

<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(1)  <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> 11/12/2017			
	<b>Stage:</b> Consultation			
	<b>Source of intervention:</b> Domestic			
	<b>Type of measure:</b> Secondary Legislation			
<b>Contact for enquiries:</b> Sophie Vickery (Sophie.Vickery@defra.gsi.gov.uk)				
<b>Summary: Intervention and Options</b>			<b>RPC Opinion: RPC Opinion Status</b>	

Cost of Preferred (or more likely) Option				
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANDCB in 2014 prices)	One-In, Three-Out	Business Impact Target Status
- £64.81m	- £6.23m	£0.4m	Not applicable	Not applicable

**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.

**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 and final 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 within the 1st and 2nd tranches would not meet this obligation. An ecologically coherent network of MPAs will also contribute to fulfilling EU and international obligations, particularly the MSFD and OSPAR 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 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> 2024				
Does implementation go beyond minimum EU requirements?			N/A	
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:** Designate a third tranche of Marine Conservation Zones in 2019 to contribute to an ecologically coherent network of Marine Protected Areas as required by the Marine and Coastal Access Act 2009.

## FULL ECONOMIC ASSESSMENT

Price Base Year 2015	PV Base Year 2019	Time Period Years 20	Net Benefit (Present Value (PV)) (£m)		
			Low: -85.38	High: -57.43	Best Estimate: -64.81

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	14.6	3.2	57.4
High	14.8	5.1	85.4
Best Estimate	14.7	3.7	64.8

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

Best estimate average annual costs (undiscounted including transitional one-off costs): **£4.397m**. This includes industry costs arising from additional management and environmental assessments totalling **£0.418m**, comprising of annual costs to: commercial fisheries (£0.109m); ports and harbours (£0.114m); recreation (£0.093m); oil and gas (£0.089m); renewable energy (£0.005m); aggregate extraction (£0.006m); & cables (£0.002m), and public annual costs totalling **£3.979m**, which comprises of: ecological surveys (£2.410m); management (£1.566m); & national defence (£0.003m).

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

For sectors where the level of activity is expected to be small, 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 beyond those included in this IA, 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 are not expected to be significant.

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 the proposed 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 11,713 km<sup>2</sup> will be protected by designation of the third tranche of MCZs (bringing the total area of MCZ protection to over 32,000 km<sup>2</sup>) and 201 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>	3.5%
It is assumed that, following the designation of a site, 75% of the affected fishing effort (landings value/GVA) will be displaced elsewhere, whilst 25% will be lost (this assumption was tested and validated in the consultation on the 1st and 2nd tranches of MCZs). 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)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m: Unquantified
Costs: 0.4	Benefits: Unquantified	Net: - 0.4	

# Evidence Base (for summary sheets)

## Contents

1. Policy background .....	5
2. Problem under consideration.....	7
3. Rationale for government intervention .....	11
4. Policy objective and intended effects .....	12
5. Descriptions of options considered.....	12
6. Costs under the baseline and preferred option .....	13
7. Benefits under the baseline and preferred option .....	33
8. MCZ Post-implementation review plan .....	42
9. Conclusion.....	42
References.....	45
Chart 1: The 41 sites proposed for the 3rd tranche of MCZs .....	10
Box 1: MCZs, conservation objectives and management measures.....	5
Box 2: The role of stakeholder engagement in identifying management scenarios and costs .....	16
Box 3: Monetisation of recreational benefits.....	40
Table 1: Summary of baseline costs to private industry and public bodies.....	14
Table 2: Costs of the 3rd tranche of MCZs .....	26
Table 3: Marine goods and benefits considered within the NEAFO study .....	34
Table 4: Existing benefits of the UK marine environment .....	34
Table 5: Ecosystem services benefits from the protection of MCZ features in sites proposed for the 3rd tranche .....	37

## 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  
EA – Environment Agency  
EANCB – Estimated Annual Net Cost to Business  
EH – English Heritage  
EIA – Environmental Impact Assessment  
EMS – European Marine Site  
ENG – Ecological Network Guidance  
EU – European Union  
FCERM – Flood and Coastal Erosion Risk Management  
FOCI – Feature of Conservation Importance (including HOCl and SOCl)  
GMA – General Management Approach  
GVA - Gross Value Added  
HOCl – Habitat of Conservation Importance  
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  
MCS – Marine Conservation Society  
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  
NE – Natural England  
NPV – Net Present Value  
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)  
SOCl – Species of Conservation Importance  
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  
WCA – Wildlife and Countryside Act  
WFD – Water Framework Directive

# 1. Policy background

- 1.1. With a coastline of over 12,429 km, 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), 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 UK Marine Policy Statement<sup>1</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 the achievement of Good Environmental Status, as required by the Marine Strategy Framework Directive (MSFD)<sup>2</sup>, and to wider 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 of Conservation Importance (FOCI) 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 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 'maintain' or a 'recover' 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, to be 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

<sup>1</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>2</sup> European Commission 2008. Marine Strategy Framework Directive 2008: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0056&from=EN>

<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.

<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). SPAs are also referred to as European Marine Sites (EMS).

<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). SACs are also referred to as European Marine Sites (EMS).

<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)

<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>

favourable condition. MCZ designation and continued appropriate management will protect the features against the risk of degradation from future, currently unplanned, human activities. If necessary, mitigation could be introduced in the future, with the consideration of associated costs and benefits.

- 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<sup>14</sup> announced that MCZs would be designated in tranches, with the best-evidenced sites designated first. 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.
- 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 9,700 km<sup>2</sup> and protected 162 features. The final supporting IA received a green opinion from the independent 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 10,812 km<sup>2</sup> and protected 234 features, bringing the total area of MCZ protection to over 20,000 km<sup>2</sup>, and the total number of sites and protected features to 50 and 597 respectively. Again, the supporting IA received a green opinion from the independent RPC.
- 1.10. The regulators, including the Marine Management Organisation (MMO) and Inshore Fisheries Conservation Authorities (IFCAs), are empowered to introduce appropriate management measures in MCZs to ensure their protection. These 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.

<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>

- 1.11. All direct costs and benefits presented in this IA have been calculated in line with the HMT Green Book.<sup>16</sup> Costs from the imposition of management measures in MCZs will be validated in the post-implementation review of the 3rd tranche of MCZs.
- 1.12. Due to limited evidence behind environmental and economic benefits, it was difficult to designate sites on a cost benefit basis. Instead a balance between protecting key ecological features, and minimising the costs on sea-users was considered. Nonetheless, this choice is underpinned by scientifically robust evidence and focuses on prioritising designation of sites 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 relies upon 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 ensure that proposed approaches are proportionate (see Table 5).

## 2. Problem under consideration

- 2.1. This IA concerns the selection of the 3rd tranche of MCZs for designation in waters for which Defra's Secretary of State is responsible<sup>17</sup> 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 proposed 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. Whilst updated data 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 this 3rd tranche.
- 2.3. JNCC's report<sup>18</sup> recommended that, in addition to considering Regional MCZ Project sites, which make up the bulk of the 3rd tranche proposals, and adding additional features to 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>19</sup>. Twelve candidate sites were identified and these were discussed with stakeholders during the pre-consultation engagement period (see Section 6.2).
- 2.5. Suitable site options to complete the network were therefore selected from two sources:
  - 2.5.1. **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.

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<sup>16</sup> HMT Green Book 2016: [www.hm-treasury.gov.uk/data\\_greenbook\\_index.htm](http://www.hm-treasury.gov.uk/data_greenbook_index.htm)

<sup>17</sup> English inshore waters and English and Northern Irish offshore waters.

