

<b>Title:</b> Designation of the second tranche of Marine Conservation Zones in waters for which the Secretary of State has responsibility (English inshore, English and Northern Irish offshore)  <b>IA No:</b> Defra 1810  <b>Lead department or agency:</b> Department for Environment, Food and Rural Affairs  <b>Other departments or agencies:</b>	<b>Impact Assessment (IA)</b>		
	<b>Date:</b> [24 <sup>th</sup> September 2015]		
	<b>Stage:</b> Final		
	<b>Source of intervention:</b> Domestic		
	<b>Type of measure:</b> Secondary Legislation		
<b>Contact for enquiries:</b> Juliette Hatchman, juliette.hatchman@defra.gsi.gov.uk			

<b>Summary: Intervention and Options</b>	<b>RPC Opinion:</b>
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Cost of Preferred (or more likely) Option			
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANCB on 2014 prices)	In scope of One-In, Measure qualifies as Three-Out?
£-31.36m	£-4.50m	£0.31m	Yes   IN

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

A biologically diverse marine environment is of high value to society and there is evidence that the quality of the UK marine environment has declined over recent decades. Market failure in the marine environment occurs because no monetary price is attached to many goods and services it provides and market mechanisms cannot ensure that actions are fully paid for by users. In such a case, individuals do not have an economic incentive to secure the continued existence of these goods and services. Even if there are costs for businesses and society, it is necessary for government to intervene and designate sites that will protect nationally representative, rare and threatened and/ or valuable species and habitats and deliver a network of Marine Conservation Zones for significant and long term benefits to both users and non-users.

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

The Government aims to have 'clean, healthy, safe, productive and biologically diverse oceans and seas'. Contributing to an ecologically coherent network of Marine Protected Areas (MPAs) is an essential part of the strategy to achieve this. As part of this strategy, the Government has made a commitment to completing a network of Marine Conservation Zones (MCZs – a type of MPA), to create a Blue Belt of protected sites around our coasts. The Government has a legal duty to designate MCZs under the Marine and Coastal Access Act 2009 (MCAA) so that those sites (along with other UK conservation sites) contribute to a marine conservation network. The designation of MCZs will help deliver the Government's aim of a well-managed network of MPAs that is understood and supported.

**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" for which no further zones would be designated additional to the 27 sites already designated. 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 marine protected areas including MCZs and the first tranche alone would not be able to meet this legal obligation

Option 1 (preferred) – designating the 2<sup>nd</sup> tranche of 23 MCZs and some additional features in the 1<sup>st</sup> tranche in 2015. These have been identified to fill big ecological gaps in the network as identified by the Joint Nature Conservation Committee, thus making a further contribution to the English component of an effective and well-managed network of MPAs as required by MCAA. This option balances ecological benefits with the socioeconomic implications to deliver a proportionate and cost-effective contribution to the MPA network. The phased, evidence based approach was announced by Ministers in 2011.

<b>Will the policy be reviewed? It will be reviewed. If applicable, set review date: 2018</b>						
Does implementation go beyond minimum EU requirements?				N/A		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.		<b>Micro</b> Yes	<b>&lt; 20</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 (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) that the benefits justify the costs.***

Signed by the responsible: Minister \_\_\_\_\_ Date: \_\_\_\_\_

# Summary: Analysis & Evidence

# Policy Option 1

**Description:** Designating a second tranche of 23 MCZs in 2015 identified to fill big ecological gaps in the network and with sufficient supporting evidence (both ecological and economic), thus making a further contribution to the English component of an effective and well-managed network of MPAs as required by MCAA.

## FULL ECONOMIC ASSESSMENT

Price Base Year 2013	PV Base Year 2015	Time Period Years 20	Net Benefit (Present Value (PV)) (£m)		
			Low: -48.73	High: -29.98	Best Estimate: -31.36

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	6.9	1.7	30.0
High	11.6	2.7	48.7
Best Estimate	7.0	1.8	31.4

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

Best estimate average annual costs (undiscounted including transition one off costs): Industry Costs: ports, harbours (£0.126m); oil and gas (£0.117m); commercial fisheries (£0.034m); aggregate extraction (£0.011m); renewable energy (£0.010m); cables (£0.001m); Public Costs average annual: ecological surveys (£1.063m); management (£0.751m); national defence (£0.002m).

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

Where the occurrence or management of future projects is highly uncertain, costs are not monetised (e.g. archaeology, recreational boating). There are potential impacts on communities from management of fisheries, and UK vessels may be affected by displacement of non-UK fleets. Other public sector costs of informing users about MCZs, advising public authorities on impacts of proposed licensed activities to MCZs, and costs to the public authorities considering the advice have not been monetised. These effects have not been monetised due to a lack of evidence, but 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 the expected benefits of MCZs have been monetised but only for illustrative purposes within this IA. This was due to uncertainty concerning the scale of benefits, and therefore they have not been included in the summary sheets.

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

A combined area of approximately 10,812km<sup>2</sup> will be protected by designation of the 2<sup>nd</sup> tranche MCZs and 234 features. These are likely to result in an increase in final ecosystem services (benefits) such as increases in provisioning (i.e. fish provision), regulating (i.e. climate regulation), supporting (i.e. nutrient cycling) and cultural (i.e. recreational) services. An overall network of marine protected areas is likely to have high additional benefits (both in the short and long term) such as conservation of marine biodiversity, protection or enhancement of ecosystem services and recovery of depleted stocks of exploited species.

<b>Key assumptions/sensitivities/risks</b>	<b>Discount rate (%)</b>	3.5
Where fishing is expected to be restricted in MCZs, 75% of affected fishing effort assumed to be displaced and 25% lost (assumption validated in consultation). The IA uses sensitivity scenarios to provide high/low costs estimates from MCZs designation for 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 small compared to the area protected. A static baseline (features' condition do not deteriorate without designation) is assumed.		

## BUSINESS ASSESSMENT (Option 1)

<b>Direct impact on business (Equivalent Annual) £m:</b>	<b>In scope of OI30?</b>	<b>Measure qualifies as</b>
Costs: 0.31	Yes	IN
Benefits: Unquantified		
Net: -0.31		

# Evidence Base (for summary sheets)

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### List of Acronyms

AT – Angling Trust  
BMAPA – British Marine Aggregate Producers Organisation  
BS – Balanced Seas Conservation Zones Project  
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  
DECC – Department for Energy and Climate Change  
DEFRA – Department for Environment, Food and Rural Affairs  
EA – Environment Agency  
EANCB – Equivalent Annual Net Costs 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 HOCI and SOCI)  
FS- Finding Sanctuary Conservation Zones Project  
GMA – General Management Approach  
GVA - Gross Value Added  
HOCI – Habitat of Conservation Importance

IA – Impact Assessment  
ICES – International Council for the Exploration of the Seas  
IFCA - Inshore Fisheries and Conservation Authority  
ISCZ - Irish Sea Conservation Zones  
JNCC - Joint Nature Conservation Committee  
MCAA – Marine and Coastal Access Act 2009  
MCS – Marine Conservation Society  
MCZ – Marine Conservation Zone  
MEA - Millennium Ecosystem Assessment  
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  
NG - Net Gain Marine Conservation Zone Project  
OSPAR – Oslo-Paris Convention for the Protection of the marine Environment of the North-East Atlantic  
pMPA – Potential Marine Protected Area  
PO – Producers Organisation (Fishing)  
PV – Present Value  
RA – Reference Area  
RAMSAR sites - marine components of RAMSAR sites<sup>1</sup>  
RA – Reference Areas  
RYA – Royal Yachting Association  
SAC - Special Areas of Conservation (SAC)<sup>2</sup>  
SAP – Science Advisory Panel  
SNCB – Statutory Nature Conservation Body (collective term for Natural England and the Joint Nature Conservation Committee)  
SOCI – Species of Conservation Importance  
SPA - Special Protection Areas (SPA)<sup>3</sup>  
SSSIs - Sites of Special Scientific Interests<sup>4</sup>  
UK BAP - UK Biodiversity Action Plan  
UKHO – UK Hydrographic Office  
UKMMAS - UK Marine Monitoring and Assessment Strategy  
UKNEA – UK National Ecosystem Assessment  
VMS – Vessel Monitoring System, used to track the location of vessels  
WCA – Wildlife and Countryside Act  
WFD – Water Framework Directive

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<sup>1</sup> Sites designated as Wetlands of International Importance under the Ramsar Convention (1971).

<sup>2</sup> Required by the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna).

<sup>3</sup> Required by the Wild Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds)

<sup>4</sup> Designated under the Wildlife and Countryside Act 1981 (as amended).

# 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. It is important to recognise that the seas around the UK are not just places of important biological diversity; they also provide us with a variety of goods and services. 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, the Government and Devolved Administrations have committed to contributing to an 'ecologically coherent' network of Marine Protected Areas (MPAs). This network will protect rare, threatened and valuable habitats in the seas around the UK, with enough sites to conserve a range of major habitats vital for the health of our marine ecosystems. The network will comprise 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), created under Part 5 of the Marine and Coastal Access Act (MCAA) 2009 in England and Wales. Unlike other types of MPA, designation of MCZs can involve taking social and economic factors into account alongside environmental factors when identifying and managing potential sites. MCZs will complement (not duplicate) other types of designation and 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.
- 1.3 Department for Environment, Food and Rural Affairs (Defra) is responsible for the MCZ process for non-devolved UK waters. These are comprised of English inshore waters (inside 12 nautical miles) and offshore waters adjacent to England, Wales and Northern Ireland (to 200 nautical miles or the agreed administrative boundary with neighbouring countries). The Devolved Administrations are running independent projects not examined here.
- 1.4 In 2009 Defra invited the Statutory Nature Conservation Bodies (SNCBs); the Joint Nature Conservation Committee (JNCC) and Natural England (NE) to recommend possible MCZs to the Government which had stakeholder support. The SNCBs set up a project to give sea-users and interest groups (stakeholders including businesses) the opportunity to make recommendations through the establishment of four regional MCZ projects<sup>9</sup>. The SNCBs provided the Regional MCZ Projects with guidance on the criteria for selecting a network of MCZs in their regions, based on the OSPAR network design principles<sup>10</sup> (the Ecological Network Guidance (ENG)) and project delivery guidance setting out the process that should be followed to select site locations and complete an Impact Assessment (IA) accompanying the site recommendations.
- 1.5 In September 2011 recommendations for 127 MCZs were submitted to Government. Whilst recognising that the recommendations had come from a stakeholder-led process, significant concerns were raised about the state of the evidence base supporting the recommendations. As a result of these concerns, a Written Ministerial Statement<sup>11</sup> in November 2011 announced that MCZ designations would be made in tranches with the best-evidenced sites designated first, revised the timetable for designation and announced additional funding to support further evidence gathering.

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

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

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

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

<sup>9</sup> <http://jncc.defra.gov.uk/page-2409>

<sup>10</sup> Oslo and Paris Commission (Ospar) Guidance on Developing an Ecologically Coherent Network of Ospar Marine Protected Areas, (Reference number 2006-3)

<sup>11</sup> <https://www.gov.uk/government/news/written-ministerial-statement-on-marine-conservation-zones>

- 1.6 Following evaluation of the recommendations from the Regional MCZ Projects and accompanying impact assessments, formal advice from the SNCBs and advice from the independent Science Advisory Panel, 31 MCZ recommendations were considered suitable for designation in the 1<sup>st</sup> tranche and consulted on publicly in early 2013. The accompanying Impact Assessment (Defra 1475<sup>12</sup>) included the option of designating all the recommended sites from the Regional MCZ projects (all 127 sites presented as Option 1) and additionally the benefits and costs of designating the 31 sites proposed for the 2013 tranche of MCZs (known as Option 2). This allowed consultees to compare these two options available to Government against a baseline option of no MCZs.
- 1.7 After careful consideration of the responses and evidence received during the public consultation, 27 MCZs were designated in November 2013 as the 1<sup>st</sup> tranche<sup>13</sup>, covering an area of around 9,700 sq km and protecting 162 features. The supporting impact assessment received a green opinion from the independent Regulatory Policy Committee (RPC).
- 1.8 At this time Defra also announced future plans for MCZs which included a 2<sup>nd</sup> tranche in 2015 and a 3<sup>rd</sup> one to complete the English component of the UK's contribution to an ecologically coherent network of MPAs and contribute to the achievement of good environmental status in our oceans by 2020 as required by the Marine Strategy Framework Directive (MSFD). A public consultation on the 2<sup>nd</sup> tranche of a proposed 23 sites ran from 30<sup>th</sup> January 2015 to 24<sup>th</sup> April 2015.
- 1.9 The MCAA does not describe specific management actions to be taken for MCZs but places a duty on public authorities to consider the effect (where relevant) of the exercise of their functions on the protected features of an MCZ. The regulators, including the Marine Management Organisation (MMO) and Inshore Fisheries Conservation Authorities (IFCAs), are empowered to make appropriate management decisions on MCZs to ensure their protection. These may include voluntary arrangements, codes of practice, extra license conditions or introduction of byelaws. Any byelaw would be accompanied by an impact assessment and subject to public consultation.
- 1.10 This IA is within the scope of the 'One In Three Out' (OI3O) as the source of the legislation is domestic. It is classed as an 'In' as designation of MCZ sites could lead to the additional regulation of business through any management adopted by regulators to achieve the conservation objectives of the designation. All direct costs and benefits are calculated using OI3O methodology in line with Green Book and Better Regulation Framework Manual guidance. Where the MMO or IFCAs impose restrictions on activity and this is accompanied by an Impact Assessment, costs to business of these measures will be accounted for and counted against OI3O where any management is additional to actions already outlined in this IA. Costs from the imposition of management measures in MCZs will be validated in the Post Implementation Review of the second tranche of MCZs.

#### **Box 1: MCZs, Conservation Objectives and Management Measures**

**MCZs** are a type of Marine Protected Area (MPA). They protect areas that are nationally representative and important to conserving diversity and nationally rare or threatened habitats or species they contain. The features listed for designation will ensure the range of marine biodiversity in the UK's seas is conserved and the condition of features are improved if they are currently in an unfavourable state and thus require additional management measures. A feature is one of the habitats, species or geological features that MCZs are intended to conserve. Examples of features include intertidal mixed sediment (habitat), Native Oyster (species) and North Sea glacial tunnel valleys (geological feature). Unlike other MPAs, designation of MCZs can take into account social and economic factors when identifying potential sites, alongside the best available scientific evidence.

<sup>12</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/82721/mcz-designate-ia-20121213.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/82721/mcz-designate-ia-20121213.pdf)

<sup>13</sup> Four features were also dropped from the MCZ process at this time

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' condition depending on the current features condition (e.g. whether or not their state is in a favourable or unfavourable condition).

The GMA defines the change in feature condition being targeted, and hence has implications for the management of human activities that may impact on that feature.

Features with a GMA of 'recover to favourable condition' are assumed to be currently in unfavourable condition but, with MCZ designation and appropriate management they will recover to favourable condition over time.

Features with a GMA of 'maintain in favourable condition' are assumed to be currently in favourable condition. MCZ designation and continued appropriate management will protect the features against the risk of degradation from future, currently unplanned, human activities. Though it is assumed that in most cases mitigation of the impacts of human activities is not currently required, mitigation would, if necessary, be introduced in the future (with the consideration of associated costs and benefits).

## 2. Problem under Consideration

2.1 This IA concerns the selection of the 2<sup>nd</sup> tranche MCZs for designation in waters for which the SoS is responsible (English inshore waters and English and Northern Irish offshore waters) and additional features for designated 1<sup>st</sup> tranche sites. These proposed sites and additional features from the 1<sup>st</sup> tranche are being considered as one package under the 2<sup>nd</sup> tranche. The process for selecting MCZs for the 2<sup>nd</sup> tranche follows similar principles to the 1<sup>st</sup> and this IA largely follows the same approach and methodologies used in the IA for the 1<sup>st</sup> tranche of MCZs, which secured a green rated opinion through the RPC at the final stage post consultation. Updated data and prices are used and where available new information for the purpose of the assessment of costs and benefits is considered.

2.2 Defra initially identified 37 sites in February 2014 from the remaining recommendations from the Regional MCZ<sup>14</sup> Projects as suitable candidates for the 2<sup>nd</sup> tranche. Sites which addressed 'big gaps'<sup>15</sup> within the network (for example features that are not currently protected in a region or only a small proportion are protected) were prioritised. Each of the candidate sites were considered in terms of: the site's potential contribution towards an ecologically coherent network of marine protected areas; adequacy of the supporting evidence; and associated social and economic costs and benefits from potential management scenarios.

2.3 A period of pre-consultation dialogue with stakeholders ran from February until August 2014, involving meetings with representatives of the main industry sectors affected, conservation NGOs and local stakeholders. JNCC and NE updated their scientific advice on these sites, incorporating data from surveys conducted over the last two years and socio-economic information was also updated using the best available data sources and pre-consultation responses.

2.4 In addition to designating 2<sup>nd</sup> tranche sites, gaps in the network can also be filled by designating additional features in sites that were established in the 1<sup>st</sup> tranche. These are features that either:

- did not have sufficient scientific evidence when the 1<sup>st</sup> tranche was designated last year, but subsequent surveys have improved the evidence available making the case for designation;
- were subject to a change in the General Management Approach (GMA) (i.e. a change from 'maintain' to 'recover') following the 1<sup>st</sup> tranche consultation and additional consultation was required to collect evidence on local management or socioeconomic impacts; or

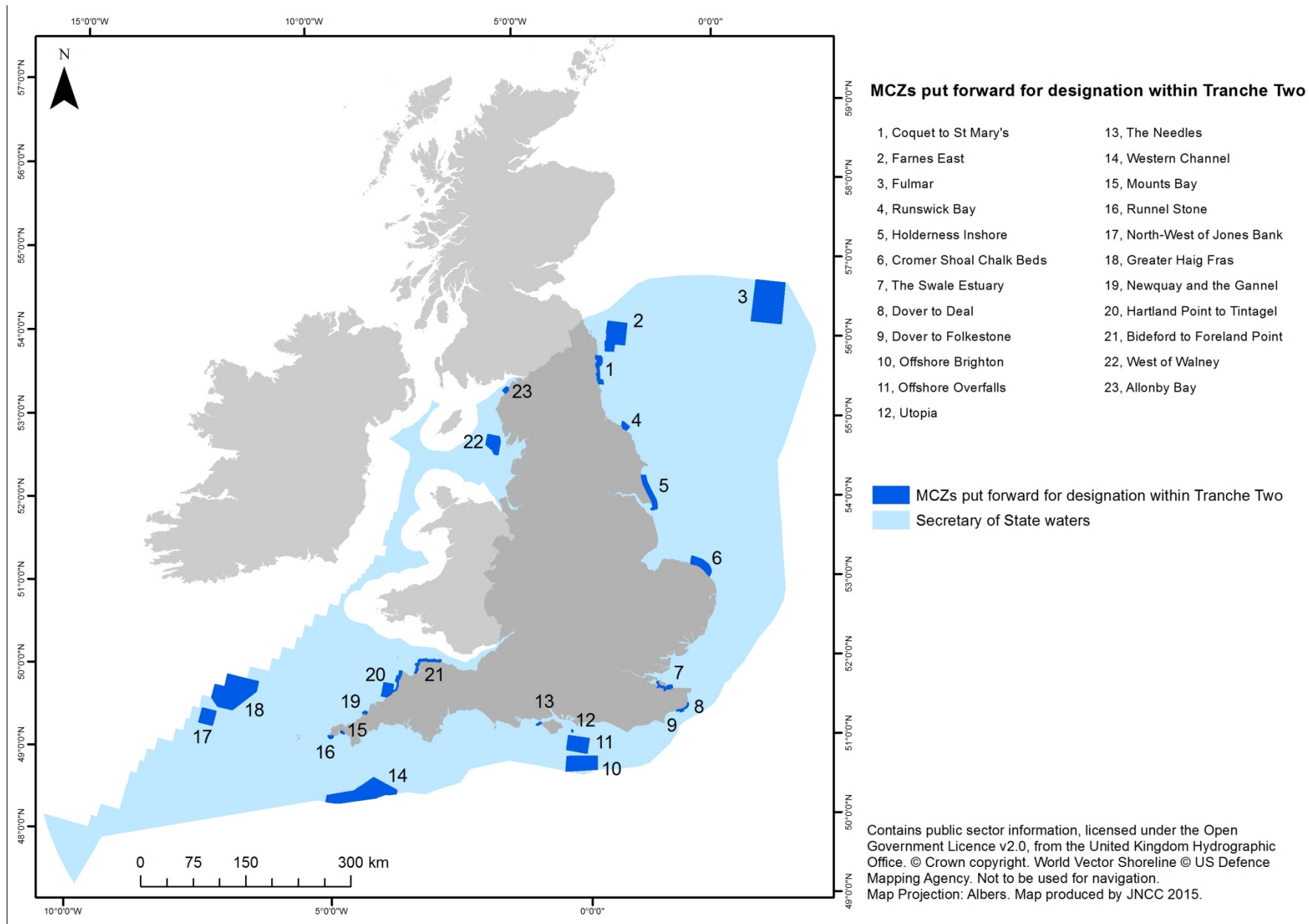
<sup>14</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/285304/pb14141-mcz-update-201402.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/285304/pb14141-mcz-update-201402.pdf)

<sup>15</sup> The MPA network is being designed to fulfil a number of OSPAR guiding principles that were developed to assist in interpreting the concept of an ecologically coherent network. These include principles to ensure the network best represents the range of species, habitats and ecologically processes; to ensure the network is well distributed in space; and is resilient through adequate replication of protection where possible.

- they are new, recently discovered in the sites, and important to cover ecological gaps

- 2.5 Defra identified 16 additional features in 10 designated 1<sup>st</sup> tranche sites that were suitable for inclusion in the consultation together with the recommended 2<sup>nd</sup> tranche sites. Before designating these features they needed to be subjected to consultation and this is why they have been included in this IA. In all cases there are no additional costs to business, above those which would be incurred in the baseline, to designating these additional features in the 1<sup>st</sup> tranche sites as there are unlikely to be any additional management requirements over and above those already deemed necessary; thus there are no additional costs to those already captured in the previous impact assessment. More details are provided in section 7 and Annex F.
- 2.6 Defra identified 23 sites that are suitable to designate (Option 1), protecting 234 features of conservation importance (including the 16 additional features from Tranche 1 sites). Fifteen of the sites are in English inshore waters (within 12 nautical miles from the coast) and 5 in English offshore waters (12-200 miles or the median line where our waters meet other Member State limits), with the remaining 3 sites crossing the 12 nautical mile boundary. The total area covered is 10,812 km<sup>2</sup>: approximately 2,500 km<sup>2</sup> in the inshore and 8,300 km<sup>2</sup> in the offshore. Further details on the 23 2<sup>nd</sup> tranche sites are provided in Annex G.
- 2.7 The remaining 14 sites of the original 37 candidate sites announced in February 2014 were considered but were not proposed for designation in the consultation for the reasons listed in para 6.9. These 14 sites are therefore not considered in this IA as they are not being proposed as part of the policy option. Further work is needed on these sites, including discussions with local stakeholders, before they may be ready for consideration for inclusion in the 3<sup>rd</sup> tranche.
- 2.8 Chart 1 lists the 23 sites recommended and agreed by Ministers to take forward to the consultation.





**Chart 1: The 23 sites recommended for the 2<sup>nd</sup> tranche of MCZs**

### 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<sup>16</sup>. Fish landings and aquaculture from the marine environment have a market value, while non-traded services include flood control, recreation, research and education. Aside from its economic value to society, the natural environment has intrinsic or 'non-use' value<sup>17</sup>. Recent work by the National Ecosystem Assessment Follow-On<sup>18</sup> supports this and in particular highlights the significant importance of ecosystem services, including less tangible cultural benefits, derived from a good quality marine environment<sup>19</sup>.
- 3.2 Human activities are having a detrimental effect on the extent and condition of many diverse marine habitats and their ecosystems. OSPAR<sup>20</sup> noted<sup>21</sup> 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. The most threatened marine and coastal habitats in the UK (as identified in the UK Biodiversity Action Plan (UK BAP)) 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<sup>22</sup>. The most recent comprehensive assessment of the UK marine environment prepared by UKMMAS was published in 2010 and showed that there are still key externalities to the marine environment to be addressed both in the short and long term<sup>23</sup>. The MSFD requires Member States to take action to achieve or maintain Good Environmental Status (GES) in their seas by 2020 and to co-ordinate their activities through the regional seas conventions – in our case OSPAR (Oslo and Paris Convention for the Protection of the North East Atlantic).
- 3.3 The reduction in extent and condition of marine habitats and ecosystems can be attributed to climate change and other anthropogenic activities, hence the 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.<sup>24</sup> 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' (no-one can be excluded from benefiting from them and consumption of the service does not diminish the service being available to others). The characteristics of public goods mean that individuals do

<sup>16</sup> OSPAR 2010. Quality Status Report. URL: <http://qsr2010.ospar.org/en/index.html> (Accessed 25 June 2012)

<sup>17</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>18</sup> <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=2&ProjectID=18081>

<sup>19</sup> [http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=2&ved=0CCwQFjAB&url=http%3A%2F%2Fukneq.unep-wcmc.org%2FLinkClick.aspx%3Ffileticket%3D5L6%252Fu%252B%252FrKKA%253D%26tabid%3D82&ei=EhEcVMHQKYPCovrnqbgqD&usq=A\\_FQjCNG6rghjwAc6Sc8EB8mqdwwV3JB6uA](http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=2&ved=0CCwQFjAB&url=http%3A%2F%2Fukneq.unep-wcmc.org%2FLinkClick.aspx%3Ffileticket%3D5L6%252Fu%252B%252FrKKA%253D%26tabid%3D82&ei=EhEcVMHQKYPCovrnqbgqD&usq=A_FQjCNG6rghjwAc6Sc8EB8mqdwwV3JB6uA)

<sup>20</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>21</sup> OSPAR 2010. Quality Status Report. URL: <http://qsr2010.ospar.org/en/index.html> (Accessed 25 June 2012)

<sup>22</sup> JNCC 2010. The UK Biodiversity Action Plan: Highlights from the 2008 reporting round. URL: [http://jncc.defra.gov.uk/pdf/pub2010\\_UKBAPHighlightsReport2008.pdf](http://jncc.defra.gov.uk/pdf/pub2010_UKBAPHighlightsReport2008.pdf) (Accessed 25 June 2012)

<sup>23</sup> Charting Progress 2, 2010. <http://webarchive.nationalarchives.gov.uk/20141203181034/http://chartingprogress.defra.gov.uk/>

<sup>24</sup> HMT Green Book [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/220541/green\\_book\\_complete.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf)

not necessarily have an economic incentive to voluntarily contribute effort or money to ensure the continued existence of these goods<sup>25</sup> leading to undersupply, or in this case under-protection.

- Negative externalities – Negative externalities occur when damage to the marine environment is not fully accounted for by users. 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, which ends up being borne by other individuals and society.

3.4 Government intervention is required to redress both these sources of market failure in the marine environment. Designation of MCZs and associated management measures to conserve features (e.g. habitats, species) will ensure negative externalities are reduced or suitably mitigated by users. Designation will also support continued provision of public goods in the marine environment, for example the features listed for designation will ensure the range of marine biodiversity in our seas is conserved.

3.5 The designation of MCZ will help to deliver the Government's aim of a well-managed network of MPAs that is understood and supported by stakeholders. MCZs are an essential component of this and Government has a legal duty to designate MCZs under the MCAA, to create a network and protect a range of nationally important habitats, species and geological features. In addition, an ecologically coherent network of MPAs will help meet the UK's commitments to national and European legislation such as the MSFD and international agreements.

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<sup>25</sup> HM Government 2011a. Overarching Impact Assessment for the Natural Environment White Paper – The Natural Choice: Securing the value of nature. URL: [www.archive.defra.gov.uk/environment/natural/documents/newp-ia-110607.pdf](http://www.archive.defra.gov.uk/environment/natural/documents/newp-ia-110607.pdf) (Accessed 25 June 2012)

## 4. Policy objective and intended effects

- 4.1 The UK administrations have committed<sup>26</sup> to contributing to an ecologically coherent UK network of MPAs as part of a broad based approach to nature conservation. However, neither English waters nor UK waters are a single ecological entity within a biogeographic<sup>27</sup> context. Our aim therefore is for the UK MPAs to contribute to an ecologically coherent network on a biogeographic basis and as a UK contribution to the wider OSPAR network<sup>28</sup>, with sites in the network working together to provide more benefits than an individual area could on its own. A coherent network can function to protect multiple habitats and species, and support a variety of key habitats and life stages of species. The UK is contributing to the development of methodologies through OSPAR and will continue to work with the administrations to agree an approach across the UK.
- 4.2 This network will contribute to achieving Good Environmental Status (GES) as required by the MSFD<sup>29</sup> and particularly in helping to ensure that biodiversity and seafloor ecosystems are protected, conserved and where appropriate recovered. The MSFD does not state a specific programme of measures that Member States should adopt to achieve GES, except for the establishment of MPAs.
- 4.3 The network required under the MCAA which includes the MCZs in 'SoS'<sup>30</sup> waters will contribute to meeting these national, European and international commitments. Designation of MCZs will help to ensure that conservation of habitats and species is given greater priority in the regulation and management of human activities, enabling protection of features and conservation objectives to be achieved. The aim of the policy option considered in this impact assessment is to designate the 2<sup>nd</sup> tranche of MCZs in line with the phased approach announced by the Fisheries Minister in 2011.
- 4.4 Unlike other MPAs, the MCAA allows for the consideration of socio-economic impacts when designating MCZs. Weighing up conservation advantages against socio-economic costs is challenging because some of the economic impacts are expressed in monetary terms while the ecological and economic benefits are expressed largely in qualitative terms.
- 4.5 The 1<sup>st</sup> tranche of MCZ sites were assessed in terms of their contribution to a network of marine protected areas. The SNCBs identified detailed ecological targets<sup>31</sup> to represent these broad requirements which also took account of the OSPAR network design principles which were provided as guidance to the Regional MCZ Projects. The SNCBs formal advice included a detailed assessment of how each MCZ recommended by the Regional Projects contributed to these targets and this is compared to socio-economic considerations to achieve these targets in the most cost effective way.
- 4.6 This 2<sup>nd</sup> tranche follows the same rationale but differs in that information about ecological gaps in the network is now available following JNCCs 'gap-analysis' work completed in Autumn 2013<sup>32</sup>. This means that prospective sites can also be considered against these gaps. Additional evidence had been collected for many sites for which there had previously been insufficient data available. This meant that many now have sufficient ecological evidence to be considered for designation. Socio-economic information and assumptions have also been updated. Some

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<sup>26</sup> UK Marine Policy Statement

<sup>27</sup> OSPAR maritime area divided into regions based on physical and biological features such as depth, temperature and seabed flora and fauna

<sup>28</sup> OSPAR Convention calls on Contracting Parties to establish an ecologically coherent network of well-managed MPAs by 2016

<sup>29</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0056>

<sup>30</sup> English inshore and English, Welsh and Northern Irish offshore waters

<sup>31</sup> 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>32</sup> Identifying the remaining MCZ site options that would fill big gaps in the existing MPA network around England and offshore waters of Wales & Northern Ireland. Available at: <http://jncc.defra.gov.uk/page-6658>

uncertainties on the scale of impacts, which may have precluded consideration of a site in the 1<sup>st</sup> tranche, have been reduced. For example, where activity has already been consented, and licensed, this will not be affected by MCZ designation until an application is made for the license to be renewed or varied significantly. As a result, uncertainty over impacts on the renewables sector has been reduced as many developments have now been consented and no extra costs as a result of future MCZs designations are expected.

