to 2015, using data provided by Cefas. However the high cost uses a more pessimistic assumption, where every application will incur an additional cost to consider potential effects on MCZ broad scale habitats, regardless of whether they include multiple applications by the same applicant. But this is considered highly unlikely (MMO pers. comm. 2014).
- 7.50. For navigational dredging, it was assumed that one maintenance licence application (renewal) is submitted for each navigational dredge area once every three years from year one of the period covered by the IA.
- 7.51. Planned future port and harbour developments were identified via discussions with port and harbour operators during the development of the 1st and 2nd tranche IAs, and during pre-consultation engagement for the 3rd tranche. Where appropriate, tranche 3 sites have been adapted to reduce or remove the need for port mitigations, and as a result no mitigation has been identified for any 3rd tranche MCZs.
- 7.52. Two consultation respondents raised concerns about potential economic and shipping safety impacts if the Saltmead anchorage within the Yarmouth to Cowes MCZ could no longer be used. Advice from SNCBs indicates that management of the Saltmead anchorage is unlikely to be required.
- 7.53. After consideration of the above, the best estimate undiscounted average annual cost for ports and harbours has risen from £0.116m pre-consultation to £0.117m post-consultation.

### **Recreation – Best estimate undiscounted average annual cost £0.287m**

- 7.54. The recreation sector is subject to additional costs due to restrictions on either the equipment businesses may use, or areas in which the businesses may operate. Recreational activities considered in this IA include: angling, boating, snorkelling and shore-based activities such as coastal walking. While some recreation businesses may own multiple boats, it is prudent to assume that all businesses in this sector are small and micro for the purposes of the IA. The majority of these activities will not be negatively impacted by the designation of MCZs and many may even benefit from them (e.g. as seabed habitats and species recover there will be improved snorkelling and angling opportunities).
- 7.55. Potential management scenarios have been identified for each MCZ (over and above the baseline situation) based on updated information on feature extent and condition provided by Natural England and JNCC in relation to recreational activities that may need to be managed to achieve the conservation objectives of each MCZ. Where multiple

management scenarios are present for an MCZ, the best estimate is the mid-point of the low and the high cost scenarios. These assumptions have been used for the purposes of the IA to estimate the potential economic impacts of MCZs on the sector<sup>50</sup>.

- 7.56. In general, most recreational activities will not interfere with the achievement of the conservation objectives of MCZs and would not need to be managed in the event of designation. However, some features are sensitive to certain recreational activities, such as anchoring and mooring, and therefore recreational boating may have to be managed if such features (particularly seagrass) have a recover GMA. Where recreational anchoring or mooring require management, scenarios to remove or mitigate the impacts of the activity on sensitive features are adopted. Potential management can range from voluntary codes of practice and no-anchor zones to mandatory no-anchor zones and the use of eco-moorings to prevent abrasion damage to sensitive features. Only three sites in the 3rd tranche contain features likely to require protection from mooring and anchoring: Cumbria Coast, Studland Bay and Bembridge. For Cumbria Coast, the costs of a possible code of conduct could not be quantified. More information about impacts and costs for Studland Bay and Bembridge can be found in Annexes A and D.
- 7.57. Following discussion with stakeholders and information received during the formal consultation, socioeconomic impacts on chartered vessel sea angling activities have now been quantified for the three sites in which black sea bream will be protected (Purbeck Coast, Poole Rocks and Southbourne Rough). This has resulted in an additional best estimate annual cost of £0.118m to the recreation sector. This estimate reflects the uniqueness of black bream nesting sites and the low opportunities for displacement to other locations for recreational fishers, compared to, for instance, commercial fishers. This estimate is based upon the best available evidence, however some uncertainties exist. Further details are given in Annex D.
- 7.58. After consideration of the above, the best estimate undiscounted average annual cost to the recreation sector has risen from £0.095m pre-consultation to £0.287m post-consultation. It should be noted that despite high annual costs monetised in this IA, the benefits to recreation are predicted to be higher, although it has not been possible to monetise these. See Section 8 for more details.

### **Renewable Energy Developments – Best estimate undiscounted average annual cost £0.005m**

- 7.59. The renewable energy sector is subject to additional costs due to assessment of environmental impacts undertaken in support of future licence applications. The renewable energy sector includes wind, wave and tidal power developments. It is assumed that the impact of renewable energy developments on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO.
- 7.60. The assumptions for this sector were based on advice from Natural England, JNCC, the MMO and BEIS in terms of how these bodies anticipate their advice to developers would differ for consents in the presence of an MCZ, and also on discussion with developers during consideration of tranche 2 sites. This represents what actions they would expect of the developer over and above the assessment of environmental impact that is already undertaken in the absence of an MCZ, which includes the assessment of impacts on broad scale habitats that are not protected under other legislation<sup>51</sup>.

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<sup>50</sup> Annex H13 Approach for assessing impacts on recreation, <http://publications.naturalengland.org.uk/publication/1940011>

<sup>51</sup> Annex H14 Approach for assessing impacts on renewable energy, <http://publications.naturalengland.org.uk/publication/1940011>

- 7.61. Additional costs apply to all future renewable energy proposals in English waters 'near to' proposed MCZs (defined here as within 0.6 miles [1 km] of an MCZ boundary). This is different to the assumption made in the tranche 1 and tranche 2 IAs, which assumed an additional cost would only be incurred for developments that overlap or pass through MCZs. This change follows the publication of MMO guidance<sup>52</sup> confirming that the assumption should be extended to include development 'near to' proposed MCZs.
- 7.62. After consideration of the above, the best estimate undiscounted average annual cost for renewables has not changed. This is because new renewable developments raised were predicted not to require further environmental assessments, were not in close proximity to sites, or both. The existing assumptions have been used.

## Summary of Public Sector Costs Methodologies

### Flood and Coastal Erosion Risk Management (FCERM) – No extra costs quantified

- 7.63. It is assumed that the potential impact of FCERM activities on features protected by MCZs will be managed under the existing marine licensing framework, as provided for under the MCAA 2009. The estimated impact is based on site-specific projects near MCZs that are likely to incur an additional cost for future FCERM licence applications, which are anticipated to result in additional monitoring or mitigation costs for operators (the Environment Agency and/or Local Authorities). Advice for each MCZ was provided based on an assessment of whether the proposed FCERM activity is: a) likely to take place in the site; b) likely to take place near to sensitive MCZ features; and c) whether the scale and type of FCERM activity anticipated would impact on the conservation objectives of the MCZ features<sup>53</sup>.
- 7.64. For the 3rd tranche of MCZ designations, there is no indication that planned FCERM developments will be impacted by the sites to be designated. The Environment Agency (pers. coms. 2012 & confirmed in 2017) have previously indicated that there may be additional costs to assess the impact on MCZs during some future licence applications. However, as future FCERM activities are not known there is uncertainty around the number of applications affected. As a consequence, at this stage, the assumption is that there are no extra costs for this 3<sup>rd</sup> tranche.
- 7.65. During consultation, no issues were raised concerning the estimation of costs to FCERM. Therefore, the same assumptions have been applied as pre-consultation.

### National Defence – Best estimate undiscounted average annual cost £0.003m

- 7.66. As a public authority and operator, the MoD is required under the MCAA to carry out its functions and activities in a way that will further, or least hinder, the conservation objectives of MCZs. To assist in meeting its environmental obligations, the MoD has developed a Maritime Environmental Sustainability Appraisal Tool (MESAT). This will include operational guidance to reduce significant impacts of military activities on MCZs. For the purposes of the IA, the same assumptions as per previous tranches apply. For example, it is assumed that the MoD will incur additional costs in adjusting MESAT and other MoD environmental assessment tools in order to consider whether its activities will impact on the conservation objectives of MCZs (MoD, pers. comm. 2011). It will also incur additional costs in adjusting electronic charts to include new MCZs as described in Annex D.

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<sup>52</sup> <https://www.gov.uk/government/publications/marine-conservation-zones-mczs-and-marine-licensing>

<sup>53</sup> Annex H14 Approach for assessing impacts on flood and coastal erosion risk management (coastal defence), <http://publications.naturalengland.org.uk/publication/1940011>



- 7.67. These costs were calculated on the basis of the MCZ network as a whole, and for the 1st and 2nd tranche IAs they were scaled down to the proportion of sites included in each tranche. The same approach was taken for the 3rd tranche. This methodology was agreed with the MoD and updated costs for officers' time were provided during the pre-consultation period (pers. comm. 2017).
- 7.68. During consultation, no issues were raised concerning the estimation of costs to national defence. Therefore, the same assumptions have been applied as pre-consultation and costs have not changed, bar uprating to 2016 prices.

**Management Implementation, Enforcement and Surveillance - Best estimate undiscounted average annual cost £1.658m**

- 7.69. Cost estimates are provided for implementing and enforcing management measures (when known) for tranche 3 sites where it is assumed that recreational or fishing activity requires additional management. Depending on the distance of the MCZ from the coastline, the responsibility to implement and enforce management measures falls to either the IFCAs or the MMO. For sites up to 6nm from the coastline, the IFCAs are responsible for managing fishing activity and the MMO are responsible for managing recreational activity. For sites beyond 6nm, the MMO are responsible for the implementation and enforcement of all management measures.
- 7.70. For the 3rd tranche sites, likely management scenarios have been updated following advice from the SNCBs and management cost assumptions have been updated following engagement with the MMO and IFCAs during the pre-consultation period (pers. comm. 2017).
- 7.71. Following correspondence with the MMO (pers. comm. 2018), the cost of Royal Navy inspections has been raised from £750-£1000 to £2,116. Best, low and high estimates have been updated to reflect this.
- 7.72. After consideration of the above, the best estimate undiscounted average annual cost for management has risen from £1.598m pre-consultation to £1.658m post-consultation. Note that the pre-consultation figure has been uprated to 2016 prices and therefore differs from the pre-consultation IA.

**Ecological Surveys – Best estimate undiscounted average annual cost £2.460m**

- 7.73. Once designated, the Secretary of State has a duty to report to Parliament every six years on the extent to which the conservation objectives for each MCZ have been achieved, and the extent to which the MPA network as a whole contributes to the conservation and/or improvement of the UK marine environment. To accomplish this, the SNCBs may be required to carry out ecological surveys of sites to monitor feature condition. For the 3rd tranche designations, Natural England has supplied costs for inshore sites (up to 12nm) and JNCC has provided costs for offshore sites (beyond 12nm) (pers. comm. 2018). These costs have been applied as appropriate and more information is provided in Annex D.
- 7.74. During consultation, no issues were raised concerning the estimation of costs for ecological surveys. Therefore, the same assumptions have been applied as pre-consultation and costs have not changed, bar uprating to 2016 prices.

## Anticipated costs to human activities that will be impacted by the 3rd tranche of MCZ designations

Table 2 summarises the present value costs and average annual costs for each sector. More details, including an annual breakdown of costs, totals and present values can be found in Annex D.

**Table 2: Present value costs and average annual undiscounted costs<sup>54</sup> of the 3rd tranche of MCZs**

Private Sector	Methodology, assumptions and sources	Best estimate scenario costs	Low / High cost scenarios
Aggregate extraction	<ul style="list-style-type: none"> <li>- Aggregate extraction activity in or near proposed MCZs was mapped.</li> <li>- Licence applications within 0.6 miles (1 km) of an MCZ incur addition cost to assess potential impact of activity.</li> <li>- During the Regional MCZ Project in 2011, consultation with industry and the British Marine Aggregates Producers Association (BMAPA) provided an estimate of the additional cost per licence application. This cost is for assessing the impact on MCZ features, as required by the BMAPA biodiversity action plan. The estimate was determined from the expected additional consultancy fees (external costs) and developer time (internal cost, including overheads). Updated to 2016 prices the additional cost per licence application is estimated to be £0.028m.</li> <li>- The Crown Estate (pers. comm. 2017) and BMAPA (pers. comm. 2017) advised when existing licences are likely to be renewed and the expected number of licence applications in strategic resource areas over the 20-year IA period.</li> </ul>	<p><b>PV: £0.074m</b>  <b>Annual average: £0.006m/yr</b></p> <p>There is expected to be 4 licence applications within existing marine aggregate option or production areas during the 20-year IA time period (at an additional one-off cost of £0.028m for each application). Each licence is renewed after 15 years.</p>	<p><b>PV: £0.074m – £0.114m</b>  <b>Annual average: £0.006m/yr - £0.007m/yr</b></p> <p>Sensitivity takes into account the number of licence applications.  <b>Low and best estimate:</b> Additional one-off cost to operators for future licence / licence renewal applications for existing production and option licence areas within 0.6 miles (1 km) of an MCZ. Costs are specific to individual MCZs.  <b>High Estimate:</b> Additional one-off cost to operators for future licence applications in strategic resource areas that overlap or are in close proximity to MCZ sites. These costs are not specific to particular MCZs as the costs are attributed to the MCZ network and scaled down to represent the cost of the 3rd tranche.</p>

<sup>54</sup> These costs are additional to the baseline (i.e. attributable to MCZs) and represent full financial costs (includes wages, overheads and NI) averaged over 20 years. Figures include transitional and annual costs. Annex D contains more detail on sector and site specific costs.

Aquaculture	<ul style="list-style-type: none"> <li>- Aquaculture activity in and near each proposed MCZ was mapped during the Regional MCZ Project process and updated during local pre-consultation engagement.</li> <li>- Scenarios were identified for each MCZ that make assumptions about the management that may be required to achieve the conservation objectives of the protected features.</li> <li>- Aquaculture may need to be managed at one site (Dart Estuary). It was established that the remaining sites do not have aquaculture activity in close proximity or would have no impact on the protected features.</li> </ul>	<p><b>No extra costs quantified</b></p> <p>Following previous and informal consultation, it was not possible to anticipate the future impacts and consequently the management required; adaptive risk management would be required based on site-specific situations. Additionally as only one site may require management, the potential costs are expected to be small.</p>	N/A
<b>Private sector</b>	<b>Methodology, assumptions and sources</b>	<b>Best estimate scenario costs</b>	<b>Low / High cost scenarios</b>
Cables	<ul style="list-style-type: none"> <li>- Existing cables and known future cable routes were mapped.</li> <li>- It is assumed there will be an additional cost to operators for assessing impacts of future cable installation on broad scale habitats protected by an MCZ.</li> <li>- 7.24. The specific locations of all future cable routes are not known, the number of potential licence applications was calculated for all MCZs and scaled down proportionally for the sites in this tranche.</li> <li>- Increased cost to operators for the additional assessment of environmental impact upon MCZ features (broad scale habitats only) was estimated to be £10,561 per licence application for one future cable installation, based on cost estimates provided by industry.</li> </ul>	<p><b>PV: £0.030m</b> <b>Annual average: £0.002m/yr</b></p> <p>4 new licence applications in each of the years 2022, 2027, 2032 and 2037 (total 16 licences over 20 years) for the 99 inshore sites initially proposed by the Regional MCZ Project process. This was scaled down proportionally for the inshore sites recommended for designation in this IA (including those which are partially within 12nm). Existing or operational cables will not be impacted upon by MCZs.</p>	<p><b>PV: £0.015m – £0.045m</b> <b>Annual average: £0.001m/yr - £0.003m/yr</b></p> <p>Sensitivity around the number of licence applications over 20 years <b>Low cost scenario:</b> 2 licence applications in each year of 2022, 2027, 2032 and 2037 (total of 8 licences over 20 years) for 99 sites, This was scaled down for the sites to be designated resulting in costs of £0.004m in each of the above mentioned years. <b>High cost scenario:</b> 6 licence applications each year of 2022, 2027, 2032 and 2037 (total of 24 licences over 20 years).</p>

Coastal Development	<ul style="list-style-type: none"> <li>- Known coastal developments were mapped for each MCZ and assessed for potential impact on conservation objectives.</li> <li>- No impacts or mitigation are anticipated as these are monetised elsewhere (e.g. ports and harbours).</li> </ul>	<p><b>Costs monetised elsewhere</b></p> <p>Competent authorities were not in the position to estimate the types and number of future licence applications. Additionally, costs associated with some developments are covered under sector-specific costs such as ports and harbours and renewables. It is therefore expected that costs of other coastal development activities will be small.</p>	N/A
Commercial Fisheries (UK)	<ul style="list-style-type: none"> <li>- Estimates of fishing activity in each MCZ uses methodology from the MCZ fisheries model.</li> <li>- Value of landing information provided by VMS data for over 15m vessels (2013-2017 data) and IFCA and MMO inshore sightings data for under 15m vessels (2010 -2014 data).</li> <li>- Costs are due to management of some fishing activities. Gear types affected and management required are specific to the site and the feature which the MCZ is designated to protect. Management scenarios for each MCZ are summarised in Annex A.</li> <li>- Costs are measured as loss in GVA, i.e. the value of landings associated with the relevant area of fishing grounds, minus costs associated with these landings. This is not directly comparable to revenue lost.</li> <li>- The default of 75% displacement (and 25% loss) of fishing activity is based on low overlap of the MCZs with core fishing grounds.</li> </ul>	<p><b>PV: £1.681m</b> <b>Annual average: £0.114m/yr</b></p> <p>The best estimate for each gear type is either the mid-point of the high and low management scenarios for each site for 'mobile' gears (assumed bottom trawls and dredges) or 25% of the range of management scenarios for 'static' gears (pots &amp; traps, nets, hooks and lines) (detailed in Annex A). This is based on the assumption that static gears are less likely to face the most stringent management option for sites because their impact on the features proposed for designation are generally less than bottom-abrading mobile gears.</p>	<p><b>PV: £0.000m - £14.087m</b> <b>Annual average: £0.000m/yr - £0.958m/yr</b></p> <p>Sensitivity takes into account a range of management scenarios and displacement assumptions included: <b>Low cost scenario:</b> Lowest potential management scenario. <b>High cost scenario:</b> Numerous displacement percentages were considered. The highest potential management scenario, with no displacement of fishing to other areas, <i>i.e. 100% of overlapping fishing GVA is lost</i></p>

Private sector	Methodology, assumptions and sources	Best estimate scenario costs	Low / High cost scenarios
Heritage Assets	<ul style="list-style-type: none"> <li>- During previous tranches, archaeological data was sourced from numerous locations including consultation responses, provided locations of currently designated sites and recorded finds.</li> <li>- Archaeological surface recovery of artefacts and full site excavations will be prohibited in MCZs with exposed peat and clay beds with a recover conservation objective.</li> <li>- Diver trails, visitors and non-intrusive surveys will be unaffected in MCZs.</li> <li>- Vessels can no longer anchor over sensitive features such as seagrass beds.</li> </ul>	<p><b>No extra costs quantified</b></p> <p>No information about future licence applications or suitable historical data with which to forecast future activities was obtained during pre-consultation or formal consultation.</p>	N/A
Oil & Gas & other energy (including Carbon Capture and Storage (CCS) at sea)	<ul style="list-style-type: none"> <li>- Current activity was mapped (including 26<sup>th</sup>, 27<sup>th</sup>, 28<sup>th</sup>, 29<sup>th</sup>, 30<sup>th</sup> and 31<sup>st</sup> rounds) and potential future oil &amp; gas developments have been assessed in each MCZ project area.</li> <li>- It is assumed there will be additional costs for licence applications due to the additional assessment of environmental impacts. The costs derive from increased developer time (internal costs, including overheads) and external costs required to complete the assessment.</li> <li>- Estimates of additional costs were provided by industry representatives during the Regional MCZ Project process in 2011, and have been updated to 2016 prices. At the discretion of industry the costs comprise a combination of external consultant costs and internal time.</li> <li>- Costs are calculated based on the 127 Regional Project MCZs and scaled down to</li> </ul>	<p><b>PV: £2.105m</b> <b>Annual average: £0.140m/yr</b></p> <p>Costs are based on additional application costs for different phases in oil, gas and CCS developments and the number of such activities likely to be affected by sites in the 3rd tranche.</p>	<p><b>PV: £1.565m – £2.518m</b> <b>Annual average: £0.105m/yr - £0.166m/yr</b></p> <p>Sensitivity around the number of future licence applications.</p> <p><b>Low cost scenario:</b> Calculated using an estimate of the total number of future licence applications in blocks in the 26th round with a ‘significant discovery’ or ‘fallow block with discovery’ that is 25% lower than that used for the best estimate. For the remaining blocks, the total number of future licence applications is assumed to be 50% less than the number used to calculate the best estimate.</p> <p><b>High cost scenario:</b> Calculated</p>

	account only for the 3 <sup>rd</sup> tranche.		using an estimate of the total number of future licence applications in blocks in the 26th round with a 'significant discovery' or 'fallow block with discovery' that is 25% higher than that used for the best estimate. For the remaining blocks, the total number of future licence applications is assumed to be 50% higher than the number used to calculate the best estimate.
Ports, Harbours, Commercial Shipping and Disposal Sites	<ul style="list-style-type: none"> <li>- Current activity was mapped (i.e. ports, harbours, disposal sites and navigational dredges).</li> <li>- Additional one-off cost will be incurred for future licence applications for ports development, disposal sites and navigational dredging</li> <li>- The crown estate for previous tranches (pers. comm. 2011) identified the navigational dredging areas within 3.1 miles (5 km) of an MCZ, as well as updated information during the formal consultation period (pers. comm. 2018). Licences for each area is assumed to require renewal once every three years from the first year of the IA. This information still applies.</li> <li>- Future port developments and disposal site licence applications are derived the number of past applications</li> <li>- Unit cost estimates were provided by industry. This includes external costs for consultants (based on the two estimates from two UK environmental consultancy firms).</li> <li>- Consultation with SNCBs has not identified</li> </ul>	<p><b>PV: £1.746m</b>  <b>Annual average: £0.117m/yr</b></p> <p>The best estimate is the mid-point of the two low cost scenarios</p>	<p><b>PV: £1.702m – £5.843m</b>  <b>Annual average: £0.114m/yr - £0.396m/yr</b></p> <p>Sensitivity around disposal sites application numbers, the assessment cost per future licence application and the number of marine dredging protocols (MDPs).</p> <p><b>Low cost scenario: <u>Cost for disposal site applications is based on number of applicants</u></b>, as individual applicants will incur a maximum of one additional cost per calendar year, irrespective of the number of applications made. This scenario assumes that 36 MDPs are in place in England and that MDPs will be used in support of 55% of future navigational dredging licence applications, whilst the remaining 45% will not be supported by MDPs. The lowest cost per licence application is used.</p>

	<p>any mitigation requirements relevant to the Ports and Harbour sector</p> <ul style="list-style-type: none"> <li>- Four scenarios were developed, two are low cost which use the lowest unit cost estimates and assume that each dredging applicant will incur one cost per year regardless of the number of licence applications made, whilst the other two are high cost as they consider a higher unit cost and assume each application will incur a cost. The two scenarios in each group are differentiated by the number of MDPs<sup>55</sup> in place and the percentage of navigational dredging applications that are supported by an MDP.</li> <li>- MDPs potentially present cost savings, hence the low cost scenario is the scenario in the low cost group, which assumes a higher number of MDPs and the high cost scenario is the scenario in the high cost group that assumes the lower number of MDPs</li> </ul>		<p><b>High cost scenario: <u>Costs for disposal site applications is based on number of applications</u> rather than applicants. This scenario assumes that 12 MDPs are in place in England and that MDPs will be used in support of 30% of future navigational dredging licence applications, whilst the remaining 70% will not be supported by MDPs. The highest cost per licence application is used.</b></p>
Recreation	<ul style="list-style-type: none"> <li>- Recreational activity in and near each MCZ was mapped as part of the Regional MCZ Project process and updated through local engagement during pre-consultation, alongside vulnerability assessments<sup>56</sup> of the sensitivity of features to the activities taking place.</li> <li>- Anchoring and mooring need to be managed</li> </ul>	<p><b>PV: £4.236m</b>  <b>Annual average: £0.287m/yr</b></p> <p>The best estimate of the impact is taken as the average of the lowest and highest cost scenarios</p>	<p><b>PV: £0.410m – £18.682m</b>  <b>Annual average: £0.026m/yr - £1.270m/yr</b></p> <p>A range of management scenarios have been developed and they depend on the issue under consideration.</p>

<sup>55</sup> A Maintenance Dredging Protocol (MDP) comprises a baseline document that describes all current maintenance dredging and establishes a baseline against which new applications are assessed in the context of the Habitats Directive (JNCC and Natural England, 2011a). MDPs potentially present cost savings to the ports and harbour sector in the longer term as they are able to undertake the assessment of environmental impact for a number of future licence applications for navigational maintenance dredges using the same baseline data. See method paper H12 <http://publications.naturalengland.org.uk/publication/1940011> for information on MDPs.

<sup>56</sup> A vulnerability assessment takes into account information on certain activities in an area (e.g. fishing and recreational activity) alongside best available science on the sensitivity of features to activities. Stakeholders were given the chance to amend assumptions based on local knowledge.