<sup>18</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>19</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)

2.5.2. **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 supported designation. Consideration was given to any additional socioeconomic impacts that designating new features within an existing site might have.
- 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 6.2.
- 2.9. In addition to considering sites and features to contribute to our 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 European or national 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 where aspects of their lifecycle have been identified as suitable for site-based protection (e.g. spawning or nursery grounds). These examples illustrate that there are situations where this type of protection is appropriate. 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>20</sup>.
- 2.10. Twenty-one proposals were received, covering seabirds, fish species and white-beaked dolphin, and the scientific case and economic impact of each proposal was assessed. Other stakeholders have not yet had the opportunity to comment on these sites, but will be able to do so during the 3rd tranche consultation.
- 2.11. Following consideration of the remaining Regional MCZ Project sites, the new site options and the proposals for highly mobile species, Defra have identified a total of 41 sites that are suitable for designation. 39 of these are sites proposed to contribute to our ecologically coherent network, of which 30 are Regional MCZ Project recommendations (from the original 127 sites recommended) and 9 are new site options. The remaining 2 sites are for protecting highly mobile species. The other sites considered are not proposed for designation and are therefore not included in this IA.
- 2.12. Defra have also identified 29 additional features in 12 existing 1st and 2nd tranche sites that are suitable for inclusion in the consultation alongside the proposed 3rd tranche sites. Additional management requirements as a result of designating these extra features are only expected for

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<sup>20</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)



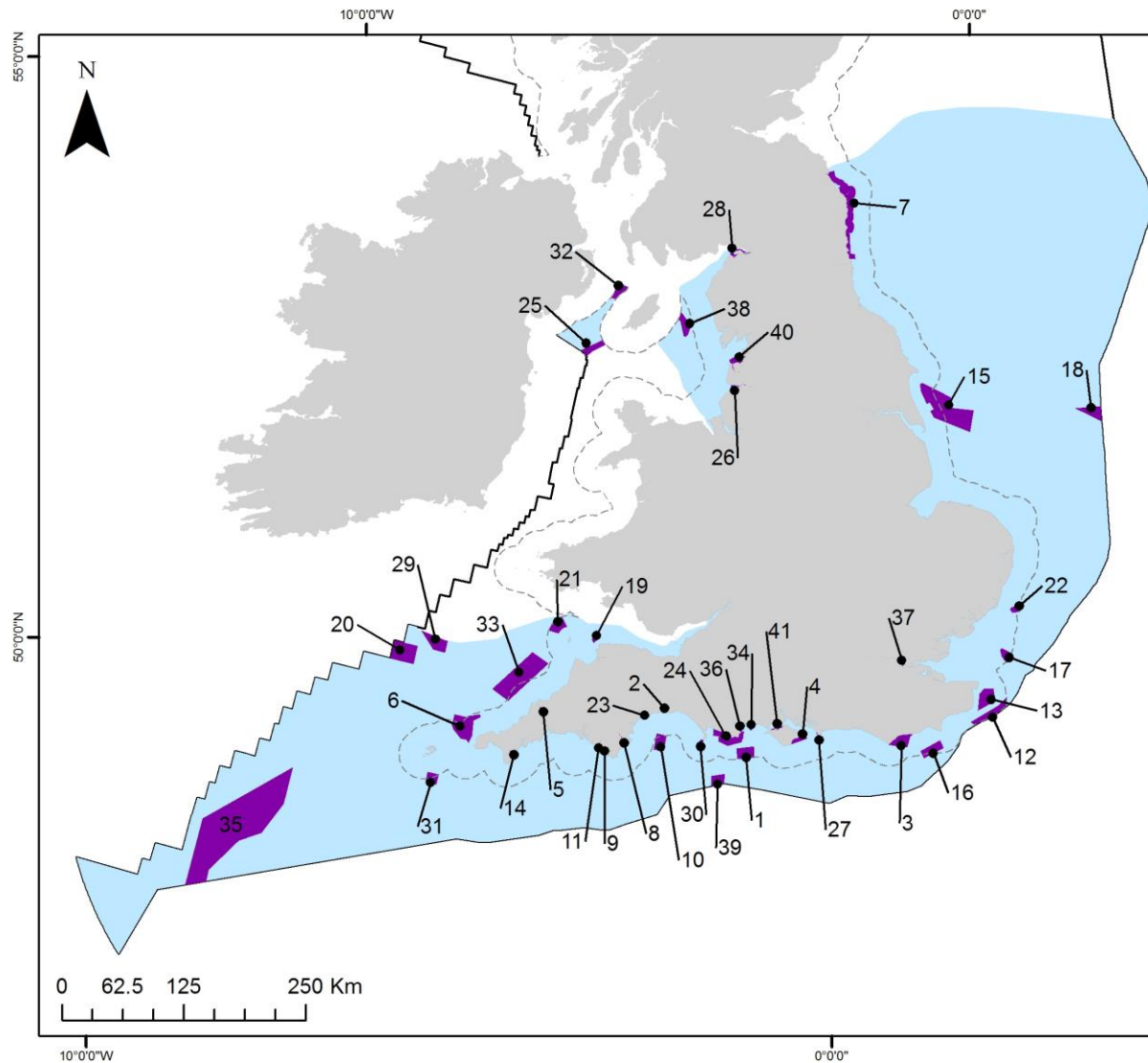
two sites, Dover to Deal MCZ and Poole Rocks MCZ, and the best estimate costs for these sites is low. More details are provided in Annexes A and F.

- 2.13. Of the 41 new MCZs to take forward to the consultation (preferred Option 1), 39 are in English waters and two are within Northern Irish offshore waters<sup>21</sup>. The total area covered by the new sites is 11,713 km<sup>2</sup>: approximately 3,441 km<sup>2</sup> in the inshore area and 8,272 km<sup>2</sup> in the offshore area.
- 2.14. The names and locations of the 41 sites are shown below in Chart 1. Further details of these proposed new sites are provided in Annex G and details of existing MCZ sites for which additional features are proposed are provided in Annex F.

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<sup>21</sup> All are in waters where the Secretary of State is the “appropriate authority”.

**Chart 1: The 41 sites proposed for the 3rd tranche of MCZs**



**Sites for Tranche Three public consultation**

- |                            |   |
|----------------------------|---|
| 1 Albert Field             | 22 Orford Inshore                           |
| 2 Axe Estuary              | 23 Otter Estuary                            |
| 3 Beachy Head East         | 24 Purbeck Coast                            |
| 4 Bembridge                | 25 Queenie Corner                           |
| 5 Camel Estuary            | 26 Ribble                                   |
| 6 Cape Bank                | 27 Selsey Bill and the Hounds               |
| 7 Coquet Island            | 28 Solway Firth                             |
| 8 Dart Estuary             | 29 South of Celtic Deep                     |
| 9 Devon Avon Estuary       | 30 South of Portland                        |
| 10 East of Start Point     | 31 South of the Isles of Scilly             |
| 11 Erme Estuary            | 32 South Rigg                               |
| 12 Foreland                | 33 South West Approaches to Bristol Channel |
| 13 Goodwin Sands           | 34 Southborne Rough                         |
| 14 Helford Estuary         | 35 South West Deeps (East)                  |
| 15 Holderness Offshore     | 36 Studland Bay                             |
| 16 Inner Bank              | 37 Swanscombe                               |
| 17 Kentish Knock East      | 38 West of Copeland                         |
| 18 Markham's Triangle      | 39 West of Wight-Barfleur                   |
| 19 Morte Platform          | 40 Wyre-Lune                                |
| 20 North-East of Haig Fras | 41 Yarmouth to Cowes                        |
| 21 North West of Lundy     |   |

- UK Continental Shelf
- - - UK Territorial Seas Limit
- Proposed T3 MCZs
- Secretary of State Waters (excluding the Welsh offshore region)

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 UK Territorial Sea Limit. © Contains JNCC information licensed under the Open Government Licence v3.0. Contains derived data from Ordnance Survey © Crown copyright. 100019741 (2015). Contains UKHO data © Crown copyright. All rights reserved. The exact limits of the UK Continental shelf are set out in orders made under section 1 (7) of the Continental Shelf Act 1964 and Continental Shelf (Designation of Area) Order 2013. World Vector Shoreline © US Defence Mapping Agency. Not to be used for navigation.