## 5. Consultation background

- 5.1 The 2<sup>nd</sup> tranche Marine Conservation Zones Public Consultation IA was published on the 30 January 2015 (Impact Assessment Defra 1810). This IA included the option of designating the 2<sup>nd</sup> tranche of 23 MCZs and some additional features for sites designated in the 1<sup>st</sup> tranche (Option 1). This allowed consultees to compare this option against the Government's baseline of not designating further MCZs.
- 5.2 The 23 sites of our preferred Policy Option 1 were chosen using the best available evidence, ensuring that they could be effective and well-managed MCZs. These sites offer the right balance between the strength of the conservation advantages relative to the economic and social implications of designation.
- 5.3 MCZs were considered suitable for inclusion in the network if they provide an opportunity to protect a feature which is a nationally rare, threatened or a representative habitat or species, to ensure a coherent network. Weighing up conservation advantages against socio-economic costs was challenging because some of the economic impacts are expressed in monetary terms while the ecological benefits are expressed largely in qualitative terms.
- 5.4 The consultation was used to test support and gather additional information, through the following ten questions mentioned in Box 2. 9371 responses were recorded, with around 98% in support of designating MCZs. These questions differed slightly from the 1<sup>st</sup> Tranche consultation because additional features were not a part of the 1<sup>st</sup> tranche. A Government response to the consultation will be produced at the point of designation which will illustrate the breakdown of responses from sectors and organisations, as well as an overview of the main concerns raised. Where concerns were raised about costings/methodologies used, and they were supported by additional and robust evidence, these have been incorporated into this IA.

### Box 2: Questions asked during MCZ consultation

#### Site specific questions applicable to all proposed second tranche sites

**Q1.** Do you agree that this site and specified features should be designated? Please explain and provide evidence to support your views as necessary.

**Q2.** Are there any additional features not currently proposed for designation located within this site that should be protected? Please explain and provide evidence to support your views and proposal.

**Q3.** Should any changes be made to the boundary of the site? If so what changes would you propose? Please explain and provide evidence to support your views and proposal.

**Q4.** Is there any additional evidence to improve scientific data certainty for features within this site? If yes, please provide evidence together with the data submission form.

**Q5.** Are there any additional activities (that may have an impact on the recommended features) occurring within this site that have not been captured within the Impact Assessment and site summary documents? Please provide evidence to support your views.

**Q6.** Do you have any new information on costs to industry not covered in the Impact Assessment that would be directly attributable to these MCZs, as opposed to costs stemming from existing regulatory requirements? If yes, please provide evidence.

**Q7.** Do you have any new information on the quantified benefits of designation? If yes, please provide evidence.

#### Questions applicable to all additional features proposed for first tranche sites

**Q8.** Do you agree that the additional feature or features should be added to the existing MCZs? Please explain and provide evidence to support your views as necessary.

**Q9.** Do you have any new information on costs to industry of these additional features not covered in the Impact Assessment? Please note that relevant costs are only those directly attributable to adding these features to the MCZs, as opposed to costs stemming from existing regulatory requirements or stemming from the existence of the MCZs with their current features. If yes, please provide evidence.

#### General comments

**Q10.** You may wish to provide comments on any other aspects the MCZs proposed. Where you disagree with the proposed approach, please provide evidence where possible to support your views.

5.5 When feasible scientific and socioeconomic information and assumptions were amended as a result of relevant additional information submitted during the consultation and the evidence base was strengthened through survey work. This has fed into the final selection process. Detail of changes to assumptions and costs are set out in section 7.8 to 7.55.

## 6. Description of Options Considered

### *Overview of Baseline Option*

- 6.1 The baseline (Option 0) or 'do nothing option' encompasses all current protection and legislation, including the features already recognised under European Union (EU) or national lists<sup>33</sup> and the existing network of MPAs including the 27 MCZs designated as part of the 1<sup>st</sup> tranche in November 2013.
- 6.2 This is not a viable policy option in this instance because Section 123 of the MCAA places a legal obligation on Government to contribute to a network of MPAs, to protect a range of nationally important habitats, species and geological features. By designating MCZs, Government will have fulfilled this obligation and will be fulfilling international obligations (e.g. OSPAR) in the creation of an ecologically coherent network. Not proceeding with designating the 2<sup>nd</sup> tranche MCZs would leave an incomplete network. Ministers have committed to designating MCZ sites in tranches. As such, the 'do nothing option' simply provides the baseline against which costs and benefits of the 2<sup>nd</sup> tranche MCZs are calculated (in line with IA guidance and the Green Book).
- 6.3 Some features located inside MCZs boundaries already have protection under existing environmental legislation or protected areas. The costs and benefits relating to the protection of these features under current legislation are not included. The costs and benefits of MCZs include only the costs flowing from the *additional* management required. Additional management largely relates to broad-scale habitats<sup>34</sup>.
- 6.4 The current condition of features depends on how past and current activity (e.g. fishing, or industry developments) has or has not had an impact on the feature; future activities are not assessed for the purpose of this IA as highlighted in 6.5 and 6.7. Location-specific information on the condition of features in the proposed MCZs is not currently available in all locations. Knowledge of feature location and of activities that are occurring in that location was used and Vulnerability Assessments<sup>35</sup> were carried out to assess whether each feature in each MCZ is likely to be in favourable or unfavourable condition and therefore whether a 'maintain' or 'recover' General Management Approach (GMA) would be required.

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<sup>33</sup> All FOCI are subject to one or more of the following national and multi-lateral agreements: 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); 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); 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).

<sup>34</sup> There are too many habitats and species in our marine environment for it to be realistic to select 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.

<sup>35</sup> A vulnerability assessment takes into account information on fishing and recreational activity in an area alongside best available science on sensitivity of features to activities. Stakeholders were given the chance to amend based on local knowledge.



- 6.5 For most MCZ sites, we do not have location-specific information on when the condition of a specific feature is improving or degrading nor do we have evidence about how features will respond to possible impacts. We have therefore assumed that, at the same level of activity as currently experienced, the features will remain in their current favourable or unfavourable condition in the absence of MCZ designation i.e. under baseline conditions<sup>36</sup>. In other words, we assume a static baseline rather than a declining baseline where the feature condition continues to deteriorate in the absence of MCZs being designated.
- 6.6 This assumption could be challenged as there is likely to be a continued increase in human use of the marine environment over the 20 years of the IA and there is a risk that not enough action will be taken even to maintain features in their current state. At a UK-wide scale, there may also be increased pressures on the marine environment from climate change<sup>37</sup>. Notwithstanding the risk of increasing pressures to the overall marine environment, it is generally not possible to predict the likely changes for specific features in specific locations with our current level of knowledge. Non-MCZ management of such activities may also act to reduce pressures despite increased activity levels e.g. successful implementation of EU fisheries policies and the Water Framework Directive.
- 6.7 Assumptions on future activities (for example, licence applications for renewable energy developments) were made where feasible on a sector-by-sector basis and validated with industry and government bodies as appropriate.

#### *Overview of the preferred Option 1*

- 6.8 Option 1 (our preferred option) involves designating a 2<sup>nd</sup> tranche of 23 MCZs, together with additional features in 1<sup>st</sup> tranche designated sites, in 2015. These sites and features were identified to fill big ecological gaps in the network based on sufficient supporting evidence (both ecological and economic), thus making a further contribution to the English component of an effective and well-managed network of MPAs and good progress towards the OSPAR network guidance. This was based on JNCCs 'gap-analysis' work which was completed in Autumn 2013<sup>32</sup>. This option balances the ecological benefits of designation with the socioeconomic implications to deliver a proportionate and cost-effective contribution to the MPA network.
- 6.9 Option 1 represents all the sites where there is sufficient ecological and socio-economic evidence to be considered as part of the 2<sup>nd</sup> tranche. There are a number of reasons why the additional 14 sites announced in February 2014 could not be considered for the 2<sup>nd</sup> tranche. This is due to:
- insufficient evidence in presence and extent of features proposed with further evidence gathering needed;
  - significantly high economic costs to one or more sectors which could be reduced with further consideration of potential management options; or
  - sites situated within the Welsh offshore area. The UK government has confirmed the intention for responsibility for these waters to transfer to the Welsh government.

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<sup>36</sup> Note that features considered to be in 'unfavourable' condition are those which would have a 'recover' conservation objective in MCZs and features considered to be in 'favourable' condition are those which would have a 'maintain' conservation objective if it were to be designated in an MCZ.

<sup>37</sup> Threats to marine ecosystems as a result of climate change are described in OSPAR (2010)

## 7. Costs under the baseline and preferred option

### *Costs under the baseline scenario*

7.1 The baseline includes all costs relating to *existing* marine protection and regulation, including the 27 1<sup>st</sup> tranche MCZs designated in 2013. These are not costs attributed to the designation of 2<sup>nd</sup> tranche MCZs because they are already incurred or will be incurred in the absence of any further MCZ designations<sup>38</sup>. The baseline includes:

- Costs of licence applications. In the baseline, applicants for marine developments and some activities have to carry out an assessment of environmental impact of the proposed activity on FOCI (which are all covered by existing environmental legislation). For example, requirements to meet the existing Water Framework Directive targets;
- Mitigation actions. Where a development / action may have an adverse impact on these listed features covered by existing environmental legislation and falling under designated protected areas, licensed industry has 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 baseline already includes costs related to monitoring of vessels, catches and species stocks; management of existing licence applications and existing protected areas;
- Some MCZ costs are fixed and not dependent on the number or size of sites designated (e.g. some costs incurred by the aggregates sector). These costs were attributed to the 1<sup>st</sup> tranche of MCZs and are now in the baseline (i.e. these costs would be incurred regardless of any further designation).

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

Impacted Private Sector	Description of baseline costs <sup>39</sup>
Aggregate extraction	Existing costs for obtaining a licence (other than assessment of environmental impact). Mitigation (conditions on where and how operation is carried out) costs may be incurred to avoid damage to features protected under existing legislation and/or designations. This baseline takes also into consideration costs allocated for tranche 1 since they are fixed and not dependent on the size and/or number of sites designated. This is explained in paragraphs 7.9 to 7.11.
Cables	Licence application costs, including assessment of environmental impact on features of conservation importance (FOCI). Industry undertakes this voluntarily in areas outside of 12nm as there is no legal requirement to do so. Mitigation activities may be required for some features protected under existing lists, such as micro-siting around features.
Coastal development	Licence application costs, including costs of EIA to consider impact on FOCI. Mitigation (such as moving planned location, using different materials) may be required to avoid damage to these features.
Commercial Fisheries	The baseline includes current policies in force, such as: -Common Fisheries Policy (CFP) e.g. Limits on commercial fishing of quota stocks, discard

<sup>38</sup> Note that, consistent with Impact Assessment guidance, we assume that these previous policies have been effectively implemented

<sup>39</sup> No figures included because in line with Green Book guidance it is not proportionate or useful to decision making to monetise baseline costs and benefits

	<p>bans.</p> <ul style="list-style-type: none"> <li>-UK fisheries management e.g. IFCA byelaws on vessel size</li> <li>-Conservation measures in existing MPAs, e.g. Management of fishing in MPAs e.g. European Marine Sites (EMS), Tranche 1 MCZs</li> <li>-Voluntary codes of conduct.</li> </ul>
Archaeological heritage	<p>Current costs for licence applications, including licence applications for archaeological activities on Historic Protected Wrecks.</p> <p>Depending on the scale and type of activity, the MMO or NE may advise that an assessment of environmental impact is undertaken. English Heritage (EH) requires that records of all sites of historic or archaeological interest are considered in any licence application. In some areas, vessel anchoring is restricted in the baseline through restrictions or codes of conducts in place to protect any sensitive features such as archaeological sites or seagrass beds.</p>
Oil & Gas	<p>Licence application costs, including costs of assessment of environmental impact to consider impact on FOCI (which are all covered by existing environmental legislation).</p> <p>Mitigation activities (such as pipeline routes, chemical release), may be required to avoid damage to these listed features, in the absence of MCZ designation.</p>
Ports, harbours, Commercial shipping and disposal sites	<p>Licence application costs, including costs of EIA to consider impact on previously designated FOCI.</p> <p>Mitigation (such as moving planned location, using different materials, seasonal restrictions) may be required to avoid damage to these features, in relation to port activities such as dredging, disposal, laying and maintenance of moorings and development/expansion.</p>
Recreation	<p>Management and best practice advice in relation to potentially damaging activities such as anchoring and wildlife watching.</p> <p>Specific management of activities in existing MPAs.</p>
Renewable Energy	<p>Licence application costs, including costs of EIA to consider impact on FOCI.</p> <p>Mitigation (such as adjusting planned cable routes, using different turbine foundations, seasonal restrictions on activity), may be required to avoid damage to these features.</p>
<b>Impacted Public Sector</b>	<b>Description of baseline costs</b>
National Defence	<p>Costs of adjusting electronic tools and charts and annual costs of maintaining to include EMS, SPAs, SSSIs, etc., in the absence of MCZs; Additional planning considerations for these sites.</p>
Flood and coastal erosion risk management	<p>Licence application costs, including costs of assessment of environmental impact to consider impact on previously designated FOCI.</p> <p>Mitigation (such as moving planned location or restrictions on construction activities) may be required to avoid damage to these features.</p>
Costs to public sector for marine management	<p>Costs to MMO, IFCA to monitor existing protected features and sites, enforce requirements of Common Fisheries Policy (CFP)<sup>40</sup> and administration of the marine licensing process.</p>
Ecological Surveys	<p>SAC and SSSI monitoring; biodiversity monitoring to meet existing requirements under EU legislation carried out by NE and JNCC.</p>

<sup>40</sup>The Common Fisheries Policy (CFP) is the fisheries policy of the European Union (EU). <http://ec.europa.eu/fisheries/reform/>

## ***Stakeholder engagement process for MCZ designation***

7.2 Box 3 below provides information on the stakeholder engagement process for the 2<sup>nd</sup> tranche MCZ designation. In 2011 and 2012, the stakeholder-led regional MCZ projects collected information from stakeholders about the level and type of human activity in each MCZ. This informed the identification of management scenarios as well as possible and preferred management measures. In addition, during spring 2014 Defra engaged extensively with each sector to verify and update the activity information for the candidate sites. Stakeholders were invited to comment on the activities identified and where possible, on the potential impact of designation on those activities. Recommendations for sites were collaboratively developed by Defra, stakeholders and industry. This process also enabled Defra to verify whether cost assumptions and information associated with certain activities/sectors were accurate (for more information see Annex A and D). Defra ensured the consultation was widely publicised and alerted a database of 2249 stakeholders with an interest in MCZs to its publication in January 2015. Defra also encouraged relevant agencies (JNCC, NE, MMO) to contact their stakeholder databases with details of the consultation.

**Box 3: The stakeholder engagement process which was used to identify management scenarios and industry costs.**

- 1) The management scenarios that are employed 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<sup>41</sup>.
- 2) The management scenarios used in the IA were also informed by initial advice provided by JNCC and NE on the mitigation that is likely to be needed. In collaboration with the relevant regulators, NE developed draft assumptions about the mitigation of impacts of certain licensed activities on features protected by MCZs that could be used for purposes of the MCZ impact assessment. This advice was peer reviewed by industry representatives and has since been adopted by Defra economists to ascertain relative costs.
- 3) Specialists in JNCC and NE 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*. Defra has engaged with stakeholders for specific sites to try to understand any concerns and to be informed of any local specific issues.
- 4) Defra and SNCBs 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 potential management scenarios, were updated as part of the pre-consultation process. Additional information submitted by stakeholders during pre-consultation engagement has been considered by appropriate experts in Defra, NE, JNCC, the MMO, Cefas and the Environment Agency.
- 5) Where concerns have been raised that the management scenarios under-estimate 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 and new information submitted during the formal consultation has been considered in order to reduce such uncertainties.
- 6) For all scenarios, industry unit costs are used based on the best available evidence pre- and post-consultation. The assumptions about management scenarios are appropriately informed by the SNCBs and regulators. The best estimate scenario for sectors was informed by an assessment of likelihood of whether the low or high cost scenarios were the more likely. The IA elements include cost estimates by government departments, JNCC, NE, stakeholder representatives on the regional MCZ project regional stakeholder groups, and independent experts in environmental economics appointed by Defra.
- 7) The costs estimates and methodologies were tested during consultation and revised where relevant. This included where consultation responses mentioned activities which had not been considered in the consultation IA, or where responses challenged assumptions within the methodologies with evidence. Paragraphs 7.60 to 7.83 describe in greater detail where cost estimates have changed following consultation responses.

### **Costs to designate 23 MCZs (preferred option 1)**

7.3 The costs to designate 23 MCZs can be considered in the context of market failures in the marine environment discussed in paragraph 3.3. In particular, management measures to conserve features help address the problem that damage to the marine environment is not always taken into account by users, individuals and businesses alike. In line with Green Book Guidance<sup>42</sup>, only *additional* costs and benefits due to MCZs are included – no costs which would have taken place in the absence of MCZs are included. Costs and benefits are only included in relation to features which will be designated in the 2<sup>nd</sup> tranche MCZs in 2015. If any further features in the 2<sup>nd</sup> tranche MCZ sites are proposed for designation for the 3<sup>rd</sup> tranche, they will be included in the Impact Assessment for the 3<sup>rd</sup> tranche, the same way the additional features in the 1<sup>st</sup> tranche sites are considered here.

<sup>41</sup> Information on the sensitivity of MCZ features to human activities was provided through research commissioned by Defra. The SNCBs, JNCC and Natural England, then undertook updated vulnerability assessments in summer 2014 that were informed by the research and other best available data.

<sup>42</sup> <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

- 7.4 Impacts are assessed over a longer time scale than the default IA 10 year period. The costs and benefits from designation are long term in nature and hence a 20 year appraisal was considered appropriate to mirror the profile of impacts. 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 projects which informed the 1<sup>st</sup> tranche impact assessment and engaged with stakeholders used a 20 year appraisal period meaning the same timeframe facilitates consistency.
- 7.5 Studies used to inform benefits in this IA<sup>43</sup> also assessed benefits over a 20 year period or longer. Due to the nature of ecosystem service processes, many significant benefits from designation (i.e. improvement in the condition of a feature if currently unfavourable) will not be realised until beyond 10 years, particularly within the marine environment. Therefore 10 years would not capture the full extent of recreational benefits to tourists, anglers and divers and non-use values to the wider public as many features would still be recovering or may have no improvement at all due to time lags. Monetised benefits, despite not being included in the summary sheets due to large uncertainties, are better represented over a 20 year appraisal period and especially when compared to costs.
- 7.6 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 real values in 2013 prices and projected values are given in constant prices. 2013 prices have been used to maintain consistency with the pre-consultation Impact Assessment. The present value of the costs and benefits has been calculated using a discount rate of 3.5% as per Treasury Green Book guidance.
- 7.7 The costs of the preferred option can be split into 3 categories (costs for activities where limited or no management is required due to MCZs, costs for activities where additional management would be required, and public sector costs):

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<sup>43</sup> E.g. Kenter, J., Bryce, R., Davies, A., Jobstvogt, N., Watson, V., Ranger, S., Solandt, J-L., Duncan, C., Christie, M., Crump, H., Irvine, K., Pinard, M., Reed, M. The value of potential Marine Protected Areas in the UK to divers and sea anglers. UK National Ecosystem Assessment Follow-on. URL: <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2BY%3D&tabid=82> , and RPA, Bright Angel Coastal Consultants, Ichthys Marine, RSS Marine Ltd (2013): Value of Marine Protected Areas on recreation and tourism services, Methodology report for Defra, July 2013, Loddon, Norfolk, UK.

- **Activities where limited or no *additional* mitigation is required due to MCZs**, such as when there is a 'maintain' GMA, but there are additional costs when obtaining a licence, for the assessment of environmental impact on broad-scale habitats (BSH). This includes aggregate extraction, navigational dredging and disposal operations, oil and gas-related activities, port and harbour developments, and renewable energy developments. The operator has to apply for a licence (to the MMO, DECC etc.) in order to carry out the activity. Additional costs would be associated with considering impacts on MCZs above what would be captured in the absence of MCZ (includes familiarisation and additional assessment costs). This is because a business wishing to undertake a licensable activity would have to become familiar with all protected areas in proximity of the proposed activity and assess its impact on the site(s) when applying for the licence. Estimates provided by industry used in 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, as set out in MMO guidance<sup>44</sup>. Existing activity which has already been licensed with consent conditions attached would continue after designation.

For sites within the 2<sup>nd</sup> tranche, it is not expected that additional mitigation of any licensable activities will be required by industry since most MCZ features must already be considered in an assessment of environmental impact for licence applications under existing environmental legislation – see 7.1 above. The features which are not already in licence applications are mainly broad scale habitats (BSH). Based on current knowledge, offshore BSH tend to cover large areas and therefore the relative impact of any licensable activities is likely to be low given the small footprint they have. This means that no changes to the activity itself or the location is likely to be necessary for these sites.

However, the sizes of inshore BSH are more varied which means that the relative size of the footprint may be larger. As part of pre-consultation analysis, Defra and SNCBs undertook an assessment of current and known planned activity which overlaps with or is in close proximity to 2<sup>nd</sup> tranche MCZs. This indicated that there is no additional mitigation of these activities expected compared to what would be required in the absence of MCZ designation. There were no consultation responses which identified any licensable activity or developments which were expected to require mitigation due to designation of 2<sup>nd</sup> tranche MCZs. In addition, there were no consultation responses which suggested evidence or identified a method which could be used to predict where future but currently unknown developments may occur and may require mitigation. Therefore there are no costs of mitigation for developers included in the IA.

- **Activities where additional mitigation will be necessary**, such as when there is a 'recover' GMA. The main sectors which will have to change their activities due to designation of MCZs are fisheries and recreation, since many other sectors are already required to mitigate impact on MCZ features of conservation importance protected on BAP, OSPAR and Wildlife and Countryside Act (WCA) lists and other existing legislation, as explained previously.

Management of activities for fisheries and recreation will be put in place by the regulatory authorities after designation<sup>45</sup>. These will be determined on a site-by-site basis, considering what is required (based on advice from the SNCBs) to meet a specific site's conservation objectives. For example, a particular fishing gear type may be shown to damage a feature, and so this gear type may be managed over the specific area of the feature in order to 'recover' the feature to favourable condition. Therefore this IA assesses costs based on the most likely management scenarios, informed by advice from NE and JNCC and relevant stakeholders over the 2 year stakeholder project and by more recent stakeholder engagement, including the consultation which ran until April 2015. A range of costs (between a low and a high cost scenario) is given to account for uncertainty and a best estimate is given. Site-specific scenarios for management and the resulting sector costs are described in Annex A and Annex D respectively.

For the commercial fishing industry sector there may also be potential familiarisation costs, as fishermen would have to be aware of the location of designated MCZs and any measures in place to protect them, as part of their fishing operation. However, familiarisation costs have not been monetised here as management at a particular site is decided by regulators (IFCAs and MMO). Where a new byelaw is passed there is an accompanying impact assessment and consultation including stakeholder engagement to inform vessel operators of any new restrictions. Where the MMO or IFCAs impose restrictions on activity, costs to business of these measures will be accounted for and counted against OI3O where any management is additional to actions already outlined in this IA. As such not all fishermen would need to become familiar with all MCZs and any extra 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 and any attempt to do so would be uninformative to site specific decisions.

- **Public sector costs** – There are potential costs to the Environment Agency (EA) for additional monitoring relating to where Flood and Coastal Erosion Risk Management (FCERM) affect MCZ features, but an assessment of known current and planned developments indicates that this is unlikely to be the case for the sites proposed for designation as part of the 2<sup>nd</sup> tranche<sup>46</sup>. There are costs to the Ministry of Defence (MoD), IFCAs, the MMO and other regulators for considering impacts on MCZs, such as: 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 Equivalent Annual Net Costs to Business (EANCB) figures because they are costs which fall on the public sector.

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<sup>45</sup> . Where regulatory measures will be used, there will be consultations on a site by site basis, where stakeholders will have a chance to comment. Regulatory measures will be subject to an Impact Assessment.

<sup>46</sup> Environment Agency, pers. comm. 2014.



## Summary of Sector Specific Methodologies (costs shown in Table 2)

7.8 Each sector potentially impacted by the designation of MCZs requires a method to assess additional costs relative to the baseline as a result of designation. As part of the Regional Project process, detailed methodology papers were written in conjunction with the relevant regulators, experts and industry representatives. These methodologies were followed for the 1<sup>st</sup> tranche IA and are followed in this IA but updated with the best available data. In relation to the additional 16 features in sites designated in 1<sup>st</sup> tranche (discussed in section 2) there are no additional costs to business, as there are unlikely to be any additional management requirements over and above those already deemed necessary. The costs presentation is organised as follows:

- The paragraphs below summarise methodologies described in the relevant methodology papers as mentioned above and providing details of any changes to methodology where relevant.
- Table 2 provides costs by sector presenting annual costs per year and best estimate, low and high cost scenarios.
- Annex D provides details of assumptions, actual calculations of unit costs, the time profile of costs used and where relevant transitional costs. Transition costs are classed as one-off costs due to the implementation of the policy and do not recur beyond a certain date (e.g. familiarisation costs). All periodic costs, such as additional application costs, are not classed as transitional because they occur regularly and are also applicable beyond the 20 year IA period for future applications.
- Consultation responses and resulting changes to cost estimates are discussed both below and in Annex D.

### Aggregates

7.9 It is assumed that the impact of marine 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. Two scenarios were developed for the IA: a high cost scenario and an alternative low cost scenario. This scenario considers areas which have already been granted approval for development, known as existing production licensed areas. It is assumed there is an additional one-off cost to operators for future licence / licence renewal applications for existing production licence areas within 1 km of an MCZ. This cost is due to the need to assess the impacts on broad-scale habitats protected by an MCZ. The high cost scenario is considered most likely, and is therefore also the best estimate of the impact on the aggregates sector.

7.10 The low-cost scenario considers additional costs of 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 identified as overlapping or being 'in close proximity' to an MCZ<sup>47</sup>. For the low-cost scenario, only two strategic resource areas are in close proximity to MCZs in the 2<sup>nd</sup> tranche. A breakdown of costs for this sector and relative assumptions are given in Annex D.

7.11 One respondent to the consultation suggested that the Impact Assessment did not account for costs incurred for aggregate extraction licenses within close proximity to an MCZ boundary. This respondent raised the case of a license application within 1km of the boundary of a Tranche 1 MCZ, which incurred additional costs due to the designation of the MCZ. However, the consultation IA included and accounted for additional costs for applications within 1km of an MCZ boundary, which the MMO have advised as appropriate<sup>48</sup>. Therefore no changes were made to the methodology for this sector.

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<sup>47</sup> Annex H2 Approach for assessing impacts on aggregate extraction, <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>48</sup> MMO, pers. comm. 2015.

## Aquaculture

7.12 Management scenarios have been identified for each MCZ making assumptions about the management of aquaculture that may be needed in order to achieve the conservation objectives of features protected. These scenarios have been used, for the purposes of the IA, to estimate the potential economic impacts of the effects of 2<sup>nd</sup> tranche MCZs on the sector<sup>49</sup>.

7.13 For the sites being considered as part of the 2<sup>nd</sup> tranche no management of, or impacts on, aquaculture have been identified. This is because, based on a review of online sources and data from the Crown Estate<sup>50</sup>, there are no aquaculture sites located in close proximity to any of the sites proposed for the 2<sup>nd</sup> tranche apart from the private fisheries and mussel seed beds in the Swale Estuary. Following latest advice from NE, further consideration needs to be given to the potential socio-economic impacts on the aquaculture sector of designating a number of features within the Swale Estuary which now have 'recover' GMAs. These features may be considered as part of the 3<sup>rd</sup> tranche but are not considered further here. The remaining features in this site have a 'maintain' GMA and so it is expected that no management or mitigation of this activity will be required. In addition, small-scale aquaculture does not require a marine license with associated application costs. There were no consultation responses which disputed these assumptions.

## Archaeological Heritage

7.14 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. Marine licenses are required for all archaeological activity with the exception of diver trails, visit and non-intrusive surveys<sup>51</sup>. Based on the advice of English Heritage and the MMO, the IA assumes that 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 license applications for archaeological activities are already required in the baseline to assess their impacts on some habitats and species, but this does not include broad-scale habitats protected by MCZs<sup>52</sup>.

7.15 Due to a lack of information about future licence applications (where the shipwrecks/activities will be, what they will comprise and when they will take place) or suitable historical data to forecast future activities, it has not been possible to quantify the impacts of MCZs on archaeological activities. Costs may arise through the mitigation of impacts of the archaeological activities on MCZ features where required and increased costs for future licence applications to undertake activities. 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 to the licence applicant (mainly archaeological bodies/ and research institutions such as universities), the licensing bodies (English Heritage and MMO) and the SNCBs. There were no consultation responses which disputed these assumptions or identified plans for any specific activities at particular sites.

## Cables (Interconnectors and Telecommunication)

7.16 The cable sector includes the interconnector (power) and telecommunications (telecom) cables sector. 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

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<sup>49</sup> Annex H3 Approach for assessing impacts on aquaculture, <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>50</sup> Crown Estate, pers. comm. 2014.

<sup>51</sup> Annex H4 Approach for assessing impacts on archaeological heritage, <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>52</sup> Annex H4 Approach for assessing impacts on archaeological heritage, <http://publications.naturalengland.org.uk/publication/1940011>.

MMO. There will be an additional cost to an operator to conduct an appropriate assessment of future cable installation on broad-scale habitats protected by an MCZ. This cost has been based on an estimate provided by the UK Cable Protection Committee in 2011 of £10,000 for the costs of additional assessment. This has been updated into 2013 prices for this IA. 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 has 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 there is no legal requirement to mitigate impacts beyond 12nm and the footprint of cables is so small compared to the extent of the broad scale habitats<sup>53</sup>.

7.17 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 1<sup>st</sup> tranche IA. This estimate was maintained for the 2<sup>nd</sup> tranche IA. For the 1<sup>st</sup> tranche IA, the costs were calculated for all potential MCZs and then scaled down proportionally for the sites proposed for designation under the 1<sup>st</sup> tranche. The same approach was taken for the 2<sup>nd</sup> tranche IA. Sensitivity analysis is conducted which considers a range of quantity of applications over the IA period.

7.18 Some consultation respondents raised concern about the planned UK-Norway NSN interconnector cable<sup>54</sup> which will pass through the Coquet to St. Mary's site. The MMO have advised that this development is already consented with a complete environmental assessment, and that there would be no additional costs for this development. There were no other responses which contained new information to alter costs assumptions.

## Coastal Development

7.19 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 impact on MCZ broad scale habitats and mitigation (such as moving planned location, using different materials) to avoid damage to these features. An assessment of known developments indicated that the 2<sup>nd</sup> tranche of MCZs will not impact on coastal development as none are sufficiently close to the proposed sites or are expected to interfere with the conservation objectives of the sites<sup>55</sup>. This does not include developments associated with some sectors (e.g. ports and harbours, renewables) covered elsewhere in this IA.

7.20 Several consultation respondents questioned whether the abstraction and subsequent release of water for cooling power stations would be managed where it took place near MCZs. Natural England advised that such activity has already been included in their pre-consultation Vulnerability Assessments for MCZ sites<sup>56</sup>, and as advised then this activity would not be managed. There were no other responses which contained new information to alter costs assumptions.