	<p>at two sites (Studland Bay and Bembridge) due to the presence of features that need to recover as per SNBC advice. Anchoring and mooring may be subject to a voluntary code of conduct at Cumbria Coast, however this has not been quantified. See Annex A for management scenarios for sites.</p> <ul style="list-style-type: none"> <li>- The costs incurred by the chartered vessels sector as a result of black sea bream protection at Poole Rocks, Purbeck Coast and Southbourne Rough MCZs has been included. Further details are given in Annex D.</li> </ul>		
<b>Private sector</b>	<b>Methodology, assumptions and sources</b>	<b>Best estimate scenario costs</b>	<b>Low / High cost scenarios</b>
Renewable Energy	<ul style="list-style-type: none"> <li>- Costs apply to all renewable energy developers seeking planning consent for renewable energy proposals in English waters 'near to' MCZs (defined as within 0.6 miles [1 km] of the MCZ boundary). The additional cost is to assess potential impact of activity.</li> <li>- The Crown Estate and MMO provided information on potential future developments within the next 20 years</li> <li>- The 3rd tranche of MCZs includes sites which overlap or are in proximity to yet-to-be consented wave and tidal marine renewable energy developments. No yet-to-be consented wind developments were identified to be within 0.6 miles (1 km) of the tranche 3 sites.</li> </ul>	<p><b>PV: £0.0.074m</b>  <b>Annual average: £0.005m/yr</b></p> <p>The best estimate is costs to wind, wave and tidal developments for additional EIA costs during licence applications.</p>	<p>No sensitivity</p> <p>A high cost scenario was considered, which would include any additional one-off costs that arise from mitigating the impact of future renewable energy cables. However Crown Estate data (pers. comm. 2016) did not identify any yet to be consented renewable energy cables to pass through the proposed MCZs. Advice during the formal consultation (pers. comm. 2018) referred to new developments, however this did not affect our assumptions as the new developments were in line with agreed predictions as to the rate of future development. Therefore there</p>



			is no sensitivity range on these costs.
		<b>Total Business PV costs : £9.946m Total annual average business costs: £0.671m</b>	<b>Total business PV costs: £3.840m - £41.364m Total annual average business costs: £0.257m - £2.804m</b>
<b>Public Sector</b>	<b>Methodology, assumptions and sources</b>	<b>Best estimate scenario</b>	<b>Low / High cost scenarios</b>
Flood and coastal erosion risk management	<ul style="list-style-type: none"> <li>- MCZs were assessed in relation to proposals in Shoreline Management Plans (SMPs).</li> <li>- No costs have been identified as a result of the sites to be designated in the 3rd tranche for monitoring, additional assessment costs or mitigation of activities. This has been confirmed by the Environment Agency.</li> <li>- In the unlikely event that costs do arise, monetisation was not possible due to uncertainty regarding the number of licence applications, plus costs are likely to be low due to expectations of only minor mitigation activities.</li> </ul>	<b>No extra costs quantified</b>	<b>N/A</b>
National Defence	<ul style="list-style-type: none"> <li>- National Defence activity in and near to all proposed MCZs was assessed.</li> <li>- Costs provided by MoD (pers. comm. 2017).</li> <li>- Anticipated costs are calculated for the full network of MCZs and scaled down to represent the 3<sup>rd</sup> tranche.</li> <li>- Costs are generic and may differ depending on the scale and nature of the military activities in each MCZ.</li> </ul>	<b>PV: £0.050m Annual average: £0.003m/yr</b>  One-off cost of adjusting electronic tools and charts (£0.026m) and annual costs of maintaining (to ensure that MCZs are featured in planning for operations/ training) of £0.012m/yr in the first 4 years, reducing to £0.006m/yr for years 5-20 of IA period	<b>N/A</b>

Management and enforcement of MCZs	<ul style="list-style-type: none"> <li>- Additional costs account for the implementation (e.g. byelaws, voluntary agreements) and enforcement of the indicative fisheries and recreation management scenarios outlined in Annex A.</li> <li>- Depending on the distance of the MCZ from the coastline, the responsibility to implement and enforce the management of these activities falls to one of three public authority: the MMO, IFCAs and Defra</li> <li>- Cost estimates were provided by IFCAs, MMO and Defra.</li> <li>- Estimates don't take account of possible cost savings of introducing one management measure that covers multiple MCZs or risk-based prioritisation of monitoring.</li> </ul>	<p><b>PV: £24.453m</b>  <b>Annual average: £1.658m/yr</b></p> <p>Best estimate is the midpoint of the high and low cost scenarios.</p>	<p><b>PV: £20.188m – £28.719m</b>  <b>Annual average: £1.370m/yr - £1.946m/yr</b></p> <p>Sensitivity around management.  <b>Low cost scenario:</b> Covers both non-regulatory and regulatory management measures.  <b>High cost scenario:</b> Covers only regulatory management measures. Both assume that only regulatory measures will be implemented in MCZs outside 6nm for commercial fisheries. This is because it is assumed it is impractical to implement non-regulatory measures such as voluntary agreements outside these limits</p>
Ecological Surveys	<ul style="list-style-type: none"> <li>- Annual costs for ecological surveys for baseline surveys and monitoring only.</li> <li>- Costs for offshore sites are based on similar surveys and provided by JNCC.</li> <li>- Costs for inshore sites are based on cost estimates provided by Natural England and applied to the number of features in each site.</li> </ul>	<p><b>PV: £36.175m</b>  <b>Annual average: £2.460m/yr</b></p>	<p>No sensitivity.</p> <p>Following investigation by Natural England of the spatial overlaps of MCZs and SACs it has been agreed to remove the previous assumption that a 50% overlap of designation types would incur a 50% cost saving.</p>
		<p><b>Total public PV costs: £60.681m</b>  <b>Total average annual public costs: £4.121m</b></p>	<p><b>Total public PV costs: £56.416m - £64.946m</b>  <b>Total average annual public costs: £3.833m - £4.409m</b></p>
<b>Non-UK</b>	<b>Methodology and sources</b>	<b>Best estimate scenario</b>	<b>Low / High cost scenarios</b>
Non-UK	- Figures for non-UK vessels were gathered	N/A	N/A

commercial fisheries vessels	during pre-consultation with all relevant member states. <ul style="list-style-type: none"><li>- These costs are not included in the summary figures or the EANCB calculation, but informed decisions on site selection.</li><li>- Sites with unknown, potentially high costs to non-UK vessels have been excluded from the preferred option. See Annex E for discussion and site specific details.</li></ul>		
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## Costs to Business (Equivalent Annual Direct Net Costs Business)

- 7.75. Costs to business have been calculated in line with the Better Regulation Framework<sup>57</sup>. These are calculated as full economic costs. Figures have been provided directly by industry during the two years of informal consultation as part of the Regional MCZ Projects process, during the tranche 3 pre-consultation period, and during formal consultation. When necessary figures from the previous tranches' consultations were considered and updated to 2016 prices. External costs (i.e. costs for additional consultant time) use the mid-point of a range of quotes from UK consultancy firms. Internal costs have been provided by industry themselves and calculated in line with the HMT Green Book and Standard Cost Model methodology, i.e. they incorporate wage costs as well as overheads plus national insurance. Some figures are not split into external and internal costs, but the full figure was provided at the discretion of industry or validated by industry, incorporating full costs. Details of assumptions, actual calculations of unit costs and the time profile of costs used are given in Annex D.
- 7.76. Assumptions had to be made on e.g. the number of licence applications and likely mitigation. This was verified with industry representatives on a case-by-case basis. This uncertainty is also tested in the sensitivity analysis, as described in Table 2. Depending on the sector, the site and the likelihood of mitigation, the best estimate is either the low cost scenario, high cost, or a weighted average of low and high cost scenarios. This has been agreed with industry for each sector and is described in Table 2.
- 7.77. These figures are illustrative only, based on potential scenarios of costs. Decisions on the actual management (and resulting costs) will be taken on a site-by-site basis by the MMO and IFCA's, including consultation with stakeholders and if required an associated regulatory IA. The costs presented provide a best estimate of what these costs may be.
- 7.78. Within the baseline option it is assumed that existing government policies and commitments related to the marine environment are fully implemented and achieve their desired goals. Particularly significant are commitments to implementation of the Environmental Impact Assessment Directive and the Water Framework Directive (or equivalent national regulations). In light of this, the IA assumes that no mitigation of impacts of water abstraction, discharge or diffuse pollutions is required over and above that which will be provided to achieve the objectives of the Water Framework Directive (or equivalent national regulations) through the River Basin Management Plan process.

**The figures result in an EANDCB of 0.7m/yr (2016 prices /2019 present value year). The PV cost to industry is £9.75m discounted over 20 years (PV base year 2019). The benefits have not been monetised other than indicatively so this only reflects costs.**

### Risks, sensitivities and limitations of costs methodology

- 7.79. The sectoral approach adopted makes it difficult to make links between sectors, which may mean that benefits (and reduction in costs) of co-location are missed, or potential additive impacts are not quantified. This is likely to be an issue for a very small number of sites only and has been discussed at a site-level, with no adjustment in cost data due to uncertainty.
- 7.80. For many sectors, including oil & gas, national defence, and aspects of renewable energy, some of the assumptions for this IA cannot be site-specific, because in most circumstances it is not yet known where future developments will be or what they will

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<sup>57</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/735587/better-regulation-framework-guidance-2018.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/735587/better-regulation-framework-guidance-2018.pdf)

comprise. Assumptions and results of sensitivity analyses have been taken at a regional level and verified with relevant industry representatives<sup>58</sup>.

- 7.81. There is still some uncertainty around the displacement of fishing activity assumption. The full range of possibilities is tested through sensitivity analysis, with a high cost scenario reflecting no displacement (i.e. all catch in the area is lost). The assumptions were validated during previous tranches as well as during pre-consultation and formal consultation with no objections providing robust evidence causing existing assumptions to be questioned; therefore they have been applied for the 3rd tranche.

## **Small and Micro Business Impact Assessment**

- 7.82. The sectors which will be directly managed as a result of the designation of MCZs are fisheries and potentially recreation through restrictions on anchoring and mooring over sensitive features. These sectors are made up almost entirely of small and micro businesses as they are generally individual boat owners with no or small crews and local yacht and sailing clubs.
- 7.83. The recreational sector may face restrictions at six sites: Cumbria Coast, Studland Bay, Bembridge, Poole Rocks, Purbeck Coast and Southbourne Rough. While some recreation businesses may own multiple boats, it is prudent to assume that all businesses in this sector are small and micro for the purposes of the IA. Management scenarios have been developed for these sites based on advice derived in consultation with the MMO, the Royal Yachting Association (RYA) and Natural England, and these are provided in Annex A. The costs incurred by the chartered vessels sector as a result of black sea bream protection at Poole Rocks, Purbeck Coast and Southbourne Rough MCZs have been included. Further details are given in Annex D. It is not appropriate to exclude these businesses from management measures, as by doing so it would not be possible to achieve the conservation objectives of the proposed sites.
- 7.84. The UK commercial fishing sector will face restrictions at a number of sites. While some fishing businesses may own multiple boats, it is prudent to assume that all businesses in this sector are small and micro for the purposes of the IA. Therefore the best estimate cost of £0.114m/yr to UK commercial fisheries is assumed to fall entirely on small and micro businesses. It is not appropriate to exclude these businesses from management measures, as by doing so it would not be possible to achieve the conservation objectives of the tranche 3 sites.
- 7.85. In 2017, the UK fishing fleet had 6,148 vessels and employed 11,692 fishermen (MMO 2017<sup>59</sup>). Statistics are provided on a devolved administration basis but in reality Scottish vessels will fish English inshore and English, Welsh and Northern Irish offshore waters and vice versa so all these vessels are potentially in scope. UK vessels landed 708 thousand tonnes of sea fish (including shellfish) into the UK and abroad with a value of £775 million in 2015 (MMO 2017).
- 7.86. Other sectors incurring additional costs to assess the impacts of their licensed activities on the conservation objectives of sites, are covered by existing licensing legislation. This legislation already contains its own exemptions and thresholds for different sized businesses and projects, which should limit the impacts on small and micro businesses. The main licensable sectors impacted, oil & gas and ports and harbours, are made up of

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<sup>58</sup> It has not been possible to publish all anticipated additional costs to specific MCZs (across all sectors) and developments in the IA because of the commercial sensitivity of some of the data. Such information has been aggregated and presented in the IA. It has not been possible to verify cost estimates provided by industry.

<sup>59</sup> UK sea fisheries annual statistics report 2017: <https://www.gov.uk/government/statistics/uk-sea-fisheries-annual-statistics-report-2017>

larger businesses with significant contributions to UK GDP; consequently, impacts would be insignificant in relation to their scale. The additional analysis which is attributable to the designation of MCZs in the 3rd tranche is minimal compared to the analysis that would be required in the baseline anyway. No developments relating to the likely additional costs of licensing have been identified which would require mitigation.

## 8. Benefits under the baseline and preferred option

- 8.1. The marine environment provides us with many benefits, such as food in terms of wild and farmed fish and shellfish, and gives millions of people the chance to enjoy sailing, angling, watching birds and other wildlife and provides environmental resilience. These can be described as 'Ecosystem Service' benefits. Ecosystem services are defined as services provided by the natural environment that benefit people (Defra 2007), several of which can be considered public goods as discussed in Section 4.3. The UK National Ecosystem Assessment Follow-on study (NEAFO 2014) has underlined the value of the marine environment and benefits derived from its ecosystem services. The NEAFO recognised both the need to take proper account of the benefits of marine conservation measures in decision making but also the challenges and lack of economic evidence currently available for doing so.
- 8.2. More recently, Hanley and Torres (2016) carried out an extensive literature review on the economic valuation of coastal and marine ecosystem services. However, despite the increasing number of studies investigating the economic value of environmental protection, there is a lack of robust evidence on the economic benefits of MCZs specifically. This is due to the fact that the positive effects generated by the measures adopted are not likely to be fully realised for many years. Moreover, such studies are often subject to a number of limitations that means they cannot be directly compared with the quantification of costs. As such, this section contains illustrative benefits from the designation of tranche 3 MCZs using the latest available literature, most notably the Kenter et al. study (2013) described in Annex B.
- 8.3. The ecosystem services that may be provided by the marine environment (and MCZ features) have been assessed under the categories set out in Table 3 based on those in NEAFO work package 4 (figure 4.S.2 p.3)<sup>60</sup>.

<b>Table 3: Marine goods and benefits considered within the NEAFO study<sup>61</sup></b>	
<b>General marine ecosystem service categorisation</b>	<b>Final goods/benefits considered for marine ecosystem</b>
Provisioning	Food (wild, farmed) Fish feed (wild, farmed, bait) Fertiliser and biofuels Ornaments and aquaria Medicines and blue biotechnology
Regulating	Healthy Climate Prevention of Coastal Erosion Sea Defence Waste burial / removal / neutralisation

<sup>60</sup> <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=KLy76Rak0WQ%3d&tabid=82>

<sup>61</sup> Adapted from the conceptual framework UK, NEA 2011

Cultural	Tourism and nature watching Spiritual and cultural well-being Aesthetic benefits Education and research Health benefits
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## Benefits under baseline

8.4. Section 6.3 above states that in the baseline option features are assumed to continue in their 'favourable' or 'unfavourable' condition over the 20-year period (i.e. their condition will not deteriorate). This is required due to uncertainty around future changes in human activities resulting in future changes to feature condition. In the IA we therefore assume that there will be no significant change in benefit levels (or ecosystem services) under the baseline, i.e. we adopt a conservative approach by assuming a static baseline rather than a declining baseline where the feature condition continues to deteriorate leading to lower ecosystem service in the absence of MCZs being designated. Table 4 below shows some of the existing benefits of the UK marine environment using the ecosystem services framework. While not all of these benefits are specific to the 3rd tranche MCZs, they help illustrate the substantial benefits people derive from the marine environment.

<b>Table 4: Existing benefits of the UK marine environment (estimates are for the UK marine environment rather than specific to MCZs)</b>		
Provisioning	Food (wild, farmed) Fish feed (wild, farmed, bait) Fertiliser and biofuels Ornaments and aquaria Medicines and blue biotechnology	In 2014, the GVA of fishing, including aquaculture, was £1.4bn. <sup>62</sup>
Regulating	Prevention of coastal erosion and sea defence  Healthy climate  Waste burial / removal / neutralisation	£1.5bn/yr total value of storm buffering and flood control (meta-analysis) <sup>63</sup> ; £300m 2004 value, avoidance cost of building flood control measures) <sup>64</sup>  £0.4-8.47bn yr 2002 values, avoidance cost; £6.74bn/yr marine carbon-sequestration 2004 value, avoidance cost <sup>65</sup>  Beaumont et al (2008) and Clarkson (2002) identifies the economic value of regulating services to the UK at £420m to £8.5bn.
Cultural	Tourism and	Between March 2015 and February 2016, 322m

<sup>62</sup> ONS ABS - ONS Annual Business Survey  
<https://www.ons.gov.uk/businessindustryandtrade/business/businessservices/methodologies/annualbusinesssurveyabs>

<sup>63</sup> UK National Ecosystem Assessment, 2011 from Fletcher et al (2012a). Total value of service assuming it is present in all UK coastal wetland.

<sup>64</sup> Beaumont et al., 2008

<sup>65</sup> UK National ecosystem assessment (2011) and Beaumont et al. (2006), from Fletcher et al (2012a)

	<p>nature watching</p> <p>Education and research</p> <p>Spiritual and cultural well-being</p> <p>Aesthetic benefits</p> <p>Health benefits</p>	<p>leisure visits were made to seaside/coastal areas in England<sup>66</sup>. In 2015, 12.4m UK adults participated in water sports and other water-based leisure activities, including boating, sea angling and coastal walking.<sup>67</sup> Willingness to pay for access to RSPB coastal reserves with visitors centres, a proxy for access to an MPA, is estimated at £9.18 per visit. Increased levels of wildlife biodiversity raised WTP to £9.71 per visit. This suggests there are economic benefits from the provision of educational infrastructure and of management measures to raise wildlife biodiversity (Paltriguera et al., 2018).</p> <p>An Oxford Economics (2013) report valued Marine Science and Marine Technical Consultancy in 2011 at £0.3bn and £0.5bn GVA respectively<sup>68</sup>.</p> <p>Work package 4 of the NEAFO reviewed the literature on cultural ecosystem services and in 2012 prices derived willingness to pay figures per household in England of £75 per year to holt loss of biodiversity and ecosystem services on the coastal shelf (McVittie &amp; Moran 2010). This equates to £1.65bn if multiplied by the estimated 22m households in England in 2012.</p>
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## Benefits of the preferred option (option 1)

- 8.5. The designation of 41 MCZs and additional features from existing 1st and 2nd tranche sites will help to conserve and improve the range of biodiversity in UK waters as well as contribute to the productivity of the seas in the long term. A combined area of 7278 mi<sup>2</sup> will be protected by the designation of these 41 additional sites and 200 features will be conserved. Following designation, around 40% of English inshore and offshore waters will be protected, and the total for the UK as a whole will be almost 25%. These MCZ sites will complement other types of designation and will provide an essential component of the UK contribution to establishing an ecologically coherent network of MPAs. In the absence of MCZs, the full range of features present in the UK marine area would not be afforded protection.
- 8.6. MCZ designation brings benefits from:
- Flows of ecosystem services from specific features and habitats that MCZs will protect. Under the preferred option, only features that are in an unfavourable condition (and would continue to be unfavourable in the absence of MCZs) and have been assigned a 'Recover' GMA are considered to yield additional benefits<sup>69</sup>.

<sup>66</sup> Monitor of Engagement with the Natural Environment:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/614353/mene-headline-report-2015-16.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/614353/mene-headline-report-2015-16.pdf)

<sup>67</sup> Watersports and leisure participation survey 2015. <https://www.britishmarine.co.uk/Resources/Publications/2016/March/Watersports-Participation-2015-Full-Report>

<sup>68</sup> <http://www.oxfordeconomics.com/publication/open/239345>

<sup>69</sup> We understand that this will result in an underestimation of benefits as future damage to features currently in a favourable condition that may otherwise occur without the protection of the MCZs is not accounted for.



Similarly, some features are already protected by existing legislation and benefits from these features are not considered additional to MCZ designation unless they are offered a higher level of protection under MCZs.

- Cumulative ecosystem service benefits of an overall coherent network of protected areas, which these sites will contribute to alongside other designations.
- By including only the benefits stemming from the features that will improve in condition due to MCZ designation, i.e. those with a recover GMA, the IA provides a conservative benefits estimate. There will be benefits from protecting features in their current favourable state (i.e. with a GMA of maintain) as this will protect them from an increase in future activity. In the absence of information on the likelihood of changes in activities in these very specific MCZ locations, we opted for an approach that assumes a static baseline. Thus, the IA does not include an assessment of the benefits of preventing potential future degradation to those features.

8.7. The different types of ecosystem service benefits expected to improve due to the 3rd tranche of MCZs are assessed in detail in this section. Where possible, additional benefits from the 3rd tranche have been quantified (see Table 5). Relevant research has been used to further monetise some of these benefits, although due to technical uncertainty around the estimates these have largely been presented as illustrative only. See Annexes B and C for information on some of these studies.

8.8. There is limited evidence on economic benefits on the marine and coastal environment suitable for adapting for use in benefits evaluation, and this is acknowledged as a challenge in the literature<sup>70</sup>. This is due to both scientific uncertainty and the lack of traded markets for some of the benefits anticipated from MCZ designation. There are many factors which contribute to growth, hence it is difficult to attribute the growth and prosperity in sectors, such as recreation and tourism, to MCZ designation alone. Similarly, any observed increase in fisheries productivity (stock levels) would be difficult to attribute solely to MCZs due to the many contributing factors. Future evaluation of MCZs and research anticipated to stem from designation is likely to enhance our quantified evidence base in this area.

### **Benefits from designation of specific features and habitats in the 3rd tranche MCZs**

8.9. Improved condition of designated features will enhance quality and quantity of certain ecosystem services and possibly leading to higher socioeconomic benefits. Potts et al. (2014) have analysed the relationship between habitats and species protected and preserved by MCZs and their contribution to the provision of ecosystem services. More specifically, they carried out a review of peer-reviewed literature (including grey literature and expert deliberations) and created a matrix table through which the importance of each feature for which MCZs will be designated is assessed and ranked. The position of a feature in the rank is also determined by the ecosystem service provided (intermediate services and goods/benefits). The table presented in this paper has been considered during the pre-consultation phase and during consultation because it provides further evidence in support of the designation of features recommended in the 3rd tranche of designations.

8.10. As described in the baseline (in the absence of MCZ designation), a number of features already have some level of protection through existing lists of habitats and species and other types of protected area e.g. SACs and SPAs. Benefits from MCZs will therefore

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<sup>70</sup> Results from the National Ecosystem Assessment marine work package 4 state that there is a huge lack of valuation evidence (primary evidence) in this area.

flow from additional features that are offered protection under MCZ designation and that will receive an increased level of protection through this. MCZ features with a recover GMA are expected to improve to favourable condition and features with a maintain GMA are expected to remain in favourable condition under MCZ designation.

- 8.11. Table 5 below provides the list of ecosystem services benefits that are derived from the features to be protected in the 3rd tranche sites. Benefits from recreational services have been monetised for illustrative purposes only. The table also provides information on the confidence level associated with these estimates.

<b>Table 5: Ecosystem services benefits from the protection of MCZ features in the 3rd tranche sites</b>			
<b>Ecosystem service</b>	<b>Description</b>	<b>Quantification/monetisation (where possible)</b>	<b>Confidence level</b>
Non-use/bequest values	People derive benefits from protecting features of sites even if they do not actually use them. These so called non-use values can comprise: option value (the value of retaining the possibility of using a site in the future, including the value of avoiding irreversibility (c.f. Arrow & Fisher 1974; Farber, Costanza & Wilson 2002); bequest value (the value of securing the site for future generations) and existence value (the value of knowing that the site and its sea life is secured regardless of any other benefits).	Based on Willingness to Pay estimates derived from Kenter et al <sup>71</sup> ((see Annex C for more detailed information on the research methodology) the one-off non-use value of protecting the sites to divers and anglers alone is estimated at <b>£180m to £345m (Best estimate £262m)</b> to protect 30 of the designated sites.  Further explanation on the estimates is provided in Box 3, Annex C and Sections 8.10 to 8.14	Med - High confidence in existence of features High confidence that there will be a non-use benefit (welfare increase). Low confidence in the scale of the benefits
Research and education	MCZ research and monitoring will contribute to our understanding of marine ecosystems and potential beneficial uses of marine species. Improvement in knowledge will support more effective marine planning and licensing in UK waters. The scale of research benefit depends on the scale of additional information gathered and the ability of information to enable better decisions to be made in the marine environment. There are specific research gaps in the effectiveness of MPAs in temperate areas and the role of biodiversity in ensuring the resilience of ecosystem service provision, to which these MCZs could contribute. Shore-accessible MCZs are likely to benefit the greatest number of people for educational	No new economic evidence since tranche 2. Estuaries, rocky bottom and coral reefs are of particular interest to researchers but designation of all features (GMA set at recover or maintain) is likely to improve the understanding of these ecosystem services	Med - High confidence in existence of features; relatively high confidence that there will be a benefit to research and education due to these designations

<sup>71</sup> Kenter, et al (2013). The value of potential Marine Protected Areas in the UK to divers and sea anglers. UK National Ecosystem Assessment Follow-on.

	uses. Any educational benefits for visitors (including school groups) to MCZs or the coast nearby will depend on the quality of public education and interpretation material provided. MCZ designation may aid site managers in accessing funding to develop such material.		
Fish and shellfish for human consumption	Managing damaging activities and the resulting habitat and species recovery can lead to improvements in populations of fish and shellfish. There is fairly strong evidence <sup>72</sup> that MCZs could result in improvements in populations of less mobile species such as shellfish (including crustaceans). For mobile species, the scale of benefit depends on the reduction in fishing mortality and the scale of spill-over effect resulting from improved habitats and protection of nursery grounds.	No new economic evidence considered since tranche 2, therefore it has not been possible to estimate the benefits in monetary terms.  In this tranche, features designated that will support this service include: intertidal sediments, coastal saltmarshes, infralittoral rock, deep-sea bed and seagrass beds. All are relevant habitats for fish. <sup>73</sup>	High confidence in existence of features; fairly high confidence in impact on provisioning services for shellfish; very low confidence in impact on provisioning services
Natural hazard protection	Some habitats can provide natural hazard protection in the form of erosion control when the gradual loss of land is mitigated by coastal habitats, or in terms of sea defence services avoiding sea flooding and inundation (Turner 2013)	No new economic evidence considered since tranche 2. Mudflats and intertidal wetlands are habitats of high importance for natural hazard protection. Estuaries and coral reefs are also important. These will be protected in the 3rd tranche of MCZs. It is highly uncertain whether a change in the condition of features will impact the level of natural hazard protection.	High confidence in existence of features; low confidence in impact on regulating services.
Environmental resilience	Protecting a wide range of species and habitats can increase resilience to natural and human pressures. <sup>74</sup> By protecting and enhancing biodiversity, MCZs will help to ensure that natural and human pressures are	No new economic evidence considered since tranche 2. The full range of different features and habitats is important, especially those that are not protected by other designations, such as	High confidence in existence of features; medium confidence in impact on environmental

<sup>72</sup> Regional MCZ Project Methodology Documents Annex H5; Rees et al. (2016).

<sup>73</sup> Fletcher et al (2012a)

<sup>74</sup> (Hughes and others, 2005; Tilman, Reich and Knops, 2006; in Beaumont and others, 2008; Rees et al. 2016).

	<p>absorbed by the marine environment, reducing degradation, irreversible damage and potential cuts in all (final) marine ecosystem services. The greatest benefits of resilience come from replication and from protecting a wide range of species and habitats, many of which will respond differently to natural or human pressures. There is additional benefit in protecting these features when the marine environment outside of MCZs is under additional pressures. Major threats to marine ecosystems are anticipated as a result of climate change, including rising sea temperatures, rising sea levels, greater frequency of storms, increases in the occurrence of severe storm surges and changes in the timing of plankton production, composition and distribution<sup>75</sup>. See discussion in Section 8.17 below, of the anticipated overall benefits of an MCZ network.</p>	<p>broad scale habitats.</p>	<p>resilience.</p>
<p>Gas and climate regulation</p>	<p>Certain habitats are efficient sequesters of carbon and contribute to gas and climate regulation. Management of MCZs may reduce human pressures on these habitats that may result in a net increase in the rate of carbon sequestration.</p>	<p>No new economic evidence considered since tranche 2. The 3rd tranche includes a number of features that are particularly efficient sequesters of carbon: intertidal mud, coastal salt marshes and saline reed beds, deep-sea bed and seagrass beds.<sup>76</sup></p> <p>Studies have valued the carbon benefit of certain relevant habitats in their entirety, for example, Beaumont et al</p>	<p>High confidence in existence of features; medium confidence in impact on carbon sequestration.</p>

<sup>75</sup> OSPAR (2010)

<sup>76</sup> Fletcher et al (2012a).