### 3. Rationale for government intervention

- 3.1. 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>22</sup>. Work by the National Ecosystem Assessment Follow-On project<sup>23</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.
- 3.2. 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>24</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>25</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>26</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. The most recent comprehensive assessment of the UK marine environment (UKMMAS 2010)<sup>27</sup> showed that there are still key externalities to the marine environment to be addressed both in the short and long term.
- 3.3. 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 2003). 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 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.
  - 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.

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<sup>22</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>23</sup> <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=2&ProjectID=18081>

<sup>24</sup> OSPAR 2010. Quality Status Report: <https://qsr2010.ospar.org/en/index.html>

<sup>25</sup> OSPAR 2017. Intermediate Assessment Report: <https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/>

<sup>26</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>27</sup> UKMMAS 2010. Charting Progress 2: <http://webarchive.nationalarchives.gov.uk/20141203181034/http://chartingprogress.defra.gov.uk/>

- 3.4. 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 further 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.

## 4. Policy objective and intended effects

- 4.1. The government aims to achieve 'clean, healthy, safe, productive and biologically diverse oceans and seas' and 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 towards achieving Good Environmental Status (as required by the MSFD) as well as contributing 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.
- 4.2. 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 proposed for designation 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.
- 4.3. Following the designation of 50 MCZs in two previous tranches, the current policy objective is to designate a 3rd and final tranche of MCZs to complete a 'Blue Belt' of protected sites around the coasts that the Secretary of State is responsible for.
- 4.4. 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.

## 5. Descriptions of options considered

### Overview of Baseline Option

- 5.1. 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>28</sup>, and the existing network of MPAs, including the 50 MCZs designated in the 1st and 2nd tranches.
- 5.2. 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 will also contribute to fulfilling existing EU and international obligations, particularly the MSFD and OSPAR commitments. Ministers have committed to designating MCZ sites in tranches and not proceeding with the third tranche of MCZs would leave the network incomplete.

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<sup>28</sup> FOCI 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.

- 5.3. 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 2016). 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 how expected costs – as part of the baseline scenarios - might materialise.
- 5.4. 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**

- 5.5. Option 1 (our preferred option) involves designating a 3rd tranche of 41 MCZs in 2019, alongside some additional features to 12 existing sites. These sites and features were identified to fill the 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.
- 5.6. Option 1 includes 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 consultation process is likely to help refine the final compilation of sites and features to be designated by the provision of currently unknown environmental and socioeconomic impacts and consideration of these. Other 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, which identifies as the preferred option the most suitable combination of sites to be designated. Due to limited ecological and economic evidence behind the benefits, the selection of the sites was mostly based on a balance between protecting key ecological features, and minimising the costs to key marine users.
- 5.7. Some features located inside the proposed MCZs’ boundaries already have protection under existing environmental legislation (see section 5.1). 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.

## **6. Costs under the baseline and preferred option**

### **Costs under the baseline scenario**

- 6.1. 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>29</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 FOCs, or to comply with existing legislation such as the Water Framework Directive (WFD). Costs of Environmental Impact Assessments (EIAs)

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<sup>29</sup> Note that, consistent with Impact Assessment guidance, we assume that these previous policies have been effectively implemented.

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>30</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 (e.g. the cost incurred by BMAPA to produce biodiversity action plans). Consequently these costs are not dependent on additional sites being designated and were fully represented in previous tranches of MCZs.

**Table 1: Summary of baseline costs to private industry and public bodies (all acronyms are explained on page 3).**

<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 impact assessment.</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 FOCI. Industry undertakes this voluntarily in areas outside of 12nm as there is no legal requirement to do so.</li> <li>- 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 FOCI.</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>- Common Fisheries Policy (CFP)<sup>31</sup> e.g. limits on commercial fishing of quota stocks, discard bans and effort &amp; gear restrictions.</li> <li>- UK fisheries management e.g. IFCA byelaws on vessel size.</li> <li>- Conservation e.g. management of fishing in MPAs such as European Marine Sites (EMS) and 1st and 2nd tranche MCZs.</li> <li>- 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 FOCI.</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>
Archaeological heritage	<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>- English Heritage (EH) 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 environmental impact to consider impact on previously designated FOCI.</li> </ul>

<sup>30</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, from 'EIA- a study on costs and benefits' <http://ec.europa.eu/environment/eia/eia-studies-and-reports/eia-costs-benefit-en.htm>

<sup>31</sup> The Common Fisheries Policy (CFP) is the fisheries policy of the European Union (EU). <http://ec.europa.eu/fisheries/reform/>

	<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 FOCI.</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 FOCI.</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 to monitor existing protected features and sites, enforce requirements of the Common Fisheries Policy (CFP) and 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 requirements under EU legislation and for 1st and 2nd tranche sites.</li> </ul>

## Stakeholder engagement process

6.2. Box 2 below provides information on how stakeholder engagement has informed the development of management scenarios and the consequent calculation of industry costs for the 3rd tranche of MCZs. In 2011 and 2012, 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 management scenarios and possible and preferred management measures. For the purpose of the 3rd tranche, during 2016 and early 2017, Defra, Natural England and JNCC carried out pre-consultation stakeholder engagement to seek stakeholder views and 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, and sites with non-UK fishing interests were additionally discussed with international stakeholders. In November 2016, JNCC held a two-day workshop to discuss the tranche 3 offshore sites and both the inshore and offshore 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 preliminary information and register any concerns. Reports were written up and published from both the workshop and webinar to capture stakeholder views<sup>32</sup>. There has been less pre-consultation engagement around the sites proposed for highly mobile species because these were third party proposals. The tranche 3 consultation will provide stakeholders with an opportunity to comment on these. 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. The selection of the proposed sites was based on both their ecological importance and, where appropriate, on cost assumptions and data from relevant activities/sectors (for more information see Annexes A and D).

<sup>32</sup> JNCC's reports are available at: <http://jncc.defra.gov.uk/page-7325>

## Box 2: The role of stakeholder engagement in identifying 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 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 draft management scenarios that reflected the mitigation that was likely to be needed, based on the information provided in (1) (2) and (3) above. Baseline data has been updated to reflect the latest and best available information. Activities, and where possible management scenarios, have been updated as part of the pre-consultation process.
- 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 will be considered in order to reduce such 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. The 3<sup>rd</sup> tranche consultation process will further test the estimates and the assumptions underpinning them.

## Costs of the preferred option (option 1)

- 6.3. 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 3.3. 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.
- 6.4. In line with HMT Green Book Guidance, only *additional* costs and benefits related to designation of features in the 3<sup>rd</sup> tranche MCZs are included. Consequently this option only represents the costs resulting from the additional management required, and the benefits flowing from the additional protection.
- 6.5. Features not included in the designation process of the 3<sup>rd</sup> 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.
- 6.6. As with the 1<sup>st</sup> and 2<sup>nd</sup> tranches, impacts are assessed over a 20-year period. The costs and benefits from 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 license renewal assumption for aggregates). Furthermore, the Regional MCZ Projects which informed the 1<sup>st</sup> and 2<sup>nd</sup> 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.
- 6.7. 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 have not 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 6.6.