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<sup>53</sup> Annex H6 Approach for assessing impacts on cables (interconnectors and telecom cables), <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>54</sup> <http://nsninterconnector.com/>

<sup>55</sup> No specific methodology paper was developed previously as such impacts would be assessed on a site by site and project by project basis

<sup>56</sup> Natural England, pers. comm. 2015

## Commercial Fisheries (UK Vessels)

- 7.21 To establish quantified costs to UK commercial fisheries it is necessary first to establish likely management scenarios for each MCZ. These are then used to estimate the economic impact of MCZ management. The SNCBs have published a management advice document<sup>57</sup> that specifies a range of possible management scenarios for each broad gear type<sup>58</sup> (mobile and static) for each feature<sup>59</sup>. Management scenarios were refined using stakeholder knowledge and input during the Regional Projects process and refreshed as necessary following updated SNCB advice on features to be designated and their objectives. Full details of the management scenarios used for the purposes of the impact assessment are given in Annex A.
- 7.22 To estimate the economic impact of management scenarios it is necessary to estimate the baseline fisheries activity at each site. For over 10m vessels, 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>60</sup>; for which revenues are known. For under 10m vessels, which tend to fish inshore areas, data coverage is less good and revenues for an area have to be derived from IFCA sightings data<sup>61</sup>.
- 7.23 Using the available information, baseline revenues for each MCZ have been estimated for the years 2010-2012 (a three year average). This is then converted to a gross added value figure using Seafish average GVA ratios<sup>62</sup> for each gear type in each region. As discussed in para 6.7 familiarisation costs to fishers have not been calculated as it is mandatory management measures they would have to become familiar with rather the designations themselves. When required regulators (MMO and IFCAs) would produce IAs with any bye-laws to take account of these impacts and inform stakeholders.
- 7.24 Using these management scenarios high- and low-cost scenarios were estimated for each site. Where the likelihood between the lowest and highest cost scenario was not known or considered equal the best estimate was halfway between the low and high cost estimate. This also reflects uncertainty in the proportion of the area of an MCZ which may be subject to management. This is the case for all bottom abrading mobile gears (bottom trawls and dredges) for sites in the 2<sup>nd</sup> tranche. Where the high cost scenario was considered unlikely (based on SNCB advice and Defra and Regional Project economist expert 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).
- 7.25 As there is likely to be displacement of fishing activity to areas outside of the MCZs, rather than a complete loss of activity, a displacement assumption of 75% is applied (25% of GVA assumed lost) to the lowest cost and best estimate management scenarios and no displacement assumed (100% of GVA assumed lost) in the high cost management scenario. The assumption that 75% of fishing GVA can be displaced to other locations is based on the low overlap of MCZs with core fishing grounds, suggesting that it is reasonable to assume that most catch can still be sourced

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<sup>57</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>58</sup> Gear type refers to the type of commercial fishing gear used, which are grouped into categories. Static fishing gear refers to gears such as pots and set nets, mobile gear refers to gears that are towed through the water such as demersal towed nets.

<sup>59</sup> Annex H7 Approach for assessing impacts on commercial fisheries, <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>60</sup> ICES use statistical rectangle areas for the gridding of data to make simplified analysis and visualisation of fishing effort, landings and revenues.

<sup>61</sup> For information on how under 10m fishing revenues are calculated, see Cefas paper MB0117 <http://icesims.oxfordjournals.org/cgi/reprint/fsu115?ijkey=FaJLWLjv39vUkSN&keytype=ref>

<sup>62</sup> <http://www.seafish.org/research-economics/industry-economics/seafish-fleet-economic-performance-data>

from existing fishing grounds<sup>63</sup>. Site specific management assumptions are given in Annex A and sector calculations are given in Annex D.

7.26 This approach did not generate significant challenge or responses during consultation for the 1<sup>st</sup> tranche of MCZs and was further tested during the 2<sup>nd</sup> tranche consultation. Some consultation respondents mentioned the displacement assumption used to calculate commercial fisheries costs, but there was no new evidence from these responses which enabled a change to the displacement assumption. The consultation did provide anecdotal evidence of landings data, which was consistent with the data on landings in MCZs used in this IA. Some other respondents also mentioned possible knock-on effects from management of non-UK fisheries on UK fishermen. For example, this may be where foreign vessels are restricted from fishing in MCZs and instead start fishing more in areas used by the UK fleet, which would increase pressure on local stocks and potentially displace UK vessels. This is a potential impact following MCZ designation, but due to a number of uncertainties it is not possible to monetise this impact (see 7.61).

### **Commercial Fisheries (non-UK Vessels)**

7.27 Impacts of management measures on non-UK vessels in offshore sites have been taken into account in decision making, as all offshore management measures have to be agreed at the EU level in conjunction with the CFP, but these 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 the IA methodology and guidance. In addition it is not possible or proportionate to assess lost GVA to other countries as each country will have different GVA ratios for different gear types and this information is not easily accessible.

7.28 Reasonable efforts have been made during the pre-consultation period to engage with the authorities in the affected member states and this has resulted in estimates of non-UK baseline revenues by gear type for each offshore site<sup>64</sup>. 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.

### **Oil & Gas & other energy (including carbon capture and storage (CCS) at sea)**

7.29 It is assumed that the impact of Oil, Gas and CCS on MCZ features will be managed under the Petroleum Act 1998 and the Energy Act 2008 and administered by DECC. A single scenario was developed for the 1<sup>st</sup> tranche IA, based on the advice of DECC, NE and JNCC. The same scenario is considered for the 2<sup>nd</sup> tranche which assumes that operators of oil, gas and carbon capture and storage (CCS) installations will incur additional costs for the assessment of environmental impacts completed in support of all future licence applications on broad scale habitats designated within MCZs. Annex D explains the specific assumptions used to derive costs for the 2<sup>nd</sup> tranche,

7.30 For the purposes of the IA it is assumed MCZ habitats and species that are on the OSPAR List (of Threatened and/or Declining Species and Habitats) and on the UK List of Priority Species and Habitats (UK BAP) are already protected and mitigated for without designation of MCZs. Additional mitigation would be required for broad-scale habitats, which are not protected under

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<sup>63</sup> The high cost scenario estimates in IA assume that there is no possible displacement i.e. all catch in this area lost

<sup>64</sup> All member states provided the required information during the period April 2014 – July 2014 apart from France, who provided information in December 2014. This new information on activities of the French fleet has been incorporated in the final impact assessment. Spanish impacts are assessed qualitatively as they were not able to provide quantified data. Please see Annex E for details.

other legislation. The footprint of oil and gas and CCS developments and their pipelines and cables are unlikely to significantly impact on the overall condition of the broad-scale habitat; therefore it is assumed that no additional mitigation (and therefore costs) will be required for this sector.

7.31 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 1<sup>st</sup> tranche IA, costs were scaled down based on the number of 1<sup>st</sup> tranche MCZ s as a proportion of the whole suite of potential MCZ and the same approach is taken with the 2<sup>nd</sup> tranche. Annex D provides detailed assumptions for the high, low and best estimate cost scenarios regarding this sector.

7.32 Some consultation responses provided details of potential oil and gas blocks which had not been considered in the consultation IA. This has led to an upward revision to costs which is discussed in more detail in paragraph 7.60. There were no other responses which led to a change in assumptions or methodology.

### **Ports, Harbours, Commercial shipping and disposal sites**

7.33 The 2<sup>nd</sup> tranche of MCZs contain sites which encompass ports and harbours seaward limits in their totality; sites which include areas under ports and harbours operational jurisdictions; or sites in close proximity to disposal sites. It is assumed that the impact of ports activity on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO.

7.34 There will be additional cost for licence applications, with two scenarios developed for the IA: a low cost scenario and a high cost scenario using different assumptions about future Maintenance Dredging Protocols to give low and high cost ranges. The best estimate is the midpoint of this range. Annex D gives further details.

7.35 Assumptions were revised for the 2<sup>nd</sup> tranche consultation IA based on the average number of applicants per MCZ rather than the number of applications for disposal sites. This was because several disposal sites are frequently used by the same business meaning additional assessment costs per application is not realistic as information on the MCZ would only have to be gathered once and 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.<sup>65</sup> However, the high costs scenario used in this IA include assumptions about additional application costs and assumes a cost per application as a worst case scenario.

7.36 For disposal sites the average number of future licence applicants per year per disposal site is assumed to be the same as the average number of businesses applying over the period 2004 to 2013, using data provided by Cefas. A high cost scenario is included based on the cost per application as discussed in the previous paragraph, but this is considered highly unlikely<sup>66</sup>.

7.37 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. This may over-estimate costs, as in some cases the MMO now issues

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<sup>65</sup> In addition, use of a scenario in the Tranche 1 IA where applications only have to consider their impacts where they are within 1km of an MCZ has been removed, as it is likely that applications beyond 1km will have to consider impacts on MCZs (MMO, pers. comm. 2014).

<sup>66</sup> MMO, pers. comm. 2014.

navigational dredging licenses with longer durations, though this may not be the case in proximity to MCZs.

7.38 Planned future port and harbour developments were identified via discussions with port and harbour operators during the 1<sup>st</sup> tranche IA, during pre-consultation for the 2<sup>nd</sup> tranche and through consultation responses. No required mitigation measures have been identified for any 2<sup>nd</sup> tranche MCZs. Further details on the methodology are shown in Annex D.

7.39 Consultation responses identified additional activities which were not accounted for in the Consultation IA. These are discussed in more detail below. In addition, some consultation responses argued that the unit cost assumptions for the costs of additional assessment that port operators would have to undertake for dredging, using disposal sites or port development occurring in proximity to MCZs are underestimates, as costs for Environmental Impact Assessment (EIA) are typically much higher. The MMO confirmed that the additional assessment required would not be as burdensome as EIA, and that the cost estimates within the consultation IA were appropriate<sup>67</sup>. There were no other responses which led to a change in the assumptions or methodology for this IA.

## Recreation

7.40 Recreational activities considered in the 1<sup>st</sup> tranche IA included angling, boating (pleasure and racing), scuba and snorkelling and shore-based activities such as coastal walking, fossil collecting, rock pooling and wildfowling. The majority of these activities will not be negatively impacted by the designation of MCZs and should benefit from them.

7.41 Potential management scenarios have been identified for each MCZ (over and above the baseline situation) in relation to recreation activities that may be needed to achieve the conservation objectives of features protected by each MCZ. These assumptions have been used for the purposes of the IA to estimate the potential economic impacts of MCZs on the sector<sup>68</sup>.

7.42 In general, recreational activities are not expected to interfere with the achievement of conservation objectives of MCZs and would therefore not need to be managed in the event of designation. Furthermore, the expected environmental improvement from the presence of the MCZs should benefit the recreational sector and provide opportunities for greater enjoyment and economic activity. However, some features are sensitive to certain recreational activities (such as anchoring) therefore recreational boating and angling may have to be managed if such features have a 'recover' conservation objective. 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.

7.43 Two sites being considered for the 2<sup>nd</sup> tranche contain features sensitive to anchoring with a 'recover' objective and these are The Needles and Utopia MCZs. During pre-consultation<sup>69</sup> stakeholders indicated that the main anchoring activity in The Needles MCZ was away from the sensitive seagrass feature. As part of their formal consultation response, the RYA provided some revised information on usage of the area, with higher levels than they had previously indicated. We also received new information about anchoring for recreational angling in the Utopia MCZ during consultation which was taken into account. Natural England reviewed existing evidence and evidence submitted during the consultation, as well as using site knowledge of local officers. They concluded that anchoring activity in both sites is low, and that anchoring in

<sup>67</sup> MMO, personal communication 2015.

<sup>68</sup> Annex H13 Approach for assessing impacts on recreation, <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>69</sup> RYA and local recreational sector interests

both areas could be managed either on a voluntary basis or through partial bans on anchoring in some of the bays<sup>70</sup>. However, it is acknowledged that any management imposed around the sensitive features within both sites could cause an inconvenience to recreational boaters and anglers in the area, for example if they have to anchor in local areas. Due to uncertainty in possible management measures and alternative anchoring locations available for recreational users, it was not possible to monetise these costs. Actual management chosen will be done in consultation with stakeholders by the MMO and any byelaws would have their own accompanying impact assessment. More details on these non-monetised costs are in paragraphs 7.74 to 7.76.

## Renewables

7.44 The renewable sector includes wind, wave and tidal power developments. It is assumed that the impact of renewable energy on MCZ features will be managed under the existing marine licensing framework, as provided for under the MCAA and administered by the MMO and DECC.

7.45 The assumptions were based on advice from NE, the JNCC, MMO and DECC in terms of how these bodies anticipate their advice to developers would differ for consents in the presence of a MCZ designation. 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 a MCZ, which includes the assessment of impact on broad scale habitats which are not protected under other legislation<sup>71</sup>.

7.46 Since the Regional Projects presented recommendations in 2011 and the designation of the 1<sup>st</sup> tranche of MCZs in 2013, there is greater certainty in where developments are and impacts of MPAs on renewables. Designation of Special Areas of Conservation (SACs), other Marine Protected Areas which have similar conservation objectives to MCZs, has shown that additional licence conditions imposed on developments that overlap with MPAs are insignificant compared to the situation in the absence of the designation.

7.47 According to Crown Estate data<sup>72</sup>, pre-consultation research and engagement and consultation responses, no yet to be consented wind energy developments overlap with MCZs being proposed as part of the 2<sup>nd</sup> tranche. West of Walney MCZ is being co-located with wind farm developments that are already consented, but no monetised impacts on this particular development above those which would be incurred in the baseline anyway are expected. Therefore there are no attributable costs to the 2<sup>nd</sup> tranche of MCZs for wind developments.

7.48 There are some costs associated with potential wave and tidal power developments which are explained further in Annex D. Some consultation responses identified potential wave and tidal developments which had not been included in the consultation impact assessment, including the potential development of the West Cumbria tidal lagoon at the Allonby Bay MCZ. These developments are discussed in more detail in paragraphs 7.69 to 7.73. There were no other consultation responses which led to a change in assumptions or methodology.

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<sup>70</sup> Natural England, personal communication 2015.

<sup>71</sup> Annex H14 Approach for assessing impacts on renewable energy, <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>72</sup> Crown Estate, pers. comm. 2014.



## **Summary of Public Sector Costs Methodology**

### **Flood and coastal erosion risk management (FCERM)**

7.49 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 Marine and Coastal Access Act 2009 (MCAA). 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). The Environment Agency and Local Authorities were involved in policy development through the Regional Projects process – for example at the Cromer Shoal Chalk Beds MCZ, stakeholder involvement in the Regional Projects process led to the site boundaries being modified to avoid any restrictions on coastal protection works. 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>73</sup>.

7.50 Research and local engagement and data from the Crown Estate<sup>74</sup> in the pre-consultation period for the sites considered for designation as part of the 2<sup>nd</sup> tranche indicates that there are no planned FCERM developments in close proximity to the sites that would incur additional costs as a result of designation. This assumption was confirmed by the Environment Agency<sup>75</sup> and was not challenged through consultation.

### **National Defence**

7.51 As a public authority and operator, 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, 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, it is assumed that 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<sup>76</sup>. It will also incur additional costs in adjusting electronic charts to consider MCZs.

7.52 These costs were calculated on the basis of the MCZ network as a whole and for the 1<sup>st</sup> tranche IA they were scaled down to the proportion of sites included in that tranche. The same approach is being taken for the 2<sup>nd</sup> tranche. This methodology was agreed with MoD and updated costs for officers' time were provided during the pre-consultation period<sup>77</sup>. No additional evidence was provided in the consultation.

### **Management measure implementation, enforcement and surveillance**

7.53 Cost estimates are provided for management measures, where it is assumed that additional management is needed in each MCZ for recreational and fishing activity. Costs have not been estimated for sites where it is anticipated that no additional management of recreation and/or fishing activity is needed. Depending on the distance of the MCZ from the coastline, the

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<sup>73</sup> Annex H14 Approach for assessing impacts on flood and coastal erosion risk management (coastal defence), <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>74</sup> Crown Estate, pers. comm. 2014.

<sup>75</sup> Environment Agency, pers. comm. 2014.

<sup>76</sup> MoD, pers. comm. 2011.

<sup>77</sup> MoD, pers. comm. 2014.

responsibility to implement and enforce the management of these activities falls to one of two types of public authority: the MMO, IFCAs. The IFCAs are responsible for managing fishing activity in inshore sites (within 6nm) and the MMO are responsible for managing recreational activity. For sites beyond 6nm the responsibility for the implementation and enforcement of management lies with the MMO<sup>78</sup>.

7.54 For the proposed 2<sup>nd</sup> tranche sites likely management scenarios have been updated following the latest advice from the SNCBs and management unit costs assumptions have been updated following engagement with the MMO and IFCAs during pre-consultation<sup>79</sup>. Public bodies may be able to make efficiencies from carrying out management activities on multiple MCZs or other MPAs at the same time, but it has not been possible to estimate these; as a result costs to public bodies may be an over-estimate.

## Ecological Surveys

7.55 In the event of designation the Secretary of State has a duty to report to Parliament every six years (next expected in 2018) on the extent to which the conservation objectives for each MCZ has been achieved as well as the extent to which MPA network as a whole contributes to the conservation or improvement of the marine environment in the UK marine area. To accomplish this, the SNCBs may be required to carry out ecological surveys of sites to monitor feature condition. NE has responsibility for inshore sites (within 6nm), JNCC has responsibility for offshore sites (beyond 12nm) and they have joint responsibility for sites between 6 and 12nm. Estimates of the costs of each site have been provided by the SNCBs<sup>80</sup> and applied as appropriate. Public bodies may be able to make efficiencies from doing ecological surveys on multiple MCZs or other MPAs at the same time, but it has not been possible to estimate these; as a result costs to public bodies may be an over-estimate.

## Costs amendments based on consultation responses and new evidence

7.56 Paragraphs 7.60 to 7.83 describe changes to the assessment of costs from the consultation IA following consultation responses and new evidence. Table 2 shows final cost estimates.

7.57 All consultation responses have been analysed and considered to inform this revised final IA and as a result some cost assumptions and final estimates have been amended, which are described below.

7.58 Some consultation responses on costs have *not* changed the final figures for the IA. Principally this was when the consultation response provided information that:

- (i) was not *additional* to the information already available through the Regional MCZ Projects and pre-consultation, used to inform the consultation IA;
- (ii) was not relating to activities which were impacted (i.e. where responses provided further baseline information of activities which will *not* be affected by MCZs);
- (iii) referred to existing requirements in the baseline, such as Water Framework Directive (WFD) or existing marine protections, and not additional costs due to MCZs.

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<sup>78</sup> Annex H14 Approach for assessing costs of management measure implementation, enforcement and surveillance, <http://publications.naturalengland.org.uk/publication/1940011>.

<sup>79</sup> MMO and IFCAs, pers. comm. 2014.

<sup>80</sup> JNCC and NE, pers. comm., 2014

7.59 9371 responses were recorded, of which over 98% were in support of MCZs. Site and sector specific changes to costs are described below:

### **Changes to business sector costs**

7.60 **Oil and Gas** – some consultation respondents mentioned potential oil and gas activity in oil and gas blocks in the 27<sup>th</sup> oil and gas licensing rounds which had not been included in the consultation IA. A re-examination of the GIS mapping of oil and gas blocks showed that 599 oil and gas blocks from the 27<sup>th</sup> round were not included in the consultation IA. In addition, Defra analysts re-ran the GIS analysis which estimated the proportion of blocks which are closest to MCZs as opposed to other environmentally sensitive areas in order to exclude oil and gas blocks closest to other environmental designations from the analysis, as costs of assessing impacts on already designated areas are in the baseline. The proportion of costs for the total suite of MCZs which are attributable to the 2<sup>nd</sup> tranche was also re-estimated. The net effects of these changes are to increase the best estimate of costs from an average annual figure of £0.049m in the consultation IA to £0.117m.

7.61 **UK Commercial fisheries** – Some consultation respondents also mentioned that UK fishing vessels might be affected if restrictions were placed on foreign fishing vessels fishing in MCZs and moved into areas targeted by the UK fleet. This was particularly raised with regard to the Mid-Channel Potting Agreement between UK and French fishermen. This may lead to a loss of fishing opportunities for the UK fleet. Due to uncertainty in whether management would be imposed on foreign vessels, the response of foreign fishing vessels to any management imposed and how this might affect UK vessels, it has not been possible to monetise this cost.

7.62 Following new evidence on certainty of features, various features have been added or removed. This has led to changes in costs for the following sites:

- Western Channel (decrease in best estimate of fisheries costs). This is because static fishing gear is no longer expected to be restricted in this site.

The net effect of the change in features is that the best estimate of average annual costs to the UK fishing sector have fallen from £0.035m in the pre-consultation IA to £0.034m.

7.63 **Non-UK fisheries** – following consultation responses and data submitted by the French Government<sup>81</sup>, estimates of landings lost to the French fleet due to the designation of offshore tranche 2 MCZs have been updated. These are shown in Annex E.

7.64 Estimates of lost landings to foreign fleets have also been updated following changes in the features in different sites – see 7.62.

7.65 **Ports & Harbours** – concerns were raised by a number of ports about the impact on navigational dredging near to MCZs. Consultation respondents mentioned two planned navigational dredging operations in the Coquet to St. Mary's MCZ, and one operation in the Holderness Inshore MCZ which were not included in the pre-consultation estimate of costs. Costs of additional assessment for these operations due to the designation of MCZs were added to the estimate of costs for this sector. In addition, costs for navigational dredging and disposal for the Utopia MCZ have been removed. This is as a result of a review of activities which showed that no navigational dredging takes place in or near the site, and no disposal takes place within 5km of the site. Therefore, we do not expect these activities to require additional assessment to assess the impacts on the MCZ.

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<sup>81</sup> Direction des Pêches Maritimes et de l' Aquaculture, pers. comm., 2014.

- 7.66 Some consultation respondents raised concerns about the costs of potential future developments, which we are unable to take account of without clear development plans. Where these are available, costs have been adjusted to include them. Extra costs related to planned development at the Port of Dover which will require additional assessment due to the designation of the Dover to Deal and Dover to Folkestone MCZs, were added to the estimate of costs for this sector.
- 7.67 Following concerns expressed during consultation by the Port of Blyth, there has been a slight change to the Coquet to St. Mary's MCZ. However, this change has not led to any changes in the costs to the ports sector or other sectors.
- 7.68 The net effect of these changes is that the best estimate of average annual costs to the ports & harbour sector increased from £0.123m per year in the pre-consultation impact assessment to £0.126m per year.
- 7.69 **Renewable Energy** – consultation respondents raised the potential development of the West Cumbria tidal lagoon energy plant, which would be located in the Allonby Bay MCZ<sup>82</sup>. The developers will be required to undertake assessment of the impact of a tidal lagoon on the MCZ's features, which will lead to additional costs, which were estimated using a similar methodology used in the consultation IA for other tidal energy developments using energy developer estimates for costs of additional assessment. The best estimate of these costs is £18,000 (or an annual average of £900 over the twenty year appraisal period). As the proposed tidal lagoon is a large project and any costs of assessment are uncertain, a high cost scenario was also estimated using the highest estimate for the costs of additional assessment provided by renewable energy developers.
- 7.70 The most likely impact of a tidal lagoon on the MCZ may be a reduction in the amount of tidal and wave energy that features within the site would be exposed to, potentially subtly changing habitats such as high energy intertidal rock into lower-energy equivalents (i.e. moderate or low energy intertidal rock). We do not anticipate that such impacts could be addressed through mitigation measures in terms of the tidal lagoon design and operation. There is still uncertainty as to whether and where the tidal lagoon may be constructed. If it proceeds, we will assess the implications for the MCZ. One option may be to protect the high-energy versions of the relevant features elsewhere in the region.
- 7.71 In addition to the tidal lagoon at Allonby Bay, consultation respondents also raised the potential development of a tidal energy device at Dover port.<sup>83</sup> Extra costs related to this development will be required to assess its impact on the features in the Dover to Deal and Dover to Folkestone MCZs, which it is close to. These costs of assessment total £35,000 (or an annual average figure of £1,750 over the twenty year appraisal period) and have been added to the best estimate of costs to the renewables sector. As the development will be outside of the MCZ and will not require cables to cross either of the MCZs, there is no anticipated mitigation required for this development.
- 7.72 The West of Walney MCZ will be partly co-located with offshore wind farm developments. The wind farm developers expressed concern during the consultation period about the effect an MCZ might have on the operation and maintenance of wind farms. MCZs are not intended to prevent developments, but to ensure they progress in a suitably environmentally-friendly manner. We therefore do not expect the windfarm activities to be unduly affected by designation of the site and no additional costs have been added. This conclusion has been informed by discussions that

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<sup>82</sup> See here for more details - <http://www.tidallagoonpower.com/h/lagoons/west-cumbria/142/> . Accessed 22/06/2015.

<sup>83</sup> See here for more details - <http://www.pro-tide.eu/portfolio/port-of-dover/> . Accessed 22/06/2015.

took place between Defra, regulators and windfarm developers prior to the consultation, during which a variety of potential licensing scenarios were discussed.

7.73 The net effects of additional costs of assessment for the potential developments at Dover and Allonby Bay are to increase the best estimate of average annual costs to the renewables sector from £0.007m per year in the pre-consultation impact assessment to £0.010m per year.

7.74 **Recreation** – new information was received about anchoring by recreational boating in the Needles MCZ and recreational anglers in Utopia MCZ during the consultation, an activity which may require management in order to reduce impacts on sensitive features. Natural England evaluated existing evidence and evidence submitted during the consultation, and concluded that anchoring activity in both sites is believed to be low. Due to uncertainty in possible management measures and alternative anchoring locations available for recreational users, it has not been possible to monetise these costs. Any costs are likely to be low because of the following factors:

- Natural England advised that any management is likely to be minimal and may only involve the use of voluntary no-anchoring agreements
- In the event of compulsory no-anchoring zones, these are likely to be concentrated in specific areas, which will leave open other areas within the same bay for recreational boaters to use
- If it is not possible to anchor in a location, then there will be other locations available both inside and outside of the MCZ.

7.75 Some consultation respondents also mentioned a knock-on effect for businesses and restaurants used by recreational boaters when anchoring in specific locations if anchoring were banned in those areas. As above, it is not expected that recreational activity will be significantly affected by management following designation of MCZs, and therefore any indirect knock-on effects will also be low.

7.76 Following the consultation, it is estimated that there is a small unmonetised cost to recreational boaters and anglers due to the designation of the Needles and Utopia MCZs, which was not previously included in the consultation IA.

7.77 **Marine Archaeological Heritage** - There were concerns of potential restrictions to activity in consultation responses. However, intrusive archaeological activities combined with policies and legal requirements to preserve historical sites have already been considered under the costs of MCZs. In all cases, diver trails, visitors and non-intrusive surveys can continue.

7.78 **Aquaculture** - Following latest advice from NE, further consideration needs to be given to the potential socio-economic impacts on the aquaculture sector of designating a number of features within the Swale Estuary with 'recover' GMAs. These features will therefore not be designated as part of the 2<sup>nd</sup> tranche, but may be considered as part of the 3<sup>rd</sup> tranche. The remaining features in this site have a 'maintain' GMA and so it is expected that no management or mitigation of this activity will be required. As a result, it is expected that there will be no quantified costs to this sector (as in the consultation IA).

7.79 **Aggregates, Cables, Coastal Development** – there was no new information from the consultation responses which led to a change in costs for these sectors.

## **Costs changes to public sector costs**

- 7.80 **Ecological Surveys** - the method for estimating costs to Natural England for undertaking ecological surveys in inshore sites depends on the number of features to survey in these sites. Following updated SNCB advice, the number of features in inshore MCZs going forward to designation as part of 2<sup>nd</sup> tranche has fallen from 230 to 198, leading to a reduction in the best estimate of average annual costs of surveys to Natural England from £0.798m to £0.690m per year.
- 7.81 There were no changes in costs to JNCC of undertaking surveys, as the method for assessing costs of surveys in offshore sites is not dependent on the number of features to be surveyed. As a result, the best estimate of average annual costs of ecological surveys has fallen from £1.171m to £1.063m per year.
- 7.82 **Flood and coastal erosion risk management**- There are no changes due to consultation responses. Concerns were raised that designation of the MCZ in Runswick Bay may affect future consideration of coastal protection projects. Given the proposed plans are unlikely to result in a loss of habitat, it is not expected that the MCZ designation will lead to any additional costs for this project.
- 7.83 **National Defence, Costs to public sector of managing MCZs** – There are no changes for costs in these sectors due to consultation responses.

## Anticipated costs to private and public sectors following 2<sup>nd</sup> tranche MCZ designation

The following table summarises methodology and average annual costs for each sector. More details, including annual breakdown of costs, totals and present values can be found in Annex D. The costs presented in the table include changes following consultation.

**Table 2: Average annual undiscounted costs<sup>84</sup> of 2<sup>nd</sup> Tranche Marine Conservation Zones**

Private Sector	Methodology, assumptions and sources	Best estimate scenario	Low / High cost scenarios
Aggregate extraction	Aggregate extraction in or near MCZs mapped. Consultation with industry and British Marine Aggregates Producers Association (BMAPA) during Regional Project Process provided cost estimates for licence applications and mitigation, including proportion of consultancy fees (external costs) as well as developer time (internal cost, including overheads) and this was updated to 2013 prices. The additional cost per license application is estimated to be £28k.	<b>£0.011m/yr</b>  <b>Licence applications</b> within 1km of an MCZ need to assess potential impact of activity on an MCZ (at additional one-off cost of £0.028m each). Each licence is assumed to be renewed after 15 years. 2 applications occurring in year 2017 and recurring in 2032, 2 applications occurring in year 2026, and 2 applications 2028.	<b>£0.003m/yr - £0.011m/yr</b>  Sensitivity around number of licence applications and mitigation requirements. <b>Low cost:</b> Additional EIA costs for licence applications for <u>strategic resource areas</u> that overlap with or are in close proximity to an MCZ (2 applications at 1 site). <b>High cost: As best estimate</b>
Aquaculture	Aquaculture activity in and near each proposed MCZ mapped during the Regional Project Process and updated during local pre-consultation engagement in summer 2014, and revised following latest SNCB advice and consultation responses.	<b>No anticipated costs</b>  Based on current information, there are no aquaculture sites in close proximity to 2 <sup>nd</sup> tranche MCZs apart from in the Swale Estuary. This sector will not be impacted as a result of the 2 <sup>nd</sup> tranche as no mitigation or management is expected and no licence applications are required in the Swale estuary.	<b>N/A</b>
Cables	Existing cables and known future cable routes mapped. Assumes additional cost to an operator of assessing impacts of future cable installation on broad-scale habitats protected by a MCZ. Since the location of 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. Increased cost to operator of additional assessment of environmental impact upon MCZ features (broad-scale habitats only) for one licence application for one future cable installation is <b>estimated to be £10K</b> based on cost estimates provided by industry.	<b>£0.001m/yr</b>  Existing or operational cables will not be impacted upon by MCZs. 4 new Licence applications in each years of 2019, 2024, 2029 and 2034 ( <b>total 16 licences over 20 years</b> ) <sup>85</sup> for the 99 inshore sites initially proposed by the Regional Project process. This was scaled down proportionally for the 18 inshore sites recommended for designation in this IA (including those which are partially within 12nm). This results in costs of £0.007m in each of the above mentioned years.	<b>£0.001m/yr - £0.002m/yr</b>  Sensitivity around number of licence applications over 20 years <b>Low cost scenario:</b> 2 licence applications in each year of 2019, 2024, 2029 and 2034 ( <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 2019, 2024, 2029 and 2034 ( <b>total of 24 licenses over 20 years</b> ). The costs are scaled

<sup>84</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. Annex D contains more detail on sector and site specific costs. Costs are estimated in 2013 prices over a 20-year appraisal period, and have been rounded to the nearest £0.001m per year.