		(2010) valued saltmarshes at £6,100-62,200/km/yr <sup>77</sup> . Andrews et al (2000) valued the carbon benefit of mudflat and salt marsh sediments at £12/ha/yr. However, MCZ designation will only change the quality of these habitats, rather than complete creation (or loss) of habitat. Carbon value relating to MCZ designation will therefore be lower for each of these habitats. Scientific evidence on the value of improving the condition of marine habitats is not available.	
Regulation of pollution (nutrient recycling )	MCZs also contribute to the regulation of pollution (nutrient recycling). To the extent that MCZs will contribute to healthier and more diverse ecosystems, they are anticipated to aid the environment's capacity to process waste and protect the regulating capacity of the marine environment.	No new economic evidence considered since tranche 2. Subtidal sediment habitats can act as pollution sinks, aided by the fauna resident within them. <sup>78</sup> Salt marshes and seagrass beds are thought to be particularly good regulators of pollution.	High confidence in existence of features; low confidence in impact on regulation of pollution.

<sup>77</sup> (DECC 2010 carbon price) Based on carbon sequestration rate of 0.64 - 2.19 tC/ha/yr (from Cannell et al. 1999), which is equivalent to 2.35 – 8.04 tonnes CO<sub>2</sub>; converted to km<sup>2</sup> for comparison with area of feature

<sup>78</sup> Beaumont and others, 2008; Fletcher and others, 2012a; Austen and others, 2011.

- 8.12. The evidence presented in Table 5 shows that many of the 3rd tranche features provide valuable ecosystem services, with resulting increases in human welfare, even though it has not been possible to fully quantify or monetise these benefits.
- 8.13. Some monetary values of MCZs have been estimated by Kenter et al (2013)<sup>79</sup>. This report investigated the recreational use and non-use values of UK divers and sea anglers for 22 Scottish potential Marine Protected Areas, 119 English recommended MCZs and 7 existing Welsh marine SACs using a combination of monetary and non-monetary valuation methods and an interactive mapping application to assess site visit numbers. The results are based on an online survey with 1683 divers and sea anglers run between December 2012 and January 2013.
- 8.14. The 3rd tranche of designations includes, along with the Regional MCZ Project sites, nine new sites in order to fill the remaining gaps in the network as well as sites to protect highly mobile species. These latter sites have not been included in the benefits calculations based on the Kenter et al. report, which only considered sites originally proposed for designation by Defra in 2011.

### **Box 3: Monetisation of recreational benefits**

#### **Use and Non-use values – Willingness to pay by divers and anglers to protect designated marine areas**

Cultural services that will be attributable to designation of sites have been assessed by a team of researchers from the University of Aberdeen in partnership with the Marine Conservation Society, British Sub Aqua Club (BSAC) and the Angling Trust (AT). Kenter et al carried out a case study on the value of marine protected areas to divers and anglers as part of the follow-on phase of the UK National Ecosystem Assessment, using a combination of primary valuation (online survey of anglers and divers) and benefits transfer, monetary (choice experiment and contingent valuation) and non-monetary valuation.

Based on their results per site (using contingent valuation method (CVM)), it is estimated that UK divers and anglers are willing to pay £180m to £345m (Best estimate £262m) one-off to protect 30 sites in 2016 prices. These estimates refer to non-use values obtained from the Kenter study but adjusted to the current 30 Regional MCZ Project sites. The authors state that their CVM design can be thought of as eliciting an insurance value. Donations requested from respondents can be thought of as a premium to pay for the avoidance of harm to environmental goods of value. They considered motivation for paying this premium to be associated with three sources of non-use value: option value (the value of retaining the possibility of using a site in the future, including the value of avoiding irreversibility of harm (c.f. Arrow & Fisher 1974; Farber, Costanza & Wilson 2002); bequest value (the value of securing the site for future generations) and existence value (the value of knowing that the site and its sea life is secured regardless of any other benefits

In addition, the study notes that MPAs would safeguard an annual recreational value currently worth £1.91 - 3.46 bn, adjusted to 2016 prices, for England alone (excluding benefits of restrictions on other users and contingent on designation not significantly

<sup>79</sup> Kenter et al (2013). The value of potential Marine Protected Areas in the UK to divers and sea anglers. UK National Ecosystem Assessment Follow-on.

restricting diving and angling). This value is only an indicative use value and is not adjusted to the 30 Regional MCZ Project sites.

Annex C provides a summary of the methodology used to arrive at these estimates. The limitations of the methodology highlighted for tranche 1 and 2 also apply to tranche 3. This is the reason why such benefits are only considered indicatively. However, considering that a large proportion of non-use benefits are not expressed in monetary terms and that use benefits are only indicative, it would have been disproportionate to embark on a scope test exercise for the purpose of this policy. In any case, the costs appear to be significantly lower than the indicative benefits.

- 8.15. The estimates in Box 3 and Annex C and Table 5 provide an indication that there are potentially high benefits for recreational users from protecting these sites. The results presented in Box 3 have not been adjusted to reflect new information on feature certainty or boundary changes made in the site consideration, nor diminishing returns considered in relation to the number of sites being designated. Uncertainty over the scale of benefits means they have not been used in the summary sheets.
- 8.16. Discussing limitations of the non-use estimates, Kenter et al. (2013) note there may be some framing bias in responses and that the use of a voluntary contribution payment vehicle may not fully reveal individual values. Also the respondents were asked to provide a hypothetical donation to a hypothetical site, which may result in bias of benefits (although budget constraints are emphasised) and the estimates value individual's perception to restricting the sites rather than actual ecological protection following designation.

### **Anticipated overall benefits of a Marine Protected Area network**

- 8.17. MPAs already exist in the form of SPAs, SACs, Sites of Special Scientific Interest (SSSI), Ramsar sites and 50 MCZs. The 3rd tranche MCZ sites have been selected to complement these sites and to contribute towards the overall MPA network. The full network of MPAs will protect a range of representative habitats and species, and a sufficient number of spatially distinct areas to offer resilience. There are additional overall benefits that go beyond the site-specific benefits described above.
- 8.18. By protecting a range of representative features from across the marine environment, the government is protecting biodiversity and the genetic diversity underpinning this. This creates biological resilience so that as conditions in the marine environment change, species and habitats remain that are able to adapt to these changed conditions. The replication of features and habitats safeguards against any loss and captures natural variation within features, hence increasing ecological resilience.
- 8.19. Alongside highly mobile marine mammal and bird species, mobile fish species are also likely to benefit from MPAs when these protect key life stages or provide areas where fishing pressure is reduced or removed. An improvement in conditions for mobile fish species is likely to benefit commercial fishermen and recreational anglers, as well as potentially increasing non-use value from knowledge that these species are being protected.



## Consultation responses received on the benefits of MCZs

- 8.20. A number of consultation responses commented on the estimation of benefits in this IA. The main responses are summarised below:
- One respondent provided details of the effect of management measures implemented in Lyme Bay upon the provision of ecosystem services and the well-being of local fishermen. The results from this project have been included in Annex B.
  - One respondent provided details of an estimated monetary value of an ecologically coherent network of Marine Protected Areas for Northern Ireland's seas. Whilst the results are not specific to the proposed tranche of MCZs, the results from this project have been included in Annex B as an example of quantifying benefits.
  - One respondent provided details of the high benefits and low private costs of closed area protection for scallops, relevant to the South Rigg, Queenie Corner and West of Copeland sites. Whilst the results do not quantify these benefits, they have been included in Annex B.
  - One respondent provided details of significant non-monetary value for various sites, referencing Kenter et al. (2013). Benefits have been considered and have been used to support decisions. There is limited evidence on economic benefits on the marine and coastal environment suitable for adapting for use in benefits evaluation, however the Kenter et al. (2013) paper referenced by this respondent has been included in the impact assessment as an indicative assessment of the benefits; it makes clear that the benefits of designation are likely to be higher than the costs. The response did not provide additional evidence.
  - A small number of respondents to the consultation stated that they were concerned about the use of a static baseline, which assumes no improvement or deterioration in feature condition without designation. They argued that given the pattern of historic deterioration in the marine environment, using a static baseline would mean that the benefits from designation would be underestimated. This IA continues to use a static baseline because we do not have site-specific evidence on where the condition of sites is changing, and therefore it would not be possible to provide an indication of the benefits of designation under a different baseline assumption. This is discussed in Section 6.

## Risks, uncertainties and sensitivities

- 8.21. The IA assumes that features will continue to remain in their 'favourable' or 'unfavourable' condition over the 20 year period (i.e. their condition will not deteriorate or improve) and, consequently, the rationale behind the adoption of a static baseline. This is required due to uncertainty around future changes in human activities resulting in future changes to feature condition (see Sections 6 and 8.4). This could potentially underestimate the benefits outlined above.
- 8.22. It has been challenging to quantify the increase in benefits arising from ecological improvements in the features following designation. It is even harder to estimate the

network benefits from designating tranches of sites. While there is strong evidence to support the likelihood of an increase in ecosystem services (see Table 5), given the uncertainties it has been hard to pin down the extent of increase in these services and what they mean from an economic perspective. This is likely to result in a relative bias against the benefits versus the costs. To overcome this, this IA has provided an indication of the scale of the benefits anticipated by providing an illustration of recreational benefits in monetary terms (see Annex C, Table 5 and Box 3 above).

- 8.23. The designation of a network of MCZs will clearly benefit marine and coastal habitats within the protected areas but there will also be positive effects for areas outside of the MCZ network that are less clear. For example, MPAs often protect nursery grounds, which will improve fish populations over a greater area. The extent to which positive externalities such as this occur will differ across species and ecosystems.
- 8.24. Overall, the main objective of creating a network of MCZs is biodiversity protection rather than increasing Maximum Sustainable Yield (MSY<sup>80</sup>). Naturally, this intervention and the protection granted through management will have positive effects in ensuring MSY and protecting marine resources. However, the effects of MCZ designation on MSY (both ecological and economic) are not quantified here since advanced modelling would be required for the assessment of either positive or negative outcomes relative to MSY and this is beyond the scope of the current policy proposal.

## 9. Potential trade implications

- 9.1. The marine economy contains a number of activities relating directly and indirectly to trade. Similarly, these are subject to significant investment. This includes commercial fisheries, ports and harbours, renewable energy, oil and gas, and recreation. The designation of the 3rd tranche of MCZs is unlikely to impact on trade and investment for the following reasons: i) MCZs have been designated in areas of low commercial activity, for instance by largely avoiding core fishing grounds or oil and gas resources; ii) relevant industries have been consulted prior to designation, permitting significant time for any mitigation required; iii) whilst there is significant uncertainty as to the effect of environmental regulation on patterns of trade and investment, empirical evidence suggests these impacts are likely to be small<sup>81</sup>. Furthermore, the measure does not include different requirements for domestic and foreign businesses.

## 10. MCZ post-implementation review plan

- 10.1. Following the designation of an MCZ, regulatory authorities will put management measures in place to meet the conservation objectives of the site. Management measures will be worked out in consultation with stakeholders, and social and economic impacts will be taken into account. MCZ sites are subject to a rolling programme of monitoring to ensure that the measures taken result in the anticipated improvements to feature condition. The MCAA 2009 requires the Secretary of State to report every 6 years on the degree to which MCZs and the MPA network as a whole are achieving their objectives, and to set out further steps that may be necessary for success<sup>82</sup>.

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<sup>80</sup> MSY: The largest average catch or yield that can continuously be taken from a stock under existing environmental conditions  
ICES definition: [https://www.ices.dk/community/Documents/Advice/Acronyms\\_and\\_terminology.pdf](https://www.ices.dk/community/Documents/Advice/Acronyms_and_terminology.pdf)

<sup>81</sup> Dechezleprêtre and Sato (2014)

<sup>82</sup> The most recent report (December 2018) is available at: <https://www.gov.uk/government/publications/marine-protected-areas-network-report-2012-to-2018>

## 11. Conclusion

- 11.1. There are considerable benefits to designating the 3rd tranche of 41 new MCZs. A combined area of 7278 mi<sup>2</sup> will be protected and 200 features (habitats, species and geological features) will be conserved. This protection will result in an increase in benefits supplied by ecosystem<sup>m</sup> services and their components, such as increases in provisioning (e.g. fish and shellfish provision), regulating (e.g. climate regulation), supporting (e.g. nutrient cycling) and cultural and recreational services. An ecologically coherent network of MPAs is likely to have additional benefits such as the conservation of marine and coastal biodiversity, an increase in biological resilience to adapt to changed conditions, the protection or enhancement of ecosystem services and will help the recovery of depleted stocks of exploited species. Illustrative studies suggest this could be worth as much as £262m from recreational benefits alone.
- 11.2. The total estimated undiscounted quantified economic costs of the 41 sites proposed for designation in 2019 ranges from £81.79m to £144.28m and the best estimate is £95.85m. This gives a present value of between -£106.31m and -£60.26m and a best estimate of -£70.62m over the 20-year timeframe of the IA, where private costs account for £9.95m and public costs £60.68m. **The best estimate equivalent annual cost to business is £0.7m/yr (2016 prices, 2019 present value base year).** The main costs to industry are for recreation (£0.287m/yr), oil and gas (£0.140m/yr), ports and harbours (£0.117m/yr) and commercial fisheries (£0.114m/yr).

**Table 6. Summary of additional costs for designating the 3rd tranche of MCZs**

Impacted Private Sector	Best Estimate average annual Cost £m/yr (low - high)	Best estimate PV Costs £m (low –high)	Description of Costs
Aggregate Extraction	0.006m/yr (0.006-0.007)	0.074m (0.074 – 0.114)	Licence application costs to collect more information on impact on designated features. These costs are additional to the cost incurred for tranche 1 and tranche 2. Some costs associated with aggregates were presented in the tranche 1 IA and are due to the existence of an MCZ network and hence not specific to tranche 3, so have not been included here as they are part of the baseline costs.
Aquaculture	No extra costs quantified	No extra costs quantified	No significant costs to aquaculture are anticipated as a result of tranche 3.
Cables	0.002m/yr (0.001-0.003) <sup>83</sup>	0.030m (0.015-	Licence application costs for future developments to collect more

		0.045)	information of impact on BSH. Mitigation costs are very unlikely, since the footprint of cables is anticipated to be small compared to the extent of BSH, especially in offshore sites.
Coastal Development	No extra costs quantified	No extra costs quantified	Additional costs unlikely.
Commercial Fisheries (UK only)	0.114m/yr (0.000-0.958)	1.681m (0.000-14.087)	Site and gear specific restrictions on fishing activities, for example restricting trawling in specific sections of an MCZ where a particular feature is present. Costs are the best estimate of the range of management scenarios, with an assumption of 75% displacement. These are calculated as loss in Gross Value Added (GVA), as for all sectors. High scenario includes sensitivity of loss of all affected fishing GVA.
Heritage Assets	No extra costs quantified	No extra costs quantified	Licence application costs to collect more information on impact on designated features. Site-specific potential non-monetised cost where potential intrusive archaeological activity could be restricted where anchoring restrictions in place.
Oil & Gas (including Carbon Capture & Storage at sea)	0.140m/yr (0.105- 0.166)	2.105m (1.565 – 2.518)	Licence application costs for future developments to collect more information specifically of impact on BSH. Mitigation costs for future developments are very unlikely, since the footprint of oil & gas is likely to be small compared to the extent of BSH, especially in offshore sites. However, since there is uncertainty in the location of future developments, there remains an additional unlikely un-monetised cost.
Ports, Harbours, Commercial Shipping and Disposal Sites	0.117m/yr (0.114–0.396)	1.746m (1.702 – 5.843m)	Licence application costs for future applications to collect more information of impact on BSH. Unknown potential future costs have been minimised by changing MCZ boundaries to exclude costs where possible
Recreation	0.287m/yr (0.026-1.270)	4.236m (0.410 – 18.681)	Management of anchoring and mooring at Bembridge and Studland bay may be needed to protect the features with a GMA of recover.

			Management of chartered vessels' access to black bream nesting sites may be needed at Southbourne Rough, Poole Rocks and Purbeck Coast.
Renewable Energy	0.005m/yr	0.074m	Licence application costs for future developments to collect more information specifically of impact on BSH.
<b>Total annual and PV costs to private sector</b>	<b>0.671m/yr (0.257 – 2.804)</b>	<b>9.946m (3.840 – 41.364)</b>  <b>PV 2019 base year; 2016 prices</b>	
<b>Impacted Public Sector</b>	<b>Cost £m/yr (low-high)</b>	<b>PV cost £m (low-high)</b>	<b>Description of Costs</b>
Environment Agency (for FCERM)	No extra costs quantified	No extra costs quantified	Potential licence application costs to Environment Agency for any future developments – additional costs to consider impact on broad scale habitats; plus potential one-off cost for additional monitoring where required.
National Defence	0.003m/yr	0.050m	Costs of adjusting electronic tools and charts and annual costs of maintaining. Additional planning considerations.
Management & enforcement of MCZs	1.658m/yr (1.370 – 1.947)	24.454m (20.189 – 28.719)	Costs to MMO, IFCA and Defra for enforcing management measures.
Ecological Surveys	2.460m/yr	36.177m	Costs of baseline surveys and costs of monitoring to JNCC and Natural England.
<b>Annual and PV costs to public sector</b>	<b>4.121/yr (3.833 – 4.410)</b>	<b>60.681m (56.416 – 64.946)</b>	
<b>Overall annual and PV costs</b>	<b>4.792m/yr (4.090 – 7.214)</b>	<b>70.627m (60.256 – 106.310)</b>	Annualised total costs for public and private sector
Notes:			
<ul style="list-style-type: none"> <li>The annual costs (m/yr) for each sector (including public costs) are total costs (transition plus annual) averaged over the 20-year period (2019 to 2038), presented in 2016 prices. The EANDCB figure of £0.7m/yr is calculated by converting the figures to 2016 prices and 2019 present value year.</li> </ul>			

- 11.3. The main (best estimate) costs to government under the preferred option are £1.658m/yr for management and enforcement of the sites, £2.460m/yr for ecological survey work and a small cost to national defence (£0.003m/yr).
- 11.4. In addition there are some costs that have not been quantified. Costs associated with sectors where future projects were highly uncertain but costs are expected to be low have not been quantified (e.g. archaeology and aquaculture). It has also not been possible to quantify impacts on local communities from the restriction and/or management of fisheries, i.e. in addition to the direct costs to the fishing industry. Some public sector costs, such as costs to inform users about MCZs or advice to public authorities on impacts of proposed licensed activities on MCZs, and other costs to the public authorities following the advice, have not been monetised. These costs have been described qualitatively.
- 11.5. The costs analysis in the IA has benefitted from engagement with stakeholders as described in Section 7.2 above. This has resulted in costs being assessed on a very detailed basis, with assumptions often varying by site. Details of calculations by sector are given in Annex D.

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## Annex A: Management Scenarios

Management measures for MCZs are not known in advance but are developed by the regulatory authorities after designation. Therefore this IA contains illustrative examples that are described in detail below for each site. These potential management scenarios are based on information collected from stakeholders about the level and type of human activity in each MCZ (initially gathered by the Regional MCZ Projects and updated during the third tranche pre-consultation engagement stage and formal public consultation) alongside scientific advice on the sensitivity of the features to be protected. A General Management Approach (GMA) is identified for each feature, and can be either a 'maintain' or a 'recover' approach depending on the current condition of the feature. Features with a GMA of 'recover to favourable condition' are assumed to currently be in an unfavourable condition but, with MCZ designation and appropriate management, to be able to recover to favourable condition over time. Features with a GMA of 'maintain in favourable condition' are assumed to currently be in a favourable condition. MCZ designation and continued appropriate management will protect the features against the risk of degradation from future, currently unplanned, human activities.

Site Name	Management Scenarios		Notes
Albert Field	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls and dredges		Subtidal coarse sediment has a recover GMA and is sensitive to mobile bottom-abrading gear.
Axe Estuary	Scenario 1: No additional management		No additional management is expected.
Beachy Head East	Scenario 1: No additional management Scenario 2: Zoned closure of the eastern side of site to bottom trawls and dredges Scenario 3: Zoned closure of specific areas (Ross worm reef) to bottom trawls and dredges Scenario 4: Closure of entire MCZ to bottom trawls and dredges		Several features have a recover GMA and are sensitive to mobile bottom-abrading gear.
Bembridge	Fisheries: Scenario 1: No additional management Scenario 2: Zoned closure to bottom trawls, dredges, pots and traps to a 2m depth contour against the shoreline Scenario 3: Zoned closure	Recreation: Scenario 1: No additional management Scenario 2: <ul style="list-style-type: none"> <li>Zoned closure (voluntary or legislated) to anchoring over seagrass in along western (landward) edge of Priory Bay MCZ</li> </ul>	There are both fisheries and recreational management scenarios for this site.  For fisheries, several features have a recover GMA and are sensitive to mobile bottom-abrading and static gears.  For recreation, sea grass and maerl beds have a recover GMA and are sensitive to

	<p>of specific areas (seagrass, sea-pen and burrowing megafauna communities and native oyster) to bottom trawls, dredges, pots and traps</p> <p>Scenario 4: Closure of entire MCZ to bottom trawls and dredges, pots, nets, lines and traps</p>	<ul style="list-style-type: none"> <li>• Re-siting (within the same location) of a small number of moorings</li> <li>• Zoned closure to anchoring over maerl beds on Culver Spit</li> </ul>	<p>anchoring and mooring. The majority of anchoring and mooring activity does not overlap sensitive features and will not be affected.</p>
Berwick to St Mary's	<p>Scenario 1: No additional management</p> <p>Scenario 2: Code of conduct including zonal speed restrictions at certain times of the year</p> <p>Scenario 3: Code of conduct including zonal speed restrictions at certain times of the year (with restrictions in place for a longer period and a greater area of the site compared to Scenario 2)</p>		<p>Common eider has a recover GMA. Management is likely through a voluntary code of conduct.</p>
Camel Estuary	<p>Scenario 1: No additional management</p>		<p>No additional management is expected.</p>
Cape Bank	<p>Scenario 1: No additional management</p> <p>Scenario 2: Closure of entire MCZ to bottom trawls and dredges</p>		<p>Moderate energy circalittoral rock and subtidal coarse sediment have a recover GMA and are sensitive to mobile bottom-abrading gear.</p>
Dart Estuary	<p>Scenario 1: No additional management</p>		<p>Several features to be designated have a recover GMA. No significant management is expected although there may be a need for aquaculture businesses to increase monitoring and management of feral Pacific oysters.</p>
Devon Avon Estuary	<p>Scenario 1: No additional management</p>		<p>No additional management is expected.</p>
Dover to Deal	<p>Scenario 1: No additional management</p> <p>Scenario 2: Closure of entire MCZ to bottom trawls and dredges</p>		<p>Some additional features have a recover GMA and are sensitive to mobile bottom-abrading gear.</p>
East of Start Point	<p>Scenario 1: No additional management</p>		<p>Subtidal sand has a recover GMA and is</p>

	Scenario 2: Closure of entire MCZ to bottom trawls and dredges	sensitive to mobile bottom-abrading gear.
Erme Estuary	Scenario 1: No additional management	No additional management is expected.
Foreland	Scenario 1: No additional management Scenario 2: Zoned closure of the western half of the MCZ to bottom trawls and dredges to protect areas of high energy and moderate energy circalittoral rock Scenario 3: Closure of entire MCZ to bottom trawls and dredges and 50% reduction in activity of lines, nets, pots and traps to protect areas of high energy infralittoral rock and high/moderate energy circalittoral rock	Several features have a recover GMA and are sensitive to mobile bottom-abrading gear.
Goodwin Sands	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls and dredges	Moderate energy circalittoral rock, ross worm reefs and blue mussel beds have a recover GMA and are sensitive to mobile bottom-abrading gear.
Helford Estuary	Scenario 1: No additional management	Native oyster has a recover GMA. It is unlikely that additional management measures will be required.
Holderness Offshore	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls and dredges	Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.
Inner Bank	Scenario 1 : No additional management Scenario 2 : Closure of entire MCZ to bottom trawls and dredges	Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.
Kentish Knock East	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls and dredges	Subtidal coarse sediment and subtidal mixed sediment have recover GMAs and are sensitive to mobile bottom-abrading gears.
Markham's Triangle	Scenario 1: No additional management Scenario 2: Closure to bottom trawls and dredges	Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.
Morte Platform	Scenario 1: No additional management Scenario 2: Zoned closure of areas of high and moderate	All features have a recover GMA and are sensitive to mobile bottom-abrading gears.

	energy circalittoral rock in the MCZ to bottom trawls and dredges Scenario 3: Closure of entire MCZ to bottom trawls and dredges	
North East of Haig Fras	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls and dredges	All features have a recover GMA and are sensitive to mobile bottom-abrading gears.
North West Lundy	Scenario 1: No additional management Scenario 2: Closure of entire MCZs to bottom trawls and dredges	Subtidal coarse sediment has a recover GMA and is sensitive to mobile bottom-abrading gears.
Orford Inshore	Scenario 1: No additional management Scenario 2: Closure of entire MCZs to bottom trawls and dredges	Subtidal mixed sediment has a recover GMA and is sensitive to mobile bottom-abrading gears.
Otter Estuary	Scenario 1: No additional management	No additional management is expected.
Poole Rocks	Scenario 1: No additional management  Scenario 2: During spawning and breeding season (April to July) in areas of known nesting sites restrict trawling, potting, netting, hooks and lines and recreational angling  Scenario 3: During spawning and breeding season (April to July), closure of entire MCZ to trawling, netting, hooks and lines and recreational angling.	Black bream has a recover GMA and is sensitive to fishing activities such as trawling netting, hooks and lines (including angling from an anchored boat). Potting could also impact on black bream but only if pots are placed directly on a nesting site.
Purbeck Coast	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls and dredges  Specifically for black bream: Scenario 1: No additional management  Scenario 2: During spawning and breeding season (April to July) in areas of known nesting sites restrict trawling, potting,	The maerl beds feature has a recover GMA and is sensitive to mobile bottom-abrading gears.  Black bream has a recover GMA and is sensitive to fishing activities such as trawling netting, hooks and lines (including angling from an anchored boat). Potting could also impact on black bream but only if

	netting, hooks and lines and recreational angling  Scenario 3: During spawning and breeding season (April to July), closure of entire MCZ to trawling, netting, hooks and lines and recreational angling.	pots are placed directly on a nesting site.
Queenie corner	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls and dredges	Subtidal mud and sea pens & burrowing megafauna have a recover GMA and are sensitive to mobile bottom-abrading gears.
Ribble Estuary	Scenario 1: No additional management	No additional management is expected.
Selsey Bill and the Hounds	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls and dredges	Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.
Solway Firth	Scenario 1: No additional management	No additional management is expected.
South of Celtic Deep	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls and dredges	Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.
South of Isles of Scilly	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls and dredges	Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.
South of Portland	Scenario 1: No additional management Scenario 2: Zoned closure to bottom trawls and dredges Scenario 3: Closure of entire MCZ to bottom trawls and dredges	Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.
South Rigg	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls Scenario 3: Closure of entire MCZ to bottom trawls, dredges, pots and traps, and hooks and lines	Several features have a recover GMA and are sensitive to mobile bottom-abrading and static gears.
South West Approaches to Bristol Channel	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls and dredges	Subtidal coarse sediment and subtidal sand have a recover GMA and are sensitive to mobile bottom-abrading gears.
South West Deeps (East)	Scenario 1: No additional management Scenario 2: Zoned closure of areas of deep-sea bed and subtidal coarse sediment in the MCZ to bottom trawls and	Several features have a recover GMA and are sensitive to mobile bottom-abrading gears.