6.8. 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 values are presented as 2015 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.

6.9. 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 costs 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 or habitat. This includes activities for which an operator has to apply for a licence (to the MMO, BEIS [formerly DECC], etc.) such as aggregate extraction, navigational dredging and disposal, oil and gas-related activities, port and harbour developments and renewable energy developments. The additional costs associated with considering impacts on the proposed MCZs includes 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. Estimates provided by industry for the IA include the time and associated costs to gather the relevant information on MCZs. 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 after designation.

For certain sectors (e.g. commercial fishing) there are also potential familiarisation costs as affected parties would need to be aware of the location of designated MCZs and any measures in place to protect them. However, familiarisation costs have not been monetised here as management at a particular site is decided by regulators (the MMO and IFCAs). Where a new byelaw is passed there will be an accompanying impact assessment and stakeholder consultation 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 and any familiarisation costs would be accounted for within local IAs. Therefore, it is not feasible or appropriate to calculate familiarisation costs as part of this impact assessment. The same assumptions applied for both the 1st and 2nd tranches.

In the low cost scenarios, no *additional* mitigation is required for relevant sectors since the majority of MCZ features must already be considered in an assessment of environmental impact for license applications. The additional features, not already considered in licence applications, are mainly broad scale habitats (BSHs<sup>33</sup>). Based on current knowledge, offshore BSHs tend to cover large areas and therefore the relative size of the footprint of any sector activities is likely to be low. This means that no changes to the activity itself or the location is likely to be necessary for these sites. However, the size of inshore BSHs are more variable hence the relative size of the footprint may be larger. This is very site specific for inshore sites and has been assessed on a case by case basis.

Where an assessment of current and known planned activity which overlaps with, or is in close proximity to MCZs proposed in the 3rd tranche, indicates that no additional mitigation will be required then this assumption will be tested at consultation.

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<sup>33</sup> There are too many habitats and species in our marine environment for it to be realistic to identify MPAs for each one. As a consequence habitats and species have been grouped together into broad scale habitats, which take the place of more detailed information on biodiversity. Protecting examples of these broad scale habitats across our MPA network will ensure that the full range of marine biodiversity in our seas is conserved.

- **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 proposed 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 5.1) 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 assesses costs based on the most likely management scenarios, informed by advice from Natural England, JNCC and relevant stakeholders. A range of costs is given to account for uncertainty and a best estimate is provided. Site-specific management scenarios for commercial fisheries 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>34</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>35</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 proposed where this was likely to be an issue. This will be tested at consultation.

- **Public sector costs** There are potential costs to the Environment Agency (EA) 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 3<sup>rd</sup> tranche (Environment Agency, pers. comm. 2014). There are costs to the Ministry of Defence (MoD), IFCA's, 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. These are not included in the Estimated Annual Net Costs to Business (EANCB) figures but are summarised in Table 2 below as well as in Annex D. The assumption will be further validated during consultation.

## Summary of Sector Specific Methodologies

Each sector potentially impacted by the designation of MCZs requires 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 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.

<sup>34</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>35</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.

- 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.

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

- 6.10. 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.
- 6.11. Two scenarios were developed for the IA: a low cost scenario (also used as best estimate) and a high cost scenario<sup>36</sup>. The assumptions for each scenario are summarised below.
- 6.12. The low cost scenario considers licence applications in areas which have already been granted approval for development, known as existing production and option license areas. There is an additional one-off cost to operators for future licence/licence renewal applications in existing production licence areas within 1 km of a proposed MCZ. This is based on the need to assess the impacts on broad scale habitats 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 info on how the costs were ascertained is provided in Annex D

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

- 6.13. Management scenarios have been identified for each MCZ making 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>37</sup>.
- 6.14. Of the proposed sites in the 3rd tranche only one site, the Dart Estuary, was identified to require the management of aquaculture activities. The remaining proposed 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 could be a combination of removal of feral oysters and the monitoring of aquaculture practices. Because the costs are likely to be low, considering management of aquaculture activities is expected to only affect one site, and the exact management that might be required is unknown, the costs have not been estimated. These assumptions will be tested at consultation.

### **Archaeological Heritage – No extra costs quantified**

- 6.15. 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 English Heritage and the MMO, all licence applications to English Heritage 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 certain habitats and species are already currently assessed without MCZs, but not specifically impacts on the broad scale habitats protected by MCZs (JNCC and Natural England 2011a)<sup>38</sup>.
- 6.16. Following preliminary and informal consultation no information about future licence applications (where the assets/activities will be, what they will comprise and when they will take place) or

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<sup>36</sup>Annex H2 Approach for assessing impacts on aggregate extraction, <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>37</sup> Annex H3 Approach for assessing impacts on aquaculture, <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>38</sup> Annex H4 Approach for assessing impacts on archaeological heritage, <http://publications.naturalengland.org.uk/publication/1940011>.

suitable historical data with which to forecast future activities was provided. Therefore it has not been possible at this stage 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 (English Heritage and MMO) and the SNCBs. This will be tested at consultation and if specific activities are planned at particular sites then we can take account of these in the final IA.

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

- 6.17. The cable sector includes the interconnector (power) and telecommunications (telecom) cables sector and the transmission power cables. 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. 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>39</sup>. If relevant, this assumption will be further tested during consultation
- 6.18. The locations of future cable routes are not known; therefore, 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. 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 2nd tranche IA and was not changed for the 3rd tranche IA. Sensitivity analysis is conducted which varies the assumed quantity of applications over the IA period.

### **Coastal Development – No extra costs quantified**

- 6.19. 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. Additionally, costs associated with some developments are covered under sector specific costs elsewhere (e.g. ports and harbours and renewables). This assumption will be tested further at consultation.

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<sup>39</sup> Annex H6 Approach for assessing impacts on cables (interconnectors and telecom cables), <http://publications.naturalengland.org.uk/publication/1940011>.

## Commercial Fisheries (UK Vessels) – Best estimate undiscounted average annual cost £0.109m

- 6.20. 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 based on intensity of fishing in those areas as a proportion of fishing in the entire ICES rectangle area<sup>40</sup>, for which revenues are known. For under 15 metre vessels, which tend to fish inshore areas, data coverage is poorer. 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>41</sup>. Using this data, baseline revenues for each MCZ have been estimated based on a five year average (2010-2014). This is then converted to a gross added value figure using Seafish average GVA ratios<sup>42</sup> for each gear type in each region.
- 6.21. 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>43</sup> that specifies a range of possible management scenarios for each broad gear type<sup>44</sup> (mobile and static) and for each feature<sup>45</sup>. Management scenarios were refined using stakeholder knowledge and input during the Regional MCZ Projects process and also refreshed as necessary based on pre-consultation engagement with stakeholders in 2016 and 2017 and updated SNCB advice on features to be designated. Consequently the scenarios are used to estimate the economic impact of MCZ designation. Full details of the management scenarios used for the purposes of the IA are given in Annex A.
- 6.22. 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 or was considered equal, 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. Where the high cost scenario was considered unlikely (based on SNCB advice and Defra and Regional Project economist judgement) the best estimate was 25% of the range between the low and high cost scenarios, which 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 calculations are given in Annex D.
- 6.23. 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.
- 6.24. The assumptions on displacement for both the best and high cost management scenarios, have been based on a prudent and cautious approach validated during the 1st and 2nd tranches of MCZs and will be tested further during the consultation for the 3rd and final tranche.
- 6.25. As discussed in section 6.9, 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 IFCA) following designation. Regulators would produce IAs with any byelaws to take account of the impacts of any closures or restrictions and to inform stakeholders.

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<sup>40</sup> ICES use statistical rectangle areas for the gridding of data to make simplified analysis and visualisation of fishing effort, landings and revenues.