<sup>85</sup> 16 licence applications for cables (either power or telecom) will be submitted over the 20-year period of the IA (4 in each regional MCZ project area within 12nm, 1 one in each regional MCZ project area at the end of each 5-year period). This is for the 99 inshore sites of the 127 sites recommended

			resulting in costs of £0.011m in each of the above mentioned years.
Coastal Development	Known coastal developments mapped for each MCZ and assessed for potential impact on conservation objectives. No impacts or mitigation anticipated.	<b>No anticipated costs</b>	N/A
Commercial Fisheries (UK)	<p>Fishing activity in each MCZ uses methodology from MCZ fisheries Model. Value of Landing information provided by VMS data for over 10m vessels and IFCA inshore sightings data for under 10m vessels (2010 -2012 data).</p> <p><b>Costs are due to management of some fishing activities.</b> Gear types affected and management required are specific to the <b>site and the feature which the MCZ</b> is designated to protect. Management scenarios for each MCZ are summarised in <b>Annex A</b>.</p> <p>Costs are measured as loss in GVA i.e. the value of landings associated with the relevant area of fishing grounds, less costs associated with these landings, such as costs of fuel and fishing gear.</p> <p>The default of 75% displacement (and 25% loss) of fishing activity is based on low overlap of the MCZs with core fishing grounds. This assumption was not challenged with evidence during consultation.</p>	<b>£0.034m/yr</b>	<b>£0.000m/yr - £0.327m/yr</b>
Archaeological heritage	Archaeological data sourced from numerous locations including consultation responses provided locations of currently designated sites and recorded finds. 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 2 <sup>nd</sup> tranche sites, as none have this feature in an unfavourable condition. Diver trails, visitors and non-intrusive surveys will be unaffected in MCZs. Vessels can no longer anchor over sensitive features such as seagrass beds.	<b>No impact monetised.</b>	N/A
Oil & Gas & other energy (including carbon capture and storage (CCS) at sea)	Current activity mapped (including 26 <sup>th</sup> 27 <sup>th</sup> and 28 <sup>th</sup> oil and gas licensing rounds <sup>86</sup> ) and potential future oil & gas developments assessed in each MCZ project area. Additional costs for licence application resulting in increased developer time (internal costs, including overheads) and external costs for additional assessment of environmental impact. Estimates provided by industry	<b>£0.117m/yr</b>	<b>£0.112m/yr - £0.122m/yr</b>
		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 2 <sup>nd</sup> tranche. Costs are scaled down by the proportion of oil and gas blocks for which a T2 MCZ is the nearest	<p><b>Assumptions are the same for best-estimate apart from the number of future licence applications.</b></p> <p><b>Low cost scenario:</b> Oil&amp; Gas: Number of future licence applications in blocks in the 26th Round</p>

<sup>86</sup> See here for an explanation of the oil and gas licensing process: <https://www.gov.uk/guidance/oil-and-gas-licensing-rounds>



	representatives, split at the discretion of industry between external consultant costs and internal time.	environmentally sensitive area compared to the full suite of MCZs.	with a 'significant discovery' or 'fallow block with discovery' 25% lower than best estimate. 50% less for remaining blocks. <b>High cost scenario:</b> Oil& Gas: Future licence numbers 25% higher than that used for the best estimate for those with 'significant discovery or fallow block with discovery'. 50% higher for remaining blocks.  Costs were scaled down as per best estimate.
Ports, Harbours, Commercial shipping and disposal sites	Current activity mapped (i.e. ports, harbours, disposal sites and navigational dredges). Details of known proposed future developments reviewed. Estimates provided by industry. This includes external costs for consultants (based on the average of two estimates from two UK environmental consultancy firms).	<b>£0.126m/yr</b>  Costs are based on costs for additional assessment of applications for dredge material disposal sites, updating Maintenance Dredging Protocols, additional assessment when undertaking navigational dredging and additional assessment for applications for port and harbour development.	<b>£0.124m/yr - £0.263m/yr</b>  <b>Sensitivity around licence applicant and application numbers and mitigation requirements.</b> <b>Low cost scenario:</b> Licence applications and applicants for disposal sites, required within 5km of MCZ (navigational dredging, disposal and future port developments) incur additional one-off costs. <b>High cost scenario:</b> Licence applications within 5km – including all future applications (i.e. costs based on number of applications for disposal sites rather than applicants as a worst case scenario). It also includes incorporating MCZ features into existing / planned Maintenance Dredging Protocols <sup>87</sup> .(for navigational dredging only). Site-specific mitigation costs were advised by NE.
Recreation	Recreation activity in and near each MCZ was mapped as part of the Regional Project process and updated through local engagement during pre-consultation and through consultation responses, alongside vulnerability assessments of the sensitivity of features to the activities taking place. Anchoring and mooring may need to be managed at two sites. The Needles may require management of anchoring due to the presence of a 'recover' seagrass feature. However, Natural England have advised that the overlap of the feature with main anchoring and moorings in the area is minimal and so any management would represent an inconvenience and may be done on a voluntary basis. Any mandatory management is likely to be minimal and would require stakeholder engagement and its own accompanying impact assessment if empowered through a bye-law.	<b>No impact monetised</b>	<b>N/A</b>

<sup>87</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.

	<p>Unquantified costs have been added to Utopia as a result of new information that anchoring for recreational angling takes place in this site. As features are likely to be sensitive to this activity, this activity would be monitored following designation with a view to identifying what, if any, management was required. We believe the level of activity to be low, so any management is likely to be limited.</p> <p>See Annex A for indicative management scenarios at these sites.</p>		
Renewable Energy	<p>Existing and planned activity was mapped against MCZs. Crown Estate and MMO provided information of potential future developments within the next 20years. There are additional costs for licence applications for developments near MCZs, to assess the impact on MCZ broad scale habitats.</p> <p>Information provided by stakeholders MMO, NE, Cefas and the Crown Estate<sup>88</sup> has indicated no yet-to-be consented renewables cables interact with the sites proposed for designation for the 2<sup>nd</sup> tranche, and no consultation responses raised any additional consented renewables cables.</p>	<p><b>£0.010m/yr</b></p> <p>The best estimate is costs to wave and tidal developments only for additional assessment costs during licence applications. This results in 6 additional application costs in 2015, 4 in 2020 and 1 in 2030 affecting 10 sites.</p> <p>For wave and tidal energy, the additional one-off assessment cost is estimated to be £0.013m per MCZ (uprated 2013 price) based on 8 developer estimates and £0.005m (uprated 2013) per MCZ broad scale habitat based on an estimate from Scottish Power (pers. comm. 2011). This is then weighted appropriately per site ((£0.005m x number of broad scale habitats proposed for designation + £0.013m x 8) / 9) leading to slightly different application costs per site depending on the number of broad scale habitats designated.</p>	<p><b>£0.010m- £0.012m</b></p> <p><b>Low cost scenario:</b> as best estimate.</p> <p><b>High cost scenario:</b> as the West Cumbria tidal lagoon development in Allonby Bay MCZ is larger than other tidal energy devices, costs of additional assessment may be higher for this case. To reflect this uncertainty, a high cost scenario has been estimated using the highest developer estimate of costs of assessment (provided by Scottish Power and based on the number of broad scale habitats). For other developments, cost estimates are as is the best estimate.</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	<p>MCZs assessed in relation to proposals in Shoreline Management Plans (SMPs). Based on advice from NE and the Environment Agency<sup>89</sup> no costs will be incurred by the Environment Agency or local authorities as a result of the sites proposed for designation in the 2<sup>nd</sup> tranche for monitoring, additional assessment costs or mitigation of activities.</p> <p><b>Confidence: High</b></p>	<p><b>No costs anticipated</b></p> <p>No additional mitigation costs are anticipated as a result of 2<sup>nd</sup> tranche MCZs.</p>	N/A

<sup>88</sup> MMO, NE, Cefas and the Crown Estate, pers. comm. 2014.

<sup>89</sup> Natural England and Environment Agency, pers. comm. 2014.

National Defence	<p>National Defence activity in and near to all potential MCZs assessed. Costs provided by MoD<sup>90</sup>.</p> <p><b>Confidence:</b> <i>Anticipated costs are generic and may differ depending on the scale and nature of the military activities in each MCZ.</i></p>	<p><b>£0.002m/yr</b></p> <p>Costs provided by MoD. One-off cost of adjusting electronic tools and charts (£0.025m) and annual costs of maintaining (to ensure that MCZs are featured in planning for operations/ training) – of £0.015m/yr in the first 4 years, reducing to £0.010m/yr thereafter; Costs of additional planning considerations.</p> <p>Costs scaled down for 23 sites (to 18%) as the costs applied for all the 127 sites</p>	No sensitivity
Costs to public sector of managing MCZs (management and enforcement)	<p>Costs were provided by local authorities, landowners, IFCAs, MMO and Defra. For the preferred option, only the cost of enforcement/surveillance of MCZ management measures is included in the headline figures in the IA Summary (i.e. excluding implementation costs).</p> <p><b>Confidence:</b> <i>Estimates don't take account of possible cost savings of introducing one management measure that covers multiple MCZs or risk based prioritisation of monitoring.</i></p>	<p><b>£0.751m/yr</b></p> <p>Best estimate is the midpoint of the high and low cost scenarios.</p>	<p><b>£0.709m/yr - £0.793m/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 that implementing non-regulatory measures such as voluntary agreements outside these limits would be impractical</p>
Ecological Surveys	<p>Annual costs to public sector for ecological surveys for baseline surveys and monitoring only. Costs for offshore sites based on similar surveys and provided by Joint Nature Conservation Committee. Costs for inshore sites based on cost estimates provided by Natural England and applied to number of features in each site.</p> <p><b>Confidence:</b> <i>costs provided by NE and JNCC based on previous experience of similar surveys, however there is still uncertainty in the level of detail and monitoring which will be required.</i></p>	<p><b>£1.063m/yr</b></p> <p>This includes costs to NE and JNCC. Best estimate is the low scenario as it is considered most likely as an outcome by JNCC and NE.</p>	<p><b>£1.063m/yr - £1.753m/yr</b></p> <p><b>Sensitivity around overlap with European SACs/SPAs to combine survey resources.</b> <b>Low cost scenario:</b> Assumes 50% of overlap with European SCAs/SPAs, based on the overlap with European sites. This reduces the cost of baseline surveys. <b>High cost scenario:</b> assumes that there is no overlap with SACs/SPAs</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	Figures for non-UK vessels were gathered in pre-consultation from all relevant member states, with this IA containing updated information on the French fleet compared to the consultation IA.	N/A	N/A

<sup>90</sup> MoD, pers. comm. 2014/

	<p>These are not included in the summary figures or the EANCB calculation, but informed the site selection decision. 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.</p>		
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## ***Equivalent Annual Net Costs to Business***

- 7.84 Costs to business have been calculated in line with the Better Regulation Framework manual<sup>91</sup>. These are calculated as full economic costs – figures have been provided directly from industry during the 2 years of informal consultation as part of the Regional Projects process, and updated through subsequent stakeholder contact and consultation. 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. incorporate wage costs as well as overheads plus national insurance and overhead costs. Some figures are not split into external and internal costs, but the full figure was provided at the discretion of industry or validated by industry, incorporating full costs. Details of assumptions, actual calculations of unit costs and the time profile of costs used are given in Annex D.
- 7.85 Assumptions had to be made on the number of licence applications and likely mitigation activities. This was verified with industry representatives on a case-by-case basis. When uncertainties apply sensitivity analysis has been conducted, 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 above.
- 7.86 This EANCB figure is illustrative, 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 IFCAs, with consultation process and if required an associated regulatory IA. These costs are taking a best estimate of what costs may occur. Where the MMO or IFCAs introduce regulatory measures and complete a regulatory Impact Assessment, the costs of these measures to business will be accounted for and assessed against the One-In Three-Out criteria where they include management measures which have not been included as a scenario in this IA. This is to avoid 'double-counting' the impacts on businesses from designation and management of MCZs.
- 7.87 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, the Water Framework Directive, the Common Fisheries Policy and the Marine Strategy Framework Directive. In light of this, the IA assumes that no mitigation of impacts of water abstraction, discharge or diffuse pollutions is required over and above that which will be provided to achieve the objectives of the Water Framework Directive through the River Basin Management Plan process.

**The figures result in an EANCB figure of £0.31m/yr (2014 prices and 2015 base year). The PV cost to industry is £4.50m discounted over 20 years (2013 prices, PV base year is 2015). The benefits have not been monetised other than indicatively so this only reflects costs.**

### ***Risks, sensitivities and limitations of costs methodology***

- 7.88 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. On-going research is being carried out on the benefits of co-location which will inform future work.

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<sup>91</sup> <https://www.gov.uk/government/publications/better-regulation-framework-manual>

- 7.89 For many sectors, including Oil & Gas, and National Defence 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 national/regional level and verified with relevant industry representatives<sup>92</sup>.
- 7.90 There is uncertainty in the displacement of fishing activity assumption. The full range of possibilities is tested through sensitivity analysis, with a high cost scenario presenting no displacement (i.e. all catch in this area lost). Further information from the previous consultation was incorporated in the Impact Assessment, and this IA has incorporated evidence provided through the consultation on the 2<sup>nd</sup> tranche of MCZs. In addition, restricting fishing activity within MCZs or certain areas raises the potential for an increase in environmental damage outside MCZs due to displaced fishing activity. There is insufficient scientific or socioeconomic evidence on displacement and any resulting environmental impact to incorporate into costs estimates.
- 7.91 There is also uncertainty on the future condition and activities within sites. While every effort has been made to identify and predict future developments within sites through existing sources, pre-consultation engagement and consultation with industry, there may be some future unplanned developments which are currently unknown. It is not possible to estimate the impact of designation on these developments. In addition, in the future the condition of some sites may deteriorate or improve without designation due to other pressures such as climate change, meaning that cost estimates based on the current condition of sites may be under- or over-estimates. There is insufficient evidence to determine where the condition of features is expected to change in the future.

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

- 7.92 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 micro and small businesses as they are individual boat owners with no or small crews and local yacht and sailing clubs.
- 7.93 The recreational sector may face restrictions at two of the sites where anchoring currently takes place over sensitive features (The Needles and Utopia MCZ). In their consultation response, the Royal Yachting Association indicated that a complete ban on anchoring in three bays in the Needles MCZ would have a significant effect on local sailing clubs and businesses used by recreational users. However, management of anchoring is expected to be less restrictive than this (e.g. voluntary no anchoring agreements or partial anchoring bans in selected areas of the MCZs with sensitive habitat), and it is expected that recreational users will have access to other areas close by for use. As a result, it is not expected that these businesses will be significantly affected following designation of MCZs.
- 7.94 The UK fishing fleet in 2013 had 6,399 vessels and employed 12,150 fishermen<sup>93</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 624 thousand tonnes of sea fish (including shellfish) into the UK and abroad with a value of £718 million in 2013. The MMO reports<sup>94</sup> that over 99% of commercial fishing enterprises in England and Wales had fewer than 10 full-time

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<sup>92</sup> It has not been possible to publish all anticipated additional costs to specific MCZs (across all sectors) and developments in the IA because of the commercial sensitivity of some of the data. Such information has been aggregated and presented in the IA. It has not been possible to verify cost estimates provided by industry.

<sup>93</sup> Marine Management Organisation, Annual Sea Fisheries Statistics 2013. <https://www.gov.uk/government/collections/uk-sea-fisheries-annual-statistics>

<sup>94</sup> Marine Management Organisation, pers. comm. 2015.

equivalent employees in 2013, with the remainder having between 11 and 49 employees<sup>95</sup>. The best estimate cost of £0.034m/yr to UK commercial fisheries is assumed to therefore fall entirely on small and micro businesses. If small and micro businesses were exempted from fisheries management measures, then this would mean that almost no management of fisheries would be possible within MCZs. This would mean that MCZ features would not be protected and would not be able to achieve their conservation objectives as sensitive habitats would continue to be vulnerable to damage from fishing. In addition, while MCZ designation is expected to lead to restrictions on commercial fishing in some areas, analysis of core fishing grounds for the 1<sup>st</sup> tranche IA showed that there was a low degree of overlap with the entire suite of 127 MCZs; this IA only considers 2<sup>nd</sup> tranche MCZs, of which only some are expected to be subject to management of fisheries.<sup>96</sup>

7.95 Both fisheries and recreational stakeholders were involved in the Regional Projects process which identified MCZs, and have also been engaged as part of pre-consultation discussions and consultation on 1<sup>st</sup> and 2<sup>nd</sup> tranche of MCZs.

7.96 Other sectors impacted through additional costs for assessing impacts of their licenced activities on the conservation objectives of designated broad scale habitats are covered by existing licencing legislation, which cannot be influenced by MCZ designations. This legislation already contains its own exemptions and thresholds for different sized businesses and projects which should limit the impact of designations of small and micro businesses. The main sectors impacted, oil and gas and ports and harbours, are made up of larger businesses with significant contributions to UK GDP and so impacts assessed here are insignificant in relation to their scale. The additional analysis which is attributable to the designation of MCZs in the 2<sup>nd</sup> tranche is minimal compared to the analysis that would be required in the baseline anyway. No developments have been identified which would require mitigation.

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<sup>95</sup> Of 3267 vessels in the English and Welsh fleet, 3616 employ fewer than 10 people, and 11 employ between 11 and 49 people. Data not available for Scotland and Northern Ireland.

<sup>96</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/82721/mcz-designate-ia-20121213.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/82721/mcz-designate-ia-20121213.pdf) , p42.

## 8. Benefits

- 8.1 The marine environment provides us with many benefits, such as food in terms of fish and shellfish, gives millions of people the chance to enjoy sailing, angling, watching birds and other wildlife, and provides environmental resilience (e.g. sea defence, climate change mitigation). These can be described as ‘Ecosystem Service’ benefits. Ecosystem services are defined as services provided by the natural environment that benefit people<sup>97</sup>, several of which can be considered public goods as discussed in para 3.3.
- 8.2 Several recent reports stress the value of the marine environment. The UK National Ecosystem Assessment Follow-on (NEAFO)<sup>98</sup> has underlined the value of the marine environment and benefits derived from its ecosystem services. The 2015 third state of natural capital report by the Natural Capital Committee emphasised the importance of investing towards the conservation of certain marine assets (e.g. the gains from improving commercial fish populations could be as much as £570m to the economy per annum)<sup>99</sup>. The 2015 VALMER project on valuing marine ecosystem services in the English Channel also highlighted that society obtains many benefits from the marine environment, including through case study work on areas containing 2<sup>nd</sup> tranche MCZs.<sup>100</sup> The NEAFO also recognised the need to take proper account of the benefits of marine conservation measures in decision making but also the challenges and lack of economic evidence currently available for doing so. As a result of the lack of economic and scientific evidence, this section contains only illustrative benefits from the designation of 2<sup>nd</sup> tranche MCZs using the latest available literature including qualitative and quantitative examples.
- 8.3 The ecosystem services that may be provided by the marine environment (and MCZ features) have been assessed under the categories set out in Table 3 based on those in the NEAFO report<sup>101</sup>.

<b>Table 3: Ecosystem services considered in the IA</b>	
<b>General Ecosystem service categorisation</b>	<b>Final ecosystem services assessed in the IA</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

<sup>97</sup> Defra 2007. An Introductory Guide to Valuing Ecosystem Services. London: Defra. URL: <http://archive.defra.gov.uk/environment/policy/natural-environ/documents/eco-valuing.pdf> (Accessed 25 June 2012)

<sup>98</sup> <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=2&ProjectID=18081>

<sup>99</sup> Natural Capital Committee, Third State of Natural Capital Report.

<sup>100</sup> <http://www.valmer.eu/>

<sup>101</sup> <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=KLy76Rak0WQ%3d&tabid=82>



	Education and research Health benefits
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**Benefits under baseline**

8.4 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 paragraph 6.5 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. As a consequence it is expected that the benefits are underestimated for the purpose of this IA. 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 monetized benefits of the UK marine environment</b>		
Provisioning	Food (wild, farmed) Fish feed (wild, farmed, bait) Fertiliser and biofuels Ornaments and aquaria Medicines and blue biotechnology	In 2012, the GVA of fishing, aquaculture, processing and preserving was £2.1bn <sup>102</sup>
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>103</sup> ; £300m 2004 value, avoidance cost of building flood control measures) <sup>104</sup>  £0.4-8.47bn yr 2002 values, avoidance cost; £6.74bn yr-1 marine Carbon-sequestration 2004 value, avoidance cost <sup>105</sup>  The economic value of regulating services to the UK is £420m to £8.5bn <sup>106</sup> . However, this value is for all of UK seas rather than the features the MCZ protects.
Cultural	Tourism and nature watching	Between March 2012 and February 2013, 284m leisure visits were made to the coast including coastal towns in England <sup>107</sup> . In 2013, 14.1m UK adults participated in water sports and other water-based leisure activities, including boating, sea angling and coastal walking. <sup>108</sup> In their consultation response for the 2 <sup>nd</sup> tranche, the National Trust highlighted that their visitors have said that they obtain many benefits from visiting coastal areas.

<sup>102</sup> European Commission - Scientific, Technical and Economic Committee on Fisheries, Annual Economic Reports on Fisheries, Fish Processing and Aquaculture, 2014. <http://stecf.jrc.ec.europa.eu/reports/economic>

<sup>103</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>104</sup> Beaumont et al., 2006

<sup>105</sup> UK National ecosystem assessment (2011) and Beaumont et al. (2006), from Fletcher et al (2012)

<sup>106</sup> Beaumont, N., Townsend, M., Mangi, S., & Austen, M.C. 2006. Marine Biodiversity. An economic valuation. Building the evidence for the Marine Bill. London: Defra, and Clarkson, R and Deyes, K. (2002), "Estimating the Social Cost of Carbon Emissions", GES Working Paper 140, HM Treasury, London.

<sup>107</sup> Natural England Monitor of Engagement with the Natural Environment, 2012 -2013 <http://publications.naturalengland.org.uk/publication/5331309618528256?category=47018>

<sup>108</sup> Watersports and leisure participation survey 2013 [http://www.rya.org.uk/SiteCollectionDocuments/sportsdevelopment/Watersports\\_survey\\_Market\\_Review\\_2013\\_Executive\\_Summary\\_.pdf](http://www.rya.org.uk/SiteCollectionDocuments/sportsdevelopment/Watersports_survey_Market_Review_2013_Executive_Summary_.pdf)

	Spiritual and cultural well-being Aesthetic benefits Health benefits	The NEAFO reviewed the literature on cultural ecosystem services and in 2012 prices derived willingness to pay figures per household in England of a willingness to pay of £75 per year to halt loss of biodiversity and ecosystem services on the coastal shelf <sup>109</sup> . This equates to £1.65bn if multiplied by the estimated 22m households in England in 2012.
<p><i>Notes of the table:</i>          These are wider estimates of the UK marine environment rather than specific to MCZs (unless specified otherwise). Some of these figures are likely to be an underestimate (e.g. non-use values associated with the existence of the marine environment).</p>		

### **Benefits under preferred option: Designate 23 MCZs**

8.5 Designation of 23 MCZs and the additional features from the 1<sup>st</sup> tranche 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 10,812km<sup>2</sup> will be protected by the designation of the 2<sup>nd</sup> tranche of MCZs and 234 features (habitats, species, geological and geomorphologic features) will be conserved. It will complement (not duplicate) other types of designation and provide an essential component of the UK contribution to establishing an ecologically coherent network of MPAs. In the absence of MCZs, the full range of features present in the UK marine area would not be afforded protection.

8.6 MCZ designation brings benefits from the:

- flows of ecosystem services from specific features and habitats that MCZs will protect. Under the preferred option, only features that are in unfavourable state (those assigned a recover GMA) 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;
- additional benefits from an overall network of protected areas, which these sites will contribute to along with other designations – for example where a network of MPAs together contribute greater benefits than the sum of the benefits from each individual MPA because they offer connectivity between protected areas for mobile species.

<sup>109</sup> McVittie, A. and D. Moran (2009) Valuing the non-use benefits of marine conservation zones: an application to the UK Marine Bill Ecological Economics 70 (2) Pages 413-424 Edinburgh: Scottish Agricultural College. Moffat, A. 2012 Draft: Anticipated benefits of marine protected area policy. Natural England.

- 8.7 The different types of ecosystem service benefits expected to improve due to the 2<sup>nd</sup> tranche MCZ designation are summarised below. Where possible additional benefits from the 2<sup>nd</sup> tranche MCZ designation have been quantified (see table 5). Relevant research has been used to further monetise some of these benefits; although technical uncertainty of the estimates means these have largely been presented as illustrative only. Annex B and C provide information on these studies.
- 8.8 There is a lack of scientific and economic research on the marine environment suitable for adapting for use in benefits evaluation. This is acknowledged as a challenge in the literature beyond this IA<sup>110</sup>. This is because of both scientific uncertainty and the lack of traded markets for some of the benefits anticipated from MCZs. Growth in sectors which are expected to directly benefit from the designation of MCZs such as recreation and tourism is difficult to attribute to MCZ as there are many factors which contribute to growth. In addition, any observed increase in fisheries productivity (stock levels) would be difficult to attribute solely to MCZs as there are always many contributing factors to fisheries productivity (e.g. the Common Fisheries Policy). Future evaluation of MCZs and research anticipated to stem from designation is likely to enhance our quantified evidence in this area.

### ***Benefits from designation of specific features and habitats in the 2<sup>nd</sup> tranche MCZs***

- 8.9 Many of the specific features of MCZs have been shown to contribute to ecosystem services. Improved condition of these features can therefore increase the flow of specific ecosystem services and the resulting benefit. 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<sup>111</sup> and other types of protected area e.g. European Marine Site. Benefits from MCZs will therefore flow from additional features which are offered protection under MCZ designation and that will receive an increased level of protection through this. MCZ features with a 'recover' GMA are expected to improve to favourable condition and features with a 'maintain' GMA are expected to remain in favourable condition under MCZ designation.
- 8.10 By including only the benefits flowing from the features for which condition will improve 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 GMA 'maintain') as this will protect them from an increase in future activity. In the absence of information of the likelihood of changes in activities (in these very specific MCZ locations), the IA does not include an assessment of the benefits of preventing potential future degradation to those features.
- 8.11 Table 5 below provides the list of ecosystem services that are derived from the features proposed for the 2<sup>nd</sup> tranche of MCZs. It also quantifies the benefits in terms of the size of the feature (where information on extent of feature is missing record numbers or sample observations are provided). Finally, the table also provides information on the certainty of realising these benefits (which is based on confidence on presence of these feature).

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<sup>110</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.

<sup>111</sup> E.g. Ospar list of threatened and declining species and habitats, etc.



Table 5: Benefits from protection of MCZ features and designation of sites in the 2 <sup>nd</sup> tranche			
Ecosystem service	Description	Quantification (where possible)	Certainty
Non-use / bequest values	People may value features and sites being preserved even if they are not currently using them and hence derive non-use benefits from protecting the site. These non-use values tend to be: option value (the value of retaining the possibility of using a site in the future, including the value of avoiding irreversibility of harm <sup>112</sup> ); 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 <sup>113</sup> (i.e. asking the hypothetical question - how much do you want to donate to protect the site?) one-off non-use value of protecting the sites to divers and anglers is estimated at <b>£148m to £280m (Best estimate £214m)</b> to protect 23 of the designated sites.  Further explanation on the estimates is provided in Box 4, and Annex C	<i>Med - High confidence</i> in existence of features <i>High confidence</i> that there will be a non-use benefit (welfare increase). <i>Low confidence</i> 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 are 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.	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 evidence <sup>114</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 spillover effect resulting from improved habitats and protection of nursery grounds.	CEFAS have provided an expert opinion that improved habitats and nursery grounds due to MCZ designation could lead to increased catches worth 0-15% of landings lost due to fishing restrictions in MCZs, which has the potential for benefits to commercial fishing as well as recreational anglers.  In this tranche features designated that will support this service include: Intertidal sediments (28 features over 10 sites), coastal saltmarshes (one feature), Infralittoral rock, deep sea bed (mud habitats in deep	<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 of fish

<sup>112</sup> See Farber, Costanza and Wilson (2002), <http://sites.biology.duke.edu/wilson/EcoSysServices/papers/FarberEtal2002.pdf>

<sup>113</sup> Derived from Kenter et al. ,2013. Available here - <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2bY%3d&tabid=82>

<sup>114</sup> Regional project Methodology Documents Annex H5 – could someone find this based on that reference – weblink is better (or year, who published etc.)

		water features in 5 sites), and Seagrass beds (features in 2 sites) are all relevant habitats <sup>115</sup> for fish.	
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 <sup>116</sup>	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 2 <sup>nd</sup> 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>117</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>118</sup> . See discussion in para 8.16 below, of the anticipated overall benefits of an MCZ network.	The full range of different features and habitats is important, especially those which are not protected by other designations (such as broad-scale habitats). The 23 sites in question represent 'big ecological gaps' in terms of the existing network as identified by JNCC's UK MPA stock-take work completed in Autumn 2013. Designating these sites makes good progress towards completing the network in-line with OSPAR network guidance.	<i>High confidence</i> in existence of features; <i>medium confidence</i> in impact on environmental resilience.
Gas and climate regulation	Certain marine 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.	In the 2 <sup>nd</sup> tranche a number of features which are particularly efficient sequesters of carbon are: Intertidal mud, coastal salt marshes and saline reed beds the deep-sea bed (mud in deep waters) and seagrass beds. <sup>119</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>120</sup> . Andrews et al (2000) valued	<i>High confidence</i> in existence of features; <i>medium confidence</i> in impact on carbon sequestration.

<sup>115</sup> Fletcher et al (2012)

<sup>116</sup> NEAFO 2013: <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=IJEp3mJSVBw%3D&tabid=82>

<sup>117</sup> Hughes et al, 2005; Tilman, Reich and Knops, 2006; in Beaumont et al, 2006.

<sup>118</sup> OSPAR (2010)

<sup>119</sup> Fletcher et al (2012).

<sup>120</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. <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=O%2B8tP%2F5ZPg%3D&tabid=82>

		the carbon benefit of mudflat and salt marsh sediments at £12/ha/yr <sup>121</sup> . However, MCZ designation will only change the quality of these habitats, rather than complete creation (or loss) of habitat. Carbon value relating to MCZ designation will therefore be lower for each of these habitats. Scientific evidence on the value of improving the condition of marine habitats is not available. The VALMER project undertook modelling of the North Devon marine area, which indicated that there would be increases in marine carbon sequestration following designation of MCZs in the area. <sup>122</sup>	
Regulation of pollution	MCZs also contribute to regulation of pollution. 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.	Subtidal sediment habitats can act as pollution sinks, aided by the fauna resident within them <sup>123</sup> Salt marshes and seagrass beds are thought to be particularly good regulators of pollution. The VALMER project undertook modelling of the North Devon marine area, which indicated that there would be increases in marine waste processing following designation of MCZs in the area. <sup>124</sup>	<i>High confidence</i> in existence of features; <i>low confidence</i> in impact on regulation of pollution.

<sup>121</sup> Andrews, J.E., Samways, G., Dennis, P.F. and Maher, B.A. (2000). Origin, abundance and storage of organic carbon and sulphur in the Holocene Humber Estuary: emphasizing human impact on storage channels. In: Shennan, I. and Andrews, J. (Eds). Holocene Land-Ocean Interaction and Environmental Change around the North Sea. Geographical Society of London, Special Publications, London 144: 145-170.