	dredges Scenario 3: Closure of entire MCZ to bottom trawls and dredges			
Southbourne Rough	Scenario 1: No additional management  Scenario 2: During spawning and breeding season (April to July) in areas of known nesting sites restrict trawling, potting, netting, hooks and lines and recreational angling  Scenario 3: During spawning and breeding season (April to July), closure of entire MCZ to trawling, netting, hooks and lines and recreational angling.	Black bream has a recover GMA and is sensitive to fishing activities such as trawling netting, hooks and lines (including angling from an anchored boat). Potting could also impact on black bream but only if pots are placed directly on a nesting site.		
Studland Bay	<table border="1"> <tr> <td>Fisheries: Scenario 1: No additional management Scenario 2: Zoned closure to bottom trawls and dredges, nets and traps Scenario 3: Closure of entire MCZ to bottom trawls and dredges, nets and traps</td> <td>Recreation: Scenario 1: Replacement of existing moorings with eco-moorings Scenario 2: No anchoring zone(s) in seagrass area; retention of open anchorage area; replacement of existing moorings and installation of additional eco-moorings (total 100) Scenario 3: No anchoring across main extent of seagrass beds (approximate to the southern quarter of the site); removal of existing moorings</td> </tr> </table>	Fisheries: Scenario 1: No additional management Scenario 2: Zoned closure to bottom trawls and dredges, nets and traps Scenario 3: Closure of entire MCZ to bottom trawls and dredges, nets and traps	Recreation: Scenario 1: Replacement of existing moorings with eco-moorings Scenario 2: No anchoring zone(s) in seagrass area; retention of open anchorage area; replacement of existing moorings and installation of additional eco-moorings (total 100) Scenario 3: No anchoring across main extent of seagrass beds (approximate to the southern quarter of the site); removal of existing moorings	<p>There are both fisheries and recreational management scenarios for this site.</p> <p>For fisheries, seagrass beds have a recover GMA and are sensitive to mobile bottom-abrading and static gears.</p> <p>For recreation, sea grass beds have a recover GMA and are sensitive to anchoring and mooring.</p>
Fisheries: Scenario 1: No additional management Scenario 2: Zoned closure to bottom trawls and dredges, nets and traps Scenario 3: Closure of entire MCZ to bottom trawls and dredges, nets and traps	Recreation: Scenario 1: Replacement of existing moorings with eco-moorings Scenario 2: No anchoring zone(s) in seagrass area; retention of open anchorage area; replacement of existing moorings and installation of additional eco-moorings (total 100) Scenario 3: No anchoring across main extent of seagrass beds (approximate to the southern quarter of the site); removal of existing moorings			
Swanscombe (Lower Thames)	Scenario 1: No additional management	No additional management is expected.		
West of Copeland	Scenario 1: No additional management	Subtidal coarse sediment and subtidal		

	Scenario 2: Closure of entire MCZ to bottom trawls and dredges	mixed sediments have a recover GMA and are sensitive to mobile bottom-abrading gears.
West of Wight Barfleur	Scenario 1: No additional management Scenario 2: Closure of entire MCZ to bottom trawls and dredges	Subtidal coarse sediment and subtidal mixed sediments have a recover GMA and are sensitive to mobile bottom-abrading gears.
Wyre Lune	Scenario 1: No additional management	No additional management is expected.
Yarmouth to Cowes	Scenario 1: No additional management Scenario 2: Zoned closure of areas to all gears Scenario 3: Zoned closure of all gears to a 2 m depth contour against the shoreline Scenario 4: Closure of entire MCZ to bottom trawls, dredges, lines, nets, pots and traps	Several features have a recover GMA and are sensitive to mobile and static bottom-abrading gears.



## Annex B: Benefit Studies

As discussed in the benefits section of the Impact Assessment, the lack of scientific and economic research on the marine environment makes analysis of the additional benefits of designation complicated. Although there has been an evident increase in the number of publications with a focus on ecosystem services and non-market valuation, the economic literature on the protection of the marine and coastal habitats is still limited.

During the first and the second tranches of Marine Conservation Zones, relevant literature valuing ecosystem services was reviewed and included in this annex. For recreational benefits, a detailed literature review was conducted in 2013 by RPA as part of their study on the Value of the Impact of Marine Protected Areas on Recreation and Tourism Services<sup>84</sup>, whilst a wider review on the benefits of the marine environment was carried out in 2014 by Turner et al. as part of the NEFAO work package 4 on coastal and marine ecosystem services<sup>85</sup>.

More recently, a full spectrum literature review was undertaken by C. Torres and N. Hanley (2016)<sup>86</sup> aimed at providing an overview of the studies on coastal and marine ecosystem services valuation, including those on the recreational benefits analysed within this IA. The authors, using the framework proposed by the Millennium Ecosystem Assessment (MEA), have considered four ecosystem services categories: provisioning services, regulating services, cultural services and supporting services (MEA, 2005)<sup>87</sup>.

Furthermore, in February 2017 the Scottish Government published a report on the socio-economic impacts associated with the management of Scottish Marine Protected Areas (MPAs)<sup>88</sup>. The assessment of these socioeconomic impacts was divided into three sections: the fish catching sector, other marine users and impacts on wider onshore activities such as fish processing, local communities and other marine/coastal developments. The results of this work are consistent with the ones presented in this IA although they are not directly comparable to this proposal since they refer to management activities already in place.

Following the approach adopted for the first and the second tranches of MCZ designations, a literature review on ecosystem services, and related economic benefits, was carried out for the third tranche as well. The table below attempts to review all existing studies containing economic valuation of ecosystem services (marine and coastal) gathered up to April 2017. Annex C provide details on the Kenter et al. paper<sup>89</sup> used to estimate benefits for the 41 sites to be designated in the 3rd tranche.

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<sup>84</sup> RPA, Bright Angel Coastal Consultants, Ichthys Marine, RSS Marine Ltd (2013): Value of Marine Protected Areas on recreation and tourism services, Methodology report for Defra, July 2013, Loddon, Norfolk, UK.

<sup>85</sup> UK National Ecosystem Assessment Follow On: <http://uknSopr@nzi1956ea.unep-wcmc.org/LinkClick.aspx?fileticket=IJEp3mJSVBw%3D&tabid=82>

<sup>86</sup> Torres C, Hanley N. Economic valuation of coastal and marine ecosystem services in the 21st century: an overview from a management perspective. 2016 Feb.

<sup>87</sup> "Millennium ecosystem assessment." *Ecosystems and Human Well-Being: Biodiversity Synthesis*, Published by World Resources Institute, Washington, DC (2005).

<sup>88</sup> Marine Scotland report: 'Scottish Marine Protected Areas Socioeconomic Monitoring 2016: <http://www.gov.scot/Resource/0051/00514589.pdf>

<sup>89</sup> Kenter et al. (2013) <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2BY%3D&tabid=82>

<b>Ecosystem Service category and type of value</b>	<b>Study</b>	<b>Methodology</b>	<b>Key Findings</b>	<b>Impact Assessment applicability</b>
Public willingness to visit (WTV) different coastal settings to assess how biodiversity and psychological restoration are rated	M.P. White et al. (2017)	Online survey panel coordinated by PFA Research in Cornwall It was assumed that higher values of WTV are associated with higher preferences.	<p>People surveyed assigned greater emotional and restorative value to coastal environments with higher levels of perceived biodiversity.</p> <p>Particularly, a one point increase in perceived biodiversity was associated with a .50 increase in WTV Marine wildlife is assumed to influence people's willingness to visit as well; indeed, observing behaviours classed as 'high fascinating' was associated with a .24-point increase in WTV</p>	While these figures cannot be taken into consideration for the valuation of the third tranche specifically, they can be used as an indicator of the significant positive relationship between higher perceived biodiversity/fascinating wildlife behaviour and willingness to visit.

<p>Public willingness to pay for alternative management regimes of remote MPAs in the North Sea (use and non-use values)</p>	<p>R. Brouwer et al. (2016)</p>	<p>A contingent valuation (CV) survey to estimate WTP of beach visitors and a random sample of coastal and non-coastal residents for two alternative management scenarios of three areas: Dogger Bank, Frisian Front and Cleaver Bank</p>	<p>Three different management options were presented:  1) Status quo scenario  2) Scenario in which the 3 areas under analysis become MPAs where economic activities are permitted under certain conditions  3) Scenario in which the 3 areas are designed as fully protected MPAs and all economic activities are not allowed  <b>MAIL SURVEY:</b> DB (double-bounded) mean WTP (per year) for the management option 2 is €87.5 while for the management option 3 is €109.9  OE (Open-ended) mean WTP (per year) for the management option 2 is €56.6 while the average WTP for the third management option is € 67.7  <b>BEACH INTERVIEWS:</b>  DB mean WTP (per year) for the management option 2 is €110.8 while for the management option 3 is € 168.8.  OE mean WTP (per year) for choosing the management alternative n.2 is €80.1 whilst people's WTP for management alternative n.3 is €132.4</p>	<p>These sites are not included in the MCZ tranche 3 designations, and therefore the figures are not specifically applicable to tranche 3. However, this work does support the findings of a previous study carried out by Börger et al. (2014) that also includes the UK portion of the Dogger Bank and reports positive willingness to pay values for the conservation of an offshore site</p>
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<p>Recreation – Tourism and Sailing: Willingness to pay for conservation of characteristic habitats and species (Use and non-use values)</p>	<p>M. Getzner, M. Jungmeier and M. Špika (2016)</p>	<p>Face to face survey presented to two different groups of visitors at Lastovo Islands (Croatia) covering the period July-August 2013. Group A: Families and individuals who went to the island by car, train, bus and further connecting via public ferry or fast boat. Group B: Sailors anchoring or mooring in selected sites of the island</p>	<p>Willingness to pay for two biodiversity conservation scenarios:  Scenario 1-Effective implementation of a Management Plan which is aimed at protecting species and habitats in order to increase biodiversity  Scenario 2 – Establishment of a Marine Park and effective zoning. This scenario is associated with a greater increase in biodiversity.  The mean WTP to pay of respondents from Group A for Scenario 1 is €3.41 whereas the WTP of Group B respondents, on the same scenario, is €2.03  § The mean WTP of respondents from Group A for Scenario 2 is €4.31 whereas the WTP of Group B visitors for the same scenario is €2.75  Overall, tourists and sailors are willing to pay an entry fee which could raise between EUR 330,000 to 451,000 per year for improvements of marine biodiversity and a greater level of protection</p>	<p>While the study illustrates the benefit of adopting a conservation strategy to reduce loss of marine biodiversity, the figures cannot be used to inform the third tranche specifically due to the very different habitats, climates and cultures involved.</p>
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<p>Willingness to pay for healthy underwater vegetation, protection of pristine areas and size of fish stock in Finland, Sweden and Lithuania</p>	<p>A.K. Kosenius, O. Markku, (2015)</p>	<p>A choice experiment (CE) to assess how much people in each of the countries surveyed would pay for marine and coastal quality improvements</p>	<p>Three marine attributes under consideration:  1. Amount of healthy vegetation  2. Preservation of pristine areas  3. Size of the fish stock  Estimated with conditional and random parameters logit models.  Overall, the WTP estimates are highest for the Swedes and lowest for the Lithuanians.  All the countries elicited a higher WTP for large improvements in vegetation  Average WTP per person: Finland \$100.8, Sweden: \$231.4 and Lithuania \$43.2. Protection of pristine areas - average WTP per person: Finland: \$92.4, Sweden: \$120.1 and Lithuania: £35.3.  Increase of fish stocks – Finland: \$83.8, Sweden: \$181.1 and Lithuania: \$ 36.</p>	
<p>Recreation – Tourism: willingness to pay to visit Lundy Island (UK)</p>	<p>D-R. Chae, P. Wattage and S. Pascoe (2012)</p>	<p>A combination of valuation methods (travel cost method and contingent valuation method) have been used in order to estimate the willingness to pay for travelling to Lundy Island under three alternative travel cost</p>	<p>Results:  Willingness to pay of each visitor per trip for the recreational use of the island under TC1 scenario is £359.4 whilst under scenario TC2 is £397.4.  Under the third scenario hypnotised, TC3, each tourist would be willing to pay £574.4 per trip.   The estimates reported in the study appear to be high but, as pointed out by the author, this may be due to several factors like higher price of petrol in UK compared to other countries and the ferry</p>	<p>Even though this study estimates both the market and the non-market value of recreation and tourism on Lundy Island, these figures cannot be used for the third tranche IA specifically because this site has been already designated during tranche two.</p>

		<p>assumptions:  TC1: Fare of ferry or helicopter plus basic motoring costs  TC2: Fare of ferry or helicopter plus total motoring costs  TC3: TC2 plus opportunity cost of travel time</p>	<p>trip to Lundy also seems to be more expensive than the average ferry ticket cost</p>	
<p>Recreation – Tourism; Education and Research: willingness to pay for access to coastal Marine Protected Areas</p>	<p>L. Paltriguera, S. Ferrini, T. Luisetti and R.K. Turner (2018)</p>	<p>Choice Experiment method to estimate preferences for recreational investments in MPAs.</p>	<p>Location of the study: Flamborough Head, England.  The researchers estimated WTP per visit under a variety of scenarios, including an improved visitors centre (£9.18), educational boards (£7.27) a website (£4.64).</p>	<p>The study is not specific to the third tranche of MCZs. Nevertheless, the study is still relevant because it shows aggregate benefits from management measures, as well as further infrastructure spending.</p>
<p>Recreation-Tourism: willingness to pay for grey seals conservation and their recreational value (use and non-use)</p>	<p>V. Bosetti and D. Pearce (2003)</p>	<p>A contingent valuation (CV) to estimate the conservation and recreational value of seals</p>	<p>Location of the study: South West England (Seal Sanctuary – Gweek, Harbours of St. Ives and Dartmouth – seal watching)  The researchers aggregated the average WTP expressed in the form of a conservation fee paid in addition to the entrance fee (£5.26) over the annual Seal Sanctuary visitors (166,240) and obtained a yearly gross WTP of £874K (non-use value)</p>	<p>Even though grey seals are not included in tranche 3, this study is still relevant because it shows the aggregate benefits arising from conservation management policies.</p>

<p>Fish and shellfish for human consumption: population densities, age and size of scallops over time.</p>	<p>Beukers-Stewart et al. (2005)</p>	<p>Diver and dredge surveys of closed area protection on <i>pecten maximus</i> populations between 1989-2003.</p>	<p>Increasing and accelerating population density of scallops within the closed area, from 0.5/100m<sup>2</sup> in 1989 to 20/100m<sup>2</sup> in 2001, and adjacent to the closed area, from 0.5m/100m<sup>2</sup> in 1996 to 5/100m<sup>2</sup> in 2000. Both densities experienced declines in years following 2001.</p> <p>Age and size compositions of the scallop population in the closed and fished areas also improved between the years 2001-2003</p>	<p>The study takes place in the Isle of Man, and is not specific to the 3<sup>rd</sup> tranche of MCZs. It does not attempt to quantify the benefits of improved human consumption of shellfish. The study is nonetheless relevant in demonstrating the benefits of closed area protection for shellfish producers and consumers.</p>
<p>Fish and shellfish for human consumption; natural hazard protection; regulation of pollution; recreation-tourism: evaluation framework of ecosystem processes &amp; services.</p>	<p>Rees et al. (2016)</p>	<p>Weight and value of static and mobile landings between 2005/06-2013/14.</p> <p>Questionnaires of Lyme Bay fishers subjective well-being (job satisfaction, income satisfaction, health) between 2005-2015.</p>	<p>Location of study: Lyme Bay Reserve. Mean static weight and value increased during the period of study. Mean mobile weight and value decreased, but there were no observation beyond 2007/08.</p> <p>Job satisfaction rose by an average of two ranking scores between the years 2008-2015. Income satisfaction remains stable over the period of observation. Stress remained static across the period of observation.</p>	<p>The study takes place in an area specific to tranche 2, and does not attempt to quantify the benefits. The study is nonetheless relevant in demonstrating the wellbeing and ecosystem benefits of closed area protection for fishers.</p>

<p>Provision of ecosystem services under baseline <i>status quo</i> scenario and a scenario of additional MPA designation.</p>	<p>Barnard et al. (2014)</p>	<p>A review of UK economic valuation literature (Beaumont et al., 2006; Moran et al., 2008; Gonzalez-Alvarez et al., 2012), scaled-down to NI proportions of wider MPA network.</p>	<p>Net present values of £52.8-£54.5 million over a 20-year period (3.5% discount rate) may be realised depending on the management regime adopted. The economic valuation focussed on on-site benefits only, and therefore off-site benefits such as the potential for spill-over effects to local commercial fisheries are not included within these estimations.</p>	<p>Whilst the results are not specific to the proposed tranche of MCZs, the results from this project have been included where appropriate as an example of quantifying benefits in NI waters.</p>
<p>Relevant literature considered in Impact Assessments for previous MCZ tranches:</p>				
<p>Willingness to pay (WTP) to protect features of an offshore marine protected area</p>	<p>Börger et al. (2014)</p>	<p><b>Choice experiment</b> which estimated willingness to pay to protect an offshore habitat: the UK portion of the Dogger Bank.</p>	<p>The study found positive willingness to pay values for the conservation of an offshore site. The only attribute used in the study that is relevant to the designation of MCZs is the diversity of species found in the area (due to removal/reduction of trawling). WTP estimates for a 10% increase in species diversity was £4.19 per household per year while WTP estimates for a 25% increase was £7.76 per household per year. Assuming that there were 26.6 million households in UK in 2013 when the survey was conducted (ONS, 2016), this gives a yearly gross WTP of £111m and £202m respectively for the increase in species diversity in the UK portion of the</p>	<p>The Dogger Bank is not part of the MCZ Tranche 3 designation but is an SAC, hence the values cannot be directly transferred to MCZs. However, the study demonstrates that the UK population holds positive benefit values for the conservation of offshore sites and their variety of species, which are relevant to several sites proposed for protection.</p>



			<p>Dogger Bank.</p> <p>Likewise, for the protection of charismatic species in the UK part of the Dogger Bank, the yearly gross WTP is £638m and £798m respectively</p>	
Willingness to pay to protect deep sea habitats	Jobstvogt et al. (2014)	<b>Choice experiment</b> which estimated willingness to pay for additional marine protected areas in the Scottish deep-sea.	<p>Scottish households were willing to pay (per household per year): £35.43 to £37.85 for a high discovery potential of medicinal products from deep sea organisms; £22.48 to £26.28 for intermediate level of species protection; and £34.83 to £38.70 for high level of species protection for Scottish deep sea habitats. Assuming that there were 2.3m households in Scotland in 2010 this gives a yearly gross WTP between £51m and £60m for intermediate level of species protection. The yearly gross WTP in Scotland for a higher level of species protection is estimated to be between £80M and £89M</p>	<p>The study considered a hypothetical increase in the number of Scottish MPAs to include deep sea habitats and therefore cannot be directly applied to the third tranche areas. However, it provides evidence on positive benefit people assigned to existence values, option values and values of unfamiliar and remote goods and services in general.</p>
Non-use value of protection for English specific MCZs	Kenter et al. (2013)	<b>Contingent valuation</b> applied to estimate the non-use value of 22 Scottish potential Marine Protected Areas (pMPAs/MPA areas of search), 120 English	<p>The report concludes that, if expressed in economic terms, the benefits to divers and sea anglers of designating marine protected areas outweigh the cost of designation (consisting of monetised costs to government and industry). The study estimates benefits from designation of MPAs in England, Wales and Scotland. The counterfactual, one off non-use value of protecting the sites to divers and</p>	<p>Study findings used for benefits figures in Impact Assessment but for illustrative purposes. There are various limitations of the study that have been provided in Annex C.</p>

		recommended Marine Conservation Zones (MCZs) and 7 existing Welsh marine Special Areas of Conservation (SACs). The study includes consideration of how these values may alter under different management regimes. A travel-cost based choice experiment was also conducted to estimate annual recreational values.	anglers alone would be worth £730-£1,310m (excluding divers and anglers willingness to pay for specific restrictions on other users). The research also estimated the recreational value of MPAs to be £1.87 – 3.39 billion for England alone.	
Non-use value of protection (also likely to include some use value relating to protection)	McVittie, A. and D. Moran (2010).	<b>Choice experiment</b> used to estimate the WTP for a hypothetical UK network of MCZs to 'halt the loss of marine biodiversity'.	English respondents WTP £69.49/yr/hh to halt loss of biodiversity, and £3.98/yr/hh to impose moderate restriction on resource extraction. Assuming there were 22 million households in England in 2008 (ONS, 2016) this equates to £1.5bn and £87m respectively.	Study only presents the benefits of a hypothetical UK network. Benefits for the smaller number and area of proposed English MCZs not possible to robustly disaggregate.

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## **Annex C: Benefit estimation taken from published report - The value of potential Marine Protected Areas in the UK to divers and sea anglers<sup>90</sup>**

As part of the NEAFO<sup>91</sup>, the University of Aberdeen has developed case studies to assess the economic and social benefits of conserving the marine environment. This particular case study on diving and angling is one of four that was produced under the marine environment component of the NEAFO and was developed in partnership with the Marine Conservation Society (MCS), British Sub Aqua Club (BSAC) and the Angling Trust (AT). This annex draws directly on the report to present the study methodology as it is used to derive indicative benefits for the third tranche of MCZs designation. While wider literature was considered as part of the third tranche, the Kenter et al. study is still considered the best available for deriving illustrative benefits for specific rMCZs.

The report investigated the recreational use and non-use values of UK divers and sea anglers for 22 Scottish potential Marine Protected Areas, 119 English recommended Marine Conservation Zones and 7 existing Welsh Marine Special Areas of Conservation. The report concludes that, if expressed in economic terms, the benefits to divers and sea anglers of designating marine protected areas outweigh the cost of designation (consisting of monetised costs to government and industry). The study estimates one-off non-use value of protecting the sites to divers and anglers alone would be worth £730 – 1,310 million<sup>92</sup>, excluding divers and anglers' willingness to pay for specific restrictions on other users; i.e. this is the minimum amount that designation of 127 sites is worth to divers and anglers. In addition, the study says this would safeguard an annual recreational value currently worth £1.87 - 3.39 billion for England alone (excluding benefits of restrictions on other users and contingent on designation not significantly restricting diving and angling). These figures come with a number of limitations.

### **Methodology**

Information was gathered using an online questionnaire. The questionnaire included a monetary valuation section, a mapping section to establish visit numbers to potential MPA sites, and a non-monetary valuation section consisting of subjective wellbeing questions<sup>93</sup>.

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<sup>90</sup> Kenter et al. (2013) <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2BY%3D&tabid=82>

<sup>91</sup> <http://uknea.unep-wcmc.org/NEWFollowonPhase/tabid/123/Default.aspx>

<sup>92</sup> This 'non use value' is mainly measuring the willingness to pay to protect features from an uncertain future risk and an insurance against future harm and degradation. The researchers state that knowing the precise risk of harm is not essential. They provide the example of home insurance - it seems likely that the vast majority of those who take up building or home contents insurance, while they have risk preferences generally, have little quantitative knowledge on the actual risk of fire or theft. Then, it is the value of the goods and general level of risk aversion that determine willingness to pay, rather than the actual specific risk to the object of value.

<sup>93</sup> Cultural ES benefits that were assessed included recreational, aesthetic, spiritual, educational, health, identity, social bonding, sense of place and existence value for marine biodiversity. Example of monetary valuation question asked: If this is a real protected area do you think you can afford to and would be willing to give a one off donation of £6? Your donation will be used to set up a local management trust to maintain this site as it is shown above, protect its natural features against the risk of future harm and degradation.

A total of 1683 usable responses were received from 1261 divers (75%) and 422 anglers (25%).

At the beginning of the survey participants answered a screening question to find out if they were divers/snorkelers or sea-anglers. Respondents not engaged in any of these marine activities (e.g. freshwater anglers) were screened out. Using the responses to the screening question, the survey wording was geared towards either diving and snorkelling or sea-angling. They ensured that the survey prevented mixing activities within the survey, and it ensured that with each single participant either diving or angling behaviour was being considered, not both (to avoid double counting).

**Table 1 MPA survey outline**

1. General background questions (educational background, etc.) and questions on how the participant engages with the environment (how often they go diving/angling, etc.).
2. Short descriptive section on the MPA proposals.
3. A combination of a travel cost, frequency based choice experiment and contingent valuation, where participants are asked to allocate trips to hypothetical sites, and their willingness to pay for protection against a risk of future harm.
4. Follow-up questions on choice-making strategies and decision-making rules.
5. An interactive mapping session to establish how often participants visit 15 potential MPA sites randomly selected from the region where they dive or angle most.
6. A non-monetary valuation component consisting of a series of Likert scale questions on the subjective wellbeing participants derived from the sites that they indicated they visited.
7. A set of psychometric questions based on the Values-Beliefs-Norms (VBN) theory and the Theory of Planned Behaviour (TPB).
8. An opportunity to leave their name and email or postal address if participant expressed an interest in participating in one of the phase 2 deliberative workshops.

The monetary valuation component of the survey consisted of a two-stage approach. In the first stage, a choice experiment (CE) was used. CEs are a stated preference technique where respondents are presented with a series of choices between more or less desirable alternatives (Hanley, Wright & Adamowicz 1998). These choices are described by of a number of attributes. Each attribute is available at different levels. Here participants were asked to compare hypothetical diving or angling sites each with a range of environmental and recreational attributes, including travel distance, which was used as a cost-proxy. This provides a lower bound for participants' use values for the sites presented, with other costs (accommodation etc.) assumed constant. Further attributes were: marine landscape, underwater objects present, fish and other sea life present, restricted activities, access, number of vulnerable species found at the site that would be protected and size of the

protected area (Section 2.2.2 and Table 7 of the report<sup>94</sup>). In the CE, participants were asked to allocate the next five opportunities for diving/angling they have within the next year between these three options: two sites, A and B, and 'staying at home'.