<sup>41</sup> <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=1&ProjectID=18126>

<sup>42</sup> <http://www.seafish.org/research-economics/industry-economics/seafish-fleet-economic-performance-data>

<sup>43</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>44</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.

<sup>45</sup> Annex H7 Approach for assessing impacts on commercial fisheries, <http://publications.naturalengland.org.uk/publication/1940011>.

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

- 6.26. 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 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.
- 6.27. Efforts have been made during the pre-consultation period to engage with the authorities and commercial stakeholders in the 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 ability 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. Assumptions will be tested at consultation.

## **Oil & Gas & other energy (including Carbon Capture and Storage [CCS] at sea) – Best estimate undiscounted average annual cost £0.089m**

- 6.28. 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 the MMO. As already highlighted in section 6.9 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.
- 6.29. 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 5.1) 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. It was suggested that 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. These assumptions will be further tested during consultation.
- 6.30. 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. 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 tranche, 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> and 29<sup>th</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 (best and low cost scenarios). If necessary, this information will be further tested during the consultation.

## **Ports, Harbours, Commercial Shipping and Disposal Sites – Best estimate undiscounted average annual cost £0.114m**

- 6.31. The 3rd tranche of MCZs contains sites which encompass ports and harbours, sites which include areas under ports and harbours operational jurisdictions 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.

- 6.32. 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.
- 6.33. 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).
- 6.34. 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.
- 6.35. 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. These assumptions will be tested at consultation and further details are given in Annex D.

### **Recreation – Best estimate undiscounted average annual cost £0.093m**

- 6.36. Recreational activities considered in this IA include: angling, boating, snorkelling and shore-based activities such as coastal walking. 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).
- 6.37. 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>46</sup>.
- 6.38. 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)

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<sup>46</sup> Annex H13 Approach for assessing impacts on recreation, <http://publications.naturalengland.org.uk/publication/1940011>.

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 two sites proposed for the 3rd tranche contain features sensitive to mooring and anchoring with a recover GMA: Studland Bay and Bembridge. More information about impacts and costs for these sites can be found in Annexes A and D, and will be tested during consultation.

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

- 6.39. 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.
- 6.40. 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>47</sup>.
- 6.41. Additional costs apply to all future renewable energy proposals in English waters 'near to' proposed MCZs (defined here as within 1km of a proposed 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>48</sup> confirming that the assumption should be extended to include development 'near to' proposed MCZs. These assumptions will be further tested during consultation.

## **Summary of Public Sector Costs Methodologies**

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

- 6.42. 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 management scenario 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>49</sup>. These assumptions will be further tested during consultation.

For the 3rd tranche of MCZ designations, sites have been avoided where possible in cases where FCERM mitigation measures were likely. Mitigation measures might be required in Beachy Head East in the future and further information will be collated during consultation to verify this. There is otherwise no indication that planned FCERM developments will be impacted by the sites proposed for designation. The Environmental Agency (EA) (pers. coms. 2012) have previously indicated that there may be additional costs to assess the impact on MCZ's during some future licence applications. However, as the design of future FCERM activities is not known there is uncertainty around the number of applications affected (EA have confirmed this advice is still correct, pers. coms. 2017). As a consequence, at this stage, the assumption is that

<sup>47</sup> Annex H14 Approach for assessing impacts on renewable energy, <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>48</sup> <https://www.gov.uk/government/publications/marine-conservation-zones-mczs-and-marine-licensing>

<sup>49</sup> Annex H14 Approach for assessing impacts on flood and coastal erosion risk management (coastal defence), <http://publications.naturalengland.org.uk/publication/1940011>.



there are no extra costs for this final tranche. This assumption will be confirmed at the consultation stage

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

- 6.43. 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 tranche 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 Appendix D. These assumptions will be further tested during consultation.
- 6.44. 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 is being 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).

#### **Management Implementation, Enforcement and Surveillance - Best estimate undiscounted average annual cost £1.566m**

- 6.45. 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.
- 6.46. For the proposed 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).

#### **Ecological Surveys – Best estimate undiscounted average annual cost £2.410m**

- 6.47. 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 this last round of designations, Natural England has supplied costs for inshore sites (up to 12nm) and JNCC has provided costs for offshore sites (beyond 12nm). These costs have been applied as appropriate and more information is provided in Appendix D.

## 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>50</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 1km of an MCZ incur addition cost to assess potential impact of activity.</li> <li>- During the Regional MCZ Project Process in 2011 a 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 2015 prices the additional cost per license 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 application in strategic resource areas over the 20 year IA period.</li> </ul>	<p><b>PV: £0.072m</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: £0.072m – £0.072m</b> <b>Annual average: £0.004m/yr - £0.006m/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 1 km of a 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 proposed MCZ sites. These costs are not specific to particular MCZs as the cost are attributed to the MCZ network and scaled down to represent the cost of the 3rd tranche.</p>
Aquaculture	<ul style="list-style-type: none"> <li>- Aquaculture activity in and near each proposed MCZ was mapped during the Regional Project Process and updated during local pre-consultation engagement.</li> <li>- Scenarios where 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 impact monetised due to uncertainty</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>	<b>N/A</b>

<sup>50</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.

Private sector	Methodology, assumptions and sources	Best estimate scenario costs	Low / High cost scenarios
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 a MCZ.</li> <li>- Since the location of all future cable routes are not known, the number of potential licence applications were calculated for all MCZs and scaled down proportionally for the sites in the preferred option.</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 style="text-align: center;"><b>PV: £0.029m</b> <b>Annual average: £0.002m/yr</b></p> <p>4 new Licence applications in each years of 2022, 2027, 2032 and 2037 (<b>total 16 licences over 20 years</b>) for the 99 inshore sites initially proposed by the Regional MCZ Project process. This was scaled down proportionally for the 25 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 style="text-align: center;"><b>PV: £0.015m – £0.044m</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 (<b>total of 8 licenses over 20 years</b>) for 99 sites, This was scaled down for the sites recommended for designation 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 (<b>total of 24 licenses over 20 years</b>).</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.</li> </ul>	<p style="text-align: center;"><b>No impact monetised due to uncertainty on the number of licence applications</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>- Fishing activity in each MCZ uses methodology from MCZ fisheries Model.</li> <li>- Value of Landing information provided by VMS data for over 15m vessels 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.</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 style="text-align: center;"><b>PV: £1.608m</b> <b>Annual average: £0.109m/yr</b></p> <p>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 <b>Annex A</b>). 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 style="text-align: center;"><b>PV: £0.000m - £13.470m</b> <b>Annual average: £0.000m/yr - £0.916m/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
Archaeological heritage	<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 but this is not applicable to the 3rd tranche sites, as none have this feature in an unfavourable condition.</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 impact monetised due to uncertainty on number of licence applications.</b></p> <p>No information about future licence applications or suitable historical data with which to forecast future activities was provided during pre-consultation, If necessary extra information will be gathered during 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> and 29<sup>th</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 project process in 2011, and have been updated to 2015 prices. At the discretion of industry the costs comprise of a combination of external consultant costs and internal time.</li> <li>- Cost are calculated based on the 127 regional project MCZs and scaled down to account only for the 3<sup>rd</sup> tranche.</li> </ul>	<p><b>PV: £1.356m</b> <b>Annual average: £0.089m/yr</b></p> <p>Costs are based on additional application costs for different phases on 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: £0.827m – £1.761m</b> <b>Annual average: £0.054m/yr - £0.114m/yr</b></p> <p>Sensitivity around the number of future licence applications.</p> <p><b>Low cost scenario:</b> is 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> is 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% 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 with the best estimate.</p>