<sup>122</sup> <http://www.valmer.eu/case-studies-overview/north-devon/>

<sup>123</sup> (Beaumont et al, 2006; Fletcher et al, 2012; Austen et al, 2011.)

<sup>124</sup> <http://www.valmer.eu/case-studies-overview/north-devon/>

8.12 The evidence presented in Table 5 shows that, as for the 1<sup>st</sup> tranche, implementation of the 2<sup>nd</sup> tranche and additional 1<sup>st</sup> tranche features is expected to provide valuable additional ecosystem services (resulting in increase in human welfare) even if it has not been possible to fully quantify or monetise these benefits.

8.13 Some monetary estimates of MCZs have been recently estimated by Kenter et al <sup>125</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.

#### Box 4: Monetisation of benefits to divers and sea anglers

##### 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 <sup>126</sup>.

Based on their results per site (using contingent valuation method (CVM)), it is estimated that UK divers and anglers are willing to pay from **£148m to £280m (Best estimate £214m)** as a one-off payment to protect 23 sites in 2013 prices. These estimates refer to non-use values obtained from Kenter study but adjusted to the 23 MCZs being designated. The authors state that their CVM design can be thought of as eliciting an insurance value. Donations requested from respondents can be thought of as a premium to pay for the avoidance of harm to environmental goods of value <sup>127</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 <sup>128</sup>); 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 indicative and not adjusted to the 23MCZs being designated.

Annex C provides a summary of the methodology used to arrive at these estimates. The limitations of the methodology highlighted for tranche 1 apply also to tranche 2, and therefore such benefits are only considered indicatively.

8.14 The estimates in Box 4 and Annex C provide an indication that there are potentially high benefits for recreational users from protecting these sites. The results presented in Box 4 have not been adjusted to reflect new information on feature certainty or boundary changes made in the site consideration. Uncertainty over the scale of benefits means they have not been used in the summary sheets.

<sup>125</sup> Kenter et al (2013) <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2bY%3d&tabid=82>

<sup>126</sup> Kenter et al (2013) <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2bY%3d&tabid=82>

<sup>127</sup> This 'non-use value' is mainly measuring the willingness to pay to protect features from an uncertain future risk and an insurance against future harm and degradation. The researchers state that knowing the precise risk of harm is not essential. They provide the example of home insurance - it seems likely that the vast majority of those who take up building or home contents insurance, while they have risk preferences generally, have little quantitative knowledge on the actual risk of fire or theft. Then, it is the value of the goods and general level of risk aversion that determine willingness to pay, rather than the actual specific risk to the object of value.

<sup>128</sup> See Farber, Costanza and Wilson (2002), <http://sites.biology.duke.edu/wilson/EcoSysServices/papers/FarberEtal2002.pdf>



8.15 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 also 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 of the impacts of restricting the sites rather than actual ecological protection following designation. Finally, the results presented in Box 4 have not been adjusted to reflect new information on feature certainty or boundary changes made in the site consideration<sup>129</sup>.

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

8.16 MPAs already exist in the form of European Marine Sites designated under the EU Habitats and Birds Directives, Sites of Special Scientific Interest (SSSI), Ramsar sites and 27 MCZs designated in 1<sup>st</sup> tranche. The MCZs have been chosen to add to and complement these, to contribute towards an overall network of MPAs which satisfies the network requirements set out in MCAA. An overall network of MPAs, including a range of representative habitats sites and enough spatial areas to offer resilience and enable mobile species to move between these. These additional benefits, described below, will be beyond the site-specific benefits described above.

8.17 By protecting a range of representative features from across the marine environment, the Government is protecting biodiversity and the genetic diversity within this. This creates biological resilience - as conditions in the marine environment change, there are species and habitats remaining which can adapt to these changed conditions. More resilience comes with replication of features and habitats, to safeguard against any loss and to capture natural variation within features. Recent studies have also found a link between higher levels of biodiversity and a lower spread of disease<sup>130</sup>.

8.18 Mobile fish species are considered 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, recreational anglers, as well as potentially increasing non-use value, from knowledge that these species are being protected, i.e. an increase in recreational services, non-use values, as well as provisioning services as described in the table above.

While existing sites have not been specifically designed to protect mobile fish species, some of the 23 MCZs include features that are important spawning and nursery area for a number of species, including commercial fish species. Management measures taken to protect these features are likely to result in reduced fishing pressures in some sites and could benefit the long term sustainability of the UK fish stocks.

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<sup>129</sup> Kenter et al. study also provided visitor estimates and use recreational values per site. These aggregate estimates at a site level have not been used in the Impact assessment. This is because of the uncertainty around the visitor numbers. The visitor estimates were based on self-reported visits and estimates of individual visit numbers also appear to be high compared to the very small number of existing studies. The limited size of the angler sample meant that anglers' visits at highly popular sites might have been underestimated while visits at less popular sites might have been overestimated

<sup>130</sup> Johnson, P.T.J., Preston, D.L., hoverman, J.T., Richgels, K.L.D. (2013) Biodiversity decreases disease through predictable changes in host community competence. Nature 494, 230-234.

## ***Consultation responses on benefits of MCZs***

8.19 A number of consultation responses commented on the estimation of benefits in this IA. These are summarised below:

- The National Trust responded with details of some of the benefits visitors to National Trust sites obtain from the marine environment. These have been included in the description of baseline benefits from the marine environment.
- Devon County Council responded to highlight the work done as part of the VALMER project to value ecosystem services from the marine environment in the Western English Channel. The results from this project have been included where appropriate.
- The Wildlife Trusts responded to the consultation that they were concerned about the use of a static baseline, which assumes no improvement or deterioration in feature condition without designation. They argued that given the pattern of historic deterioration in the marine environment, using a static baseline would mean that the benefits from designation would be underestimated. This IA continues to use a static baseline because we do not have site-specific evidence on where the condition of sites is changing, and therefore it would not be possible to provide an indication of the benefits of designation under a different baseline assumption. This is discussed in Section 6.
- Some individual respondents noted that the benefits of designation were not adequately presented or monetised in the consultation impact assessment. Compared to costs, benefits are much harder to quantify with very few data to help to value marginal changes in ecosystem services in the marine environment following MCZ designation. Defra will continue work to address these evidence gaps. Defra received a consultation response directly from Dr Jasper Kenter, one of the authors of the benefits study discussed in Box 4, and in light of those comments Annex C has been amended concerning limitations of the study. The author further argued that the results of the study should be included in the benefits section of the Impact Assessment summary sheets. However, it was considered that the current presentation was most appropriate use of the evidence and their inclusion in the evidence base gave a clear indication of the potential benefits of MCZs. Whilst the benefits of MCZs are harder to quantify it does not mean they were given any less weight in the decision making - we are designating MCZs because of the benefits they will bring in terms of protecting marine biodiversity and resources.

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

8.20 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). This is due to a lack of site-specific knowledge on the change in feature condition (see Section 6). This could potentially underestimate the benefits.

8.21 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 evidence (as presented in table 5) to support the likelihood of an increase in ecosystem services, given the uncertainty it has been hard to pin down the extent of increase in these services and what they mean in monetary terms. This is likely to result in a more conservative assessment of 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.

8.22 Designating in tranches may mean that vulnerable MCZ features may continue to incur damage, particularly for those at higher risk, prior to eventual designation. This may incur risks to achieving the 'network' benefits described above. This is in part mitigated by a risk based approach to designation, where some high risk sites are proposed for designation first, but the risk of damage remains for other sites where data certainty issues remain to be resolved.

## **9. MCZ Post implementation Review Plan**

- 9.1 Following designation of MCZs regulatory authorities will put in place the management measures necessary to meet the conservation objectives taking into account any requirements to consider social and economic impacts and for local consultation with stakeholders (e.g. when implementing byelaws). MCZ sites are expected to be subject to a rolling programme of monitoring to ensure that the measures being taken are resulting in the anticipated improvements to feature condition. The MCAA requires the Secretary of State to report every 6 years (expected in 2018) on the degree to which MCZs and the MPA network are achieving objectives, stating steps that may be necessary for success.
- 9.2 The MCAA allows MCZ designating orders to be reviewed, amended or revoked, and the Government intends to keep MCZs under review, making alterations to boundaries, conservation objectives or management where supported by evidence. This will incorporate new data on features (habitats or species) 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, which may give rise to additional designation or de-designation of MCZs. Any future designations will be accompanied by an impact assessment setting out the costs and benefits of such changes.

## 10. Conclusion

10.1 There are large benefits to designating 23 sites. A combined area of 10,812km<sup>2</sup> will be protected by the designation of these MCZs and 234 features (habitats, species, geological and geomorphologic features) will be conserved. Protection will encompass:

- activities which are directly managed (commercial fisheries and anchoring) which will help MCZ features to recover to a favourable condition;

- and activities which are managed through the marine licensing system, which will require additional assessment of the impacts of licensable activities on an MCZ's features and may impose mitigation measures on activities which threaten features' condition. Analysis for this Impact Assessment indicated no current or planned activities which are expected to require mitigation, but designation of the 2<sup>nd</sup> tranche MCZs will protect features from damage from unknown developments in the future which cannot be anticipated.

This protection is expected to result in an increase in final ecosystem services (benefits) such as increases in provisioning (i.e. increase in fish provision), regulating (i.e. climate regulation) and cultural (and recreational) services. An overall network of marine protected areas (including a range of representative habitat sites) is likely to have additional benefits such as increase in biological resilience to adapt to changed conditions.

10.2 The total estimated quantified economic costs of the 23 sites proposed for designation in 2015 ranges from £2.024m/yr to £3.286m/yr and best estimate is £2.116m/yr. This gives a present value of between £29.78m and £48.73m and a best estimate of £31.36m over the 20-year timeframe of the IA. **The best estimate equivalent annual cost to business is £0.31m/yr (2014 prices 2015 PV base year).** The main costs to industry are for the ports and shipping sector (£0.126m/yr), the Oil, Gas and CCS sector (£0.117m/yr), and the commercial fisheries sector (£0.034m/yr).

<b>Impacted Private Sector</b>	<b>Best Estimate Cost £m/yr (low - high)</b>	<b>Best estimate PV Costs £m (low –high)</b>	<b>Description of Costs</b>
Aggregate extraction	<b>0.011m/yr (0.003-0.011)</b>	0.156m (0.037 – 0.156)	Licence application costs, to collect more information on impact on designated features. These costs are additional to the cost incurred for Tranche 1. Some costs associated with aggregates where were presented in the Tranche 1 IA are due to the existence of an MCZ network and hence not specific to Tranche 2 and so have not been included here as they are part of the baseline costs.
Aquaculture	<b>No costs anticipated as a result of tranche 2</b>	<b>No costs anticipated as a result of tranche 2</b>	No costs to aquaculture are anticipated as a result of tranche 2. There is some aquaculture activity near certain sites the Swale Estuary but this is not anticipated to be impacted as all features being designated in the 2 <sup>nd</sup> Tranche are maintain GMA and aquaculture does not require a licence.
Cables	<b>0.001m/yr (0.001-0.002)<sup>132</sup></b>	0.020m (0.010-0.031)	Licence application costs for future developments, to collect more information of impact on BSH. Mitigation

<sup>131</sup> All figures rounded to nearest £1000.

			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	<b>Non-monetised</b>	<b>Non-monetised</b>	Additional un-monetised costs unlikely.
Commercial Fisheries (UK only)	<b>0.034m/yr (0.000-0.327)</b>	<b>0.496m (0.004-4.814)</b>	Site and gear specific restrictions on fishing activities, for example restricting trawling in specific sections of an MCZ, where a particular feature is present. Costs are the best estimate of the range of management scenarios, with an assumption of 75% displacement. These are calculated as loss in Gross Value Added (GVA), as for all sectors. High scenario includes sensitivity of loss of <i>all</i> affected fishing GVA.
Historic Environment	<b>Not possible to monetise</b>	<b>Not possible to monetise</b>	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)	<b>0.117m/yr (0.112 – 0.122)</b>	1.777m (1.675 – 1.878)	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	<b>0.126m/yr (0.124 – 0.263)</b>	1.876m (1.853 – 3.890)	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	<b>No anticipated monetised costs</b>	<b>No anticipated monetised costs</b>	Management of anchoring and mooring at the Needles and Utopia is potentially needed to protect the sensitive features there. However, this is not expected to have significant impacts as data indicates areas away from the features are used.
Renewable Energy	<b>0.010m/yr (0.010 – 0.012)</b>	<b>0.177m (0.177 – 0.215)</b>	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>0.300m/yr (0.250 – 0.738)</b>	<b>4.502m (3.756 – 10.983)</b>  <b>PV 2015 base year; 2013 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	<b>No costs anticipated</b>	<b>No costs anticipated</b>	Potential licence application costs to Environment Agency for any future

FCERM)	as a result of tranche 2	as a result of tranche 2	
National Defence	<b>0.002m/yr</b>	0.035m	developments – additional costs to consider impact on broad scale habitats; plus potential one off cost for additional monitoring where required.
Costs to public sector of managing MCZs	<b>0.751m/yr (0.709 - 0.793)</b>	11.078m (10.441 - 11.715)	Costs of adjusting electronic tools and charts and annual costs of maintaining; Additional planning considerations
Ecological Surveys	<b>1.063m/yr (1.063- 1.753)</b>	15.745m (15.745- 25.996)	Costs to MMO, IFCA and Defra for enforcing management measures.
<b>Annual and PV costs to public sector</b>	<b>1.816m/yr (1.774 – 2.548)</b>	26.858m (26.221 – 37.745)	Costs of baseline surveys and costs of monitoring to JNCC and NE.
<b>Overall annual and PV costs</b>	<b>2.116m/yr (2.024 - 3.286)</b>	31.359m (29.977m – 48.729m)	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 (2015 to 2034), presented in 2013 prices. The EANCB figure of £0.31m/yr is calculated by converting the figures to 2014 prices.</li> </ul>			

10.3 The main costs to government under preferred option are £0.751m/yr (best estimate) for management and enforcement of sites, £1.063m/yr (best estimate) year for survey work as well as small costs to national defence (£0.002m/yr). 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). It has also not been possible to quantify impacts on local communities from restriction/management of fisheries. Other public sector costs such as costs to inform users about MCZs (including setting up educational programmes), advise public authorities on impacts of proposed licensed activities to MCZs, and costs to the public authorities considering the advice. These costs have been described qualitatively.

10.4 The costs analysis in the IA has benefitted from a pre- consultation process for all 23 sites considered and for all sectors affected as discussed above. This has resulted in costs being assessed on a very detailed basis, with assumptions often varying by site. Details of calculations by sector are given in Annex D.

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## Annex A: Management Scenarios

Management measures for MCZs are not known in advance, they will be set by the regulatory authorities after designation, and therefore this IA contains illustrative examples which are described in detail below for each site. In most instances, the regional MCZ projects collected information from stakeholders about the level and type of human activity in each MCZ (or group of sites). This was further verified through pre-consultation engagement with stakeholders and tested during the recent public consultation. This informed the identification of management scenarios and identification of possible and preferred management measures. For all sites, the best estimate costs are based on the assumptions of 50% likelihood, i.e. midpoint, between the low and high cost for 'mobile' gears (Bottom Trawls and Dredges) and 25% of the high cost scenario for 'static' (Pots & Traps, Nets, Hooks and Lines). This is because fewer features are sensitive to static gears and so the likelihood for the most stringent management scenario is considered lower than that of bottom abrading mobile gears.

Site	Management Scenarios	Notes
Allonby Bay	No additional management	All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.
Bideford to Foreland Point	Management scenario 1: No additional management Management scenario 2: Closure of entire MCZ to bottom trawls & dredges Management scenario 3: Closure of entire MCZ to bottom trawls & dredges. No removal of crawfish/spiny lobster ( <i>Palinurus elephas</i> ) from the MCZ	Subtidal Sand has a recover general management approach objective due to exposure to benthic trawling. Therefore this activity may need to be managed.  Crawfish/spiny lobster ( <i>Palinurus elephas</i> ) has a recover objective which may result in a 'no take' management measure being introduced in the area. No other management of static gears is anticipated as recover objectives triggered by mobile gear activity and not static gears (Natural England pers. comm. 2014).
Coquet to St Mary's	No additional management	All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.
Cromer Shoal Chalk Beds	No additional management	All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.
Dover to Deal	No additional management	All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.
Dover to Folkestone	No additional management	All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.
Farnes East	Management scenario 1: No additional management Management scenario 2: Regional Seas Group suggestion – closure of subtidal mud to the nephrops fishery Management scenario 3: Zoned management – closure of subtidal mud to bottom trawls and dredges	Several features are have a recover to favourable condition general management approach and are sensitive to mobile bottom abrading gears. It is not anticipated that static gears would have to be managed at this site (JNCC, pers. comm. 2014).

	Management scenario 4: Entire MCZ closed to bottom trawls and dredges	
Fulmar	No additional management	All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.
Greater Haig Fras	Management scenario 1: No additional management Management scenario 2: Closure of entire MCZ to bottom trawls & dredges (Stakeholder Recommendation) Management scenario 3: Closure of entire MCZ to bottom trawls and dredges - Zoned closure of sub-tidal mixed sediment (whole site closure assumed due to interspersed nature of habitats) in the MCZ to pots & traps, nets, hooks & lines Management scenario 4: Closure of entire MCZ to bottom trawls, dredges, pots & traps, nets, hooks & lines	Multiple features are recover. Therefore a range of scenarios for all gear types is necessary to reflect uncertainty over management needed.
Hartland Point to Tintagel	Management Scenario 1: No additional management Management Scenario 2: Closure of entire MCZ to bottom trawls and dredges	There are multiple features with a recover objective due to benthic trawling. No other management of static gears is anticipated as recover objectives triggered by mobile gear activity and not static gears (Natural England pers. comm. 2014).
Holderness Inshore	No additional management	All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.
Land's End (Runnel Stone)	No additional management	All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.
Mounts Bay	No additional management	All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.
Newquay and The Gannel	No additional management	All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.
North-West Jones Bank	Management Scenario 1: No additional management Management Scenario 2: Closure of entire MCZ to bottom trawls & dredges (Stakeholder Recommendation)	There are multiple features with a recover objective due to benthic trawling but these features are not assessed as being sensitive to static gears.
Offshore Brighton	Management Scenario 1: No additional management Management scenario 2: Closure of entire MCZ to bottom trawls, dredges, pots & traps, nets, hooks & lines	Multiple features are recover including those potentially sensitive to static gears. Therefore a range of scenarios for all gear types is necessary to reflect uncertainty over management needed.
Offshore Overfalls	Management Scenario 1: No additional management Management scenario 2: Closure of entire MCZ to bottom trawls, dredges, pots & traps, nets, hooks & lines	Multiple features are recover including those potentially sensitive to static gears. Therefore a range of scenarios for all gear types is necessary to reflect uncertainty over management needed.
Runswick Bay	No additional management	All features proposed for designation have a maintain in current favourable condition general management approach and so no additional

			management is expected.
The Needles	<p>Fisheries Management Scenario 1: Zoned closure of MCZ to bottom trawls and dredges at a 2 metre depth contour along the shoreline to protect areas of sea grass bed (Statutory Nature Conservation Bodies (SNCB) informed scenario). Management Scenario 2: Closure of entire MCZ to bottom trawls, dredges, nets, lines, pots and traps (SNCB informed scenario)</p>	<p>Recreation Management Scenario 1: Voluntary anchoring code of practice over areas of sea grass Management Scenario 2: Zoned approach – Closure of entirety of sensitive feature plus appropriate buffer zone to mooring and anchoring Management Scenario 3: Use of innovative techniques to reduce impact of mooring/anchoring to sensitive features in the MCZ</p>	<p>For fisheries, multiple features are recover including those potentially sensitive to static gears. Therefore a range of scenarios for all gear types is necessary to reflect uncertainty over management needed.</p> <p>Anchoring and mooring over areas of sea grass may need to be managed as this feature has a recover to favourable condition general management approach. However, evidence indicates that overlap of the feature with the main anchoring and moorings in the area is minimal and so any management would represent an inconvenience only and may be done on a voluntary basis. Any mandatory management is likely to be minimal and is unlikely to significantly affect use of the area.</p>
The Swale Estuary	No additional management		All features proposed for designation have a maintain in current favourable condition general management approach and so no additional management is expected.
Utopia	<p>Management Scenario 1: Zoned closure of MCZ to bottom trawls and dredges to protect areas of fragile sponge and anthozoan communities. Management Scenario 2: Closure of entire MCZ to bottom trawls, dredges, lines, nets, pots and traps (Statutory Nature Conservation Bodies informed scenario)</p>		<p>For fisheries, all features have a recover objective including those potentially sensitive to static gears. Therefore a range of scenarios for all gear types is necessary to reflect uncertainty over management needed.</p> <p>All features are sensitive to anchoring and mooring, so this activity may need to be managed across the site. It is unclear what level of activity is currently taking place, but it is thought to be minimal. This activity will therefore be monitored in the first instance with a view to understanding what management may be required.</p>
West of Walney including proposed Co-Location Zone	<p>Management Scenario 1: No additional management Management scenario 2: Closure of entire MCZ to bottom trawls, dredges, pots &amp; traps, nets, hooks &amp; lines</p>		Multiple features have a recover objective including those potentially sensitive to static gears. Therefore a range of scenarios for all gear types is necessary to reflect uncertainty over management needed.
Western Channel	<p>Management scenario 1: No additional management Management scenario 2: Closure of entire MCZ to bottom trawls &amp; dredges</p>		Multiple features have a recover objective including those potentially sensitive to static gears. Therefore a range of scenarios for all gear types is necessary to reflect uncertainty over management needed.

## Annex B: Benefit studies

As discussed in the benefits section of the Impact Assessment, the lack of scientific and economic research on the Marine Environment makes analysis of the additional benefits of designation complicated. Relevant literature was reviewed for the first tranche of MCZs and updated reviews were conducted for the second tranche consultation and post-consultation IAs. For recreational benefits, a detailed literature review was conducted by RPA (2013) as part of their study on the Value of the Impact of Marine Protected Areas on Recreation and Tourism Services and a wider review in relation to benefits of the marine environment was conducted by Turner et al. (2014) as part of the NEAFO work package 4 on coastal and marine ecosystem services.

The table below outlines studies reviewed whilst preparing this post-consultation Impact Assessment. There were no studies which were raised during consultation specifically on the benefits of MPAs, but several responses described evidence on benefits which society obtains from the marine environment – these are mentioned in the main Impact Assessment where appropriate. Annex C provides details on the Kenter et al. paper specifically which can be used to derive benefits for the 23 sites proposed for designation in the second tranche.

Ecosystem Service Category and type of value	Study	Methodology	Key Findings	Impact Assessment Applicability
Recreation – Angling: Willingness to pay for improvement in angling experience	Drew Associates Limited (2004).	A <b>choice experiment</b> (CE) estimated the values associated with changes in the diversity and quality of the angling experience.	All types of angler were willing to pay more for larger fish (£0.22 per 1% increase in size) and for greater diversity in the catch (£11.38 to catch different species from those usually caught). However, only shore anglers were willing to pay for more fish (£0.81 per extra fish caught). Boat anglers had a negative valuation for more fish. Assuming there are 884,000 sea anglers in England alone (Sea Angling 2012) this amounts to a WTP of £1.9m for a 1% increase fish size and £10m for different fish species.	While these figures cannot be adapted for the second tranche specifically they show a willingness to pay for improvements in the size and abundance of fish, which MCZs are expected to contribute to.

Recreational Angling: Willingness to Pay for improvement in quality of angling experience	Lawrence, K. (2005).	<b>Choice experiment</b> which assesses the value of the recreational sea angling experience in south west England. This included angling from boats as well as from the shore.	Anglers were found to be willing to pay £13.56 per trip for the first fish caught, and proportionately less for each additional fish caught. This represents a hypothetical total trip cost, incorporating transport, parking, accommodation and equipment, rather than a fee/charge per fish. On average, anglers were willing to pay an additional £13.27 in trip costs for a 50% increase in the size of each fish caught. Environmental quality was found to be only a minor determinant of an angler's decision on where to fish. Assuming there are 884,000 sea anglers in England alone (Sea Angling 2012) this amounts to a WTP of £11.7m.	While these figures cannot be adapted for the second tranche specifically they show a willingness to pay for improvements in the size and abundance of fish, which MCZs are expected to contribute to.
Non-use value of protection for English specific MCZs	Kenter et al. (2013)	Estimated using <b>contingent valuation</b> the non-use value of 22 Scottish potential Marine Protected Areas (pMPAs/MPA areas of search), 120 English recommended Marine Conservation Zones (MCZs) and 7 existing Welsh marine Special Areas of Conservation (SACs). The study includes consideration of how these values may alter under different management regimes <sup>1</sup> . A travel-cost based <b>choice experiment</b> was also conducted to estimate annual recreational values.	The report concludes that, if expressed in economic terms, the benefits to divers and sea anglers of designating marine protected areas outweigh the cost of designation (consisting of monetised costs to government and industry). The study estimates benefits from designation of marine protected areas (MPAs) in England, Wales and Scotland. The counterfactual, one off non-use value of protecting the sites to divers and anglers alone would be worth £730-£1,310m (excluding divers and anglers willingness to pay for specific restrictions on other users). The research also estimated the current recreational value of MPAs to be £1.87 – 3.39 billion for England alone.	Study findings used for benefits figures in Impact Assessment but for illustrative purposes. There are various limitations of the study that have been provided in Annex C.
Non-use value of protection (also likely to include some	McVittie, A. and D. Moran (2010).	<b>Choice experiment</b> used to estimate the WTP for a	English respondents WTP £69.49/yr/hh to halt loss of biodiversity, and £3.98/yr/hh to impose moderate restriction on	Study only presents the benefits of a hypothetical UK network. Benefits for

<sup>1</sup> However it does not seek to establish how these values change in response to changes in the overall environmental or feature-specific condition, as the underlying science on environmental change is not available to take such an approach forward.



use value relating to protection)		hypothetical UK network of MCZs to 'halt the loss of marine biodiversity'.	resource extraction. Assuming there are 22 million households in England (English Housing Survey 2012) this equates to £1.5bn and £88m respectively.	the smaller number and area of proposed English MCZs not possibly to robustly disaggregate.
Willingness to pay for protection (use and non-use). This value is net of the loss suffered by individuals as result of restrictions on their access to the zone.	Hall, D., Hall, J. and S. Murray (2002).	Willingness to pay to preserve the rocky intertidal zone in California through additional management of public access, through a <b>contingent valuation</b> questionnaire.	Respondents were willing to pay an additional \$6 per visit to the coast to protect the coastline from further damage.	No 2013 MCZ could be considered to 'protect coastline from damage', therefore value not relevant.
Willingness to pay for preventing the loss of marine biodiversity: Use and non-use values.	Ressurreicao et al (2012).	This study estimated willingness to pay for preventing the loss of marine biodiversity in three case study sites in the EU, through a one-off payment to a conservation fund.	For Isles of Scilly, UK, WTP estimates were US\$70/62 (residents/visitors) to prevent a decline in the taxa of marine mammals, US\$63/56 to protect seabirds, US\$61/54 for fish, US\$59/52 to protect marine invertebrates and US\$75/66 for algae. [Other case studies: Azores islands (Portugal), Gulf of Gdansk (Poland)].	Marine mammals and seabirds not relevant for the MCZs. 'Preventing loss of marine biodiversity' is a benefit which the MCZs contribute towards, not possible to separate the proportion which they contribute.
Willingness to pay (WTP) to protect features of an offshore marine protected area	Börger et al. (2014)	<b>Choice experiment</b> which estimated willingness to pay to protect an offshore habitat: the UK portion of the Dogger Bank.	The study found positive willingness to pay values for the conservation of an offshore site. The only attribute used in the study that is relevant to the designation of MCZs is the diversity of species found in the area (due to removal/reduction of trawling). WTP estimates for a 10% increase in species diversity was £4.19 per household per year while WTP estimates for a 25% increase was £7.76 per household per year.	The Dogger Bank is not part of the MCZ Tranche 2 designation. However, the study demonstrates that the UK population holds positive benefit values for the conservation of offshore sites, which are relevant to some of the sites in the second tranche.
Willingness to pay to protect deep sea habitats	Jobstvogt et al. (2014)	<b>Choice experiment</b> which estimated willingness to pay for additional marine protected areas in the Scottish deep-sea.	Scottish households were willing to pay (per household per year): £35.43 to £37.85 for a high discovery potential of medicinal products from deep sea organisms; £22.48 to £26.28 for intermediate level of species protection; and £34.83 to £38.70 for high level of species protection for Scottish deep sea habitats.	The study considered a hypothetical increase in the number of Scottish MPAs to include deep sea habitats and therefore cannot be directly applied to the second tranche areas. However, it provides evidence on positive benefit values assigned to existence values, option values and values of unfamiliar and remote goods and services in general.

Many studies consider the *baseline* levels of activity, particularly for recreational services and do not consider the value of changes relative to the baseline as a result of marine conservation measures due specific policy options such as MCZs. These studies include market values as well as travel cost and contingent valuation studies. These are summarised in RPA (2013) Literature Review.

Fletcher et al (2012 (b)) also provide a review of valuation information for all ecosystem services.

## **Annex C: Benefit estimation taken from published report - *The value of potential Marine Protected Areas in the UK to divers and sea anglers*<sup>1</sup>**

As part of the National Ecosystem Assessment Follow On project (NEAFO)<sup>2</sup>, the University of Aberdeen has developed case studies to assess the economic and social benefits of conserving the marine environment. This particular case study on diving and angling is one of four that was produced under the marine environment component of the NEAFO and was developed in partnership with the Marine Conservation Society (MCS), British Sub Aqua Club (BSAC) and the Angling Trust (AT). This annex draws directly on the report to present the study methodology as it is used to derive indicative benefits for the second tranche of MCZs. While wider literature was considered as part of the second tranche, the Kenter et al. study is still considered the best available for deriving illustrative benefits for specific rMCZs due to the inclusion of candidate and designated MCZs in the study. However, it has to be noted that the benefit values found in this study only represents a proportion of the cultural ecosystem service benefits and non-use value of the marine environment due to the specific target population (i.e. benefit values of other users are not considered).

The report investigated the recreational use and non-use values of UK divers and sea anglers for 22 Scottish potential Marine Protected Areas, 119 English recommended Marine Conservation Zones and 7 existing Welsh Marine Special Areas of Conservation. The report concludes that expressed in economic terms the benefits to divers and sea anglers of designating marine protected areas outweigh the cost of designation (consisting of monetised costs to government and industry). The study estimates one-off non-use value of protecting the sites to divers and anglers alone would be worth £730 – 1,310 million<sup>3</sup>, excluding divers and anglers' willingness to pay for specific restrictions on other users; i.e. this is the minimum amount that designation of 127 sites is worth to divers and anglers. In addition, the study says this would safeguard an annual recreational value currently worth £1.87 - 3.39 billion for England alone (excluding benefits of restrictions on other users and contingent on designation not significantly restricting diving and angling). The report also highlighted a number of limitations.

### *Methodology*

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

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<sup>1</sup> Kenter et al. (2013) <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2BY%3D&tabid=82>

<sup>2</sup> <http://uknea.unep-wcmc.org/NEWFollowonPhase/tabid/123/Default.aspx>

<sup>3</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.

wellbeing questions<sup>4</sup>. A total of 1683 usable responses were received from 1261 divers (75%) and 422 anglers (25%).