In the second stage, one of the two presented sites was selected at random and a contingent valuation question asked participants about their willingness to pay (WTP) for future protection of the site and its natural features (example in Figure 6). In contrast to CEs, where participants choose between multiple scenarios, in Contingent Valuation Method (CVM) participants are presented with a single hypothetical scenario and asked directly whether they would be willing to pay to attain it. The authors state that their attribute-based CVM allowed them to better understand preferences and trade-offs than would be possible in a conventional CVM approach by incorporating an important benefit of choice experiments into contingent valuation. Participants completed four sets comprised of a CE and CVM task.

The authors state their CVM design can be thought of as eliciting an insurance value. Donations requested from respondents can be thought of as a premium to pay for the avoidance of harm to environmental goods of value. They considered motivation for paying this premium to be associated with three sources of non-use value: option value (the value of retaining the possibility of using a site in the future, including the value of avoiding irreversibility of harm (c.f. Arrow & Fisher 1974; Farber, Costanza & Wilson 2002)); bequest value (the value of securing the site for future generations) and existence value (the value of knowing that the site and its sea life is secured regardless of any other benefits). The authors state that the nature of the value that is elicited through the two different instruments, CE and CVM, is fundamentally different, as a result of the different framings: one on whether someone would currently use the site, the other whether they would be willing to pay for its protection.

To transfer the benefits from the hypothetical sites included in the survey to real sites and aggregate them across the UK populations of divers and sea-anglers, they used a matrix of sites and their characteristics, matching actual sites against the attributes of the CE/CVM. GIS was used to establish distances between each participant and each actual candidate MPA in England and Scotland. Recreational use values were calculated by multiplying individual WTP by visit numbers. Visit numbers were based on how often the participants stated they visited a random selection of 15 sites in their region in an interactive mapping application within the survey. To avoid double counting of those who were both divers and anglers, the survey was framed to prompt participants to only consider one or the other activity when indicating numbers of trips.

### **Assessing diver and angler recreational values for the proposed MCZs**

Bringing together the results of these various tools applied by Kenter et al. (2013), we could estimate divers and anglers recreational values for each pMCZ as well as aggregates for the sites that are within the group of the current 30 English Regional Project sites (see table 2) that have been proposed by Defra to be designated as part of the third tranche<sup>95</sup>.

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<sup>94</sup> Kenter et al. (2013) <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2BY%3D&tabid=82>

<sup>95</sup> Tranche 3 included, following advice provided by SNCBs, and has also considered a number of new sites to be suitable for designation as well as sites protecting highly mobile species. Nevertheless, those sites have not been included in the calculation of benefits in order

There are clearly many benefits to designating marine protected areas, just as there are costs. These benefits are challenging to estimate and Defra recognises the complexities of the scientific evidence as well as the effort that has been made by the report to value these estimates. Caution is needed in interpreting the figures and the report highlights that there are a range of limitations related to either sampling issues or framing of the monetary valuation.

For example as the report notes, there is considerable uncertainty about the real number of divers and anglers in the UK and their geographical distribution<sup>96</sup>. Based on existing evidence, the visitor estimates used in the report looks high and are a key factor driving the high recreational benefits numbers<sup>97</sup>.

Discussing limitations of the estimates the authors note there may be some framing bias in responses and that use of a voluntary contribution payment vehicle may not fully reveal individual values. Also the respondents were also asked to provide a hypothetical donation to a hypothetical site, which may result in bias of benefits (although budget constraints are emphasised)<sup>98</sup> and the estimates value individual's perception to restricting the sites rather than actual ecological protection following designation.

The report looks at restriction scenarios where the sites are completely closed to specific activities<sup>99</sup>. In reality most of the new MCZs will be multi-use areas. This means that only potentially damaging activities will be restricted or need additional management, just as is the case at existing sites<sup>100</sup>. The report also highlights limitations for using voluntary donations to estimate the one off non-use benefits<sup>101</sup>.

The CVM do not depend on the visitor numbers. Table 16 in the report provides CVM estimates for each site corresponding to 4 restriction scenarios – e.g. 'no restriction', 'no Dredging and Trawling', 'no dredging, trawling, potting and gillnetting' and 'no dredging, trawling, anchoring and mooring'. Therefore, the values in Table 16 of the report were

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to be consistent with the work carried out by Kenter et al. which is based only on the Regional Project sites proposed for Designation in 2011.

<sup>96</sup> Visitor estimates were based on self-reported visits and assumptions were made that self-reported visit counts were representative for regional populations in terms of the sites they visit.

<sup>97</sup> This report states on average this constitutes 12 visits per individual in UK diver per annum to the pool of sites considered in this survey and 39 per angler. Compared to the National Angling Survey, which came to 34 days out across the UK for anglers in general, these estimates look high.

<sup>98</sup> Hausman, Jerry, Contingent valuation: from dubious to hopeless. *Journal of Economic Perspectives* 26(4):43-56, 2012; <http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.26.4.43>

<sup>99</sup> no potting and gillnetting; no anchoring or mooring; no dredging and trawling

<sup>100</sup> Restricted activities will vary from site to site, depending on the natural features and species that are being protected. The additional management that is needed for the new sites will be identified after the sites are designated using further information on the impacts of activities. In the vast majority of cases, activities that do not damage the environment could continue.

<sup>101</sup> In terms of CVM framing the report used voluntary donations as a payment vehicle to estimate the willingness to pay to protect features from an uncertain future risk and an insurance against future harm and degradation. Although commonly used, there are risks that respondents ignore their budget constraints when responding to the survey. In addition, there might be free rider concerns as well. The report states that a separate potential framing bias in the CVM is that the preamble mentions BSAC, AT and MCS as research partners, and that the results of the study may be used in their consultation submissions. This might have increased willingness to donate if participants felt sympathetic to these organisations.



matched to the management scenarios considered in the third tranche IA to come up with site and tranche specific estimate ranges. Depending on the management scenario in each of the 30 proposed regional project sites and whether values were available in the original report, these estimates were matched according and aggregated to get a total one off non-use value (£180m to £345m<sup>102</sup>).

**Table 2: Proposed Regional Project Sites included in T3 calculation of benefits**

<b>Finding Sanctuary</b>	<b>Balanced Seas</b>	<b>Net Gain</b>	<b>Irish Sea Conservation Zones</b>
Cape Bank	Swanscombe	Orford Inshore	South Rigg
South of Portland	Selsey Bill and the Hounds	Holderness Offshore	Ribble Estuary
Dart Estuary	Goodwin Sands	Markham's Triangle	Solway Firth
Devon Avon Estuary	Inner Bank		Wyre Lune
Erme Estuary	Offshore Foreland		
Morte Platform	Kentish Knock East		
South West Deep (East)	Beachy Head East		
South of Celtic Deep	Bembridge		
South of Isles of Scilly	Yarmouth to Cowes		
Axe Estuary			
Studland Bay			
North East of Haig Fras			
Otter Estuary			
Camel Estuary			

<sup>102</sup> Estimates updated to 2016 prices.

## Annex D: Costs to private and public sectors (profile of costs over 20 years) and key assumptions

This annex sets out the sector specific cost assumptions and their sources used to derive the costs of designating 41 third tranche Marine Conservation Zones (MCZs) over the 20 year IA period. The methodologies used are summarised in Section 7 of the IA and contain links to detailed methodology papers written for the Regional MCZ Projects. Design of the methodologies involved heavy stakeholder input during previous tranches designation, including unit cost assumptions from industry, affected public agencies and other government departments. Those same assumptions have been used here but in all cases updated and the best available data is used. In addition, pre-consultation engagement has been undertaken with key organisations in relation to potential management scenarios and future developments, and responses to the formal tranche 3 consultation have been taken into account.

The potential management scenarios used to derive commercial fisheries, recreation and management costs are given in Annex A. Please note that all figures in the following tables are in 2016 prices and £m rounded to 3 decimal places. Therefore, tables may not sum exactly due to rounding. All costs that are one-off and do not repeat later in the IA period or would not repeat beyond the IA period, are considered as transitional and such costs are identified below. All other costs, including those one-off costs which repeat periodically (e.g. licence application costs) are not classed as transitional costs as they would continue to be incurred in the future.

### Business Costs:

Aggregates: Best Estimate and Low estimate																						
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Licence application costs (£m)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.087	0.029	0.000	0.000	0.000	0.000	0.000	0.116	0.006
<b>Total (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.087</b>	<b>0.029</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.116</b>	<b>0.006</b>
Present value costs (£m)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.018	0.000	0.000	0.000	0.000	0.000	0.074	0.004

Assumptions: Costs are based on additional assessment costs for considering impacts of aggregate activities on the conservation objectives of MCZ broad-scale habitats on a site specific basis. In 2011 the cost per future licence application was provided by the British Marine Aggregate Producers Association (BMAPA, pers. comm. 2011). For tranche 3 this has been updated by inflation with the ONS GDP deflator to 2016 prices equating to £0.029m. The Crown Estate (pers. comm. Feb 2017) and BMAPA (pers. comm. Feb 2017) identified that 4 licence applications for existing production or option areas within 1km of proposed sites are due for renewal. 3 are due for renewal in 2032 (£0.029m x 3 = £0.087m) and 1 in 2033 (£0.029m), giving an undiscounted total of £0.029m + £0.087m = £0.116m.

**Aggregates: High Estimate**

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Licence application costs (£m)	0.000	0.000	0.000	0.000	0.000	0.136	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.136	0.007
<b>Total (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.136</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.136</b>	<b>0.007</b>
Present value costs (£m)	0.000	0.000	0.000	0.000	0.000	0.114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.114	0.006

Assumptions: The costs are based on additional one-off costs for licence applications in strategic resource areas that overlap with or are in close proximity to T3 MCZs during the 20 year period covered by the IA. The Crown Estate (pers. comm. Feb 2017) and BMAPA (pers. comm. Feb 2017) anticipate that additional costs will be incurred for 3 licence applications, during the 20 year period of the IA, with a cost of £0.029m per licence (unit cost used is the same as best estimate). It is assumed that the additional cost will be incurred in 2024 as indicated by The Crown Estate (pers. comm. Feb 2017) equating to a cost of 3 x £0.029m = £0.087m. All other costs associated with this scenario are baseline costs as they relate to the existence of an MCZ network rather than the 3rd tranche specifically. Assumptions used for the high estimate (i.e. costs in strategic resource areas) means that site specific high cost estimate is not available.

**Cables: Best Estimate**

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Licence costs for all regions within 12nm (£m)	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.044	0.002
<b>Total (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.044</b>	<b>0.002</b>
Present value costs (£m)	0.000	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.006	0.030	0.001

For the tranche 1 IA, the UK cable protection committee (UKCPC) estimated the additional cost to an operator of assessing the impacts of a future cable installation on broad-scale habitats protected by a MCZ to be £0.011m, for each future cable installation. This unit cost was updated by inflation using the GDP deflator from 2011 to 2016 for the Tranche 3 IA; this gives the additional cost of £0.011m per licence. Costs are assumed to occur for cables that cross an MCZ within 12nm of the shoreline, but not those that are wholly beyond 12nm as they do not require a licence or EIA, unless they concern activities such as rock protection or unexploded ordnance, for which a marine licence would be required even in the absence of the 3<sup>rd</sup> tranche of MCZs. As it is not known where or when new telecoms and interconnector cables will occur, regional rather than site specific estimates are provided and potential licence applications was agreed with the UKCPC. The best estimate assumes that 4 cables license applications will incur an additional cost at the end of every 5 year period across all regions over the 20 year IA period. This calculates the costs from the 127 regional MCZ project sites proposed in 2011 (99 inshore sites). Hence this is then scaled down by 25.3% to estimate the cost for the 25 recommended inshore regional MCZ project sites in the 3<sup>rd</sup> tranche (25/99 = 25.3%), resulting in a cost of £0.011 every 5 years x 4 cables x 25.3% = 0.011 every 5 years (total £0.044). As the estimates of licence numbers by region were developed based only on the regional MCZ project sites, the new option sites are not included in this cost calculation. Nevertheless the additional cost from these sites are expected to be minimal, hence it was seen as disproportionate to repeat the original analysis to include the new option sites.

Cables: Low Costs Estimates																						
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
License costs for all regions within 12nm (£m)	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.005	0.022	0.001
<b>Total (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.005</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.005</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.005</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.005</b>	<b>0.022</b>	<b>0.001</b>
<b>Present value costs (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.005</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.004</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.003</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.003</b>	<b>0.015</b>	<b>0.001</b>

Assumptions: Unit cost assumptions and scaling are the same as the best estimate described above. The low cost estimate assumes that 0.5 licence applications, in each of the 4 regions, will incur an additional cost at the end of every 5 years period (i.e. 8 across all regions over the 20 year IA period), scaled down this results in a cost of £0.011m x 2 x 25.3% = £0.005m every 5 year.

### Cables: High Costs Estimates

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
License costs for all regions within 12nm (£m)	0.000	0.000	0.000	0.000	0.016	0.000	0.000	0.000	0.000	0.016	0.000	0.000	0.000	0.000	0.016	0.000	0.000	0.000	0.000	0.016	0.065	0.003
<b>Total (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.016</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.016</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.016</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.016</b>	<b>0.065</b>	<b>0.003</b>
<b>Present value costs (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.014</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.012</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.010</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.008</b>	<b>0.045</b>	<b>0.002</b>

Assumptions: Unit cost assumptions and scaling are the same as the best estimate described above. The high cost estimate assumes that 1.5 cables, in each of the 4 regions, will incur an additional cost at the end of every 5 years period (i.e. 24 across all regions over the 20 year IA period), scaled down this results in a cost of £0.011m x 6 x 25.3% = 0.016 every 5 years

### Commercial fisheries (UK): Best Estimate

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Gross Value Added lost	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	2.285	0.114
<b>Total (£m)</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>0.114</b>	<b>2.285</b>	<b>0.114</b>
<b>Present value costs (£m)</b>	<b>0.114</b>	<b>0.110</b>	<b>0.107</b>	<b>0.103</b>	<b>0.100</b>	<b>0.096</b>	<b>0.093</b>	<b>0.090</b>	<b>0.087</b>	<b>0.084</b>	<b>0.081</b>	<b>0.078</b>	<b>0.076</b>	<b>0.073</b>	<b>0.071</b>	<b>0.068</b>	<b>0.066</b>	<b>0.064</b>	<b>0.062</b>	<b>0.059</b>	<b>1.681</b>	<b>0.084</b>

Assumptions: Costs arise when management of some fishing activities change due to the designation of an MCZ relative to baseline management. Gear types affected and management required are specific to the site and the feature which the MCZ is designated to protect. For example, if a feature is sensitive to static gears, such as pots and trapping, then the management scenario is likely require restriction to the particular gear implying landings from the gear will be affected. The scenarios of management are site specific (provided in Annex A) and are based on the sensitivity of features to different gear types and when a site has a 'maintain' or 'recover' General Management Approach (GMA) as discussed in the main body of the IA. Actual management chosen is a regulator decision (MMO and IFCA) and this IA contains a range of illustrative examples for each site. Although costs are calculated on the basis of year of designation (2019), in reality regulators could take up to 2 years to impose management measures as any bye-law must go through due process and may have its own impact assessment. However, as it is not known in which year measures will be in place for a particular site, costs are conservatively calculated from a 2019 basis, which may lead to a potential overestimate.

Estimates of the value of landings taken from each MCZ by the UK fleet were generated using IFCA sightings data for the under 15m fleet between 2010-2014, and satellite VMS data for the over 15m fleet between the years 2013-2017. Data used for the under 15m fleet was not updated due to a lack of more recent IFCA sightings data, and insufficient satellite VMA data. It provides information on the spatial distribution of the value of landings by broad-scale gear types 'static' and 'mobile'. For the purposes of the IA and in the absence of further information, it is assumed that mobile gears are bottom abrading (i.e. bottom trawls and dredges) which is likely to lead to an overestimate of costs on the sector, since some will be midwater gears that are unlikely to be affected by management.

These estimates of fishing revenues are converted into Gross Added Value (GVA) using average Seafish multipliers for each gear type 'mobile' and 'static'. This is based on 2013-2017 Seafish Fleet Economic Survey data on industry revenues and costs. GVA ratio is the percentage of revenue that constitutes GVA and for mobile it is assumed to be 39% and static 53%.

The best estimate is the 50th percentile, i.e. the mid-point of the range of management scenarios, for mobile gear types where they were considered equally likely to be imposed and the 25th percentile, i.e. at the lower end of the range of management scenarios, for static gear types where the high cost scenario is considered unlikely. The default of 75% displacement (and 25% loss in GVA) of fishing activity is based on low overlap of the MCZs with core fishing grounds for the best estimate. Fishing revenues for each site were sense checked with the MMO.

Summary for best scenario:

Cost for gear type = baseline landings value x best estimate management scenario assumption x displacement assumption where only 25% of landings will be lost x GVA as proportion of landings.

### Commercial fisheries (UK): Low Estimate

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Gross Value Added lost	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>Total (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
<b>Present value costs (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>

Low scenario assumes no additional management therefore cost to the fisheries sector is zero.

### Commercial fisheries (UK): High Estimate

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Gross Value Added lost	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958	19.154	0.958
<b>Total (£m)</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>0.958</b>	<b>19.154</b>	<b>0.958</b>
<b>Present value costs (£m)</b>	<b>0.958</b>	<b>0.925</b>	<b>0.894</b>	<b>0.864</b>	<b>0.835</b>	<b>0.806</b>	<b>0.779</b>	<b>0.753</b>	<b>0.727</b>	<b>0.703</b>	<b>0.679</b>	<b>0.656</b>	<b>0.634</b>	<b>0.612</b>	<b>0.592</b>	<b>0.572</b>	<b>0.552</b>	<b>0.534</b>	<b>0.516</b>	<b>0.498</b>	<b>14.087</b>	<b>0.704</b>

Assumptions: The GVA for each site is calculated using the same method as the best estimate. High cost scenario is the highest potential management scenario (detailed in Annex A for each site), This scenario assumes no displacement of fishing to other areas, i.e. 100% of overlapping fishing GVA is lost.

Summary for best scenario:

Cost for gear type = baseline landings value x high estimate management scenario assumption x GVA as proportion of landings (more information on costs calculation is provided in this Appendix D spreadsheet)

<b>Oil and Gas and CCS: Best Estimate</b>																						
<b>Year</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>	<b>2038</b>	<b>Total (£m)</b>	<b>Annual Average (£m)</b>
Additional costs to future applications in Licensed 26th	0.213	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.983	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.196	0.060
Additional cost to decommissioning licences (£m)	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.012	0.047	0.002
Additional costs to future CCS apps. (£m)	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.000	0.205	0.010
Additional costs to future applications in Licensed 27th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.319	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.319	0.016
Additional costs to future applications in Licensed 28th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Additional costs to future applications in Licensed 29th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043	0.002
Additional costs to future applications in Licensed 30th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.099	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.099	0.005
Additional costs to future applications in Licensed 31st	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.883	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.883	0.044
<b>Total Costs (£m)</b>	<b>0.213</b>	<b>0.000</b>	<b>0.000</b>	<b>0.051</b>	<b>0.012</b>	<b>0.000</b>	<b>0.000</b>	<b>0.051</b>	<b>0.000</b>	<b>2.339</b>	<b>0.000</b>	<b>0.051</b>	<b>0.000</b>	<b>0.000</b>	<b>0.012</b>	<b>0.051</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.012</b>	<b>2.792</b>	<b>0.140</b>
<b>Present value costs (£m)</b>	<b>0.213</b>	<b>0.000</b>	<b>0.000</b>	<b>0.046</b>	<b>0.010</b>	<b>0.000</b>	<b>0.000</b>	<b>0.040</b>	<b>0.000</b>	<b>1.716</b>	<b>0.000</b>	<b>0.035</b>	<b>0.000</b>	<b>0.000</b>	<b>0.007</b>	<b>0.031</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.006</b>	<b>2.105</b>	<b>0.105</b>



Assumptions: All costs to this sector are based on additional costs from appropriate assessments of environmental impacts of future oil and gas and CCS developments. There are 8 phases during application process (1. survey, 2. drilling exploration, 3. actual drilling, 4. development, 5. operation, 6. maintenance, 7. decommission and 8. post closure monitoring). All unit costs were uprated using the GDP deflator from 2011 (base price year for the Tranche 1 IA) to 2016 (base price year for the Tranche 3 IA) following consultation with DECC (Pers. Comm. 2016); For phase 1, 6 and 7 the costs are £0.002m each; for phases 2, 3 and 4 this increases to £0.004m each; for phase 5 this is £0.021m. Phase 8 costs are not expected to take place within the 20yr IA period and so are not included in calculations. Costs were calculated based on phases of the application process.

The number of applications that will be submitted during the 20 year IA period will be dependent on the number of blocks offered during oil and gas licencing rounds, and the stages of development that are carried out in each of those blocks over the 20 year IA period.

Hence the number of future licence applications was estimated based on: the number of blocks offered in the 26<sup>th</sup> oil and gas licencing round; The known status of blocks offered in the 26<sup>th</sup> oil and gas licencing round; The number of blocks offered in the 27<sup>th</sup>, 28<sup>th</sup>, 29<sup>th</sup>, 30<sup>th</sup> and 31<sup>st</sup> oil and gas licencing round that provided additional acreage to those offered in the 26<sup>th</sup> round; the expected number of future CCS applications and the expected decommissioning licence applications. The Tranche 3 IA used the same scenario and assumptions as for the Tranche 1 and 2 IAs, but with some changes regarding the assumptions behind each round since it was important to take account of the phases that are likely to take place during 20 year period of this IA. These were sent to the Oil and Gas Authority, receiving broad approval (OGA, pers. Comm., 2018).

The scenario summarised below calculates costs for the potential whole suite of MCZs, as the costs are not site-specific. Costs were then scaled down from to be proportion to the sites proposed in 3<sup>rd</sup> tranche (25%).

For the 26<sup>th</sup> round it is assumed that 50% of applicants for block awarded in the 26<sup>th</sup> round with discovery incur no cost as it is assumed that Phases 1, 2 and 3 would have already occurred (i.e. they are sunk costs). For the remaining 50% of these blocks, assumed that these blocks will incur an additional cost in Phases 4, 5 and 6 in 2019 (£0.004m + £0.002m + £0.021m = £0.027m per application). The estimated number of oil and gas applications in licenced 26<sup>th</sup> round blocks with discovery is 1 in 2019. Therefore for the full network of MCZs the relevant cost calculation is (£0.027m x 1 x 50%) = £0.014m in 2019. For blocks awarded in the 26<sup>th</sup> round without discovery 50% will complete phase 3 (£0.004m per application) whilst the other 50% will complete phase 3 and 4 (£0.004m x 2 = £0.008m). The estimated number of oil and gas applications in licenced 26<sup>th</sup> round block without discovery is 130 in 2019. Therefore for all regional MCZ project sites the relevant cost calculation is (£0.004m x 130 x 50%) + (£0.008m x 130 x 50%) = £0.823m in 2019. This is scaled down 2/8 = 25% to account for the 3<sup>rd</sup> tranche only, as 2 of the 8 sites which are the nearest environmentally sensitive area to blocks on offer as part of the 26<sup>th</sup> round are proposed for designation as part of the 3<sup>rd</sup> tranche. This results in costs of £0.014m + £0.823m = £0.837m x 25% = £0.213m in 2019, after uprating to 2016 prices.

For the 26<sup>th</sup> round it is assumed that 50% of applications for round blocks not awarded in the 26<sup>th</sup> round with discovery will complete phases 2 and 3 (£0.004m x 2 = £0.008m per application) and the remaining 50% will complete phases 2, 3, 4 and 5 (£0.004m x 3 + £0.021m = £0.034m per application). The estimated number of oil and gas applications in licenced 26<sup>th</sup> round blocks with discovery that are not awarded is 54 in 2028. Therefore the relevant cost calculation is

$(£0.008m \times 54 \times 50\%) + (£0.011m \times 54 \times 50\%) = £1.139m$  in 2028. For blocks not awarded in the 26<sup>th</sup> round without discovery it is assumed all will complete phases 1, 2 and 3 ( $£0.002m + £0.004m \times 2 = £0.011m$  per application). The estimated number of oil and gas applications in licenced 26<sup>th</sup> round blocks without discovery that are awarded is 257 in 2028. Therefore the relevant cost calculation is  $£0.011m \times 257 = £2.711m$  in 2028. As above this is scaled down to  $2/8 = 25\%$  to capture the cost for the 3<sup>rd</sup> tranche only. This results in costs of  $£1.139m + £2.711m = £3.851m \times 25\% = £0.983m$  in 2028, after uprating to 2016 prices.

For decommissioning licence applications, it is assumed that 50% of 175 fields currently in production will incur additional assessment costs in the 20 year IA period and applicants will complete phase 7 at the cost of £0.002m per application it is assumed that  $175 \times 50\% / 4 = 22$  decommissions take place every 5 years occurring in the years 2023, 2028, 2033 and 2038. This results in  $22 \times £0.002m = £0.045m$  in each of those years. This is scaled down to 25% as with the 26<sup>th</sup> round, resulting in a cost of  $£0.045m \times 25\% = £0.012m$  in 2023, 2028, 2033 and 2038, after uprating to 2016 prices. For carbon capture and storage, it is assumed that applicants will complete phases 1 to 8 in the 20 year period resulting in a cost of  $£0.002m \times 3 + £0.004m \times 3 + £0.021m = £0.040m$  per application. It is assumed that there will be 20 CCS applications over the 20 year period, with 5 in 2022, 5 in 2026, 5 in 2030 and 5 in 2034 resulting in a cost of  $£0.021m \times 5 = £0.200m$  for those years. This is scaled down to 25% as with the 26<sup>th</sup> round, resulting in costs of  $£0.200m \times 25\% = £0.051m$  in 2022, 2026, 2030, and 2034, after uprating to 2016 prices.

In the 27<sup>th</sup>, 28<sup>th</sup>, 29<sup>th</sup>, 30<sup>th</sup> and 31<sup>st</sup> round it is assumed that applicants will complete phases 1 – 3 in the 20 year IA period resulting in costs of  $£0.002m + £0.004m \times 2 = £0.010m$  per application. There are 123 27<sup>th</sup> round blocks on offer which give additional acreage compared to acreage in the 26<sup>th</sup> round, this results in a cost of  $£0.010m \times 123 = £1.298m$  in 2028. This is scaled down to  $13/54 = 24.1\%$  to account only for the 3<sup>rd</sup> tranche, as 13 of the 54 sites which are the nearest environmentally sensitive area to blocks on offer as part of the 27<sup>th</sup> round are proposed for designation as part of 3<sup>rd</sup> tranche. The results in costs of  $£1.298m \times 24.1\% = £0.319m$  in 2028, after uprating to 2016 prices. There are 34 28<sup>th</sup> round blocks on offer which give additional acreage compared to acreage in the 26<sup>th</sup> round. However, the sites proposed for designation in the 3<sup>rd</sup> tranche are not the nearest environmental sensitive area to blocks on offer in the 28<sup>th</sup> round and so there are no attributable costs to the third tranche. There are 20 29<sup>th</sup> round blocks on offer which give additional acreage compared to acreage in the 26<sup>th</sup> round, this results in a cost of  $£0.010m \times 20 = £0.211m$  in 2028. This is scaled down to  $1/5 = 20\%$  to account only for the 3<sup>rd</sup> tranche, as 1 of the 5 sites which are the nearest environmentally sensitive area to blocks on offer as part of the 29<sup>th</sup> round are proposed for designation as part of third tranche. The results in costs of  $£0.211m \times 20\% = £0.043m$  in 2028, after adjusting to 2016 prices.