Private sector	Methodology, assumptions and sources	Best estimate scenario costs	Low / High cost scenarios
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 5km of an MCZ. 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 any mitigation requirements relevant to the Ports and Harbour sector</li> <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 groups are differentiated by the number of MDPs<sup>51</sup> in place and the percentage of navigational dredging applications that are supported by a MDP.</li> <li>- MDP's 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 style="text-align: center;"><b>PV: £1.702m</b> <b>Annual average: £0.114m/yr</b></p> <p>The best estimate is the mid-point of the 2 low cost scenarios</p>	<p style="text-align: center;"><b>PV: £1.659m – £4.804m</b> <b>Annual average: £0.111m/yr - £0.326m/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:</b> <u>Cost for disposal sites applications is based on number of applicants</u>, 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 costs per licence application is used.</p> <p><b>High cost scenario:</b> <u>Costs for disposal sites 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 costs per licence application is used.</p>
Recreation	<ul style="list-style-type: none"> <li>- Recreation 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>52</sup> of the sensitivity of features to the activities taking place.</li> <li>- Anchoring and mooring need to be managed at two sites (Studland Bay and Bembridge) due to the presence of</li> </ul>	<p style="text-align: center;"><b>PV: £1.385m</b> <b>Annual average: £0.093m/yr</b></p> <p>The best estimate of the impact is taken as the average of the lowest and highest cost scenarios</p>	<p style="text-align: center;"><b>PV: £0.242m – £2.526m</b> <b>Annual average: £0.015m/yr - £0.172m/yr</b></p> <p>A range of management scenarios have been developed and they depend on the issue under consideration and whether it involves either Regional Project Sites or New Options sites or</p>

<sup>51</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>52</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.

	various features that need to recover as per SNBC advice. See Annex A for management scenarios for the sites.		Highly mobile species.
<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 here as within 1km of the MCZ boundary). The additional cost is to assess potential impact of activity.</li> <li>- Crown Estate and MMO provided information of 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 1km of the proposed sites.</li> </ul>	<p><b>PV: £0.0.073m</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><b>No sensitivity</b></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. Therefore there is no sensitivity range on these costs.</p>
		<p><b>Total Business PV costs : £6.226m</b> <b>Total annual average business costs: £0.418m</b></p>	<p><b>Total business PV costs: £2.887m - £22.749m</b> <b>Total annual average business costs: £0.192m - £1.539m</b></p>
<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 are assumed at this stage as a result of the sites proposed for designation in the 3rd tranche for monitoring, additional assessment costs or mitigation of activities. This will be confirmed in due course by the EA as well as being tested during consultation.</li> </ul>	<p><b>No impact monetised</b></p> <p>No costs anticipated due to uncertainty of number of licence applications, It is likely that costs are relatively low since selection of sites considered also areas where only minor mitigation activities would be expected</p>	<p><b>N/A</b></p>
National Defence	<ul style="list-style-type: none"> <li>- National Defence activity in and near to all potential MCZs were 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>- <i>Costs are generic and may differ depending on the scale and nature of the military activities in each MCZ.</i></li> </ul>	<p><b>PV: £0.049m</b> <b>Annual average: £0.003m/yr</b></p> <p>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;</p>	<p><b>N/A</b></p>

<b>Public Sector</b>	<b>Methodology, assumptions and sources</b>	<b>Best estimate scenario</b>	<b>Low / High cost scenarios</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, and the responsibility to implement and enforce the management of these activities falls to one of three public authority: the MMO, IFCAs and the 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: £23.093m</b>  <b>Annual average: £1.566/yr</b></p> <p>Best estimate is the midpoint of the high and low cost scenarios.</p>	<p><b>PV: £19.048m – £27.137m</b>  <b>Annual average: £1.292m/yr - £1.839m/yr</b></p> <p><b>Sensitivity around management.</b>  <b>Low cost scenario:</b> looks at both non-regulatory and regulatory management measures.  <b>High cost scenario:</b> only regulatory management measures for all MCZs. 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: £35.446m</b>  <b>Annual average: £2.410/yr</b></p>	<p><b>No sensitivity</b></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:</b>  <b>£58.588m</b>  <b>Total average annual public costs:</b>  <b>£3.979m</b></p>	<p><b>Total public PV costs:</b>  <b>£54.543m - £62.632m</b>  <b>Total average annual public costs:</b>  <b>£3.706m - £4.252m</b></p>
<b>Non-UK</b>	<b>Methodology and sources</b>	<b>Best estimate scenario</b>	<b>Low / High cost scenarios</b>
Non-UK commercial fisheries vessels	<ul style="list-style-type: none"> <li>- Figures for non-UK vessels were gathered during pre-consultation from all relevant member states.</li> <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>	N/A	N/A

## Costs to Business (Equivalent Annual Direct Net Costs Business)

- 6.48. Costs to business have been calculated in line with the Better Regulation Framework manual<sup>53</sup>. These are calculated as full economic costs. Figures have been provided directly by industry during the 2 years of informal consultation as part of the Regional MCZ Projects process and also during the tranche 3 pre-consultation period. When necessary figures from the previous tranches consultations were considered and updated to 2015 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 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.
- 6.49. 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.
- 6.50. 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, including consultation with stakeholders and if required an associated regulatory IA. These costs provide a best estimate of what these costs may be and will be tested at consultation.
- 6.51. 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. In light of this, the IA assumes that no mitigation of impacts of water abstraction, discharge or diffuse pollution is required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process.

**The figures result in an EANDCB of 0.5m/yr (2014 prices /2015 present value year). The PV cost to industry is £6.63m 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

- 6.52. 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.
- 6.53. 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 comprise. Assumptions and results of sensitivity analysis have been taken at a regional level and verified with relevant industry representatives<sup>54</sup>.

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<sup>53</sup> <https://www.gov.uk/government/publications/better-regulation-framework-manual>

<sup>54</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.



- 6.54. 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 this area is lost). The assumptions were validated during previous tranches as well as during pre-consultation with no major objections, therefore they have been applied for the 3rd tranche. Formal consultation will allow to verify again whether such assumptions are valid.

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

- 6.55. 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.

The recreational sector may face restrictions at two sites: Studland Bay and Bembridge. 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.

- 6.56. 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 £0.137m/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 proposed sites.
- 6.57. The UK fishing fleet in 2015 had 6,187 vessels and employed 12,107 fishermen (MMO, 2016<sup>55</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, 2016). Some fishing data has been recently published and, if necessary, these figures will be updated during consultation.
- 6.58. Other sectors incurring additional costs to assess the impacts of their licenced activities on the conservation objectives of sites, are covered by existing licencing 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 sectors impacted, oil & gas and ports and harbours, are made up of 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 have been identified which would require mitigation and consultation responses will be used to refine impacts on small and micro businesses as necessary.

## **7. Benefits under the baseline and preferred option**

- 7.1. 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 3.3. The UK National Ecosystem Assessment Follow-on (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

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<sup>55</sup>[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/647482/UK\\_Sea\\_Fisheries\\_Statistics\\_2016\\_Full\\_report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/647482/UK_Sea_Fisheries_Statistics_2016_Full_report.pdf)

of marine conservation measures in decision making but also the challenges and lack of economic evidence currently available for doing so.

More recently, Hanley and Torres (2016) carried out an extensive literature review on economic valuation of coastal and marine ecosystem services. However, despite the number of studies investigating the economic value of environmental protection is increasing, there is lack of robust evidence on economic benefits targeting specifically MCZs. 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. 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.

7.2. 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>56</sup>.