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

**Table 1 MPA survey outline**

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

The monetary valuation component of the survey consisted of a two-stage approach. In the first stage, a choice experiment (CE) was used. CEs are a stated preference technique where respondents are presented with a series of choices between more or less desirable alternatives (Hanley, Wright & Adamowicz 1998). These choices are described by of a number of attributes. Each attribute is available at different levels. Here participants were asked to compare hypothetical diving or angling sites each with a range of environmental and recreational attributes, including travel distance, which was used as a cost-proxy. This provides a lower bound for participants' use values for the sites presented, with other costs (accommodation

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<sup>4</sup> Cultural ES benefits that were assessed included recreational, aesthetic, spiritual, educational, health, identity, social bonding, sense of place and existence value for marine biodiversity. Example of monetary valuation question asked: *If this is a real protected area do you think you can afford to and would be willing to give a one off donation of £6? Your donation will be used to set up a local management trust to maintain this site as it is shown above, protect its natural features against the risk of future harm and degradation.*

etc.) assumed constant. Further attributes were: marine landscape, underwater objects present, fish and other sea life present, restricted activities, access, number of vulnerable species found at the site that would be protected and size of the protected area (Section 2.2.2 and Table 7 of the report<sup>5</sup>). In the CE, participants were asked to allocate the next five opportunities for diving/angling they have within the next year between these three options: two sites, A and B, and 'staying at home'.

In the second stage, one of the two presented sites was selected at random and a contingent valuation question asked participants about their willingness to pay (WTP) for future protection of the site and its natural features (example in Figure 6, p.16 in the Kenter et al study). In contrast to CEs, where participants choose between multiple scenarios, in Contingent Valuation Method (CVM) participants are presented with a single hypothetical scenario and asked directly whether they would be willing to pay to attain it. The authors state that their attribute-based CVM allowed them to better understand preferences and trade-offs than would be possible in a conventional CVM approach by incorporating an important benefit of choice experiments (i.e. the use of attributes to describe a scenario) into contingent valuation. Participants completed four sets comprised of a CE and CVM task.

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

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

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<sup>5</sup> Kenter et al. (2013) <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=Mb8nUAphh%2BY%3D&tabid=82>

prompt participants to only consider one or the other activity when indicating numbers of trips.

Bringing together the results of these various tools, the authors estimated:

- diver and angler recreational values for each pMPA and the value of protecting the pMPA
- aggregates for the sites that are within the group of:
  - 23 English rMCZs that have been proposed by Defra to be designated as part of the second tranche
  - the larger group of 120 rMCZs (of 127; seven excluded due to depth<sup>6</sup>)
  - 22 of 35 proposed Scottish sites 23 (13 excluded due to depth)
  - and the seven existing marine SACs in Wales to be included, given that when this research was conducted, it was uncertain which Welsh sites would be selected as candidate (HP)MCZs.

It was assumed that the value functions can be applied to estimate divers' and sea anglers' values for any future UK potential marine protected areas.

*Application of study results to the Tranche 2 MCZ Impact Assessment: issues to consider*

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

For example as the report notes, there is considerable uncertainty about the real number of divers and anglers in the UK and their geographical distribution<sup>7</sup>. Based on existing evidence, the visitor estimates used in the report looks high and therefore could be overestimating the benefits derived by anglers and divers<sup>8</sup>. On the other hand the study omitted other benefits derived from other users, which means that it is an underestimate of benefits to the whole population.

When discussing limitations of the estimates, the authors noted there may be some framing bias in responses due to several factors, some of which are: the mention of partner organisations (BSAC, MCS, AT) in the preamble of the study and that the results may be used in these organisations' MCZ Impact Assessment consultation

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<sup>6</sup> Sites at a depth of over 100m were excluded from the full list of English rMCZs and Scottish rMPAs.

<sup>7</sup> Visitor estimates were based on self-reported visits and assumptions were made that self-reported visit counts were representative for regional populations in terms of the sites they visit.

<sup>8</sup> This report states on average this constitutes 12 visits per individual in UK diver per annum to the pool of sites considered in this survey and 39 per angler. Compared to the National Angling Survey, which came to 34 days out across the UK for anglers in general, these estimates look high.

<http://www.anglingtrust.net//page.asp?section=816&sectionTitle=National+Angling+Strategy>

submission/responses<sup>9</sup>; the use of a voluntary contribution payment vehicle which may not fully reveal individual values and has the potential for free riding; limitations in the presentation of the geographical context for questions on visit numbers; and not estimating increases in visits due to ecological improvements in a site. Also, as with other CVM studies, the respondents were asked to provide a hypothetical donation to a hypothetical site, which may result in an upward bias of stated benefit values<sup>10</sup> (although budget constraints were emphasised in the survey).

The report also looks at restriction scenarios where the sites are completely closed to specific activities<sup>11</sup>. In reality most of the new MCZs will be multi-use areas. This means that only potentially damaging activities will be restricted or need additional management, just as is the case at existing sites<sup>12</sup>. This means that there is uncertainty on whether the use of less restrictive scenarios in the study could have yielded different results.

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

The stated values found in the CVM were found by asking for the one-off non-use value of a site. Table 16 in the Kenter et al. report provides CVM estimates for each site corresponding to 4 restriction scenarios – e.g. ‘no restriction’, ‘no dredging and trawling’, ‘no dredging, trawling, potting and gillnetting’ and ‘no dredging, trawling, anchoring and mooring’. Therefore, the values in Table 16 of the report (under the different restriction scenarios) were matched to the management scenarios considered in the second tranche IA to come up with site and tranche specific benefit estimate ranges. Estimates for divers and anglers for each site were aggregated, giving a total one off non-use value of £148m to £280m (2013 prices) for all 23 Tranche 2 sites. The table below is a summary of how these figures were calculated for this IA, based on the data from Table 16 of the Kenter et al (2013) report. However, it has to be noted that these non-use values can only be attributed to a limited group of users of the marine environment, i.e. anglers and divers, therefore is likely to be an underestimate of the total non-use value of the second tranche sites included in this Impact Assessment. Additionally, due to the limitations of the study that are made clear by the authors at the beginning of the report, the results can only be used to illustrate some of the benefits of the 23 tranche 2 MCZs in this Impact Assessment.

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<sup>9</sup> This might have increased willingness to donate if participants felt sympathetic to these organisations. However, the CVM part of the study made use of follow-up questions in order to screen out protest and strategic voters.

<sup>10</sup> Hausman, Jerry, Contingent valuation: from dubious to hopeless. *Journal of Economic Perspectives* 26(4):43-56, 2012; <http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.26.4.43>

<sup>11</sup> no potting and gillnetting; no anchoring or mooring; no dredging and trawling

<sup>12</sup> Restricted activities will vary from site to site, depending on the natural features and species that are being protected. The additional management that is needed for the new sites will be identified after the sites are designated using further information on the impacts of activities. In the vast majority of cases, activities that do not damage the environment could continue.

**Table 1. Divers' and anglers' one-off non-use value for protecting the 23 Tranche 2 MCZ sites, taken from the contingent valuation results in Kenter et al (2013)**

Site name	Potential management scenarios for fisheries	Total (aggregate value from divers and anglers; £)		Best Estimate (£)	Total (adjusted to 2013 prices; £)		Best estimate (adjusted to 2013 prices; £)
		Low	High		Low	High	
Allonby Bay	No additional management	4,347,000	7,808,000	6,078,000	4,414,543	7,929,319	6,171,931
Bideford to Foreland Point	No additional management Closure of site to bottom trawls and dredges Closure of site to bottom trawls & dredges, pots and traps. No removal of crawfish/spiny lobster ( <i>Palinurus elephas</i> ) from the MCZ.	10,019,000	20,956,000	15,487,500	10,174,672	21,281,609	15,728,141
Coquet to St Mary's	No additional management	8,902,000	15,973,000	12,437,500	9,040,317	16,221,184	12,630,750
Cromer Shoal Chalk Beds	No additional management	7,808,000	14,033,000	10,920,500	7,929,319	14,251,041	11,090,180
Dover to Deal	No additional management	7,636,000	13,712,000	10,674,000	7,754,646	13,925,053	10,839,850
Dover to Folkestone	No additional management	8,993,000	16,169,000	12,581,000	9,132,731	16,420,230	12,776,480
Farnes East	Management scenario 1: No additional management Management Scenario 2: Closure of entire site to bottom trawls, dredges, nets, pots & traps and lines	4,207,000	8,703,000	6,455,000	4,272,367	8,838,225	6,555,296
Fulmar <sup>a</sup>	No additional management	0	0	0	0	0	0
Greater Haig Fras <sup>a</sup>	Management scenario 1: No additional management Management Scenario 2: Closure of entire rMCZ to bottom trawls, dredges, hooks and lines, nets, pots and traps	0	0	0	0	0	0



Site name	Potential management scenarios for fisheries	Total (aggregate value from divers and anglers; £)		Best Estimate (£)	Total (adjusted to 2013 prices; £)		Best estimate (adjusted to 2013 prices; £)
		Low	High		Low	High	
Hartland Point to Tintagel	Management scenario 1: No additional management Management Scenario 3: Closure of entire rMCZ to bottom trawls, dredges	9,703,000	19,728,000	14,715,500	9,853,763	20,034,528	14,944,145
Holderness Inshore	No additional management	6,876,000	12,352,000	9,614,000	6,982,837	12,543,922	9,763,380
Land's End	No additional management (Stakeholder recommendation)	6,440,000	11,565,000	9,002,500	6,540,063	11,744,694	9,142,378
Mounts Bay	No additional management (Stakeholder Recommendation)	8,587,000	15,457,000	12,022,000	8,720,422	15,697,167	12,208,795
Newquay and The Gannel	No additional management	7,255,000	13,045,000	10,150,000	7,367,726	13,247,690	10,307,708
North-West Jones Bank <sup>a</sup>	Management scenario 1: No additional management Management scenario 2: Closure of rMCZ to bottom trawls & dredges (Stakeholder Recommendation)	0	0	0	0	0	0
Offshore Brighton	Management scenario 1: No additional management Management scenario 2: Closure of entire MCZ to bottom trawls, dredges, pots & traps, nets, hooks & lines	4,811,000	10,231,000	7,521,000	4,885,752	10,389,966	7,637,859
Offshore Overfalls	Management scenario 1: No additional management Management scenario 2: Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps (SNCR informed scenario)	5,440,000	11,508,000	8,474,000	5,524,525	11,686,808	8,605,667
Runswick Bay	No additional management	6,235,000	11,199,000	8,717,000	6,331,878	11,373,007	8,852,442
The Needles	Management scenario 1: Zoned closure of rMCZ to bottom trawls and dredges	9,478,000	17,523,000	13,500,500	9,625,267	17,795,268	13,710,267

Site name	Potential management scenarios for fisheries	Total (aggregate value from divers and anglers; £)		Best Estimate (£)	Total (adjusted to 2013 prices; £)		Best estimate (adjusted to 2013 prices; £)
		Low	High		Low	High	
	Management scenario 2: Closure of rMCZ to bottom trawls, dredges, nets, lines, pots and traps (SNCB informed scenario).						
The Swale Estuary	No additional management	9,355,000	16,836,000	13,095,500	9,500,355	17,097,593	13,298,974
Utopia	Management scenario 1: Closure of entire rMCZ to bottom trawls and dredges to protect areas of fragile sponge and anthozoan communities (Balanced Seas informed scenario). Management scenario 2: Closure of entire rMCZ to bottom trawls, dredges, lines, nets, pots and traps (Statutory Nature Conservation Bodies informed scenario).	9,260,000	17,084,000	13,172,000	9,403,879	17,349,447	13,376,663
West of Walney including proposed Co-Location Zone	Management scenario 1: No additional management Management scenario 2: Closure of entire MCZ to bottom trawls, dredges, pots & traps, nets, hooks & lines.	6,167,000	13,007,000	9,587,000	6,262,821	13,209,099	9,735,960
Western Channel	Management scenario 1: No additional management Management scenario 2: Closure of entire rMCZ to bottom trawls, and dredges	4,369,000	9,040,000	6,704,500	4,436,884	9,180,461	6,808,673
<b>TOTAL</b>					<b>148,154,768</b>	<b>280,216,310</b>	<b>214,185,539</b>
<p>Note:</p> <p><sup>a</sup> The Kenter et al study did not include these sites (likely because they are farther offshore and therefore not used by divers and/or anglers); therefore the values are assumed to be zero.</p>							

## Annex D: Costs to Private and Public Sectors (profile of costs over 20 years) and key assumptions

This annex sets out the sector specific cost assumptions and their sources used to derive the costs of designating 23 second tranche MCZs over the 20 year IA period. The methodologies used are summarised in section 7.1 onwards of the IA and contain links to detailed methodology papers written for the MCZ Regional Projects<sup>1</sup>. Design of the methodologies involved heavy stakeholder input including unit cost assumptions from industry, affected public agencies and other government departments. Those same assumptions have been used here but in all cases updated and best available data is used. In addition, key representatives from the sectors affected were consulted during the spring and summer of 2014 and responses and information provided was used in site selection for the 2<sup>nd</sup> tranche and to inform the assessment of costs. The management options to derive commercial fisheries and management costs are given in Annex A. Section 7 of the Impact Assessment explains where we received consultation responses on the assumptions and methodologies for different sectors, and any changes made to the methodologies. This annex includes the effects of any changes.

Please note: all figures in the following tables are in 2013 prices and £m rounded to 3 decimal places. Therefore, tables may not sum exactly due to rounding. All costs which are one off and do not repeat later in the IA or period or would not repeat beyond the IA period are considered as transitional and such costs are identified below. All other costs, including those one-off costs which repeat periodically (e.g. licence application costs), are not classed as transitional costs as they would continue to be incurred in the future.

### Business Costs

#### Aggregates

Scenario 1: Best Estimate (and High Cost scenario)																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Licence application costs (£m)	0.000	0.000	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.055	0.000	0.055	0.000	0.000	0.000	0.055	0.000	0.000	0.221	0.011
<b>Total (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.055</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.055</b>	<b>0.000</b>	<b>0.055</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.055</b>	<b>0.000</b>	<b>0.000</b>	<b>0.221</b>	<b>0.011</b>
<b>Present Value Costs (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.052</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.038</b>	<b>0.000</b>	<b>0.035</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.031</b>	<b>0.000</b>	<b>0.000</b>	<b>0.156</b>	<b>0.008</b>
Assumptions: Costs are based on additional appropriate assessment costs for considering impacts of aggregate activities on the conservation objectives of MCZ broad-scale habitats on a site specific basis. The British Marine Aggregates Producers Association provided an estimate of this cost of £0.027m per future licence application (BMAPA, pers. comm. 2011), which has been updated by the ONS GDP deflator to £0.028m in 2013 prices. A pre-consultation meeting with industry representatives including BMAPA in May 2014 indicated that approach used in IA is reasonable assuming dredging can continue and that 23 sites proposed for the 2 <sup>nd</sup> tranche are not expected to have significant impacts on the sector. No site specific mitigation such as a restriction of activity was identified for the sites under consideration. The high cost scenario is considered the most likely scenario, and is therefore treated as the best estimate. Licence applications: 2 applications*£0.028m occurring in years 2017, 2026, 2028 and 2032.																						

<sup>1</sup> Available here - <http://publications.naturalengland.org.uk/publication/1940011>

Scenario 2: Low cost scenario																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Licence application costs (£m)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.055	0.003
<b>Total (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.055</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.055</b>	<b>0.003</b>
<b>Present Value Costs (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.037</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.037</b>	<b>0.002</b>

Assumptions: Licence applications: Additional appropriate assessment costs for licence applications for strategic resource areas that overlap with or are in close proximity to an MCZ. Additional costs incurred only for 2 strategic resource area future licence applications\*£0.028m in 2027. This is because all other costs (costs associated with existing production areas and production of an industry Biodiversity Action Plan) associated with scenario 2 for aggregates are baseline costs as they relate to the existence of an MCZ network rather than the 2<sup>nd</sup> tranche specifically, and were included in the IA for the first tranche of MCZs.

## Cables

Cables : Best Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Licence costs for 18 inshore tranche 2 sites within 12nm (£m)	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.007	0.030	0.001
<b>Total (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.007</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.007</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.007</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.007</b>	<b>0.030</b>	<b>0.001</b>
<b>Present Value Costs (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.006</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.005</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.005</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.004</b>	<b>0.020</b>	<b>0.001</b>

Assumptions: The UK Cable Protection Committee (UKCPC) has provided an estimate of additional costs to an operator of assessing the impacts of a future cable installation on broad-scale habitats protected by an MCZ of £0.010m and this has been updated to 2013 prices by the GDP deflator (still £0.010m with rounding). Costs are assumed to occur for cables that cross an MCZ within 12nm but not those that are wholly beyond 12nm as they do not require a licence or EIA. As a result the cables industry will only incur costs for inshore MCZs, of which 99 were originally recommended by the Regional Projects and 18 are included in Tranche 2. As it is not known where or when new telecoms and interconnector cables will occur, regional rather than site specific estimates are provided. The best estimate assumes that 4 cables which cross one of the 99 inshore MCZs are developed every five years (i.e. 16 across all regions over the 20 year IA period). This is scaled down by 18.2% for the 2<sup>nd</sup> tranche for the 18 inshore sites being recommended i.e. 18/99 = 18.2%. So £0.010m x 4 x 18.2% = £0.007m every 5 years.

Cables : Low Cost Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Licence costs for 18 tranche 2 sites within 12nm (£m)	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.004	0.015	0.001
<b>Total (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.004</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.004</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.004</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.004</b>	<b>0.015</b>	<b>0.001</b>
<b>Present Value Costs (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.003</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.003</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.002</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.002</b>	<b>0.010</b>	<b>0.001</b>

Assumptions: Unit cost assumptions and scaling as for best estimate described above. The low cost estimate assumes that 2 cables which cross one of the 99 inshore MCZs are developed every five years across all MCZs (i.e. 8 across all regions over the 20 year IA period). This is scaled down by 18.2% for the 2<sup>nd</sup> tranche i.e. 18/99 = 18.2%. So £0.010m x 2 x 18.2% = £0.004m every 5 years.

Cables : High Cost Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Licence costs for 18 tranche 2 sites within 12nm (£m)	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.045	0.002
<b>Total (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.045</b>	<b>0.002</b>
<b>Present Value Costs (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.010</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.008</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.007</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.006</b>	<b>0.031</b>	<b>0.002</b>

Assumptions: Unit cost assumptions and scaling as for best estimate described above. The low cost estimate assumes that 6 cables which cross one of the 99 inshore MCZs are developed every five years across all MCZs (i.e. 24 across all regions over the 20 year IA period). This is scaled down by 18.2% for tranche 2 i.e. 18/99 = 18.2%. So £0.010m x 6 x 18.2% = £0.011m every 5 years.

## Commercial Fisheries (UK)

Commercial Fisheries (UK): Best Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Gross value added lost (£m)	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.674	0.034
<b>Total (£m)</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.034</b>	<b>0.674</b>	<b>0.034</b>
<b>Present Value Costs (£m)</b>	<b>0.034</b>	<b>0.033</b>	<b>0.031</b>	<b>0.030</b>	<b>0.029</b>	<b>0.028</b>	<b>0.027</b>	<b>0.026</b>	<b>0.026</b>	<b>0.025</b>	<b>0.024</b>	<b>0.023</b>	<b>0.022</b>	<b>0.022</b>	<b>0.021</b>	<b>0.020</b>	<b>0.019</b>	<b>0.019</b>	<b>0.018</b>	<b>0.018</b>	<b>0.495</b>	<b>0.025</b>

Costs arise when management of some fishing activities change due to the designation of an MCZ relative to management in the baseline scenario. The scenarios of management are based on the sensitivity of features to different gear types and when a site has a 'maintain' or 'recover' General Management Approach (GMA) as discussed in the main body of the IA. Gear types affected and management required are specific to the site and the feature which the MCZ is designated to protect – these are shown for each site in Annex A. For example, if a feature is sensitive to static gears, such as pots and traps, then the management scenario will likely require restrictions on the use of static gear in the site implying landings from static gear will be affected. Actual management to be applied is for regulators (MMO and IFCA) to decide on and this IA contains a range of illustrative examples for each site. Although costs are calculated from 2015 (when designated), in reality regulators could take a period of time to impose management measures as any bye-law must go through due process and may have its own impact assessment. However, as it is not known in which year measures will be in place for a particular site, costs are conservatively calculated from a 2015 basis leading to a potential overestimate.

Assumptions: Estimates of the fishing activity in each MCZ by the UK fleet between 2010 and 2012 were generated using IFCA sightings data for the under 15m fleet and satellite VMS data for the over 15m fleet. These were then matched to data on landings of fish over 2010 to 2012 to estimate the value of landings from each MCZ. It provides information on the spatial distribution of the value of landings by broad-scale gear types 'static' and 'mobile'. For the purposes of the IA and in the absence of further information, it is assumed that mobile gears are bottom abrading (i.e. bottom trawls and dredges) which is likely to lead to an overestimate of costs on the sector since some will be midwater gears which are unlikely to be affected by management. Fishing revenues are converted into Gross Added Value (GVA) using GVA ratios (the percentage of revenue that constitutes GVA). This is based on the 2010-2012 Seafish Fleet Economic Survey data on industry revenues and costs. The GVA ratio for mobile gear is 37%. The GVA ratio for static gear is 45%.

The best estimate is the 50th percentile, i.e. the mid-point between the lowest and highest cost management scenario for mobile gear types, as both scenarios were considered equally likely to be imposed. For static gear, the best estimate management scenario is the 25th percentile between the lowest and highest cost management scenario, i.e. at the lower end of the range of management scenarios, as for static gear types the high cost scenario is considered unlikely.

The best estimate also assumes that 75% of GVA is displaced as fishermen move to other areas, with 25% of GVA lost. This assumption is based on the low overlap of the MCZs with core fishing grounds<sup>2</sup>. Fishing revenues for each site were sense checked with local IFCA and the MMO. This displacement assumption was not significantly challenged during consultation.

Example (all figures rounded to the nearest £100): Bottom trawling for demersal species, dredging for scallops and potting and creeling for lobster, prawn and crabs all take place within the Farnes East MCZ. The IFCA sightings data, satellite VMS data and data on landings indicated that there were average annual landings worth £78,500 using mobile gear and £241,000 using static gear over 2010-2012 in this site. This site has multiple features with a recover GMA which are sensitive to bottom trawling. A number of illustrative management scenarios were considered for this site. It is not expected that static gear would be managed in this site, and it is not included in any management scenario. Using the Seafish GVA ratios of 37% for mobile gear, it is estimated that GVA from fishing using mobile gear in this site is £29,000 (£78,500\*0.37).

The best estimate of GVA affected by management is the mid-point between the lowest cost and highest cost management scenarios. The lowest cost scenario is that no additional management is imposed and the highest cost is a complete ban on bottom trawling in the MCZ. The best estimate of GVA affected is therefore  $(£0+£29,000)/2 = £14,500$ . It is assumed that 75% of fishing activity is displaced to other locations, meaning that the best

<sup>2</sup> See p42 of the Tranche 1 consultation IA here: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/82721/mcz-designate-ia-20121213.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/82721/mcz-designate-ia-20121213.pdf)

estimate of the annual costs to the fishing sector from the Farnes East site is £14,500\*(1-0.75) = £3,600. This process has been followed for the other sites to reach the total cost estimates shown in the Table above.

Commercial Fisheries (UK): Low Cost Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Gross value added lost (£m)	0.000 <sup>3</sup>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000
<b>Total (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.006</b>	<b>0.000</b>
<b>Present Value Costs (£m)</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.004</b>	<b>0.000</b>

Assumptions: Low cost scenario is the lowest potential management scenario (detailed in Annex A for each site) and assumes 25% of gross value added affected by management is lost, as with the best estimate scenario. As the majority of low cost management scenarios for sites proposed for designation in the 2nd tranche are 'no additional management' actual GVA assumed lost per year is low (£280).

Commercial Fisheries (UK): High Cost Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Gross value added lost (£m)	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	0.327	6.545	0.327
<b>Total (£m)</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>0.327</b>	<b>6.545</b>	<b>0.327</b>
<b>Present Value Costs (£m)</b>	<b>0.327</b>	<b>0.316</b>	<b>0.305</b>	<b>0.295</b>	<b>0.285</b>	<b>0.276</b>	<b>0.266</b>	<b>0.257</b>	<b>0.249</b>	<b>0.240</b>	<b>0.232</b>	<b>0.224</b>	<b>0.217</b>	<b>0.209</b>	<b>0.202</b>	<b>0.195</b>	<b>0.189</b>	<b>0.182</b>	<b>0.176</b>	<b>0.170</b>	<b>4.814</b>	<b>0.241</b>

Assumptions: High cost scenario is the highest potential management scenario (detailed in Annex A for each site) and assumes no displacement of fishing to other areas, i.e. 100% of overlapping fishing GVA is lost.

<sup>3</sup> Note: there is a small estimated cost of £280 GVA lost **per year** under the low cost scenario which does not show in rounding.

## Oil and Gas and Carbon Capture and Storage

Oil and Gas and CCS: Best Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Additional costs to future applications in Licensed 26 <sup>th</sup> Round Blocks (£m)	0.203	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.203	0.010
Additional costs to future CCS apps. (£m)	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.000	0.195	0.010
Additional cost to decommissioning licences (£m)	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.045	0.002
Additional costs to future applications in Licensed 27 <sup>th</sup> and 28 <sup>th</sup> Round Blocks (£m)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.906	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.906	0.095
<b>Total (£m)</b>	<b>0.203</b>	<b>0.000</b>	<b>0.000</b>	<b>0.049</b>	<b>0.011</b>	<b>0.000</b>	<b>0.000</b>	<b>0.049</b>	<b>0.000</b>	<b>1.917</b>	<b>0.000</b>	<b>0.049</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.049</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>2.348</b>	<b>0.117</b>
<b>Present Value Costs (£m)</b>	<b>0.203</b>	<b>0.000</b>	<b>0.000</b>	<b>0.044</b>	<b>0.010</b>	<b>0.000</b>	<b>0.000</b>	<b>0.038</b>	<b>0.000</b>	<b>1.407</b>	<b>0.000</b>	<b>0.033</b>	<b>0.000</b>	<b>0.000</b>	<b>0.007</b>	<b>0.029</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.006</b>	<b>1.777</b>	<b>0.089</b>

The methodology developed for this IA<sup>5</sup> was done in consultation with industry and a pre-consultation meeting in July 2014 with Oil and Gas UK raised no significant concerns with the 2<sup>nd</sup> tranche, and DECC (pers. comm. 2014) confirmed that this is still the most appropriate approach to take in the IA.

Assumptions: All costs to this sector are based on additional costs for appropriate assessment of activities for considering effects on the conservation objectives of broad scale habitats. There are 8 phases during application process (1.survey, 2.drilling exploration, 3. actual drilling, 4. development, 5. operation, 6. maintenance, 7. decommission and 8. post closure monitoring). Industry representatives estimated additional costs to account for MCZs in each phase which has been uprated to 2013 prices using the GDP deflator, as below (all 2013 prices, rounded to nearest £0.001m):

<sup>5</sup> <http://publications.naturalengland.org.uk/publication/1940011>



- For phase 1, 6 and 7 the costs are £0.002m each;
- For phases 2, 3 and 4 the costs are £0.004m each;
- For phase 5 the costs of assessment is £0.021m;
- Phase 8 costs are not expected to take place within the 20yr IA period and so are not included in calculations.

Costs were calculated based on phases of the application process. For applications in the 26<sup>th</sup> round, it is assumed that applications for licensed blocks which are not awarded will only complete phases 2 and 3, but any assessment for these phases will be completed before MCZs are designated and therefore no costs are incurred. Following analysis of DECC GIS files which indicate where oil and gas blocks are offered for licensing<sup>6</sup>, it is estimated that there are no oil and gas blocks in licensed oil and gas blocks awarded in the 26<sup>th</sup> round with discovery or fallow where an MCZ is the nearest environmentally sensitive area, and therefore there are no costs for blocks in the 26<sup>th</sup> round which are awarded with discovery or fallow. The estimated number of oil and gas applications in licenced 26<sup>th</sup> round blocks without discovery or fallow that are awarded is 99 in 2015. Of applications for licensed blocks which were awarded, those applications without discovery or fallow are assumed to complete phases 2 and 3 within the appraisal period, and therefore incur additional costs of assessment of £0.008m (£0.004m + £0.004m). Therefore the relevant calculation is  $(£0.008m \times 99) = £0.812m^7$  in 2015 for the entire suite of 127 MCZs.

These costs are scaled down to MCZs in the second tranche by a factor of  $2/8 = 25.0\%$  as 2 of the 8 sites which are the nearest environmentally sensitive area to blocks on offer as part of the 26<sup>th</sup> round are proposed for designation as part of second tranche. The costs of additional assessment in the 26<sup>th</sup> round therefore total £0.203m ( $£0.812m \times 0.250$ ).

For decommissioning, it is assumed that 50% of 175 fields currently in production will incur additional assessment costs in the 20 year IA period and applicants will complete phase 7 at a cost of £0.002m per application. It is assumed that decommissions take place in 4 phases, in the years 2019, 2024, 2029 and 2034, with  $175 \times 50\% / 4 = 22$  decommissions in each of those years. This results in  $22 \times £0.002m = £0.045m$  in each of those years. This is scaled down to 25.0% resulting in costs of £0.011m in 2019, 2024, 2029 and 2034.

For carbon capture and storage, it is assumed that applicants will complete phases 1 – 7 in the 20 year IA period resulting in costs of  $(£0.002m + £0.004m + £0.004m + £0.004m + £0.021m + £0.002m + £0.002m) = £0.039m$  per application. It is assumed that there will be 20 CCS applications over the 20 year IA period with 5 in 2018, 5 in 2022, 5 in 2026 and 5 in 2030 resulting in costs of £0.195m in each of those years. As with the 26<sup>th</sup> licensing round, costs are scaled down by 25.0% to reflect the proportion of MCZs in the second tranche which are the closest environmentally sensitive area. This results in costs of  $£0.195m \times 25.0\% = £0.049m$  in 2018, 2022, 2026, and 2030.

In the 27<sup>th</sup> and 28<sup>th</sup> round it is assumed that applicants will complete phases 1 – 3 in the 20 year IA period resulting in costs of  $£0.002m + £0.004m + £0.004m = £0.010m$  per application. GIS analysis shows that there are 717 27<sup>th</sup> round blocks on offer which give additional acreage compared to acreage in the 26<sup>th</sup> round where an MCZ is the nearest environmentally sensitive area resulting in costs of  $£0.010m \times 717 = £7.351m^8$  in 2024. This is scaled down by a factor of  $14/54 = 25.9\%$  as 14 of the 54 sites which are the nearest environmentally sensitive area to blocks on offer as part of the 27<sup>th</sup> round are proposed for designation as part of second tranche. The results in costs of  $£7.351m \times 25.4\% = £1.906m$  in 2024.

There are 52 28<sup>th</sup> round blocks on offer which give additional acreage compared to acreage in the 26<sup>th</sup> round where an MCZ is the nearest environmentally sensitive area. However, the sites proposed for designation in the second tranche are not the nearest MCZ to any of the blocks on offer in the 28<sup>th</sup> round and so there are no attributable costs to the second tranche from the 28<sup>th</sup> round of oil and gas licensing.

<sup>6</sup> GIS data available here: <https://www.gov.uk/oil-and-gas-licensing-rounds>

<sup>7</sup> Cost per application is £8,202 resulting in a higher total when multiplied up.

<sup>8</sup> Cost per application is £10,252 resulting in a higher total when multiplied up.