There are 28 30<sup>th</sup> round blocks on offer which give additional acreage compared to acreage in the 26<sup>th</sup> round, this results in a cost of £0.295m in 2028. This is scaled down to  $1/3 = 33\%$  to account only for the 3<sup>rd</sup> tranche, as 1 in 3 sites which are the nearest environmentally sensitive area to blocks on offer as part of the 30<sup>th</sup> round are proposed for designation as part of third tranche. This results in costs of  $£0.295m \times 33\% = £0.099m$  in 2028, after adjusting to 2016 prices.

There are 139 31<sup>st</sup> round blocks on offer which give additional acreage compared to acreage in the 26<sup>th</sup> round, this results in a cost of £1.466m in 2028. This is scaled down to  $59/100 = 59\%$  to account only for the 3<sup>rd</sup> tranche, as almost 6 in 10 sites which are the nearest environmentally sensitive area to blocks on offer as part of the 31<sup>st</sup> round are proposed for designation as part of third tranche. The results in costs of  $£1.466m \times 59\% = £0.883m$  in 2028, after adjusting to 2016 prices.

This analysis only takes into account the sites proposed as part of the regional MCZ projects, consequently the new options developed specifically for the 3<sup>rd</sup> tranche have not been included in the cost calculation. However the additional cost due to these sites are expected to be minimal, hence it was considered to be disproportionate to repeat the analysis to include these sites.

<b>Oil and Gas and CCS: High Estimate</b>																						
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Additional costs to future applications in Licensed 26th	0.319	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.401	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.720	0.086
Additional cost to decommissioning licences (£m)	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.012	0.047	0.002
Additional costs to future CCS apps. (£m)	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.000	0.205	0.010
Additional costs to future applications in Licensed 27th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.319	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.319	0.016
Additional costs to future applications in Licensed 28th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Additional costs to future applications in Licensed 29th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043	0.002
Additional costs to future applications in Licensed 30th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.099	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.099	0.005

Additional costs to future applications in Licensed 31st	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.883	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.883	0.044
<b>Total Costs (£m)</b>	<b>0.319</b>	<b>0.000</b>	<b>0.000</b>	<b>0.051</b>	<b>0.012</b>	<b>0.000</b>	<b>0.000</b>	<b>0.051</b>	<b>0.000</b>	<b>2.757</b>	<b>0.000</b>	<b>0.051</b>	<b>0.000</b>	<b>0.000</b>	<b>0.012</b>	<b>0.051</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.012</b>	<b>3.317</b>	<b>0.166</b>	
<b>Present value costs (£m)</b>	<b>0.319</b>	<b>0.000</b>	<b>0.000</b>	<b>0.046</b>	<b>0.010</b>	<b>0.000</b>	<b>0.000</b>	<b>0.040</b>	<b>0.000</b>	<b>2.023</b>	<b>0.000</b>	<b>0.035</b>	<b>0.000</b>	<b>0.000</b>	<b>0.007</b>	<b>0.031</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.006</b>	<b>2.518</b>	<b>0.126</b>	

Based on advice provided by DECC (Pers. Comm. 2012), the high cost estimate is calculated using an estimate of the total number of future licence applications in blocks in the 26<sup>th</sup> Round with a discovery that is 25% higher than that used for the best estimate. For the remaining blocks, the total number of future licence applications is assumed to be 50% higher than the number used to calculate the best estimate. Therefore:

For the 26<sup>th</sup> round it is assumed that 50% of applicants for block awarded in the 26<sup>th</sup> round with discovery incur no cost as it is assumed that Phases 1, 2 and 3 would have already occurred (i.e. they are sunk costs). For the remaining 50%, it is assumed that these blocks will incur an additional cost in Phases 4, 5 and 6 in 2019 (£0.004m + £0.002m + £0.021m = £0.027m per application). The estimated number of oil and gas applications in licenced 26<sup>th</sup> round blocks with discovery is 1.25 in 2019. Therefore the relevant calculation is (£0.027m x 1.25 x 50%) = £0.017m in 2019. For blocks awarded in the 26<sup>th</sup> round without discovery 50% will complete phase 3 (£0.004m per application) and the other 50% will complete phase 3 and 4 (£0.004m x 2 = £0.008m). The estimated number of oil and gas applications in licenced 26<sup>th</sup> round block without discovery is 195 in 2019. Therefore the relevant calculation is (£0.004m x 195 x 50%) + (£0.008m x 195 x 50%) = £1.234m in 2019. This is scaled down to 2/8 = 25% as 2 of the 8 sites which are the nearest environmentally sensitive area to blocks on offer as part of the 26<sup>th</sup> round are proposed for designation as part of the 3<sup>rd</sup> tranche. This results in costs of £0.017 + 1.234m = £1.251m x 25% = £0.319m in 2019, after adjusting to 2016 prices.

For the 26<sup>th</sup> round it is assumed that 50% of Applications for round blocks not awarded in the 26<sup>th</sup> round with discovery will complete phases 2 and 3 (£0.004m x 2 = £0.008m per application) and the remaining 50% will complete phases 2, 3, 4 and 5 (£0.004m x 3 + £0.021m = £0.034m per application). The estimated number of oil and gas applications in licenced 26<sup>th</sup> round blocks with discovery that are not awarded is 68 in 2028. Therefore the relevant calculation is (£0.008m x 68 x 50%) + (£0.034m x 68 x 50%) = £1.424m in 2028. For blocks not awarded in the 26<sup>th</sup> round without discovery it is assumed all will complete phases 1, 2 and 3 (£0.002m + £0.004m x 2 = £0.011m per application). The estimated number of oil and gas applications in licenced 26<sup>th</sup> round blocks without discovery that are awarded is 386 in 2028. Therefore the relevant calculation is £0.011m x 386 = £4.067m in 2028. As above this is scaled down to 2/8 = 25% to account only for the 3<sup>rd</sup> tranche. This results in costs of £1.424m + £4.067m = £5.491m x 25% = £1.401m in 2028, after adjusting to 2016 prices.

Additional cost attributed to future licence applications in the 27<sup>th</sup>, 28<sup>th</sup> and 29<sup>th</sup> rounds, decommissioning and carbon capture and storage are as described in the estimate best estimate.

<b>Oil and Gas and CCS: Low Estimate</b>																						
<b>Year</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>	<b>2038</b>	<b>Total (£m)</b>	<b>Annual Average (£m)</b>
Additional costs to future applications in Licensed 26th	0.108	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.391	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.499	0.025
Additional cost to decommissioning licences (£m)	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.012	0.047	0.002
Additional costs to future CCS apps. (£m)	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.000	0.205	0.010
Additional costs to future applications in Licensed 27th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.319	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.319	0.016
Additional costs to future applications in Licensed 28th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Additional costs to future applications in Licensed 29th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043	0.002
Additional costs to future applications in Licensed 30th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.099	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.099	0.005
Additional costs to future applications in Licensed 31st	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.883	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.883	0.044
<b>Total Costs (£m)</b>	<b>0.108</b>	<b>0.000</b>	<b>0.000</b>	<b>0.051</b>	<b>0.012</b>	<b>0.000</b>	<b>0.000</b>	<b>0.051</b>	<b>0.000</b>	<b>1.747</b>	<b>0.000</b>	<b>0.051</b>	<b>0.000</b>	<b>0.000</b>	<b>0.012</b>	<b>0.051</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.012</b>	<b>2.095</b>	<b>0.105</b>
<b>Present value cost (£m)</b>	<b>0.108</b>	<b>0.000</b>	<b>0.000</b>	<b>0.046</b>	<b>0.010</b>	<b>0.000</b>	<b>0.000</b>	<b>0.040</b>	<b>0.000</b>	<b>1.282</b>	<b>0.000</b>	<b>0.035</b>	<b>0.000</b>	<b>0.000</b>	<b>0.007</b>	<b>0.031</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.006</b>	<b>1.565</b>	<b>0.078</b>

Based on advice provided by DECC (Pers. Comm. 2012), the low cost estimate is calculated using an estimate of the total number of future licence applications in blocks in the 26<sup>th</sup> Round with a discovery that is 25% lower than that used for the best estimate. For the remaining blocks, the total number of future licence applications is assumed

to be 50% less than the number used to calculate the best estimate. Therefore:

For the 26<sup>th</sup> round it is assumed that 50% of applicants for block awarded in the 26<sup>th</sup> round with discovery incur no cost as it is assumed that Phases 1, 2 and 3 would have already occurred (i.e. they are sunk costs). For the remaining 50%, it is assumed that these blocks will incur an additional cost in Phases 4, 5 and 6 in 2019 (£0.004m + £0.002m + £0.021m = £0.027m per application), and for blocks awarded in the 26<sup>th</sup> round without discovery 50% will complete phase 3 (£0.004m per application) and the other 50% will complete phase 3 and 4 (£0.004m x 2 = £0.008m). The estimated number of oil and gas applications in licenced 26<sup>th</sup> round blocks with discovery is 0.75 in 2019. Therefore the relevant calculation is (£0.027m x 0.75 x 50%) = £0.010m in 2019. The estimated number of oil and gas applications in licenced 26<sup>th</sup> round block without discovery is 65 in 2019. Therefore the relevant calculation is (£0.004m x 65 x 50%) + (£0.008m x 65 x 50%) = £0.411m in 2019. This is scaled down to 2/8 = 25% to account only for the 3<sup>rd</sup> tranche, as 2 of the 8 sites which are the nearest environmentally sensitive area to blocks on offer as part of the 26<sup>th</sup> round are proposed for designation as part of the 3<sup>rd</sup> tranche. This results in costs of £0.010 + £0.411m = £0.422m x 25% = £0.108m in 2019, after adjusting to 2016 prices.

For the 26<sup>th</sup> round it is assumed that 50% of Applications for round blocks not awarded in the 26<sup>th</sup> round with discovery will complete phases 2 and 3 (£0.004m x 2 = £0.008m per application) and the remaining 50% will complete phases 2, 3, 4 and 5 (£0.004m x 3 + £0.021m = £0.034m per application). The estimated number of oil and gas applications in licenced 26<sup>th</sup> round blocks with discovery that are not awarded is 41 in 2028. Therefore the relevant calculation is (£0.008m x 41 x 50%) + (£0.011m x 41 x 50%) = £0.855m in 2028. For blocks not awarded in the 26<sup>th</sup> round without discovery it is assumed all will complete phases 1, 2 and 3 (£0.002m + £0.004m x 2 = £0.011m per application). The estimated number of oil and gas applications in licenced 26<sup>th</sup> round blocks without discovery that are awarded is 129 in 2028. Therefore the relevant calculation is £0.011m x 129 = £0.678m in 2028. As above this is scaled down to 2/8 = 25% to account only for the 3<sup>rd</sup> tranche. This results in costs of £0.855m + £0.678m = £1.532m x 25% = £0.391m in 2028, after adjusting to 2016 prices.

Additional cost attributed to future licence applications in the 27<sup>th</sup>, 28<sup>th</sup> and 29<sup>th</sup> rounds, decommissioning and carbon capture and storage are as described in the estimate best estimate.

### Ports and Harbours: Best Estimate

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Cost to update assessment of environmental impact in future licence applications for navigational dredging only, incurred to ports within 5km of an MCZ that do not have a MDP.	0.063	0.000	0.000	0.063	0.000	0.000	0.063	0.000	0.000	0.063	0.000	0.000	0.063	0.000	0.000	0.063	0.000	0.000	0.063	0.000	0.439	0.022
Cost to update assessment of environmental impact incurred to ports within 5km of an MCZ that do have a MDP for navigational dredging only.	0.0549 43	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.055	0.003
Total additional costs in future licence applications for all other port activities	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	1.852	0.093
<b>Total (£m)</b>	<b>0.210</b>	<b>0.093</b>	<b>0.093</b>	<b>0.155</b>	<b>0.093</b>	<b>0.093</b>	<b>0.155</b>	<b>0.093</b>	<b>0.093</b>	<b>0.155</b>	<b>0.093</b>	<b>0.093</b>	<b>0.155</b>	<b>0.093</b>	<b>0.093</b>	<b>0.155</b>	<b>0.093</b>	<b>0.093</b>	<b>0.155</b>	<b>0.093</b>	<b>2.346</b>	<b>0.117</b>

Present value costs (£m)	0.210	0.089	0.086	0.140	0.081	0.078	0.126	0.073	0.070	0.114	0.066	0.063	0.103	0.059	0.057	0.093	0.053	0.052	0.084	0.048	1.746	0.087
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Assumptions: Additional costs will be incurred for future licence applications for navigational dredging areas, disposal sites and port developments within 5km of an MCZ.

There is a one off transitional cost in 2019 for ports that have a maintenance dredge protocol (MDP) for navigational dredging of £0.054m which is based on the midpoint of Option 1A, where it is assumed that approximately 30% of ports within 5km (3 ports) have a cost of £0.009m x 3 = £0.027m with rounding, and Option B, where it is assumed that approximately 55% of ports within 5km (9 ports) have a costs of £0.009m x 9 = £0.081m with rounding. So (£0.027 + £0.081) / 2 = £0.054m in 2019. In addition, there is a cost of £0.007m per future licence application for those ports not covered by MDPs within 5km of MCZs and this applies to (70% + 45%) / 2 = 57.5% of applications for the best estimate. It is assumed that a navigational dredge licence renews every 3 years and there are 15 navigational dredge licences at MCZs proposed for designation in the 3<sup>rd</sup> tranche. Cost from all 15 licences occur every three years from 2019 onwards resulting in costs of 15 x £0.007m x 57.5% = £0.061m in those years. After adjusting to 2016 prices, this estimate equals £0.063m

For most disposal site applications that incur a cost, the unit costs was assumed to be £2,250, however every 6 years the cost will be greater, estimated at £6,750, in order to take into account that SNCBs on average produce an updated detailed baseline every 6 years. As it is not known in which year the detailed baseline will be updated for particular MCZs, the average cost of (£0.006750m + (5 x 0.002250))/6 = £0.003m (uprated to 2016 prices) is used as the unit cost for each application

The additional cost for disposal of dredged material at sea is £0.041m each year of the 20 year period if the IA, this is based on the estimated number future application for disposal sites within 5km of a MCZ (or within a MCZ). The estimate of the future number of applications is calculated on a site by site basis, based on the average number of disposal site license applications per year over the period 2006-2015 (Cefas, pers. Comm 2017). In this scenario an individual applicant will incur a maximum of one additional cost per calendar year. Additionally only one additional cost per disposal site is allowed for the total costs (irrespective of number of MCZs within 5km), consequently any duplication of costs have been removed. Therefore on average there were 12.8 applications per year within 5km of a MCZ recommended for designation for the third tranche of MCZ, equating to a cost of 12.8 x £0.003m = £0.041m

Costs for port development additional licence application costs are £0.007m per application (same unit cost as navigational dredging unit cost). It is assumed that each region will have some form of development over the 20 year IA period. The number of future port developments is based on MMO data on the number of licence applications received for port developments in each region over 2011 – 2013, for all regions the average number of applications was 56 per year. The assumption is that 50% of ports will incur this cost, this means for the full MCZ network there are 28 possible applications per year within 5km of an MCZ. Scaled down to 25% to represent the 3<sup>rd</sup> tranche of MCZs, consequently 7 proposed sites are expected to incur this costs for 1 application each years. This results in a cost of 7 x £0.007m = £0.050m. The sum of the cost for ports developments and disposal sites give a total of £0.050 + £0.041m = £0.091m per year. After adjusting to 2016 prices, this estimate equals £0.093m.

It is assumed that no mitigation will be required for sites proposed for designation in the 3<sup>rd</sup> tranche.

Ports and Harbours: High Estimate (Option 2a)																							
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)	
Cost to update assessment of environmental impact in future licence applications for navigational dredging only, incurred to ports within 5km of an MCZ that do not have a MDP.	0.076	0.000	0.000	0.076	0.000	0.000	0.076	0.000	0.000	0.076	0.000	0.000	0.076	0.000	0.000	0.076	0.000	0.000	0.076	0.000	0.534	0.027	
Cost to update assessment of environmental impact incurred to ports within 5km of an MCZ that do have a MDP for navigational dredging only.	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.001	
Total additional costs in future licence applications for all other port activities	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	7.363	0.368
<b>Total (£m)</b>	<b>0.472</b>	<b>0.368</b>	<b>0.368</b>	<b>0.444</b>	<b>0.368</b>	<b>0.368</b>	<b>0.444</b>	<b>0.368</b>	<b>0.368</b>	<b>0.444</b>	<b>0.368</b>	<b>0.368</b>	<b>0.444</b>	<b>0.368</b>	<b>0.368</b>	<b>0.444</b>	<b>0.368</b>	<b>0.368</b>	<b>0.444</b>	<b>0.368</b>	<b>7.925</b>	<b>0.396</b>	
<b>Present value costs (£m)</b>	<b>0.472</b>	<b>0.356</b>	<b>0.344</b>	<b>0.401</b>	<b>0.321</b>	<b>0.310</b>	<b>0.362</b>	<b>0.289</b>	<b>0.280</b>	<b>0.326</b>	<b>0.261</b>	<b>0.252</b>	<b>0.294</b>	<b>0.235</b>	<b>0.227</b>	<b>0.265</b>	<b>0.212</b>	<b>0.205</b>	<b>0.239</b>	<b>0.192</b>	<b>5.843</b>	<b>0.292</b>	

Assumptions: Additional costs will be incurred for future licence applications for navigational dredging areas, disposal sites and port developments within 5km of an MCZ. There is a one off transitional cost in 2019 for ports that have a maintenance dredge protocol (MDP) for navigational dredging of £0.027m which is Option 2a, where it is assumed that approximately 30% of ports within 5km (3 ports) have a costs of £0.009m x 3 = £0.027m with rounding. In addition, there is a cost of £0.007m per future licence application for those ports not covered by MDPs within 5km of MCZs and this applies to 70% of applications for the low estimate. It is assumed that a navigational dredge licence renews every 3 years and there are 15 navigational dredge licences at MCZs proposed for designation in the 3<sup>rd</sup> tranche. Cost from all 15 licences occur every three years from 2019 onwards resulting in costs of 15 x £0.007m x 70% = £0.075m in those years. After adjusting to 2016 prices, this estimate equals £0.076m

For the disposal sites within 5km of a proposed MCZ, it is assumed that every application will incur an additional cost to consider potential effects on MCZ broad scale habitats, regardless of whether they include multiple applications by the same applicant, this equates 43.6 applications and a total cost of £0.007m x 43.6 = £0.310m per year

Port development is as described in the best estimate. The sum of the cost for ports developments and disposal sites give a total of £0.050m + £0.310m = £0.361m per year. After adjusting to 2016 prices, this estimate equals £0.368m.



Ports and Harbours: Low Estimate (option 1b)																						
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Cost to update assessment of environmental impact in future licence applications for navigational dredging only, incurred to ports within 5km of an MCZ that do not have a MDP.	0.049	0.000	0.000	0.049	0.000	0.000	0.049	0.000	0.000	0.049	0.000	0.000	0.049	0.000	0.000	0.049	0.000	0.000	0.049	0.000	0.343	0.017
Cost to update assessment of environmental impact incurred to ports within 5km of an MCZ that do have a MDP for navigational dredging only.	0.082	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.082	0.004
Total additional costs in future licence applications for all other port activities	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	1.852	0.093
<b>Total (£m)</b>	<b>0.224</b>	<b>0.093</b>	<b>0.093</b>	<b>0.142</b>	<b>0.093</b>	<b>0.093</b>	<b>0.142</b>	<b>0.093</b>	<b>0.093</b>	<b>0.142</b>	<b>0.093</b>	<b>0.093</b>	<b>0.142</b>	<b>0.093</b>	<b>0.093</b>	<b>0.142</b>	<b>0.093</b>	<b>0.093</b>	<b>0.142</b>	<b>0.093</b>	<b>2.278</b>	<b>0.114</b>
<b>Present value costs (£m)</b>	<b>0.224</b>	<b>0.089</b>	<b>0.086</b>	<b>0.128</b>	<b>0.081</b>	<b>0.078</b>	<b>0.115</b>	<b>0.073</b>	<b>0.070</b>	<b>0.104</b>	<b>0.066</b>	<b>0.063</b>	<b>0.094</b>	<b>0.059</b>	<b>0.057</b>	<b>0.085</b>	<b>0.053</b>	<b>0.052</b>	<b>0.076</b>	<b>0.048</b>	<b>1.702</b>	<b>0.085</b>

Assumptions: Additional costs will be incurred for future licence applications for navigational dredging areas, disposal sites and port developments within 5km of an MCZ. There is a one off transitional cost in 2019 for ports that have a maintenance dredge protocol (MDP) for navigational dredging of £0.081m which is Option 1B, where it is assumed that approximately 55% of ports within 5km (9 ports) have a costs of £0.009m x 9 = £0.081m with rounding. In addition, there is a cost of £0.007m per future licence application for those ports not covered by MDPs within 5km of MCZs and this applies to 45% of applications for the low estimate. It is assumed that a navigational dredge licence renews every 3 years and there are 15 navigational dredge licences at MCZs proposed for designation in the 3rd tranche. Cost from all 15 licences occur every three years from 2019 onwards resulting in costs of 15 applications x £0.007m x 45% = £0.048m in those years. After adjusting to 2016 prices, this estimate equals £0.049m.

Disposal of dredged material at sea and Port development is as described in the best estimate.

Recreation: Best Estimate																						
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Additional cost from management scenarios	0.141	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.125	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	1.905	0.095

Additional cost from black bream restrictions	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192	3.838	0.192
<b>Total (£m)</b>	<b>0.333</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.317</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>0.283</b>	<b>5.743</b>	<b>0.287</b>
<b>Present value costs (£m)</b>	<b>0.333</b>	<b>0.273</b>	<b>0.264</b>	<b>0.255</b>	<b>0.247</b>	<b>0.238</b>	<b>0.230</b>	<b>0.222</b>	<b>0.215</b>	<b>0.208</b>	<b>0.225</b>	<b>0.194</b>	<b>0.187</b>	<b>0.181</b>	<b>0.175</b>	<b>0.169</b>	<b>0.163</b>	<b>0.158</b>	<b>0.152</b>	<b>0.147</b>	<b>4.236</b>	<b>0.212</b>	

Assumptions: Costs arise when management of some recreation activities change due to the designation of an MCZ relative to baseline management. The best estimate is the mid-point between the low and high cost scenarios. (Studland Bay and Bembridge are the only MCZ proposed sites in tranche 3 bearing costs, whilst Cumbria Coast may be subject to a voluntary code of conduct for anchoring/mooring, which has not been costed). This results in the cost of (£0.095m + £0.181m)/2 = £0.138m for the first year and (£0.007m + £0.171m)/2 = £0.089m for each of the remaining 19 years of the 20 year IA.

Additionally, an annual undiscounted cost of £0.188m (after adjusting to 2016 prices, this estimate equals £0.192m) has been included to account for the estimated impact upon chartered vessels operating near the Poole Rocks, Southbourne Rough and Purbeck Coast MCZs, due to the restriction on Black Bream nesting sites during the period April-July. This was derived from the best available evidence on the profit foregone by chartered vessels that was not displaced to other fishing opportunities. Total forgone income is derived from the product of fee paid per angler and the angler trips lost due to implementation of the MCZs (£0.775m). Forgone profit was calculated using the profit ratio for charter boats (£0.317m). A displacement assumption of 0.41 was assumed by comparing charter boat revenues in the nesting period with the months immediately adjacent (March, April) (£0.317 x (1-0.42) = £0.188m).

The total annualised value was partitioned between the three relevant MCZs. For every port from which charter boats operate in the region, each MCZ was assigned a proportion of that port's fishing effort based upon distance between the port and MCZ. Each port was then weighted by the number of boats estimated to operate from each port. Each MCZ is assigned a portion of the total cost to the charter boat industry equal to the number of charter boats operating out of local ports as a proportion of the local fleet. Purbeck Coast = 51.6% (£0.099m in 2016 prices); Southbourne Rough = 24.5% (£0.047m in 2016 prices); Purbeck Coast = 23.9% (£0.046m in 2016 prices).

Recreation: High Cost Estimate																						
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Additional cost from management scenarios	0.185	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	3.505	0.175

Additional cost from black bream restrictions	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	21.892	1.095
<b>Total Costs</b>	<b>1.280</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>1.269</b>	<b>25.397</b>	<b>1.270</b>
<b>Present value costs (£m)</b>	<b>1.280</b>	<b>1.226</b>	<b>1.185</b>	<b>1.145</b>	<b>1.106</b>	<b>1.069</b>	<b>1.033</b>	<b>0.998</b>	<b>0.964</b>	<b>0.931</b>	<b>0.900</b>	<b>0.869</b>	<b>0.840</b>	<b>0.812</b>	<b>0.784</b>	<b>0.758</b>	<b>0.732</b>	<b>0.707</b>	<b>0.683</b>	<b>0.660</b>	<b>18.682</b>	<b>0.934</b>	

Assumptions: High cost scenario is the highest potential management scenario. Management scenarios are site specific (provided in Annex A). Under this scenario there are additional costs due to the management in Bembridge and Studland bay. Management in Bembridge results in a one of cost of £0.010m in 2019, due to the resitting of moorings. Management in Studland bay results in an annual cost of £0.171m per year, due to the loss in GVA to the local economy.

Under the high estimated cost to chartered vessels, total forgone income is equal to £2.804m. Forgone profit was calculated using the profit ratio for charter boats (£1.262m). A displacement assumption of 0.15 was assumed by comparing charter boat revenues in the nesting period with the months immediately adjacent (March, April) (£1.262m x (1-0.15) = £1.072m). After adjusting to 2016 prices, this is equal to £1.095m.

<b>Recreation: Low Cost Estimate</b>																						
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Additional cost from management scenarios	0.097	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.075	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.306	0.015
Additional cost from black bream restrictions	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.221	0.011
<b>Total Costs</b>	<b>0.108</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.086</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.018</b>	<b>0.527</b>	<b>0.026</b>
<b>Present value costs (£m)</b>	<b>0.108</b>	<b>0.018</b>	<b>0.017</b>	<b>0.017</b>	<b>0.016</b>	<b>0.016</b>	<b>0.015</b>	<b>0.015</b>	<b>0.014</b>	<b>0.014</b>	<b>0.061</b>	<b>0.013</b>	<b>0.012</b>	<b>0.012</b>	<b>0.011</b>	<b>0.011</b>	<b>0.011</b>	<b>0.010</b>	<b>0.010</b>	<b>0.010</b>	<b>0.410</b>	<b>0.020</b>

Assumptions: Low cost scenario is the lowest potential management scenario. Management scenarios are site specific (provided in Annex A). Under this scenario there are additional costs due to the management in Studland bay. The management results in costs from the installation, operational and

maintenance of eco-mooring.