<b>Table 3: Marine goods and benefits considered within the NEAFO study<sup>57</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
Cultural	Tourism and nature watching Spiritual and cultural well-being Aesthetic benefits Education and research Health benefits

### Benefits under baseline

7.3. Section 5 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 due to a lack of site-specific knowledge on the change in feature condition (see sections 5.3 and 5.4 above). 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 MCZs under consideration they help illustrate the substantial benefits people derive from the marine environment

<b>Table 4: Existing benefits of the UK marine environment (Unless specified, estimates are for the UK marine environment rather than specific to MCZs)</b>		
Provisioning	Food (wild, farmed)	In 2014, the GVA of fishing, including aquaculture, was £1.4bn <sup>58</sup>

<sup>56</sup> <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=KLy76Rak0WQ%3d&tabid=82>

<sup>57</sup> Adapted from the conceptual framework UK, NEA, 2011

<sup>58</sup> ONS ABS - ONS Annual Business Survey <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcn%3A77-330927>

	Fish feed (wild, farmed, bait) Fertiliser and biofuels Ornaments and aquaria Medicines and blue biotechnology	
Regulating	Prevention of coastal erosion and sea defence  Healthy climate  Waste burial / removal / neutralisation	£1.5bn yr total value storm buffering and flood control (meta-analysis) <sup>59</sup> ; £300m 2004 value, avoidance cost of building flood control measures) <sup>60</sup>  £0.4-8.47bn yr 2002 values, avoidance cost; £6.74bn yr-1 marine Carbon-sequestration 2004 value, avoidance cost <sup>61</sup>  Beaumont et al (2008) and Clarkson (2002) identifies the economic value of regulating services to the UK at £420m to £8.5bn. However, this value is for all of UK seas rather than the features the MCZ protects.
Cultural	Tourism and nature watching  Education and research  Spiritual and cultural well-being Aesthetic benefits Health benefits	Between March 2015 and February 2016, 322m leisure visits were made to seaside/coastal areas in England <sup>62</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>63</sup>  An Oxford Economics (2013) report valued Marine Science and Marine Technical Consultancy in 2011 at £0.3bn and £0.5bn GVA respectively <sup>64</sup> .  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 & Moran, 2010). This equates to £1.65bn if multiplied by the estimated 22m households in England in 2012.

## Benefits of the preferred option (option 1)

7.4. The designation of 41 MCZs and additional features from existing 1st and 2nd tranche sites will help to conserve 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 11,713 km<sup>2</sup> will be protected by the designation of these 41 additional sites and 201 features will be conserved. 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.

7.5. MCZ designation brings benefits from the:

- 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 objective' are considered to yield additional benefits. 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.

<sup>59</sup> UK National Ecosystem Assessment, 2011 from Fletcher et al (2012). Total value of service assuming it is present in all UK coastal wetland.

<sup>60</sup> Beaumont et al., 2008

<sup>61</sup> UK National ecosystem assessment (2011) and Beaumont et al. (2006), from Fletcher et al (2012)

<sup>62</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>63</sup> Watersports and leisure participation survey 2015

[http://www.rya.org.uk/SiteCollectionDocuments/sportsdevelopment/Watersports\\_Participation\\_Survey\\_2015\\_Executive\\_Summary.pdf](http://www.rya.org.uk/SiteCollectionDocuments/sportsdevelopment/Watersports_Participation_Survey_2015_Executive_Summary.pdf)

<sup>64</sup> <http://www.oxfordeconomics.com/publication/open/239345>

- Cumulative ecosystem service benefits of an overall coherent network of protected areas, which these sites will contribute to alongside other designations.

- 7.6. 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 Annex B and C for information on some of these studies.
- 7.7. 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>65</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**

- 7.8. Improved condition of designated features will enhance quality and quantity of certain ecosystem services and possibly leading to higher socio-economic 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 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 because it provides further evidence in support of the designation of features recommended in this last tranche of designations.
- 7.9. As described in the baseline (in the absence of MCZ designation) there are a number of features which already have some level of protection through existing lists of habitats and species requiring protection and other types of protected area e.g. European Marine Sites (EMS). Benefits from MCZs will therefore 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.
- 7.10. 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 which assumes a static baseline. Thus, the IA does not include an assessment of the benefits of preventing potential future degradation to those features.
- 7.11. Table 5 below provides the list of ecosystem services that are derived from the features proposed for the 3rd tranche of MCZs. Benefits from recreational services have been monetised for illustrative purposes only. The table also provides information on the confidence level associated with these estimates.

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<sup>65</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.

<b>Table 5: Ecosystem services benefits from the protection of MCZ features in sites proposed for the 3rd tranche</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 features are preserved 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 study <sup>66</sup> ((see Annex C for more detailed information on the research methodology) one-off non-use value of protecting the sites to divers and anglers alone estimated at <b>£176m to £338m (Best estimate £257m)</b> to protect 30 of the designated sites.  Further explanation on the estimates is provided in Box 4, Annex C and sections 7.10 to 7.14	<i>Med - High confidence</i> 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 <i>additional</i> 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 likely to benefit the greatest number of people for educational 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.	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	<i>Med - High confidence</i> in existence of features; <i>relatively high confidence</i> that there will be a benefit to research and education due to these designations
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>67</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 (2 features over 7 sites), coastal saltmarshes (1 feature over 5 sites), infralittoral rock (3 features over 2 sites), deep sea bed (1 feature in 1 site) and seagrass beds (1 feature in 2 sites) are all relevant habitats <sup>68</sup> for fish.	<i>High confidence</i> in existence of features; <i>fairly high confidence</i> in impact on provisioning services for shellfish; <i>very low confidence</i> in impact on provisioning services

<sup>66</sup> <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2bY%3d&tabid=82>

<sup>67</sup> Regional MCZ Project Methodology Documents Annex H5

<sup>68</sup> Fletcher et al (2012)

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, 2013:4)	No new economic evidence considered since tranche 2 Mudflats, 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.	<i>High confidence</i> in existence of features; <i>low confidence</i> in impact on regulating services
Environmental resilience	Protecting a wide range of species and habitats can increase resilience to natural and human pressures <sup>69</sup> By protecting and enhancing biodiversity, MCZs will help to ensure that natural and human pressures are absorbed by the marine environment, reducing degradation, irreversible damage and potential cuts in all (final) marine ecosystem services. 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 include 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>70</sup> . See discussion in section 7.16 below, of the anticipated overall benefits of an MCZ network.	No new economic evidence considered since tranche 2: The full range of different features and habitats is important, especially those which are not protected by other designations (such as broad scale habitats).	<i>High confidence</i> in existence of features; <i>medium confidence</i> in impact on environmental resilience.
Gas and climate regulation	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.	No new economic evidence considered since tranche 2 In the 3rd tranche a number of features which are particularly efficient sequesters of carbon: Intertidal mud, coastal salt marshes and saline reed beds the deep-sea bed (mud in deep waters) and seagrass beds. <sup>71</sup>  Studies have valued the carbon benefit of certain relevant habitats <i>in their entirety</i> , for example, Beaumont et al (2010) valued saltmarshes at e.g. £6,100-62,200/km/yr <sup>72</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	<i>High confidence</i> in existence of features; <i>medium confidence</i> in impact on carbon sequestration.

<sup>69</sup> (Hughes and others, 2005; Tilman, Reich and Knops, 2006; in Beaumont and others, 2008).

<sup>70</sup> OSPAR (2010)

<sup>71</sup> Fletcher et al (2012).

<sup>72</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

		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 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>73</sup> Salt marshes and seagrass beds are thought to be particularly good regulators of pollution.	<i>High confidence</i> in existence of features; <i>low confidence</i> in impact on regulation of pollution.

<sup>73</sup> Beaumont and others, 2008; Fletcher and others, 2012; Austen and others, 2011.