Oil and Gas and CCS: Low Cost Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Additional costs to future applications in Licensed 26 <sup>th</sup> Round Blocks (£m)	0.101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.101	0.005
Additional costs to future CCS apps. (£m)	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.000	0.195	0.010
Additional cost to decommissioning licences (£m)	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.045	0.002
Additional costs to future applications in Licensed 27 <sup>th</sup> and 28 <sup>th</sup> Round Blocks (£m)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.906	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.906	0.095
<b>Total (£m)</b>	<b>0.101</b>	<b>0.000</b>	<b>0.000</b>	<b>0.049</b>	<b>0.011</b>	<b>0.000</b>	<b>0.000</b>	<b>0.049</b>	<b>0.000</b>	<b>1.917</b>	<b>0.000</b>	<b>0.049</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.049</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>2.247</b>	<b>0.112</b>
<b>Present Value Costs (£m)</b>	<b>0.101</b>	<b>0.000</b>	<b>0.000</b>	<b>0.044</b>	<b>0.010</b>	<b>0.000</b>	<b>0.000</b>	<b>0.038</b>	<b>0.000</b>	<b>1.407</b>	<b>0.000</b>	<b>0.033</b>	<b>0.000</b>	<b>0.000</b>	<b>0.007</b>	<b>0.029</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.006</b>	<b>1.675</b>	<b>0.084</b>
Assumptions: Estimates related to decommissioning, CCS, 27 <sup>th</sup> and 28 <sup>th</sup> rounds are same as the best estimate.																						
Only costs related to 26th round differ. All assumptions stay the same apart from the number of future licence applications in blocks in 26th round. The number of future licence applications in awarded blocks in the 26th Round without discovery or fallow are 50% lower than the best estimate resulting in 50 applications x £0.008m = £0.406m <sup>10</sup> . This is scaled down by a factor of 25.0% for the second tranche = £0.101m in 2015.																						

<sup>10</sup> Cost per application is £8,202 resulting in a higher total when multiplied up.

Oil and Gas and CCS: High Cost Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Additional costs to future applications in Licensed 26 <sup>th</sup> Round Blocks (£m)	0.304	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.015
Additional costs to future CCS apps. (£m)	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.000	0.195	0.010
Additional cost to decommissioning licences (£m)	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.011	0.045	0.002
Additional costs to future applications in Licensed 27 <sup>th</sup> and 28 <sup>th</sup> <sup>11</sup> Round Blocks (£m)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.906	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.906	0.095
<b>Total (£m)</b>	<b>0.304</b>	<b>0.000</b>	<b>0.000</b>	<b>0.049</b>	<b>0.011</b>	<b>0.000</b>	<b>0.000</b>	<b>0.049</b>	<b>0.000</b>	<b>1.917</b>	<b>0.000</b>	<b>0.049</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.049</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>2.450</b>	<b>0.122</b>
<b>Present Value Costs (£m)</b>	<b>0.304</b>	<b>0.000</b>	<b>0.000</b>	<b>0.044</b>	<b>0.010</b>	<b>0.000</b>	<b>0.000</b>	<b>0.038</b>	<b>0.000</b>	<b>1.407</b>	<b>0.000</b>	<b>0.033</b>	<b>0.000</b>	<b>0.000</b>	<b>0.007</b>	<b>0.029</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.006</b>	<b>1.878</b>	<b>0.094</b>

Assumptions: Estimates related to decommissioning, CCS, 27<sup>th</sup> and 28<sup>th</sup> rounds are same as the best estimate.

Only costs related to 26th round differ. All assumptions stay the same apart from the number of future licence applications in blocks in 26th round. The number of future licence applications in awarded blocks in the 26th Round without discovery or fallow are 50% higher than the best estimate resulting in 149 applications x £0.008m = £1.218m<sup>12</sup>. This is scaled down by a factor of 25.0% for the second tranche = £0.304m in 2015.

<sup>12</sup> Cost per application is £8,202 resulting in a higher total when multiplied up.

## Ports and Harbours

Ports and Harbours: Best Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
One off Transitional costs to ports with a MDP (£m)	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.002
Navigational Dredging Licence Application Costs (£m)	0.037	0.006	0.004	0.031	0.000	0.004	0.031	0.000	0.010	0.031	0.006	0.004	0.031	0.000	0.004	0.037	0.000	0.004	0.031	0.000	0.273	0.014
Port Development Additional Licence Application Costs (£m)	0.043	0.049	0.043	0.043	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.835	0.042
Disposal at sea additional Licence Application Costs (£m)	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	1.378	0.069
<b>Total (£m)</b>	<b>0.189</b>	<b>0.124</b>	<b>0.116</b>	<b>0.143</b>	<b>0.110</b>	<b>0.114</b>	<b>0.141</b>	<b>0.110</b>	<b>0.120</b>	<b>0.141</b>	<b>0.116</b>	<b>0.114</b>	<b>0.141</b>	<b>0.110</b>	<b>0.114</b>	<b>0.147</b>	<b>0.110</b>	<b>0.114</b>	<b>0.141</b>	<b>0.110</b>	<b>2.526</b>	<b>0.126</b>
<b>Present Value Costs (£m)</b>	<b>0.189</b>	<b>0.120</b>	<b>0.108</b>	<b>0.129</b>	<b>0.096</b>	<b>0.096</b>	<b>0.115</b>	<b>0.086</b>	<b>0.091</b>	<b>0.104</b>	<b>0.082</b>	<b>0.078</b>	<b>0.093</b>	<b>0.070</b>	<b>0.071</b>	<b>0.088</b>	<b>0.063</b>	<b>0.063</b>	<b>0.076</b>	<b>0.057</b>	<b>1.876</b>	<b>0.094</b>

Assumptions: Additional costs will be incurred for future licence applications for navigational dredging areas, disposal sites and port developments within 5km of an MCZ. Unit costs are based on estimates provided by environmental consultants during the regional projects process.

For navigational dredging areas, ports within 5km of an MCZ will either incur:

- Where ports have a Maintenance Dredging Protocol (MDP), a one-off cost of £0.009m per port to update the MDP in 2015; or
- Where ports do not have an MDP, a cost of £0.007m each time they apply for a licence for navigational dredging for additional assessment

**Cost of updating MDPs:** In Scenario A, it is assumed that approximately 30% of ports within 5km of an MCZ being designated in Tranche 2 (approximately 2 ports) have an MDP, and therefore incur a total cost of £0.020m. In Scenario B it is assumed that approximately 60% of ports within 5km (approximately 7 ports), and therefore the costs of updating MDPs is £0.061m. The best estimate of these is the midpoint of Scenarios A and B and equals  $(£0.020m + £0.061m) / 2 = £0.040m$  in 2015.

**Cost of additional assessment for navigational dredging:** Ports not covered by MDPs within 5km of MCZs must carry out additional assessment when applying for a licence for navigational dredging. As shown above, in scenario A it is assumed that 30% of ports have an MDP, while in Scenario B it is assumed that 60% of ports have an MDP. The best estimate is therefore that 45% of ports have an MDP, while 55% do not have an MDP and must carry out additional assessment when applying for a licence for navigational dredging. Unless otherwise indicated, it is assumed that a navigational dredge licence renews every 3 years. There are 9 navigational dredge licences at MCZs proposed for designation in the 2<sup>nd</sup> tranche. There are 8 every three years from 2015 onwards resulting in costs of 8 applications x £0.007m x 55% = £0.031m in those years and 1 every three years from 2017 onwards resulting in costs of 1 application x £0.007m x 55% = £0.004m in those years. In addition, two other ports in the North East responded in consultation that they applied for a navigational dredging licence more irregularly than every three years. In the North-East fewer ports currently have an MDP, and therefore in the best estimate only 12.5% of ports are assumed to have an MDP. Costs for these ports therefore total:

- One port indicated that they expected to apply for a license every 10 years from 2015, thus resulting in costs of £0.007m x 87.5% (£0.006m) in 2015 and 2025.
- Another port indicated that they expected to apply for a license every 7 years from 2016, thus resulting in costs of £0.007m x 87.5% (£0.006m) in 2016, 2023 and 2030.

**Costs for port development:** additional licence application costs are £0.007m per application. Future developments are currently known about in two sites:

- In Bideford to Foreland Point port developers are expected to incur these costs for 1 application in each of the years 2015, 2016, 2017 and 2018 i.e. a cost of £0.007m in those years.
- In Dover to Deal port developers are expected to incur these costs for 1 application 2016, i.e. a cost of £0.007m in this year.<sup>13</sup>

In addition, it is assumed that each region will have some form of development over the 20 year IA period. The number of estimated developments is based on MMO data on the number of licence applications received for port developments in each region over 2011 – 2013. It is assumed that 50% of applications are within 5km of an MCZ resulting in 28 possible applications per year. This is scaled down in each region by the number of MCZs proposed for designation in the 2<sup>nd</sup> tranche: North Sea = 8 applications x (6 sites / 26 sites) x £0.007m = £0.013m; South West waters = 8 applications x (8 sites / 51 sites) x £0.007m = £0.005m; Irish Sea = 1 application x (2 sites / 19 sites) x £0.007m = £0.000m; and South East waters = 15 applications x (7 sites / 31 sites) x £0.007m = £0.023m. £0.013m + £0.005m + £0.000m + £0.023m = £0.041m each year from 2019. In the years 2015 – 2018 the South West Waters the cost is £0.007m to account for the development at Bideford to Foreland Point instead of £0.005m to avoid double counting. This gives £0.007m + £0.013m + £0.000m + £0.023m = £0.043m in those years.

**Costs for disposal site licence applications** include £4,500 external costs (estimates from consultancy firms), plus £2,250 internal costs (industry estimates, including overheads) every 6 years when SNCBs update the detailed baseline for each site and £2,250 in the intervening years. This is because in the intervening years no new information is expected to be available and so costs of finding it and using it should be less as it can be recycled from previous applications (MMO, pers. comm. 2014). This results in an average of £0.003m per year (uprated 2013 price) over 6 years as it is not known in which year the detailed baseline will be updated for a particular MCZs. The number of licence applicants for disposal sites is based on the average annual number of licence applicants who have used sites in over ten years (2004 – 2013, Cefas, pers. comm, 2014). This varies from site to site, but on average there are 22.4 applicants per year for disposal sites within 5km of MCZs recommended for designation as part of the 2<sup>nd</sup> tranche which results in costs of 22.4 x £0.003m = £0.069m per year.

For all ports scenarios, the mitigation of impacts on MCZ features that is likely to be needed has been identified on a site-by-site basis based on advice provided by Natural England, MMO, CEFAS and the Crown Estate (pers. comms. 2014) and through pre-consultation engagement with the ports sector including Associated British Ports in May 2014. It is assumed that no mitigation will be required for sites proposed for designation in the 2<sup>nd</sup> tranche.

<sup>13</sup> Developers will also have to account for their impact on the Dover to Folkestone site, but it is not expected there will be an additional cost for this over the cost of assessing the impact on the Dover to Deal site.

Ports and Harbours: Low Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
One off Transitional costs to ports with a MDP (£m)	0.061	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.061	0.003
Navigational Dredging Licence Application Costs (£m)	0.029	0.005	0.003	0.024	0.000	0.003	0.024	0.000	0.008	0.024	0.005	0.003	0.024	0.000	0.003	0.029	0.000	0.003	0.024	0.000	0.214	0.011
Port Development Additional Licence Application Costs (£m)	0.043	0.049	0.043	0.043	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.835	0.042
Disposal at sea additional Licence Application Costs (£m)	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	1.378	0.069
<b>Total (£m)</b>	<b>0.202</b>	<b>0.124</b>	<b>0.115</b>	<b>0.136</b>	<b>0.110</b>	<b>0.113</b>	<b>0.134</b>	<b>0.110</b>	<b>0.118</b>	<b>0.134</b>	<b>0.115</b>	<b>0.113</b>	<b>0.134</b>	<b>0.110</b>	<b>0.113</b>	<b>0.139</b>	<b>0.110</b>	<b>0.113</b>	<b>0.134</b>	<b>0.110</b>	<b>2.487</b>	<b>0.124</b>
<b>Present Value Costs (£m)</b>	<b>0.202</b>	<b>0.119</b>	<b>0.107</b>	<b>0.122</b>	<b>0.096</b>	<b>0.095</b>	<b>0.109</b>	<b>0.086</b>	<b>0.090</b>	<b>0.098</b>	<b>0.082</b>	<b>0.077</b>	<b>0.089</b>	<b>0.070</b>	<b>0.070</b>	<b>0.083</b>	<b>0.063</b>	<b>0.063</b>	<b>0.072</b>	<b>0.057</b>	<b>1.853</b>	<b>0.093</b>
Assumptions: Port development application costs and disposal licence application costs as best estimate.																						
<p>There is a one off transitional cost in 2015 for ports that have a maintenance dredge protocol (MDP) for navigational dredging where it is assumed that approximately 60% of ports within 5km (approximately 7 ports) have a cost of £0.009m = £0.061m with rounding<sup>14</sup>. In addition, there is a cost of £0.007m per future licence application for those ports not covered by MDPs within 5km of MCZs and this applies to approximately 40% of applications. It is assumed that a navigational dredge licence renews every 3 years and there are 9 navigational dredge licences at MCZs proposed for designation in the 2<sup>nd</sup> tranche. There are 8 every three years from 2015 onwards resulting in costs of 8 applications x £0.007m x 40% = £0.024m in those years and 1 every three years from 2017 onwards resulting in costs of 1 application x £0.007m x 40% = £0.003m in those years. In addition, two other ports in the North East responded in consultation that they applied for a navigational dredging licence more irregularly than every three years. In the North-East fewer ports currently have an MDP, and therefore in the low cost estimate only 25% of ports are assumed to have an MDP. Costs for these ports therefore total:</p>																						

<sup>14</sup> The transitional cost for the low cost ports scenario is higher than for the high cost scenario is it associated with Maintenance Dredge Protocols which save businesses money over time.

- One port indicated that they expected to apply for a license every 10 years from 2015, thus resulting in costs of £0.007m x 75% (£0.005m) in 2015 and 2025.
- Another port indicated that they expected to apply for a license every 7 years from 2016, thus resulting in costs of £0.007m x 75% (£0.005m) in 2016, 2023 and 2030.

**Ports and Harbours: High Estimate**

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
One off Transitional costs to ports with a MDP (£m)	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.001
Navigational Dredging Licence Application Costs (£m)	0.045	0.007	0.005	0.038	0.000	0.005	0.038	0.000	0.012	0.038	0.007	0.005	0.038	0.000	0.005	0.045	0.000	0.005	0.038	0.000	0.332	0.017
Port Development Additional Licence Application Costs (£m)	0.043	0.049	0.043	0.043	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.835	0.042
Disposal at sea additional Licence Application Costs (£m)	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	0.204	4.083	0.204
<b>Total (£m)</b>	<b>0.311</b>	<b>0.261</b>	<b>0.252</b>	<b>0.285</b>	<b>0.245</b>	<b>0.250</b>	<b>0.283</b>	<b>0.245</b>	<b>0.257</b>	<b>0.283</b>	<b>0.252</b>	<b>0.250</b>	<b>0.283</b>	<b>0.245</b>	<b>0.250</b>	<b>0.290</b>	<b>0.245</b>	<b>0.250</b>	<b>0.283</b>	<b>0.245</b>	<b>5.269</b>	<b>0.263</b>
<b>Present Value Costs (£m)</b>	<b>0.311</b>	<b>0.252</b>	<b>0.235</b>	<b>0.257</b>	<b>0.214</b>	<b>0.211</b>	<b>0.230</b>	<b>0.193</b>	<b>0.195</b>	<b>0.208</b>	<b>0.179</b>	<b>0.172</b>	<b>0.187</b>	<b>0.157</b>	<b>0.155</b>	<b>0.173</b>	<b>0.141</b>	<b>0.140</b>	<b>0.153</b>	<b>0.128</b>	<b>3.890</b>	<b>0.194</b>

Assumptions: Port development application costs as best estimate.

There is a one off transitional cost in 2015 for ports that have a maintenance dredge protocol (MDP) for navigational dredging where it is assumed that approximately 30% of ports within 5km (approximately 2 ports) have costs of £0.009m = £0.020m with rounding. In addition, there is a cost of £0.007m per future licence application for those ports not covered by MDPs within 5km of MCZs and this applies to approximately 70% of applications. It is assumed that a navigational dredge licence renews every 3 years and there are 9 navigational dredge licences at MCZs proposed for designation in the 2<sup>nd</sup> tranche. There are 8 every three years from 2015 onwards resulting in costs of 8 applications x £0.007m x 70% = £0.038m with rounding in those years and 1 every three years from 2017 onwards resulting in costs of 1 application x £0.007m x 70% = £0.005m in those years. In addition, two other ports in the North East responded in consultation that they applied for a navigational dredging licence more irregularly than every three years. In the North-East fewer ports currently have an MDP, and therefore in the high cost estimate no ports are assumed to have an MDP. Costs for these ports therefore total:

- One port indicated that they expected to apply for a license every 10 years from 2015, thus resulting in costs of £0.007m x 100% (£0.007m) in 2015 and 2025.
- Another port indicated that they expected to apply for a license every 7 years from 2016, thus resulting in costs of £0.007m x 100% (£0.007m) in 2016, 2023 and 2030.

In the high cost scenario for disposal licence applications the assumed costs are £0.007m per application rather than applicant. The number of licence applications for disposal sites is based on the average annual number of licence applicants who have used sites in over ten years (2004 – 2013, Cefas, pers. comm, 2014, which varies from site to site). On average there are 29.5 applications per year for disposal sites within 5km of MCZs recommended for designation as part of the second tranche which results in costs of 29.5 x £0.007m = £0.204m per year with rounding.

## Renewable Energy

### Renewable Energy: Best & Low Cost Estimate

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Wave & Tidal Energy one-off costs (£m)	0.109	0.000	0.000	0.000	0.000	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.000	0.000	0.000	0.000	0.195	0.010
<b>Total costs (£m)</b>	<b>0.109</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.067</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.019</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.195</b>	<b>0.010</b>
<b>Present Value Costs (£m)</b>	<b>0.109</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.057</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.177</b>	<b>0.009</b>

Assumptions: Additional application costs for wind energy operators are only assumed to occur for yet-to-be consented developments via additional application costs and mitigation measures for cables that overlap with an MCZ. Pre-consultation engagement and information from MMO, Natural England and Crown Estate (pers. comms. 2014) indicates that no such developments overlap with sites proposed for the 2<sup>nd</sup> tranche of MCZs so there are no additional associated monetised costs. There were no consultation responses which disputed this.

For wave and tidal energy, the additional one-off licence cost is estimated based on estimates by 9 developers. 8 developers provided estimates on a per site basis, the average of which is £0.013m per MCZ (uprated 2013 price). Scottish Power provided the ninth estimate (pers. comm., 2011), which was £0.005m (uprated 2013 price) per MCZ broad scale habitat. This is then weighted appropriately per site ((£0.005m x number of broad scale habitats proposed for designation + £0.013m x 8) / 9 developer estimates in total to get an average cost) leading to slightly different application costs per site depending on the number of broad scale habitats designated. It is assumed that for each of the sites within potential tidal and wave generation potential development areas there will be 1 licence application in the 20 year IA period. Bideford to Foreland Point MCZ GIS analysis shows the MCZ to overlap with the known 'Lynmouth Commercial Demonstration' tidal project (in development, at the pre-scoping consent stage) so this site has an additional application assumed for this. Costs have also been added for additional assessment for the planned West Cumbria tidal lagoon project at Allonby Bay MCZ and the Pro Tide tidal energy project which is close to the Dover to Folkestone and Dover to Deal MCZs. No developments are expected to face mitigation costs as a result of MCZs. There were no consultation responses which disputed this.

This results in 6 additional application costs in 2015 (£0.020m +£0.019m + £0.018m + £0.018m + £0.017m + £0.016m), 4 in 2020 (£0.015m + £0.013m + £0.020m + £0.019m) and 1 in 2030 (£0.019m) affecting 10 sites.

### Renewable Energy: High Cost Estimate

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Wave & Tidal Energy one-off costs (£m)	0.147	0.000	0.000	0.000	0.000	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.000	0.000	0.000	0.000	0.233	0.012
<b>Total costs (£m)</b>	<b>0.147</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.067</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.019</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.233</b>	<b>0.012</b>
<b>Present Value Costs (£m)</b>	<b>0.147</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.057</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.011</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.215</b>	<b>0.011</b>



Assumptions: As best estimate, except for the costs of additional assessment for the West Cumbria Tidal Lagoon at Allonby Bay MCZ. Costs of additional assessment following designation of an MCZ are more uncertain for this development, as it is larger than other potential tidal and wave energy devices. To illustrate this uncertainty, in the high cost scenario the highest developer estimate for additional assessment is used. This is £0.005m (uprated 2013 price) per MCZ broad scale habitat based on an estimate from Scottish Power (pers. comm. 2011). As there are 11 broad-scale habitats proposed for designation in this MCZ, this results in an additional cost of assessment of £0.056m in the high cost scenario at this site in 2015, compared to £0.018m in the best estimate. As a result, in the high cost scenario costs to the renewables sector are £0.038m higher in 2015 than in the best estimate.

## Public Sector Costs

### Ecological Surveys, Verification and Monitoring

Ecological Surveys, Verification and Monitoring: Best Estimate and Low Cost Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Total NE one-off costs (transitional baseline setting) (£m)	0.758	0.758	0.758	0.758	0.758	0.758	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.550	0.228
Total JNCC one-off costs (transitional baseline setting) (£m)	0.374	0.374	0.374	0.374	0.374	0.374	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.241	0.11205
Total NE one-off costs of monitoring (£m)	0.000	0.000	0.000	0.000	0.000	0.000	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	9.240	0.462
Total JNCC one-off costs of monitoring (£m)	0.000	0.000	0.000	0.000	0.000	0.000	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	5.229	0.26145
<b>Total (£m)</b>	<b>1.132</b>	<b>1.132</b>	<b>1.132</b>	<b>1.132</b>	<b>1.132</b>	<b>1.132</b>	<b>1.034</b>	<b>1.034</b>	<b>1.034</b>	<b>1.034</b>	<b>1.034</b>	<b>1.034</b>	<b>1.034</b>	<b>1.034</b>	<b>1.034</b>	<b>1.034</b>	<b>1.034</b>	<b>1.034</b>	<b>1.034</b>	<b>1.034</b>	<b>21.260</b>	<b>1.063</b>
<b>Present Value Costs (£m)</b>	<b>1.132</b>	<b>1.094</b>	<b>1.057</b>	<b>1.021</b>	<b>0.986</b>	<b>0.953</b>	<b>0.841</b>	<b>0.812</b>	<b>0.785</b>	<b>0.758</b>	<b>0.733</b>	<b>0.708</b>	<b>0.684</b>	<b>0.661</b>	<b>0.638</b>	<b>0.617</b>	<b>0.596</b>	<b>0.576</b>	<b>0.556</b>	<b>0.536</b>	<b>15.745</b>	<b>0.787</b>

Assumptions: Natural England provided assumptions for the monitoring of inshore sites (within 6nm) for the 1<sup>st</sup> tranche impact assessment and confirmed that those assumptions are still valid for the 2<sup>nd</sup> tranche impact assessment (NE, pers. comm. 2014). Costs are based on £0.050m per feature (broad-scale habitat / habitat of conservation interest only - not including species of conservation interest) to include 7 days of acoustic survey and grab and sample analysis in a vessel. For the best and low estimate this is assumed to be reduced to £0.025m per feature assuming 50% overlap with SACs / SPAs leading to less costs attributable to MCZs as costs for monitoring these would be incurred in the baseline. Reporting cycles for MCZs are every 6 years and it is not clear in which year the detailed baseline will be undertaken and subsequent reports. Therefore all estimates of costs are divided by 6 and baseline costs included in the first 6 years of the analysis. The calculation is £0.025m x 182 inshore habitat features (including 9 additional features in 1<sup>st</sup> tranche sites) / 6 = £0.758m baseline costs in the first 6 years, which is a transitional cost.

For monitoring, which applies to the total number of features (irrespective of scientific confidence, including species of conservation interest), the estimate per feature per site has been reduced to £40,000, by eliminating most of the acoustic survey costs which for many sites would only be required as part of the baseline survey. Cost per feature reduced by 50% assuming 50% of inshore MCZs will overlap with SAC/SPA and therefore incur a

survey cost saving. The calculation is £0.020m x 198 inshore features (including 10 additional features in 1<sup>st</sup> tranche sites) / 6 = £0.660m monitoring costs on average per year after 6 years.

JNCC have provided costs on a site basis (pers. comm. 2014) based on the costs of using a boat and its crew, survey time, weather downtime and data analysis, interpretation and report production for the 2<sup>nd</sup> tranche sites. This equates to £2.241m in total for all 7 sites every 6 years. Therefore, this figure is divided by 6 to obtain an annual average cost to JNCC of £0.374m as it is not known in which year the baseline report and subsequent reporting will occur. The costs for the first 6 years for JNCC are also transitional as they are establishing the baseline. As overlap with SACs / SPAs is minimal there is no sensitivity range on costs to them.

These assumptions do not include further savings for economies of scale from surveying several sites in one trip or the potential for technological improvements to reduce costs over time.

#### Ecological Surveys, Verification and Monitoring: High Cost Estimate

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
Total NE one-off costs (transitional baseline setting) (£m)	1.517	1.517	1.517	1.517	1.517	1.517	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.100	0.455
Total JNCC one-off costs (transitional baseline setting) (£m)	0.374	0.374	0.374	0.374	0.374	0.374	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.241	0.112
Total NE one-off costs of monitoring (£m)	0.000	0.000	0.000	0.000	0.000	0.000	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320	18.480	0.924
Total JNCC one-off costs of monitoring (£m)	0.000	0.000	0.000	0.000	0.000	0.000	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	0.374	5.229	0.261
<b>Total (£m)</b>	<b>1.890</b>	<b>1.890</b>	<b>1.890</b>	<b>1.890</b>	<b>1.890</b>	<b>1.890</b>	<b>1.694</b>	<b>1.694</b>	<b>1.694</b>	<b>1.694</b>	<b>1.694</b>	<b>1.694</b>	<b>1.694</b>	<b>1.694</b>	<b>1.694</b>	<b>1.694</b>	<b>1.694</b>	<b>1.694</b>	<b>1.694</b>	<b>1.694</b>	<b>35.050</b>	<b>1.753</b>
<b>Present Value Costs (£m)</b>	<b>1.890</b>	<b>1.826</b>	<b>1.764</b>	<b>1.705</b>	<b>1.647</b>	<b>1.591</b>	<b>1.378</b>	<b>1.331</b>	<b>1.286</b>	<b>1.243</b>	<b>1.201</b>	<b>1.160</b>	<b>1.121</b>	<b>1.083</b>	<b>1.046</b>	<b>1.011</b>	<b>0.977</b>	<b>0.944</b>	<b>0.912</b>	<b>0.881</b>	<b>25.996</b>	<b>1.300</b>

Assumptions: For Natural England costs are based on £0.050m per feature (broad-scale habitat / habitat of conservation interest only - not including species of conservation interest) to include 7 days of acoustic survey and grab and sample analysis in a vessel. The calculation is £0.050m x 182 inshore habitat features (including 9 additional features in 1<sup>st</sup> tranche sites) / 6 = £1.517m baseline costs in the first 6 years, which are transitional costs. For monitoring, which applies to the total number of features (irrespective of scientific confidence, including species of conservation interest), the estimate per feature per site has been reduced to £40,000, by eliminating most of the acoustic survey costs which for many sites would only be required as part of the baseline survey. The calculation is £0.040m x 198 inshore features (including 10 additional features in 1<sup>st</sup> tranche sites) / 6 = £1.320m monitoring costs on average per year after 6 years.

JNCC assumptions are as best and low estimate.

## Management and Enforcement

Management and Enforcement: Best Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
IFCA Implementation Costs (Transitional) (£m)	0.082	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.082	0.004
IFCA enforcement of commercial fisheries management measure costs <6nm (£m)	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	1.992	0.100
Defra and MMO Implementation Costs (Transitional) (£m)	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044	0.002
MMO enforcement of commercial fisheries >6nm and recreation management measure costs (£m)	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	0.645	12.898	0.645
<b>Total (£m)</b>	<b>0.871</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>0.744</b>	<b>15.016</b>	<b>0.751</b>
<b>Present Value Costs (£m)</b>	<b>0.871</b>	<b>0.719</b>	<b>0.695</b>	<b>0.671</b>	<b>0.649</b>	<b>0.627</b>	<b>0.606</b>	<b>0.585</b>	<b>0.565</b>	<b>0.546</b>	<b>0.528</b>	<b>0.510</b>	<b>0.493</b>	<b>0.476</b>	<b>0.460</b>	<b>0.444</b>	<b>0.429</b>	<b>0.415</b>	<b>0.401</b>	<b>0.387</b>	<b>11.078</b>	<b>0.554</b>
Assumptions: The best estimate is the mid-point between the low and high cost scenarios for management and enforcement of MCZs. See below for low and high specific assumptions.																						

Management and Enforcement: Low Cost Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
IFCA Implementation Costs (Transitional) (£m)	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.001
IFCA implementation + enforcement of commercial fisheries management measure costs <6nm (£m)	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	0.072	1.435	0.072
Defra and MMO Implementation Costs (Transitional) (£m)	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.002
MMO enforcement of commercial fisheries >6nm and recreation management measure costs (£m)	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633	12.669	0.633
<b>Total (£m)</b>	<b>0.773</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>0.705</b>	<b>14.172</b>	<b>0.709</b>
<b>Present Value Costs (£m)</b>	<b>0.773</b>	<b>0.681</b>	<b>0.658</b>	<b>0.636</b>	<b>0.615</b>	<b>0.594</b>	<b>0.574</b>	<b>0.554</b>	<b>0.536</b>	<b>0.517</b>	<b>0.500</b>	<b>0.483</b>	<b>0.467</b>	<b>0.451</b>	<b>0.436</b>	<b>0.421</b>	<b>0.407</b>	<b>0.393</b>	<b>0.380</b>	<b>0.367</b>	<b>10.441</b>	<b>0.522</b>
Assumptions: Costs to IFCA's have been supplied by each IFCA in different regions or average assumptions have been used where individual IFCA's have not supplied information (provided by MMO) for the Regional Projects and figures updated in the summer 2014 for the 2 <sup>nd</sup> tranche inshore sites (within 6nm). For the low cost scenario IFCA implementation costs, which are transitional costs, amount to £0.028m in 2015 in total for all IFCA's which																						

reflects the lowest possible management scenarios (detailed in annex A and mainly no additional management / voluntary agreements). Annual IFCA enforcement costs (mainly surveillance in as most sites are no additional mandatory management in the low scenario) are estimated at £0.072m over all IFCAs per year.

Costs to MMO have been supplied on a site by site basis by the MMO based on assumed employee time taken and other overheads to implement, administer and enforce fisheries management measures in sites beyond 6nm and sites where recreational management is a possibility (applicable to 1 site, The Needles, in tranche 2) for the Regional Projects in 2011. These assumptions have been updated or validated as necessary to 2013 prices for the 2<sup>nd</sup> tranche sites (MMO, pers. comm. 2014). For the low cost scenario MMO implementation costs amount to £0.015m for implementing a voluntary agreement on anchoring and mooring at The Needles and Defra implementation costs are estimated to be £0.025m based on employee time and overheads to low scenario management measures which are transitional costs. MMO estimate enforcement costs of £0.381m per year for 9 sites (including The Needles) proposed for designation in the 2<sup>nd</sup> tranche with low scenario management measures that are the responsibility of the MMO (recreational management and fisheries beyond 6nm) and additional administration costs of £0.252m per year. Therefore MMO costs are £0.633m per year thereafter (£0.381m + £0.252m).