Under the low estimated cost to chartered vessels, total forgone income is equal to £0.115m. Forgone profit was calculated using the profit ratio for charter boats (£0.047m). A displacement assumption of 0.77 was assumed by comparing charter boat revenues in the nesting period with the months immediately adjacent (March, April) (£0.047m x (1-0.77) = £0.011m).

**Renewables: Best Estimate (Low and High)**

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
wave & tidal one-off costs	0.000	0.022	0.000	0.000	0.014	0.000	0.000	0.000	0.000	0.033	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.000	0.013	0.000	0.097	0.005
<b>Total costs (£m)</b>	<b>0.000</b>	<b>0.022</b>	<b>0.000</b>	<b>0.000</b>	<b>0.014</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.033</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.014</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.013</b>	<b>0.000</b>	<b>0.097</b>	<b>0.005</b>
<b>Present value costs (£m)</b>	<b>0.000</b>	<b>0.022</b>	<b>0.000</b>	<b>0.000</b>	<b>0.013</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.024</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.009</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.007</b>	<b>0.000</b>	<b>0.074</b>	<b>0.004</b>

Assumptions: for wind energy operators it is assumed that costs would be occur via additional application costs to consider the impacts upon broad-scale habitats. This is assumed to apply to proposed developments that spatially overlap with proposed MCZs or are 'near to' MCZs (as per MMO guidance) defined here as within 1km of an MCZ. The crown estate did not identify any wind development proposals to incur additional cost during the 20 year IA period.

For wave and tidal energy, the additional one-off licence cost is calculated from the estimated additional assessment costs of £0.014m per MCZ (uprated 2016 price) based on 8 developer estimates and £0.005m (uprated 2016 price) per MCZ broad scale habitat based on an estimate from Scottish Power (pers. comm. 2011). This is weighted appropriately per site to get an average cost ((£0.005m x number of broad scale habitats proposed for designation + £0.014m x 8) / 9) leading to slightly different application costs per site depending on the number of broad scale habitats designated. The number of applications during the 20 year period, was predicted for each potential wave and tidal development area by BEIS (formally DECC) (per. Comms. 2011) for those that overlap or are within 1km of a proposed MCZ. Where more than one wave or tidal development is expected to take place within the same potential development area in the same year, it is assumed that the cost is equal to the average of these costs.

There is expected to be a 2 applications for wave developments located within the same development during 2023, 2028 and 2033 resulting in a cost of (£0.015m + £0.013m)/2 = £0.014m for those years. For tidal developments these is expected to be 1 application in 2020 with a cost of £0.022m, 2 applications within the same potential development area in 2028 resulting in a cost of (£0.023m + £0.013m)/2 = £0.018m and 1 application in 2037 with a cost of £0.013m.

No developments are expected to face mitigation costs as a result of MCZs, hence there is no sensitivity analysis for wind, wave and tidal developments. During consultation, a response from the Crown Estate highlighted wind developments near to Berwick to St Mary's, Markham's Triangle and Kentish Knock East. During

further correspondence, Crown Estate confirmed that they anticipated no additional costs associated with these developments due to no requirements of further EIAs, or uncertainty around the future of the development.

## Public Costs:

National Defence: Best Estimate (also low and high)																						
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
One-off transitional costs for adjustment of electronic tools and charts (£m)	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000
Annual Costs for maintenance of electronic tools and charts and costs to mitigate impacts of activity (£m)	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.058	0.003
<b>Total costs (£m)</b>	<b>0.010</b>	<b>0.004</b>	<b>0.004</b>	<b>0.004</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.064</b>	<b>0.003</b>
<b>Present value costs (£m)</b>	<b>0.010</b>	<b>0.004</b>	<b>0.004</b>	<b>0.004</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.050</b>	<b>0.003</b>

Assumptions: The Ministry of Defence provided costs and assumptions for the impact of MCZs on national defence and this was updated in January 2017 (Ministry of Defence. pers. comm. 2017). As it is not known where military activities will take place costs were estimated for the 127 regional MCZ project sites then scaled down by 23.6% to represent the cost of the regional MCZ project sites in the 3<sup>rd</sup> tranche (30/127). The MoD estimate that the transitional cost of adjusting electronic tools and charts for the whole network is £0.026m based on officer time and overheads, the cost scaled down for the 3<sup>rd</sup> tranche only is £0.026m x 23.6% = £0.006m in 2019, which is a transitional cost. Annual costs are for maintenance of charts and mitigation of activities on MCZs which, based on officer time and technical inputs by UK Hydrographic Office. For all regional MCZ project sites this results in a cost of £0.017m per year for the first 4 years and £0.011m per year thereafter. Scaled down to account for the 3<sup>rd</sup> tranche only results in a cost of £0.017m x 23.6% = £0.004m per year for the first 4 years, and £0.011m x 23.6% = £0.003m per year thereafter. As the costs provided by the Mod were based only on the 127 regional project sites, the new option sites are not included in this cost calculation. Nevertheless the additional cost is expected to be minimal, hence it was seen as disproportionate repeat the original calculation to include the new option sites.

Management of the sites: Best Estimate																						
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
IFCA implementation of commercial fisheries and recreational management measure costs <6nm	0.147	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.147	0.007
MMO implementation of recreational management measures costs <12nm	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.003
Defra implementation of commercial fisheries management measure costs >6nm	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.001
IFCA surveillance (not enforcement) of commercial fisheries and recreational angling management measure costs <6nm	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	7.977	0.399
MMO enforcement of recreational management measure costs <12nm, and commercial fisheries >6nm	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	1.167	23.337	1.167

MMO administration costs	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	1.618	0.081
<b>Total Costs (£m)</b>	<b>1.880</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>1.647</b>	<b>33.165</b>	<b>1.658</b>
<b>Present value costs (£m)</b>	<b>1.880</b>	<b>1.591</b>	<b>1.537</b>	<b>1.485</b>	<b>1.435</b>	<b>1.386</b>	<b>1.339</b>	<b>1.294</b>	<b>1.250</b>	<b>1.208</b>	<b>1.167</b>	<b>1.128</b>	<b>1.090</b>	<b>1.053</b>	<b>1.017</b>	<b>0.983</b>	<b>0.950</b>	<b>0.917</b>	<b>0.886</b>	<b>0.856</b>	<b>24.454</b>	<b>1.223</b>	

Assumptions: The best estimate is the mid-point between the low and high cost scenarios for management and enforcement of MCZs. See below for low and high specific assumptions.

<b>Management of the sites: Low Estimate</b>																							
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)	
IFCA implementation of commercial fisheries and recreational management measure costs <6nm	0.072	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.072	0.004
MMO implementation of recreational management measures costs <12nm	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046	0.002
Defra implementation of commercial fisheries management measure costs >6nm	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.001
IFCA surveillance (not enforcement) of commercial fisheries and recreational angling management measure costs <6nm	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	0.317	6.333	0.317

MMO enforcement of recreational management measure costs <12nm, and commercial fisheries >6nm	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965	19.303	0.965
MMO administration costs	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	1.618	0.081
<b>Total Costs</b>	<b>1.506</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>1.363</b>	<b>27.398</b>	<b>1.370</b>
<b>Present value costs (£m)</b>	<b>1.506</b>	<b>1.317</b>	<b>1.272</b>	<b>1.229</b>	<b>1.188</b>	<b>1.147</b>	<b>1.109</b>	<b>1.071</b>	<b>1.035</b>	<b>1.000</b>	<b>0.966</b>	<b>0.933</b>	<b>0.902</b>	<b>0.871</b>	<b>0.842</b>	<b>0.813</b>	<b>0.786</b>	<b>0.759</b>	<b>0.734</b>	<b>0.709</b>	<b>20.189</b>	<b>1.009</b>	

Assumptions: Costs to IFCA have been supplied by IFCA in different regions or where individual IFCAs have not supplied information average implementation and enforcement costs provided by MMO (Pers. Comms. 2011) have been used, which have been updated to 2016 prices. For the low cost scenario the transitional IFCA implementation costs amount to £0.072m in 2019 for all IFCAs, this reflects the lowest possible management scenario for each site (detailed in annex A). Annual IFCA enforcement costs (mainly surveillance in as most sites are no additional mandatory management in the low scenario) are estimated at £0.317m over all IFCAs per year.

Costs to MMO are on a site by site basis based on the management scenarios and MMO assumptions which include the assumed employee time taken and other overheads to implement, administer and enforce fisheries management measures in sites beyond 6nm and sites where recreational management is a possibility (Studland bay and Bembridge). The MMO supplied updated unit cost for the 3<sup>rd</sup> tranche sites (MMO, pers. comm. 2017). For the low cost scenario the transitional MMO implementation costs amount to £0.046m. With the lowest management measures (recreational management and fisheries beyond 6nm) MMO estimate enforcement costs of £0.965m per year for 18 sites identified to require management in the 3<sup>rd</sup> tranche and additional administration costs of £0.081m per year.

Defra costs to implement fisheries management for MCZs outside of 6nm where it is assumed that management of fishing activities is required are assumed to be a transitional cost in 2019 of £0.026 (updated to 2016 prices).

<b>Management of the sites: High Estimate</b>																						
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)



IFCA implementation of commercial fisheries and recreational management measure costs <6nm	0.223	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.223	0.011
MMO implementation of recreational management measures costs <12nm	0.074	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.074	0.004
Defra implementation of commercial fisheries management measure costs >6nm	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.001
IFCA surveillance (not enforcement) of commercial fisheries and recreational angling management measure costs <6nm	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	0.481	9.620	0.481
MMO enforcement of recreational management measure costs <12nm, and commercial fisheries >6nm	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	1.369	27.371	1.369
MMO administration costs	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	1.618	0.081
<b>Total Costs</b>	<b>2.253</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>1.930</b>	<b>38.931</b>	<b>1.947</b>	
<b>Present value costs (£m)</b>	<b>2.253</b>	<b>1.865</b>	<b>1.802</b>	<b>1.741</b>	<b>1.682</b>	<b>1.625</b>	<b>1.570</b>	<b>1.517</b>	<b>1.466</b>	<b>1.416</b>	<b>1.369</b>	<b>1.322</b>	<b>1.278</b>	<b>1.234</b>	<b>1.193</b>	<b>1.152</b>	<b>1.113</b>	<b>1.076</b>	<b>1.039</b>	<b>1.004</b>	<b>1.004</b>	<b>28.719</b>	<b>1.436</b>	

Assumptions: Costs to IFCA have been supplied by IFCA in different regions or where individual IFCA have not supplied information average implementation and enforcement costs provided by MMO (Pers. Comms. 2011) have been used, which have been updated to 2016 prices. The high cost scenario the transitional IFCA implementation costs amount to £0.223m in 2019 for all IFCA, this reflects the highest possible management scenario for each site (detailed in annex A). Annual IFCA enforcement costs are estimated at £0.481m over all IFCA per year.

Costs to MMO are on a site by site basis based on the management scenarios and MMO assumptions which include the assumed employee time taken and other overheads to implement, administer and enforce fisheries management measures in sites beyond 6nm and sites where recreational management is a possibility (Studland bay and Bembridge). The MMO supplied updated unit cost for the 3<sup>rd</sup> tranche sites (MMO, pers. comm. 2017). For the high cost scenario the transitional MMO implementation costs amount to £0.074m. With the highest management measures (recreational management and fisheries beyond 6nm) MMO estimate enforcement costs of £1.369m per year for 18 sites identified to require management in the 3<sup>rd</sup> tranche and additional administration costs of £0.081m per year.

Defra costs to implement fisheries management for MCZs outside of 6nm where it is assumed that management of fishing activities is required are assumed to be a transitional cost in 2020 of £0.026m (updated to 2016 prices).

Ecological Survey: Baseline setting and monitoring. Best estimate (include low and high)																						
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total (£m)	Annual Average (£m)
Total NE one-off costs (transitional baseline setting) (£m)	1.149	1.149	1.149	1.149	1.149	1.149	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.891	0.345
Total NE one-off costs (transitional baseline setting) (£m)	0.042	0.042	0.042	0.042	0.042	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.251	0.013

HMS																								
Total JNCC one-off costs (transitional baseline setting) (£m)	1.266	1.266	1.266	1.266	1.266	1.266	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.593	0.380
Total NE one-off costs of monitoring (£m)	0.000	0.000	0.000	0.000	0.000	0.000	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	1.154	16.156	0.808
Total NE one-off costs of monitoring (£m) HMS	0.000	0.000	0.000	0.000	0.000	0.000	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.586	0.029
Total JNCC one-off costs of monitoring (£m)	0.000	0.000	0.000	0.000	0.000	0.000	1.266	1.266	1.266	1.266	1.266	1.266	1.266	1.266	1.266	1.266	1.266	1.266	1.266	1.266	1.266	1.266	17.718	0.886
<b>Total costs (£m)</b>	<b>2.456</b>	<b>2.456</b>	<b>2.456</b>	<b>2.456</b>	<b>2.456</b>	<b>2.456</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>2.461</b>	<b>49.195</b>	<b>2.460</b>
<b>Present value costs (£m)</b>	<b>2.456</b>	<b>2.373</b>	<b>2.293</b>	<b>2.215</b>	<b>2.140</b>	<b>2.068</b>	<b>2.002</b>	<b>1.935</b>	<b>1.869</b>	<b>1.806</b>	<b>1.745</b>	<b>1.686</b>	<b>1.629</b>	<b>1.574</b>	<b>1.521</b>	<b>1.469</b>	<b>1.419</b>	<b>1.371</b>	<b>1.325</b>	<b>1.280</b>	<b>1.280</b>	<b>36.177</b>	<b>1.809</b>	

Assumptions: Costs to conduct ecological surveys in MCZ Sites, additional features and HMS sites located within 12nm are incurred by NE and those located beyond 12nm are incurred by JNCC. The cost for the first 6 years for both NE and JNCC are transitional as they are to establish a baseline. The sequent years are for the cost of monitoring.

Reporting cycles for MCZs are every 6 years but it is not known in which year the detailed baseline and subsequent monitoring will be undertaken. Therefore all estimates of baseline and monitoring costs are divided by 6 and baseline costs included in each of the first 6 years of the analysis.

For costs incurred by NE (uprated to 2016 prices) for features within 6nm have an estimated unit cost of £0.05m for baselining and £0.04m for monitoring, whilst for those between 6nm and 12nm have the estimated unit costs of £0.09m and £0.075m respectively. Unit costs for new option sites are estimated to be £0.07m for baselining and £0.04m for monitoring. These baseline unit costs relate to the broad scale and features of conservation interest (FOCI) only, whilst the monitoring unit cost relate to the total number of features. Cost per site or additional features added to existing sites were calculated by multiplying the number of respective number of features by the unit cost. This gives a total for NE baseline cost setting of £1.266m per year for the first 6 years and a total for monitoring costs of £1.154m per year starting from 2025. Additionally NE provided site by site costs for the baselining and monitoring of HMS sites this came to a total of 0.041 per year.

JNCC have provided costs on a site by site basis (pers. comm. 2017) based on the costs of using a boat and its crew, survey time, weather downtime and data analysis, interpretation and report production for the 3<sup>rd</sup> tranche sites. This equates to a total cost of £7.59m over 6 years for the 13 MCZ sites located beyond 12nm and the 2 existing sites located beyond 12nm where additional features are proposed. As it is not known in which year the detailed baseline and subsequent monitoring will be undertaken this figure is divided by 6 to obtain a cost to JNCC of £1.266m per year.

Whilst JNCC has confirmed that the assumptions for the monitoring of the offshore sites are the same as the ones applied in tranche 2, NE has reviewed and updated the assumptions provided during tranche 2 pre-consultation and new costings have been delivered accordingly. Following its investigation of the spatial overlaps of MCZs and SACs, NE opted for the removal of the previous assumption that an overlap of designation types would incur a 50% cost saving (NE, pers. comm. 2017). Therefore, the public costs calculated for tranche 3 for the monitoring of habitats and features proposed to complete the network is higher. Sensitivity analysis behind cost savings assumptions and economies of scale have not been considered at this stage.

## Annex E: Impacts on non-UK vessels

Although impacts outside of the UK are not formally assessed as part of UK policy impact assessments, the implications for non-UK commercial fishing vessels were considered in full when deciding which sites to designate. This is because, within membership of the EU, any management measures required for these sites have to be agreed at the EU level<sup>103</sup>.

In order to gather evidence for analysis, in 2016, relevant member states were contacted by Defra and the MMO and asked to provide data on the revenues obtained by their vessels (both through bottom-abrading gears and other gears) in the proposed sites. Belgium, Denmark, France, Ireland and the Netherlands provided data, however, Germany and Spain did not submit data.

The tranche 3 consultation provided all countries with an opportunity to comment on the proposals and on the estimated costs of designation to their fishing industries. Consultation responses were received from authorities and/or commercial stakeholders in France, Belgium and the Netherlands. Although some of these responses provided updated activity information, no updated cost estimates were provided. No specific issues were raised concerning the assumptions and methods used to calculate costs to non-UK fishing fleets. On this basis, the same assumptions have been applied as pre-consultation and costs have not changed.

The following table provides an analysis of likely impacts on non-UK vessels at particular sites<sup>104</sup>. The second column sets out the data received from other countries on the level of fishing by their vessels in the proposed area and the third column sets out a range and best estimate of how much revenues may be affected by the site designation<sup>105</sup>. **These figures are not comparable to the impacts estimated for UK vessels, which are based on lost Gross Value Added.** These impacts are presented as a range: at the bottom end, the impact on non-UK vessels will be zero as it is assumed that all fishermen move their fishing elsewhere; at the top of the range, the assumption is that fishermen stop all fishing using bottom-abrading gear that would have been undertaken in that area and so this reflects the total fishing values reported by countries. In order to estimate the likely impact (as some fishing is likely to be displaced) the same displacement effects were assumed for non-UK vessels as for UK vessels (see Annex A for details of the methodology). Actual impacts on non-UK vessels will probably depend on the Gross Value Added rather than the revenue for each country and their ability to fish elsewhere, which is likely to be greater for such vessels as they have a large range due to their transnational nature and size.

Note that all figures in the following table are expressed in 2016 prices and are rounded to 3 decimal places. Figures may not sum exactly due to rounding.

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<sup>103</sup> Our future fishing arrangements with the EU after EU exit will be a matter for negotiation.

<sup>104</sup> Note: Non-UK fishing vessels are not permitted to fish within 6nm of the UK coast unless historic access rights exist (e.g. North of Lundy) and so most entirely inshore sites are excluded from this analysis

<sup>105</sup> The data is based on a formal request to countries to provide data on affected revenues. This data was used for all but two of the sites listed in the table under 'pers. comm. 2016/2017' with the exception of South West Approach to the Bristol Channel and East of Start Point. For these two sites, data were not available and in-house analyses were carried out instead. Some uncertainties still apply for the non-UK landing activities.

MCZ	Annual average non-UK revenues and data source(s) by country (£m/yr <sup>106</sup> 2009-2015 average unless otherwise stated)	Total annual revenues potentially affected by management (£m/yr 2009-2015 average unless otherwise stated) <sup>107 108</sup>
Cape Bank	<p>Belgium: 0.215 (Bottom Mobile Gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</p> <p>France: 0.190 (Mobile Gears<sup>109</sup>) Source: Les Pêcheurs de Bretagne and Cobrenord (pers. comms. 2017)<sup>110</sup></p> <p>Ireland: 0.013 (Bottom Mobile Gears); &lt; 0.001 (Mid-water gear) Source: Marine Institute Ireland (pers. comms. 2016)</p> <p>Netherlands: &lt; 0.001 (Mid-water mobile gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)<sup>111</sup></p> <p><b>Total Revenue Bottom-Abrading Gears: 0.417</b> <b>Total Non-UK Revenue: 0.417</b></p>	Best Estimate: 0.053 (0.000 - 0.425)
South West Deeps (East)	<p>Denmark: 0.286 (Mid-Water Mobile Gear) Source: Ministry of Environment and Food of Denmark (pers. comms. 2016)</p> <p>France: 1.681 (Mobile Gear) Source: Les Pêcheurs de Bretagne and Cobrenord (pers. comms. 2017)</p> <p>Ireland: 0.114 (Bottom Mobile Gear); 0.288 (Mid Water Mobile Gear); &lt; 0.001 (Static); Source: Marine Institute Ireland (pers. comms. 2016)</p>	Best estimate: 0.229 (0.000 – 1.833)

<sup>106</sup> Where revenues were provided in Euros this has been converted to Pounds Sterling, using the average exchange rate corresponding to the price year of the revenue data used.

<sup>107</sup> Low and high estimates are calculated based on each site's respective lowest and highest management scenarios as outlined in Annex A. The best estimate is calculated from the highest scenario, but with the following assumptions: only 50% of estimated value landed via mobile gear will be affected, only 25% of estimated value landed via static gear will be affected, 75% of commercial fishing activity will be displaced to other locations, the other 25% will be lost.

<sup>108</sup> All figures expressed in this column have been adjusted to 2016 prices.

<sup>109</sup> Data from this source does not differentiate bottom mobile gear and mid-water mobile gear. For this analysis, the value of landings from French vessels using mobile gear, has been included in the total revenue of bottom-abrading gears.

<sup>110</sup> All revenue figures from this source is based on 2013 only

<sup>111</sup> All revenue figures from this source are an average of 2010 – 2015

	<p>Netherlands: 0.932 (Mid-Water Mobile Gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</p> <p><b>Total Revenue Bottom-Abrading Gears:</b> 1.796</p> <p><b>Total Non-UK Revenue:</b> 3.302</p>	
South of Celtic Deep	<p>Belgium: 0.061 (Bottom Mobile Gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</p> <p>Denmark: 0.002 (Mid-Water Mobile Gear) Source: Ministry of Environment and Food of Denmark (pers. comms. 2016)</p> <p>France: 0.097 (Mobile Gear) Source: Les Pêcheurs de Bretagne and Cobrenord (pers. comms. 2017)</p> <p>Ireland: 1.266 (Bottom Mobile Gear); 0.228 (Mid-Water Mobile Gear); 0.014 (Static) Source: Marine Institute Ireland (pers. comms. 2016)</p> <p>Netherlands: &lt; 0.001 (Mid-Water Mobile Gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</p> <p><b>Total Revenue Bottom-Abrading Gears:</b> 1.424</p> <p><b>Total Non-UK Revenue:</b> 1.667</p>	Best estimate: 0.182 (0.000 -1.453)
South of the Isles of Scilly	<p>France: 0.065 (Mobile Gear) Source: Les Pêcheurs de Bretagne and Cobrenord (pers. comms. 2017)</p> <p><b>Total Revenue Bottom-Abrading Gears:</b> 0.065</p> <p><b>Total Non-UK Revenue:</b> 0.065</p>	Best estimate: 0.008 (0.000 – 0.066)
North East of Haig Fras	<p>Belgium: 0.040 (Bottom Mobile Gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</p> <p>France: 0.159 (Mobile Gear) Source: Les Pêcheurs de Bretagne and Cobrenord (pers. comms. 2017)</p>	Best estimate: 0.052 (0.000 – 0.420)

	<p>Ireland: 0.213 (Bottom Mobile Gear); 0.001 (Mid-Water Mobile Gear); 0.003 (Static) Source: Marine Institute Ireland (pers. comms. 2016)</p> <p><b>Total Revenue Bottom-Abrading Gears:</b> 0.412</p> <p><b>Total Non-UK Revenue:</b> 0.416</p>	
Goodwin Sands	<p>Belgium: 0.141 (Bottom mobile gear); &lt; 0.001 (Mid-water mobile gear); 0.003 (static gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</p> <p>Denmark: 0.001 (Mid-Water Mobile Gear); &lt; 0.001 (Static gear) Source: Ministry of Environment and Food of Denmark (pers. comms. 2016)</p> <p>France: &lt; 0.001 (mobile gear) Source: Nord-Pas de Calais/Picardie Regional Fisheries Committee (pers. comms. 2016)</p> <p>Netherland: &lt; 0.001 (bottom mobile gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</p> <p><b>Total Revenue Bottom-Abrading Gears:</b> 0.141</p> <p><b>Total Non-UK Revenue:</b> 0.145</p>	Best Estimate: 0.018 (0.000 - 0.144)
Inner Bank	<p>Belgium: 0.592 (Bottom Mobile Gear); &lt;0.001 (Mid-Water Mobile Gear); &lt; 0.001 (Static Gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</p> <p>Denmark: 0.003 (Mid-Water Mobile Gear) Source: Ministry of Environment and Food of Denmark (pers. comms. 2016)</p> <p>France: 0.274 (Mobile Gear) Source: Nord-Pas de Calais/Picardie Regional Fisheries Committee (pers. comms. 2016)</p> <p>Ireland: 0.002 (Bottom Mobile Gear); &lt; 0.001 (Static Gear)</p>	Best estimate: 0.111 (0.000 – 0.888)



	<p>Source: Marine Institute Ireland (pers. comms. 2016)</p> <p>Netherlands: 0.002 (Bottom Mobile Gear); 0.002 (Mid-Water Mobile Gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</p> <p><b>Total Revenue Bottom-Abrading Gears:</b> 0.870</p> <p><b>Total Non-UK Revenue:</b> 0.875</p>	
Foreland	<p>Belgium: 0.141 (Bottom Mobile Gear); &lt; 0.001 (Mid-Water Mobile Gear); 0.003 (Static Gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</p> <p>Denmark: 0.001 (Mid Water Mobile Gear); &lt; 0.001 (Static) Source: Ministry of Environment and Food of Denmark (pers. comms. 2016)</p> <p>France: 1.215 (Mobile Gear) Source: Nord-Pas de Calais/Picardie Regional Fisheries Committee (pers. comms. 2016)</p> <p>Netherlands: 0.033 (Bottom Mobile Gear); 0.046 (Mid-Water Mobile Gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</p> <p><b>Total Revenue Bottom-Abrading Gears:</b> 1.389</p> <p><b>Total Non-UK Revenue:</b> 1.438</p>	Best estimate: 0.178 (0.000 – 1.420)
Kentish Knock East	<p>Belgium: 0.185 (Bottom Mobile Gear); &lt; 0.001 (Static gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</p> <p>France: 0.007 (Mobile gear) Source: Nord-Pas de Calais/Picardie Regional Fisheries Committee (pers. comms. 2016)</p> <p>Netherlands: 0.133 (Bottom mobile gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</p>	Best estimate: 0.042 (0.000 – 0.331)