- 7.12. The evidence presented in Table 5 shows that many of the 3rd tranche features proposed for protection along with additional 1st and 2nd tranches features and highly mobile species, provide valuable ecosystem services, with resulting increase in human welfare, albeit it has not been possible to fully quantify or monetise these benefits.
- 7.13. Some monetary values of MCZs have been estimated by Kenter et al (2013)<sup>74</sup>. This report investigated the recreational use and non-use values of UK divers and sea anglers for 22 Scottish potential Marine Protected Areas (pMPAs), 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 Dec 2012 and Jan 2013.
- 7.14. The current final tranche of designations has included, along with the Regional MCZ Project sites, a number of new sites in order to fill the remaining gaps in the network as well as to protect highly mobile species. Nonetheless, those sites have not been included in the benefits calculations based on Kenter et al. report. This is due to the fact that the report looks only at sites originally proposed for designation by Defra in 2011 which did not include either new option sites or sites where protection for highly mobile species is, at present, deemed necessary.

### Box 3: Monetisation of recreational benefits

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

Cultural services that will be attributable to designation of sites have been assessed by a team of researchers from University of Aberdeen in partnership with the Marine Conservation Society (MCS), 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 a 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 to **£176m to £338m (Best estimate £257m)** one-off to protect 30 sites in 2015 prices. These estimates refer to non-use values obtained from Kenter study but adjusted to the current proposed 30 sites. 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<sup>75</sup>. 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 says that MPAs would safeguard an annual recreational value currently worth £1.87 - 3.39 bln for England alone (excluding benefits of restrictions on other users and contingent on designation not significantly restricting diving and angling). This value is only an indicative use value and 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 in a scope test exercise for the purpose of this policy proposal. In any case, the costs appear to be significantly lower than the indicative benefits.

- 7.15. 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

<sup>74</sup> Kenter et al (2013) <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAph%2bY%3d&tabid=82>

<sup>74</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.



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.

- 7.16. Discussing limitations of the non-use 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 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**

- 7.17. MPAs already exist in the form of European Marine Sites (EMS) designated under the EU Habitats and Birds Directives, 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.
- 7.18. 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.
- 7.19. 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.

### **Risks, uncertainties and sensitivities**

- 7.20. 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 due to a lack of site-specific knowledge on the change in feature condition (see Sections 5, 7.3, 7.5 and 7.8 above). This could potentially underestimate the benefits outlined above.
- 7.21. 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).
- 7.22. The designation of a network of MCZs will clearly benefit marine and coastal habitats within the protected areas but the extent to which designation will affect areas outside of the MCZ network is less clear. For example, fishermen may need to move their activity elsewhere which may put

new pressures on adjacent fishing grounds that are still open. The extent to which spill over effects such as this occur, will differ across species and ecosystems.

- 7.23. Overall, the main objective of creating a network of MCZs is biodiversity protection rather than increasing Maximum Sustainable Yield (MSY<sup>76</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.

## 8. MCZ Post-implementation review plan

- 8.1. 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 set out further steps that may be necessary for success. The MCAA allows MCZ designating orders to be reviewed, amended or revoked, and the government intends to keep MCZs under review, considering amendments to boundaries, conservation objectives and/or management where supported by evidence. This will include the consideration of any new data on features and on the effect of pressures, and allows for changes required to meet new laws and policies. Defra will also keep the ecological coherence of the network under review, taking account of any new scientific developments that may give rise to additional designation or de-designation of MCZs. Any future designations or de-designations will be accompanied by an impact assessment setting out the costs and benefits of such changes.

## 9. Conclusion

- 9.1. There are considerable benefits to designating the proposed 41 new MCZs. A combined area of 11,713 km<sup>2</sup> will be protected by the designation of this 3rd tranche and 201 features (habitats, species and geological features) will be conserved. This protection will result in an increase in 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 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.
- 9.2. The total estimated quantified economic costs of the 41 sites proposed for designation in 2019 ranges from £77.95m to £115.83m and the best estimate is £87.94m. This gives a present value of between -£85.38m and -£57.43m and a best estimate of -£64.81m over the 20-year timeframe of the IA, where private costs account for £6.23m and public costs £58.59m. **The best estimate equivalent annual cost to business is £0.4m/yr (2014 prices, 2015 present value base year).** The main costs to industry are for ports and harbours (£0.114m/yr), commercial fisheries (£0.109m/yr), recreation (£0.093m) and oil, gas and CCS (£0.089m/yr).

<b>Impacted Private Sector</b>	<b>Best Estimate average annual Cost</b>	<b>Best estimate PV Costs £m (low –high)</b>	<b>Description of Costs</b>

<sup>76</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)

	£m/yr (low - high)		
Aggregate extraction	0.006m/yr (0.006-0.004)	0.072m (0.072 – 0.072)	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	Not monetised due to uncertainty	Not costs monetised due to uncertainty	No significant costs to aquaculture are anticipated as a result of tranche 3.
Cables	0.002m/yr (0.001-0.003) <sup>77</sup>	0.029m (0.015-0.044)	Licence application costs for future developments, to collect more 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	Not monetised due to uncertainty	Not monetised due to uncertainty	Additional un-monetised costs unlikely.
Commercial Fisheries (UK only)	0.109m/yr (0.000-0.916)	1.608m (0.000-13.470)	Site and gear specific restrictions on fishing activities, for example restricting trawling in specific sections of a 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.
Archaeological heritage	Not possible to monetise	Not possible to monetise	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)	0.089m/yr (0.054-0.114)	1.356m (0.827 – 1.761)	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	0.114m/yr (0.111–0.326)	1.702m (1.659 – 4.804m)	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	0.093m/yr	1.385m	Management of anchoring and mooring

	(0.015-0.172)	(0.242 – 2.526)	at Bembridge and Studland bay may be needed to protect the features with a GMA of recover.
Renewable Energy	0.005m/yr	0.073m	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>0.418m/yr (0.192 – 1.539)</b>	<b>6.226m (2.887 – 22.749)</b>  <b>PV 2019 base year; 2015 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)	<b>No costs anticipated as a result of tranche 3</b>	<b>No costs anticipated as a result of tranche 3</b>	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	0.049m	Costs of adjusting electronic tools and charts and annual costs of maintaining; Additional planning considerations
Management and enforcement of MCZs	1.566m/yr (1.292 – 1.839)	23.093m (19.048 – 27.137)	Costs to MMO, IFCA and Defra for enforcing management measures.
Ecological Surveys	2.410m/yr	35.446m	Costs of baseline surveys and costs of monitoring to JNCC and Natural England.
<b>Annual and PV costs to public sector</b>	<b>3.979/yr (3.706 – 4.252)</b>	58.588m (54.543 – 62.632)	
<b>Overall annual and PV costs</b>	<b>4.397m/yr (3.898 – 5.793)</b>	<b>64.813m (57.430 – 85.381)</b>	Annualised total costs for public and private sector
Notes:			
<ul style="list-style-type: none"> <li>The annual costs (m/yr) for each sectors (including public costs) are total costs (transition plus annual) averaged of the 20 year period (2019 to 2038), presented in 2015 prices. The EANDCB figure of £0.4m/yr is calculated by converting the figures to 2014 prices and 2015 present value year.</li> </ul>			

9.3. The main (best estimate) costs to government under the preferred option are £1.556m/yr for management and enforcement of the sites, £2.410m/yr for ecological survey work and a small cost to national defence (£0.003m/yr).

9.4. In addition there are some costs that have not been quantified. Costs associated with sectors where future projects were highly uncertain 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. 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.

9.5. The costs analysis in the IA has benefitted from pre-consultation engagement with stakeholders as described in Section 6.2 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, and these assumptions and costs will be tested during consultation.

## References

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