Management and Enforcement: High Cost Estimate																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
IFCA Implementation Costs (Transitional) (£m)	0.137	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.137	0.007
IFCA implementation + enforcement of commercial fisheries management measure costs <6nm (£m)	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127	2.549	0.127
Defra and MMO Implementation Costs (Transitional) (£m)	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.049	0.002
MMO enforcement of commercial fisheries >6nm and recreation management measure costs (£m)	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	0.656	13.127	0.656

<b>Total (£m)</b>	0.969	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	15.861	0.793
<b>Present Value Costs (£m)</b>	0.969	0.757	0.732	0.707	0.683	0.660	0.638	0.616	0.595	0.575	0.556	0.537	0.519	0.501	0.484	0.468	0.452	0.437	0.422	0.408	11.715	0.586	

Assumptions: Costs to IFCA have been supplied by each IFCA in different regions. Where IFCA did not supply information, then average assumptions on or average assumptions have been used where individual IFCA have not supplied information (provided by MMO) for the Regional Projects and figures updated in the summer 2014 for the 2<sup>nd</sup> tranche inshore sites (within 6nm). For the High cost scenario IFCA implementation costs, which are transitional costs, amount to £0.137m in 2015 in total for all IFCA which reflects the highest possible management scenarios (detailed in annex A and mainly mandatory bye-laws). Annual IFCA enforcement costs are estimated at £0.127m over all IFCA per year.

Costs to MMO have been supplied on a site by site basis by the MMO based on assumed employee time taken and other overheads to implement administer and enforce fisheries management measures in sites beyond 6nm and sites where recreational management is a possibility (applicable to 1 site, The Needles, in tranche 2) for the Regional Projects in 2011. These assumptions have been updated or validated as necessary to 2013 prices for tranche 2 sites (MMO, pers. comm. 2014). For the high cost scenario MMO implementation costs amount to £0.024m for implementing a bye-law on anchoring and mooring at The Needles and Defra implementation costs are estimated to be £0.025m based on employee time and overheads to low scenario management measures, which are transitional costs. MMO estimate enforcement costs of £0.404m per year for 9 sites (including The Needles) proposed for designation in the second tranche with high scenario management measures that are the responsibility of the MMO (recreational management and fisheries beyond 6nm) and additional administration costs of £0.252m per year. Therefore MMO costs are £0.656m per year thereafter (£0.404m + £0.252m).

### **National Defence**

<b>National: Best Estimate (also low and high cost estimate as no sensitivity)</b>																						
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total (£m)	Annual Average (£m)
One-off transitional costs for adjustment of electronic tools and charts (£m)	0.006	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.001
Annual Costs for maintenance of electronic tools and charts and costs to mitigate impacts of activity (£m)	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.033	0.002
<b>Total (£m)</b>	<b>0.007</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.045</b>	<b>0.002</b>
<b>Present Value Costs</b>	<b>0.007</b>	<b>0.003</b>	<b>0.003</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.035</b>	<b>0.002</b>

<b>(£m)</b>																						
<p>Assumptions: The Ministry of Defence provided costs and assumptions for the impact of MCZs on national defence and this was updated in summer 2014 (MoD, pers. comm. 2014). They estimate that the cost of adjusting electronic tools and charts to take account of MCZs is £0.025m in 2015 based on officer time and overheads, which is a transitional cost in 2015. Annual costs are for maintenance of charts and mitigation of activities on MCZs which, based on officer time and technical inputs by UK Hydrographic Office, is estimated to be £0.015m in the first 4 years, which are transitional costs, and £0.010m per year thereafter. As it is not known where military activities will take place costs are estimated on a whole network basis. Costs have been scaled down by 18.1% for the number of sites in the second tranche (23/127).</p>																						

## Annex E – Impacts on Non-UK Vessels

Although impacts outside the UK are not formally assessed as part of UK policy impact assessments, the implications of designation to Non-UK commercial fishing Vessels are considered in deciding which sites to designate. This is because any management measure imposed at these sites has to be agreed at the EU level as it will need to be done through the Common Fisheries Policy to apply to all member states. Therefore, during the spring and summer of 2014, relevant member states were contacted to provide data on the revenues obtained in MCZs by their vessels by broad gear type.

The following provides an analysis of likely impacts on Non-UK vessels at particular sites<sup>1</sup>. **It estimates revenues affected by potential management measures at particular sites but it is not comparable to impacts estimated for UK vessels which is based on lost Gross Value Added assuming some displacement occurs.** Actual impacts on Non-UK vessels will depend on ability to displace to other areas, Gross Value Added of their revenue to their particular member state and ability to displace, which is likely to be greater for such vessels as they have a large range due to their transnational nature and size. The best estimate revenues affected is based on a 75% displacement assumption as with UK vessels.

This annex has been updated to include details of updated data on fishing activities of the French fleet received from the Direction des Pêches Maritimes et de l'Aquaculture in December 2014. In addition, estimates of the impacts on Non-UK vessels at the Western Channel MCZ have been changed, as it is no longer expected that static gear would be managed at this site following a change in the features at this site. There were no other consultation responses which contained evidence to support changes to the analysis below.

MCZ	Baseline Annual Non-UK Revenues and Data Source(s) (£m/yr <sup>2</sup> 2009-2013 average unless otherwise stated)	Annual Revenues Potentially Affected by Management (£m/yr 2009-2013 average unless otherwise stated)
Farnes East	France: 0.000 <sup>3</sup> (2012-2013 average) Source: Direction des Pêches Maritimes et de l'Aquaculture, pers. comm., 2014  Netherlands: 0.002 (Bottom Trawls/ Dredges); 0.270 (All Other Gear Types) Source: IMARES, part of Wageningen UR, 2014 <sup>4</sup>  <b>Total Revenue from Bottom Abrading Gears<sup>5</sup>: 0.002</b> <b>Total Non-UK Revenue: 0.272</b>	<b>Best Estimate: &lt;0.001</b> <b>(0.000 - 0.002) dependent on management decisions and ability to displace</b>
Fulmar	Belgium: 0.005 (Bottom Trawls) Source: Departement Landbouw en Visserij, 2014 <sup>6</sup>	<b>None as all features have a maintain GMA at this site and so no additional</b>

<sup>1</sup> Note: non-UK fishing vessels are not permitted to fish within 6nm of the UK coast unless historic access rights exist (e.g. North of Lundy) and so most entirely inshore sites are excluded from this analysis.

<sup>2</sup> Where Euros were given from member states, an exchange rate of €1:£0.80 is used to convert all values to £ sterling.

<sup>3</sup> Previous data from DPMA suggested a small amount of activity by French vessels in this site, but updated data shows that there was no activity between 2012 and 2013.

<sup>4</sup> Report prepared for Defra for this IA can be found here: <http://edepot.wur.nl/309495>

<sup>5</sup> Where gear type is not known or it is classed as 'mobile' it is assumed bottom abrading for the purposes of the IA



	<p>Denmark: 0.008 (Bottom Trawls) ; 0.004 (Purse Seines) Source: DTU Aqua, 2014</p> <p>Germany: 0.001 (Mid Water Otter Trawl) Source: Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung), 2014</p> <p>Netherlands: 0.029 (Bottom Trawls); 0.003 (All Other Gear Types) Source: IMARES, part of Wageningen UR, 2014</p> <p><b>Total Revenue from Bottom Abrading Gears: 0.042</b> <b>Total Non-UK Revenue: 0.050</b></p>	<b>management is anticipated</b>
Greater Haig Fras	<p>France: 1.315 (Mobile Gear, 2012-2013 data) Source: Direction des Pêches Maritimes et de l' Aquaculture, 2014</p> <p>Ireland: 0.216 (Bottom Abrading Mobile<sup>7</sup>); 0.021 (Static); 0.001 (Pelagic Trawl) Source: Marine Institute Ireland, 2014</p> <p>Spain: Unquantified but expected to be low, 2013 VMS indicates some low intensity (less than 10 hours fished) demersal trawl activity near but not within the site Source: Secretaría General de Pesca, 2014<sup>8</sup> and Cefas (pers. comm. 2014)</p> <p><b>Total Revenue from Bottom Abrading Gears: 1.531</b> <b>Total Non-UK Revenue: 1.553</b></p>	<b>Best Estimate: 0.193</b> <b>(0.000 – 1.552) dependent on management decisions and ability to displace</b>
North-West of Jones Bank	<p>France: 0.223 (Mobile Gear, 2012-2013 data) Source: Direction des Pêches Maritimes et de l' Aquaculture, 2014</p> <p>Ireland: 0.311 (Bottom Abrading Mobile); 0.001 (Pelagic Trawl) Source: Marine Institute Ireland, 2014</p> <p>Spain: Unquantified but expected to be low, 2013 VMS indicates some low intensity (less than 10 hours fished) demersal trawl activity in the site which could be managed Source: Secretaría General de Pesca, 2014 and Cefas (pers. comm. 2014)</p>	<b>Best Estimate: 0.067</b> <b>(0.000 - 0.534) dependent on management decisions and ability to displace</b>

<sup>6</sup> All Belgian data was given by ICES rectangle from Departement Landbouw en Visserij, 2014 and processed by MMO (pers. comm. 2014) to be MCZ and gear type specific based on the EU fleet register.

<sup>7</sup> For Irish data gear type 'otter' not specified in more detailed and some gear types not given so assumed to be bottom abrading for purposes of IA.

<sup>8</sup> Spanish authorities provided information on which tranche 2 zones have had activity over 2009-2013 but no what gear types or revenues obtained from those zones.

	<p><b>Total Revenue from Bottom Abrading Gears: 0.534</b>  <b>Total Non-UK Revenue: 0.535</b></p>	
Offshore Brighton	<p>Belgium: 0.023 (Bottom Trawls); 0.005 (Scottish Seines)  Source: Departement Landbouw en Visserij, 2014</p> <p>Denmark: 0.016 (Pelagic Trawl)  Source: DTU Aqua, 2014</p> <p>France: 0.347 (bottom trawls / dredges, 2012-2013 data); 0.012 (Mid-water trawl, 2012-2013 data)  Source: Direction des Pêches Maritimes et de l' Aquaculture, 2014</p> <p>Germany: 0.123 (Mid Water Otter Trawl)  Source: Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung), 2014</p> <p>Netherlands: 0.007 (Bottom Trawls/ Dredges); 0.282 (Static); 0.261 (Mid Water Trawls)  Source: IMARES, part of Wageningen UR, 2014</p> <p><b>Total Revenue from Bottom Abrading Gears: 0.377</b>  <b>Total Non-UK Revenue: 1.076</b></p>	<p><b>Best Estimate: 0.065</b>  <b>(0.000 – 0.659) dependent on management decisions and ability to displace</b></p>
Offshore Overfalls	<p>Belgium: 0.038 (Bottom Trawls)  Source: Departement Landbouw en Visserij, 2014</p> <p>Denmark: 0.003 (Pelagic Trawl)  Source: DTU Aqua, 2014</p> <p>France: 0.456 (Bottom Trawls / Dredges, 2012-2013 data); 0.017 (Mid-water trawl, 2012-2013 data)  Source: Direction des Pêches Maritimes et de l' Aquaculture, 2014</p> <p>Germany: 0.011 (Mid Water Otter Trawl)  Source: Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung), 2014</p> <p><b>Total Revenue from Bottom Abrading Gears: 0.494</b>  <b>Total Non-UK Revenue: 0.525</b></p>	<p><b>Best Estimate: 0.062</b>  <b>(0.000 - 0.494) dependent on management decisions and ability to displace</b></p>
West of Walney including proposed co-location zone	<p>Belgium: 0.017 (Bottom Trawls)  Source: Departement Landbouw en Visserij, 2014</p> <p>Denmark: 0.044 (Pelagic Trawl)  Source: DTU Aqua, 2014</p> <p>Ireland: 0.024 (Otter Trawl)  Source: Marine Institute Ireland, 2014</p> <p><b>Total Revenue from Bottom Abrading Gears: 0.041</b>  <b>Total Non-UK Revenue:</b></p>	<p><b>Best Estimate: 0.005</b>  <b>(0.000 - 0.041) dependent on management decisions and ability to displace</b></p>

	<b>0.085</b>	
Western Channel	<p>Belgium: 0.002 (Bottom Trawls) Source: Departement Landbouw en Visserij, 2014</p> <p>France: 2.446 (Bottom Trawls/ Dredges, 2012-2013 data); 0.042 (Static Gear, 2012-2013 data); 0.001 (mid-water trawl, 2012-2013 data) Source: Direction des Pêches Maritimes et de l' Aquaculture, 2014</p> <p>Germany: 0.035 (Mid Water Otter Trawl) Source: Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung), 2014</p> <p>Ireland: 0.012 (Pelagic Trawl) Source: Marine Institute Ireland, 2014</p> <p>Netherlands: 0.001 (Bottom Trawls/ Dredges); 0.012 (Static); 0.067 (Mid Water Trawl) Source: IMARES, part of Wageningen UR, 2014</p> <p>Spain: Unquantified but expected to be low, VMS indicates no activity in the site since 2011 Source: Secretaría General de Pesca, 2014 and Cefas (pers. comm. 2014)</p> <p><b>Total Revenue from Bottom Abrading Gears: 2.449 Total Non-UK Revenue: 2.618</b></p>	<p><b>Best Estimate: 0.306 (0.000 - 2.449) dependent on management decisions and ability to displace</b></p>
<b>All Applicable Tranche 2 sites</b>	<p><b>Total Revenue Bottom Abrading Gears: 5.470 Total Non-UK Revenue: 6.714</b></p>	<p><b>Best Estimate: 0.697 (0.000 – 5.731) dependent on management chose and ability to displace</b></p>

## **Annex F**

### **ADDITIONAL FEATURES RECOMMENDED FOR INCLUSION IN FIRST TRANCHE MCZs**

A number of additional features, which would help fill gaps in the network, have been identified in 1<sup>st</sup> tranche designated MCZs. These sites and the additional features are described below.

#### **NE WATERS**

##### North East of Farnes Deep

This offshore site is located in the North Sea and protects an area of 492 km<sup>2</sup>. The three additional features would be: subtidal mud; subtidal mixed sediments; and ocean quahog. There are no additional costs to business attributable to the inclusion of these features.

#### **SE WATERS**

##### Beachy Head West

This inshore site runs parallel to the East Sussex coastline, from Brighton to the Beachy Head Cliffs, and protects an area of 24 km<sup>2</sup>. The two additional features would be: moderate energy circalittoral rock and high energy circalittoral rock. There are no additional costs to business attributable to the inclusion of these features.

#### **SW WATERS**

##### South Dorset

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

##### Chesil Beach and Stennis Ledges

This inshore site runs along the length of Chesil Beach to the Isle of Portland off the Dorset coast and protects an area of 37 km<sup>2</sup>. The one additional feature would be high energy infralittoral rock. There are no additional costs to business attributable to the inclusion of this feature.

##### Torbay

This inshore site on the South Devon coast protects an area of 20 km<sup>2</sup>. The one additional feature would be peat and clay exposures. There are no additional costs to business attributable to the inclusion of this feature.

##### Upper Fowey and Pont Pill

This inshore site consists of two spatially separate estuary areas on the south coast of Cornwall and protects a total area of 2 km<sup>2</sup>. The one additional feature would be intertidal sand and muddy sand. There are no additional costs to business attributable to the inclusion of this feature.

##### The Manacles

This inshore site is located on the south coast of Cornwall and protects a total area of 3.5 km<sup>2</sup>. The three additional features would be: subtidal coarse sediment; subtidal mixed sediment; and pink sea-fan. There are no additional costs to business attributable to the inclusion of these features.

#### East of Haig Fras

This is an offshore site located north west of Cornwall and protects an area of 400 km<sup>2</sup>. The additional feature is subtidal mud. There are no additional costs to business attributable to the inclusion of this feature.

#### South West Deeps (West)

This large offshore site is located in the far western area of UK waters and protects an area of 1,824 km<sup>2</sup>. The two additional features would be: subtidal mud and fan mussel. There are no additional costs to business attributable to the inclusion of these features.

### **IRISH SEA**

#### Fylde

This inshore site is located off the coast of North West England and protects an area of 260 km<sup>2</sup>. The one additional feature would be subtidal mud. There are no additional costs to business attributable to the inclusion of this feature.

## **SUMMARY OF SITES RECOMMENDED FOR SECOND TRANCHE**

Recommended sites for the 2<sup>nd</sup> tranche of MCZs are described below. These sites fill ecological gaps within the network and have sufficient supporting evidence (both ecological and economic). Site numbers refer to sites detailed in Chart 1.

### **NE WATERS**

#### **Coquet to St. Mary's (1)**

This is an inshore site located on the Northumberland coast in the North East of England. The site covers approximately 199 km<sup>2</sup>. This site fills big gaps in the region for subtidal mixed sediment, infralittoral and circalittoral rock.

The overall costs associated with this site are £13.1k per year relating to the ports and harbours sector, although this is considered to be an overestimate due to economies of scale savings from multiple dredge disposal applications. We have amended the boundary of this site after taking into account the Port of Blyth's concerns to remove the statutory limits of the port.

#### **Farnes East (2)**

This is an offshore site located off the Northumberland Coast. The site covers an area of 945 km<sup>2</sup>. This site protects a wide range of features including: moderate energy circalittoral rock, subtidal coarse sediment, subtidal sand, subtidal mud, sea-pen and burrowing megafauna communities and ocean quahog and will contribute to the percentage protection of several habitats. It is only one of two options to offer a replicate for moderate energy circalittoral rock and also to fill a spatial gap for circalittoral rock. The data is sufficient to support the designation of eight of the features recommended by the Net Gain Regional Project.

The overall costs associated with this site are low at £3.6k per year affecting the UK fishing industry with some minor, unquantified, impact on the non-UK fishing industry.

#### **Fulmar (3)**

This is an offshore site located off the Northumberland coast. The site covers an area of 2,437 km<sup>2</sup>. This site is one of four options to provide a replicate for subtidal mixed sediment and increase the percentage protection in the region for subtidal sand, shallow sands and shelf sands. The data sufficiency is good for five features.

There are no monetised costs for this site as no additional management of fisheries is expected. There is some overlap with oil and gas works being carried out within the site. JNCC are undertaking case work related to the decommissioning of any overlapping works. We do not anticipate any significant costs to fall on this sector.

#### **Runswick Bay (4)**

This is an inshore site covering an area of approximately 68 km<sup>2</sup>. This site protects a wide range of features and fills a spatial gap for infralittoral rock, circalittoral rock and subtidal sediments. It is one of four options to fill a gap for ocean quahog and the only option to increase the percentage protection of high energy infralittoral rock in the region. The site would also increase the percentage protection of coarse and mixed sediments within the region.

The best estimate costs to this site are £3.4k per year which falls on the ports sector for additional licence application costs.

#### Holderness Inshore (5)

This is an inshore site covering an area of approximately 307 km<sup>2</sup>. Although this site does not fill any big gaps within the network it does have the potential to fill smaller gaps with seven features having sufficient data for designation. Additionally, it is recommended that high energy circalittoral rock and moderate energy circalittoral rock are included in the consultation, recognising that while the features are technically present they are not typical examples of the features.

The costs associated with this site are low at £5.5k per year falling primarily to the Ports and Harbour sector due to the proximity of one disposal site and one navigational dredge site within 5km of the MCZ.

#### Cromer Shoal Chalk Beds (6)

This is an inshore site located off the North Norfolk coast covering an area of 316 km<sup>2</sup>. This site fills a gap for high and moderate infralittoral rock. It also provides a replicate for high energy infralittoral rock, increases the percentage protection in the region for moderate energy infralittoral rock and fills a spatial gap for infralittoral rock and circalittoral rock.

At present there are no associated quantified costs identified with regards to this site.

The Regional Project proposal for this site had the inner boundary at 200m from the shoreline to allow for future coastal protection works. Natural England has suggested extending the site by moving the inner boundary to 50m from the shoreline. This would allow a greater area of the features present in the location to be included in the site. However to ensure there would be no impact on any future coastal defence or protection projects this boundary remains at 200m from the shoreline. .

### **SE WATERS**

#### The Swale Estuary (7)

This inshore site covers the Swale Estuary and covers an area of 51 km<sup>2</sup>. This site fills a big gap for smelt and native oyster and provides replicates for several other features including subtidal coarse sediment.

The costs associated with this site are £3.7k per year to the ports sector, although this is considered to be an overestimate due to economies of scale savings from multiple dredge disposal applications. The sector most affected is ports and harbours due to the proximity of a disposal site, with licensed maintenance and navigational dredging associated with local port and harbour operations. Private fishing ground operators have expressed concerns that their activities would be affected but this is unlikely as the features do not appear to have been damaged by current their activities.

#### Dover to Deal (8) & Dover to Folkestone (9)

The Dover to Deal site is located in the Dover Straits, between Deal in the north and Dover harbour in the south. It has an area of 10 km<sup>2</sup>. The site protects a wide range of features in intertidal and subtidal habitats and will offer replicates for Rossworm reef, intertidal

underboulder communities and will contribute to the percentage protection of subtidal coarse sediment.

The Dover to Folkestone site has an area of 20 km<sup>2</sup>. This site protects a wide range of features and will fill a gap for peat and clay exposures. It also provides replicates for intertidal under boulder communities and ross worm reef. Littoral chalk communities in this site are considered to be the best regional examples of these features.

The cost of both sites are £6.1k each per year, with costs mainly relating to the ports sector due to the proximity of Dover harbour and its ongoing operations.

#### Offshore Brighton (10)

This is an offshore site with an area of 862 km<sup>2</sup>. The site lies in the deeper waters of the mid English Channel. This site is the only option to fill the gap for high energy circalittoral rock and one of two options for replicates for subtidal coarse sediment and subtidal mixed sediments.

This site overlaps a productive fishing ground and therefore costs are associated with the commercial fisheries sector. Best estimate costs for the site for UK commercial fishing activity are £3.0k per year. This site is heavily fished by the Belgian, Danish, French, German and Dutch fleets resulting in significant unquantified costs to these fleets.

The French fishing sector proposed an alternative site to replace both Offshore Overfalls and Offshore Brighton MCZs, however initial analysis indicated that the proposed site would not offer the same ecological value to the network.

#### Offshore Overfalls (11)

This site sits across the 12 nautical mile inshore-offshore boundary and has an area of 593 km<sup>2</sup>. This site is the only option to fill a gap for subtidal sand and provides replicates for subtidal mixed sediments and subtidal coarse sediment. This site also contains a geological channel outburst flood feature.

The overall cost to this site is £49.7k per year, mostly falling on the ports and harbour sector, although this is considered to be an overestimate due to economies of scale savings from multiple dredge disposal applications. The cost to UK fishing is £4.9k per year, with significant unquantified costs to the non-UK fishing sector as the site is heavily fished by the Belgian, French and Dutch fleets.

A boundary change proposal made by a group of UK commercial fishermen and recreational sea anglers was considered, but whilst it would reduce socio-economic impacts, it would provide limited conservation benefit. The French fishing sector also proposed an alternative site to replace both Offshore Overfalls and Offshore Brighton MCZs, however initial analysis indicated that the proposed site would not offer the same ecological value to the network.

#### Utopia (12)

This is a small inshore site located to the east of the Isle of Wight and has an area of 2.7 km<sup>2</sup>. The site covers an area of bedrock and large boulders hosting rich communities of sponges, anthozoans, hydroids and bryozoans. This site does not fill a big gap within the network, but the bedrock feature is thought to be locally unique, being an isolated area of rock surrounded by extensive sediment, with significant amounts of reef.



The overall cost to this site is £5.1k per year, mainly affecting the aggregates sector which operates in close proximity to the site.

### The Needles (13)

The site covers the stretch of the Solent adjacent to the northwest side of the Isle of Wight and covers an area of 11 km<sup>2</sup>. This site fills network gaps for subtidal coarse sediment and moderate energy circalittoral rock. It also provides replicates for stalked jellyfish, peacocks tail and seagrass beds.

The cost associated with this site is £16.2k per year. The ports and harbours sector is most affected due to the proximity of two disposal sites which are heavily used and two navigational dredge channels, although this is considered to be an overestimate due to economics of scale savings from multiple dredge disposal applications.

Whilst no formal requests for a boundary change were made, suggestions were made to remove some or all of the bays from the site to ensure recreational boating and anchoring can continue unrestricted. In light of advice on potential management of anchoring within the site, management is likely to be minimal so we do not recommend a boundary change.

## **SW WATERS**

### Western Channel (14)

This is a large offshore site south of Cornwall with an area of 1,614 km<sup>2</sup>. It provides a significant contribution towards protection of subtidal sediment features within the MPA network which are not well protected within the region. The location of the site is also important to improve spatial connectivity between MPAs. Recent survey work has improved our understanding of features within the site, and there is good data supporting the features proposed for designation.

The site overlaps a productive fishing ground and therefore is associated with high UK fishing costs and significant non-UK fishing costs. Best estimate costs for the site, quantified only for UK commercial fishing activity, are £11.0k per year. There may also be significant unquantified costs to non-UK vessels depending on the management measures chosen and the scope for displacing to fishing elsewhere. The site is used by vessels from Spain, Belgium and the Netherlands, and is particularly important to French vessels.

Boundary options may be considered with stakeholders during the consultation to reduce socioeconomic concerns, whilst still maintaining an appropriate level of conservation benefit.

### Mounts Bay (15)

This inshore site covers an area of 11 km<sup>2</sup>. It will protect a range of habitats and species, including the giant goby which is not well protected in MPAs within the region. The site is recognised for its importance to stalked jellyfish. The site is also important for connectivity and offers protection to features that are not included in any existing MPAs.

There are costs related to additional requirements for licence application of £3.0k attributed to the ports sector for a nearby disposal site and navigational dredging.

Minor amendments to the boundary are being considered to include an additional patch of sea grass, which is thought to be important for several species including the Stalked jellyfish. No significant socioeconomic impacts due to the boundary alteration are anticipated.

#### Lands End (Runnel Stone) (16)

This inshore site covers an area of 19 km<sup>2</sup>. It will protect a number of habitats from rock to soft sediments. The site will protect important supporting species such as the Pink sea-fan. The site also contains the Runnelstone reef which is of high ecological importance for a range of mobile species and has scientific value.

The estimated cost associated with this site is £0.8k per year. This falls on the renewable sector assuming that 1 wave and tidal development will be applied for in the next 20 years, however no specific anticipated renewable energy developments are known to be present within or near the site or proposed for the near future. The site is locally important for small amounts of fishing activity, but this is unlikely to be significantly impacted under the current management scenarios. There is a proposal for a change in the site name to Runnel Stone, to more accurately reflect the location of the site and reduce confusion with adjacent MPAs. Minor amendments to the boundary are being considered to improve and simplify for management and enforcement purposes.

#### North West Jones Bank (17)

This offshore site is west of Cornwall and has an area of 464 km<sup>2</sup>. It provides an important contribution to the network by protecting subtidal sediment habitats, and in particular subtidal mud which is not well protected within current MPAs. The site will also protect important supporting species of seapens and burrowing megafauna. Recent survey work undertaken at the site provides good data to support the features.

The designation of the site will impact UK and non-UK commercial fishing interests. Best estimate costs for the site, quantified only for UK commercial fishing activity, are £1.4k per year. Vessels from France, Ireland and Spain may be significantly impacted depending on the management measures chosen and ability to fish elsewhere.

#### Greater Haig Fras (18)

This is a large offshore site west of Cornwall with an area of 2,041 km<sup>2</sup>. The site encompasses the geomorphological feature Haig Fras rock complex and Haig Fras Special Area of Conservation. The site contains a wide range of habitats ranging from rocky to soft sediment habitats which contribute significantly to the network. The site will protect important supporting species such as seapens and burrowing megafauna. The site makes a significant contribution towards achieving the adequacy targets for several subtidal sediment features which are not well protected in the region, as well as additional protection for geological features in the network.

The site sits within an area of high fishing activity from non-UK commercial fishing vessels. Quantified best estimated costs are to UK commercial fishing activity is £5.5k per year, plus potentially significant costs to Non-UK fishing (particularly French, Spanish and Irish vessels).

#### Newquay and the Gannel (19)

This relatively small, 9 km<sup>2</sup>, inshore site covers the Gannel estuary and coastline around Newquay. The site is proposed for a range of habitats and species, including the giant goby

which is not well protected in MPAs within the region. The site has been highlighted as an area of high biodiversity, and includes sediment and saltmarsh habitats which may be important nursery areas for juvenile fish.

Quantified best estimate costs for the site are £1.0k per year to the renewable sector assuming that one application will be made for a wave and tidal development in the next 20 years. While the site overlaps a potential wave energy development area, no specific developments are currently planned. The site is important for local fishing activity, particularly static gear fishing activity. However, this sector is not expected to be impacted under current management scenarios.

#### Hartland Point to Tintagel (20)

This inshore site covers an area of 304 km<sup>2</sup> across the north coast of Devon and Cornwall and contains a wide range of habitats ranging from rocky to soft sediment. The site also offers an option to be a replicate in the region for Honeycomb worm reefs.

A number of sectors will be impacted depending on specific management measures. Quantified best estimated costs are £1.9k per year, mainly for the renewables sector (the site is a potential wave and tidal development area). The site contains locally important fishing activity, particularly using static gear, but this is not expected to be significantly impacted under current management scenarios.

#### Bideford to Foreland Point (21)

This inshore site covers an area of 101 km<sup>2</sup> and would include a large number of features, including both habitats and species that are currently unprotected along this area of coast. This site is critical for connectivity along the north coast of Devon and Cornwall, and contributes large areas of broad-scale habitats. The site is one of two options to protect honeycomb worm reefs.

A number of sectors will be impacted depending on specific management measures. Quantified best estimated costs are £3.4k per year, due to impacts to the renewable energy and ports, harbours and shipping sectors. Baseline values for commercial fishing activity are likely to be underestimated in this region due to data gaps, however, significant impact to local fishing activity is not expected, and the site is generally well supported by local stakeholders.

### **IRISH SEA**

#### West of Walney (22)

This site is located off the Cumbrian coast and covers an area of 388km<sup>2</sup>. This is one of the sites that would provide an important contribution to protecting subtidal mud habitats in the region and contains about 3% of the subtidal mud in the Irish Sea. The other habitat in the site is subtidal sand.

Estimated costs of the site are £3.1k per year, falling on UK commercial fisheries, plus limited unquantified impact on non-UK fishing activity. Unlike the other sites in the region proposed for protecting mud, this site is not strongly opposed by the fishing industry, due to lower levels of current fishing in the site due to part of it being co-located with a windfarm. There are concerns from the windfarm developers about the effects an MCZ designation might have on their future operations. We remain of the view (as set out for the industry

during discussions prior to the consultation) that we do not expect their activities to be unduly affected by designation.

#### Allonby Bay (23)

This site is in inshore waters near the Solway Firth in Cumbria and covers an area of 39km<sup>2</sup>. It would protect a variety of features including intertidal and infralittoral rock, reefs, blue mussel beds, peat and clay exposures, intertidal sand and coarse sediments. None of these features fill big gaps in the marine protected area network but will contribute to filling smaller gaps.

The site has low potential costs associated with it and the local IFCA considers it would be uncontroversial with fishing stakeholders (there are consistently low levels of fishing there). There is a cost associated with the ports sector for this site of £0.9k per annum due to licence application renewals for one disposal site within 5km of the MCZ, and with the renewables sector of £0.9k per annum in relation to additional assessment for a proposed tidal lagoon.