	<p><b>Total Revenue Bottom-Abrading Gears:</b> 0.325</p> <p><b>Total Non-UK Revenue:</b> 0.325</p>	
Orford Inshore	<p>Belgium: 0.058 (Bottom Mobile Gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</p> <p>France: 0.003 (Mobile Gear) Source: Nord-Pas de Calais/Picardie Regional Fisheries Committee (pers. comms. 2016)</p> <p>Netherlands: &lt; 0.001 (Bottom Mobile Gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</p> <p><b>Total Revenue Bottom-Abrading Gears:</b> 0.061</p> <p><b>Total Non-UK Revenue:</b> 0.061</p>	Best estimate: 0.008 (0.000 – 0.062)
Holderness Offshore	<p>Belgium: 0.010 (Bottom mobile gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</p> <p>Denmark: &lt; 0.001 (Bottom mobile gear); 0.003 (mid-water mobile gear); &lt; 0.001 (static gear) Source: Ministry of Environment and Food of Denmark (pers. comms. 2016)</p> <p>France: 0.099 (Mobile gear) Source: Nord-Pas de Calais/Picardie Regional Fisheries Committee (pers. comms. 2016)</p> <p>Netherlands: 0.012 (bottom mobile gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</p> <p><b>Total Revenue Bottom-Abrading Gears:</b> 0.120</p> <p><b>Total Non-UK Revenue:</b> 0.120</p>	Best estimate: 0.015 (0.000 – 0.122)
Markham's Triangle	<p>Belgium: 0.151 (Bottom Mobile Gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</p> <p>Denmark: 0.040 (Bottom Mobile Gear); 0.053</p>	Best estimate: 0.057 (0.000 – 0.454)

	<p>(Mid-Water Mobile Gear); &lt; 0.001(Static Gear) Source: Ministry of Environment and Food of Denmark (pers. comms. 2016)</p> <p>France: 0.020 (Mobile Gear) Source: Nord-Pas de Calais/Picardie Regional Fisheries Committee (pers. comms. 2016)</p> <p>Netherlands: 0.230 (Bottom Mobile Gear) Source: VisNed (pers. comms. 2016)</p> <p>Sweden: 0.005 (Mobile Gear) Source: Swedish agency for marine and water management (pers. comms. 2016)</p> <p><b>Total Revenue Bottom-Abrading Gears:</b> 0.445 <b>Total Non-UK Revenue:</b> 0.498</p>	
South Rigg	<p>Belgium: 0.010 (Bottom Mobile Gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</p> <p>Ireland: 0.012 (Bottom Mobile Gear); 0.001 (Mid-Water Gear) Source: Marine Institute Ireland, pers. comms. 2016</p> <p>Netherlands: 0.002 (Bottom Mobile Gear); 0.002 (Mid-Water Mobile Gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)</p> <p><b>Total Revenue Bottom-Abrading Gears:</b> 0.024 <b>Total Non-UK Revenue:</b> 0.026</p>	Best estimate: 0.003 (0.000 – 0.024)
Queenie Corner	<p>Belgium: 0.040 (Bottom Mobile Gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)</p> <p>Ireland: 0.976 (Bottom Mobile Gear); 0.001 (Mid-water Mobile Gear); &lt; 0.001 (Static Gear) Source: Marine Institute Ireland (pers. comms. 2016)</p> <p>Netherlands: 0.002 (Bottom Mobile Gear);</p>	Best estimate: 0.130 (0.000 – 1.04)

	0.002 (Mid-Water Mobile Gear) Source: Dutch Ministry of Economic Affairs (per. comms. 2016)  <b>Total Revenue Bottom-Abrading Gears:</b> 1.019 <b>Total Non-UK Revenue:</b> 1.021	
South-West Approaches to the Bristol Channel	Formal request was not submitted to countries. N/A <sup>112</sup> :	N/A
West of Copeland	Belgium: 0.016 (Bottom Mobile Gear) Source: Belgium Institute for Agricultural and Fisheries Research (pers. comms. 2017)  <b>Total Revenue Bottom-Abrading Gears:</b> 0.016 <b>Total Non-UK Revenue:</b> 0.016	Best estimate: 0.002 (0.000 – 0.016)
East of Start point <sup>9</sup>	Formal request was not submitted to countries. N/A	N/A
<b>Total</b>		<b>Best estimate: 1.308</b> <b>(0.000-11.729)</b>

<sup>112</sup> Data for this site could not be collected directly from member states. Some in-house analysis was carried out but due to some uncertainties on non-UK revenues figures are not included here.

## **Annex F: Additional features to be included in existing first and second tranche Marine Conservation Zones (MCZs)**

A number of additional features are to be included within existing MCZs designated in the 1st and 2nd tranches. These are features that were not supported by sufficient scientific evidence during previous tranches, but for which subsequent evidence has become available and supports designation. These sites and the additional features are described below.

### **Chesil Beach and Stennis Ledges**

Chesil Beach and Stennis Ledges MCZ is an inshore site located off the Dorset coast. The site protects an area of approximately 37 km<sup>2</sup>. The four additional features to be designated at this site are high energy circalittoral rock, subtidal coarse sediment, subtidal mixed sediment and subtidal sand. There are no additional costs to business attributable to the inclusion of these features.

### **Cumbria Coast**

Cumbria Coast MCZ is an inshore site located along the Cumbrian Coast, south of Whitehaven in the Irish Sea. The original site covers an area of approximately 18 km<sup>2</sup>. The additional feature to be designated is Razorbill (*Alca torda*) and a small extension (approximately 4 km<sup>2</sup>) is also to be made to the site boundary. There is the potential for some costs to fishing or recreational activities. These have not been quantified due to uncertainties around potential restrictions but they are expected to be small.

### **Dover to Deal**

Dover to Deal MCZ is an inshore site located off the coast of Kent. The site covers an area of 10 km<sup>2</sup>. The four additional features to be designated at this site are blue mussel beds, ross worm reefs (*Sabellaria spinulosa*), high energy circalittoral rock and moderate energy circalittoral rock. The addition of these features will incur a small cost to the commercial fishing sector (best cost estimate of £56 per year).

### **East of Haig Fras`**

East of Haig Fras MCZ is an offshore site located in the Celtic sea, approximately 67 km north of Land's End in Cornwall. The site covers an area of 400 km<sup>2</sup>. The three additional features to be designated at this site are high energy circalittoral rock, sea-pen & burrowing megafauna communities, and fan mussel (*Atrina fragilis*). There are no additional costs to business attributable to the inclusion of these features.

### **Isles of Scilly sites**

The Isles of Scilly MCZ sites are composed of 11 inshore sites and lie approximately 45 km southwest of the Cornish coast. Additional features will be designated in four of these sites and these are listed below. There are no additional costs to business attributable to the inclusion of these features.

### **Isles of Scilly- Bristows to the Stones**

This site protects 28 km<sup>2</sup>. The two additional features to be designated are moderate energy circalittoral rock and subtidal coarse sediment.

### **Isles of Scilly- Higher Town**

This site protects 2 km<sup>2</sup>. The additional feature to be designated is stalked jellyfish (*Calvadosia cruxmelitensis*).

### **Isles of Scilly- Men a Vaur to White Island**

This site protects 4 km<sup>2</sup>. The additional feature to be designated is giant goby (*Gobius cobitis*).

### **Isles of Scilly- Peninnis to Dry Ledge**

This site protects 3 km<sup>2</sup>. The additional feature to be designated is stalked jellyfish (*Calvadosia cruxmelitensis*).

### **Medway Estuary**

Medway Estuary MCZ is an inshore site located on the Kent coast that protects an area of 60 km<sup>2</sup>. The additional feature to be designated is smelt (*Osmerus eperlanus*) and a small extension (approximately 1.4 km<sup>2</sup>) is also to be made to the site boundary. There are no additional costs to business attributable to the inclusion of this feature.

### **Poole Rocks**

Poole Rocks MCZ is an inshore site that covers an area of 4 km<sup>2</sup>. It is located in the Eastern Channel, east of the entrance to Poole Harbour. The one additional feature to be designated is black bream (*Spondyllosoma cantharus*). The addition of this feature will incur an estimated cost of £312 per year to the commercial fishing sector and £45,000 per year to the recreational sector.

### **South Dorset**

South Dorset MCZ is an inshore site located off the south coast of Dorset, south-east of Swanage. The site protects an area of 193 km<sup>2</sup>. The additional feature to be designated is high energy circalittoral rock. There are no additional costs to business attributable to the inclusion of this feature.

### **Thanet Coast**

Thanet Coast MCZ is an inshore site located on the Kent coast that protects an area of 64 km<sup>2</sup>. The additional feature to be designated is stalked jellyfish (*Haliclystus auricula*). There are no additional costs to business attributable to the inclusion of this feature.

### **The Canyons**

The Canyons MCZ is an offshore site located to the far south-west corner of the UK's continental shelf area. The site protects an area of around 661 km<sup>2</sup> and lies more than 330

km from the Cornish coast. The two additional features to be designated are coral gardens and sea pen & burrowing megafauna. There are no additional costs to business attributable to the inclusion of these features.

### **Torbay**

Torbay MCZ is an inshore site on the South Devon coast that protects an area of 20 km<sup>2</sup>. The two additional features to be designated are peacock's tail (*Padina pavonica*) and subtidal coarse sediment. There are no additional costs to business attributable to the inclusion of these features.

### **Whitsand and Looe Bay**

The Whitsand and Looe Bay MCZ is an inshore site located off the south coast of Cornwall. The site protects an area of 52 km<sup>2</sup>. The four additional features to be designated are giant goby (*Gobius cobitis*), moderate energy circalittoral rock and stalked jellyfish species (*Calvadosia campanulata* and *Calvadosia cruxmelitensis*). There are no additional costs to business attributable to the inclusion of these features.

## **Annex G: Summary of sites to be designated in the third tranche of Marine Conservation Zones (MCZs)**

The sites to be designated in the 3rd tranche of MCZs are described below. These sites have been selected because they fill important ecological gaps in the Marine Protected Area network whilst minimising negative socioeconomic impacts on sea-users. Site numbers refer to the map in the Impact Assessment.

### **Albert Field (1)**

This is an inshore site located off the south coast of England within the Eastern Channel region, approximately 20 km south of the entrance to Poole Harbour. It extends from the 6 nm limit at its northern boundary to the 12 nm limit at its southern boundary. This site covers approximately 192 km<sup>2</sup>. This site will protect subtidal coarse sediment and subtidal mixed sediment.

The overall cost estimate for the site is approximately £1k per year relating to the commercial fishing sector.

### **Axe Estuary (2)**

This is an inshore site located near Seaton in Devon in the Eastern Channel region. The site covers an area of 0.33 km<sup>2</sup>. The site will protect estuarine rocky habitats, intertidal coarse sediment, coastal saltmarsh and saline reedbeds, intertidal mixed sediment and intertidal mud.

The cost estimate for the site is approximately £5k per year relating to the ports and harbours sector.

### **Beachy Head East (3)**

This is an inshore site located in the Eastern Channel region on the South East Coast of England and covering an area of 195 km<sup>2</sup>. The site will protect high/moderate energy circalittoral rock, littoral chalk communities, subtidal sand, subtidal coarse sediment, short-snouted seahorse (*Hippocampus hippocampus*), subtidal chalk, peat and clay exposures and ross worm reefs (*Sabellaria spinulosa*).

The cost estimates for the site are approximately £11k per year relating to the commercial fishing sector and £5k per year relating to the ports and harbours sector.

### **Bembridge (4)**

This is an inshore site located adjacent to the east coast of the Isle of Wight and covering an area of 75 km<sup>2</sup> within the Eastern Channel region. The site will protect sheltered muddy gravels, short-snouted seahorse (*Hippocampus hippocampus*), stalked jellyfish (*Haliclystus* species and *Calvadosia campanulata*), subtidal coarse sediment, subtidal sand, native oyster (*Ostrea edulis*), seagrass beds, maerl beds, sea pens and burrowing megafauna, peacock's tail (*Padina pavonica*), subtidal mixed sediments and subtidal mud.



The cost estimates for the site are approximately £6k per year relating to the commercial fishing sector, £4k per year relating to the ports and harbours sector, £600 per year to the renewables sector and £300 per year to recreation.

### **Berwick to St Mary's<sup>113</sup> (5)**

This inshore site is located along the Northumberland coast in the north east of England within the Northern North Sea region. It encompasses the existing Coquet to St Mary's MCZ and a large extension to the north of the MCZ up to Berwick-upon-Tweed.

Collectively, the new site will cover an area of 634 km<sup>2</sup>. The site will protect breeding and non-breeding common eider (*Somateria mollissima*).

No costs have been quantified for this site as any management required is likely to be in the form of a voluntary code of conduct.

### **Camel Estuary (6)**

This is an inshore site located near Wadebridge in north Cornwall in the Western Channel and Celtic Sea region and covering an area of 2.2 km<sup>2</sup>. The site will protect estuarine rocky habitats, intertidal coarse sediment, coastal saltmarsh and saline reedbeds, intertidal mud, and low energy intertidal rock.

The site has a low level of human activity. The overall cost estimate for the site is approximately £2k per year relating to ports and harbours.

### **Cape Bank (7)**

This is an inshore site located west of Land's End, Cornwall within the Western Channel and Celtic Sea region and covering an area of 474 km<sup>2</sup>. The site will protect subtidal coarse sediment and moderate energy circalittoral rock.

The cost estimates for the site are approximately £4k per year relating to the commercial fishing sector and £2k per year relating to the renewable energy sector.

### **Dart Estuary (8)**

This is an inshore site located in South Devon within the Western Channel and Celtic Sea region. It covers an area of approximately 5 km<sup>2</sup>. The site will protect tentacled lagoon-worm (*Alkmaria romijni*), coastal saltmarshes and saline reedbeds, intertidal mud, low energy intertidal rock and estuarine rocky habitats.

No significant management or costs are expected for this site although there may be a need for aquaculture businesses to increase monitoring and management of feral Pacific oysters.

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<sup>113</sup> Previously called Coquet Island.

### **Devon Avon Estuary (9)**

This is an inshore site located in the Western Channel and Celtic Sea region on the south West Coast. The site covers an area of approximately 2 km<sup>2</sup>. The site will protect coastal saltmarshes and saline reedbeds, intertidal mud, intertidal sand and muddy sand, moderate energy intertidal rock and tentacled lagoon-worm (*Alkmaria romijni*).

The Devon Avon Estuary site has a low level of human activity and no costs are expected to be incurred for this site.

### **East of Start Point (10)**

This is an offshore site located south of Lyme bay and Torbay SAC within the Eastern Channel region. The site covers an area of 116 km<sup>2</sup>. The site will protect subtidal sand and will improve connectivity between inshore and offshore sites protecting subtidal sediment habitats.

The overall cost estimate for the site is approximately £20k per year relating to the commercial fishing sector.

### **Erme Estuary (11)**

This is an inshore site located on the south coast of Devon in the Western Channel and Celtic Sea region. The site covers an area of approximately 1 km<sup>2</sup>. The site will protect estuarine rocky habitats, sheltered muddy gravels, tentacled lagoon-worm (*Alkmaria romijni*), high energy intertidal rock, intertidal mixed sediments, low energy intertidal rock, moderate energy intertidal rock and intertidal coarse sediment.

The Erme Estuary site has a low level of human activity and no costs are expected to be incurred for this site.

### **Foreland (12)**

This is an inshore site located in the Southern North Sea and Eastern Channel regions extending along the mid-channel between Kent and France. The site covers 244 km<sup>2</sup>. The site will protect subtidal sand, subtidal coarse sediment, high energy circalittoral rock, moderate energy circalittoral rock and the geological English Channel outburst flood features.

The cost estimates for the site are approximately £300 per year relating to the ports and harbours sector and £100 per year relating to the commercial fishing sector.

### **Goodwin Sands (13)**

This is an inshore site located off Sandwich Bay on the Kent coast within the Southern North Sea region. The site covers 277 km<sup>2</sup>. The site will protect subtidal coarse sediment, subtidal sand, moderate energy circalittoral rock, ross worm reefs (*Sabellaria spinulosa*), blue mussel beds and the geological English Channel outburst flood features.

The cost estimates for the site are approximately £4k per year relating to the ports and harbours sector, £2k per year relating to the commercial fishing sector and £1k per year relating to aggregates.

#### **Helford Estuary (14)**

This is an inshore site located on the south coast of Cornwall within the Western Channel and Celtic Sea region and covering an area of 6 km<sup>2</sup>. The site will protect native oyster (*Ostrea edulis*).

No significant management or costs are expected for this site. A new aquaculture business is expected to start operating in the area, and, depending on the activities to be carried out, certain management and monitoring conditions might need to be met.

#### **Holderness Offshore (15)**

This is a large site that straddles the inshore and offshore areas within the Southern North Sea region and is located 11 km off the Holderness Coast. The site covers an area of 1176 km<sup>2</sup>. The site will protect subtidal coarse sediment, subtidal mixed sediment, subtidal sand, ocean quahog (*Arctica islandica*) and the North Sea glacial tunnel valleys.

The cost estimates for the site are approximately £11k per year relating to the commercial fishing sector and £1k per year relating to the ports and harbours sector.

#### **Inner Bank (16)**

This site straddles the inshore and offshore areas and is located within the Eastern Channel. The site covers an area of 199 km<sup>2</sup> and will protect subtidal coarse sediment, subtidal sand and subtidal mixed sediments.

The overall cost estimate for this site is approximately £2k per year relating to commercial fishing.

#### **Kentish Knock East (17)**

This is an inshore site located between the 6nm and 12nm lines in the Outer Thames Estuary within the Southern North Sea region. This site covers an area of 96 km<sup>2</sup> and will protect subtidal sand, subtidal coarse sediment and subtidal mixed sediments.

The overall cost estimate for this site is approximately £1k per year relating to commercial fishing.

#### **Markham's Triangle (18)**

This is an offshore site located approximately 137 km from the Humberside coastline in the Southern North Sea region. This site covers an area of 200 km<sup>2</sup> and will protect subtidal sand, subtidal coarse sediment, subtidal mud and subtidal mixed sediments.

The overall cost estimate for this site is approximately £200 per year relating to commercial fishing.

### **Morte Platform (19)**

This is an inshore site located approximately 5 km off the coast of North Devon in the Western Channel and Celtic Sea region. The site covers an area of 25 km<sup>2</sup> and will protect subtidal coarse sediment, high energy circalittoral rock and moderate energy circalittoral rock.

The overall cost estimate for this site is approximately £100 per year relating to the commercial fishing sector.

### **North East of Haig Fras (20)**

This an offshore site located in the Western Channel and Celtic Sea region. The site covers an area of 464 km<sup>2</sup> and will protect subtidal coarse sediment, subtidal sand and subtidal mud.

The overall cost estimate for this site is approximately £700 per year relating to the commercial fishing sector.

### **North West of Lundy (21)**

This is an offshore site extending in an arc between the 6nm and 12nm limits, and located 15 km northwest of Lundy Island within the Western Channel and Celtic Sea region. The site covers an area of 173 km<sup>2</sup> and will protect subtidal coarse sediment.

The overall cost estimate for this site is approximately £1k per year relating to the commercial fishing sector.

### **Orford Inshore (22)**

This is an inshore site that is located within the Southern North Sea region approximately 14 km offshore from the Alde Ore Estuary on the Suffolk coast. The site covers an area of 72 km<sup>2</sup> and will protect subtidal mixed sediments.

The cost estimates for the site are approximately £4k per year relating to aggregate extraction, £100 per year relating to commercial fishing and £600 per year relating to the ports and harbours sector.

### **Otter Estuary (23)**

This is a small inshore site that is located near Budleigh Salterton in Devon in the Eastern Channel region. The site covers an area of 0.11 km<sup>2</sup> and will protect coastal saltmarshes and saline reedbeds, intertidal coarse sediment and intertidal mud.

The site has a low level of human activity and no costs are expected to be incurred for this site.

### **Purbeck Coast (24)**

This is an inshore site within the Eastern Channel region that stretches from Ringstead Bay in the west to Swanage Bay in the east and covers an area of 282 km<sup>2</sup>. The site will protect high energy intertidal rock, intertidal coarse sediment, moderate energy intertidal rock, stalked jellyfish (*Haliclystus* species), maerl beds, peacock's tail (*Padina pavonica*), subtidal coarse sediment, subtidal mixed sediment and nesting black bream (*Spondyliosoma cantharus*) during the breeding season (April to July).

The cost estimates for this site are approximately £97k per year relating to recreation (angling and charter boats), £15k per year relating to the ports and harbours sector and £100 per year to commercial fishing.

### **Queenie Corner (25)**

This offshore site is located in the Western Irish Sea, within the Irish Sea region and covers an area of 146 km<sup>2</sup>. The site will protect subtidal mud and sea pen & burrowing megafauna communities.

The overall cost estimate for this site is approximately £8k per year relating to the commercial fishing sector.

### **Ribble Estuary (26)**

This is an inshore site within the Irish Sea region located on the north-west coast of England, near Preston. The site covers an area of 15 km<sup>2</sup> and will protect smelt (*Osmerus eperlanus*).

No costs are expected to be incurred for this site.

### **Selsey Bill and the Hounds (27)**

This is an inshore site located in the Eastern Channel region on the South East coast, and covering an area of approximately 16 km<sup>2</sup>. The site will protect peat and clay exposures, short-snouted seahorse (*Hippocampus hippocampus*), subtidal mixed sediments, subtidal sand, high energy infralittoral rock, moderate energy infralittoral rock, moderate energy circalittoral rock, low energy infralittoral rock and the Bracklesham Bay geological feature. The cost estimates for the site are approximately £700 per year relating to commercial fishing and £300 per year relating to the renewables sector.

### **Solway Firth (28)**

This is an inshore site within the Irish Sea region located in the Solway Firth Estuary, Cumbria, in the far north-eastern Irish Sea. The site covers an area of 45 km<sup>2</sup> and will protect smelt (*Osmerus eperlanus*).

The overall cost estimate for the site is approximately £2k per year relating to the ports and harbours sector.

### **South of Celtic Deep (29)**

This is an offshore site located in the Western Channel and Celtic Sea region on the south west coast. The site covers an area of 278 km<sup>2</sup> and will protect subtidal coarse sediment, subtidal sand, subtidal mixed sediments and moderate energy circalittoral rock. The overall cost estimate for this site is approximately £600 per year relating to the commercial fishing sector.

### **South of Isles of Scilly (30)**

This site straddles the inshore and offshore areas and is located in the Western Channel and Celtic Sea region. The site covers an area of 132 km<sup>2</sup> and will protect subtidal sand, subtidal coarse sediment / subtidal mixed sediment mosaic habitat and fan mussel (*Atrina fragilis*).

The cost estimates for the site are approximately £2k per year relating to commercial fishing and £1k per year relating to the renewables sector.

### **South of Portland (31)**

This is an inshore site located off Portland Bill on the South Coast in the Eastern Channel region. The site covers an area of 17 km<sup>2</sup> and will protect subtidal coarse sediment, subtidal mixed sediments, subtidal sand, high energy circalittoral rock, moderate energy circalittoral rock and the Portland Deep geological feature.

The overall cost estimate for this site is approximately £300 per year relating to commercial fishing.

### **South Rigg (32)**

This is an offshore site located within the Irish Sea region in the western Irish Sea. The site covers an area of 143 km<sup>2</sup> and will protect moderate energy circalittoral rock, subtidal coarse sediment, subtidal sand, subtidal mixed sediments, subtidal mud and sea pen & burrowing megafauna communities.

The overall cost estimate for the site is approximately £6k per year relating to the commercial fishing sector.

### **South West Approaches to the Bristol Channel (33)**

This is an offshore site located within the Western Channel and Celtic Sea region off the northern coast of Cornwall. The site covers an area of 1,128 km<sup>2</sup> and will protect subtidal coarse sediment and subtidal sand.

The overall cost estimate for the site is approximately £12k per year relating to the commercial fishing sector.

### **South West Deeps (East) (34)**

This is a large offshore site located approximately 190 km southwest off Land's End in the Western Channel and Celtic Sea region. The site covers an area of 4,653 km<sup>2</sup> and will protect subtidal coarse sediment, subtidal sand, deep-sea bed and the Celtic Sea Relict Sandbanks geomorphological feature.

The overall cost estimate for this site is approximately £5k per year relating to the commercial fishing sector.

### **Southbourne Rough (35)**

This is an inshore site located within the Eastern Channel region in Poole Bay, to the east of Poole Rocks MCZ. The site covers an area of around 5 km<sup>2</sup> and will provide protection for nesting black bream (*Spondyllosoma cantharus*) during the breeding season (April to July).

The cost estimates for this site are approximately £46k per year relating to recreation (angling and charter boats) and £700 per year to commercial fishing.

### **Studland Bay (36)**

This is an inshore site located within the Eastern Channel region on the Dorset coast, south of Poole. The site covers an area of 4 km<sup>2</sup>. The site will protect intertidal coarse sediment, long-snouted seahorse (*Hippocampus guttulatus*), subtidal sand and seagrass beds. The cost estimates for this site are approximately £93k per year relating to the recreational sector, £20k per year to the ports and harbours sector and £400 per year to commercial fishing.

### **Swanscombe (37)**

This is an inshore site located within the Southern North Sea region in the Thames Estuary. The site covers an area of 3 km<sup>2</sup> and will protect tentacled lagoon-worm (*Alkmaria romijni*) and intertidal mud.

The overall cost estimate for this site is approximately £13k per year relating to the ports and harbours sector.

### **West of Copeland (38)**

This is an offshore site located within the Irish Sea region in the east of the Irish Sea. The site covers an area of 158 km<sup>2</sup> and will protect subtidal coarse sediment, subtidal sand and subtidal mixed sediments.

The overall cost estimate for this site is approximately £200 per year relating to the commercial fishing sector.

### **West of Wight Barfleur (39)**

This is an offshore site located approximately 12 km south of the South Dorset MCZ in the Eastern Channel region. The site covers an area of 138 km<sup>2</sup> and will protect subtidal coarse sediment and subtidal mixed sediments.

The overall cost estimate for this site is approximately £100 per year relating to the commercial fishing sector.

### **Wyre Lune (40)**

This is an inshore site located in the southern part of Morecambe Bay, Lancashire, in the Irish Sea region. The site covers an area of approximately 92 km<sup>2</sup> and will protect smelt (*Osmerus eperlanus*).

The overall costs estimate for this site is approximately £8k per year relating to the ports and harbours sector.

### **Yarmouth to Cowes (41)**

This is an inshore site located within the Eastern Channel region along the northwest coast of the Isle of Wight. The site covers an area of 16 km<sup>2</sup>. The site will protect estuarine rocky habitats, intertidal coarse sediment, intertidal under-boulder communities, littoral chalk communities, low energy intertidal rock, moderate energy intertidal rock, subtidal coarse sediment, high energy circalittoral rock, high energy infralittoral rock, moderate energy circalittoral rock, moderate energy infralittoral rock, native oyster (*Ostrea edulis*), peat and clay exposures, sheltered muddy gravels, subtidal chalk, subtidal mixed sediments, subtidal mud and the Bouldnor Cliff geological feature.

The cost estimates for this site are approximately £13k per year relating to the ports and harbours sector, £1k per year to commercial fishing and £1k per year to the renewables sector.